The First International Conference on Maintenance and Rehabilitation of Constructed Infrastructure Facilities (MAIREINFRA1)

FINAL PROGRAM-FIRST DRAFT

J.W. Marriott Dongdaemun Square Hotel
Seoul, Korea
July 19-21, 2017
Welcome to MAIREINFRA1

MAIREINFRA1 is the 1st International Conference on MAIntenance and REhabilitation of Constructed INFRAstructure Facilities. The objective of this series of conferences is to provide a forum for researchers, government agencies, consultants and contractors to exchange technological advancements and innovations related to constructing and maintaining civil and transportation infrastructure facilities.

The main theme of MAIREINFRA1 is the sustainable and disaster resilient maintenance and rehabilitation of constructed infrastructure facilities. Civil and transportation infrastructure is a backbone of the economic prosperity and public welfare. But, the sustainability and the resiliency challenges constructors and managers to respond creatively to a new paradigm shift in rehabilitating and maintaining civil and transportation facilities in the most environmentally friendly manner by lowering the energy cost, enhancing the safety, and minimizing air and water pollution.

This conference features:

- Over one-hundred papers from twenty countries in three technical tracks of 1) pavements and railroad tracks, 2) construction engineering and management and 3) disaster resilience, safety and sustainability
- World-famous keynote speakers in opening and plenary sessions and three technical tracks.
- Three workshops on 1) FAA pavement design procedure for airfields, 2) disaster information and infrastructure resiliency, and US-Korea cooperation on the construction technology transfer.
- Many networking opportunities that include Wednesday’s welcoming reception; Thursday’s lunch and banquet and Friday’s lunch and closing dinner at JW Dongdaemun Square.

We would like to recognize the co-sponsors of MAIREINFRA1: International Society for Maintenance and Rehabilitation of Transportation Infrastructure (iSMARTi), Federal Aviation Administration (FAA), Transportation Research Board (TRB), American Society of Civil Engineers (ASCE), Canadian Society of Civil Engineers (CSCE), Korean Society of Civil Engineers (KSCE), Korean Society of Road Engineers (KSRE), and Laboratory for Advanced Construction Technology (LACT) at the University of Iowa. We would like to record our indebtedness to distinguished members of the Organizing and Scientific Committees who helped with the peer-review of papers and provided valuable guidance in making this conference a success. Finally, we would like to thank the authors from all over the world who convened in Seoul, South Korea to share their knowledge and experiences in constructing and maintaining pavements. It is my honor and privilege to host MAIREINFRA1. Enjoy!

Hosin “David” Lee, Chairman of MAIREINFRA1
President of iSMARTi
Opening Remarks (Not actual; Included here as a placeholder)

Congratulations on hosting “The First International Conference on Maintenance and Rehabilitation of Constructed Infrastructure Facilities (MAIREINFRA1)”, and I’m very honored to give a welcoming speech as the President of Korean Federation of Science and Technology Societies (KOFST). This conference will significantly contribute to the development of rehabilitation and maintenance technologies for sustainable and resilient civil and transportation infrastructure facilities. I’m very pleased that our institution has an opportunity to sponsor this inaugural conference.

The KOFST was established in 1966, and now has 609 science and technology societies and both national and corporate research institutes with over 462,000 members who are actively engaged in the research and development in all disciplines of science and technology.

I wish a great success of the conference in this beautiful metropolitan city, Seoul, Korea, and hope that everyone learns brand new ideas and perspectives from one another.

Thank you.

Myung-Ja Kim, President
Korean Federation of Science and Technology Societies (KOFST)
Acknowledgements

We gratefully acknowledge the following individuals and organizations for their contributions to the success of the 2017 First International Conference on maintenance and rehabilitation of constructed infrastructure facilities (MAIREINFRA1).

Conference Chair
Hosin “David” Lee, University of Iowa, USA
President, iSMARTi and Director, LACT

Conference Secretariat
Junggon Kim, Korea Electronics Technology Institute

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Rita Fortes, Universidade Anhembi Morumbi, Brazil

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Petur Petursson, PP Consult, Iceland
Carla Lopez del Puerto, University of Puerto Rico at Mayaguez, Puerto Rico
Christiane Raab, EMPA, Switzerland, 2020 MAIREPAV9 Chair
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Waheed Uddin, University of Mississippi, USA, Program Co-Chair
Chris Williams, Iowa State University, USA
Alan Woodside, Ulster University, United Kingdom
Zhanping You, Michigan Technological University, USA
Jungho Yu, Kwangwoon University, Korea
WEDNESDAY, July 19, 2001

8:00 am – 8:30 am
Registration (breakfast on your own)

8:30 am – 9:30 am
Ballroom I, II, and III
Opening Ceremonies Presided by Hosin “David” Lee, Chairman, MAIREINFRA1 (President, iSMARTi and Professor, University of Iowa)

Myung-Ja Kim, President, Korean Federation of Science and Technology Societies (KOFST)
YongKul Lee, 5th-term Member of the Korea National Assembly and former Chairman of the Education, Science and Technology Committee

9:30 am – 10:30 am
Ballroom I, II and III
Keynote Addresses Presided by Samuel Labi, Professor, Purdue University (USA)

Burcu Akinci, Paul Christiano Professor and Associate Dean for Research, Carnegie Mellon University (USA).

SENSORS AND INFORMATION MODELS FOR CONSTRUCTION AND INFRASTRUCTURE MANAGEMENT

Sue McNeil, Professor, University of Delaware (USA).

ASSET MANAGEMENT, SUSTAINABILITY AND RESILIENCE: CONNECTING THE CONCEPTS TO MAINTENANCE AND INSPECTION DECISIONS FOR INFRASTRUCTURE SYSTEMS

10:30 am – 10:45 am
Coffee Break (Exhibition Hall)

10:45 am - 11:45 pm
Ballroom I, II and III
Keynote Addresses Presided by Douglas Gransberg, Iowa State University

Kelvin C.P. Wang, Professor, Oklahoma State University and President of ASCE’s Transportation and Development Institute (USA).

RECENT ADVANCES OF AUTOMATED SURVEY OF TRANSPORTATION INFRASTRUCTURES: HIGHWAY, AIRPORT, TUNNEL AND RAIL

Stephen Mulva, Director, Construction Industry Institute at the University of Texas at Austin (USA)

A BLUEPRINT FOR THE CAPITAL PROJECTS INDUSTRY

12:00 pm – 1:00 pm
Lunch (Dining Hall)
<table>
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<tr>
<th>Time</th>
<th>Track A.1. Keynote Addresses Presided by Track Co-Chairs</th>
<th>Track B.1. Keynote Addresses Presided by Track Co-Chairs</th>
<th>Track C.1. Keynote Addresses Presided by Track Co-Chairs</th>
<th>Coffee Break (Exhibition Hall)</th>
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<tr>
<td>1:15 am -</td>
<td>Athanassios Nikolaides, Professor and Director of Highway Engineering Laboratory at Aristotle University of Thessaloniki (Greece). <strong>SUSTAINABLE AND LONG LIFE FLEXIBLE PAVEMENTS: FROM RESEARCH TO PRACTICE</strong></td>
<td>TBD. <strong>SENSORS AND INFORMATION MODELS FOR CONSTRUCTION AND INFRASTRUCTURE MANAGEMENT</strong></td>
<td>Susan Tighe, Endowed Chair Professor in Sustainable Pavement Engineering and Director of CPATT, University of Waterloo (Canada). <strong>DEVELOPMENT OF INFRASTRUCTURE THAT IS RESISTANT TO NATURAL DISASTERS</strong></td>
<td>3:00 pm – 3:15 pm</td>
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<td>3:00 pm</td>
<td>Hussain Bahia, Distinguished Professor and Founder/Director of the Modified Asphalt Research Center (MARC) at the University of Wisconsin-Madison (USA). <strong>DEVELOPMENT OF A MORE RATIONAL SYSTEM FOR SELECTING EMULSIONS AND HOT BINDERS FOR SURFACE TREATMENTS</strong></td>
<td>Jeb S. Tingle, Senior Research Civil Engineer and Program Manager, U.S. Army Engineer Research and Development Center (ERDC) (USA) <strong>ACCELERATED TESTING OF RAPID SETTING REPAIR MATERIALS FOR CONSTRUCTED INFRASTRUCTURE FACILITIES</strong></td>
<td>Gerardo Flintsch, Professor and Director of VTTI’s Center for Sustainable Transportation Infrastructure, Virginia Tech. <strong>MANAGING THE TRANSPORTATION INFRASTRUCTURE IN THE AGE OF AUTONOMOUS VEHICLES, INTELLIGENT INFRASTRUCTURE, AND HUMAN-CENTERED COMMUNITIES</strong></td>
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<td>3:15 pm</td>
<td>Hyun Jong Lee, Professor at Sejong University (Korea). <strong>APPLICATION OF A DEVELOPED RUTTING MODEL IN MIX DESIGN PREPARATION AND PAY ADJUSTMENT FACTOR DETERMINATION IN SEOUL CITY</strong></td>
<td>Charles T. Jahren, W. A. Klinger Teaching Professor at Iowa State University (USA). <strong>DIGITAL DATA EXCHANGE INNOVATION ON CONSTRUCTION IN US TRANSPORTATION AGENCIES</strong></td>
<td>Waheed Uddin, Professor and Director of CAIT, University of Mississippi (USA). <strong>DISASTER RESILIENCE MANAGEMENT AND FLOOD HAZARD ASSESSMENT OF INFRASTRUCTURE USING COMPUTATIONAL MODELING AND GEOSPATIAL RISK MAPPING</strong></td>
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<td>David Woodward, Director of SABER and Reader in Infrastructure Engineering, Ulster University (UK). <strong>SUSTAINABLE SURFACING ASPHALT – FICTION OR FACT?</strong></td>
<td>TBD. <strong>DRONES AND SENSORS FOR CONSTRUCTION MANAGEMENT</strong></td>
<td>Chia-Pei Chou, Distinguished Professor National Taiwan University (Taiwan). <strong>SMOOTHNESS SPECIFICATION FOR TAIWAN FREEWAY SYSTEM</strong></td>
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### Session A.2 Sustainable Pavements

**Session Chair:** Mansour Solaimanian, Pennsylvania State University (USA)

| A.2.1 LOST OF STRENGTH OF THE MIXTURES MADE WITH WATER-AFFECTED ASPHALTS USING THE MIST TEST, Figueroa Ana Sofia* De La Salle University and Reyes Fredy at La Javeriana University (Colombia) |
| A.2.2 FEASIBILITY STUDY OF OPTIMIZED POLYMER-MODIFIED WARM-MIX ASPHALT PAVEMENT FOR COLD AND MONSOON CLIMATE REGIONS, Kang-Hun Lee, Yong-Joo Kim* and Soo-Ahn Kwon, Korea Institute of Civil Engineering and Building Technology (KOREA) |
| A.2.3 FATIGUE CRACK RESISTANCE EVALUATION OF WARM IN-PLACE RECYCLED ASPHALT MIXTURES, Kyu-Dong Jeong, Soo-Ahn Kwon, Jung-Tan Son and Moon-Sup Lee, Korea Institute of Civil Engineering and Building Technology (KOREA) |
| A.2.4 MECHANISTIC AND EXPERIMENTAL SIMULATION OF RAINFALL IN A PERMEABLE PAVEMENT SYSTEM, Christopher Jabonero, Hyunsik Hwang, Wuguang Lin and Yoon-Ho Cho, Chung-Ang University (Korea) |

### Session B.2 Infrastructure Renewal and Asset Management

**Session Chair:** Dr. Tarek Zayed, Concordia University (Canada)

| B.2.1 MULTI-OBJECTIVE PREEMPTIVE GOAL OPTIMIZATION FRAMEWORK FOR CORRIDOR INFRASTRUCTURE, Soliman A. Abu-Samra, Smaer Al-Zahab, Mahmoud Ahmed, and Tarek Zayed (CANADA) |
| B.2.2 EFFECT OF THE SOCIO-GEOGRAPHIC FACTORS ON COST OVERRUNS IN ROADWAY RENEWAL PROJECTS, Kyeong Rok Ryu, Kunhee Choi, Junseo Bae, and Dong-Wook Lee (USA) |
| B.2.3 UTILITY THEORY FOR NORMALIZATION OF PERFORMANCE MEASURE, Myungjin Chae (USA) |
| B.2.4 AN OPTIMIZED APPROACH TO LEAK REPAIR PRIORITIZATION, Samer El-Zahab, Soliman Abusamra, and Tarek Zayed (CANADA) |

### Session C.2 Traffic Safety

**Session Chair:**

| C.2.1 HSM’S PREDICTIVE METHOD BASED LIFE CYCLE ANALYSIS OF SAFETY IMPROVEMENT ALTERNATIVES Jordan B. Frustaci, Mitsuhiro Saito* and Grant G. Schultz, Brigham Young University (USA) |
| C.2.2 SYSTEMIC SAFETY APPROACH: ANALYZING FACTORS INFLUENCING WET ROADWAY CRASHES, Seri Park* Virginia Smith, Thomas Saidutti and Nicholas Zoccoli, Villanova University (USA) |
| C.2.3 THE RELATIONSHIP BETWEEN SAFETY FEATURE INTENSITY AND SAFETY PERFORMANCE: THE TRI-ZONE CURVE AND ITS INTERPRETATION, Samuel Labi, Purdue University (USA) |
| C.2.4 LANE AND SHOULDER WIDTHS AT RURAL TWO-LANE HIGHWAYS – DESIGN POLICY EVALUATION, Sikai Chen*, Julie Qiao, Samuel Labi and Paul V. Preckel, Purdue University (USA) |
| C.2.5 RUNAWAY TRUCK RAMP - A METHODOLOGY TO DEFINE BY SOFTWARE THE BEST LOCATION FOR RAMPS THAT CAN PREVENT SEVERE ACCIDENTS INVOLVING RUNAWAY HEAVY VEHICLES, Rafael Ricardo da Costa Nascimento, Karina A. Andrade, Felipe P. Augusto, Augusto G. Ribeiro, Giovanna M. S. Borzacchini and Rita Moura Fortes*, Anhembi Morumbi University (Brazil) |

Visit Exhibition Hall

### Opening Reception (Location):

“Entertainment” in Kangbook Style

### iSMART Meeting (Open to all Registered Participants)
### Session A.3 Concrete Pavements

**Session Chair:**

A.3.1 **LOAD TRANSFER RESTORATION WITH DIAMOND GRINDING ON RIGID PAVEMENTS: SHORT-TERM AND LONG-TERM EFFECTIVENESS**, Sharlan Montgomery*, Samuel Labi and John E. Haddock, Purdue University (USA)

A.3.2 **INFLUENCE OF HORIZONTAL LOADING ON RCC-BASE COMPOSITE PAVEMENT PERFORMANCE AT HEAVY DUTY AREA**, Makara Rith, Young Kyu Kim, Seung Woo Lee*, Beom Jun Chon and Seung Hwan Han, Gangneung-Wonju National University (KOREA)

A.3.3 **NANOMECHANICAL PROPERTIES OF INTERPHASE ZONE IN FLY ASH-BASED CEMENTITIOUS CONCRETE MIXTURE**, Mahdieh Khedmati, Hani Alanazi and Yong-Rak Kim*, University of Nebraska (USA)

A.3.4 **ABRASION RESISTANCE OF PAVEMENT CONCRETE ACCORDING TO SILICA FUME CONTENTS**, Kyong-Ku Yun*, Seung-Yeon Han, Kyeo-Re Lee and Young-Chul Seon, Kangwon National University (KOREA)

A.3.5 **STUDY OF REAL-WORLD SLAB LEVEL JPCP DETERIORATION BEHAVIOR USING 3D TECHNOLOGY**, Yichang (James) Tsai and Georgene M. Geary, Georgia Tech (USA)

### Session B.3 Infrastructure Resilience and Alternate Project Delivery

**Session Chair:** Dr. Kunhee Choi (Associate Professor, Texas A&M University)

B.3.1 **EMERGENCY RESTORATION OF SERVICES IN COMPLEX INFRASTRUCTURE PROJECTS: UNITED STATES AND NEW ZEALAND CASE STUDIES**, Douglas D. Gransberg, Carla Lopez del Puerto, Eric Scheepbouwer (USA & New Zealand)

B.3.2 **USING LINEAR MIXED EFFECTS MODELS TO ASSESS THE PERFORMANCE OF DESIGN-BUILD PAVEMENT PROJECTS IN THE U.S.**, Namho Cho, Mounir El Asmar, Shane Underwood, and Austin Aguinaga (USA)

B.3.3 **RISK PERCEPTIONS OF DESIGN AND BUILD PROJECTS IN MALAYSIAN CONSTRUCTION INDUSTRY**, Sabihah Saaidin, Intan Rohani Endut, Siti Akmar Abu Samah, and Ahmad Ruslan Mohd Ridzuan (Malaysia)

B.3.4 **RELATIONSHIP BETWEEN THE IMPLEMENTATION OF QUALITY CONTROL TECHNIQUES DURING SITE INSPECTION**, Nur Nabihah Abd Razak, Intan Rohani Endut, Siti Akmar Abu, Samah, Ahmad Ruslan Mohd Ridzuan, and Sabihah Saaidin (Malaysia)

### Session C.3 Resilient Rail and Runway Infrastructure

**Session Chair:**

C.3.1 **MEASURING THE RESILIENCE OF TRANSPORTATION INFRASTRUCTURE SYSTEMS: A CASE STUDY IN CHINA'S RAILWAY NETWORK**, Liang Wang*, Xiaolong Xue and Xun Zhou, Harbin Institute of Technology (China)

C.3.2 **DEVELOPMENT OF AUTOMATED CRACK MEASUREMENT SYSTEM FOR CONCRETE SLAB BALLST OF HIGH-SPEED RAILROAD TRACKS IN KOREA**, Byungkyu Moon*, Eunchurn Park, Hosin "David" Lee, Miyun Park and Sungbaek Park, S.H. Tech and Policy (Korea)

C.3.3 **FEASIBILITY STUDY OF HEATED PAVEMENT THROUGH LIFE-CYCLE ASSESSMENT**, Younho Rew, Xijun Shi, Kunhee Choi and Philip Park*, Texas A&M University (USA)

C.3.4 **MAINTENANCE TARGETS FOR FUNCTIONAL ASPHALT RUNWAY PAVEMENT EVALUATION**, Lívia Fortes Merighi* and Carlos Yukio Suzuki, University of Sao Paulo (Brazil)
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<th>Time</th>
<th>Session</th>
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<tr>
<td>10:15 am - 11:45 pm</td>
<td>Ballroom I</td>
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<tr>
<td></td>
<td>Session A.4 Asphalt Pavement Design and Recycling</td>
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<td>Session Chair: Abhishek Mittal* and Aravind K Swamy, Indian Institute of Technology, Delhi</td>
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<td>A.4.1 DESIGN OF ASPHALT PAVEMENTS CONSIDERING VARIABILITY OF DESIGN PARAMETERS, Abhishek Mittal* and Aravind K Swamy, Indian Institute of Technology, Delhi</td>
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<td>A.4.2 ENGINEERING PROPERTIES OF RECYCLED ASPHALT PAVEMENT IN THAILAND, Saravut Jaritngam* and Opas Somchaintuek, Prince of Songkla University (THAILAND)</td>
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<td>A.4.3 FATIGUE PROPERTIES OF COLD MIX RECYCLED ASPHALT MIXTURES IN CYCLIC UNIAXIAL TESTING, Pezhouhan Tavassoti-Kheiry*, Mansour Solaimanian and Xuan Chen, Pennsylvania State University (USA)</td>
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<td>A.4.4 ASPHALT PAVEMENT RECYCLING WITH HIGH RAP CONTENTS, Sungun Kim, Junan Shen* and M. Myung Jeong, Georgia Southern University (USA)</td>
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<td>A.4.5 A INFLUENCE OF RECLAIMED ASPHALT PAVEMENT (RAP) ON ASPHALT MIXTURES PERFORMANCE EVALUATED BY HAMBURG WHEEL TRACKING DEVICE (HWTD), Ali Mokhtari and Hosin “David” Lee, University of Iowa (USA)</td>
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<td>Ballroom II</td>
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<td>Session B.4 Building Information Modeling and Facility Management</td>
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<td>Session Chair: Dr. Sarel Lavy (Associate Professor, Texas A&amp;M University)</td>
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<td>B.4.1 VISUALIZING THE CONSTRUCTABILITY OF A STEEL STRUCTURE USING BUILDING INFORMATION MODELING AND GAME SIMULATION, Mohammed Aldafayy, Jiansong Zhang, and Jun-Seok Oh (USA)</td>
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<td>B.4.2 BIM TECHNOLOGY IN DATACENTER DESIGN AND CONSTRUCTION, Christopher Ingalsbe, and Jeong-Han Woo (USA)</td>
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<td>B.4.3 THE FUTURE OF FACILITY MANAGEMENT IN THE FACE OF RAPIDLY CHANGING TECHNOLOGY, Sarel Lavy, Nishith Singh, Kunhee Choi, and Antony Justin (USA)</td>
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<td>B.4.4 A CASE STUDY OF CIVIL INTEGRATED MANAGEMENT (CIM) APPLICATION USING A THREE-DIMENSIONAL ENGINEERED MODEL FOR A HIGHWAY INTERCHANGE PROJECT, Jonghoon Kim, Hariharan Naganathan, and Dan Daehyun Koo (USA)</td>
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<tr>
<td>12:00 pm – 1:00 pm</td>
<td>Ballroom III</td>
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<td>Lunch (Location)</td>
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<td>Session C.4. Neural Network and Life Cycle Analysis</td>
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<td>Session Chair: Trenton Clark, Virginia Department of Transportation</td>
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<td>C.4.1 PRELIMINARY LIFE CYCLE ASSESSMENT OF A NEW AND COST EFFECTIVE PAVEMENT PRESERVATION TREATMENT: MICRO-MILLING AND THIN OVERLAY, Yichang (James) Tsai and April Gadaby*, Georgia Tech (USA)</td>
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<td>C.4.2 UTILIZING DYNAMIC-SEQUENTIAL NETWORK APPROACH ON CIVIL ENGINEERING DATABASES, Hakan Yasarar* and Yakoub Najjar, University of Mississippi (USA)</td>
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<td>C.4.3 DECISION-MAKING FRAMEWORK FOR NON-STRUCTURAL SUSTAINABLE PRODUCTS IN CONSTRUCTION INDUSTRY, Dharmaraj Sivasubramanian, Moonseo Park*, Hyun-Soo Lee and Kwonsik Song, Seoul National University (Korea)</td>
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<td>C.4.4 Development of Pavement Life-Cycle Assessment (LCA) for Highways in Illinois, Seunggu Kang*, Imad L. Al-Qadi and Hasan Ozer, University of Illinois at Urbana-Champaign (USA)</td>
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### Session A.5 Airfield Asphalt Pavements
**Session Chair:** TBD

**A.5.1 ASPHALTIC DRAINABLE BASE PERFORMANCE FOR FLEXIBLE AIRPORT PAVEMENT DESIGN**, Benjmain Mahaffay*, Qiang Li and Jeff Gagnon, Federal Aviation Administration (USA)

**A.5.2 SURFACE SHEAR STRENGTH OF AIRFIELD THIN ASPHALT Overlay**, Iswandaru Widyatmoko*, Martin Hestop, John Cook, AECOM (UK)

**A.5.3 FUEL RESISTANT BINDER**, G. Mohammed Memon* and Areeka Memon, Phaltech Corporation (USA)

**A.5.4 TIME HISTORY DATA ANALYSIS USING FALLING WEIGHT DEFLECTOMETER AT NATIONAL AIRPORT PAVEMENT TEST FACILITY**, Injun Song*, Jeffrey Gagnon and Albert Larkin, CSRA Inc. (USA)

### Session B.5 Robotics in Construction / Modular Construction
**Session Chair:** Dr. Jin Ouk Choi (Assistant Professor, University of Nevada, Las Vegas)

**B.5.1 ROBOTICS IN SOLAR FIELD PROJECTS**, Constantine Moshi, Sadie Bennett, Ryan Flores, and Jeong-Han Woo (USA)

**B.5.2 RAPID SPALL DAMAGE REPAIR USING 3D PRINTER**, Jaeheum Yeon, and Julian Kang (USA)

**B.5.3 IDENTIFYING INDUSTRY-WIDE MAXIMIZATION ENABLERS FOR HIGHER LEVELS OF MODULARIZATION**, James T. O’Conner, William J. O’Brien, and Jin Ouk Choi (USA)

**B.5.4 AN EFFICIENT EQUIPMENT OPERATION PLAN FOR MANAGING OVERLAP BETWEEN LIFTING AND FINISHING EQUIPMENT IN MODULAR CONSTRUCTION**, Joo Ho Kim, Moonseo Park, Hyun-soo Lee, and Hosang Hyun (Korea)

**B.5.5 DESIGN DIRECTIONS OF A GUIDERAIL-TYPE WINDOW CLEANING ROBOT**, Jun Young Hun and Kyoon Taek Kim (Korea)

### Session C.5 Building Energy and Facility Management
**Session Chair:**

**C.5.1 ENERGY AUDIT OF BUILT ENVIRONMENTS THROUGH SIMULTANEOUS LOCALIZATION AND THERMAL MAPPING**, Bharathkumar Ramachandra*, Jacob Monroe, Pranav Nawathe, Kevin Han, North Carolina State University (USA)

**C.5.2 AN INNOVATIVE APPROACH TO INCREASING POWER DISTRIBUTION NETWORK RESILIENCE**, Berna Eren Tokgoz*, Seokyong Hwang and Mahdi Safa, Lamar University (USA)

**C.5.3 OFFICE BUILDING FACILITY MANAGEMENT PROCESS MODEL**, Hyunji Shin*, Hyun-Soo Lee, Moonseo Park and Jin Gang Lee, Seoul National University (Korea)

**C.5.4 A STUDY ON EFFECTS OF THE INTRODUCTION OF BUSINESS CONTINUITY MANAGEMENT SYSTEM ON NATIONAL INFRASTRUCTURE FACILITIES MANAGEMENT SYSTEM**, Sahong Lee and Chongsou Cheung*, Soongsil University (Korea)

**C.5.5 A MOBILE APPLICATION FOR MAINTENANCE MANAGEMENT**, Haena Kim University of Washington and Hosin “David” Lee, University of Iowa (USA)
### Session A.6 Asphalt Pavement Performance Modeling

**Session Chair:** Ana Sofia Figueroa, Universidad de la Salle (Colombia)

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<td>Determination of Asphalt Layer Thickness for Top-Down Cracking Initiation</td>
<td>Athanasios Nikolaides, Evangelos Mantos, Aristotele University of Thessaloniki (Greece)</td>
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<td>A.6.2</td>
<td>Use of Beta Distribution to Fit Thermal Fracture of Asphalt Pavements</td>
<td>M. Myung Jeong and Dan D. Koo, Georgia Southern University (USA)</td>
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<td>A.6.3</td>
<td>Experimental Comparison of SCB and IDT Tests on Asphalt Mixtures</td>
<td>Augusto Cannone Falchetto, Ji Hoon Moon, Technische Universität Braunschweig (Germany)</td>
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<td>A.6.4</td>
<td>Performance-Based In Situ Tests for Compaction Quality Control of Pavement Layers</td>
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### Session B.6 Construction Safety & Sustainability

**Session Chair:** Dr. Yong Han Ahn (Hanyang University, Korea)

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<td>A Comparative Study on the Environmental Load-Estimating Methods for Road Earthwork in the Early Design Phase</td>
<td>Jin-Young Park, Solomon Sackey, and Byung-So Kim (Korea)</td>
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### Session C.6 Nondestructive Evaluation of Infrastructure

**Session Chair:** Chuck Larson, Stantec, Inc.

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<td>Behavior and Monitoring of Existing Bridges for the Transportation of the Special Heavy Load</td>
<td>Rae-Chul Lee, Yoon-Je Park, Woo-Jun Yang and Jin-Moo Han, SQ Engineering (Korea)</td>
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<td>C.6.3</td>
<td>Evaluation of Subgrade Modulus of Flexible Pavement Utilizing Results from Non-Destructive Tests</td>
<td>S. Sonny Kim and Amy Brooks, University of Georgia (USA)</td>
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<td>C.6.4</td>
<td>Innovative Data Fusion of High Resolution 3D Sensing Data and Low-Cost Accelerometer Data for Pavement Health Condition Evaluation</td>
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<td>A.7.1 DETERIORATION COST DUE TO CAMBER FOR CHIPSEALED PAVEMENTS OVER GRANULAR BASES, Jacobus Daniel van der Walt*, Eric Scheepbouwer, Bryan Pidwerbesky and Brian H.W. Guo, University of Canterbury (New Zealand)</td>
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<td>A.7.2 THE EFFECTS OF PART-TIME SHOULDER USE ON THE SERVICE LIFE OF THE MAINLINE TRAVEL LANES WITH FULL DEPTH PAVED SHOULDERS, Sean Coffey, Seri Park* and Leslie Myers McCarthy, Villanova University (USA).</td>
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<td>A.7.3 EVALUATION OF THE RUTTING SUSCEPTIBILITY OF LOUISIANA SUPERPAVE MIXTURES, Louay Mohammad, Shadi Saadeh (USA)</td>
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<td>A.7.4 CORRELATING PAVEMENT FRICTION WITH A NOVEL MACRO-TEXTURE INDICATOR DERIVED FROM HIGH SPEED THREE-DIMENSIONAL TECHNOLOGY, Yichang (James) Tsai and Lauren Gardner, Georgia Tech (USA)</td>
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<td>A.7.5 DEVELOPMENT OF A SIMPLE ASPHALT OVERLAY PROGRAM CONSIDERING EXISTING PAVEMENT CONDITION, LIFE, AND DISTRESS IN SEOUL CITY, Hyun Jong Lee, Wonjae Kim, Van Phuc Le, Julius Marvin Flores, Jongeun Baek and Taewoo Kim, Sejong University (Korea)</td>
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<td>Session B.7 Big Data and Information Analytics in Construction</td>
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<td>B.7.1 INFORMATON DELIVERY WORKFLOWS THROUGHOUT THE LIFE-CYCLE OF TRANSPORTATION ASSETS, Tuyen Le, H. David Jeong, Chuck Jahren, Jennifer Shane, and Kristen Cetin (USA)</td>
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<td>B.7.3 DEVELOPING A FRAMEWORK FOR IDENTIFYING BRIDGE DAMAGE CAUSAL FACTORS AND DAMAGE PATTERNS BASED ON TEXT MINING, Sehwan Chung, Soram Lim, Seokho Chi, Bon-Gang (BG) Hwang (KOREA)</td>
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<td>B.7.4 MACHINE-LEARNING FOR AUTOMATED IMPACT PREDICTIONS OF HIGHWAY CONSTRUCTION, Kunhee Choi, and Junseo Bae (USA)</td>
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<td>C.7.1 PARAMETRIC MODELING OF KOREAN CONSTRUCTION WORKERS FOR THE SAFER CONSTRUCTION ENVIRONMENT, Stephen Baek*, Hosin &quot;David&quot; Lee, Rajan Bhatt, Kimberly Farrell, Jasbir S. Arora and Karim Abdel Malek, University of Iowa (USA)</td>
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<td>C.7.2 EVALUATING INNOVATIVE PAVEMENT SUSTAINABILITY TOOLS, Cristina Torres-Machi*, Jessica Achebe and Susan L. Tighe, University of Waterloo (Canada)</td>
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<td>C.7.3 TRUST SERVICE DESIGN FOR BUSINESS CONTINUITY PLANNING AND DISASTER RECOVERY, Lee Won Park, Sangho Park, Yanghoon Kim(Far East University) and Hangbae Chang, Chung-Ang University (KOREA)</td>
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Session A.8 Pavement Management System

Session Chair:

A.8.1 NEW PAVEMENT MANAGEMENT INFORMATION SYSTEM IMPLEMENTATION IN THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT), Jungyong "Joe" Kim*, Jenny Li and Magdy Mikhail, Texas Department of Transportation (USA)

A.8.2 PAVEMENT MAINTENANCE MANAGEMENT SYSTEM FOR TIRUCHIRAPALLI CITY, Rejani V.U., Sunitha V.* and Samson Mathew, NIT Tiruchirapalli (INDIA)

A.8.3 TEST METHOD FOR ACCURACY VERIFICATION OF LOW-SPEED PROFILERS IN CONSTRUCTION CONTROL OF PAVEMENT SURFACES, Kazuya Tomiyama*, Akira Kawamura, Masayuki Eguchi, Masaru Terada and Kazuhiro Watanabe, Kitami Institute of Technology (JAPAN)

Session B.8 Innovative Bridge and Roadway Construction Engineering and Management

Session Chair:

B.8.1 UTILIZATION OF KOREAN ULTRA HIGH PERFORMANCE CONCRETE IN ACCELERATED SHORT-SPAN BRIDGE CONSTRUCTION, Alex M. Davi (USA)

B.8.2 DEVELOPMENT OF A DIAGNOSTIC INDEX FOR CONCRETE BRIDGE DECKS WITH ASPHALT CONCRETE IN COLD AND SNOWY REGION, Jiyoung Rhee, Hongsam Kim, and Jaewon Shim (KOREA)

B.8.3 DURABILITY AND FATIGUE PERFORMANCE OF NEW PRECAST CONCRETE PAVEMENT SYSTEM, Okpin Na, Taesuk Seo, Junhyung Kim, Yunsoo Jung, and Hoonjae Choi (Korea)

B.8.4 DESIGN AND FABRICATION OF PRECAST PI-GIRDER USING NEW ULTRA HIGH PERFORMANCE CONCRETE FOR ACCELERATED BRIDGE CONSTRUCTION, Haena Kim, Hosin "David" Lee (University of Iowa), Gum Sung Ryu, Chang Bin Joh, Gyung Taek Koh, and Byung Suk Kim, Korea Institute of Civil Engineering and Building Technology (KOREA)

Session C.8. Disaster Information and Resilience

Session Chair:

C.8.1 SYSTEMATIC LITERATURE REVIEW ON CRITICAL INFRASTRUCTURE INTERDEPENDENCIES IMPACTED BY NATURAL DISASTERS, Kyubyung Kang*, Rana Khallaf and Makarand Hastak (USA)

C.8.2 DISASTER RISK ASSESSMENT OF EXTREME RAINFALL FLOOD AND SEA LEVEL RISE IMPACTS ON THE PORT CITY OF HAI PHONG IN VIETNAM, Quang Nguyen* and Waheed Uddin, University of Mississippi (USA)

C.8.3 UNDERSTANDING DYNAMIC RISK PERCEPTION IN LARGE-SCALE INFRASTRUCTURE EVACUATIONS USING AN INTERACTIVE SIMULATION, Minji Choi, SangHyun Lee*, Moonseo Park and Hyun-Soo Lee, Seoul National University (Korea)

C.8.4 INVESTIGATING THE ROLE OF EMERGENCY MANAGEMENT INFORMATION: THE CASE OF KOREA, Kyoo-Man Ha*, Jin-Kyu Park, Tae Hawn Kim and ChangYeol Lee, Pusan National University (Korea)

C.8.5 RESILIENCE ASSESSMENT FRAMEWORK FOR MUNICIPAL INFRASTRUCTURE, Ahmed Mohammed*, Soliman A. Abu-Samra and Tarek Zayed, Concordia University (Canada)
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<td><strong>A.9.1 OPENING REMARKS</strong>, Ungin Na, Director of Airport Policy Division, Ministry of Land, Infrastructure and Transport</td>
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<td><strong>A.9.2 CONSTRUCTION OF MEASUREMENT SYSTEM FOR DEVELOPMENT OF KOREAN AIRPORT CONCRETE PAVEMENT DESIGN METHOD</strong>, Nam Hyon Cho, Jin Hoon Jeong, Jong Hoon Lee and Hae Won Park, Inha University (KOREA)</td>
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<td><strong>B.9.1 WARM MIX ASPHALT ADDITIVES</strong>, Youngjoo Kim</td>
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<td><strong>C.9.1 DISASTER RESILIENCE</strong>, Sue McNeil, University of Delaware</td>
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<td><strong>C.9.2 TRANSPORTATION SAFETY</strong>, Jun S. Oh, Director of Center for Livable Communities, Western Michigan University</td>
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### A.10 Introducing FAARFIELD 1.41: Latest Updates to FAA Airport Pavement Design Procedures

The US Federal Aviation Administration (FAA) released the latest update to its pavement design software, FAARFIELD 1.41, in November 2016. FAARFIELD implements a mechanistic-empirical approach to rigid and flexible pavement design, incorporating both layered elastic and 3D finite element structural models. The latest program includes many changes from the previous versions. While some of these changes are intended to improve the user experience or to add new functionality, others are more fundamental and affect the underlying structural, traffic and pavement life models.

This workshop will familiarize participants with the latest FAA design procedures, with an emphasis on practical design examples. Because FAARFIELD was developed to support FAA standard pavement designs, a basic understanding of FAA material and construction standards is necessary for proper use of the program. Therefore, the properties of FAA standard materials including P-401 (hot-mix asphalt) and P-501 (portland cement concrete) will be examined in some detail. Other topics covered in this workshop will include: design life; cumulative damage factors (CDF) and pass/coverage ratio, subgrade and subbase layer characterization for design; using the FAARFIELD aircraft libraries; and interpreting the design report. The FAARFIELD methods of airport overlay design will be covered if time permits.

### B.10 International Cooperation in Advanced Construction Technology

**Session Chair:** Hosin “David” Lee, Laboratory for Advanced Construction Technology (LACT), U of Iowa

### C.10 Safety, Disaster Resilience and Sustainability

**Session Chair:** Jun S. Oh, Western Michigan University
Co-Organizers and Sponsors: