CE 295 - RESEARCH SEMINARS IN STRUCTURAL & GEOTECHNICAL ENGINEERING

THE NEXUS OF INFRASTRUCTURE EFFICIENCY AND RESILIENCY

Date: Monday, April 14th Time: 10:00AM-11:00AM Room: EG - 2430 (Colloqiua Room) Guest Speaker: Sarah Taylor-Lange, Ph.D.



Abstract:

Most urban mega-centers face major challenges due to overly stressed resource and support systems, increasing population density, environmental waste stream and pollution issues, and ageing and inefficient infrastructure systems. These issues are amplified by climate change and natural disasters, causing infrastructure fragility. Motivated by these issues, three interdisciplinary projects will be discussed, highlighting strategies for setting realistic targets and achieving more efficient, resilient, and sustainable infrastructure. The first project employs an integrated, econometric approach, to model current and future energy consumption and GHG emissions from residential buildings, in select U.S. counties. The modeling results highlight the importance of capturing the complexities of integrated urban infrastructure systems to achieve more feasible emissions policy planning. The second project investigates the feasibility of developing and using novel materials for a sustainable infrastructure with reduced carbon footprint. The results of life cycle assessment of these strategies demonstrate the beneficial impact of using smart composite materials. The third project assesses the passive pollutant removal technologies by buildings using experimental monitoring techniques. The results provide a quantitative insight on the pollutant mitigation potential of buildings for increasing indoor and outdoor air quality. Finally, a future research vision is presented for furthering these research efforts for balancing the efficiency and resiliency of our civil infrastructure while meeting the urban sustainability goals.

Sarah C. Taylor-Lange received her B.S., M.S., Ph.D. degrees in civil and environmental engineering from UC Davis, UCLA, and UT Austin, respectively. She is currently a postdoctoral research fellow in the Civil, Architectural, and Environmental Engineering Department at UT Austin. She is an NSF IGERT-Indoor Environmental Science and Engineering affiliate, a United States Environmental Protection Agency STAR fellow, and a P.E.O. International scholar. Her passion in research is the nexus of civil infrastructure efficiency and resiliency in response to societal and environmental challenges. Particularly, she is interested in multifaceted systems level analysis of integrated civil infrastructure using novel data collection, modeling and action planning/implementation for addressing today's and tomorrow's major urban challenges.

