

URBAN TRANSFORMATIONS & REGIONAL RESILIENCE

VIRTUAL LECTURE SERIES | SPRING 2021

SEMINAR #2

UNRAVELING THE INTERPLAY OF THE URBAN FORM & MOBILITY SCIENCE FOR PLANNING CITIES

ABSTRACT

The marketing rhetoric around Smart Cities is replete with unfulfilled promises, and predictions exercises that may benefit industries and not necessarily the social good. Yet, ubiquitous data collection (including mobile devices, GPS, social media, and synoptic video) require new capabilities for urban planners that respond to these innovations, such that we could support and even disrupt the field. In the first part of my talk, I present one example of how to use big-data to support urban planning decisions in the covid-19 era. Via mobile phone data for twenty cities around the world, we study how the distance covered by individuals (rg) varies as the location of their residences moves away from the central business district (CBD). We show that the changes in the statistical distribution of rg between the inner city and the residents of the suburbs classify the centrality of cities better than the population distributions alone. In turn, we propose metrics of urban form and mobility based on rg to predict the infective reproduction number (RO) of COVID-19 in eleven Spanish cities. In the second part I show how we go from raw mobile from data to the science to traffic. We measure the resilience of the system by increasing the volume of cars in the network, keeping the road capacity and the empirical spatial dynamics from origins to destinations unchanged. We identify three states of urban traffic, separated by two distinctive transitions. The first describing the appearance of the first bottle necks, and the second the transition to a complete collapse of the system. The transition to the second state measures the resilience of the various cities and is characterized by a non-equilibrium phase transition.

PRESENTED BY

Marta C. Gonzalez is Associate Professor of City and Regional Planning at the University of California, Berkeley, and a Physics Research faculty in the Energy Technology Area (ETA) at the Lawrence Berkeley National Laboratory (Berkeley Lab).

She works in the urban science space, focusing on the intersections between people within social networks and the built and natural environments. Her goal is to design urban solutions through new technologies. To that end, she has developed tools that impact transportation research and discovered novel approaches to model human mobility and the adoption of energy technologies. Statistical physics of complex systems and network science informs her scientific approach. Gonzalez's research includes applying big data to understanding human network behavior, with applications in transportation networks, energy efficiency planning, and disease proliferation characterization. Prior to joining Berkeley, Marta worked as an Associate Professor of Civil and Environmental Engineering at MIT, a member of the Operations Research Center and the Center for Advanced Urbanism. She is a member of the scientific council of technology companies such as Gran Data, PTV and the Pecan Street Project consortium.

Marta Gonzalez was a Scientific Advisory Board member of PTV AG. She was the recipient of a U.N. Foundation award to study consumption patterns of women and girls in the developing world and of a Bill and Melinda Gates Foundation award to study access to financial services in the developing world.

MARTA GONZALEZ

ASSOCIATE PROFESSOR OF CIVIL &
ENVIRONMENTAL ENGINEERING,
UC-BERKELEY



JOIN US ON ZOOM

FEB 10, 2021 | 12:00-1:30 PM (EST)

REGISTER



PURDUE
UNIVERSITY

LYLES SCHOOL OF CIVIL ENGINEERING