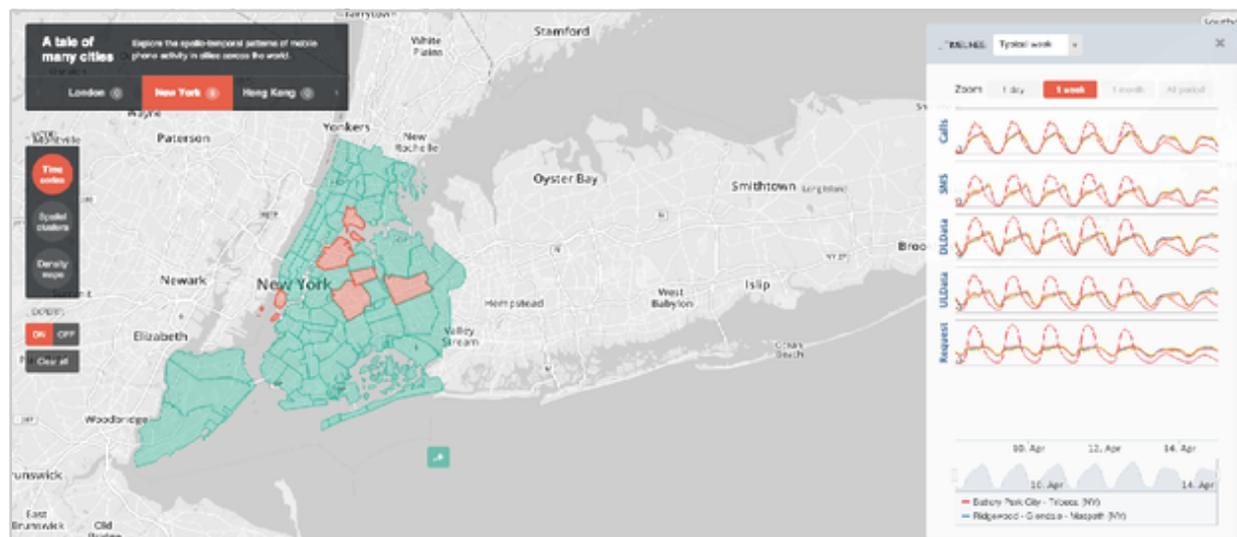




What Can 'the Mystery' of Cell-Phone Data Tell Us About What a City Needs?

Tracking communication patterns can help city planners improve digital and other infrastructure by revealing the behaviors of residents.

TANVI MISRA | [@Tanvim](#) | Dec 2, 2014 | [Comments](#)



A new app tracks communication patterns for four major cities revealing why residents behave a certain way. ([MIT SENSEable Lab/ Ericsson](#))

Most people are pretty attached to their phones. [Ninety percent](#) of adults have one, and [78 percent of kids](#) use one. As [Aaron Reiss observes in his documentation of the cell phone storage industry](#) in New York, cell phones are a huge part of our lives. And the information they provide about us reveals regional patterns of urban life.

"Cellphones now live with us—they have a symbiotic relation with our bodies," Carlo Ratti, director of the [Massachusetts Institute of Technology's SENSEable Lab](#), writes in an email. "Using aggregated data from cellphone

networks, we can better understand our cities and the ways we inhabit them."

Ratti and his colleagues Pierrick Thebault, Sebastian Grauwin, and Stanislav Sobolevsky at MIT's Senseable City Lab built the [Many Cities app](#) in partnership with the [Ericsson](#) phone company. The tool mapped calls, texts, and data traffic for a 10-month period across New York, Los Angeles, Hong Kong, and London—four well-connected, global, "[alpha](#)" cities.

"Census and surveys could be things of the past if this data and the findings we can extract from it is ... made accessible to everyone, from researchers to politicians to artists."

The point was to extract communication trends that are universal, as well as those that unique to each city. The latter, called "signatures of humanity" by the researchers, can help interpret the behavior of the city's inhabitants.

"Census and surveys could be things of the past if this data and the findings we can extract from it is shared and made accessible to everyone, from researchers to politicians to artists," Ratti says. They say that urban planners could infer how people behave at events such as festivals, concerts, sports games, and protests and design accordingly. Businesses could search for consumer behavior and telecom providers could improve subscription models.

In all the cities, the [researchers observed](#) similar daily patterns through the week: Activity climbs up in the morning, remains steady, and then decreases slowly into the night. During the weekdays, there are small spikes during lunch and commute hours. On the weekends, the curve is flatter because activity is slower.

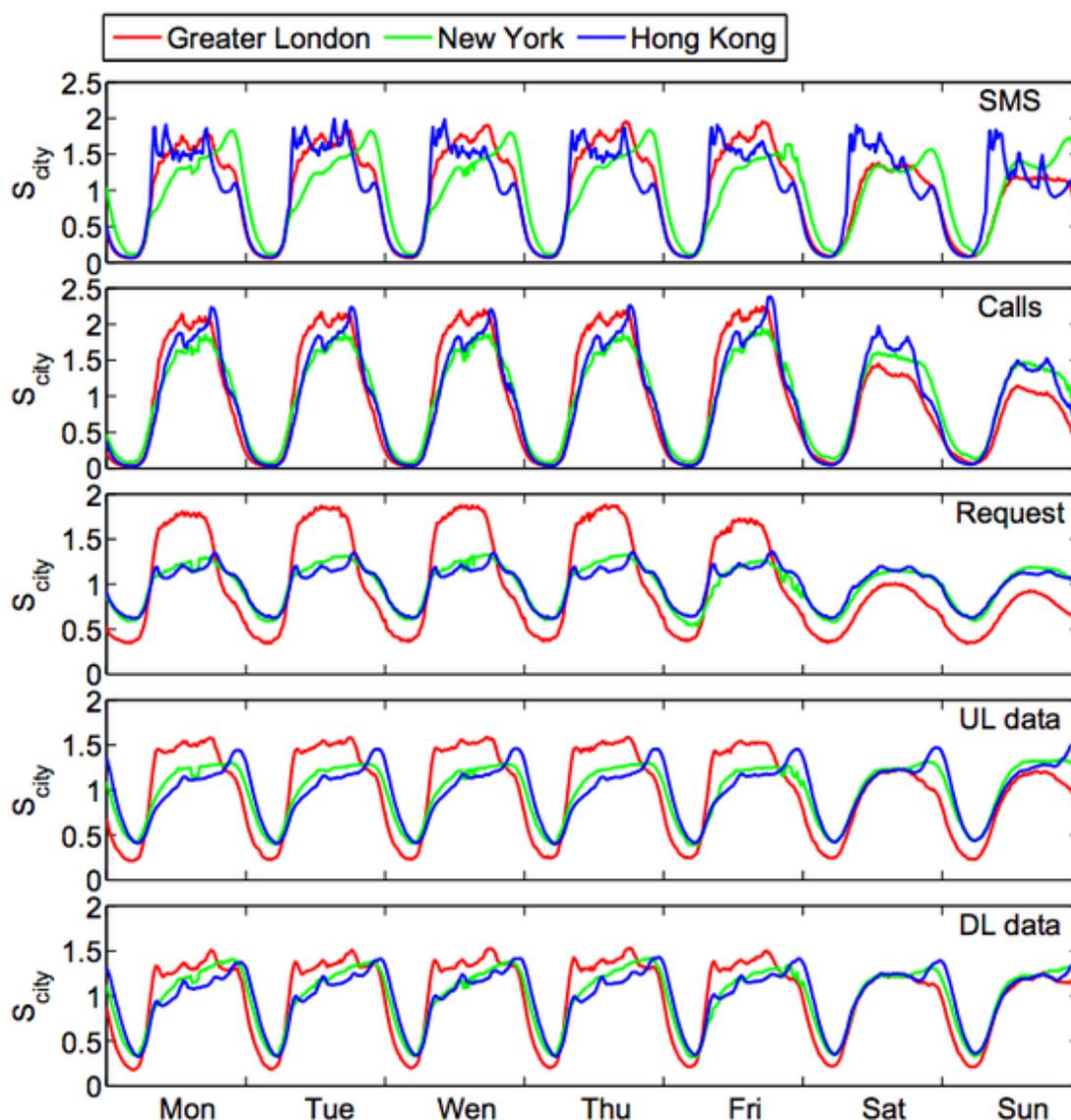


Figure 4: Cities signatures, showing the normalized typical week patterns for the different components of activity at the city scale.

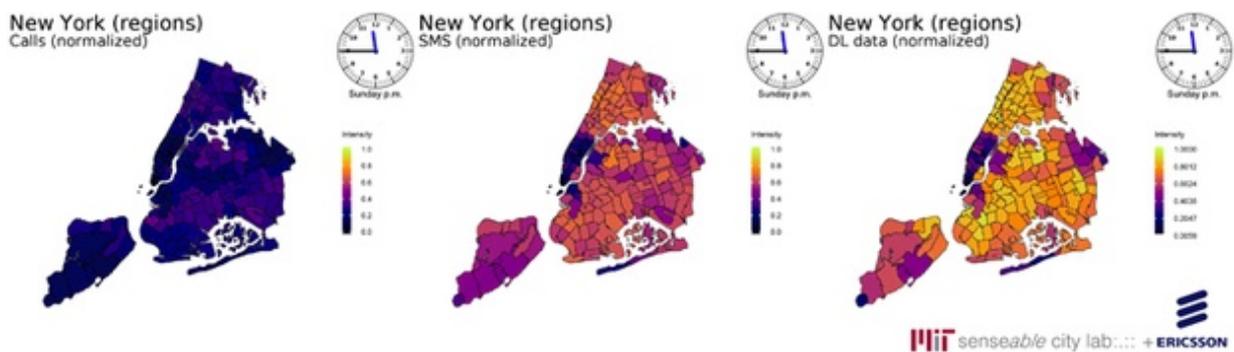
Citywide communication patterns for three out of the four cities in the app show that the crests and dips in weekly activity are the same. ([MIT SENSEable Lab paper](#))

But there are certain city-specific observations. For example, Americans text more in the evenings, and in London, activity tends to drop significantly around Christmas. Viewing these trends in local cultural and economic contexts by using event calendars, geo-located tweets, weather and traffic reports, and real estate prices can help interpret them.

Comparing trends in two cities, for instance Hong Kong and London, we can see stark differences. Hong Kong data show much more activity in the

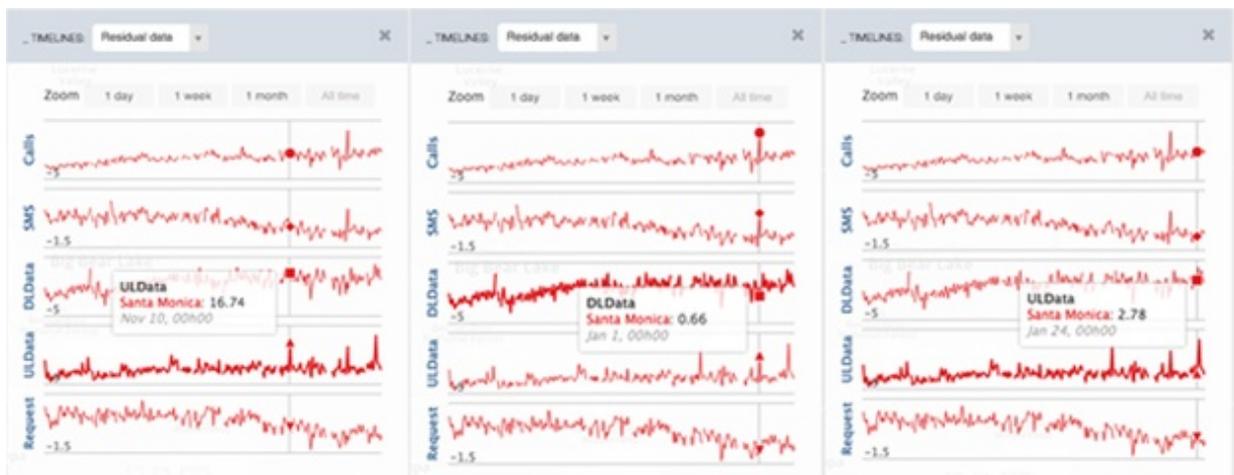
evenings. The researchers say this is because of how the data plans are priced in the two cities. In Hong Kong, data tariffs are very low and people use their cell phone broadband to connect their laptops to the Internet to watch movies. In London, it's the opposite: Because of that city's expensive data tariffs and dense Wi-Fi networks, London's residents use landline and hotspots rather than phone connections to access the Internet, explains data analyst Sebastian Grauwin.

New Yorkers also have specific cell-usage behaviors: People tend to text and use data late. Their mornings are reserved for phone calls.



New Yorkers tend to make calls in the morning and text at night. (Ericsson Research Blog)

It's not just general trends that the tool can help us understand, but also how specific events affect communication. For example, the researchers discovered that two peaks in uploaded data traffic from the Santa Monica region of Los Angeles was because of a conference and a "hackathon" scheduled in the area. The second peak was because it was New Year's Day.



The researchers easily found probable reasons for distinct peaks in uploaded traffic data in Santa Monica, Los Angeles.

People can play around with the tool and generate similar insights for these four cities while the researchers are trying to expand the number of cities the tool covers.

"We don't know exactly what people will find," developer Pierrick Thebault says. "We wanted to create a tool that would let them unlock the mystery of the data."

About the Author



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