

July 11-15, 2010  
Philadelphia, PA, USA  
http://www.iabmas2010.org  
secretariat@iabmas2010.org

Organized by:  
International Association for Bridge Maintenance and Safety  
Aim: To bring together all of the very best work that has been done  
in the field of bridge maintenance, safety and management and  
to bridge the gap between theory and practice.



Hosted by:

The Fifth International Conference on Bridge Maintenance, Safety and Management



# IABMAS2010

2<sup>nd</sup> Announcement

International Scientific Committee of  
IABMAS2010

#### Committee Chairs

Fabio Biondini, *Italy*  
Andrzej Nowak, *USA*  
Chung-Bang Yun, *Korea*

#### Secretary

Shamim Pakzad, *USA*

#### Ex-Officio Member

Chad Kusko, *USA*

#### Members

A. Emin Atkan, *USA*  
Haluk Aktan, *USA*  
Sreenivas Alampalli, *USA*  
Alfredo H. S. Ang, *USA*  
Giuliano Augusti, *Italy*  
Konrad Bergmeister, *Austria*  
Jan Bien, *Poland*  
Franco Bontempi, *Italy*  
Geoff Bouilly, *Australia*  
Fernando Branco, *Portugal*  
James Brownjohn, *UK*  
Eugen Bruehwiler, *Switzerland*  
Michael Bruneau, *USA*  
Christian Bucher, *Austria*  
Harald Budelmann, *Germany*

Xin Ruan, *China*  
Salvatore Russo, *Italy*  
Mehdi Saiidi, *USA*  
Richard Sause, *USA*  
Richard Shepard, *USA*  
Masanolu Shinozuka, *USA*  
Dong-Ku Shin, *Korea*  
Soobong Shin, *Korea*  
Arunprakash M. Shirole, *USA*  
Jongsung Sim, *Korea*  
Marja-Kaarina Söderqvist, *Finland*  
Mark Stewart, *Australia*  
Luc Taerwe, *Belgium*  
Man-Chung Tang, *USA*  
Palle Thoft-Christensen, *Denmark*  
Paul Thompson, *USA*  
Tomoaki Utsunomiya, *Japan*  
Pedro Vellasco, *Brazil*  
Thomas Vogel, *Switzerland*  
Eiichi Watanabe, *Japan*  
You-Lin Xu, *Hong Kong, P.R.C.*  
Zhishen Wu, *Japan*  
Bojidar Yanev, *USA*  
Riccardo Zandonini, *Italy*  
Yunfeng Zhang, *USA*

Joan Casas, *Spain*  
Necati Catbas, *USA*  
Chin-Chen Chang, *Hong Kong, P.R.C.*  
Michael Chajes, *USA*  
Kuo-Chun Chang, *Taiwan, R.O.C.*  
Sung-Pil Chang, *Korea*  
Steven Chase, *USA*  
Airong Chen, *China*  
Moe Cheung, *Hong Kong, P.R.C.*  
Hyo-nam Cho, *Korea*  
Marios Chryssanthopoulos, *UK*  
Young Soo Chung, *Korea*  
Marcello Ciampoli, *Italy*  
Joel Conte, *USA*  
Ross Corotis, *USA*  
Christian Cremona, *France*  
Paulo Cruz, *Portugal*  
Andrea Del Grosso, *Italy*  
George Deodatis, *USA*  
Sofia Diniz, *Brazil*  
Sheila Duwadi, *USA*  
Lennart Elfgren, *Sweden*  
Bruce Ellingwood, *USA*  
Ib Enevoldsen, *Denmark*  
Allen Estes, *USA*  
Glauco Feltrin, *Switzerland*  
João Almeida Fernandes, *Portugal*  
Joaquim Figuerias, *Portugal*  
John W. Fisher, *USA*

International Organizing Committee  
of IABMAS2010

#### Committee Chairs

A. Emin Aktan, *USA*  
Jens Sandager Jensen, *Denmark*  
Hyun-Moo Koh, *Korea*

#### Ex-Officio Members

Dan Frangopol, *USA*  
Chad Kusko, *USA*  
Richard Sause, *USA*

#### Members

Eugene Bruehwiler, *Switzerland*  
Joan Casas, *Spain*  
Airong Chen, *China*  
Sheng-Jin Chen, *Taiwan, R.O.C.*  
Christian Cremona, *France*  
Paulo Cruz, *Portugal*  
Yozo Fujino, *Japan*  
Hitoshi Furuta, *Japan*  
Rudolph Kotze, *New Zealand*  
Pier-Giorgio Malerba, *Italy*  
Chitoshi Miki, *Japan*  
Aftab Mufti, *Canada*  
Young Suk Park, *Korea*  
Robert Sweeney, *Canada*  
Man Chung Tang, *USA*  
Teng, Jin-Guang, *Hong Kong, P.R.C.*  
Eiichi Watanabe, *Japan*  
Chung-Bang Yun, *Korea*

Michael Forde, *UK*  
Dan M. Frangopol, *USA*  
Karl Frank, *USA*  
Ian M. Friedland, *USA*  
Gongkang Fu, *USA*  
Yozo Fujino, *Japan*  
Hitoshi Furuta, *Japan*  
James H. Garrett, *USA*  
Yaojun Ge, *China*  
Hamid Ghasemi, *USA*  
Michel Ghosn, *USA*  
Paul Grundy, *Australia*  
Rade Hajdin, *Switzerland*  
Geir Horrigmoe, *Norway*  
Michael C.H. Hui, *Hong Kong, P.R.C.*  
Naeem Hussain, *Hong Kong, P.R.C.*  
Daniele Inaudi, *Switzerland*  
Jens Sandager Jensen, *Denmark*  
Maarten-Jan Kallen, *The Netherlands*  
Ahsan Kareem, *USA*  
Maria Kaszynska, *Poland*  
Malcolm Kerley, *USA*  
Sang-Hyo Kim, *Korea*  
Sungkon Kim, *Korea*  
Risto Kiviluoma, *Finland*  
F. Wayne Klaiber, *USA*  
Leo Klatter, *The Netherlands*  
Jan-Ming Ko, *Hong Kong, P.R.C.*  
C. G. Koh, *Singapore*

National Organizing Committee of  
IABMAS2010

#### Committee Chair

Mehdi Saiidi, *USA*

#### Ex-Officio Members

Dan Frangopol, *USA*  
Chad Kusko, *USA*  
Richard Sause, *USA*

#### Members

Sreenivas Alampalli, *USA*  
Raimondo Betti, *USA*  
Harry Capers, *USA*  
Necati Catbas, *USA*  
Michael Chajes, *USA*  
Steven Chase, *USA*  
Karl Frank, *USA*  
Ian M. Friedland, *USA*  
Gongkang Fu, *USA*  
James H. Garrett, *USA*  
Martin Kendall, *USA*  
Myint Lwin, *USA*  
Tom Macioce, *USA*  
Ali Maher, *USA*  
Barney Martin, *USA*  
Dennis Mertz, *USA*  
Andrzej Nowak, *USA*  
Mary Lou Ralls, *USA*  
Mark Reno, *USA*  
Mehdi Saiidi, *USA*  
Bala Sivakumar, *USA*  
Bill Spencer, Jr., *USA*  
Richard Walther, *USA*  
Bojidar Yanev, *USA*

Hyun-Moo Koh, *Korea*  
Jung Sik Kong, *Korea*  
Ulrike Kuhlmann, *Germany*  
John Lane, *UK*  
Jørn Lauridsen, *Denmark*  
Kincho Law, *USA*  
Hakeun Lee, *Korea*  
Jeeho Lee, *Korea*  
Chin-Hsiung Loh, *Taiwan, R.O.C.*  
Jerome Lynch, *USA*  
Giorgio Malerba, *Italy*  
Ayaz Malik, *USA*  
Lance Manuel, *USA*  
René Maquoi, *Belgium*  
Antonio Mari, *Spain*  
Barney Martin, *USA*  
Sami Masri, *USA*  
Thomas Messervey, *Italy*  
Ayaho Miyamoto, *Japan*  
Aftab Mufti, *Canada*  
Hani Nassif, *USA*  
Jinping Ou, *China*  
Shamim Pakzad, *USA*  
Livia Pardi, *Italy*  
Udo Peil, *Germany*  
Stephen Pessiki, *USA*  
Victor Popa, *Romania*  
Mark Reno, *USA*  
James Ricles, *USA*

Local Organizing Committee of  
IABMAS 2010

#### Committee Chair

Chad Kusko, *USA*

#### Members

Peter Bryan, *USA*  
Mary Ann Cahalan, *USA*  
Jun Cao, *USA*  
Xiaohua (Hannah) Cheng, *USA*  
John W. Fisher, *USA*  
Dan M. Frangopol, *USA*  
Dan Hall, *USA*  
Ian C. Hodgson, *USA*  
Jian Jin, *USA*  
Peter A. Mazzeo, *USA*  
Ronnie Medlock, *USA*  
Bill Michaleyra, *USA*  
Franklin Moon, *USA*  
Clay Naito, *USA*  
Shamim Pakzad, *USA*  
Alan W. Pense, *USA*  
Stephen P. Pessiki, *USA*  
James M. Ricles, *USA*  
Matt Sanfilippo, *USA*  
Richard Sause, *USA*  
Harry W. Shenton III, *USA*  
Wagdy Wassef, *USA*  
Ben T. Yen, *USA*  
Yunfeng Zhang, *USA*

# IABMAS2010

The Fifth International Conference  
on Bridge Maintenance, Safety and Management  
<http://www.iabmas2010.org>

The International Association for Bridge Maintenance and Safety (IABMAS) encompasses all aspects of bridge maintenance, safety and management. Specifically, it deals with: bridge repair and rehabilitation issues; bridge management systems; needs of bridge owners, financial planning, whole life costing and investment for the future; bridge related safety and risk issues; economic and other implications. The objective of IABMAS is to promote international cooperation in the fields of bridge maintenance, safety and management for the purpose of enhancing the welfare of society. For more information about the Association, please visit the homepage of IABMAS at:

<http://www.iabmas.org>

## Delegates

The Conference will be of interest to university researchers, representatives from all sectors of bridge engineering, bridge engineers working with transportation departments, consultants, contractors, and local authorities interested in all aspects of bridge maintenance, safety and management.

## Venue

IABMAS2010 Conference will be held in downtown Philadelphia at the Loews Hotel from July 11-15, 2010. A block of rooms has been reserved at the hotel for the participants. Granted a charter in 1701, Philadelphia, also known as “the City of Brotherly Love”, is the fifth largest city in the United States with a population of just over 6.2 million people. Philadelphia is known as the city of neighborhoods. Philadelphia is rich in colonial history and the history of the American Revolution. Notable attractions include the Betsy Ross House, the Liberty Bell Center, Independence Hall, the National Constitution Center, the Old City District, the U.S. Mint and the Franklin Institute. Philadelphia is also a vibrant and rich center for arts and culture. Philadelphia offers museums, the performing arts, and more. Walk across the South Street Bridge, for pedestrians only, and take a walk on South Street. Visit Penns Landing where there are open air concerts on the great plaza. Visit the historic ships, the Independence Seaport Museum or just walk along the water. Philadelphia is also home to wonderful eating establishments that span the spectrum of culinary and cultural traditions

## Language

The official language of the conference and proceedings will be English.

# IABMAS2010

The Fifth International Conference  
on Bridge Maintenance, Safety and Management  
<http://www.iabmas2010.org>

## Mini-Symposia

**MS1:** Futuristic Bridge Maintenance Technologies, *Yun, Spencer*

**MS2:** Monitoring & Assessment of Bridges using Novel Techniques, *Strauss, Frangopol*

**MS3:** Present and Future of Bridge Inspection and Evaluation, *Alampalli, Agrawal*

**MS4:** Research and Applications in Bridge Health Monitoring, *Catbas, Casas, Furuta, Frangopol*

**MS5:** The new procedures for bridge rehabilitation, *Popa*

**MS6:** Measurement Systems for Bridge Weigh-in-Motion (B-WIM), *Bakht, Zidaric, McNeill*

**MS7:** Bridge Management Tools & Research, *Klatter*

**MS8:** Uncertainty in Bridge Damageability Modelling, *Shinozuka*

**MS9:** Performance Based Asset & Risk Management of Highway Infrastructure System, *Atkan*

**MS10:** Symposium on Bridging the Data Gaps for Effective Management, *Ghasemi*

**MS11:** Futuristic Bridge Maintenance Technologies, *Shin*

**MS12:** Computational Prediction and in Field Validation of Bridge Performance, *Biondini, Bontempi, Frangopol*

**MS13:** Management and Maintenance of Long Span Bridges, *Chen, Frangopol*

**MS14:** SmartEN Marie Curie ITN - Smart Management for Sustainable Human Environment, *Onoufriou, Helmerich*

**MS 15:** European Approach on Integrated Infrastructure Risk Management (IRIS), *Wenzel*

**MS 16:** Safety and Management of Bridges in Mexico, *DeLeon*

**MS17:** COWI Group Mini-Symposium, *Jensen*

**MS18:** Lifetime Design of Super Long Span Bridges, *Koh*

## Special Sessions

**SS1:** Use of Health Monitoring for Life Cycle Cost Optimization, *Frangopol, Orcesi*

**SS2:** Safety Monitoring & Maintenance Strategy for Long Span Bridge, *Cheng*

**SS3:** Bridge Condition Assessment, *Miyamoto, Tondolo*

**SS4:** Bridges for High Speed Railways, *Calcada*

**SS5:** Industrial Smart Material Applications for Civil Infrastructure (ISMA), *Messervy*

**SS6:** Advances in Structural Robustness: Dependability Framework, *Bontempi*

**SS7:** Bridge Adaption to the Environmental and Climate Changes, *Popa*

**SS8:** Nondeterministic Schemes for Structural Safety and Reliability of Bridges, *Arangio*

**SS10:** Life Cycle Bridge Engineering in Korea, *Cho, Kong*

**SS11:** ARCHES: Assessment and Rehabilitation of Central European Highway Structures, *Wierzbicki, Casas*

**SS12:** IIS Research and Applications on BC Bridges, *Aktan*

**SS13:** Current Advancements in Bridge Technologies, *Malik*

**SS14:** Using Technology to Manage, Preserve, and Renew Landmark Signature Bridges, *Loudermilk, Moon*

**SS15:** Modeling of Bridge Seismic Response, *Fischinger*

**SS16:** Recent Challenging Bridge Structures, *Darwish*

**SS17:** Life-Cycle Design of Structural Systems, *Biondini, Frangopol*

**SS18:** Optical Monitoring Techniques for Bridge Maintenance and Safety, *Sumitro, Matsuda*

**SS19:** Implementation of Bridge Management Administration in Japan, *Furuta, Watanabe*

**SS20:** Challenges for Enhancing Bridge Security, *Duwadi*

**SS21:** Structural Monitoring of Bridges: Hong Kong's Experience, *Xu, Hui*

**SS23:** Performance-Based Design for Steel Structures, *Kim*

**SS24:** Steel Bridge Rehabilitation, *Sakano*

**SS25:** New Developments in Bridge Design Codes, *Nowak*

**SS26:** WIM-Based Live Loads for Bridges, *Nowak*

**SS27:** High Performance Concrete - Lessons of Past Decades, *Ralls*

**SS28:** Construction, Architecture & Testing of Soil-Steel Bridges, *Manko, Beben*

**SS29:** Lessons Learned from Instrumented Bridges, *Feng*

**SS30:** Chinese Bridges, *Tang*

## Sponsors of IABMAS2010

### Financial Sponsors of IABMAS2010

ATLSS, Center for Advanced Technology for Large Structural Systems, USA

PITA, Pennsylvania Infrastructure Technology Alliance, USA  
T.Y. Lin International, USA

### Non-Financial Sponsors of IABMAS2010

AASHTO American Association of State Highway and Transportation Officials, USA

ACI, American Concrete Institute, USA

AICAP, Associazione Italiana Calcestruzzo Armato e Precompresso (Italian Association for Reinforced and Prestressed Concrete), Italy

AIOM, Associazione di Ingegneria Offshore e Marina (Association of Offshore and Marine Engineering), Italy

ASCP, The Portuguese Group of IABMAS, Portugal

CAU, Chung-Ang University, Korea

CERIC, Civil Engineering Research Information Center, Korea

COWI A/S, Denmark

CTE, Collegio dei Tecnici dell'Edilizia (Italian Society of Building Engineers), Italy

COSEIK, Computational Structural Engineering Institute of Korea, Korea

CMM, Portuguese Steelwork Association, Portugal

CU, University of Colorado at Boulder, USA

D'APPOLONIA, Italy

DGU, Dongguk University, Korea

ECCS, European Convention for Constructional Steelwork, Belgium

FHWA, Federal Highway Administration, USA

U.S. Department of Transportation, USA

IALCCE, International Association for

Life-Cycle Civil Engineering, Italy

IASSAR, International Association for Structural Safety and Reliability

ISISE, Institute for Sustainability and Innovation in Structural Engineering, Portugal

JSCE, Japan Society of Civil Engineers, Japan

JSSC Japanese Society of Steel Construction, Japan

JSMS Japanese Society of Materials Science, Japan

ISTEC, Smart Infra-Structure Technology Center, KAIST, Korea

KU, Kansai University, Osaka, Japan

KBRC, Korea Bridge Design & Engineering Research Center, Korea

KCI, Korean Concrete Institute, Korea

KEC, Korea Expressway Corporation, Korea

KICT, Korea Institute of Construction Technology, Korea

KISTEC, Korea Infrastructure Safety & Technology Corporation, Korea

KSSC, Korean Society of Steel Construction, Korea

KU-CER, Kyoto University, Dept. of Civil and Earth Resources Engng., Japan

MJU, Mongji University, Korea

P.C. Rossin College of Engineering and Applied Science, Lehigh University, USA

PCI, Precast/Prestressed Concrete Institute, USA

Politecnico di Milano, Italy

Tongji University, China

UM, University of Minho, Portugal

UniS, University of Surrey, UK

UPC, Technical University of Catalonia, Spain

Samsung C&T Corporation, Korea

SNU, Seoul National University, Korea

SEI, Structural Engineering Institute of ASCE, USA

TRB, Transportation Research Board, USA

T.Y. Lin International, USA

## Conference Chairs of IABMAS2010

### Richard Sause

*Lehigh University, Bethlehem, PA, USA*

### Dan M. Frangopol

*Lehigh University, Bethlehem, PA, USA*

## Secretariat of IABMAS2010

Mary Ann Cahalan, Conference Coordinator  
Lehigh University

ATLSS Engineering Research Center  
117 ATLSS Drive, Bethlehem, PA 18015, USA

email: [secretariat@iabmas2010.org](mailto:secretariat@iabmas2010.org)

<http://www.iabmas2010.org>

610-758-3468 Telephone, USA

610-758-6842 Fax, USA

## Accommodation

The organizers have arranged block reservations with the Loews Hotel, Philadelphia, PA offering a special rate for the participants of this event. For further information please see our website (<http://www.iabmas2010.org>) for updates.