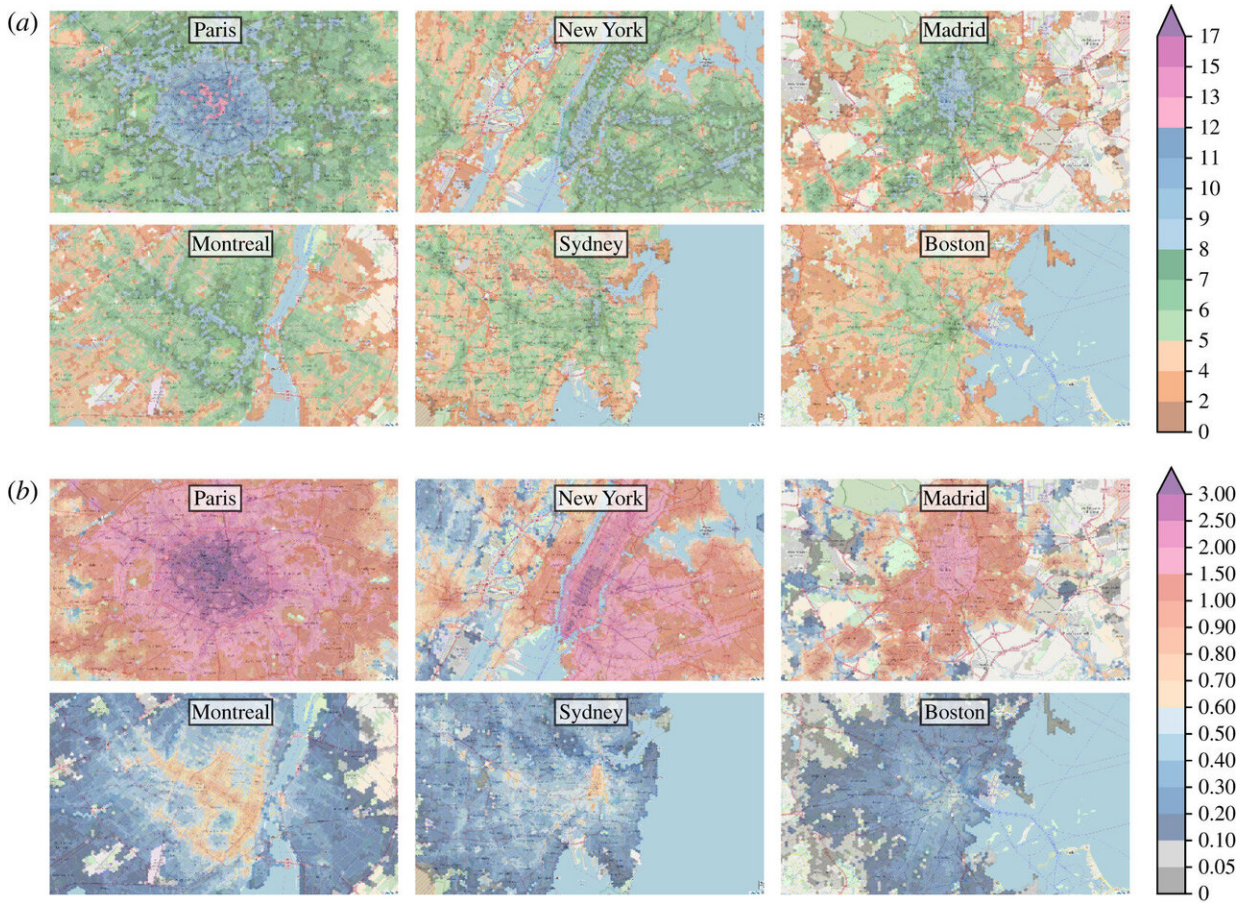
Ranking cities around the world by transportation accessibility

August 28 2019, by Bob Yirka



Maps of the velocity score and the sociality score. In the six maps of panel (a) we report the velocity score in km h^{-1} and in (b) the sociality score in millions of inhabitants for six different cities: Paris, New York, Madrid, Montreal, Sidney and Boston. The values of the velocity score range from less than 2 km h−1 (brown) of velocity score up to more than 17 km h^{-1} (purple), whereas the sociality score ranges from less 0.05 millions of inhabitants reachable up to more

than 3 millions of individuals. The great variability of the colours reveals a strong dissimilarity of performances of the public transport across cities. Credit: *Royal Society Open Science* (2019). DOI: 10.1098/rsos.190979

A trio of researchers at the Polytechnic University of Turin and Sony CSL Paris has ranked the major cities of the world by transportation accessibility to highlight inequality in major urban areas. In their paper published in the journal *Royal Society Open Science*, Indaco Biazzo, Bernardo Monechi and Vittorio Loreto describe their study and explain what it shows.

Over the past century, major cities around the world have grown ever-larger, forcing city planners to chart new ways for people to get around. In addition to commercial ventures such as taxi services, most major cities have public transportation options, such as buses and subway systems. But as the researchers with this new effort note that most such systems benefit only some of the people and not others. They suggest one way to measure transportation accessibility is to look at three major urban transportation phenomena: city cohesion, average velocity and city sociality.

The researchers define city cohesion as a fraction that represents the portion of a population that can be reached when taking a trip into a given city. Average velocity was how long it took, on average, to get from one place to another. And city sociality was the average number of people a person using transportation options on a given trip might meet.

The researchers report that they used mathematical equations to create isochronic maps in making their comparisons between cities. When looking at velocity and cohesion, they found that Berlin ranked the best in the world, followed by Paris and then Copenhagen. Out of 32 major

cities, Mexico City came in dead last. The researchers suggest a city's ranking is important because it highlights accessibility equality in a given city. Extremely long commute times, for example, can make it difficult for low wage earners to make a living in large urban areas. The researchers also found that when looking at city sociality only, the rankings were quite different—Paris came out on top, followed by New York and then Madrid.

The researchers conclude their study by noting that over the past several decades, urban growth has accelerated, leading to higher levels of interdependencies and interactions. And because of that, city planners must put greater effort into finding transportation solutions that are more equitable.

More information: Indaco Biazzo et al. General scores for accessibility and inequality measures in urban areas, *Royal Society Open Science* (2019). DOI: 10.1098/rsos.190979