CITY MODELS

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Lecture 9

1-Concentric zone model

2- Sector model

3 multiple nuclei model

4 Linear city

5 The irregular pattern model

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7 Core frame model

8 Urban Realms Model

1-Concentric zone model

founder

- The **Concentric zone model**,
- also known as the **Burgess model** or the **CBD model**,
- is one of the earliest theoretical models to explain urban social structures.
- It was created by sociologist **Ernest Burgess** in 1923.

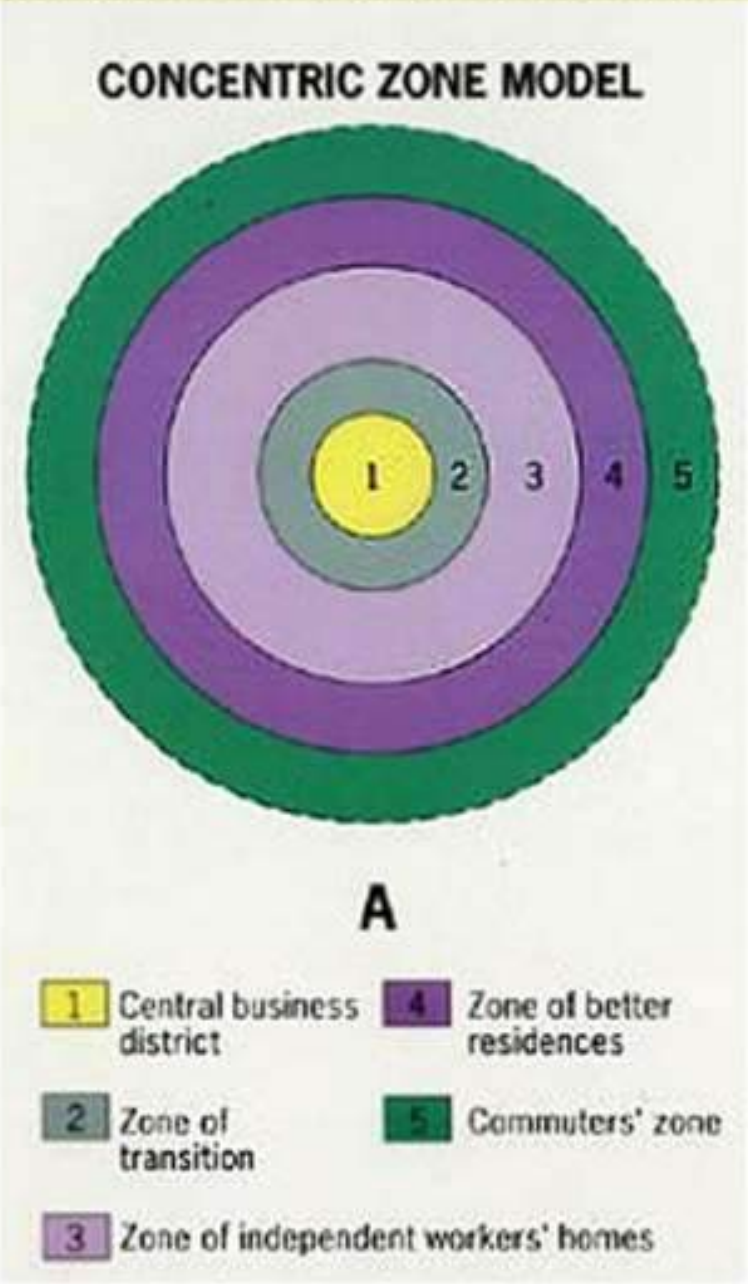
THE MODEL

- Based on human ecology theories done by Burgess
- applied on Chicago, it was the first to give the explanation of distribution of social **groups** within urban areas. This concentric ring model depicts سوريurban land usage in **concentric rings**:

A. The Central Business District (or CBD) was in the middle of the model,
B. and the city expanded in rings with different land uses.
C. It contrasts with Homer Hoyt's sector model and the multiple nuclei model.

Identification zones

- The zones identified are:
- The center was the **CBD**
- The transition zone of mixed residential and commercial uses or the **Zone of Transition**
- Working class **residential** homes (inner suburbs), in later decades called **inner city** or **Zone of independent working men's home**
- **Better quality middle-class homes** (Outer Suburbs) or Zone of better Housing
- Commuters لاةكرح رنك zone



Business District

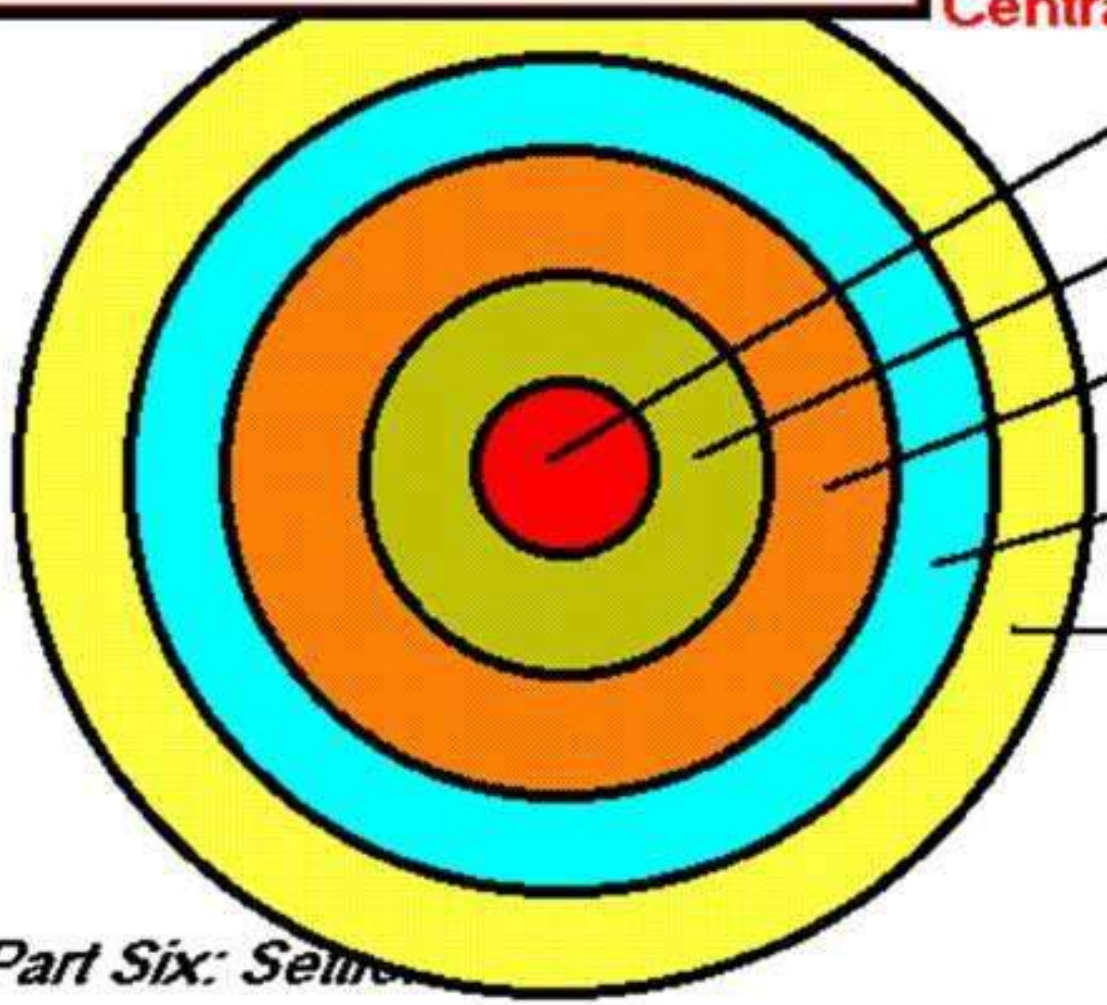
Transition

Working Class

Better Residence

Commuter's

Concentric Zone Model



Central Business District

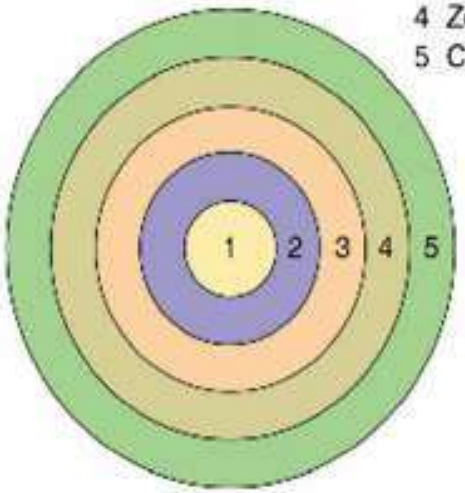
Zone in Transition

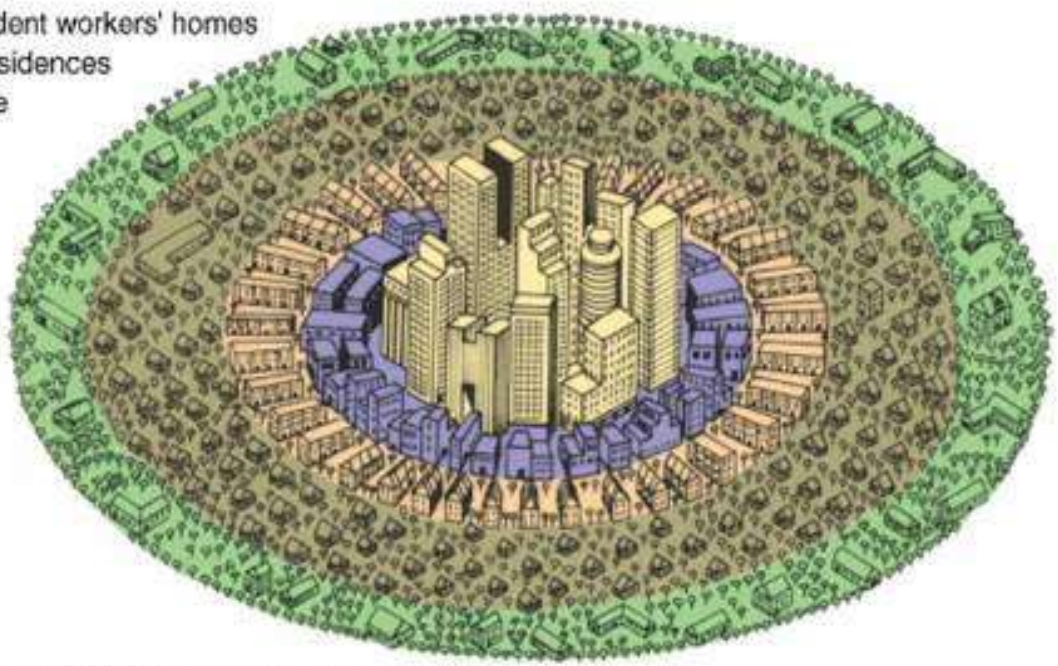
Workingmen's Homes

Better Residences

Commuters

1 Central business district
2 Zone of transition
3 Zone of independent workers' homes
4 Zone of better residences
5 Commuter's zone





Criticisms

- The model has been challenged by many contemporary urban geographers.
- First, the model does not work well with cities outside the United States, in particular with those developed under different historical contexts.
- Even in the United States, because of changes such as advancement in transportation and information technology and transformation in global economy,
- cities are no longer organized with clear "zones”

DISADVANTAGES

- It describes the peculiar American geography, where the inner city is poor while suburbs are wealthy; **the converse is the norm elsewhere**
- It assumes an isotropic plain - an even, unchanging landscape, **land may restrict growth of certain sectors**; hills and water features may make some locations unusually desirable for residential purposes
- **commuter villages** defy the theory, being a distant part of the commuter zone
- **Decentralization** of shops, manufacturing industry and entertainment

DISADVANTAGES

- **Urban regeneration and gentrification**- more expensive property can be found in formerly 'low class' housing areas
- Many new housing estates were built on the edges of cities in Britain
- It does not address local **urban politics** and forces of **globalization**
- The model does not fit **polycentric cities**, for example Stoke-on-Trent ابلا ةعزنلالافارط

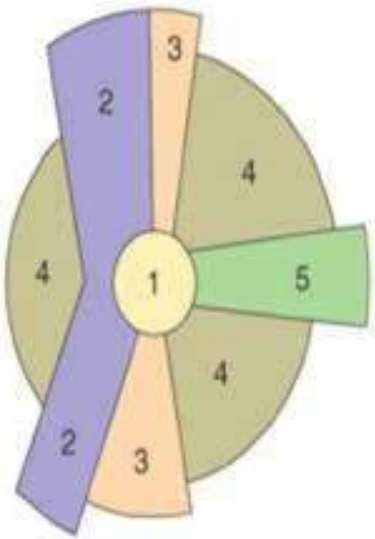
2- Sector model

Definition

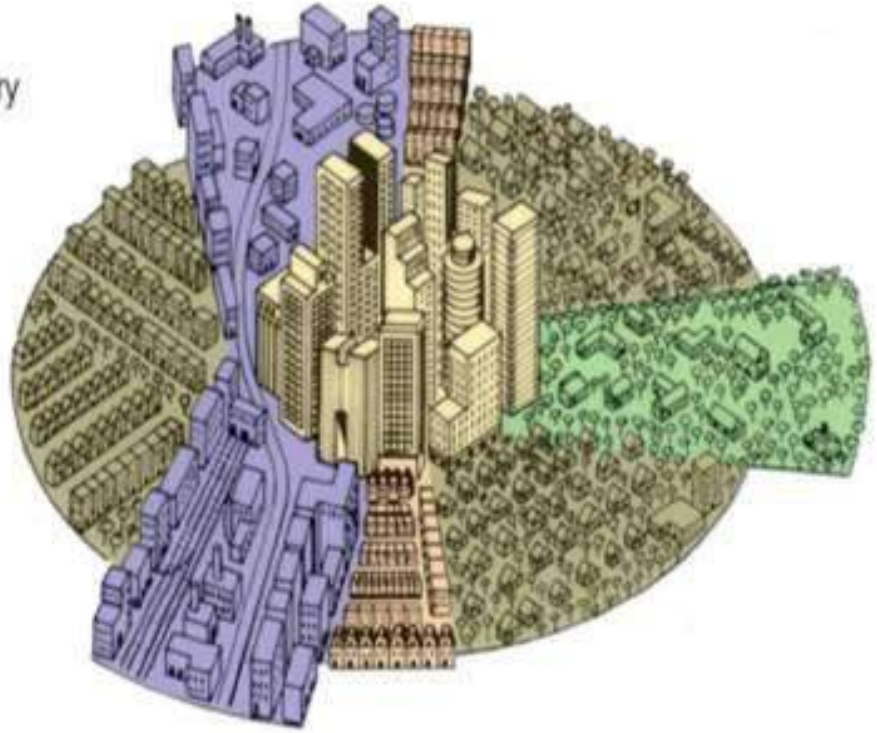
- The **sector model**, also known as the **Hoyt model**, is a model of urban land use proposed in 1939 by economist Homer Hoyt.
- It is a modification of the concentric zone model.
- The **benefits** of the application of this model include the fact it allows for an outward progression of growth.
- As with all simple models of such complex phenomena its validity is limited.

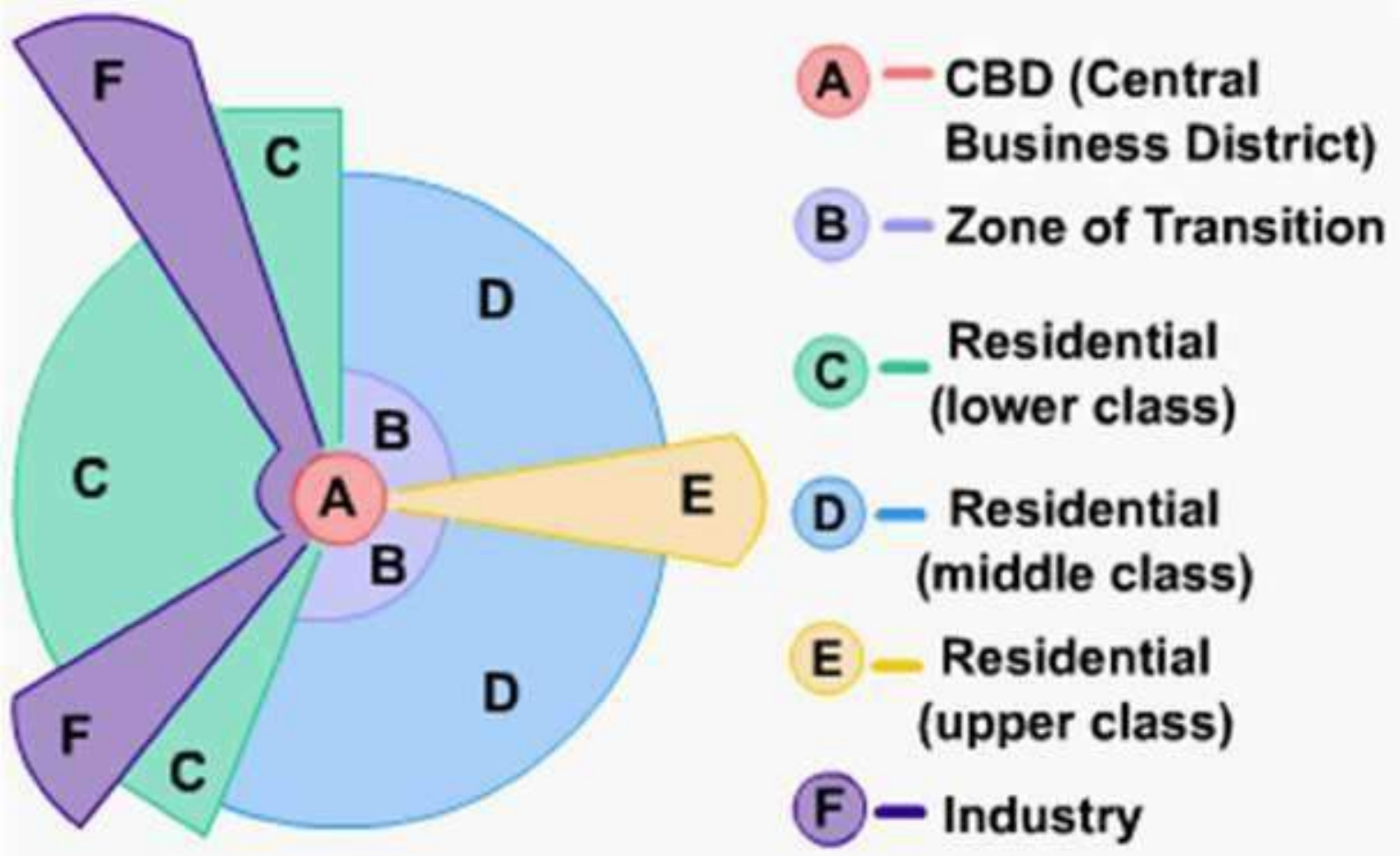
Explanation

- While accepting the existence of a CBD
- Hoyt suggested in 1939 that zones expand outward from the city center along railroad, highways, and other transportation arteries.
- Using Chicago as an example, an upper class residential sector evolved outward along the desirable Lake Michigan shoreline north of the CBD, while industry extended southward in sectors that followed railroad lines.



1. Central business district
2. Transportation and industry
3. Low-class residential
4. Middle-class residential
5. High-class residential




F
C
D
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C
A
E
B
D
F
C
A CBD (Central Business District)
B Zone of Transition
C Residential (lower class)
D Residential (middle class)
E Residential (upper class)
F Industry

description

1. It was common for **low-income households to be near railroad lines**, and **commercial establishments to be along business thoroughfares**
2. Recognizing that the various transportation routes into an urban area, including railroads, sea ports, and tram lines, represented greater access,
3. Cities tended to grow in **wedge-shaped patterns -- or sectors** -- emanating from the CBD and centered on major transportation routes.
4. Higher levels of access meant higher land values, thus, **many commercial functions would remain in the CBD** but **manufacturing functions would develop in a wedge surrounding transportation routes.**
5. Residential functions would grow in wedge-shaped patterns with **a sector of low income housing bordering manufacturing/industrial sectors (traffic, noise, and pollution makes these areas the least desirable)**
6. while sectors of **middle- and high-income households were located furthest away from these functions.**

limitations

- The theory is based on early twentieth century rail transport and does not make allowances for private cars that enable commuting from cheaper land outside city boundaries
- This occurred in **Calgary** in the 1930s when many near slums were established outside the city but close to the termini of the street car lines. These are now incorporated into the city boundary but are pockets of low cost housing in medium cost areas.
- Physical features - physical features may restrict or direct growth along certain wedges
- The growth of a sector can be limited by leapfrog land.
- The theory too lacks the idea based on land topography.

3-multiple nuclei model

- The **multiple nuclei model** is an economical model created by **Chauncy Harris** and **Edward Ullman** in the 1945 article "The Nature of Cities”

scope

- The model describes the layout of a city. It says that even though a city may have begun with a central business district, or CBD, other smaller CBDs develop on the outskirts of the city near the more valuable housing areas to allow shorter commutes حرلات from the outskirts يحاوض of the city.
- This creates nodes or nuclei in other parts of the city besides the CBD thus the name multiple nuclei model.

The purpose

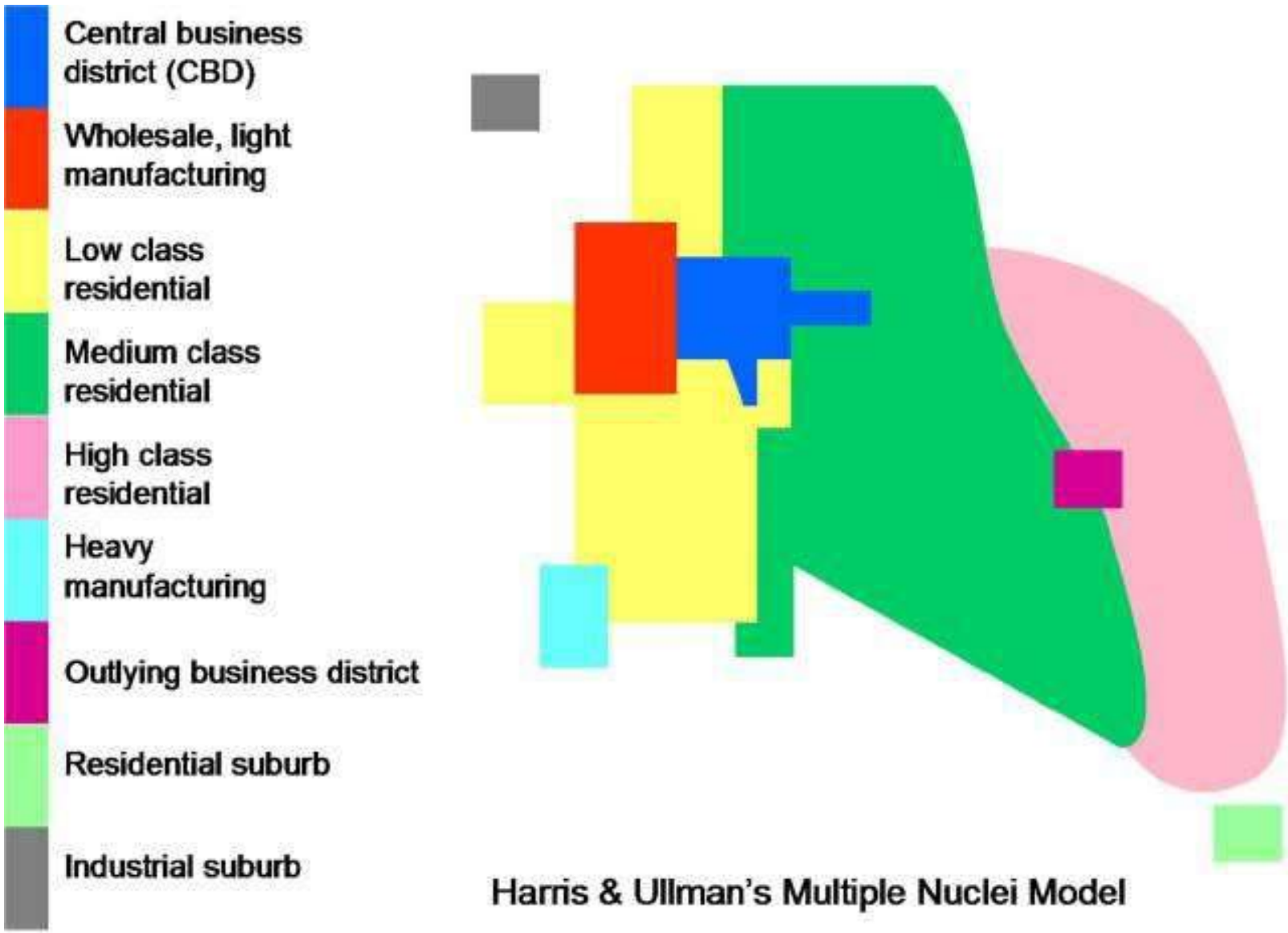
Their aim was to produce a more realistic, if more complicated, model. Their main goals in this were to:

- Move away from the concentric zone model
- To better reflect the complex nature of urban areas, especially those of larger size

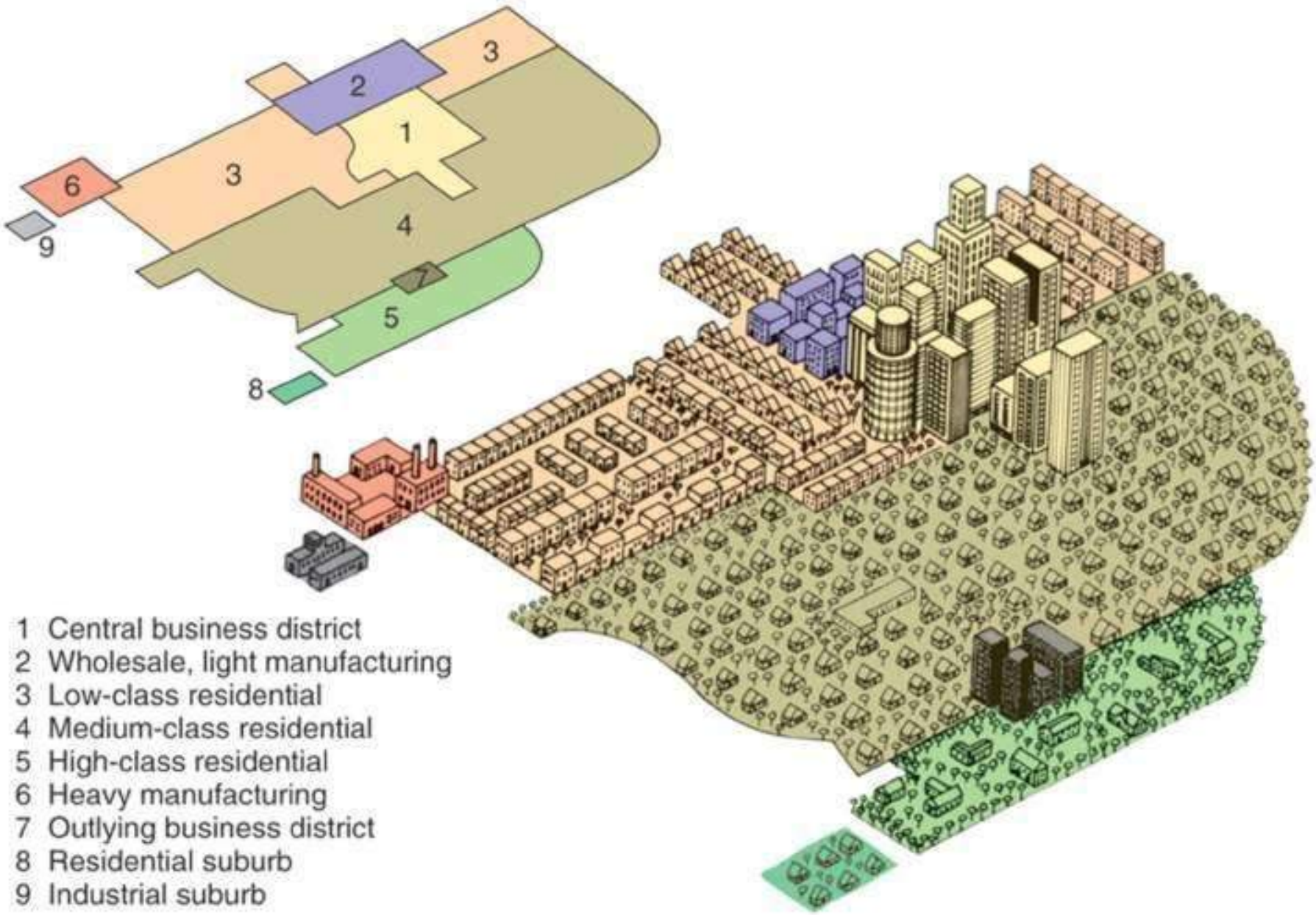
Effects of multiple nuclei on Industry

As multiple nuclei develop, transportation hubs such as: لا رواحم

- airports are constructed which allow industries to be established with reduced transportation costs. These transportation hubs have negative externalities such as noise pollution and lower land values, making land around the hub cheaper.
- Hotels are also constructed near airports because people who travel tend to want to stay near the source of travel.
- Housing develops in wedges and gets more expensive the farther it is from the CBD



Harris & Ullman's Multiple Nuclei Model



Reasons for the model

- Harris and Ullman argued that cities do not grow a single nucleus but several separate nuclei. Each nucleus acts like a growth point.
- The theory was formed based on the idea that people have greater movement due to increased car ownership. This increase of movement allows for the specialization of regional centers (e.g. heavy industry, business parks, retail areas). The model is suitable for the large, expanding cities.

The number of nuclei around which the city expands depends upon situational as well as historical factors.
Multiple nuclei develop because:

A. Certain industrial activities require transportation facilities e.g. ports, railway stations, etc. to lower transportation costs.
B. Various combinations of activities tend to be kept apart e.g. residential areas and airports, factories and parks, etc.
C. Other activities are found together to their mutual advantage e.g. universities, bookstores and coffee shops, etc.
D. Some facilities need to be set in specific areas in a city - for example the CBD requires convenient traffic systems, and many factories need an abundant source of water
E. Certain events benefit from the adjacent distance like the positions of factories and residence.
F. In some cases, some constructions are located in less-than-ideal locations, often due to outside factors such as rent.

Assumptions for Model

A. Land is Flat
B. Even Distribution of Resources
C. Even Distribution of people in Residential areas
D. Even Transportation Costs

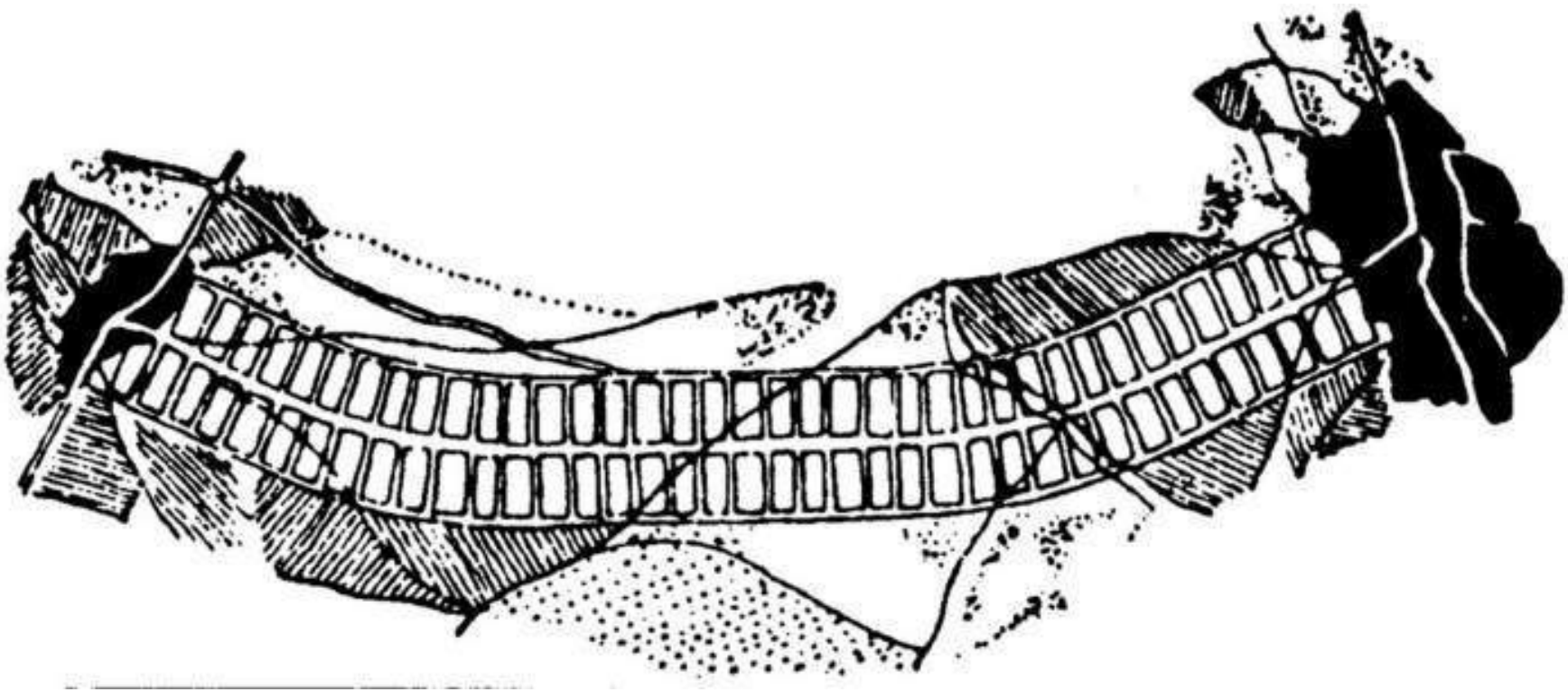
4- Linear city

founders

- The linear city design was first developed by **Arturo Soria Y Mata in Madrid, Spain** during the 19th century
- it was promoted by the Soviet planner **Nikolay Alexandrovich Milyutin** in the late 1920s.
- **Milyutin** justified placing production enterprises and schools in the same band with Engels' statement that "education and labor will be united“.

scope

- The **linear city** was an urban plan for an elongated متممurban formation.
- The city would consist of a series of functionally specialized parallel sectors.
- Generally, the city would run parallel to a river and be built so that the dominant wind would blow from the residential areas to the industrial strip.



application

Ernst May, a famous German functionalist architect, formulated his initial plan for Magnitogorsk, a new city in the Soviet Union, primarily following the model that he had established with his Frankfurt settlements: identical, equidistant علا يواستم five-story communal عاشمapartment buildings and an extensive network of dining halls and other public services.

The sectors of a linear city would be:

1. a purely segregated zone for railway lines,
2. a zone of production and communal enterprises, with related scientific, technical and educational institutions,
3. a green belt or buffer zone with major highway,
4. a residential zone, including a band of social institutions, a band of residential buildings and a "children's band",
5. a park zone, and
6. an agricultural zone with gardens and state-run farms

utilization

- As the city expanded, additional sectors would be added to the end of each band, so that the city would become ever longer, without growing wider.

5- The irregular pattern model

- The irregular pattern model was developed to explain urban structure in the Third World.
- It attempts to model the lack of planning and construction found in many rapidly built Third World cities.
- It attempts to model the transition from village to city,
- It attempts to model the rapid built in the ancient cities specially in the third world.
- This model includes blocks with no fixed order; or permanent and temporary structures.
- urban structure is not related to an urban center or CBD.

advantages

- Practical planning trial and error
- Respecting rapid development
- Specify land due to temporary needs

Disadvantages

- Non standard intersections, blocks and plot sizes and shapes.
- Lack of physical safety, unclear map, so many hidden entrances, cause difficulties for understanding zonings' application
- Difficult to extend streets.
- Difficult to apply building codes
- Mixed land uses which harm each other
- Unsettled land uses cause continuous invasion and succession

6- Grid Iron Model

contents

- Definition of model
- Who is the designer of the model?
- Ancient grid plans
- First example of model
- Second example of model
- Advantages and Disadvantages
- Why came out the model
- Type of residential
- Transportation

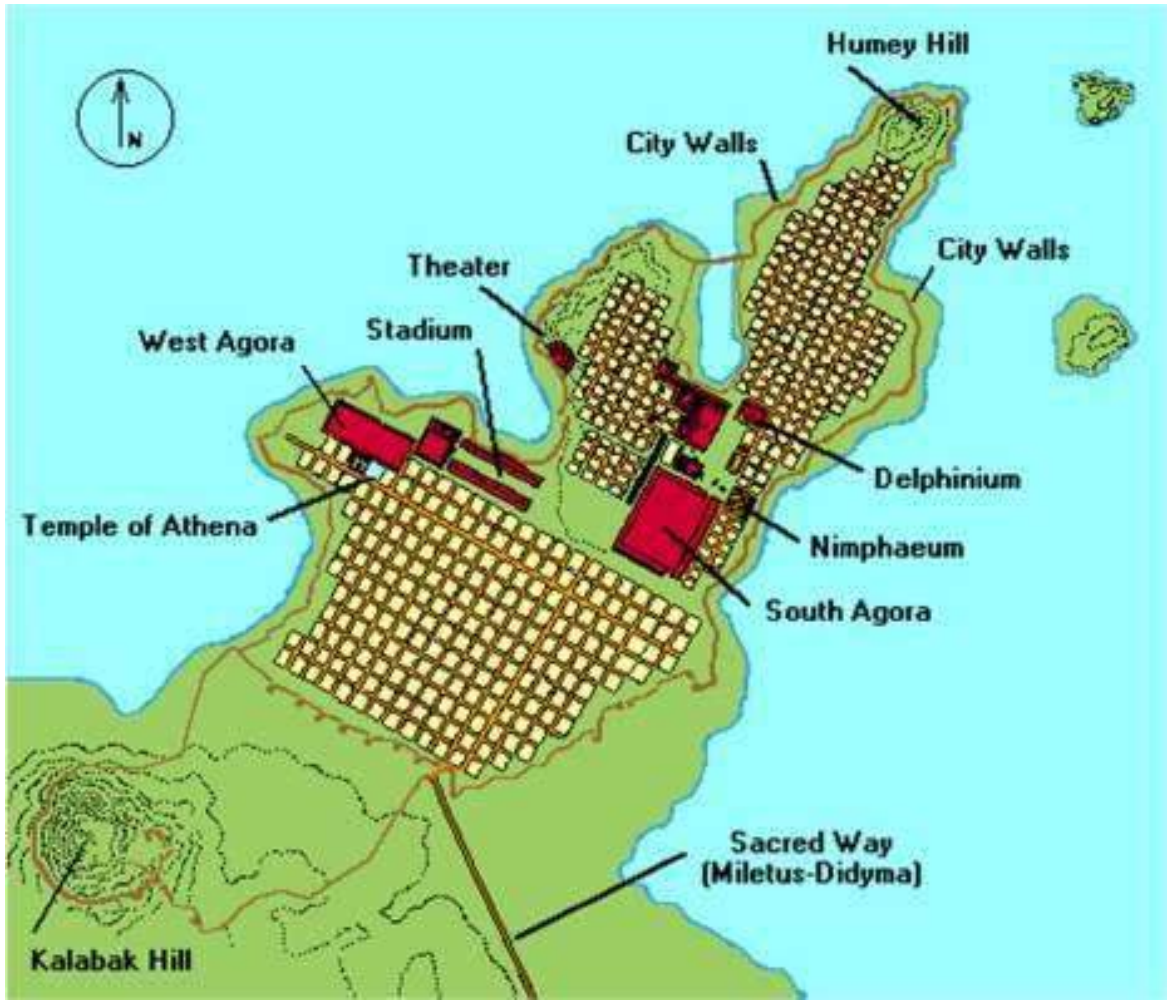
definition

- Gridiron is a type of city plan in which streets run at right angles to each other, forming a grid.
- Usually founded in the oldest part of the city (CBD).
- This pattern is characterized by rectangular street block.

❖Who is the designer of the model?

- Hippodamus of Miletus, was an ancient Greek architect, urban planner, physician, mathematician, meteorologist and philosopher and is considered to be the “father” of urban planning, the namesake of Hippodamian plan of city layouts.
- His plans of Greek cities were characterised by order and regularity in contrast to the more intricacy and confusion common to cities of that period, even Athens. He is seen as the originator of the idea that a town plan might formally embody and clarify a rational social order.
- He was involved in 479 BC with helping the reconstruction of Miletus he would have been very old when this project took place

Hippodamus of Miletus



❖ Ancient grid plans

The grid plan dates from antiquity and originated in multiple cultures; some of the earliest planned cities were built using grid plans.

By 2600 BC, Mohenjo-daro and Harappa, major cities of the Indus Valley Civilization (now in Pakistan), were built with blocks divided by a grid of straight streets, running north-south and east-west. Each block was subdivided by small lanes. The cities and monasteries
of Gandhara (e.g. Sirkap and Taxila), dating to 1st millennium BC to the 11th century AD .

❖First example of model

- The Greek grid had its streets aligned roughly in relation to the cardinal points and generally looked to take advantage of visual cues based on the hilly landscape typical of Greece and Asia Minor.
- This was probably best exemplified in Priene, in present-day western Turkey, where the orthogonal city grid was laid out according with respect to the cardinal points, on sloping terrain that struck views out towards a river and the aforementioned city of Miletus .

❖Second example of model

Arguably the most famous grid plan in history is the plan for New York City formulated in theCommissioners' Plan of 1811, a visionary proposal by the state legislature of New York for the development of most of Manhattan above Houston Street.

❖ Advantages and Disadvantages

Advantages :

- Easy to navigate around
- Easy to extend streets
- Easy to subdivide stands and to build on

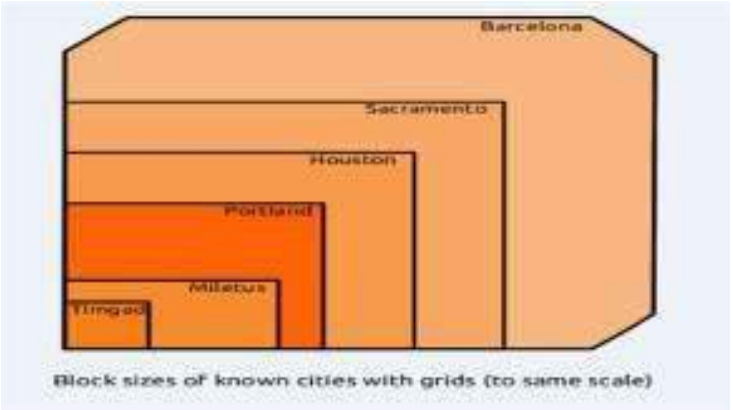
Disadvantages :

- Many intersections that can cause traffic congestion
- Uninteresting design
- Can lead to long steep roads

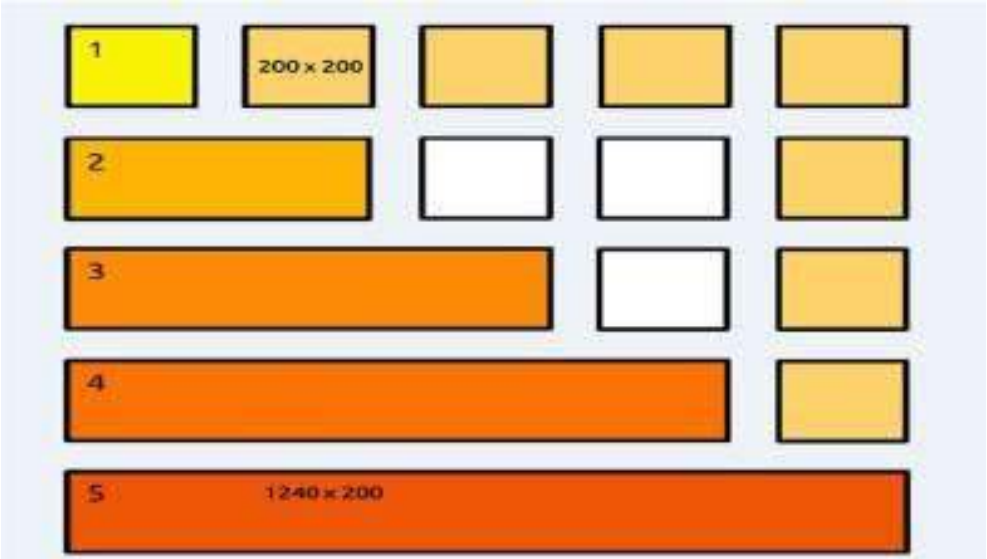
❖Why came out the model

The smaller the block dimensions the higher the frequency of the streets. As the frequency of street increases so does the number of intersections. Intersections normally cost more than straight street length because they are labour-intensive and require street and traffic signage.

❖Type of residential



Block sizes of known cities with grids (to same scale)



The effect of increasing block size on total street length in a 40 acre development parcel (dimensions in feet)

❖Transportation

- Two inherent characteristics of the grid plan, frequent intersections and orthogonal geometry, assist pedestrian movement. The geometry helps with orientation and way finding and its frequent intersections with the choice and directness of route to desired destinations.
- also a disadvantage for pedestrians and bicycles. It disrupts the relaxed canter of walking and forces pedestrians repeatedly onto the road, a hostile, anxiety-generating territory. People with physical limitations or frailties, children and seniors for example, can find such walk challenging. For bicycles this disadvantage is accentuated as their normal speed is at least double that of pedestrians.
- Intersections are not only unpleasant but also dangerous. Most traffic collisions and injuries occur at intersections and the majority of the injuries to pedestrians crossing with the right of way.

7-Core frame model

- The **Core frame model** is a model showing the **urban structure of the CBD** of a town or city.

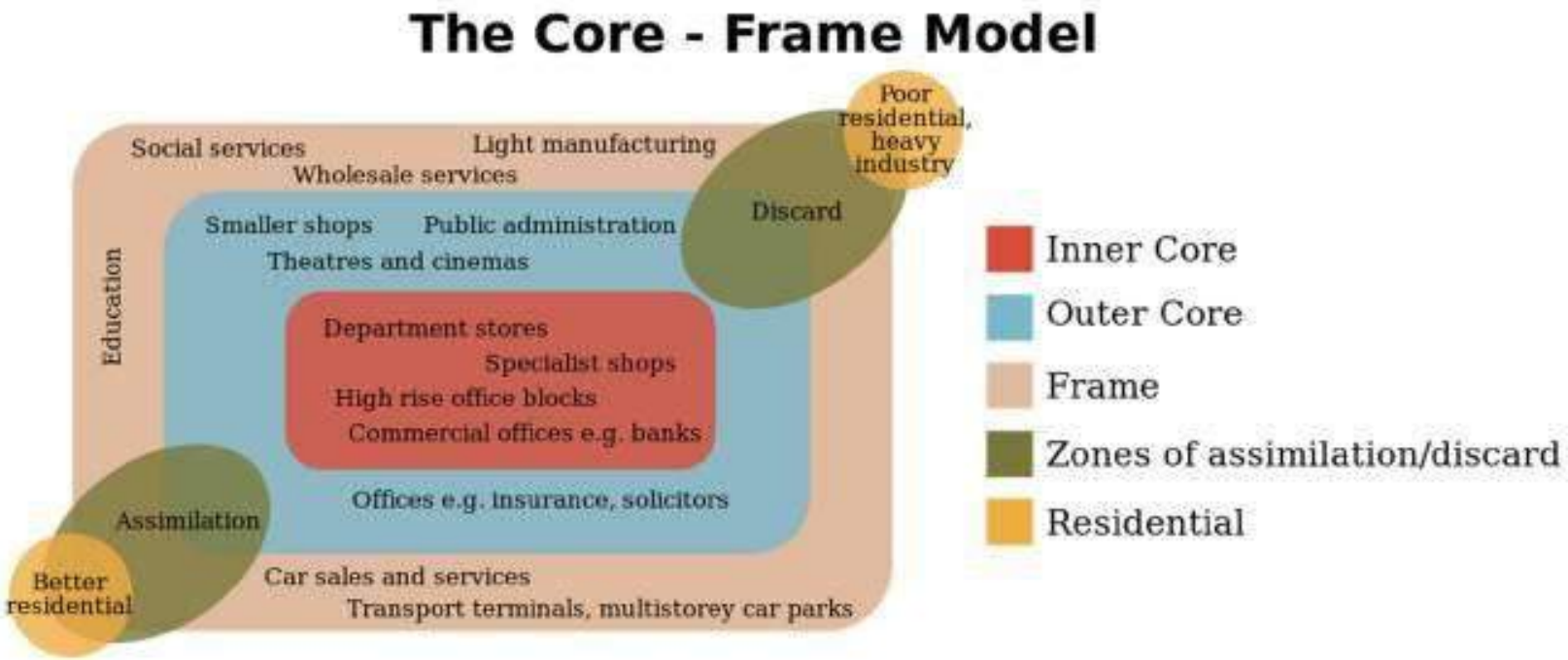
The inner core

- where land is expensive
- and used intensively,
- resulting in vertical development.
- This area is the focus of the transport system and
- has a concentrated daytime population.

The outer core and frame

- Have lower land values
- Less intensively developed
- The various land uses are linked to the bid rent theory and includes zone of transition consisted of:
- The zone of assimilation نيلاعفلا باعيتسا
- The zone of discard نيقفلا

Core frame model



8- Urban Realm theory

Developed by James E. Vance Jr

Urban Realms Model

The Urban Realms Model, created by James E. Vance Jr., in the 1960s,

- shows the spatial components of a modern metropolis. Each "realm" of the model is separate and used for a different purpose,
- but are linked together to make one large, fluid city. The city modeled by the Urban Realm Model is automobile-dependent, which enables it to be as large as necessary for that city's purposes.

Urban Realms Model

- The model includes a central business district, which is not only the center of the city, but meshes with the surrounding realms to create a fluid transition into each separate realm.
- It also includes a central city;
- a "new" downtown, most likely an edge city that has become so urbanized that it mimics the central city without being the central city;
- and a suburban downtown, the center of the suburbs of that city, giving those residents a downtown to go to if travelling to the central city is unlikely.

Each realm has a different purpose

Each realm has a different purpose, and serves separately from all other realms; in some realms, edge cities are apparent--small residential areas that have become so urbanized that they become a smaller version of a major city (i.e. Cary).
Four criteria shape the extent, character and structure of each urban realm:
1. terrain (water, topography, etc.)
2. size of metropolis
3. amount of economic activity in each realm
4. internal accessibility of each realm based on its dominant economic core

The Urban Realms Model constitutes the latest step in identifying and modelling the modern American urban structure. It shows that the outer cities are not "satellites" of the central city, but are in fact becoming cities themselves and shaping the metropolis.

Urban Realms Model

Each realm is a separate economic, social and political entity that is linked together to form a larger metro framework.

Now urban realms have become, so large they even have exurbs, not just suburbs.

Exurbs are suburbs that are, so far away from a city they really can't be called suburbs any more.

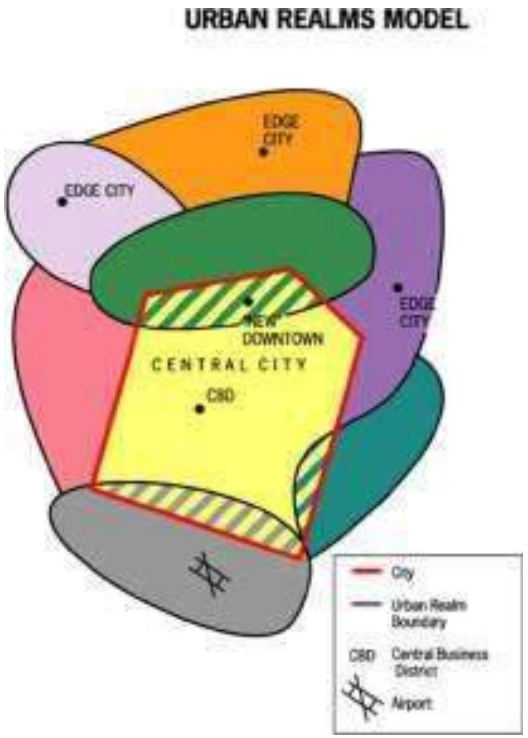
The model works extremely well wit the San Francisco Bay area, because it is where Vance came up with the model for it.

The city this worst applies to is to Phoenix, Arizona, because the city just sprawls, with very bad development, and shows a lot of characteristics of urban sprawl.

Urban Realms Model

a. Vance developed the urban realms model from his observation of the San Francisco Bay area and its sprawling metropolis.
b. This model includes independent suburban downtowns as their foci, and yet they are within the sphere of influence of the central city and its metropolitan CBD.
c. Each urban realm depends on four factors:
i. The overall size of the metropolitan region
ii. The amount of economic activity in each urban realm
iii. The topography and major land features, which help to identify each realm
iv. The internal accessibility of each realm for daily economic functions and travel patterns.
d. An urban realm is likely to become self-sufficient if:
i. The size of the overall metropolis is large
ii. There is a large amount of decentralized economic activity in the region
iii. Topography barriers isolate the suburban region
iv. Good internal accessibility for daily commercial and business travel exists (especially to airport)

Urban Realms Model



Thank you