

# Models of Urban Structure

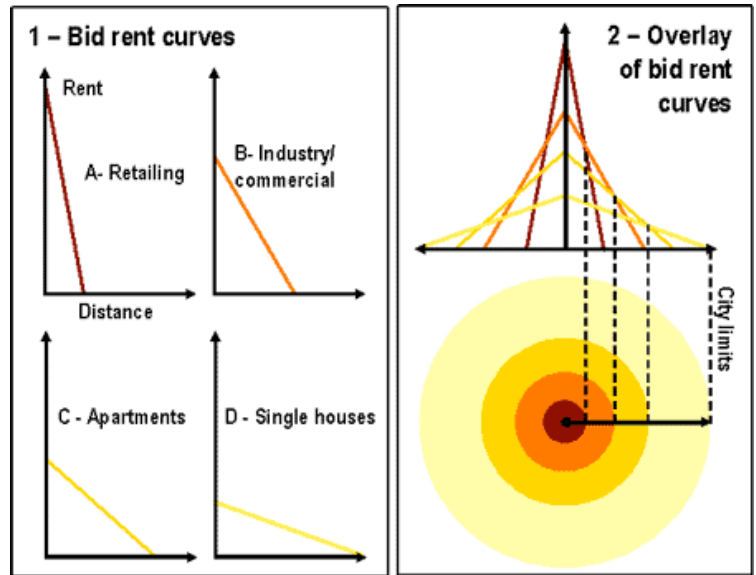
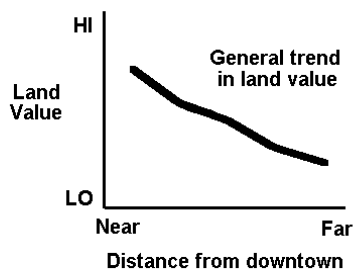
Cities are not simply random collections of buildings and people. They exhibit functional structure: they are spatially organized to perform their functions as places of commerce, production, education, and much more. One of the most important forces determining where certain buildings or activities are located within a city deals with the price of land. This tends to be the highest in the downtown area and declines as one moves outward from the center. The United States is the only country in the world in which the majority of the people live in the suburbs. Even though house prices may be higher in the suburbs, the land value is lower (a downtown apartment complex will produce much more revenue per year than a few suburban homes occupying the same amount of space). In every other country the majority resides in either rural or urban areas.

Before proceeding, it is important to define some commonly used terms in referring to city structure. The **central business district (CBD)** (or "downtown") is the core of the city. High land values, tall buildings, busy traffic, converging highways, and mass transit systems (e.g., South Florida's "Tri-Rail") mark the American or European CBD. An **urban zone** is a sector of a city within which land use is relatively uniform (e.g., an industrial or residential zone). The term **central city** is often used to denote the part of an urban area that lies within the outer ring of residential suburbs. A **suburb** is an outlying, functionally uniform part of an urban area, often (but not always) adjacent to the central city. All of these urban regions or zones lie near or adjacent to each other and together make up the **metropolis**. The term **hinterland** is a German word meaning the "land behind" the city (the surrounding service area).

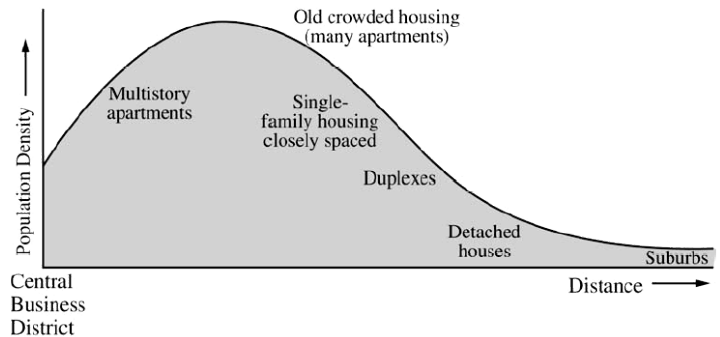
## Bid Rent and its Application

The **bid rent curve** is a geographical economic theory that refers to how the price and demand for real estate change as the distance from the central business district (CBD) increases. It states that different land users will compete with one another for land close to the city center. This is based upon the idea that retail establishments wish to maximize their profitability, so they are much more willing to pay more for land close to the CBD and less for land further away from this area. This theory is based upon the reasoning that the more accessible an area is (i.e., the greater the concentration of customers), the more profitable it will be.

Looking at the simple graphic, land value decreases as distance increases from the CBD because it is less accessible to the people and therefore, less desirable. However, since many businesses



depend on accessibility to customers and interpersonal relationships, moving away from the CBD would generally lead to a drop in profits. This is very similar in shape and structure to the **land-rent curve** related to von Thünen's Isolated State model, in which certain land uses are more profitable depending on their distance from the market.

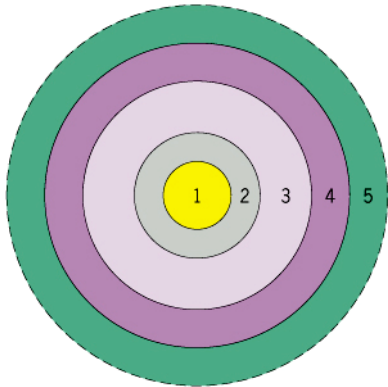


What is shown above is a typical density profile the North American city. The y-axis represents the population density, and the x-axis is the distance away from the CBD. In the CBD is where more commercial enterprises would agglomerate (cluster for mutual advantage), and since there would be a great deal of competition for this space the cost would be relatively high. Commercial and industrial land users are willing to pay higher rent for this central location much more than most individual land users are willing, or able to pay. However, notice how the population density increases initially as the distance from the CBD increases. This is the area that is often called the inner city, and many multistory apartments lead to greater population density. The average income tends to be lower in this area, since many working class people do not earn enough to afford better amenities, or the cost of travelling greater distances to their jobs in and around the CBD. The quality of homes tends to improve as distance continues to increase, with closely spaced single-family homes, to duplexes, and eventually to detached houses in the suburbs. While the cost of the land itself decreases away

from the CBD, the amount of land individuals can afford improves, as does the overall quality of the residences. It is interesting to note that space for downtown commercial real estate is often sold or leased by the square foot. By contrast, land in the suburbs is often sold by the acre.

## Development of the North American City

### CONCENTRIC ZONE MODEL



A

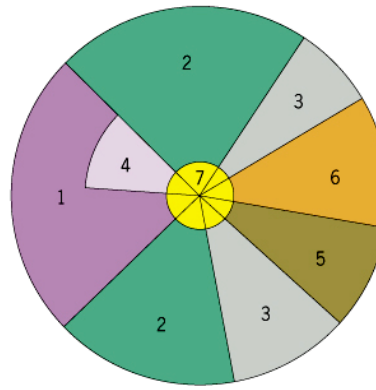
- |                                      |                             |
|--------------------------------------|-----------------------------|
| 1 Central business district          | 4 Zone of better residences |
| 2 Zone of transition                 | 5 Commuters' zone           |
| 3 Zone of independent workers' homes |                             |

As cities evolved, they displayed increasing complexity over time. The **Concentric Zone Model** (Burgess Land Use Model) (A) resulted from a study of Chicago in the 1920s by Ernest Burgess, and strongly reflects the bid-rent curve. This model was drawn up at a time when the full impact of the Industrial Revolution came to bear on the American City. Burgess recognized five concentric functional zones. At the center was the CBD (1). The zone of transition (2) was characterized by residential deterioration and encroachment by business and light manufacturing. The zone of independent workers' homes (3) was primarily occupied by the **blue-collar** (wage-earners, manual laborers) labor force. The zone of better residences (4) consisted mainly of the middle-class. Finally, the commuters' zone (5) was the suburban ring, consisting mostly of **white-collar** workers who could afford to live further from the CBD. This model was dynamic. As the city grew, the inner zones encroached on the outer ones.

Remember, the Concentric Zone Model was developed for American cities and had limited applicability elsewhere. It has been demonstrated that pre-industrial cities, notably in Europe, did not at all followed the concentric circles model. For instance, in most pre-industrial European cities, the center was much more important than the periphery, notably in terms of social status. The Burgess concentric model is consequently partially inverted in these instances.

In the late 1930s, Homer Hoyt's **Sector Model** (B) was published, partly as an answer to the drawbacks of Burgess' concentric zone model. As technology dealing with transportation and communication was improving, growth alone created more of a pie-shaped urban

### SECTOR MODEL



B

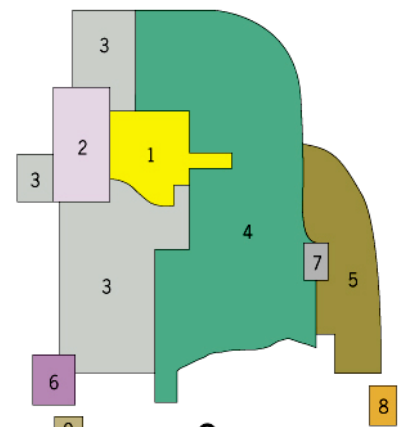
- |                                 |                            |
|---------------------------------|----------------------------|
| 1 High-rent residential         | 4 Education and recreation |
| 2 Intermediate-rent residential | 5 Transportation           |
| 3 Low-rent residential          | 6 Industrial               |
|                                 | 7 Core                     |

structure. Hoyt discovered that land rent (for residential, commercial, or industrial) could remain consistent all the way from the CBD to the city's outer edge. Outside the CBD, industrial, commercial, and residential space tended to be organized as a linear corridor surrounding a main transportation line (e.g., a light rail line, or a riverfront). In the 1940s, Chauncy Harris and Edward Ullman, arguing that neither of the earlier models adequately reflected city structure, proposed the **Multiple Nuclei Model** (C). This model was based on the notion the CBD was losing its dominant position and primacy as the nucleus of the urban area. The increase in affordability and prevalence of automobiles enabled people to travel more freely and comfortably, so mobility increased. Several of the urban regions would have their own subsidiary but competing "nuclei." As manufacturing cities became modern cities and modern cities became increasingly complex, these models became less and less accurate.

### Suburbanization

With the fragmentation of the locations of activities, the increasing number of jobs in the service sector, and the dispersal of amenities such as lakes or parks, the growth of **suburbs** became an inevitable reality. Suburbs are residential areas, either existing as part of a city (e.g., Australia and New Zealand), or as a separate residential community within commuting distance of a city (e.g., US and Canada). Suburbs often contain mostly middle and upper class residents.

### MULTIPLE NUCLEI MODEL



C

- |                                  |
|----------------------------------|
| 1 Central business district      |
| 2 Wholesale, light manufacturing |
| 3 Low-class residential          |
| 4 Middle-class residential       |
| 5 High-class residential         |
| 6 Heavy manufacturing            |
| 7 Outlying business district     |
| 8 Residential suburb             |
| 9 Industrial suburb              |

Although suburbanization mostly occurred in the US after World War II, the first planned community was in Riverside, IL in 1869, which was part of the **garden city movement**. Homes were designed to resemble European farmhouses with front lawns, and were built for the emerging middle class.



*Riverside, Illinois was designed in 1869 by Frederick Law Olmsted (who also designed Central Park, NYC)*

And often beyond the suburbs exist “commuter zones”, or **exurbs**, that are rings of prosperous communities beyond the suburbs acting as commuter towns for an urban area. They initially sprung up as country estates, in many cases on multi-acre lots. Exurbs vary in size, but may be composed of smaller neighborhoods to larger towns or cities. Often, the residents are relatively wealthy with higher levels of education than the average suburbanite. In many respects, areas like Weston, Florida, adjacent to the Everglades, have all the characteristics of exurbs.

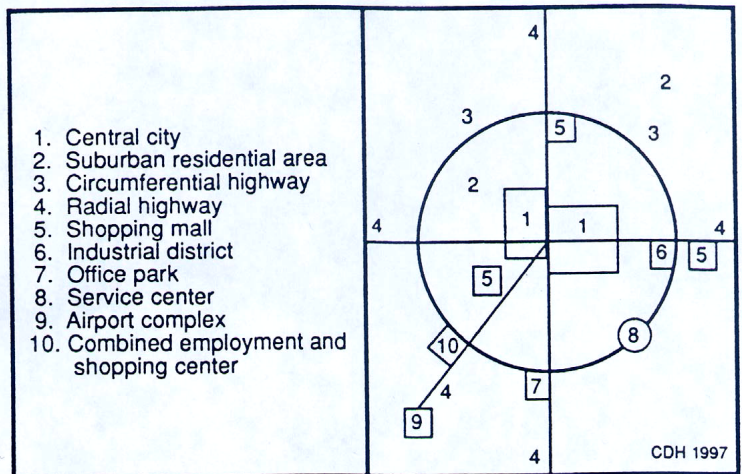
As cities continued to grow, and especially in areas with relatively flat topography (e.g., South Florida and Los Angeles) began to **sprawl**, or spread outward with the relatively unrestricted expansion of residential, commercial and transportation zones. Urban and suburban sprawl is usually seen as wasteful and inefficient. In contrast to the occurrence of sprawl, is the opposite push for cities and suburbs to develop **infill**. In an urban sense, infill is the use of land within a city for further construction. In cities, it focuses on the reuse and repositioning of obsolete or underutilized buildings and sites. Infill buildings are constructed on vacant or underutilized property or between existing buildings. For example, buildings are sometimes constructed on what was open area. Suburban infill is virtually the same thing, only the focus is on filling in unused spaces – to reduce sprawl.



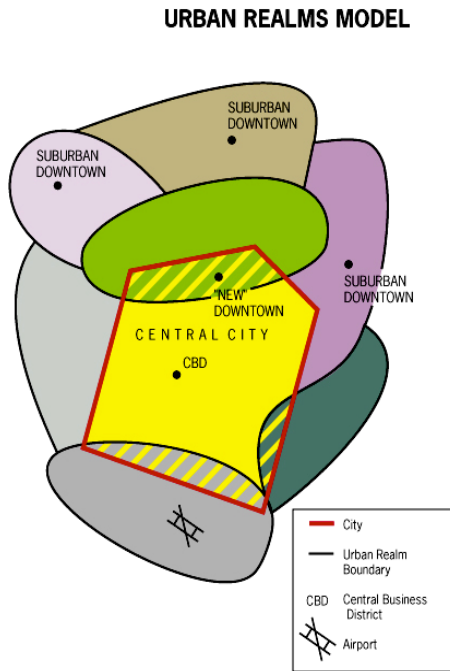
*The buildings in the center of the image - from Lancaster, UK - were built on what was an open area*

## Modern Models of the North American City

Since the latter half of the twentieth century, geographers have noticed that suburban CBDs in the United States and Canada have become more specialized. What has emerged is better represented through the **Galactic City Model (Peripheral Model or Edge City Model)**. Chauncy Harris helped pioneer this approach to observing the modern growth of urbanization, which was actually an offshoot of the multiple nuclei model. As suburbs continue to sprawl, they spawn many suburban nucleations (or concentrations), and this urban decentralization leads to more downtowns and specialized corridors. Location is key for any business or industry, so the specialized CBDs are often located along **transportation nodes**, linked by a metropolitan expressway system (sometimes called a beltway). The model shows that the periphery is part of a functional metropolitan complex; not a series of separate CBDs. This is the reality of a post-industrial economy, where the bulk of people are working on tertiary economic activities more than secondary activities.



Today, many suburban CBDs have evolved into urban realms, components of giant conurbations (connected urban areas) that function separately in certain ways, but are linked together in a greater metropolitan sphere. In the early postwar period (1950s), rapid population diffusion to the outer suburbs created distant nuclei, but also reduced the volume and level of interaction between the central city and these emerging suburban cities. In 1964, James Vance looked at San Francisco's urban ecology and developed the **Urban Realms Model**. He stated that four criteria shaped the extent, character, and internal structure of each urban realm. These criteria included terrain (e.g., topography), size of metropolis, amount of economic activity (in each realm), and internal accessibility (transportation within each realm and between all realms).



*Tysons Corner skyline*

Tysons Corner, Virginia was one of the inspirations for, and figured prominently in, Garreau's pioneering study of the edge city phenomenon. According to Garreau, several rules must apply for a place to be considered an edge city (of which Tysons Corner fits very well).

1. The area must have substantial office space (about the space of a good-sized downtown) and substantial retail space (the size of a large regional shopping mall);
2. The population must rise every morning and drop every afternoon (i.e., there are more jobs than homes);
3. The place is known as a single end destination (the place "has it all;" entertainment, shopping, recreation);
4. They are often near transportation nodes (e.g., airports, expressways);
5. The area must not have been anything like a "city" in 1960.

The reality of urbanization is that people are constantly adjusting to new technologies and lifestyles. As the world changes, so does the shape, style, and function of the spaces in which we live. Cities have evolved over time, and will continue to do so as long as people inhabit the earth.

There were three waves in which the modern urban system of the United States emerged. First, many Americans moved their homes out past the traditional idea of what constituted a city. This was the suburbanization of America, especially after World War II. In the 1960s and 1970s, outer cities were becoming increasingly independent of the CBD to which these former suburbs had once been closely tied. Marketplaces were increasingly located in the suburbs, and these regional shopping centers (e.g., malls) in the suburban zone were becoming the new CBDs of the outer nuclei. Today, many Americans have moved their means of creating wealth, the essence of urbanism - their jobs - out to where most of the people have lived and shopped for two generations. Today more than half of US citizens live in the suburbs, and the US is the only country in the world structured in this manner. This expansion has led to the rise of the edge city.

Washington Post journalist and author Joel Garreau coined the term "**edge city**" in 1991. We can equate the growing edge cities at major suburban freeway interchanges around America as the latest transformation of how we live and work. These new suburban cities are home to glistening office towers, huge retail complexes, and are always located close to major highways.



*Mizner Park is in Boca Raton's financial district, and the northernmost part of Boca's downtown area*