Prof. Samer M. Madanat
XENEL DISTINGUISHED PROFESSOR OF ENGINEERING EMERITUS IN THE DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING AT UC BERKELEY
DEAN OF ENGINEERING AT NYU ABU DHABI

Flood Protection Infrastructure, Transportation, and Government Networks
Resilient Infrastructures as Seas Rise (RISeR)

Abstract
The RISeR research project explores how coastal flooding, shoreline infrastructure, the transportation system, and decision-makers interact in coastal communities, including the feedback between them. It comprises three components: hydrodynamics, governance, and transportation. The geographical focus is the San Francisco Bay Area and the challenges associated with sea level rise and bayside flooding. Its objective is to develop tools, information, and insights to help government institutions and networks be better prepared to make effective decisions about infrastructure planning and operations. The presentation will overview the broad research scope of RISeR, and focus on the transportation and protective infrastructure components. We analyze the decision-makers’ problem of allocating limited protection budgets to minimize traffic delays resulting from link inundation. We first consider the case of a central decision-maker, obtain Pareto frontiers representing the optimal strategies, and identify the most critical counties to protect. Next, we present models and results for the case of multiple decision-makers operating either competitively (as in a Nash game) or cooperatively, and demonstrate the benefits of well-designed collaborations. We also present results from smaller units of analysis, Operational Landscape Units (OLU), which demonstrate the advantages of such fine-grained elements for informing protection policies. We conclude with suggestions for further research over longer time scales, multi-modal transportation perspectives, and other critical infrastructures.

April 22nd, 2019

Pre-lecture Reception: 4:30pm
Lecture: 5:00pm
Building 1-190

Faculty Hosts:
Carolina Osorio + Saurabh Amin
+ Lydia Bourouiba

Biography
Dr. Samer M. Madanat is the Dean of Engineering at NYU Abu Dhabi. Xenel Distinguished Professor of Engineering Emeritus and former Chair of the Department of Civil & Environmental Engineering at the University of California at Berkeley. From 2005 to 2014, he served as the Director of the Institute of Transportation Studies. Prior to that, he served as Director of the PATH program at UC Berkeley. He received a B.Sc. in Civil Engineering from the University of Jordan in 1986, and a M.S. and Ph.D. in Transportation Systems from MIT in 1988 and 1991 respectively. He is Editor of the Journal of Transport Policy and Associate Editor of the European Journal of Transportation and Logistics. Prof. Madanat is also a member of the Editorial Boards of Transportation Research part D, and Computer-Aided Civil and Infrastructure Engineering.