

MULTIPLEX URBAN FINGERPRINTS FOR BICYCLE NETWORK PLANNING



A TALK BY

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ABSTRACT | The idea of cities as complex systems lies at the core of seminal theories in different disciplines from sociology to human geography, which have shaped how we understand and study urban settlements. The recent availability of transport infrastructure networks, thanks to OpenStreetMap (www.openstreetmap.org) along with network science approaches, has offered new insights into the network organization of cities and their transportation modes. In particular, multi-modal infrastructure, where each layer consists of a specific set of links (pedestrian, bicycle infrastructure, streets, and public transportation systems) and nodes represent intersections, can be naturally described by the mathematical framework of multiplex networks. In this talk I will present our analyzes on the overlap and completeness of these layers in multiple cities around the world and show that similar patterns arise within distinct classes of cities, using network component analysis and multiplex measures such as a node overlap census. Based on the insights from our network measures, we introduce a set of algorithms to detect the most critical missing links in the bicycle layer, showing that small but focused investments allow to significantly increase the efficiency of the bicycle network.

BIO | Luis studies cities and urban mobility using network science methods. Currently, he is working on multiplex urban fingerprints for bicycle network planning. Luis has a background in architecture and urban planning; he has worked in the public and private sector.