George C. Lee
gclee@buffalo.edu

George C. Lee is a SUNY Distinguished Professor in the Department of Civil, Structural and Environmental Engineering. Previously, he had served as Chair of the Department of Civil Engineering (1974-77) and Dean of the School of Engineering and Applied Sciences (1978-95) at UB. Since 1995, Dr. Lee is Samuel P. Capen Professor of Engineering. Between 1992 and 2003 he served as Director of the Multidisciplinary Center for Earthquake Engineering Research (MCEER). He earned both his Ph.D. and M.S. degrees at Lehigh University, and his undergraduate degree from the National Taiwan University. His research expertise is in the areas of structural engineering and mechanics, with emphasis in steel structures and earthquake engineering. In his earlier career, he also made contributions in cold regions structural engineering and in biomechanics and living systems. In recent years he contributed extensively in seismic design of structures with added response modification and isolation systems, decision-support systems for managing utility systems for critical facilities, and seismic design of segmental piers for accelerated bridge construction. During the past five years, he devoted a major effort to establish design principles and guidelines against multiple extreme hazard events for bridges and infrastructure systems.

Dr. Lee has held leadership positions in numerous professional organizations in which he is a member including the American Society of Civil Engineers, and has served as the editor or as a member of editorial boards of several ASCE and international journals. At present, he is the editor-in-chief (US) of *Journal of Earthquake Engineering and Earthquake Vibration.* He is the recipient of numerous awards and citations including the superior accomplishment award from NSF, and the Newmark Medal of the ASCE. In 2006, he received a Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.

George C. Lee

gclee@buffalo.edu

Department of Civil, Structural and Environmental Engineering

University at Buffalo, Buffalo, NY, USA

US-Taiwan Workshop on Mega-City/Mega-Disaster (MCMD)

There is definitely a need to formulate strategies for densely populated communities to become more mega-disaster resilient. Major natural and manmade disasters in recent years throughout the world have elevated the urgency to systematically examine the complex, interlocking mitigation and response issues, to establish and prioritize research foci and to identify the weak links of the organizational infrastructure responsible for safeguarding these disaster vulnerable mega-city and/or densely populated communities.

In recent years, many conferences and workshops have been organized on a variety of relevant topics such as understanding and forecasting extreme events; loss estimation methodologies for the physical and social infrastructure systems due to individual hazards; hazard mitigation technologies for constructed facilities; disaster preparedness and emergency management, etc. The outcome of these gatherings has been very limited from the MCMD perspective. Because the scale, nature, scope and complexity of the MCMD problem are also at a "mega-level," which were never addressed systematically by the funding organizations nor the academic research community. There are too many unknowns at all levels and involve too many disciplines.

It is highly desirable that this US-Taiwan Workshop gives emphasis to establish an overall plan involving a series of future MCMD workshops over the next few years, and a roadmap to systematically identify and prioritize the future research agenda. Important issues are addressed in several future workshops each by an expert group. For example, this workshop should identify the extreme events to be considered, but the state-of-the-art on methods to forecast the frequency of occurrence of the selected extreme hazards and their intensity or other disaster-specific topics would be addressed by appropriate expert group in future special workshops. This workshop should not talk about a new sensor, a control system or a nonlinear structural analysis method.

Based on my very limited experience from working on multi-extreme hazard design of bridges, I would say that the emphasis of this first workshop should concentrate on developing only one or two themes at most (the last two). In my opinion, the most important theme for MCMD now is disaster preparedness and emergency management to minimize casualties. It is not too closely related to the type of disaster, so it does not require the integration of experts from different scientific disciplines. The next most urgent theme for MCMD is a vulnerability assessment method of the physical and organizational infrastructure. This is very tricky because community vulnerability is a dynamic process. Both these themes should only include necessary and relevant technologies, excluding those applicable at the lower systems levels (e.g. structural control).

Two years ago in planning of a post-mega earthquake workshop, I proposed a new focus for discussion to establish several levels of minimal casualties to aid in the development of policies and planning decisions for dense urban communities. It was rejected by engineering researchers, as they typically are conditioned to use no structural collapse as the bottom line. However, in preparing for a potential mega-disaster, a mega-city has to be realistic and willing to accept the possible outcome of a limited number of casualties when developing mitigation policies and response strategies. I suggest that this first MCMD workshop address this issue as well.