

II. Trends in Land Use: Two Kinds of Growth

In the early 1970's, bipartisan legislation was introduced in Congress to establish a national land-use policy. The proposals, recognizing the primacy of State authority over land use, would have provided Federal grants to States to better manage growth and development. The bills were debated for 5 years and passed by the Senate, but died on a narrow vote in the House on June 11, 1974.

In the decades that followed, urban area in the United States has more than doubled. Some of this growth has been at low densities, with little planning, and has fragmented the rural landscape, prompting communities, States, and the Federal Government to examine more closely unplanned development and its consequences, including the loss of productive farmland. Public concerns about the consequences of ill-controlled growth once again have raised the issue of the Federal role in land-use policy.

Anecdotes of uncontrolled growth across the Nation abound:

- From 1950 to 1990, St. Louis experienced a 355-percent growth in developed land even though population increased by just 35 percent (Missouri Coalition for the Environment).
- Between 1970 and 1990, Kansas City's population grew by 29 percent while developed land increased by 110 percent (Missouri Coalition for the Environment).
- Between 1990 and 1996, the Denver metropolitan region increased by 66 percent. If each county in the Denver metro area grew based on its current comprehensive plan, Denver's urbanized area would swell to 1,150 square miles, an area larger than California's major cities combined (Sierra Club, 1998).
- The Chicago metropolitan area now covers over 3,800 square miles. Over the last decade, the population of the area grew by only 4 percent, but land occupied by housing increased by 46 percent and commercial land uses by 74 percent (U.S. OTA, 1995).
- From 1950 to 1980, population in the Chesapeake Bay watershed increased by 50 percent, while land used for commercial and residential activity climbed 180 percent (EPA, 1993).

- Philadelphia's population increased 2.8 percent between 1970 and 1990, but its developed area increased by 32 percent (U.S. OTA, 1995).

While anecdotes are legion, and much has been written by commentators, advocates, and experts, there are surprisingly few places to find a comprehensive picture of land-use changes in urbanizing areas, relative to the rural landscape. This report responds to that need.

What Is Sprawl?

This report is about urban development at the edges of cities and in rural areas, often referred to as "urban sprawl." There is no widely accepted definition of sprawl (U.S. GAO, 1999; Staley, 1999). Definitions range from the expansive...

"When you cannot tell where the country ends and a community begins, that is sprawl. Small towns sprawl, suburbs sprawl, big cities sprawl, and metropolitan areas stretch into giant megalopolises—formless webs of urban development like Swiss cheeses with more holes than cheese."

U.S. House, 1980.

"Cities have become impossible to describe. Their centers are not as central as they used to be, their edges ambiguous, they have no beginnings and apparently no end. Neither words, numbers, nor pictures can adequately comprehend their complex forms and social structures. ...It's almost as if Frank Lloyd Wright's 1932 tract against the metropolis, *The Disappearing City*, has been vindicated, and the diffusionary proposal of Broadacre City has become the de facto ideology of urbanism."

Ingersoll, 1992.

to the prescriptive...

"...a spreading, low-density, automobile dependent development pattern of housing, shopping centers, and business parks that wastes land needlessly."

Pennsylvania 21st Century Environment Commission cited in Staley, 1999.

Burchell et al. (1998) devote the first chapter of their report, "The Costs of Sprawl – Revisited," to defining the elusive term. Commonly cited are several features

that are captured in urban economist John F. McDonald's characterization:

- Low-density development that is dispersed and uses a lot of land;
- Geographic separation of essential places such as work, homes, schools, and shopping; and
- Almost complete dependence on automobiles for travel.

Myers and Kitsuse (1997) point out that “the very lack of agreed definition about what constitutes density, sprawl or compactness prevents any authoritative measurement.” Any growth in suburban areas may be accused of “sprawling.” Planned developments at relatively high densities can be accused of accelerating sprawl. As Ewing (1997) points out,

. . . sprawl is a matter of degree. The line between scattered development, a type of sprawl, and mul-

ticentered development, a type of compact development by most people's reckoning, is a fine one. . . Equally elusive is the line between leapfrog development and economically efficient ‘discontinuous development’, or between commercial strips and ‘activity corridors’.

Ewing also suggests that his notion of compact development—which is multicentered, has moderate average densities, and is continuous except for permanent open spaces or vacant lands to be developed in the near future—is not all that different from Gordon and Richardson's (1997) definition of sprawl.

Short of a return to a form of urban living not seen since before World War II, it is not clear how growth can be accommodated at suburban densities without being accused of being “sprawl.”

Some people oppose any change in established land uses and react just as negatively to well-planned, rea-

Metropolitan, Urban, and Rural Geography

Statistics describing trends in land use are based on one or another geographic entities defined by the U.S. Bureau of the Census (see U.S. Census, Geographic Areas Reference Manual), the USDA National Resources Inventory (NRI), or the American Housing Survey (AHS).

Census of Population (these concepts are shown schematically in figure 1)

Metropolitan/Nonmetropolitan Area—a core area containing a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that core. Metro areas are defined in terms of entire counties (except in New England, where towns are used). Metropolitan areas contain a mix of land uses, ranging from deserts, forests, and farms, to suburban landscapes, and include the densest urban core. In 1990, there were 274 metropolitan areas, containing 198.2 million people (80 percent of the total U.S. population) and covering 20 percent of U.S. land area.

Urban/Rural—Census defines urban as comprising all territory, population, and housing units located in urbanized areas (UAs), defined in terms of census tracts, and in places of 2,500 or more inhabitants outside of UAs. In 1990, 187 million people (75 percent of the total) lived in 8,510 places of 2,500 or more covering 2.5 percent of U.S. land area.

Urbanized Areas (UAs) are continuously built-up areas with a population of 50,000 or more, comprised of one or

more places—central place(s)—and the adjacent densely settled surrounding area consisting of other places and territory not in defined places.

Urban Places Outside of UAs are any incorporated place or Census-designated place (CDP) with at least 2,500 inhabitants.

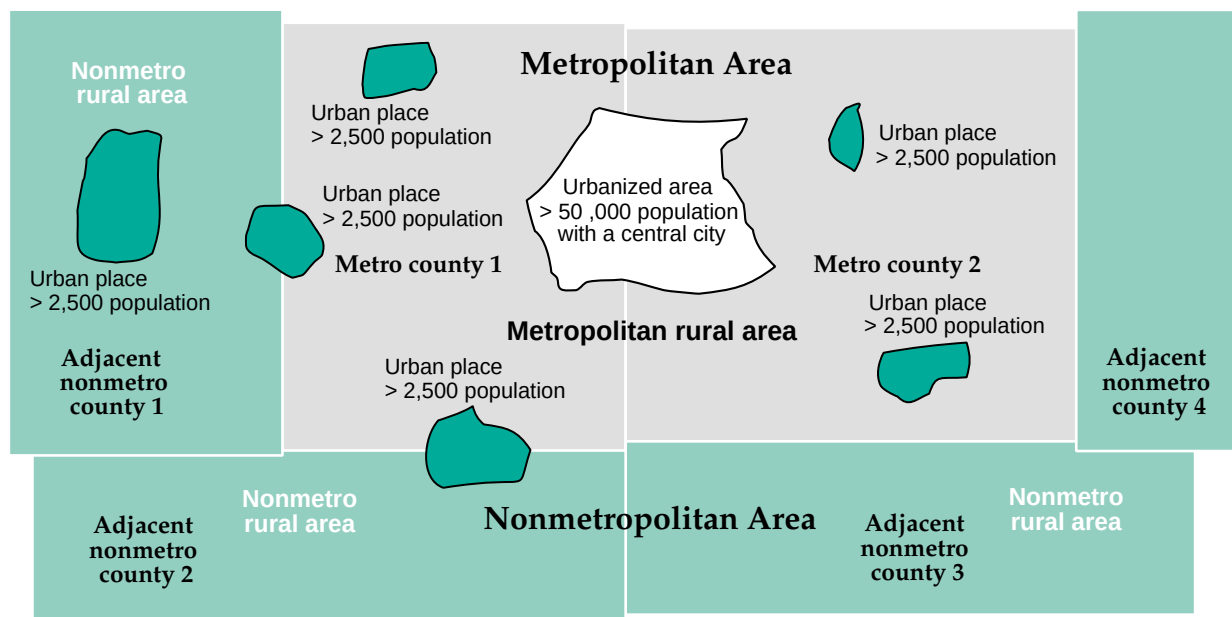
Rural Places and Territory not classified as urban are classified as rural. For instance, a rural place is any incorporated place or CDP with fewer than 2,500 inhabitants that is located outside of a UA. A place is either entirely urban or entirely rural.

Urban Fringe consists of rural areas in metropolitan counties. The part of the urban fringe nearest to existing UAs and urban places is likely to grow the fastest and eventually be absorbed when densities rise to urban levels.

Places—Census defines a place as a concentration of population, with a name and local recognition, that is not part of any other place. A place either is legally incorporated under the laws of its respective State or a statistical equivalent that the Census Bureau treats as a Census-designated place (CDP). Not everyone resides in a place; in 1990, approximately 66 million people (26 percent) in the United States lived outside of any place, either in small settlements, in the open countryside, or in the densely settled fringe of large cities in areas that were built-up, but not identifiable as places. Most Census places (19,289 out of a total of 23,435 in 1990) are incorporated.

Figure 1

Schematic diagram of urban geography



Metropolitan, Urban, and Rural Geography (continued)

National Resources Inventory (NRI)

Developed land in the National Resources Inventory consists of urban and built-up areas and land devoted to rural transportation.

Urban and built-up areas consist of residential, industrial, commercial, and institutional land; construction and public administrative sites; railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage plants, water control structures, small parks, and transportation facilities within urban areas.

Large urban and built-up areas include developed tracts of 10 acres and more.

Small built-up areas include developed tracts of 0.25 to 10 acres, which do not meet the definition of urban area, but are completely surrounded by urban and built-up land.

Rural transportation land includes highways, roads, railroads and rights-of-way outside of urban and built-up areas.

American Housing Survey (AHS)

The American Housing Survey, conducted every 2 years by the Bureau of the Census represents all housing units for the entire Nation, including housing lots on farms. The AHS started the current series in 1980.

Residential area is land devoted to residential housing lots, both urban and rural, based on respondents' estimates of lot

size for their house. Sample-based responses are expanded to area totals.

Comparison

Due to differences in data collection techniques and definitions, the NRI estimates of "large urban and built-up areas" are usually higher than the Census "urban area" estimates for nearly all States. The Census urban area series runs from 1950, while the NRI started providing a consistent series in 1982. Prior to the 1982 NRI, Census urban area was the only reliable national source of urban area data available.

The American Housing Survey residential area is the sum of acres in lots used for housing units. While the data have limitations and are not available by State, the series does allow compilation of two important estimates. First, an estimate of the residential component of urban land shows how much land is used for housing in urban areas versus land used for all other urban purposes, such as commercial and industrial sites, institutional uses, urban parks, and all other non-housing urban uses. Second and more important, an estimate is made of land used for residences in rural areas. Recently there appears to be a growing trend toward an increasing demand for more and larger housing lots outside of urban areas. The AHS residential area does not include non-residential areas shown in the Census and NRI, but does include a large area of rural residential land not found in either the Census or the NRI.

sonably dense and compact development as others do to “sprawl.” Because “sprawl” is so hard to define, we use it only when citing others and set it off in quotation marks. We couch our discussion in the more neutral terms “development” or “growth,” without making implicit judgments about the quality or outcomes of that development or growth.

Two Kinds of Growth

Government officials, housing consumers, farmers, and other interest groups appear to be concerned about two kinds of growth. First is the continuing accretion of urban development at the fringes of existing urban areas in rural parts of metropolitan counties. A second kind of growth is the proliferation of more isolated large-lot housing development (1 acre or more) well beyond the urban fringe and into adjacent nonmetropolitan counties. Growth at the edge of existing developed areas gradually shades out into more and more fragmented developments, farther out in the countryside, so there is no clear geographic dividing line between the two kinds of growth. While related, these two forms of growth have qualitatively different causes and have different consequences, especially for agriculture and the environment.

Trends at the Urban Fringe

Even low-density development (2 or fewer houses per acre) of new houses, roads, and commercial buildings at the fringe of existing urban areas can cause greater traffic congestion, loss of open space, loss of agricultural land, and impacts on the natural environment.

The amount of land in urban and developed land uses is measured in different ways, all of which have specific denotations (see box “Metropolitan, Urban, and Rural Geography” and figure 1). The concept of “urbanized area,” defined by the Bureau of Census, includes the densely settled areas within and adjacent to cities with 50,000 people or more, while “urbanized places” include populations of 2,500 people or more that are outside of urbanized areas. Urbanized areas alone increased from 15.9 million acres in 1960 to 39 million acres in 1990, increasing 2.5 times. Total Census urban area (urbanized areas and urban places) more than doubled over the last 40 years from 25.5 million acres in 1960 to 55.9 million acres in 1990. These two categories of urbanization likely reached about 65 million acres by 2000 (table 1; figure 2; Daugherty, 1992).

“Urban and built-up areas” counted in USDA’s National Resources Inventory (NRI) include those

measured by the Census Bureau, as well as developed areas as small as 10 acres outside urban areas, encompassing some large-lot development. NRI urban and built-up area increased from 51.9 million acres in 1982 to 76.5 million acres in 1997, and likely rose to about 79 million acres by 2000 (table 1 and figure 2). “Developed land” defined by NRI adds the area in rural roads and other transportation developments. By this definition, developed area increased from 73.2 million acres in 1982 to 98.3 million acres in 1997, and likely reached 107 million acres by 2000.

Census-defined urban area has grown by about a million acres per year since 1960, an increase of about 4 percent per year. The rate of increase dropped from 3.5 percent per year in the 1960’s and 1970’s to 1.8 percent per year in the 1980’s. NRI urban and built-up area increased faster than Census urban area in the 1980’s, rising 2.9 percent. Much of the increase in NRI urban and built-up area is in less dense, extensive large-lot development beyond the urban fringe and in nonmetropolitan counties. This kind of development will not meet the population density criteria for Census-defined urban area for many years.

Despite doubling since 1960, urban areas still made up less than 3 percent of U.S. land area (excluding Alaska) in 1990 (figure 3). Developed areas, including rural roads and transportation, made up less than 5 percent in 1992. Both kinds of growth (on the metro fringe and large-lot development) take land irreversibly out of commercial agricultural production that might otherwise be available for use. Growth causes social and environmental problems in local areas, but the increase in urban area in the United States poses no threat to U.S. food and fiber production capacity (Vesterby et al., 1994; USDA, 2000).

Table 1—Trends in U.S. urban development, 1960-2000

Year	Census urban	NRI urban and built-up	NRI developed
<i>Million acres</i>			
1960	25		
1970	34		
1980	47		
1982		52	73
1987		58	80
1990	56		
1992	57	65	87
1997 ¹	62	76	98
2000 ¹	65	79	107

Sources and definitions: See box “Metropolitan, Urban, and Rural Geography.”

¹Census urban for 1997 estimated; all data for 2000 estimated

Trends Beyond the Urban Fringe

Another kind of development occurs beyond the existing urban fringe, often far out in the rural countryside of metropolitan counties or adjacent nonmetropolitan counties. Development of new housing on large parcels of land is growth with a different character than that occurring at the city's edge. Instead of relatively dense

development of 4-6 houses per acre, exurban development consists of scattered single houses on large parcels (often 10 acres or more). Rural large-lot development is not a new phenomenon, although it may be getting more attention than in the past. Growth in the area used for housing rose steadily throughout the last century (figure 4, Peterson and Branagan, 2000).

Figure 2
Trends in developed land use, 1960-2000

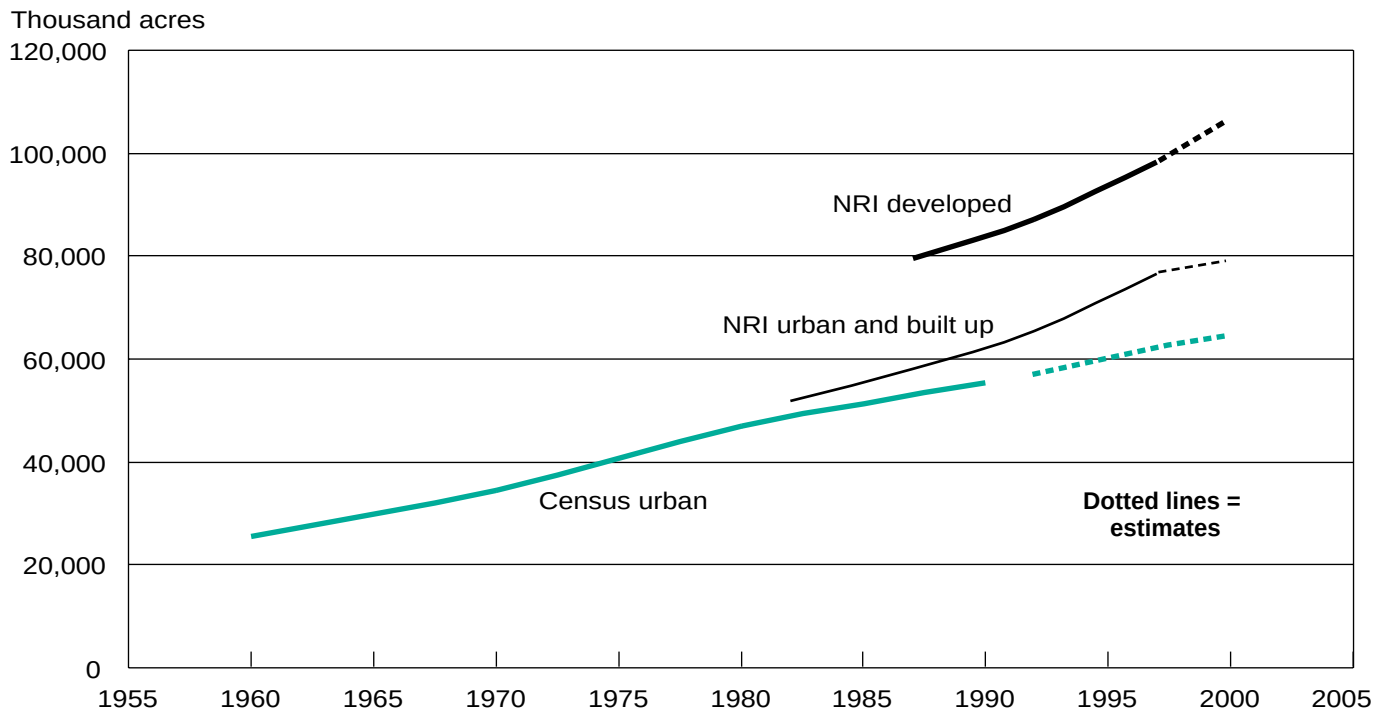
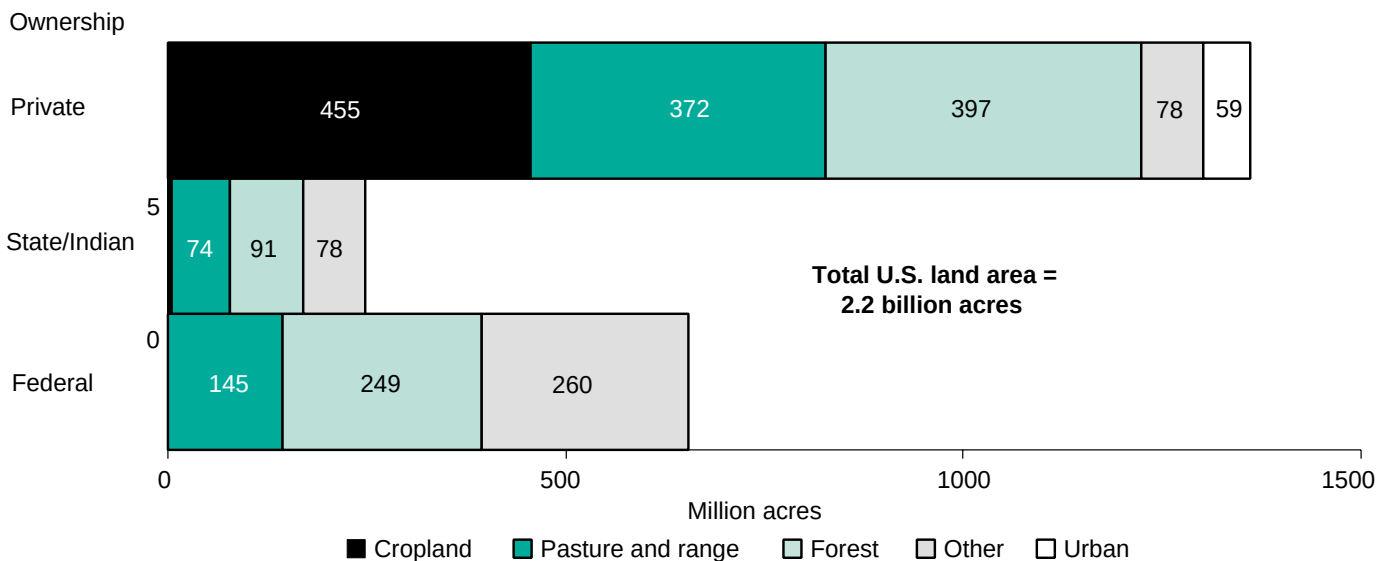


Figure 3
Land base of the United States, 1992



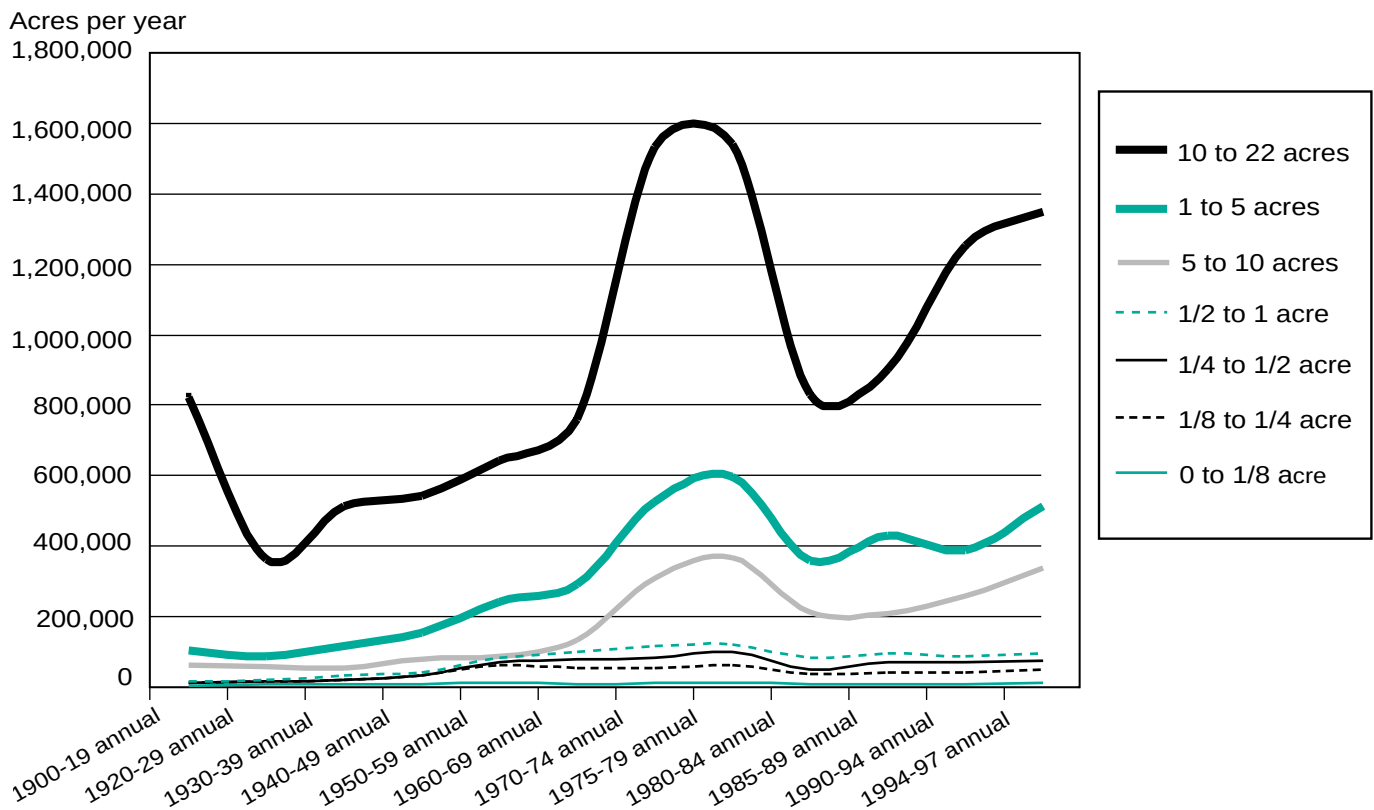
Source: Daugherty, 1995.

Large-lot categories dominate this process, and growth in large-lot development has accelerated with periods of prosperity and recession since 1970. The largest lot size category (10-22 acres) accounted for 55 percent of the growth in housing area since 1994, and lots greater than 1 acre accounted for over 90 percent of land for new housing. About 5 percent of the acreage used by houses built between 1994 and 1997 is for existing farms, and 16 percent is in existing urban areas within Metropolitan Statistical Areas (MSAs) defined by the Bureau of the Census. Thus, nearly 80 percent of the acreage used for recently constructed housing—about 2 million acres—is land outside urban areas or in non-

metropolitan areas. Almost all of this land (94 percent) is in lots of 1 acre or larger, with 57 percent on lots of 10 acres or larger.

The people who move into these new houses may be pioneers moving from cities that once seemed distant. They may be pioneers in another sense: Areas experiencing this kind of development may be just starting on a gradual process of infill and expansion that will gradually transform the once-rural countryside into suburban and urban settlements resembling the existing urban fringe.

Figure 4
Annual additions to housing area, by lot size, 1900-97



Source: ERS analysis of American Housing Survey, 1997 data.