GENERAL DESCRIPTION OF THE SPECIAL SESSION

As the types and causes of disaster become more diverse, the discipline of disaster management becomes wider. Disaster management requires transportation strategies for detection, evacuation, and emergency transport plan. It is also important part to road safety system. This sessions aim to widen the role of transport in road safety system and disaster management. The session provides the emerging issues and advanced technologies in road safety and disaster management system by presenting practical cases from Korea, Japan, Canada, Australia and Puerto Rico. Additionally, the officials and experts from governments, universities and institutes would discuss application plan and method as to recommended studies and technologies. The special session hope participates to enlarge their view so as to develop and improve road safety and disaster management systems.

1. PREEMPTIVE REALLOCATION OF FIRE SERVICES IN EMERGENCY RESPONSE FOR SMALL MUNICIPALITIES

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When multiple emergency calls occur, response times to multiple emergency incidents may increase due to the lack of fire engines with appropriate equipment and/or associated fire crews to handle more than one emergency call simultaneously. This presentation discusses a data-driven and scientific approach to assist in decision making process related to the preemptive reallocation of fire engines (and associated fire crews) in a fire department where multiple fire or other emergency incidents is expected to occur concurrently in a fire district for a limited time window. The preemptive reallocation of fire engines refers to the systematic reallocation of a secondary fire engine and associated fire crews to a certain fire district in order to respond to multiple incidents more efficiently by maximizing the use of existing emergency response resources. The preemptive reallocation tactic is particularly useful for a small municipality where they lack the operating budget to create and maintain large-scale emergency response resources.
2. NATURAL DISASTER AND EMERGENCY INFORMATION MANAGEMENT RESEARCH IN AUSTRALIA

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As an expert leading a number of research and industry projects on traffic control and operation, travel behaviour and mode choices, Dr. Lee currently focuses on exploring the roles of disaster and emergency information and understanding public attitude and behaviour under emergency situation. The presentation will introduce an ongoing research to improve the natural disaster and emergency information in Queensland, Australia. The nature and severity of natural hazard consequences is dependent on people’s behaviour based on their interpretations of emergency/disaster information available to the public. The presentation will provide an overview of the project and the progress to develop a human-computer-interactions testbed to examine and improve how emergency and disaster information is accessed, interpreted and responded when the information is presented in various contents, types, formats, and delivery methods and to understand and formulate the processes involved in people's decision-makings under risk and uncertainty situations.

3. EVACUATION POLICIES AND STRATEGIES FOR INFRASTRUCTURE CONSTRUCTION AND SUPPORTING METHOD DEVELOPMENT AGAINST HUGE DISASTERS

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The tragic events have gathered much attention and have opened way to research opportunities on topics related to evacuation and risk reduction from earthquakes as well as from tsunami and nuclear disaster immediately after them. The central government of Japan has conducted surveys using formulated questionnaires to collect data on the condition of the actual evacuations after the Great East Japan Earthquake in 2011. And researchers became able to utilize the data on individual evacuation time, distance, speed, mode share ratio and other information. Since another huge disaster is forecast to attack Japan soon, we are required to prepare for it by infrastructure construction and supporting software development as well based on researches. Evacuation is not always between two areas in the vicinity, but often across long distances from one city to another. This presentation will report the present situation of evacuation policies and discuss how to consider guidance and supporting method to develop the evacuation plans.
4. LESSONS LEARNED ON THE PASSAGE OF CATEGORY 5 HURRICANE MARIA OVER THE ISLAND OF PUERTO RICO: ROAD SAFETY INFRASTRUCTURE PERSPECTIVE

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Director, Puerto Rico Transportation Technology Transfer Center and
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The transportation infrastructure of the Caribbean Island of Puerto Rico with a surface area of 9104 km², is responsible for the mobility and accessibility of people and goods with over 28,000 kilometers of paved roadways, were more than 93% of all trips are generated by private vehicles.

On September 20, 2017, Puerto Rico was impacted by Hurricane Maria of Category 5, causing an unprecedented damage to the country's transportation infrastructure recorded in its history. The entire Island was without electric power and communication, and over 50,000 landslides and mudslides occurred, over 20 major bridges in the strategic highway network have structural failure or collapse due to flooding, scoursing and other drainage related problems. Most of the guide and directional overhead signs in major freeways and urban areas collapsed, including break-away devices, creating hazardous condition to our motorists. The logistics associated with the transportation infrastructure that includes roads, bridges, ports, airports, suffered significant damage that affected the quality of life of all residents on the island with a major impact to the economic development of the country. The $94.3 US billion dollars budget has been estimated to restore the infrastructure to its original condition prior to the hurricane.

Transportation systems adjacent to coastal regions present a particular challenge due to flooding, erosion potential and collapse during extreme climatic actions. In the last two decades, the increase in Mean Sea Level (MSL) combined with the accelerated deterioration of infrastructure at alarming rates due to lack of maintenance is creating dangerous conditions for residents, travelers and tourists in the Caribbean coastal regions. On the other hand, the cuts and slopes of the mountains that suffered innumerable landslides as a result of the saturation of the soil and precipitation of intense rains during the 20 hours of the hurricane created a collapse in the road network of the country affecting the logistics of transporting supplies to the municipalities and affected areas.

The United Nations has identified climatic change as one of the fundamental Sustainable Development Goal (SDG). The Caribbean Region is one of the geographical areas of the world in which the civil transport infrastructure and its appurtenance (light poles, fiber optics, guardrails, trees, overhead signs) are more fragile to the natural hazards associated with hurricanes, strong winds, flash floods and El Niño and Niña events. These events have accelerated the natural fluctuation of ocean temperatures in which unprecedented floods and heat waves have occurred in the Caribbean as well as precipitation levels not seen in much of the designs of the existing bridge and transport infrastructure.

This presentation will document the process in which the Government of Puerto Rico, its Department of Transportation and Public Works and related agencies addressed the road safety and transportation logistic during this extreme natural disaster, the resiliency/recovery process and lessons learned as a result of the passage of Category 5 Hurricane Maria by Puerto Rico. The road safety infrastructure perspective will be emphasized with recommendations to Islands with similar geographical characteristics such as Jeju Island.
5. DISASTER PREVENTION AND MITIGATION: DESIGNING NATIONAL EMERGENCY ROAD

Jun, Lee
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This presentation offers the plan for designation, operation and management of emergency transportation route. Redefining the role for Ministry of Public Safety and Security and relevant organizations in Korea and examining related laws and system are performed to support emergency transportation route. It would provide useful information to improve transportation countermeasures against disasters and establish specific and practical plans. In particular, the presentation supports the establishment of Korea’s disaster prevention and management plan which is reflected the geographical characteristic in transport network, the detailed type of disaster and the accumulated climatic information.

6. PENAL DISCUSSION

(Chair for the session) Jeong Bok, YU
Chief Director, Dept. of Road Transport, The Korea Transport Institute
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(Central government in Korea) Ministry of Land, Infrastructure and Transport, Ministry of Public Safety and Security

(University) Nagaoka University of Technology, Chungang University, Queens land University of Technology, York University, University of Puerto Rico

(Relevant institute) The Korea Transport Institute