



SMALL BUILDINGS

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The National Trust for Historic Preservation has tapped into big data to explore the relationship between urban livability and clusters of smaller, older, dense buildings.

Big data is big news these days. Shorthand for the exponentially growing pool of information—scraped together from subscriptions and surveys, social media and location-aware apps—big data is making it possible for civic leaders to analyze, understand, and plan for their communities in ways never before possible.

Sociologist and *Rise of the Creative Class* author Richard Florida has used big data to pinpoint how the type of work we do divides communities more than the amount of money we earn.¹ Jawbone, a

company that makes Bluetooth-connected personal-activity tracking devices, has tapped aggregated data from its users to identify the U.S. cities in which people get the most sleep—and the least.² Now the National Trust for Historic Preservation is using big data to explore the correlation between neighborhood vibrancy and the size and density of neighborhood buildings.

A New Role for Big Data

The correlation between dense, human-scale buildings and lively streets is hardly a new concept. It was one of the bedrock observations of famed community activist Jane Jacobs about what makes communities work. In her groundbreaking 1961 book *The Death and Life of Great American Cities*, Jacobs pointed out the most important characteristics that make neighborhoods and cities work well: Blocks must be short, buildings must vary in age, each block must have multiple uses, and there must be a dense concentration

of people living and working in the area.

The characteristics Jacobs described exist in abundance in New England communities, from the stately streets of downtown Montpelier to bustling Boston neighborhoods like Roslindale Village and Codman Square. Towns and cities like these have grown organically over the centuries from small, compact, mixed-use cores, and many have retained those characteristics.

But, in other neighborhoods, some of the urban fabric has unraveled. For many reasons, reusing older buildings is often more difficult than building new ones. For example, zoning codes sometimes restrict the mix of uses—ground-floor shops with upper-floor offices and apartments—for which older commercial buildings were designed. If loan products that blend financing for rehabilitation of ground-floor commercial space with financing for rehabilitation of upper-floor housing are unavailable, piecing together financing can be prohibitively cumbersome. Financial incentives sometimes direct development away from walkable town centers to car-dependent, single-use shopping centers and housing complexes.

Until now, no one has quantified the characteristics that Jacobs believed are essential to making communities vibrant and productive. The National Trust recognized the need to make the case, in numbers, about the relationship between such characteristics and neighborhood livability.

The National Trust's Preservation Green Lab spent a year examining a horde of fine-grained data about the age and size of buildings in three cities—San Francisco, Seattle, and Washington, DC—and then correlating the data with 40 different characteristics of vibrancy. It has compiled and published its findings in a report called *Older, Smaller, Better*.³

The researchers found that the presence of older, smaller, and age-diverse buildings had strong correlations with indicators of livability.⁴ Consider the following:

- **Walkability:** Neighborhoods with smaller buildings and a wide range of building ages have higher Walk Score ratings than neighborhoods with larger buildings and buildings more homogenous in age.⁵
- **New businesses:** Neighborhoods with smaller buildings and buildings of different ages have a higher percentage of new businesses than those with larger buildings and buildings of the same age. They also have higher percentages of minority- and woman-owned businesses.
- **Young residents:** The median age of people living in neighborhoods with smaller, older buildings is lower than that of neighborhoods with larger buildings of the same age.
- **Diversity:** Neighborhoods with smaller, older buildings have a broader mix of people, with a wider age range, than other neighborhoods.
- **Nightlife:** Cellphone use on Friday nights is higher in neighborhoods with smaller, mixed-age buildings than in other neighborhoods.

- **Density:** There are more residents and more businesses per square foot in neighborhoods with smaller, older buildings than in those with newer, larger buildings.

Methodology

For each of the three cities the Green Lab chose to examine, it did six things.

First, it collected information from a variety of sources, including the U.S. Census Bureau, Yelp (information on business density, numbers of nonchain businesses, and business operating hours), Flickr (information on the geographic coordinates of buildings in grid squares), municipal real estate assessors, and Skyhook (a hybrid location-positioning company whose data made it possible to estimate the volume of cellphone use in different grid squares on different days and different times of day).

Second, it divided each city into a grid of 200-by-200-meter squares. Using a grid made it possible to tap into and connect data from many different sources.⁶ Third, it matched data to each of the grid squares. Fourth, it excluded squares that were purely residential, as their inclusion would have resulted in apples-to-oranges comparisons. To be included, a grid needed to have at least 10 commercial square feet, three businesses, and one full-time job, with at least 1 percent multifamily housing and one complete parcel record in the municipal property assessor's database. Fifth, the Green Lab developed a "character score," a composite rating of a grid square's building age, age diversity, and granularity (the number of parcels per grid square).

Finally, it correlated the character scores of each grid square with roughly 40 economic, cultural, social, and environmental characteristics, including:

- businesses per 1,000 square feet of commercial space,
- jobs per 1,000 square feet of commercial space,
- percentage of new businesses (opened in 2012),
- percentage of businesses owned by women and minorities,
- percentage of jobs in small businesses,
- percentage of nonchain businesses,
- racial and ethnic diversity,
- Walk Score rating,
- population density (persons per square mile),
- average standard deviation of residential rents,
- income diversity,
- numbers of nonprofit organizations focusing on arts and culture, and
- permitted outdoor seating areas (for example, attached to cafés).

The National Trust's Green Lab and its partners in this project demonstrated that neighborhoods with older buildings, smaller buildings, and buildings of diverse ages do, in fact, correlate with greater vibrancy than neighborhoods with newer, larger, and age-homogeneous buildings.⁷

What are the implications for public policy and urban plan-

ning? The Green Lab extracted half a dozen key lessons from its research: appreciate the efficiencies that older, smaller buildings provide; ensure that new buildings are compatible in scale with older buildings; encourage incremental development; reintegrate public transit into downtown and neighborhood hubs; recognize the appeal of older buildings to creative industries; and remove barriers to rehabilitating older buildings.

Until now, no one had quantified the characteristics that Jane Jacobs called essential to making communities vibrant.

The study represents one of the first times that big data has been used to help with understanding the importance of historic buildings to cities. And since prior research on the economic and cultural impacts of older buildings has been largely limited to buildings listed on the National Register of Historic Places (a list maintained by the National Park Service), it also represents one of the broadest studies of older, mixed-use buildings in the nation.

Jane Jacobs wrote, “Old ideas can sometimes use new buildings. New ideas must use old buildings.” The Green Lab’s *Older, Smaller, Better* report provides the first quantitative proof that she was right.

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Endnotes

- ¹ See <http://martinprosperity.org/2014/08/25/the-divided-city>.
- ² Brooklyn residents stay up latest; people in Pocahontas County, West Virginia, get the most sleep. See <https://jawbone.com/blog/circadian-rhythm>.
- ³ *Older, Smaller, Better: Measuring How the Character of Buildings and Blocks Influences Urban Vitality* (Washington, DC: National Trust for Historic Preservation, 2014), <http://www.preservationnation.org/information-center/sustainable-communities/green-lab/oldersmallerbetter>.
- ⁴ The number of buildings per block has a connection to the footprint and also the height of buildings. The more buildings the researchers counted in a block, the smaller those buildings were likely to be.
- ⁵ The Walk Score index assigns a numerical score to most U.S. addresses on the basis of proximity to a range of amenities, including schools, shops, public transit, parks, and theaters. In downtown Beverly, Massachusetts, 265 Cabot Street has a “Walker’s Paradise” Walk Score of 97, whereas 444 Broadway in Saugus, 30 miles south, scores 55, “Somewhat Walkable.” For more on walkability, see Scott Bricker, “Walkable and Affordable Communities,” in this issue.
- ⁶ The U.S. Census Bureau recently launched Demobase, a grid-based tool for

retrieving population estimates for any area, not just those within the boundaries of census tracts or political jurisdictions.

- ⁷ Essentially, the lab was testing whether areas with the *combined* characteristics of building age, age variety, and varied building size contributed to livability. They created measures for those characteristics, combined the measures into a “character score” for each block, then assessed how 40 commonly accepted livability factors related to the character scores.

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