

What Does It Take To See Gentrification Before It Happens?

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Gentrification brings with it new restaurants, businesses and housing but often pushes out longtime residents.

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Gentrification of neighborhoods can wreak havoc for those most vulnerable to change.

Sure, access to services and amenities rise in a gentrifying neighborhood. That is a good thing. But those amenities won't do you much good if you're forced to move because of skyrocketing housing costs.

That is why neighborhood and housing advocacy groups have spent decades searching for ways to protect longtime residents from the negative effects of gentrification.

But how can you tell if a neighborhood is gentrifying? Is it the [art gallery](#) that appears next to the bodegas? Is it the hipster coffee shop opening up where the old deli used to be? Maybe it's the expensive new condos rising up across from the older row houses? The problem with any of these obvious indicators is that by the time they appear, it may already be too late. The tide of living expenses in a given neighborhood may already be rising so fast that there is little that local groups, city planners or outside agencies can do. If you're poor or working class, it's just time to leave.

But what if there were a way to see gentrification long before the coffee shops, condos and Whole Foods appear? What if city planners and neighborhoods had an early warning system that could sniff out the changes just as they begin? In that way, cities might prepare for the coming changes — securing a diverse range of housing options before land and rent prices shoot through the roof.

A [neighborhood early warning system](#) like this has been a dream for city planners for decades. The first versions of it stretch back as far as the [1980s](#). Now, though, with the rise of big data, [this dream has taken a giant step forward](#) toward becoming a reality. As with all things big data, however, taking that step comes with both considerable promise — and peril.

Big data is a shorthand term for the insane amounts of information being generated by human beings in our digital world. From cellphones to credit card transactions to social media, we are all leaving digital contrails of almost all of our activity in the world. Learning how to harvest and analyze these

digital traces en masse holds the promise of allowing data scientists to see how societies operate at a resolution that was simply impossible before. And seeing hidden patterns in gentrification may be exactly the kind of task big data and data science are best at.

So what does it take to see gentrification before it happens? The most obvious indicator is housing prices. Cities have always done a pretty good job of keeping track of property sales. That is why those records have, for many decades, been the primary data set for studies of neighborhood change. But big data has already swept through the housing price field, as apps like [Zillow](#) and [Trulia](#) allow anyone access to real estate information going back years. Using a data science technique called machine learning, computers can analyze patterns in these real estate records and extract future trends — allowing companies to try to predict what your house will be worth next year.

But even if it works, this kind of "predictive analytics" for housing prices is too blunt an instrument to predict which neighborhoods might gentrify. To really develop an early warning system, data scientists need to go deeper into human behavior. Going deeper, however, means getting new kinds of data.

Evictions of both people and businesses might be one of the best representations of how gentrification negatively affects a neighborhood. But unlike real estate transactions, most cities do a terrible job of keeping track of who, where and why evictions are initiated. Getting that data used to mean a trip to city hall to dig through the musty records department. Because of this, evictions remain invisible to data scientists in their search for gentrification indicators.

A different kind of problem is faced by urban scientists who want to see who exactly is moving into, and out of, the neighborhoods. How does the economic and racial profile of a neighborhood change when gentrification occurs? Data from the U.S. census contains a wealth of information relevant to this question — but it comes just once a decade. That is too slow to catch the details of a changing neighborhood. Social scientists also have what is

called the [American Community Survey](#), which is done every year. But it's a fraction of the size of the census and, like a bad cellphone camera, it doesn't have the resolution scientists need to see the spatial details of how neighborhoods change.

The difficulties in these tools limited earlier heroic attempts at building a neighborhood early warning system. But with big data, the situation has radically changed. Rather than asking a handful of people a few direct questions about their lives, these days we're all leaving volumes of answers about ourselves in the data we generate just, for example, by using our phones.

Consider [a study](#) from October 2015 that used Twitter [to look at](#) how residents of different neighborhoods moved around the city of Louisville, Ky. For generations, Louisville residents have seen Ninth Street as [the boundary](#) of the poorer African-American neighborhood to the west and wealthier white neighborhood to the east. But by carefully tracking tweets that were geotagged, meaning they contained location information, researchers could study mobility patterns of residents in the different neighborhoods. In particular, they found that Twitter users from the western neighborhoods were far more likely to be found in different regions of the city than residents of the eastern neighborhoods. In this way, the researchers found that the traditional boundaries of the neighborhoods could be redrawn based on the way people actually behaved rather than just "common wisdom."

The Louisville research highlights how studies of what is called "human mobility" can provide ground-truth insights into how neighborhoods function for the people who use them. In the future, perhaps, it will be possible to identify gentrifying neighborhoods by looking for unexpected patterns in how people travel into and out them on a daily basis. Studies of the mixing of ethnic groups in [Estonia](#) tracked changes in neighborhood composition between the daytime and nighttime hours as well as weekday vs. weekend. By analyzing these patterns over months or years, it may be possible to see the "signal" of

gentrification appear as people who normally would not be visiting a neighborhood begin making more frequent appearances.

With an early warning system in place, neighborhood advocates would have the opportunity to [implement policies](#) ranging from reserving affordable housing units to educating residents of their renting rights to helping small businesses negotiate long-term lease extensions.

And given that gentrification represents a small problem compared with existing urban poverty, early warning systems could also be applied to the other direction of neighborhood change. Using big data alongside traditional social science methods, it may be possible to identify neighborhoods at risk of decline. In this way, predictive analytics would let residents and city officials take steps to keep these at-risk neighborhoods healthy through early intervention in the availability of services or policing.

The methods of big data might even allow neighborhood equality to be crowdsourced. A recent study using data from cellphones and credit card transactions tracked shopping trips across a range of rich and poor neighborhoods in Spain. By rewiring just 5 percent of those shopping trips to more economically challenged neighborhoods, the researchers found income disparity could be significantly flattened. That means that by changing the destination of just 5 out of 100 of our shopping trips, we might all be a source for positive change.

But, as is becoming clear with everything to do with big data, while advances hold great promise for dealing with neighborhood change, they also hold significant peril. The great hope of urban advocates is to democratize data and its analysis tools, allowing residents and other stakeholders to see more clearly how a neighborhood is changing. But knowledge of those changes might act in a way that accelerates them. [Seeing gentrification early](#) may spur more development more quickly. Seeing neighborhoods decline early may provide more disincentive for investment.

As the first wave of optimism for big data passes, both researchers and users have become more realistic about its possibilities. But with eyes wide open, we may be at the beginning of seeing human communities in an entirely new way. From this new vantage point we will, hopefully, have new tools to ensure their health and well-being, even in the midst of change.

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Adam Frank is a co-founder of the 13.7 blog, an astrophysics professor at the University of Rochester, a book author and a self-described "evangelist of science." You can keep up with more of what Adam is thinking on [Facebook](#) and Twitter: [@adamfrank4](#).