



ICUS

International Center for Urban Safety Engineering,
Institute of Industrial Science, The University of Tokyo

Annual Report 2010



Annual Report 2010

Research Topics

Sustainable Engineering Division

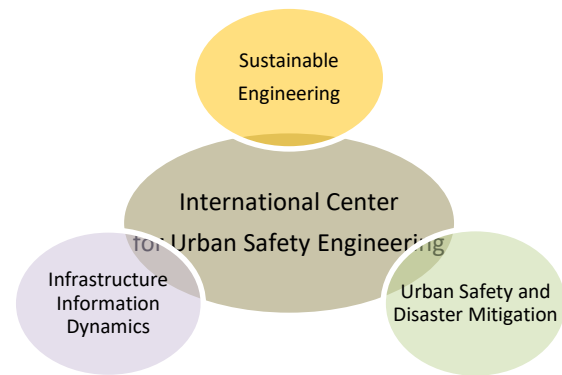
life cycle and stock management, materials property management, performance verification / quality assessment, ground maintenance and sustainability, ground improvement

Urban Safety and Disaster Mitigation Division

urban safety and disaster mitigation strategy, development of disaster information sharing platform, development of information station for emergency management and disaster prevention, post-disaster urban recovery and rehabilitation planning, efficient and economic retrofitting method for masonry structures, development of disaster mitigation planning support technologies

Infrastructure Information Dynamics Division

realization, assessment, prediction, mitigation, and adaptation to climate change, improvement of water resources management, realization, monitoring, and conservation of biodiversity, urban traffic management



Activities and Events

2010/04/27	@IIS	18 th ICUS Open Lecture, "Traffic safety and ITS"
2010/05/12-14	@Hongo	Tsinghua-Todai 2010 (Tsinghua Week at Today)
2010/06/03-05	@IIS	Open House
2010/07/29-30	@Bangkok (AIT)	3 rd Joint Student Seminar on Civil Infrastructures
2010/10/13-15	@Kobe	9 th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA2010)
2010/11/10	@IIS	19 th ICUS Open Lecture, "The construction industry's vision of the future: overseas projects, environmental strategies, and industry structure"



18th ICUS Open Lecture, "Traffic safety and ITS"



Open House



3rd Joint Student Seminar on Civil Infrastructures



Tsinghua-Todai 2010



19th ICUS Open Lecture, "The construction industry's vision of the future: overseas projects, environmental strategies, and industry structure"

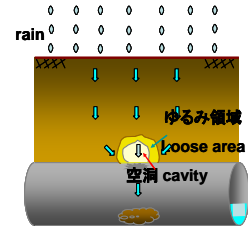
Research Themes

- Formation and evaluation of sustainable construction materials based on social perspectives
- Clarification and practical techniques for measurement of corrosion in RC structures
- RC structures maintenance planning based on risk evaluation
- Development of low cost and ecological repair method for RC structures damaged by fire
- Clarification of carbonation progress in RC structures
- Development of safe, easy and emergency repair method for structures damaged by disaster
- Inspection system during construction process for quality assurance of structural concrete
- Study on lifecycle management for civil infrastructure
- Healing capability of bio-cemented sand
- Effects of underground structure on the formation and expansion of subsurface cavity
- Evaluation of long-term behaviour of earth structure
- Development of sensors for the evaluation of dynamic properties of un-cemented soil
- Assessment of performance degradation of deteriorated infrastructure

Urban Safety Engineering

Infrastructure
Information
Dynamics

Urban Safety and
Disaster Mitigation



Generation and expanding process of cavity and loosening in the ground

Projects

Grant-in-Aid for Scientific Research

- Maintenance planning and risk evaluation for deterioration of cracked RC structures
- Reliability on the lifetime prediction of deteriorated reinforced concrete structures
- Rational management of old earth structure with the evaluation of its soundness

Cooperative Researches

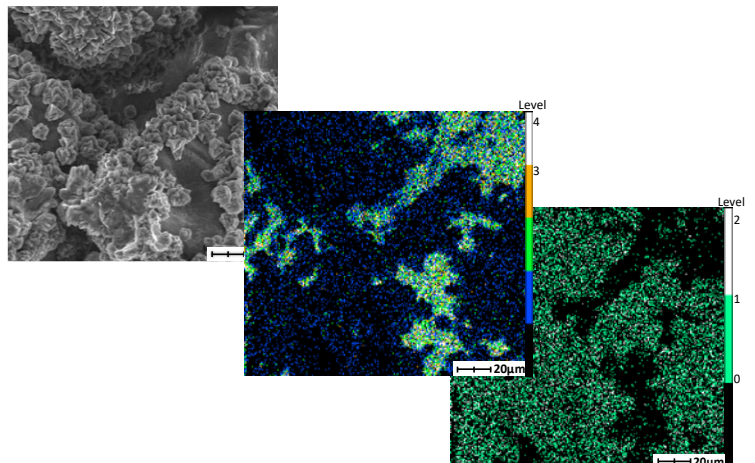
- Development of emergency rapid retrofitting method for damaged structures by disasters (Tokyu Construction Co., LTD)
- Quantitative evaluation of the influence of construction work on the cover concrete durability (Tokyu Construction Co., LTD)
- Techniques for the detection of deep underground cavity
- Study on the process of loosening formation in the ground around a buried structure



Cave-in due to the corrosion failure of sewer pipe



Opening at ground surface at Abira -cho country club , Hokkaido, April, 2009



Soil improvement using the function of microbes

Urban Safety and Disaster Mitigation Division

Sustainable
Engineering

Research Themes

Urban Safety
Engineering

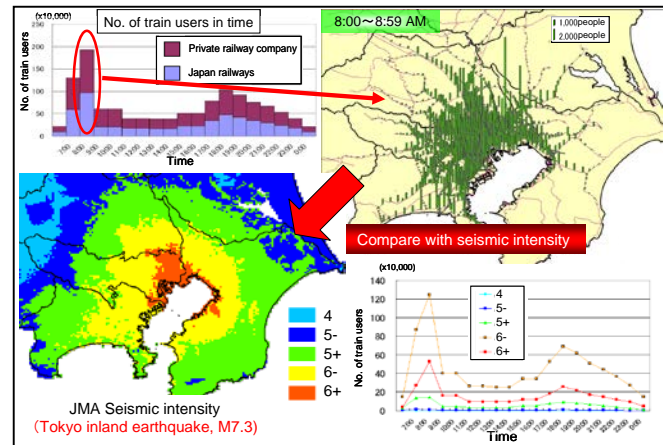
Infrastructure
Information Dynamics

Urban Safety and
Disaster
Mitigation

- Development of integrated information system for total disaster management
- Development of next generation disaster management manual for implementation of efficient countermeasures
- System for promotion of retrofitting of low earthquake resistant structures
- Efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship
- Study on functions of key disaster hospital and its disaster management manual system
- Earthquake-resistant assessment of wooden houses using dynamic properties evaluated through exciter induced vibration
- Research on electric power demand after large-scale earthquake
- Development of Ubiquitous Disaster Mitigation Information system for resident and administration
- Development of support system with multi-dimensional evaluation and search function for crime prevention activity for children.
- Research on early damage assessment system at large-scale earthquake disaster
- Practical Study on Image Training for Urban Rehabilitation and Reconstruction Planning as Preparation for Social Recovery
- Discussion on Advanced Community-based Activities and Planning for Disaster Prevention affected the trend of the present times.
- Study on Urban Mitigation against Large-scale Flooding Focusing on Building Code and Urban Planning Control.
- Study on Long-Distance Evacuation from a Large-scale Flooding in Below-sea-level Cities
- Practical Study on Local Community Collaborative Activities and Planning Adaptable for Climate Change
- Development of SCM Model of University in Preparation for Emergency
- A Study on Trend Analysis on Research Field and efficient research system for disaster mitigation



Establishment of residents participatory planning system in widespread built-up area against climate change



Estimation of the number of train users in each seismic intensity area in the event of Tokyo metropolitan inland earthquake

Projects

Grant-Aid for Scientific Research

- Development of integrated assessment model of water resources for supporting sustainable water security policies
- Research for the formation of a strong coast regional community to the disaster based on the earthquake tsunami risk reduction.
- Policy analysis for the system of crisis-management as accident and disaster measures

Research Promotion Fund

- Project for mitigation of metropolitan earthquake disaster: Study on widespread crisis management and establishment of disaster mitigation (MEXT)
- Development of support system with multi-dimensional evaluation and search function for crime prevention activity for children.
- Research Project for safe and secure scientific technology: Development of Ubiquitous Disaster Mitigation Information system for resident and administration (Ministry of Education, Culture, Sports, Science and Technology)
- Research on electric power demand after large-scale earthquake
- Development of Geographic Disaster Management Information Mash-up Service, (MEXT)
- A Study on Evacuation Population from Large-scale Flood Disaster Regions

Others

- A Study on Solutions for Wide-area and Large-amount Evacuation in Large-scale Flood Disaster
- A consideration of a suitable water resources management boundary for climate change adaptation in international river basins (The Kurita Water and Environment Foundation, 2010-2011)
- Water Resources Management in the Mekong River Basin: Cooperation and Conflict at Basin and Sub-Basin Levels (Spain Government, Casa Asia research grant)
- Development of risk finance method for using BCM for local finance independence in the period of low growth (Nomura Foundation)



Development of triage system for sharing the information in the wide-area

Infrastructure Information Dynamics Division

Sustainable
Engineering

Urban Safety
Engineering

Infrastructure
Information Dynamics

Urban Safety and
Disaster Mitigation

Research Themes

- Analysis of annual change of Russian environment using remote sensing data
- Estimating water ratio of terrestrial surface using visible and microwave remote sensing
- Monitoring phenomena of global change and disasters using remote sensing
- Developing vector based estimation method of tree crown delineation using LiDAR data
- Initial study on 3D rendering of curved surface shape of roof using LiDAR data
- Analysis of documents on environmental issues by natural language processing
- Seismic evaluation of wooden houses in preserved historic districts
- Structural health monitoring of detached wooden houses
- Research on efficient utilization of road space
- Feasibility study of dynamic park & ride
- Microscopic risk analysis of rear-end collision on Metropolitan Expressway

Projects

Grant-in-Aid for Scientific Research

- Development of LES model coupled with chemical reaction model and the analysis of air pollutant behavior in micro-scale area
- Carbon dynamics of Amazonian forest(CADAF), JICA-JST

Research Promotion Fund

- Construction of integrative forest ecosystem observation site and observation network formation in middle and lower Mekong river basin, (Ministry of the Environment Government of Japan)
- A Secular change monitoring of wooden bridge "KINTAI-KYO" (Iwakuni City, Yamaguchi Prefecture)
- Evaluation of seismic performance of traditional wooden houses in important preservation districts for groups of historic buildings, Sawara City (Sawara City, Chiba Prefecture)
- Evaluation of ITS services using universal driving simulator (National Institute of Land and Infrastructure Management)
- Energy ITS project: Establishment of internationally reliable effect evaluation method (New Energy and Industry Technology Development Organization)

Cooperative Researches

- Study on improvement of LIDAR measurement accuracy for forest, (Pasco Corporation)
- Research on advanced mobility (Panasonic System Networks Co., Ltd.)
- Research on application system using road traffic data (Toshiba Corporation)
- Evaluation of intergreen considering platoon in signal control coordination (Sumitomo Electric Industries Ltd.)



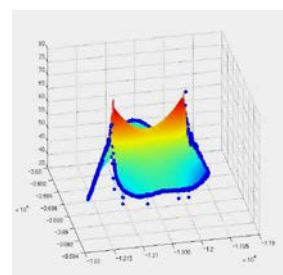
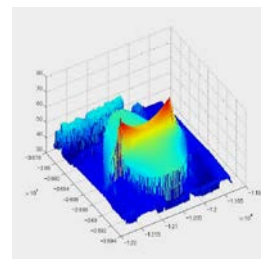
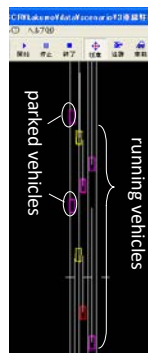
Tsunami line aerial photo map



Traffic management in disaster



Traffic simulation to analyze on-street parking



The extraction of a curved surface roof using LiDAR

Network

Global Network

BNUS

(Bangladesh Network office for Urban Safety) at BUET, Bangladesh

Projects

- Assessment of RC bridges using Ground Penetrating Radar and Microtremor
- Assessment of low lands of Dhaka city using CPT, Microtremor and SPT
- Assessment of high-rise buildings in Dhaka for Fire
- Strong Motion Monitoring System in Bangladesh: 2009 to 2011

Workshops

- Training course on “ Application of GIS for natural hazard and risk assessment ” on September 25-29, 2010
- Workshop on “Risk resilient infrastructures: role of education and training” on November 13-14, 2010
- Lecture course and seminar on “Urban building fire mitigation and safety issues in Asian mega cities: Bangladesh chapter” on December 21-23, 2010
- Workshop on “ Fundamental concepts of fire fighting and formulation of legislation regarding hazardous fire ” on January 20, 2011

Publication

- BNUS annual report — 2010

RNUS

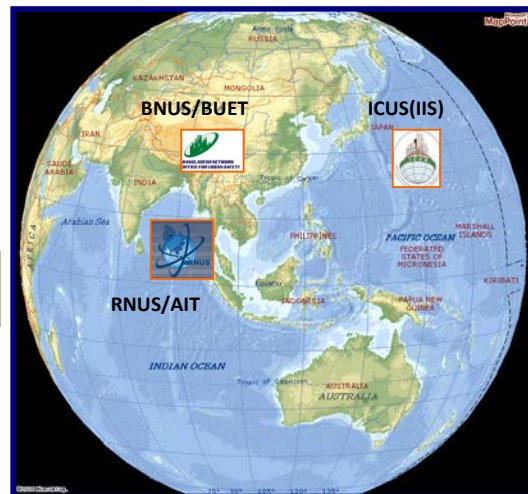
(Regional Network Office for Urban Safety) at AIT, Thailand

Projects / Seminars

- RNUS Seminar on “ Fiber Reinforced Concrete ” on June 30, 2010 at AIT
- “ 3rd International Joint Student Seminar on Civil Infrastructures ” on July 29-30, 2010 at AIT
- “Forefront and Challenges of Geospatial Technologies for Environmental and Disaster Management in Southeast Asia ” on November 27, 2010 at Phatumwan Princess Hotel, Bangkok
- “ Forefront and Challenges of Water Resources Management in Southeast Asia ” on January 29, 2011 at Novotel Bangkok Fenix Ploenchi, Bangkok

Publications

- Forefront and Challenges of Water Resources Management in Southeast Asia
- Forefront and Challenges of Geospatial Technologies for Environment and Disaster Management in Southeast Asia
- 3rd Joint Student Seminar on Civil Infrastructures



Memorandum of Understandings

- RNUS, Asian Institute of Technology
- National Centre for Earthquake Engineering
- Bangladesh Earthquake Society
- Indian Institute of Technology, Kanpur
- Protective Technology Research Centre, Nanyang Technological University
- Dept. of Civil Engineering, National University of Singapore
- LCM Research Center, The Port and Airport Research Institute
- BNUS, Dept of Civil Engineering, Bangladesh University of Engineering and Technology
- Sirindhorn International Institute of Technology, Thammasat University
- Dept. of Civil Engineering, Shibaura Institute of Technology
- Global U-City Construction & Information, Hub Dept. of Civil Engineering, Han Yang University
- Dept. of Construction Engineering, National Kaohsiung First University of Science and Technology
- Center for Public Safety Research, Tsinghua University
- School of Applied Sciences and Engineering, Monash University, Gippsland Campus

(Thailand)
(Bangladesh)
(Bangladesh)
(India)
(Singapore)
(Singapore)
(Japan)
(Bangladesh)
(Thailand)
(Japan)
(Korea)
(Chinese Taipei)
(P. R. China)
(Australia)

Research Committees

The Research Committee 62 (RC62)

- Technologies for evaluation of aging infrastructure performance degradation

The Research Committee 67 (RC67)

- Evaluation of CSR (Cooperate Social Responsibility) activities in Environment conscious Society



RC67 meeting

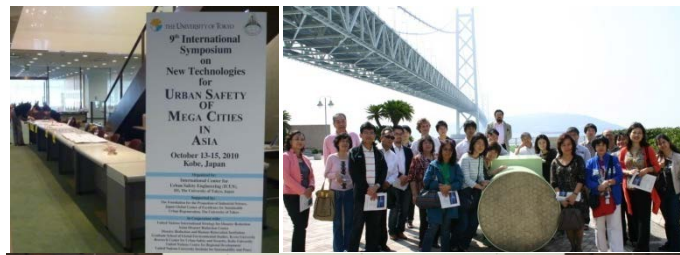
The final reports of The Research Committee 62 (RC62) and 67(RC67) were published.

USMCA

9th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA2010)

Date October 13-15
Venus Kobe International Conference Center, Japan
Participants 125
Key note Speakers

- Prof. Kenzo Toki (Ritsumeikan -Global Innovation Research Organization),
 - Risk management of cultural heritage in Kyoto
- Prof. Yasuo Tanaka (Kobe Univ.),
 - Human resource development for UDRR(Urban Disaster Risk Reduction)
- Prof. Taketo Uomoto (Public Works Research Institute),
 - How long can we use concrete structures?
- Prof. Tsuneo Katayama (Tokyo Denki Univ.),
 - Global warming and its impacts on Asia-from the IPCC AR4
- Prof. Srikantha Herath (UNU),
 - UNU-IPS's challenges on global change and sustainability research
- Prof. Yoshiaki Kawata (Kansai Univ.),
 - Catastrophic compound disasters in Tokyo metropolitan area-



ICUS Project

Proposal of innovative safety cities

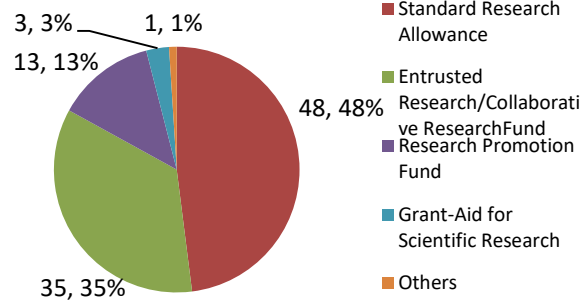
- 3-Dimensional middle rised high density dwelling model for urban block 「500mR」
- Research on high-dense wooden structure city



Research Publications

	Sustainable Engineering Division	Urban Safety and Disaster Mitigation Division	Infrastructure Information Dynamics Division
IIS Bi-monthly Research Report (SEISAN KENKYU)	21	19	15
Books/Translated Books	0	0	0
Reviewed Papers/Journal Papers	17	19	5
Conference Papers (International)	32	18	25
Conference Papers (Domestic)	23	24	32
Survey Reports	6	0	1
Others	12	32	5
Total	111	112	83

Budget



ICUS Activities Recognized

Kimiro Meguro	Apr.,2010	The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Prizes for Science and Technology, Development Category, 2010.	The Minister of Education, Culture, Sports, Science and Technology	Meguro Lab.
Reiko Kuwano Ko, DongHee	May, 2010 July, 2010	Best Paper Award 1st place in the poster presentations	Japan Geotechnical Society the 7th International Conference on Physical Modelling in Geotechnics	Kuwano Lab. Kuwano Lab.
Kenji Hayakawa Mari Sato Takahiro Endo	July, 2010 Aug., 2010 Aug., 2010	Best Presentation Award Best Presentation Award Best Paper Award	Japan Concrete Institute Japan Geotechnical Society International Society for Photo grammetry and Remote Sensing (ISPRS), Commission VIII	Kato (Y) Lab. Kuwano Lab. Sawada Lab.
Kohei Makinodan Kohei Makinodan Michael Henry	Sept.,2 010 Sept., 2010 Sept., 2010	Best Research Award Best Presentation Award Best Presentation Award	Japan Society for Natural Disaster Science	Ohara Lab. Ohara Lab
Tsutomu Takaishi Akiyuki Kawasaki Mari Sato Muneyoshi Numada	Sept., 2010 Oct., 2010 Oct., 2010 Mar., 2011	Best Presentation Award Young Researcher Award Young Award USCMA2010 Best Presentation Awards for Young Researchers	Japan Society of Civil Engineers Japan Society of Civil Engineers GIS Association of Japan USCMA2010	ICUS Meguro Lab. ICUS Kuwano Lab.
Makoto Hosoo Mari Sato	Mar., 2011 Mar., 2011	Furuichi Award Furuichi Award	8th International Conference on Urban Earthquake Engineering Civil Engineering Dept., The University of Tokyo Civil Engineering Dept., The University of Tokyo	Meguro Lab. Kuwano Lab. Kuwano Lab.



International Center for Urban Safety Engineering, Institute of Industrial Science, The University of Tokyo

BW603, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, JAPAN

Tel: 03-5452-6472 Fax: 03-5452-6476

E-mail: icus@iis.u-tokyo.ac.jp <http://icus.iis.u-tokyo.ac.jp/>

Staff Members

Sustainable Engineering Division

- Prof. Hiroshi YOKOTA (Visiting Professor)
- Dr. Reiko KUWANO (Associate Professor)
- Dr. Yoshitaka KATO (Associate Professor)
- Dr. Michael Henry (Project Researcher)

Urban Safety and Disaster Mitigation Division

- Prof. Kimiro MEGURO (Professor / Director)
- Prof. Yasuyoshi ICHIHASHI (Visiting Professor)
- Dr. Takaaki KATO (Associate Professor)
- Dr. Miho OHARA (Associate Professor)
- Dr. Akiyuki KAWASAKI
(Project Research Associate Professor)
- Dr. Muneyoshi NUMADA (Research Associate)
- Dr. Shinya KONDO (Project Researcher)

Infrastructure Information Dynamics Division

- Prof. Haruo SAWADA (Professor)
- Dr. Mikio KOSHIHARA (Associate Professor)
- Dr. Shinji TANAKA (Lecturer)
- Dr. Takahiro ENDO (Research Associate)

Secretary

- Ms. Eiko YOSHIMOTO



Publications

ICUS News Letter

Volume 10, 1-3

ICUS Newsletter is sent to individuals and organizations comprising of foreign embassies, researchers, engineers, consultants and practitioners in about 70 countries, 1300 persons.

The newsletters can be freely downloaded from

<http://icus.iis.u-tokyo.ac.jp/>

ICUS Report

2010/01-09

- "3rd Joint student seminar on civil infrastructures July 30-31, 2010"
- "ICUS External Evaluation Committee Report"
- "Forefront and Challenges of Geospatial Technologies for Environment and Disaster Management in Southeast Asia"
- "Katoyosh Laboratory Research Activities Report 2002-2011"
- "2010 New Technologies for Urban Safety of Mega Cities in Asia"
- "18th ICUS Open Lecture, "Traffic safety and ITS"
- "Properties and sustainability evaluation of green concrete utilizing waste and recycled materials"
- "Forefront and Challenges of Water Resources Management in Southeast Asia"
- "BNUS annual report-2010"

ICUS Research Committee Report

2010/01-02

- "Report on Technologies for evaluation of aging infrastructure performance degradation, 2009-10"
- "Report on Evaluation of CSR (Cooperate Social Responsibility) activities in Environment conscious Society, 2010"

Annual Report