People live in cities for many reasons — to be close to their jobs, to culture, and to neighbors, among other motivations. Economists tend to think of these reasons as the positive externalities — or byproducts — of population density. In theory, living close together helps people work together. This in turn improves the productivity of their endeavors. Dense cities have been termed the economic “nucleus of an atom” because of their role in sparking transfers of human capital. One study found that patents per capita rise 20 percent as the employment density of a city doubles. Of course, density also brings negative externalities, such as congestion and higher land prices.

In a new paper, economists with the Richmond Fed lay some groundwork for studying the implications of population density in the early 21st century. With speedy transportation options and hi-tech communication devices, how important is population density to a city’s economic growth? The authors build an electronic database containing land area, population, and urban density for every U.S. city with a population greater than 25,000. Such data has been available in the past, but most of it was not in electronic form. Then the authors use the data to estimate the distribution of city densities since 1940.

The results are clear and robust: “There has been a stark decrease in density during the period studied. This deconcentration has been occurring continuously since at least 1940, in every area of the United States, and among both new and old cities.” Since 1940, density in legal cities with populations over 25,000 has fallen from 6,742 people per square mile to 3,802, in large part because of increases in city size (mostly through annexation). The leading theories for why people live farther apart include decreased transportation costs, thanks to the automobile, and a desire among some people to live in more homogenized environments, with lower tax rates and better schools.

The authors also believe that improved communication technologies allow people to live farther apart without giving up the positive externalities normally gained through population density. “Falling urban densities suggest that, over the past seven decades, the productivity benefits of dense cities have been weakening,” they conclude.

The authors have made their data and replication files available to the public at http://www.richmondfed.org/research/research_economists/pierre-daniel_sarte.cfm.