CASE WESTERN RESERVE
UNIVERSITY

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

is pleased to present,

THE 2025 HIGLEY LECTURE

DR. JOHN W. VAN DE LINDT - Colorado State University

Date: *Thursday, May 1st, 2025*

Lunch *at 11:30pm, followed by* **Lecture** *at 12:00pm, Adelbert Hall, Toepfer Room*

Zoom Link*:* https://cwru.zoom.us/j/93460065868?pwd=ZzZFVUhldkZtRWNuaWQvQXdmbW1rQT09

Reception *at 4:00pm, Bingham Building, Geotech Lab, Room 286*

Community Scale Modeling for Resilience: Interdisciplinary Research for Real-World Impacts

Abstract: Resilience is the ability to prepare for, adapt to, and recovery rapidly from hazards such as earthquakes, hurricanes, tornadoes, or floods. While a single building or facility can perform well it cannot realistically be resilient by itself since interconnectivity, interdependencies, and other complex socio-economic factors necessitate goals and objectives be defined at the community, city, or county level. Retrofit or adaptation level decisions are often made based on single facility performance with community-level resilience only assumed. Resolving this challenge would require that an entire city be modeled, resilience goals across the physical, social institutions, and economy of the community somehow agreed upon and set, and then the model used to deaggregate and determine what adaptation level achieves these goals under specified natural hazard events. The Center for Risk-Based Community Resilience Modeling, a NIST-funded partnership of 14 universities, developed an open-source platform to integrate models across disciplines which is publicly available. This presentation will provide a brief overview of the interdisciplinary science behind the integrated community resilience models and then present several examples: The deaggregation process demonstrated for tornado wind retrofit accounting for community-level social and economic goals; the retrofit of masonry buildings in Salt Lake City based on financial constraints; and finally a residential building adaptation decisions for the combination of sea level rise and hurricanes over a 100 year time horizon seeking to limit population outmigration over time. The presentation will close with a summary of activities that the nonprofit Project IN-CORE, which applies IN-CORE to help communities adapt to climate hazards at no cost to them, has completed.

Bio: Dr. John W. van de Lindt is the Harold H. Short Chaired Professor in the Department of Civil and Environmental Engineering at Colorado State University. Over the last two-and-a half decades van de Lindt's research program has focused on performance-based engineering and test bed applications of buildings and other systems for earthquakes, hurricanes, tsunamis, tornadoes and floods. Professor van de Lindt is the Co-director for the National Institute of Standards and Technology-funded Center of Excellence (COE) for Risk-Based Community Resilience Planning headquartered at Colorado State University in its tenth year. A major portion of the COE is to develop a computational platform IN-CORE to enable communities to measure their resilience to natural hazards. He has served as Chair of a number of ASCE committees throughout the Structural Engineering Institute and Infrastructure Resilience Division. He has published more than 500 technical articles and currently serves as the Editor-in-Chief for the ASCE *Journal of Structural Engineering*.