

Settlement patterns and services

2023年5月16日 20:05

Quizlet

- <https://quizlet.com/cn/803278101/flash-cards/>

Site factors

- Wet point sites
 - Have a good fresh water supply e.g. by a river or spring
 - Rivers can also be used for food resource (fish a good source of protein)
- Dry point sites
 - Away from the risk of flooding e.g. on higher land near a river
 - Avoid unhealthy marshes
 - Marsh in tropical areas are a source of water borne diseases
- Defensive sites
 - Often found on higher ground
 - Top of a hill - all round view of landscape, in the past enemies could be seen
 - Inside of a meander - protection on three sides
- Relief
 - Easier to construct buildings on flat land
 - Easier to grow crops where fields are on gentle slopes and where the soil is most likely to be fertile
 - Steep slopes usually have thin, rocky soils
- Aspect and shelter
 - (= where the slope faces)
 - In northern hemisphere villages are normally south facing slope and on the leeward slope (opposite to windward)
 - Most sunshine
 - Protected from prevailing winds
- Resources
 - Firstly a good supply of wood e.g. next to a forest
 - Later, a source of coal
- Fuel supply
 - Forest which provides fuel wood for cooking and heating
- Altitude
 - Lower altitude is sometimes better
 - Higher temperature
 - Less windy
- Bridging point
 - On a narrow part of the river
 - Easier to build a bridge to cross the river
 - Easier to travel and more accessible
- Route centre / nodal point
 - Where transport routes meet e.g. crossroads, transport link connect with rivers
 - More accessible
 - Good for trading

Settlement pattern

- Linear
 - Buildings are built along a line of communication in long thin rows
 - Reasons
 - To allow every house to access the transport link
 - Sometimes each house has an area of farmland at right angles to the road
 - Might be along a river for water supply

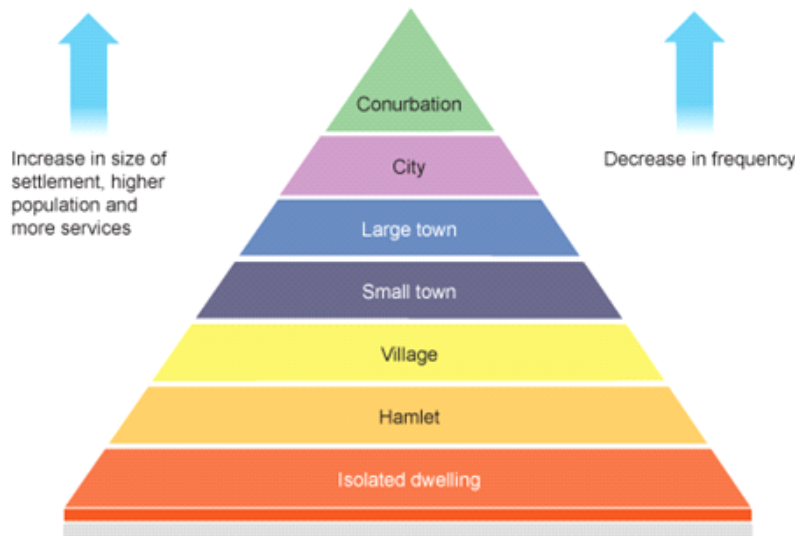
- Dispersed
 - Scattered isolated farmhouses with very few villages
 - Reasons
 - Poor agricultural land so people need to farm large areas e.g. grazing sheep
 - Hard to live in a village and travel to their land
 - Cultural reasons = no tradition to live in grouped areas
 - Huge commercial farms e.g. ranches or plantations + farmhouses separated
 - Limited resources, only support a few people
- Nucleated
 - Buildings are grouped together, initially for defence, or a common resource
 - Reasons
 - Rich agricultural land
 - Farmers can live in the village and be near the farm
 - Enjoy social benefits of neighbours
 - Easy access to services such as shops and schools
 - Help with defence in time of attacks
 - Favoured by culture

Functions of settlement

Market town	Provides services for the surrounding agricultural area e.g. selling farm products
Mining town	Where minerals are extracted e.g. coal
Industrial	Where many factories are located
Port	Located on the coast or large river where goods are imported and exported
Route Centre	Has excellent transport links e.g. roads, railways and airports
Commercial	Provides the needs of trade, industry and business e.g. financial or retail centre
Residential	Majority of residents live there but do not work there: a commuter settlement
Tourist resort	A settlement people visit for their leisure time or holidays

Settlement hierarchy

- Factors
 - The population size
 - The range and number of services
 - The sphere of influence
- The higher up the hierarchy
 - The fewer the number of settlements of that type
 - The more population size
 - More and higher order of goods and services
- Isolated dwelling - village = low order settlements, <3000
- Town = medium order < 100000
- City / conurbation = high order



Convenience / comparison goods or services

- Convenience / low order goods or services
 - Bought frequently (even every day)
 - Prices are generally cheaper
 - e.g. food stores, bakers, pharmacy
 - Sell goods that you can buy easily and for the same price all over the place
 - People will buy these goods locally and will not travel far to purchase them
 - They have a small range
 - The settlement which only has convenience goods + services is called a low order settlement.
- Comparison / high order goods or services
 - Bought less frequently
 - More expensive
 - e.g. clothes, furniture or electronics.
 - Some of them are specialist goods which are not sold in many shops
 - People will compare the prices and are prepared to travel further to buy them
 - They have a large range
 - The settlement where they are located is called a high order settlement.

Why do convenience shops and services have a small threshold population?

- People buy convenience goods frequently and visit the store often
- Although the goods are cheaper in price they are bought more frequently
- Therefore fewer potential customers are needed to support the shop
- People do not buy comparison goods very often
- The goods are usually more expensive
- The shop needs a larger number of potential customers to make sure they sell enough goods to make a profit

Why do larger settlements usually have more services?

- Larger settlements have enough people living there to reach the threshold population for most services including the high order services e.g. clothes and furniture stores as well as multiple low order services e.g. food stores
- Larger settlements provide the high order goods and services for the surrounding area as well as their own population
- The number of potential customers is increased
- This is because their sphere of influence is larger than smaller settlements

Why does the sphere of influence vary in size?

- Size of settlement and number of services it provides - larger town with more high-order services will have a larger sphere of influence

- Population density – in sparsely populated the services are more widely spread out and so the sphere of influence is larger
- Transport facilities – good transport link allow people to travel further in the same amount of time and so the sphere of influence is larger
- Competition for nearby settlements – the sphere of influence will be smaller when there is a settlement nearby which is of similar size and has similar services

Why do some settlements have more services than would be expected for its size?

- It is located in an area of natural beauty and has a tourist function with many services for tourists
- It is the largest settlement in an isolated area and so has to provide all services needed for the whole region
- The population is rich and demand for services is high

Why do some settlements have fewer services than would be expected for its size?

- It is located close to a larger settlement which has a greater variety of services
 - People choose to use the larger settlement for their services instead
- Residential function (commuter settlement)
 - People use the settlement where they work for their services instead of where they live
- The population is poor and can not afford to support a large number of services

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Urban land uses

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Quizlet

- <https://quizlet.com/cn/804098883/flash-cards/>

Land use purposes

- Business and commerce - offices and banks
- Leisure and recreation – including built services e.g. theatres or open space e.g. urban parks
- Residential - the building of houses and flats
- Transport - road and rail networks, stations and airports
- Industry – factories and storage warehouses
- Retail – shops on high street of retail parks
- Tourism facilities – hotels, museums, art galleries

CBD characteristics

- High rise buildings
- High density buildings, limited open space
- Government buildings
- Old historic buildings e.g. cathedrals or palaces
- High order retail services, such as department stores and international chain stores
- Offices, including headquarters of transnational corporations
- High order entertainment services e.g. theatres, hotels and restaurants
- Vertical zoning e.g. retail on the ground and offices on upper floors
- Route centre of public transport services, including busses and underground railways
- High traffic congestion
- Few residents, the number of people living in the CBD is low

Why CBD is in the city centre

- The original centre of the settlement
 - It has the oldest buildings and the government buildings
 - The buildings of historic importance encourage tourism services e.g. hotels to locate in CBD
- The city centre is the most accessible place
 - Roads and public transport networks meet in the centre
 - This makes the land desirable for businesses because it is accessible for customers from all parts of the city
- The high bid rent in the CBD
 - Bid rent curve theorem
 - Land uses compete = higher cost = higher bid rent
 - Only commerce can afford the bid rent so there are few houses or factories in the CBD
 - The buildings are high rise to make the most use of the expensive land
- Comparative, high order shops and services locate in the CBD
 - The population of the whole settlement has access to their businesses
 - Meet their threshold population
 - The whole settlement is within their sphere of influence

Inner city characteristics

- Low class housing originally built for factory workers in 19th century
 - Mainly terraced housing
 - Built in long straight rows + uniform (identical)
- Now often used by lower income groups such as students
- Small back gardens, very small or no front garden
- Narrow congested roads which were not originally built for cars

- Very few garages and on street parking increases congestion
- Few leisure amenities, small stores or corner shops
- In some places the old terraced houses have been knocked down and redeveloped but it is usually still high density residential with modern, high rise flats

Inner city pros and cons

- Advantages
 - Cheap and often available for rent
 - Near the centre where there are job opportunities + entertainment services
- Disadvantages
 - Areas of Industrial decline and high unemployment
 - Abandoned warehousing- eyesore
 - High crime rates e.g. vandalism
 - Overcrowding
 - Poor quality housing (except redeveloped)
 - Lack of open areas
 - Parking problems

Suburbs characteristics

- Medium density residential
- Semi-detached and detached homes
- Larger homes with larger gardens, both front and back gardens, more open space
- Most houses have garages or driveways
- Many services available including local shopping areas, schools, parks and other leisure facilities e.g. golf courses, swimming pools
- Some more modern housing estates with detached houses built since 1980s

Suburbs pros and cons

- Advantages
 - Lower cost of land
 - Better quality housing
 - Off street parking / safer
 - Less congestion
 - Close to countryside
 - More open space
- Disadvantages
 - Long commuting times
 - Higher cost of journeys
 - Higher housing costs

Rural urban fringe

- Where most of the greenfield sites are found
- Common for this area to have a mixture of land uses
- e.g. some housing, golf courses, allotments, business parks and airports
- Advantages
 - Cheap land
 - Room for expansion
 - Attractive environment, little pollution
 - Good accessibility
 - Workers available close by
 - Plenty of car parking space
- How it grows
 - Urban sprawl
 - Suburbanisation

Building on green field sites pros and cons

- Advantages

- Land may be more accessible, less traffic congestion
- Cheaper land
- People prefer more space and pleasant environment
- Allows planners to have freedom
- Disadvantages
 - Habitat destruction
 - Reduction in biodiversity
 - Increased pollution
 - Increased impermeability of ground leads to flooding

Building on brown field sites pros and cons

- Advantages
 - Redevelopment of derelict land
 - Does not harm environment
 - Creates local jobs
 - Provides boost to local economy
 - May use existing infrastructure e.g. roads, electricity
- Disadvantages
 - Land may be contaminated
 - Increases air pollution
 - Increases congestion
 - Increases overcrowding
 - Expensive land

Burgess model

- Based on the idea that land values are highest in the centre of a town or city
- The CBD is in the centre
- High-rise, high-density buildings and traditional factories will be found near the CBD (inner city)
- Low-density, housing developments will be on the outskirts of the town or city (suburbs)
- Problems
 - The model is old and was developed before the car ownership, which has led to the development of the rural-urban fringe
 - It does not include the influence of the redevelopment of the old industrial zones in the inner city
 - Every city is different. There is no such thing as a typical city.
 - The physical geography of the landscape can influence the settlement pattern. For example, a river or an area of higher land

Hoyt model

- Based on the circles of the Burgess model, but adds sectors of similar land uses
- The CBD is in the centre
- The factories/industry zone follow the line of a transport link (main road, a railway or a river) for transportation of raw materials and produced goods
- The working class housing is located next to the factories
 - It is a less desirable place to live with the high pollution level and there is the advantages for the workers to live in walking distance from their work

Problems of the CBD

- Increasing car ownership
 - Lead to congestion so inaccessible, slow down journey times
 - Lack of parking space
- Decline of retailing
 - Smaller shops leave because they cannot afford the high rent
 - Larger shops have moved out as well
 - Reasons
 - Shops such as DIY stores, furniture shops and carpet shops have moved to brown field sites

- Major department stores and hypermarkets have moved to green field sites with more parking space and cheaper land
 - Major growth in online shopping so loss of customers
- Decentralisation of companies and administration
 - Relocated to new better premises on the outskirts of the town for cheaper land and more parking space
- CBD in evening
 - Can be very empty
 - Unsafe (high crime rate) if the only services open are bars, restaurants and nightclubs
- Twilight zone
 - Problem areas in the transition zone of the CBD
 - Particularly affected by change
 - Improved if CBD expands in that direction
 - May also decline from derelict land and buildings; high crime rates and social problems

CBD problem solutions

- Pedestrianisation
 - Traffic free areas or only allow delivery vehicles at certain times of the day
 - Create a safer, more relaxing environment with less pollution
- Shopping malls
 - Undercover shopping areas
 - Shoppers can look around to compare the prices while ignoring the weather
 - Air conditioned / heated
 - Often try to have at least a major department store to encourage other shops to locate
- Visual improvements
 - Provide flowerbeds, seated areas, trees and hanging baskets
 - Introduce pavement café and bars
 - Find new tenants to occupy vacant buildings as soon as possible
 - Street cleaning and waste collection
- Security
 - Police / private security firms
 - CCTV to deter pickpockets and shoplifters

Decline of inner city

- Closure of factories
 - Relocation due to rural urban fringe or even abroad for cheaper production cost
 - High unemployment, social problems old housing in the city

Internal migration / causes of urbanisation

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Quizlet

- <https://quizlet.com/cn/807395528/flash-cards/>

Urbanisation

- The increasing % of the population living in towns and cities
- Causes
 - Rural urban migration
 - High natural increase (birth rates higher than death rates) in urban areas
 - Youthful population in urban areas
 - In-migrants are young adults

Causes of rural urban migration - push factors

- Rural overpopulation
 - Quality of life poor in rural areas
 - Rapid population growth has put pressure on agricultural economy
- Mechanisation of agriculture
 - More machines means less need for labour
 - Less job opportunities
- Tribal conflict
 - Violence and lack of government forces to ensure safety in isolated areas
- Falling harvests
 - Possibly because of drought, poor farming practice, water shortages and climate change
- Natural disasters
 - Less assistance is available in rural areas
 - People migrate to cities after a flood
 - Drought may lead to famine
- Poor social services
 - Very high people per doctor ratio
 - Few education prospects

Causes of rural urban migration - pull factors

- 'Bright Lights Effect'
 - Opportunities available for exciting life with leisure opportunities, sports tournaments, cinemas, festivals
- Medical services
 - Easier to get medication for sick offspring
- Broad range of employment
 - e.g. factory / informal economy
 - Chance to increase income and remittances
- Education
 - University courses and further education available in cities
- Tolerant community
 - Cities are often more 'liberal' rather than conservative, diverse
 - Minority groups such as religious or ethnic minorities will not be persecuted in urban areas
- More job opportunities
- Higher income
- Higher SoL
- Lower level of crime
- * All are perceptions

Obstacles of rural urban migration

- Higher cost of living in cities
- Lack of skill, can only make livings in rural areas
- Family connections / friends living in rural areas may discourage migration
- Lack of capital / money to move
- Lack of safety e.g. passing war zones
- Government policy

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Impacts of urbanisation on people and natural environment

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Impacts of rural urban migrations on rural areas

- Positive
 - Remittances (money sent home by workers)
 - Improve quality of life and SoL
 - Buy more seeds / machineries for the farm
 - Open shops
 - Improve home / move to better home
 - Less pressure on food and water resources
 - More job opportunities
- Negative
 - Young people have left the villages so losing the most capable workers
 - Field go untended and reduce crop yields
 - Ageing population left behind
 - The rest of the village may have to leave the village as well

Impacts of rural urban migrations on urban areas

- Positive
 - Gain able young workers
 - Workers are motivated and hardworking, good work ethics
 - Provide an increased market as migrants spend money on goods and services
- Negative
 - Migrants need to find work quickly and may cause conflicts with existing population
 - Too many migrants coming in = overcrowded
 - Migrants may be exploited by their employers by paying low wages for long hours in unsafe working conditions
 - New migrants often live together and create squatter settlements

Characteristics of squatter settlements

- Densely populated
- Buildings tightly packed together
- Homemade houses
- Poorly built structures
- Lack of infrastructure e.g. limited sanitation, clean water, or electricity

Problems of squatter settlements

- Insufficient housing
 - Shanty towns develop
 - Poor quality housing built by residents
 - People live in slums settlements with limited infrastructure e.g. lack of electricity or clean water supply
 - Some housing is located in dangerous positions e.g. on steep slopes so vulnerable to landslides or next to rivers which could flood
- Inadequate transport infrastructure
 - Limited public transport / overcrowded public buses and poor road networks
 - Causes traffic congestion
 - Leading to high air pollution
- Waste management problems
 - Municipal waste and industrial waste in landfill and rivers
- Poor sanitation
 - Raw sewage emptied into rivers
 - Leads to water pollution and waterborne diseases

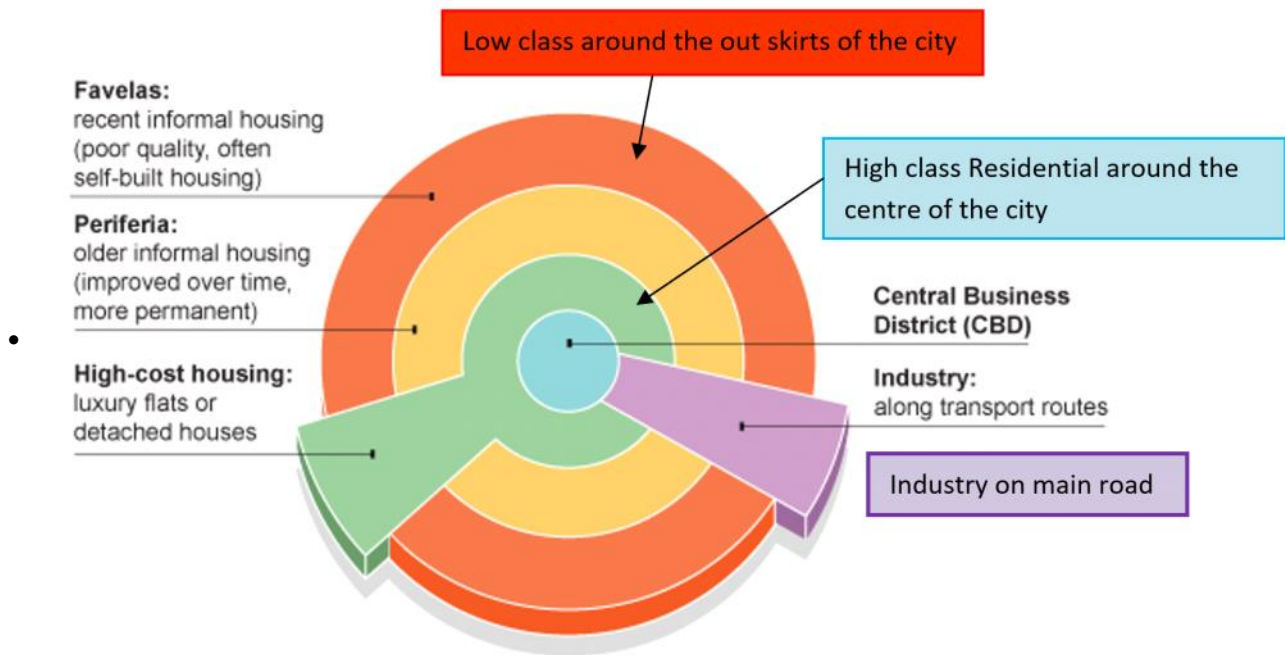
- Disease may break out
- Lack of jobs with regular income
 - Leads to unemployment and an increase in informal employment
 - Can lead to exploitation by employers because it is not regulated
 - Lack of tax revenue because workers do not pay tax
- Crime gangs
 - Fill the vacuum left by lack of jobs
 - Limited police presence
 - Often related to drugs
- Pressure on schools
 - Inadequate education provision
- Pressure on medical services
 - Inadequate medical care provision
 - Disease spreads easily
- Inequality in wealth, housing quality, living standards between the wealthy and the poor living in shanty towns

(Negative) Impacts of urbanisation on the environment

- Loss of habitats
 - Loss of greenspace due to land cleared for shanty town development
 - Impacts food chain and reduces biodiversity.
- Pollution of rivers
 - From industrial waste dumped in rivers and untreated sewage (caused by insufficient sanitation systems)
 - Causes death of fish / other species.
- Pollution of ground water
 - Seepage of toxins from industrial waste and sewage infiltrating into ground
- Air/atmospheric pollution
 - From factories and power generation burning fossil fuels
 - From domestic fires (fires in the homes)
 - From increased traffic congestion

LEDC Housing model

- CBD is located in the city centre because the land is the most accessible
- Industry is located in sectors along the main transport routes out of the city
 - Could be along main roads, railways, rivers, or canals (artificial rivers)
 - Usually built on flat land.
- High class housing is located around the CBD
 - Close to the job opportunities and entertainment services in the CBD
 - The luxury apartments are around the CBD where the land costs are higher
 - The housing is in a sector stretching along transport links to the CBD
 - On the other side of the city from the industry to be away from the pollution
- Middle income housing / periferia
 - An area of informal housing that was built several decades ago
 - People have had the time and some money to improve their homes
 - The government have provided some infrastructure e.g., electricity and there will be some schools and medical facilities → public services
- Low-income housing / slum / favelas / shanty town / squatter settlement
 - On the outskirts of the city
 - An area of recent informal housing which is self-built and poor quality
 - Limited infrastructure or services available to the people



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Service provision South Shropshire

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Settlement hierarchy

- How important different settlements are judged by population and order of services

Shrewsbury

- The county town of Shropshire
- Large market town
- Population of about 70,000
- A highest order settlement in the hierarchy of Shropshire.
- It has a variety of high order services
- Two hospitals – one NHS and one private.
- There are several shopping centres within the CBD
 - Pride Hill
 - High street chain stores such as Marks and Spencer and Boots can be found
 - Darwin centre
- A range of independent retailers
- Abundant number of charity shops and restaurants
 - Both fast food and high end dining
- A range of fitness and leisure centres and plenty of entertainment opportunities
 - Theatres and cinemas
- On the outskirts of the large town, there are various retail parks, such as Meole Brace
 - Supermarkets and chain stores have established
 - Taking advantage of the cheaper land and high accessibility.
- Shrewsbury is accessible with three park and rides, many bus services and a railway station which links to Birmingham as well as being located near the motorway M54.

Acton Burnell

- A small village located 8 miles south of Shrewsbury and with a population of just 544 (not including the boarding school students)
- It has only a few low order services
- A post office which sells convenience goods, such as newspapers, sweets, bread, eggs and milk
 - Providing this service for the surrounding villages.
- There is an international boarding school in the village for over 500 students
 - Provides considerable local employment
 - The college also hosts cultural events that local residents can sometimes attend and its swimming pool is used by a nearby primary school
- The students from the College provide the threshold population required to keep the post office economically viable
- Acton Burnell also has a church but services are not weekly and a waste collection service.
- A bus service to Shrewsbury does operate but the service is infrequent

Land use pattern Shrewsbury

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Burgess model

- CBD
 - 1km²
 - Defensive site: inside meander of River Severn
 - Higher rise up to 4 floors, high density
 - High order shops: Darwin Shopping Centre, Pride Hill, indoor market
 - High order services e.g. restaurants and cinema, theatre
 - Tourist attractions: tourist info / museum / art gallery / cinema
 - Route centre: bus & train station. Traffic congestion → accessible
 - Limited open space: the Quarry, a public park, next to river on floodplain
 - Historical buildings: castle, cathedral
 - Meets the threshold population
- Castlefield NE
 - Terraced, high-density inner-city housing
 - Little or no open space
 - House railway workers from industrial revolution
 - Traditional Victorian housing
 - Low order services
- Suburban expansion SW
 - The largest land use in the town by area
 - Detached and semi-detached
 - Low-density housing
 - Built since 1950s.
 - High income housing

Hoyt model

- New developments built on rural-urban fringe
 - Meole Brace retail park
 - Housing estates in Bowbrook
 - Shrewsbury Town Football Club stadium
- New infrastructure
 - New park and ride
 - A5 bypass built on rural-urban fringe, form a ring road
- Land to NW left undeveloped
 - Low economic value green field site
 - Low-lying flood plain for the River Severn.
 - Susceptible to flooding
- Battlefield Retail Park
 - New industrial and retail space. Large buildings on map

Rio de Janeiro

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Background facts

- Rio's population increases by 1 million every 10 years
- Population 6 million or 12 million for total metropolitan area
- Caused by land degradation, over-population and periodic droughts in rural regions
 - e.g. NE Brazil
 - Resulted in rural-urban migration to Rio

Problems + advantage of rural urban migration for the rural area

- Problems
 - Loss of young adults / workforce
 - Lack of labour for farms, some farms abandoned
 - Families split up
 - Usually fathers migrate first
 - Leaving women, children and elderly people in village
 - Aging population in rural areas
 - Increasing dependency ratio
 - Depopulation of rural area
- Advantage
 - Migrant sends remittances (money) back to family
 - Can be invested to improve housing and farm in rural areas

Problems of rural urban migration for Rio de Janeiro

- Has 750 favelas
 - Favelas = housing areas which often lack basic amenities such as running water, sewerage and electricity
 - Slums, lack basic amenities
 - Rocinha is the largest favela with 100,000 - 300,000 residents
- Many are built on steep hillsides, near risky areas such as electricity cables/railways, chemicals factories
- Landslides can occur and kill people during heavy rains
- Police have little control in many favelas and these areas are often run by dangerous rival drugs gangs
- **Add general ideas of problems of squatter settlements**

Housing issues and inequality

- Segregation of the population by socio-economic level
 - Wealthier population live in high quality homes near CBD
 - Poorer population including recent migrants to the city live in shanty towns on the outskirts of the city
- Poor quality housing and living standards in shanty towns
 - Densely populated
 - Homemade houses
 - Poorly built
 - Tightly packed
- Squatter settlements
 - Residents could be evicted
- Informal settlement
 - Limited sanitation and water supply provision
 - Can lead to outbreaks of disease
 - No electricity supply or it is illegally tapped which is dangerous
- Overcrowding

- Whole families in one or two rooms
- High levels of crime often related to drugs
- Located on outskirts of city
 - No local employment
 - Must travel far to work with poor road structure & limited public transport

Housing issues and inequality evidence

- Sao Conrado compared with Rocinha
 - Located next to each other in southern Rio
- Sao Conrado is a beachside location
 - 21,000 population in 6.5km² so population density = 3,000 per km²
 - High-rise luxury apartments and mansions
 - Have all amenities e.g. running water/ electricity
 - Landscaped gardens, swimming pools, golf course
 - High order retail
 - e.g. the Fashion Mall which houses over 150 stores
 - Have national and international designer shops
 - High order services
 - e.g. night clubs, and high quality restaurants.
- Rocinha is a hillside location
 - 100,000- 300,000 population with population density 48,000 per km²
 - Hillsides too steep for roads
 - Everything must be carried
 - Mountains around the city trap smog caused by exhaust fumes
 - Causing poor quality air
 - Frequent flash floods and mudslides
 - Organised crime = high levels of violence
 - Housing quality poor compared with Sao Conrado
 - High density but low rise
 - Made from concrete and brick with basic sanitation and electricity
 - Some businesses & services
 - e.g. banks, schools, shops and some health provision, with a lot of community support

Solutions to inequality

- Favela Bairro Project
 - A site + service scheme
 - Residents legally own land → more willing to improve their homes
 - Basic services provided e.g. electricity and water, rubbish collection, health care and schools.
- Self-help schemes
 - Government provides building materials and training
 - Wncourages the community to improve their own neighbourhoods
- Microfinance for people to learn new skills and start businesses
- Pacification
 - Elite government armed police units go into violent favelas to fight the drugs gangs
- Cable Cars
 - Built to make commuting easier because they cannot build roads on steep hillside in favelas
- Building new 'satellite cities'
 - Cities on the edge of Rio e.g. Barra de Tijuca is 20kms to the south
 - Homes in Barra de Tijuca are well-constructed and have electricity / running water
 - 'Gated communities' with security guards
 - Communal green space and leisure facilities

Traffic congestion

- Large population
 - Over 6 million people
 - + 1 million every 10 years
- High and increasing car ownership as Brazil's economy develops

- In 2020 80% households owned a car in Brazil
- Physical geography
 - Steep relief / surrounded by mountains
 - Difficult to build roads
- A large volume of traffic is forced along a few main roads
 - Causing severe congestion, accidents and noise and air pollution

Traffic congestion solutions

- The Maestro System
 - Managing Traffic in Real Time
 - A system of cameras + speed checks
 - Radio links sends traffic information to a control centre in real time
 - They can change traffic signals to help increase the traffic flow
- Investment in infrastructure
 - e.g. Yellow Line Expressway (motorway) and Elevado Dual Carriageway
- Improved public transport in Rio
 - 440 city bus lines transport over four million passengers each day
 - Cheap & with frequent services.
 - Metro
 - Three subway lines with 41 stations.
 - Light rail transport (LRT)
 - New tram system
 - Connects the port to the financial centre in the city and the international airport
 - 300,000 passengers each day
 - Bike Rio
 - A bicycle sharing scheme which started in 2011
 - There are 600 bicycles available at 60 rental stations throughout the city

Pollution

- Air pollution from:
 - Higher car ownership increases traffic congestion and vehicle emissions (CO, CO₂ + NO₂)
 - Power stations burn fossil fuels e.g. coal
 - Produce CO₂ (linked to global warming) + SO₂ (linked to acid rain).
 - Wealthier and growing population use more electricity
 - Factories emit various types of air pollution
- Water pollution from:
 - Industrial and domestic waste dumped in rivers
 - Increase in sewage flowing into rivers from large population
- Noise pollution from
 - Increased traffic
 - Construction
 - Late night services e.g. bars/ clubs
- Visual pollution from:
 - Unsightly (unattractive) derelict sites + construction sites
 - Graffiti + litter from growing population
 - Increased light pollution

Pollution solutions

- All solutions to traffic problem could reduce air pollution from traffic congestion
 - Particularly improving public transport and encouraging the use of bikes
- Reduce amount of electricity from burning coal
 - Use more renewable energy
 - Now 80% of electricity is from renewable, mostly hydroelectric power & some solar
- Improve sanitation system
 - Prevent sewage flowing into rivers
- CTR RIO
 - The main city landfill

- Opened in 2011 to solve waste problem
- It recycles rubbish but also produces recycled water and creates job opportunities for local poor people
- Nearby rubbish dumps which caused a lot of pollution have now been closed
- Laws to reduce emissions from factories and power stations
 - e.g. using scrubbers in the chimneys to absorb pollution
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Shrewsbury urban area

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Decline of CBD

- Closure of office space due to technological developments increasing work from home
- Inaccessible
 - Congestion during rush hour as workers commute by car
- Decline in the retail area of the CBD because shops cannot afford high rents and competition from online shopping
- Rural urban fringe more attractive
 - Retail & businesses have moved to cheaper land on rural urban fringe with space for expansion and car parks
 - Meole Brace retail park built on rural urban fringe to south of the town with supermarkets + chain stores
 - More accessible
- Vacant shops in CBD
 - 18% of shops are vacant
 - Shops close leaving empty shops & increased graffiti / vandalism
- CBD becomes deserted at night which makes it unsafe and higher crime rates

Decline of CBD solution

- Pedestrianisation
 - Pride Hill high street and market square are pedestrianized
 - With street furniture & pavement cafes
 - Improved built environment
- New development
 - Local government bought Pride Hill, Darwin & Riverside shopping centres in 2018
 - Now redeveloping area into ONE large building for retail and leisure
- Transport improvements
 - 3 park and rides e.g. Meole Brace
 - Reduce traffic in town
- Security
 - CCTV
 - Prevent theft

Urban sprawl evidence

- New developments on the rural-urban fringe of Shrewsbury include:
 - Retail park & Shrewsbury Town Football stadium built at Meole Brace
 - New road infrastructure e.g. A5 widened to provide ring road
 - Three park and ride bus services e.g. one at Meole Brace
 - New housing estates built along southern edge e.g. Bowbrook currently under construction next to new football stadium
 - Proposed North Shrewsbury Relief Road to link NE and SE areas of Shrewsbury and complete the ring road

Urban sprawl problems

- New development on the rural-urban fringe cause conflict with local people because:
 - Changing character of the surrounding villages as they become part of the city / town
 - Loss of valuable farmland + attractive scenery
 - Loss of natural habitats for wildlife + loss of biodiversity in the area
 - Increased noise and light pollution in the countryside
 - Construction sites / new housing
 - Increased flood risk with impermeable surface