Research Title:

Pedestrian walking patterns and traffic in Tel-Aviv, Israel, during COVID-19 quarantine and exit-quarantine policies, using BT sensor technology

Primary Investigator:

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This study aims at scrutinizing the impact of COVID-19 pandemic policies on pedestrian traffic and walking patterns in Tel-Aviv, Israel. Accordingly, we aim to identify, analyze, and quantify the changes in pedestrians' travel behavior during the 'first wave' period of COVID-19 quarantine and exit-quarantine policies in Israel. The underlying principle of this study is that governmental policies, aiming at controlling and limiting the spread of the virus, have significant impacts on urban mobility in general, and on pedestrian mobility in the public realm particularly. To record pedestrian traffic data, we used Bluetooth (BT) sensor technology. A network of 65 BT sensors (detectors) that are placed at intersections around the study area (installed on traffic lights in road junctions) was used to record pedestrian movement in 77 street segments, referred as network "links". The data for this work was collected between 1.2.2020 and 26.7.2020 and was compared to 'normal' pre-COVID-19 conditions for the equivalent period in 2019. The travel behavior of pedestrians has been investigated in eight phases, divided according to the varying legal enforcements and policy decisions given by the Israeli government. Data was divided into weekdays and weekends and times of the day. In addition to general changes in pedestrian counts in the study area, we are interested in revealing what is the local impact of the aforementioned policies at the street-level. This includes changes in popular network links distribution over the study area and changes (volume and walking patterns) in network links with different land-use distinguishing between commercial and residential links. The contribution of this study is to the field of pedestrian mobility monitoring and behavior research in general, using new emerging technology and big-data, and to the growing interest in the influence of the COVID-19 pandemic on urban mobility. Moreover, this work constitutes a first attempt to use BT sensor technology for pedestrian monitoring in a large-scale and in a real mixed-mode urban environment. The results indicate the reliability of this technology and its great potential for future work in that field, that can greatly support planning decisions and enhance sustainable, pedestrian-oriented development in cities.