Multiple-Nuclei Model: AP Human Geography Crash Course

Are you an urbanite? Whether you like it or not, you are probably one of the growing numbers of people in the United States who live either in a city or close enough to quickly travel to one. Cities are growing much faster than rural areas, and the dynamics of urban geography are an important subject to know about for the AP Human Geography exam. There are several classic models used to understand and explain the internal structures of cities and urban areas, and we are going to learn about Harris and Ullman's **Multiple-Nuclei Model** in this AP Human Geography study guide.

What is a City?

Cities are at the center of every advanced society and act as the hub of economic, social and political activities in that area. They have a variety of shapes and functions, and their geography impacts the daily lives of those who live in the city and surrounding areas. All cities provide their residents a variety of services and functions: shopping, manufacturing, transportation, education, medical, and protective services.

Cities evolved over time, and if a city had favorable factors (agriculture, access to water, trade, defense), its population increased. This led to urbanization (rapid growth, and migration to large cities). This increase in urban population resulted in rapid expansion of the city and greater urbanization of the society. After the conclusion of World War II, North America experienced rapid urbanization. There was a need for housing outside of the core urban areas due to growing population and demand. The result was the **suburbanization** of our society. Suburbanization is the movement of people from core urban areas to the outskirts.

If you have ever been to a large city, you may have noticed that they are all laid out differently. The shapes and design of the city are called its urban morphology. Urban morphology studies the form of cities, how they are formed, and attempts to understand its spatial structure by looking at the patterns of its parts. In an attempt to find out more about how the land was used in the city, several researchers developed urban land use models.

Urban Land Use Models

In the early 1900's, researchers wanted to find out how cities worked. They developed a variety of urban land use models to help describe and explain different types of cities and the neighborhoods that made up the city. It makes sense that scholars at the University of Chicago developed many of these land use models because Chicago was a city that saw rapid growth in the 18th century.

Some of those models like Burgess's concentric zone model and Hoyt's sector model asserted that all of the models used to explain urban land use have at their center the **central business district** (CBD). The CDB is found at the heart of every older city and is the area of skyscrapers, business headquarters, and banks.

Spreading out from this intensive economic land use area is a fringe of wholesale and retail businesses, warehouses, transportation terminals, and light industry. The residential area extends outward beyond this ring of activity. Several of these models try to depict the use of this urban area spatially.

A few years after Burgess and Hoyt published their findings, Chicagoan geographers Chauncey Harris and Edward Ullman came up with their own idea of urban land use, the multiple-nuclei model.

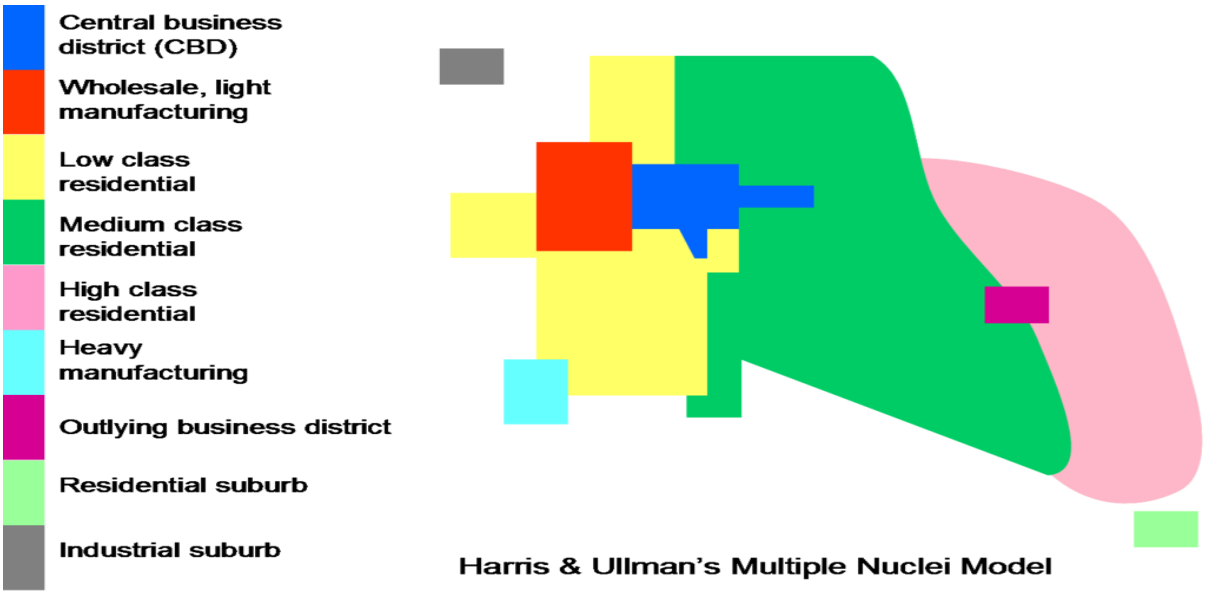
Harris and Ullman's Multiple-Nuclei Model

In 1945, Harris and Ullman developed the multiple-nuclei model. They asserted that the Central Business District (CBD) was no longer the only center of an urban area or city. In earlier models, the CBD was at the core of the urban land use model and was found at the heart of every older city. The CBD is the commercial and business center of the city and in bigger cities, the CDB is often referred to as the "financial district". They were the first to consider the complexity of the city and its surrounding areas.

Harris and Ullman claimed that, in newer cities, automobile-based intraurban dispersal was creating a multiple-nuclei structure of urban land use. This mobility allows for regional centers to specialize the businesses. In the multiple-nuclei, the "nuclei" are multiple smaller growth centers that developed around the metropolitan area. These nuclei can be ports, universities, airports, parks, neighborhoods business, and governmental centers. Their goal was to produce a more realistic model, even at the expense of being more complicated. Their aim in this model was to move away from the concentric zones and better show the complex nature of large urban areas.

The model, to no one's surprise, describes the layout of a city based on Chicago. The multiple-nuclei model illustrates that even though an urban center may have been founded with a CBD, other smaller CBD's evolve on the outskirts of the city near the more high-class housing areas. This allows shorter commutes from the suburbs. This phenomenon creates nodes or nuclei in other parts of the city other than the CBD, thus the name multiple nuclei model.

As multiple nuclei evolve, transportation hubs, are built which allow industries to be established with reduced shipping costs. These transportation hubs have negative by-products, such as noise pollution and lower land values, making land around the hub cheaper. You will find hotels near airports because people who travel want to stay near the source of travel. Housing develops in sections and gets more expensive the farther it is from the CBD.



Harris & Ullman's Multiple Nuclei Model

Nodes of the Multiple-Nuclei Model

The Central Business District

The CBD still exists as the primary nucleus, but multiple small business districts developed, distributed around the metropolitan area. Some of these newer areas compete with the CBD for traditional businesses like banks, real estate and insurance companies. These separate nuclei become specialized and differentiated, reducing the pull of the CDB.

Wholesale/Light Manufacturing

These businesses are more consumer-oriented and near residential areas. Manufacturing goods that need small amounts of raw materials and space develop in this area. Businesses that offer wholesale goods like clothes, furniture and consumer electronics are found in this node.

Residential Districts

Residential neighborhoods of varying status also emerged in nearly random fashion as well, creating "pockets" of housing for both the rich and poor, alongside large zones of lower middle-class housing. There is a sort of randomness to multiple nuclei cities, making the landscape less legible for those not familiar with the city, unlike concentric ring cities that are easy to read by outsiders who have been to other similar cities.

Low-Class

Next to the industrial corridors are the lower- or working-class residential zones. People who live here tend to be factory workers and live in low-income housing. Housing is cheap due to its proximity to industry where pollution, traffic, railroads, and environmental hazards make living conditions poor. Those who live in this sector do so to reduce the cost to commute to work. They are sometimes stereotyped as living on the "other side of the tracks," and may experience discrimination.

Middle-Class

This residential area is a bit more desirable because it is located further from industry and pollution. People who work in the CBD have access to good transportation lines, making their commute easier. The middle-class sector is the largest residential area.

High-Class

Hoyt's model also identified an elite zone, for the handful of upper-class people who live in the city. Michigan Avenue was that elite district in Chicago. High-class residential sectors tend to be quiet, clean, and have less traffic that the other ones. There is also a corridor that extends from the CBD to the edge of the city, where you find prime real estate.

In many cities, you will find the high-class district on the west side, where prevailing winds enter the city and are upwind from industrial zones, which are dirty and smelly. It is unlikely that high-class residential housing would be found near factories or lower-class housing areas. In this way, Hoyt's model suggests a distinct physical separation between the wealthy and the poor.

Residential Suburb

These suburbs are usually single-family homes on a small plot of land on the outskirts of the city. They tend to be laid out on roads with cul-de-sacs instead of following the traditional grid pattern.

Outlying Business District

This district competes with the CBD for residents who lived in nearby middle and high-class neighborhoods offering similar services and products as the CBD. Businesses found in this node are malls, airports, colleges and community businesses.

Heavy Manufacturing

This node is occupied by factories that produce material that is heavy like chemicals, steel, industrial machinery. Mining and oil refining industries also can be found in this node.

Industrial Suburb

This is a community created and zoned for industrial sources on the outskirts of the city. Industrial districts in these new cities, unfettered by the need to access rail or water corridors, rely instead on truck freight to receive supplies and to ship products, allowing them to occur anywhere zoning laws permitted. Because industrial zones create pollution, they are located away from residential areas.

Multiple-Nuclei Model and the AP Human Geography Exam

The AP Human Geography Course Description wants you to use your knowledge of classic urban land use models like the one developed by Harris and Ullman to explain the internal structures of cities and urban development. You should be able to identify the type of neighborhood expected when analyzing the multiple-nuclei model.

You should also know that automobile-based intraurban dispersal was creating a multiple-nuclei structure of urban land use and this mobility allowed for regional centers to specialize their businesses. The “nuclei” in this model are multiple smaller growth centers that developed around the metropolitan area.

Conclusion

Urban land use models were developed to explain different types of cities and the neighborhoods that made up the city and how each of the areas functioned. But the contemporary metropolis has spilled out of its central-city confines in the second half of the 20th century, and these models are no longer capable of accommodating a new urban reality in which the suburbs are the essence of the American city.

The Multiple-Nuclei Model does still provide a good interpretation of the land-use organization of today using multiple nodes to illustrate how the urban land is used. The CBD is no longer at the center of the action, but multiple business districts develop to support the outlying areas of the city. Knowing how to classify types of areas using classic models is an important part of the study of cities in AP Human Geography.