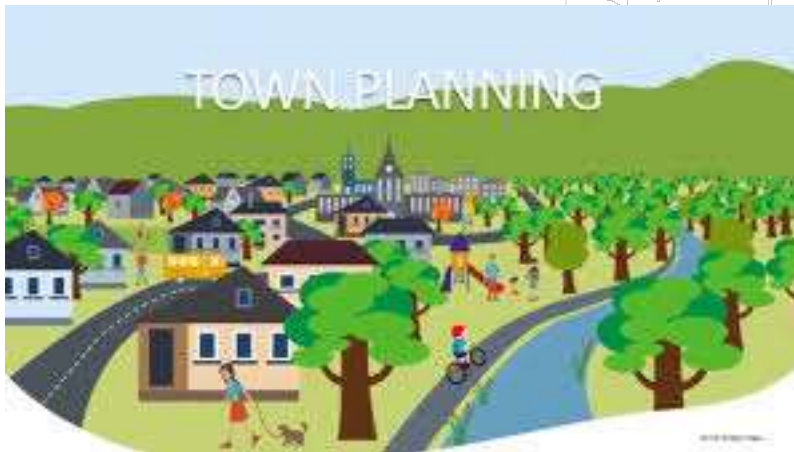


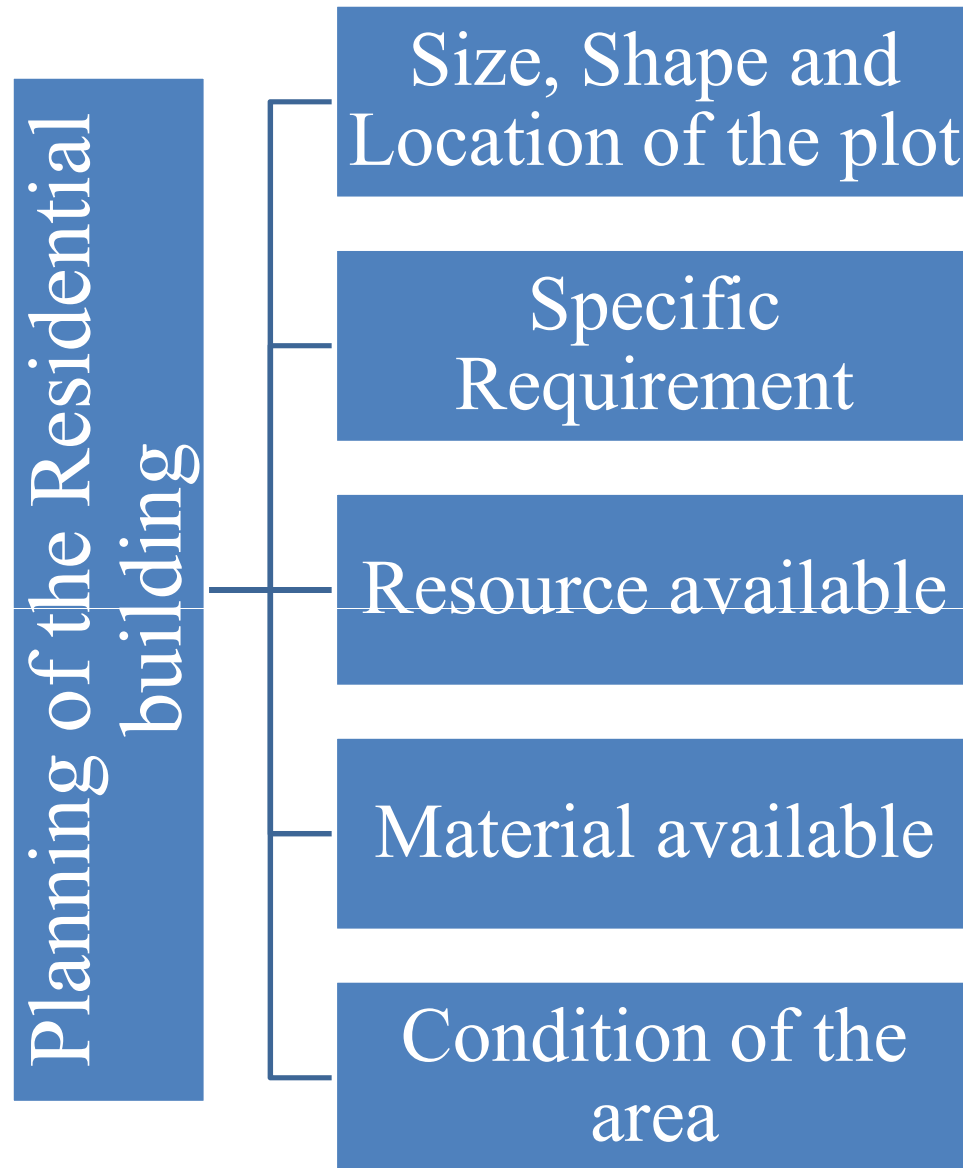
Module - 2

Introduction to building and Town Planning

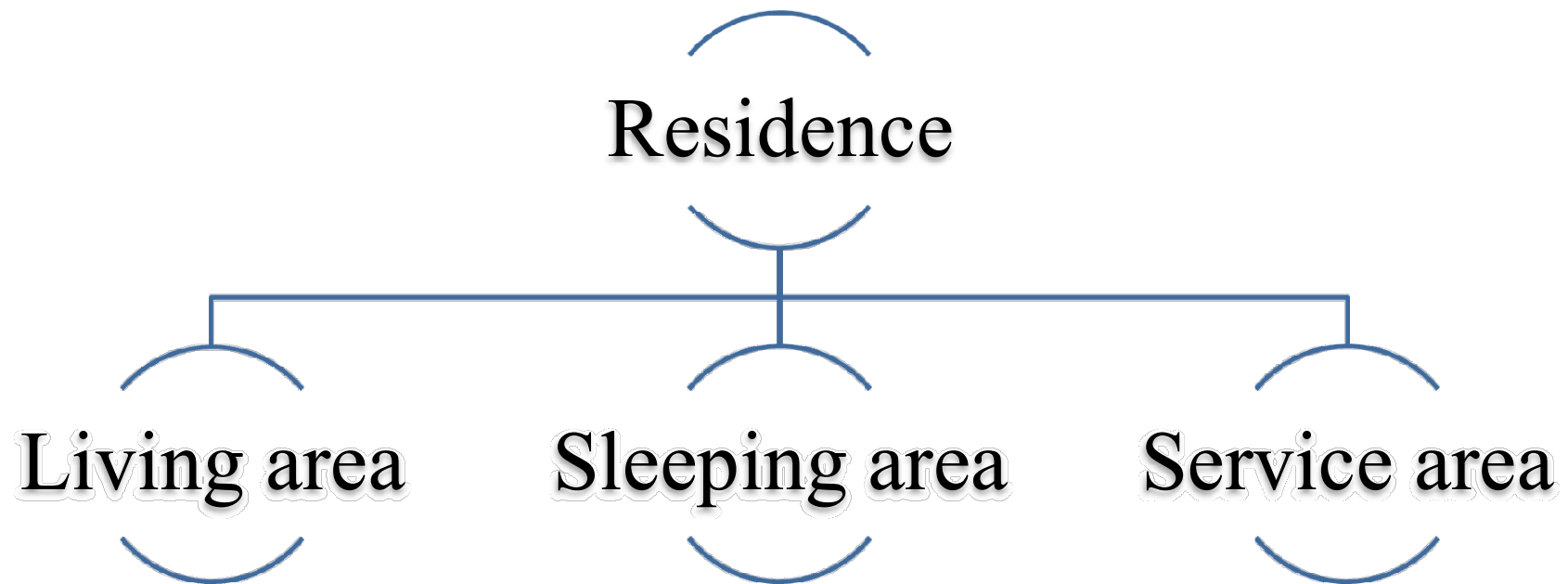


Introduction

- Residential building is one which is used wholly or partly for considerable time or permanently for human habitation.
- A house give the shelter against weathering elements like sun, rain, wind, snow.
- Detached house, semi-detached house, Row house, flats used for residential purpose for long time or life time.
- Hotel and hostel used for residential purpose for short duration.



Three Major area



- Living area :-

Drawing room, Dining room, Office room,
Guest room, Entrance foyer

- Sleeping area :-

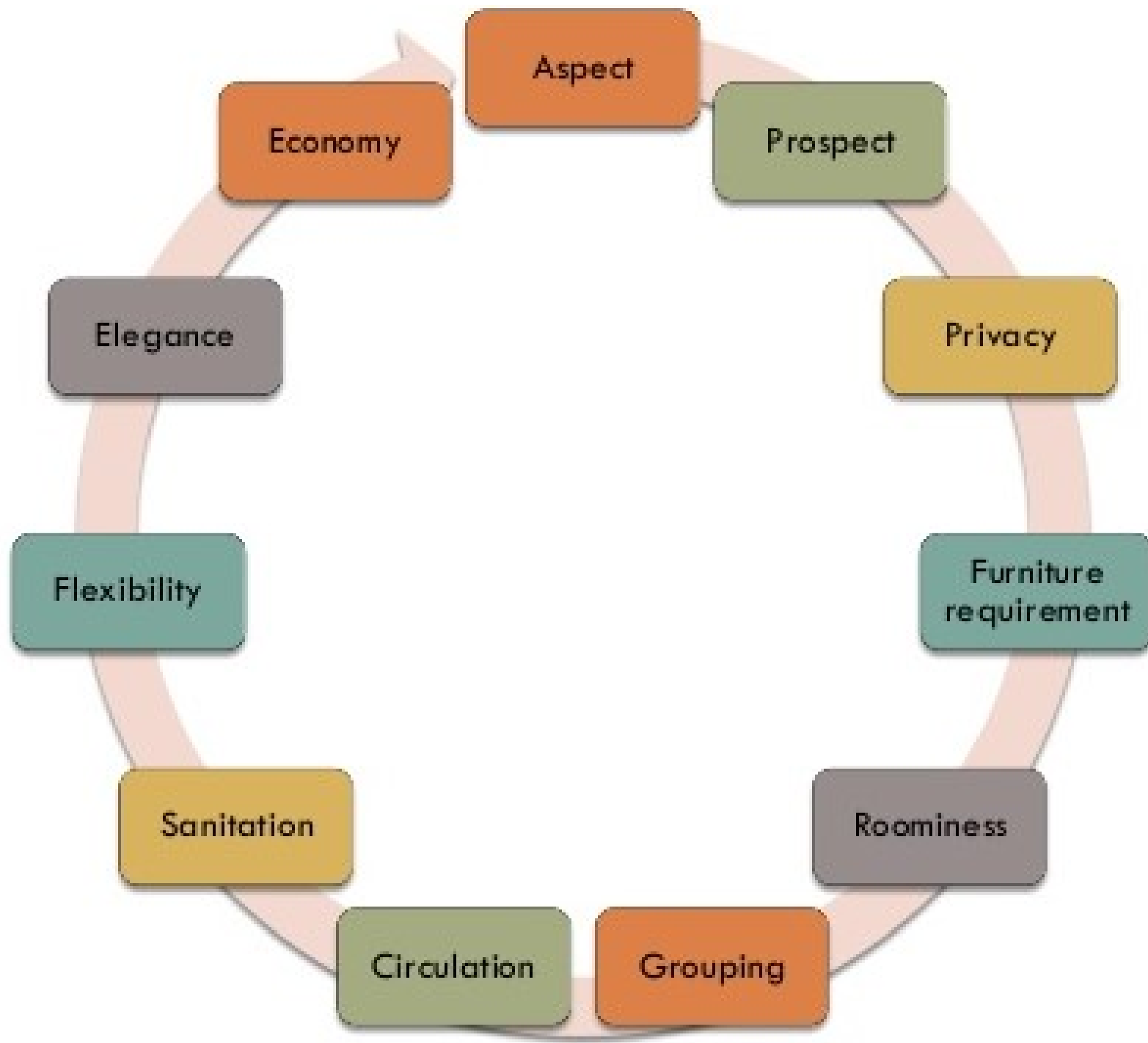
Bedroom

- Service area :-

Kitchen, Storeroom, Bathroom, W.C, Garage

Principle of planning

- Plan of building: it is grouping and arrangement of components of building in a systematic manner so as to form a homogeneous body with a comprehensive look out to meet its functional purpose
- Planning of building depends on:
 - ▣ Functional object & requirements
 - ▣ Component parts, sizes and inter-relationship
 - ▣ Topography and shape of plot
 - ▣ Climatic condition
 - ▣ Location and neighbourhood



- ❑ **ASPECT:** placement of different rooms of house in accordance with our activities at different hours of day.
- ❑ Rooms should get enough sunlight and air, which gives
 - ❑ Cheerful atmosphere
 - ❑ Comfort
 - ❑ Hygienic condition
- ❑ A room which receives light & air from particular direction is said to have 'aspect' of that direction.

Room	Recommended aspect	Influencing factor
Bed	SW-W-NW	To receive plentiful of breeze in summer
Kitchen	E and rarely NE	To receive morning sun which is germicidal. It purifies air. It should be well illuminated and cool in afternoon.
Dining	SE-S-SW	Proximity of kitchen. It should be cool.
Drawing	SE-S-SW-W	Adequate natural lighting during winter, obviate sun during summer
Reading	N-NW	Light from north being diffused and evenly distributed and cool
Store	NW-N-NE	Dark and cool

- ❑ **PROSPECT:** it refers to view as seen of the outside from the windows and doors in external walls
- ❑ It is determined by view as desired from certain rooms of house
 - ▣ View of the garden or a nearby hill
- ❑ At the same time, it is naturally intended to conceal some undesirable views

- **PRIVACY:** privacy can be of
 - Sight (bath, w/c)
 - Sound (confidential discussion, study room)
 - Both sight and sound (bed room)
- It broadly classified in two categories i.e.
 - Internal privacy
 - External privacy

- Internal privacy: it is privacy within building, it can be achieved by
 - Correct positioning of doors and openings of shutters
 - Proper grouping of rooms
 - Providing buffer area between bed room and other rooms
 - Vertical segregation of rooms i.e., by providing drawing, dining, kitchen, toilet at GF and bed and toilet at FF

- External privacy: it is privacy of whole building with reference to surroundings (buildings and road)
- It can be achieved by
 - ▣ Compound wall to a height of 1.35 to 1.5 m.
 - ▣ Planting trees along compound wall (acts as sound & sight barrier)
 - ▣ Providing screen walls, curtain walls and dwarf wall on verandah

- **FURNITURE REQUIREMENT:** planner should know how much space is needed by each function
 - ▣ Room sizes can be completed on basis of
 - permanent furniture to be used
 - It's dimensions and arrangement
 - Clearance for circulation
- **ROOMINESS:** it is feeling created after a room is well-furnished with all permanent furniture as spacious and well-planned.
 - ▣ Max use of a room with min possible dimensions

- ❑ Rectangular room gives better outlook compare to square room of same floor area.
- ❑ Length/breadth ratio of 1.2 to 1.5 is desirable
- ❑ When it exceeds 2, it creates tunnel like feeling
- ❑ Similarly height also plays imp role
- ❑ Room should have all proportional dimensions
- ❑ Light colours create effect of more space
- ❑ Light and dark colour for different walls of same room will reduce effect of less width and more length

- **GROUPING:** it is arrangement of different rooms with reference to their functions, it improves comfort, privacy and convenience and minimises circulation
- Points to be considered
 - Verandah adjacent to drawing room
 - Dining room close to kitchen
 - Bed room, toilet and dressing room grouped together
 - Bath and w/c should be nearer to each other
 - Staircase should be easily accessible from all rooms
 - w/c should be away from dining, psychological feeling of being away from insanitary place

- **CIRCULATION:** it is access into or out of a room, it is internal movement inside a building
- Circulation area shall be straight, short, bright, lighted both day and night, well ventilated and free from obstructions
- It should not affect privacy nor interfere with utility
- It is of two types
 - ▣ Horizontal – circulation within same floor
 - ▣ Vertical – circulation between different floors

- ❑ **SANITATION:** it is provision and upkeep of various components of house to keep inmates cheerful and free from disease
- ❑ Factors influence sanitation are
 - ❑ Lighting
 - ❑ Ventilation
 - ❑ Cleanliness
- ❑ **Lighting:** natural sunlight or artificial
 - ❑ Intensity of natural light is affected by pollutants like smoke, dirt, dust, gases and clouds
 - ❑ Min window area = $1/7^{\text{th}}$ floor area (hot-humid climate)
 - ❑ Min window area = $1/10^{\text{th}}$ floor area (dry climate)

- Ventilation: a system of supplying or removing air by natural or mechanical means to or from any enclosed space to create and maintain comfortable condition
- Orientation of building and location of windows help in providing proper ventilation
- Basic requirements in ventilation
 - Sensation of comfort
 - Reduction in humidity
 - Removal of heat
 - Proper supply of oxygen
 - Reduction of dust

- There are two methods of ventilation
 - Natural: suitable for houses and flats, achieved by designing windows and ventilators opposite to each other
 - Artificial: necessary if room is to be occupied by more than 50 persons or where space per occupant is less than 3 m³, it is achieved by exhaust system of supply system.

□ Cleanliness:

□ Dust:

- Harbours bacteria
- Creates health problems
- Makes surfaces dull
- Floors shall be smooth, impervious, non-absorbing, uniformly sloping

□ Dampness:

- Root cause of infection
- Walls and floors shall be damp-proof
- Kitchen, bath and w/c shall be drained off quickly

- ❑ **FLEXIBILITY:** i.e. That a room which is planned for one function be used for other, if so required.
 - ❑ It is ease with which a room designated for a particular activity can accommodate more load temporarily or may supplement activity of another room
 - ❑ As drawing room used as guest bed room
 - ❑ Kitchen as additional dining room etc.
- ❑ **ELEGANCE:** is grand appearance of a building, mainly owing to the elevation which in turn depends on plan

- Depends on
 - ▣ Elevated site
 - ▣ Architecture
 - ▣ Neighbourhood
 - ▣ Conformity with nature
 - ▣ Nativity
 - ▣ Adjoining building and relative placement
- A better elegance can be obtained by
 - ▣ Superior building materials for facing – like paint, glass, timber, polished stones – granite, marble, mosaic etc.
 - ▣ Providing projections – like sunshades, balconies, porch etc.
 - ▣ Providing bay windows, corner windows etc.

- ❑ **ECONOMY:** building should have min floor area with max utility
- ❑ It should not be achieved at the cost of strength
- ❑ Only with proper planning and utility of space being maximized (waste being minimized)
- ❑ Can be achieved by,
 - ❑ Simple elevation
 - ❑ Dispensing of porches, balconies, lobbies
 - ❑ Reducing storey height
 - ❑ Reducing no of steps of stairs
 - ❑ Standardization of sizes of various components and materials

Basic requirement of Building Planning

Site Selection

Building Bye Laws

Orientation of Building

Requirements of Building

Functional Requirement of Residential Building

Site selection

- ❑ Residential bldg: is one in which people reside permanently or considerable time
- ❑ A house is expected to protect its inmates from weathering elements like sun, wind, rain and snow.
- ❑ It regulated amount of light, provides controlled conditions as required, privacy and security.
- ❑ Every human being likes to work/live in a comfortable and pleasant surrounding

- Factors affecting the selection of site:
 - Topography
 - Nature of subsoil
 - Position of ground water table (GWT)
 - Facilities
 - Neighborhood
 - Certain things those should not be near the site
 - Vegetation
 - Shape of site
 - Availability of men and materials
 - Proximity to sea-shore, river, lake or place of natural beauty

□ Topography:

- Plain ground: easy marking, excavation, construction, no leveling required, drainage can be a problem, stagnant pools are formed after rainfall/by septic tank
- Sloping ground:
 - Effective drainage : slope min 1%
 - Parking area: not more than 5%
 - Pedestrian ramp: not more than 10%
 - Always desirable to have the road in front of building to be a lower level than floor level of building

- Topography (cont.)
 - ▣ Undulating ground: leveling required or split level construction shall be carried out
- Nature of subsoil: soil below ground is called subsoil, it should possess good bearing capacity at a reasonable depth for economical foundation
- Position of ground water table: shallow GWT reduces the bearing capacity of subsoil, causes uneven settlement, promotes dampness in building

- Facilities:
 - ▣ Community services: police, fire protection, street cleaning etc,
 - ▣ Utilities: water, gas, power supply, drainage line
 - ▣ Amenities: school, college, hospital, telephone
 - ▣ Transport system: city bus stop, railway station shall be nearer
- Neighborhood: controls living environment, resi. bldg undesirable in commercial/industrial areas.

- Things those should not be near the site:
 - Markets, theatres etc – which create noise and nuisance, safety and security is less in and around
 - Industries, sewage farms, busy traffic junctions – which produce foul air, dust, smoke etc.,
 - Slaughter houses, cemeteries – which create panic in children
 - Kilns, quarries – which are quite dusty, noisy
 - Busy highway/railway/aerodromes – quite noisy
 - Stagnant pool or running waste water – which pollute GWT, create health problems

□ Vegetation:

- Site with trees, shrubs, bushes is preferred over bare land
- Gives pleasant atmosphere, privacy, shade, oxygen
- Act as barrier of heat, dust and noise
- Site in vicinity of peepal, banyan trees are to be avoided as they protrude their roots through foundation causing their failure

□ Shape of site: rectangular with length 1 to 2 times its width, width parallel to road is ideal

- Triangular sites shall be avoided
- Irregular & narrow site rarely gets natural light and breeze, planning becomes difficult, increase length of boundary

- Availability of men and materials:
 - ▣ Materials of construction as stones, bricks, timber, steel, lime, cement, sand and good quality water shall be available at site
 - ▣ Skilled labour such as masons, bar benders, carpenter, electricians, plumber etc and unskilled labours shall be available at site
- Proximity to seashore: coastal town present better climate, building near beach has advantages as
 - ▣ Pleasant view of sunrise/sunset
 - ▣ Cool breeze in summer
 - ▣ Ozone of beaches induces exhilarating effect

Building Buylaws

Building Bye-Laws: min provisions designed from National Building Code (NBC) by town planning authorities/Urban development authorities/Municipalities, to protect the safety of public with regarding to structural sufficiency, fire hazards and health aspects

NBC published by Bureau of Indian Standards (BIS) to maintain uniform building regulations throughout the country.

1st Ed: 1970

2nd Ed: 1983

3rd Ed: 2005

■ Objectives of building bye-laws

- Disciplined and systematic growth of buildings and towns
- Prevent haphazard development
- Protect safety of public against fire, noise, health hazards and structural failure

- Proper utilization of space
- Give guideline to arch/engr in effective planning
- To provide health, safety and comfort to people
- Due to it, each building will have proper approaches, light, air and ventilation

□ APPLICABILITY of BYE-LAWS:

- ▣ New construction:
- ▣ Additions and alterations to a building
- ▣ Occupancy of building changed

- ▣ Development of land
- ▣ Any part or whole building is demolished

- Bye-laws/regulations for different types of building:
 - ▣ Line of building frontage
 - ▣ Open spaces around residential building
 - ▣ Min standard dimensions of building elements
 - ▣ Provisions for lighting and ventilation
 - ▣ Provisions for safety from fire and explosion
 - ▣ Provisions for means of access

- ▣ Provisions for drainage and sanitation
- ▣ Provisions for safety of works against hazards or accidents
- ▣ Requirements for off-street parking spaces
- ▣ Requirements for greenbelt and landscaping
- ▣ Special requirements for low income group housing
- ▣ Sizes of structural elements

□ BUILDING FRONTAGE:

- it is margin to be left beyond extreme edge of road to front of building line (incl excavations for fdn and sunshades/ balcony/ projections of super str)

- i.e. it is the width of clearance of land to be left 'within the private plot' to facilitate
 - Widening of roads in future
 - More site dist at corners
 - Minimizing sound pollution
 - To create a buffer space between public (road) and private (plot) properties

□ Building frontage: (cont.)

□ This clearance depends on

- Status of the area, i.e. within municipal/ panchayat/ sub-urban areas
- Nature of road adjoining the building
- Nature of building

- Clearance margin should be more within municipal limits where more traffic is expected
- Max clearance is required on either side of national highways and least on either side of village roads
- Resi bldg require min clearance, public bldg require more, cinema halls release a lot of rush at a time need still more clearance
- 'SETBACK line' / 'Front bldg line': it is the line up-to which we can extend our construction

□ OPEN SPACES:

- To cater for lighting and ventilation requirements every human habitation room shall abut on an exterior / interior open space or open verandah

□ Residential buildings: (up-to 10m height)

- Exterior open space
 - Front open space

*For a bldg up-to a max height of 7m

Width of street fronting the plot (m)	Front open space minimum (m)
Upto 7.5*	1.5*
7.5 to 18	3.0
18 to 30	4.5
Above 30	6.0

■ Rear open space:

- Every resi bldg shall have rear open space
- Avg width = 3 m
- At no place less than 1.8 m
- Can be reduced to 1.5 m for plot depth <9m, building ht <7m

■ Side open space:

- Detached bldg: min 3m either side
If ht<7m, frontage <12m, one side can be 1.5m
- Semi-detached: one side open space 3m
If ht<7m, frontage <9m, side open space can be 1.5m
- Row-type: no side open spaces

■ Interior open space:

- Inner courtyard: if whole of one side of every room (except bath, w/c, store) is not abutting on either front/ rear or side open spaces, it shall abut on an inner courtyard whose min width shall be 3.0 m.

- Ventilation shaft: if w/c, bath are not opening on to front/ rear or side open spaces, these shall be open to ventilation shaft, the size of which shall not be less than 1.2 sq.m area, 0.9m width min.

- Outer courtyard: min width shall be 2.4m
- Joint open air space: all interior/exterior open spaces shall be entirely within owner's premises. If it is jointly owned by more than one person, its width shall be as per exterior open space

■ Exemption to open space:

■ Projections:

- Cornice/ weather shed not wider than 0.75m
- Balconies not wider than 1.2m

□ MIN STD DIMENSIONS
of BLDG ELEMENTS:

- ▣ Area limitations
- ▣ Ht of the building
- ▣ Plinth ht
- ▣ Requirement of diff types of room
- ▣ Parapet wall
- ▣ Boundary wall

- ▣ Area limitation: it is achieved by satisfying '*floor area ratio (FAR)*'
 - $FAR = \text{total covered area of all floors} / \text{plot area}$
 - For example, if plot size is 15m x 20m, FAR is 2.0 then max built-up area on such plot is $15 \times 20 \times 2 = 600 \text{ sq.m}$

- ▣ Height of building: Where building ht is not covered by FAR, max ht should be limited to the width of street as follows,
 - $\leq (2 \times \text{road width} + \text{front open space})$
 - if 2 or more streets, wider street shall be considered
 - In vicinity of aerodromes, max ht is fixed in consultation with aviation authorities

- Appurtenances like following are not included in height of building
 - Roof tank (supp ht $< 1\text{m}$)
 - Ventilation, Air-conditioning, Lift rooms
 - Stair cover (MUMTY) $< 3\text{m ht}$
 - Chimneys, Parapet walls ($\leq 1.2\text{m}$)

- Requirement of different types of room:

- As shown in tables shown in following slides

- Plinth height:

- Min 450 mm

- Parapet wall:

- 1.05 – 1.2 m height

- Boundary wall:

- Max ht = 1.5m
- Up-to 2.4m (top 0.9m open type), subject to permission from authority
- Corner plot: restricted to 0.75m for a length of 10m (front & side of intersection), balance height may be made up of open type construction (railing) subject to approval from authorities

Room type	Min area (sq.m)	Min size of side (m)	Height (m)	Other requirements
Habitable room (bed/living/drawing /dining/study room)			2.75 (surface of floor to lowest point of ceiling)	Min 2.4 m headroom, in case of AC duct/false ceiling
where there is only one room	9.5	2.4		
if more than one room	9.5 for one & 7.5 for other	2.4 & 2.1 resp.		

Room type	Min area (sq.m)	Min size of side (m)	Height (m)	Other requirements
Kitchen	4.5	1.8	2.75	Floor should be impermeable. Unless separate pantry provided, means for washing kitchen utensils which shall lead directly or through a sink to grated and trapped connection to waste pipe
Kitchen + store	5.0	1.8	-do-	
Kitchen + store + dining area	7.5	2.1	-do-	

Room type	Min area (sq.m)	Min size of side (m)	Height (m)	Other requirements
Bath room	1.8		2.0	<p>At least one wall open to external air.</p> <p>Should not be directly over or under any room other than another latrine/washing place/bath unless the floor is water tight.</p> <p>Platform shall be non-absorbent materials.</p> <p>Floor should be impermeable with slope towards drain.</p>
Water-closets (w/c)	1.1		-do-	
Bath + w/c	2.8	1.2	-do-	

Room type	Min area (sq.m)	Min size of side (m)	Height (m)	Other requirements
Store room	3	-	2.2	-
Garage	12.5	-	2.4	-
Stair case		Min width of stair 1.0m	Min clear head room shall be 2.2m	For residential building, Min Tread (w/o nosing) = 250mm Max Rise = 190mm

□ LIGHT & VENTILATION:

▣ Habitable room

- Min one opening to external air of open space
- Door openings not counted
- Fixed part of window shall not be counted

- Min aggregate area of such openings, excluding doors inclusive frame shall not be less than
 - $1/10^{\text{th}}$ of floor area (dry-hot climate)
 - $1/6^{\text{th}}$ of floor area (wet-hot climate)
 - $1/12^{\text{th}}$ of floor area (cold climate)
- Above areas of openings can be increased by 25% in case of kitchen

□ SAFETY from FIRE & EXPLOSIONS:

- Use of non-inflammable materials of construction
- Providing open space on all sides of building
- Standard sizes for load bearing members
- Foolproof construction with adequate ventilation for quick escape of inflammable gases

□ MEANS of ACCESS:

- Every building should abut on a public/private means of access like streets/roads
- It should be free from any obstruction
- It should be satisfactorily drained and lighted
- Min width = 6m
- Min length = 75m

□ DRAINAGE & SANITATION:

- ▣ Align the road to gentle slope and provide reasonable camber
- ▣ Provide more plinth height so that storm water from road should never rush into house

□ SAFETY of works against HAZARDS & ACCIDENTS:

- ▣ Excavation: sufficient workforce, broad day-light, good working condition, oxygen cylinders
- ▣ Walkway shall be free from sharp and hard projecting materials
- ▣ Floor should be non-slippery
- ▣ Material of construction should not fall in public place
- ▣ Skilled personnel shall be employed

Orientation of Building

Definition & Introduction

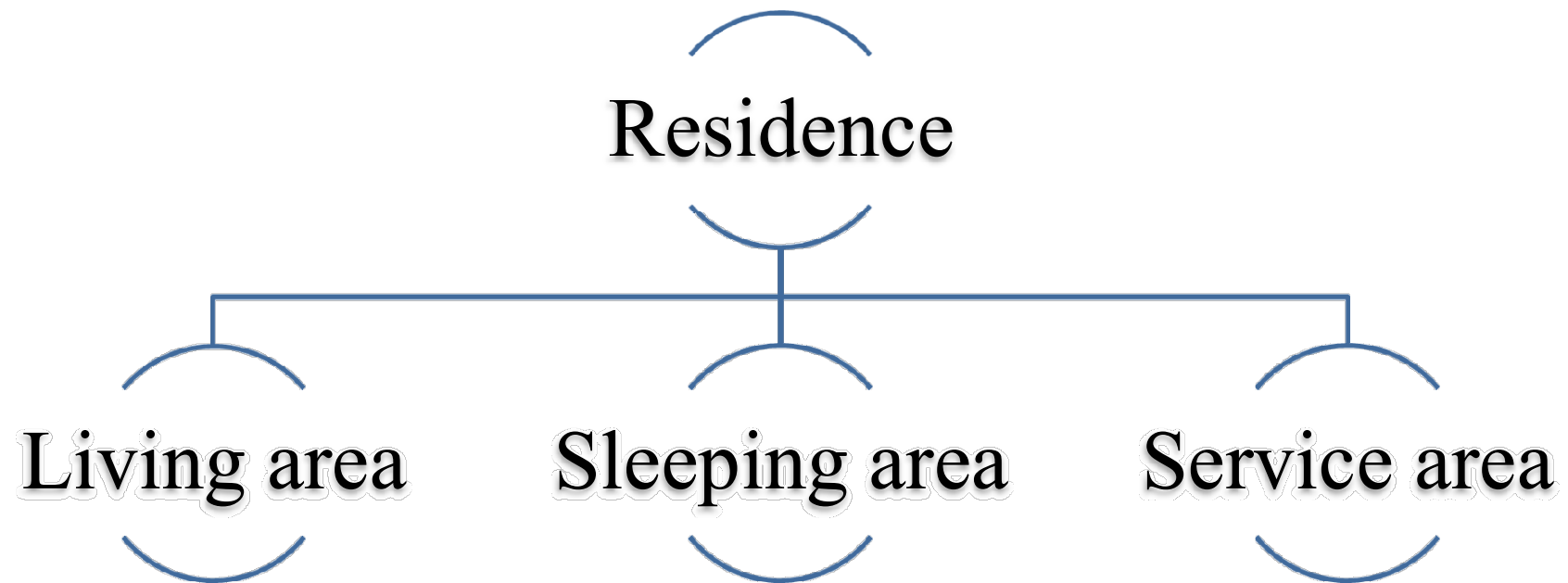
- Orientation is defined as the setting of plan of the building on its site location with reference to the direction
- Proper orientation of the building gives benefit of natural resource like wind, sun, rain etc...

Requirement of Building

- Building Should provide the maximum living area
- Building should be durable , strong, and resist the impact of environment and earthquake.
- Building should be stable and take a load on it
- Building is free from dampness
- Building is sufficiently ventilated
- Grouping is properly done
- Protected against fire

Functional Requirement of Residential building

Three Major area



- Living area :-

Drawing room, Dining room, Office room,
Guest room, Entrance foyer

- Sleeping area :-

Bedroom

- Service area :-

Kitchen, Storeroom, Bathroom, W.C, Garage

F.S.I (Floor Space Index)

- FSI is the ratio of total built up area for the building to total plot area.
- Also called F.A.R (Floor Area Ratio)
- $$\text{F.S.I} = \frac{\text{Built Up area}}{\text{Plot Area}}$$
- Different FAR is permitted at different place by the competent authority.

Town Planning

Principal of Town Planning

Health

Zoning

Convenience

Beauty

Health

- To create and promote healthy conditions and environments for all the peoples rich and poor, to live, to work, to play or relax.

Zoning

- Use of the land for the right purpose.
 1. Residential
 2. Industrial
 3. Institutional
 4. Recreational

Convenience

- The object of convenience is meant in the form of various need of the community such as social, economic, cultural and recreational amenities etc...

Beauty

- To create the beautiful of the town by developing natural conditions like natural greenery, improve buildings, temples, churches, historical building.

Necessity of town planning

- In absence of town planning, town faces following kind of problems
 - ▣ Defective road system, narrow streets/ roads
 - ▣ Development of slums
 - ▣ Haphazard location of industries
 - ▣ Heavy traffic during working hrs of day
 - ▣ Inadequate open spaces for parks and playgrounds, i.e. unhealthy living conditions
 - ▣ Lack of essential amenities like power, water supply, drainage
 - ▣ Noisy atmosphere
 - ▣ Uncontrolled development of town

Origin of the town

Topographical

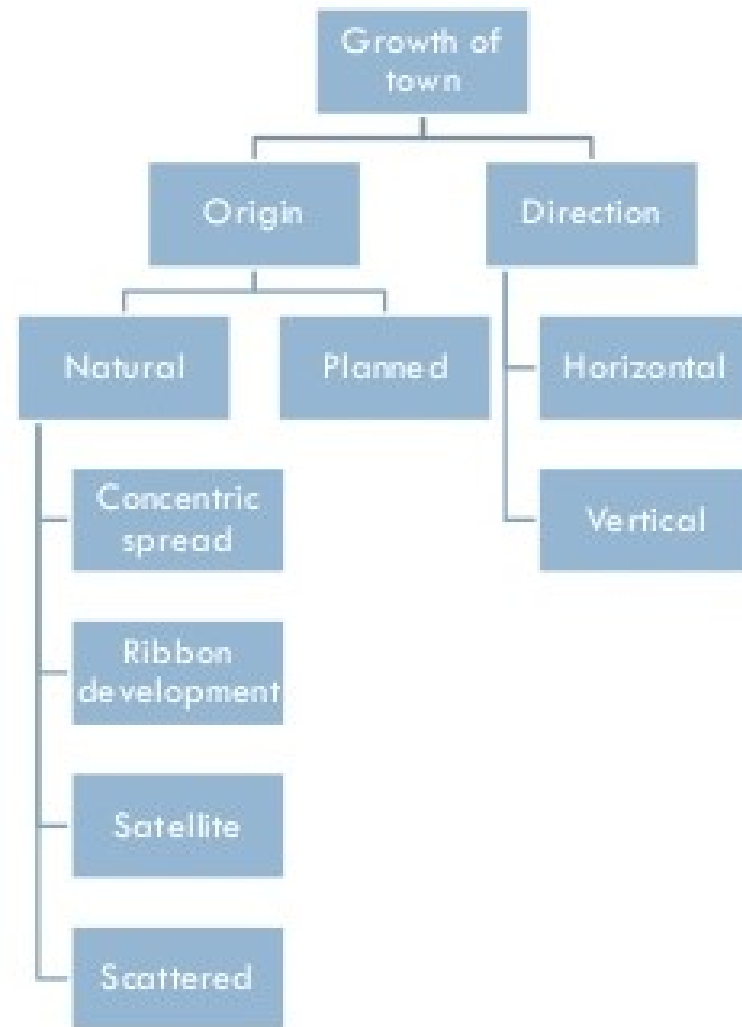
- Conditions favorable for industrial units
- Hilly areas - object of defense
- Plain area - business activities
- River banks
- Sea / ocean fronts

Functional

- Education
- Health resorts
- political
- religious

Growth of the town

- Why people like to stay close together in urban areas?
 - To facilitate defense against attack from outsiders
 - Man is social animal, gets satisfaction of living life in company of his fellows
 - Can develop many contacts, also can retain privacy
 - Urban area provide facilities like water supply, market etc



- Concentric spread:
 - ▣ Natural tendency of people to be as near as possible to town, hence town develops in concentric rings
 - ▣ Many complicated problems such as
 - Traffic congestion
 - Narrow streets
 - Concentration of population



CBD : Central business district

LIG: Low income group

MIG: Middle income group

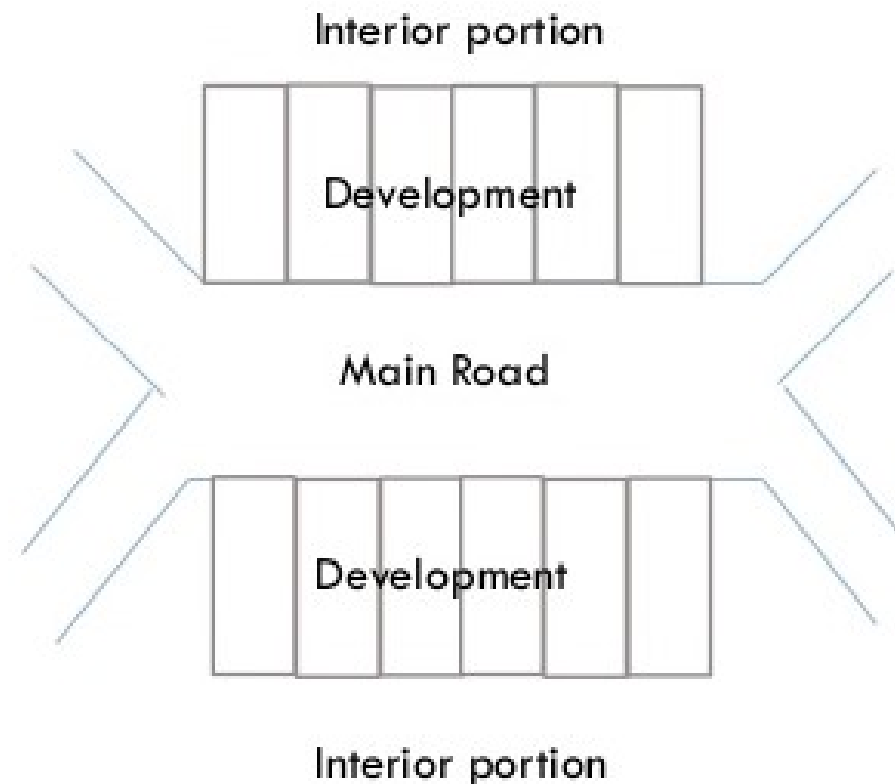
HIG: High income group

-Town grows radially

-Similar or functionally related activities will be at same distance from center of town

□ Ribbon development:

- Everyone like to build as near as possible to main road
- Buildings develop along side of main road
- Long fingers or ribbons of houses/shops develop



▣ Disadvantages:

- Increase in cost of various utility services like water supply, power, telephone etc
- Loose and scatter community – lack of social life
- Costly and difficult future improvement
- Houses face heavy traffic, noise, dust
- Interior portion left undeveloped, wastage of land
- Traffic capacity and efficiency of main road reduces

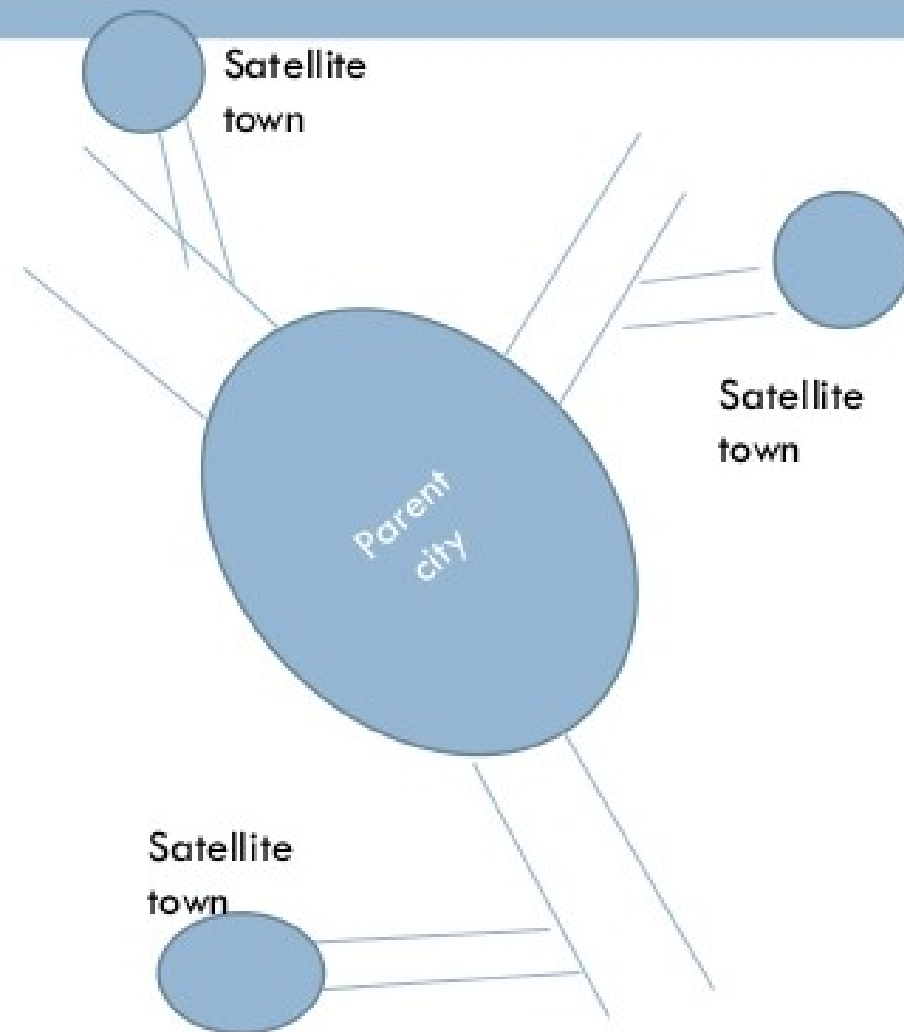
- More pedestrians on main road causes traffic accidents/ traffic delays
- Harms naturalness of country, spoils countryside, aesthetically faulty

▣ Measures to be taken:

- Land use zoning
- Regulation and control of traffic
- Removal of encroachments from road side
- Planning road side amenities
- Expressway with complete controlled access

□ Satellite growth:

- Term *Satellite* is used to indicate a body under the influence of a more powerful body but possessing its own identity



□ Features of satellite town:

- Own local government
- It is town itself, but it depends to a certain extent upon parent city
- Well connected by local trains, buses etc
- Free to decide its economic, social and cultural activities
- Situated beyond green belt of parent city
- Its neither a village nor a suburb

□ Mainly residential area with only local shops, schools for children etc

□ It need not have zoning regulations

□ It can be even considered as part of market for goods and services being produced in parent city

□ Disadvantage:

- necessity of the journey to work

❑ Scattered growth:

- ❑ Very irregular
- ❑ Traffic congestion
- ❑ Encroachment of industries on resi area
- ❑ Slums
- ❑ Lack of parks and playgrounds
- ❑ Complex problems become too difficult to be solved in future

❑ PLANNED GROWTH:

- ❑ Growth is controlled by suitable rules & regulations
- ❑ Rational distribution of various blocks such as resi/comm/ industrial
- ❑ Provision of various amenities like water supply, drainage, parks etc is made to meet future requirements
- ❑ Orderly growth avoids clashing of many activities of normal town

□ HORIZONTAL GROWTH:

- Town develops horizontally in all directions
- It is possible where land is available in plenty at nominal cost

□ Advantages:

- Cost saving: buildings are generally 2/3 storey
- High tech personnel not required
- Max possible use of natural light

- Restricted density of population
- Surrounding marginal space can be used to develop garden

□ Disadvantage:

- Requires more land, so can be uneconomical where land values are high
- Foundation cost per unit area will be more
- Absence of group living

□ VERTICAL GROWTH:

- Multi-storied buildings
- Where land is less and costly

□ Advantages:

- Use of common amenities, sense of group living develops
- Foundation cost per unit area is reasonable
- Higher level floor enjoys natural sceneries such as river view, sea view etc.
- Considerable saving in land
- Economy in construction cost, repetition of typical floors
- Max use of modern construction techniques such as,

- Fire proofing, Sound proofing, Heat insulation. Air-conditioning, High speed lifts

□ Disadvantages:

- Natural calamities, difficult to escape
- More population density
- Design of flats stereo-typed
- Have to tolerate evils of group living
- Failure of lift or water raising pump will cause great inconvenience
- Wastage of floor space, as lifts, supporting column etc have to be provided

- ❑ Availability of natural advantages
- ❑ Availability of electric power
- ❑ Available means of communication
- ❑ Climatic conditions
- ❑ Contours of area
- ❑ Development of surrounding area
- ❑ Drainage of area

- ❑ Available facility of sewage disposal
- ❑ Soil fertility
- ❑ Frequency of floods
- ❑ Growths of trees
- ❑ Nature of soil
- ❑ Position of streams and lakes
- ❑ Water resources, etc.

Land Use

- Land use planning is a planning of a region according to use of land.
- Land use plan shows residential zones, industrial zones, public zones, green spaces, water bodies, road, railway network.
- Land use plan understand the present situation.

Consideration while preparing a land use plan

1. Area allocation
2. Population
3. Land market
4. Location
5. Natural resources
6. Topography

1. Area allocation

- Area allocation for residential, commercial, and industrial areas are decided depending on city and its activity

2. Population

- Population are important factors while deciding residential, commercial, and industrial area

3. Land Market

- Land plan can be measured to control land prices and also a reason to increase land prices.

4. Location

- Location for industrial, commercial, and residential area are considered while making land use plan.

5. Natural Resources

- River, lakes, hills, Sea are considered in Land use

6. Topography

- Topography of Region (Hilly or Valley) are considered in land use.

Zoning

- Zoning is defined as the regulation by law of the use of land for the purpose of securing convenience, health, safety, and general welfare of the community.

Principles of Zoning

1. Concentric growth
2. Boundary
3. Existing town
4. Flexibility
5. New town

1. Concentric growth

- Definition : When the growth of building spread from a centre of town, then it is termed as concentric growth.
- If population increase concentric circle increase and create growth of town.
- The central area of town is followed by
 1. Developed area
 2. Green are
 3. Undeveloped area

2. Boundary

- Boundary between two zones usually be road, railway line, river, or a green belt.

3. Existing town

- The planning of zoning of new towns should be done in the convenience of the existing towns without disturbing the ecosystem.

4. Flexibility

- Zoning should be done by considering the new town in future expansion.

5. New town

- To construct a new town areas is planned
 1. Residential
 2. Industries
 3. Business

Objects of town

- Future growth and development of the town due to zoning.
- Zoning affords a coordination between transport, water supply, drainage, electricity.
- Making town planning scheme effective and successful.

Advantages of Zoning

- Allocation of land for specific use
- Control of use, height, and construction of building.
- Use of Land divided into two part.
 1. Profitable (Offices, industries, Residence society)
 2. Non profitable (Roads, Park, Play ground, Gov. Offices)

Introduction to different Zones of Land in Town Planning

1. Residential Zone (40 – 50 %)
2. Commercial Zone (2 – 5 %)
3. Industrial Zone (2 – 25 %)
4. Public and Semi Public Zone (15 – 20 %)
5. Recreational Zone (Remaining %)
6. Transportation

Colour Code fro zoning

Sr. No	Category	Description	Colour Code
1	Residential Zone	Plot used for Bungalow, Houses, Hostel, Dharamshala	Yellow
2	Commercial	Office, Bank, Gov. Offices, Storage Houses	Dark Blue
3	Industrial	Light and Heavy Industries	Violet/ Pink
4	Open Space	Sports Ground, Play ground, Park	Light Green
5	Agricultural zone	Agriculture and Nurseries	Dark Green
6	Transportation	Communication of All route	Grey
7	Utility and Services	Water supply & Drainage treatment plant	Brown
8	Public and Semi Public Zone	Institutes of Religious centre	Red Clubs
9	Water Bodies	Lake, River	Blue

Low Cost houses

- Effective budgeting houses to reduce the cost of construction through the use of locally available material.
- Cost of construction divided in to two part
 1. Building material cost (65 to 70 %)
 2. Labour Cost (65 to 70 %)

Areas to reduce the housing Cost

- Use of thinner wall of solid concrete block
- Use locally available material
- Use eco-friendly material like in place of wooden frame of door and window use RCC or stone Frame.
- Use alternate material
- Prepare simple design of construction

Cost Reduction using adhoc methods in various building component

1. Foundation
2. Lintel & Chajjas
3. Filler Slabs
4. Roofing
5. Ferro cement channel
6. Roof or Floor
7. Plinth
8. Rat-trap bond wall
9. Concrete block walling
10. Walling
11. Doors and windows
12. Soil cement block technology
13. Finishing Work