



Northeastern

Department of Civil and Environmental Engineering
Distinguished Seminar Series

Critical Urban Infrastructure, and Community Resilience to Natural Hazards - A Complex System View

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12pm-1pm
105 Shillman Hall

Abstract

In an urban community, certain infrastructure systems are critical for its normal functioning. Technical systems act together interdependently with socio-economic systems making the overall community system a complex system. The relationship among various sub-systems is non-linear and complex. Although interdependence among technical systems can be quantified to some degree, it is not possible to capture it in totality as actions by various actors are involved in operating these systems thus changing the behavior of the system based on the feedback as a result of these actions.

Developing resilience in technical system, economic system, and societal system is critical to minimize the impact of natural hazards. However, developing resilience in technical system is entirely different than developing resilience in economic or societal system. Community resiliency is multi-disciplinary, multi-stakeholder dependent, thus making it a challenging system to actualize. Although it is possible to quantify resiliency of technical systems, quantifying overall Community Resiliency is difficult.

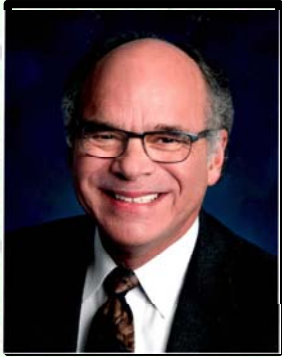
To minimize the impact of a damaging natural hazard on a community, actions by several levels of decision-makers are necessary. Some actions are immediate as a response to the hazard and other actions are taken for long-term solutions. On a long term basis, a community is interested in minimizing the loss of daily functionality due a damaging natural hazard thus an integrated approach by all stakeholders is important.

Bio

Vilas Mujumdar is an independent consulting engineer since 2009. Previously he was CEO, President, and Partner in many large engineering firms and a highest-level administrator in the public sector; Chief of Operations, Division of State Architect, State of California; Director, Engineering Research Centers Program at the National Science Foundation (NSF). His professional experience uniquely combines Structural engineering, Project management, Teaching, and Research Management in Asia, Europe, Canada and the US.

He is a recipient of many *awards* and *recognitions* nationally and internationally. Some recent awards are: *NSF Director's Award* (2009); *NSF Outstanding Service Award* (2008); *NEES Community Visionary award* (2005); *Special recognition* from California Governor "for making a significant contribution to reforming public school construction and enhancing seismic safety in California" (1999). Won many international awards for Building Projects in the private industry, many projects as feature articles in *Engineering News Record*.

Vilas serves on many board committees of ASCE, and is a Director of The Masonry Society as well as ASCE. He is recognized internationally for his leadership and *contribution to integrated trans-disciplinary work in reducing natural hazard risks*, and is proactively involved in addressing sustainability issues facing the global society through engineering.



Vilas Mujumdar, P.E., S.E.

Consulting Engineer

VIENNA, VA

Former Positions

- **Chief of Operations, Division of State Architect, State of California**
- **Director, Engineering Research Centers Program, National Science Foundation**

Research Interests

- **Seismic engineering**
- **Infrastructure systems**
- **Infrastructure resilience**
- **Reducing natural hazard risks**

Selected Service and Awards

- **2009 NSF Director's Award**
- **2008 NSF Outstanding Service Award**
- **2005 NEES Community Visionary Award**
- **ASCE board committees**
- **Director, The Masonry Society**