

# **CHAPTER 1 : INTRODUCTION**

## Chapter 1.0 Introduction

### 1.1 Aim

To design a commercial hub as a mixed use development utilizing the site proximity to sanjay lake.

### 1.2 Scope of the Thesis

- Analysis and incorporating bioclimatic design principles for mixed use development.
- Analysing and using new design techniques.

### 1.3 Objectives

- To study how architecture contribute to the mixed use development
- To design spaces with enhances the physical and visual interaction and reduce isolation.
- To design spaces which bring closer to nature and harmony.
- To bring transparency, openness and fluidity of space.
- Priority to sustainable materials and functional requirements in design, while integrating Services to it.

### 1.4 Need for the Study

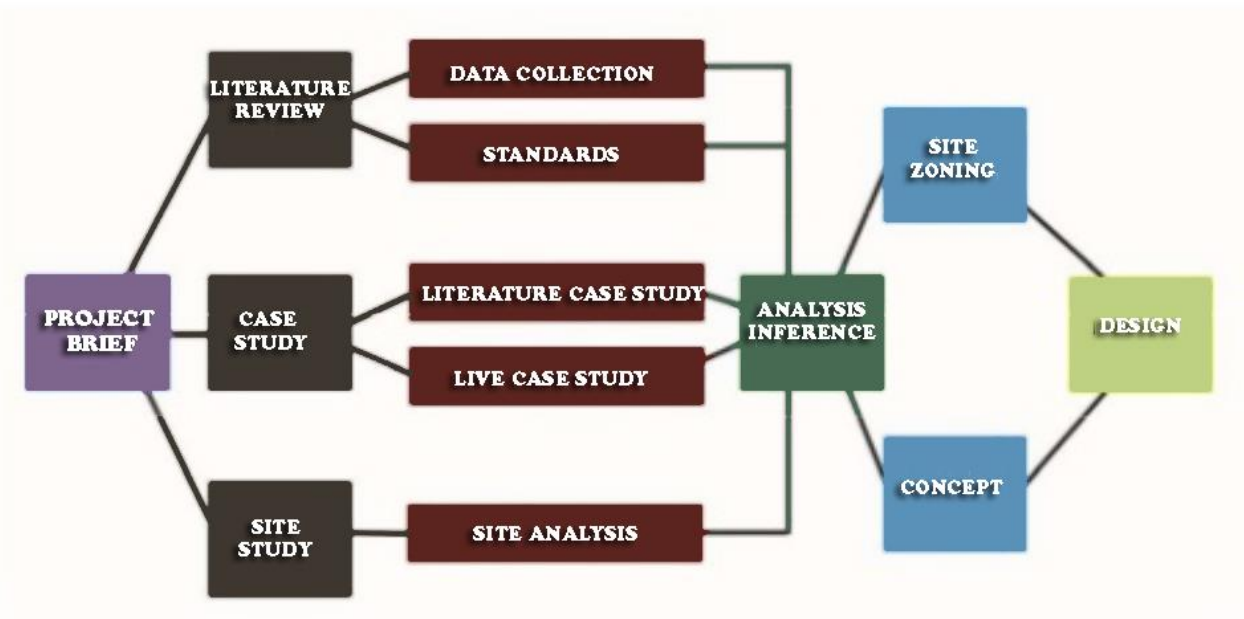
- It is a project that aims at satisfying the need of modern age business organizations. Entire building of this new age business centre is highly equipped with all the latest features and facilities so that people can perform their work easily and swiftly.
- It boasts of all the latest features and facilities that require for conducting smooth and hassle free business activity. High speed internet service is offered here using which one can send or receive any important data in a fraction of second. Also, hi-tech communication features including video conferencing, audio-visual aid, help in establishing a communication network with clientele a business associates based in any part of the world.
- These offer a wide range of commercial spaces including luxurious business cabins, food courts. Retail shops and lockable & virtual office spaces.

## 1.5 Approach Adopted For the Study

Based on the study objectives listed above, the process adopted for undertaking the study is set out below.

- |        |   |
|--------|---|
| Step 1 | Identification of all mixed use in the state, based on secondary data and<br>Analysis of district maps  |
| Step 2 | Prioritization of 10 locations for further analysis<br>Based on the following criteria <ul style="list-style-type: none"> <li>• growth potential of the town</li> <li>• good access and connectivity</li> <li>• proximity to tourism sites</li> </ul> |
| Step 3 | Selection of an illustrative town for undertaking further feasibility studies   |
| Step 4 | Site visits   |
| Step 5 | Discussion with officials from various agencies such as deputy commissioners, ngo's, urban development authority, town planning department, etc.  |
| Step 6 | Preliminary financial viability analysis review of relevant acts, laws & legislative pertaining to mixed use building.  |
| Step 7 | Option for implementation on framework broad contours of the project structure  |
| Step 8 | Key issues and way forward  |

## 1.6 Methodology



- Project proposal
- Aim, objective, scope
- Site study
- Site analysis
- Literature study -KOHINOOR SQUARE (DADAR, MUMBAI 2009-15)
- Case studies - WAVE ONE, NOIDA
  - IHC, DELHI
  - CYBER HUB, GURGAON

## 1.7 Introduction

Building inclusive, healthy, functional, and productive cities is perhaps the greatest challenge facing humanity today, and there are no easy solutions. A key part of the puzzle, though, lies right at the heart of the world's urban areas: its public spaces.

Public spaces range from parks, squares, plazas, green spaces and streets, the success of which is based on the activity and quality of human interaction they make possible. Vehicles no longer rule the street, design is now oriented towards the pedestrian.

The Delhi Development Authority (DDA) has taken up the guidelines of Transit Oriented Development (TOD) to be followed for all future development in the vicinity of the upcoming metro corridors. This allows for a great opportunity to create an urban realm that engages actively with the people that it encompasses. The site being a part of one such stretch of land which is up for TOD, requires that the project being constructed be public -one that augments the sense of community.

For the project to be successful it is critical for these public spaces to capitalize on the building design and its functions. The built environment should allow and be able to support a robust environment around it. It should accommodate multiple uses (mixed-use development and multiple users).

Public buildings are at their best when they not only are active community places in their own right, but when they form part of a larger civic district. One the key issues that architecture today has to tackle is the creation of architecture that belongs.

The rate at which cities are growing causes us to consider the kind of architecture being produced. With most Indian cities, Delhi included, aiming at the glorified image of the globalized city with placeless structures that seem to represent a faraway future, the current development is alienating and monochromatic. Buildings in the suburb represent clearly this void in the urban range. This being said, it is extremely important for structures to stay relevant in the contemporary environment, with the required standards of workability and comfort.

The project chosen represents an opportunity to explore an architecture that is both contemporary and responsive to the context. Together with the help of the TOD norms and involving in the creation of an elaborate public plaza it becomes possible to imagine the kind of positive public environment that can be realized in the current wave of development in Delhi and many other cities alike.

## **1.8 Information about the Site**

The proposed site for mixed use building is located along Sanjay lake, Patparganj Mayur vihar phase II of East Delhi.

D.D.A plans to develop the project as an integrated scheme on 10.26 ha D.D.A land in partnership with N.B.C.C.

East Delhi is the developing area of Delhi. Therefore land along Sanjay Lake is a tourist spot, in which 10.26 ha of land is allotted for mixed use, site is being proposed by D.D.A

The project also envisions a transformatory role for the area, and it is expected that the creation of a city level destination near a beautiful lake will enhance the local economy and help catalyse change/ up gradation of the area.

## **1.9 Some Reasons For, Why The Development Should Take Place.**

- The local market is depressed and these seem to be no takes or single use (commercial) development in the area.
- Even the local cinema had shut down due to social problems in the area. The local area which is currently neglected and ridden with crime.
- It is essential that some city level attractions are introduced in the area so that footfalls of visitors makes the site area, the lake and its surroundings better used, better watched and more active around clock
- To reduce car dependence and increase transit use.
- As there is no good infrastructure such as malls, markets so need of hour is providing these facilities for convenience of local public.

## 1.10 Research Question

How can architecture help create and sustain an active public realm supported by the built environment?

Good public spaces need to stay active. More often than not, despite the efforts of architecture, public spaces in the suburban context tend to be deserted or non-existent, thanks to the vehicle oriented development. With the pedestrian as the focus of development, the nature of space produced is drastically different. This idea of returning power to the pedestrian is in line with the current view of sustainable development.

The scheme of TOD works on similar principles to reduce vehicular movement and promote walking or cycling. With the help of these guidelines, and the government's interest in such development, elaborate public realms are now possible. The success of the upcoming projects relies heavily on how public and vibrant they remain during the day as well as night. Thus, the research will directly inform the kind of urban realms of the future.

These places need to capitalize on the function and nature of the surrounding built environment to be able to work well in the context. They in turn enrich the quality of built by allowing for spaces of leisure and recreation. This thesis thus investigates the essence of public plazas activated by the architecture that surround them.

Through this thesis, I would like to engage in one such project where the creation and sustenance of an active public space can be explored. This has been made possible by the government's proposal for a mixed use development in Delhi modelled on the lines of India Habitat Centre.

## Need Identification

Discourse on public spaces and TOD is abound in architectural circles. Developed countries and cities are now implementing pedestrian friendly elements into their urban environments. With the global urbanizing at such a fast step, the application of these principles is very viable in the situation of developing cities. Indian government is also pro this type of building

practices. However further research is required in the field to apply it in the Indian context the thesis presents the opportunity to do the same.

Moreover, with the current frenzy of building leading to an architecture that has little to do with the context, there is merit in exploring a kind of way forward that is conscious of the place as well as time. It act as an intervention in the present scenario and help create more humanizing architecture.



**CHAPTER 2:**  
**LITERATURE STUDY**

## Chapter 2.0 Literature Study

### 2.1 What is the project?

The mixed-use development offers a sustainable way of living in the city, with a unique mix of restaurants, shops, offices and residence spaced through the building. It is building wrapped entirely from top to bottom in public spaces and terrace garden.

Developing mixed-use building, and incorporating transit oriented development policy.

### 2.2 Area of research

#### 2.2.1 Mixed Use Building

Mixed-use is the integration of multiple uses within one building or group of buildings -retail, office, and residential, in any combination. The building prototype has long historical roots and serves as a fitting model for adaptation in the inner city. Mixed-use addresses two fundamental needs of the community - housing and commercial services. The diversity of commercial and residential uses and architectural forms brings to the streetscape added life and vibrancy. The natural surveillance of people coming and going at different hours (office, retail, and housing) maximizes utility and provides security for the area.

- Seek to create pedestrian friendly environments with a variety of uses that enable people to live, work, shops and play in one place.
- Include several different uses that work together and share infrastructure, utilities, and public amenities.
- Typically higher in density than a single use development.
- Types of mixed use building
  - A) Vertical mixed-use buildings;
  - B) Horizontal mixed-use blocks;
  - C) Mixed-use walkable neighbourhoods.

**Vertical mixed-use buildings:** combines different uses in the same building. Lower floors should have more public uses with more private uses on the upper floors. For example, the ground floor could have retail, second floor and up having professional offices and uppermost floors being some form of residential, such as flats or a hotel. In more areas, an entire block or neighbourhood may be composed of vertical mixed-use buildings.

**Horizontal mixed-use blocks:** Combines single-use building on distinct parcels in a range of land uses within one block. In more urban areas, this approach avoids the financing and coding complexities of vertical layered uses while achieving the goal of place making that is made possible by bringing together + complementary uses in one place. In less urban areas, horizontal mixed-use offers the advantage of sharing utilities and amenities while providing an easier to build and entitle mix of uses within a walkable block circumscribed by thoroughfare.

**Mixed-use walkable neighbourhoods:** With the infinite number of various possibilities, these places combine vertical and horizontal use mixing in an area ideally within a 5 to 10 minute walking distance (a pedestrian shed) or quarter mile radius of a neighbourhood centre.

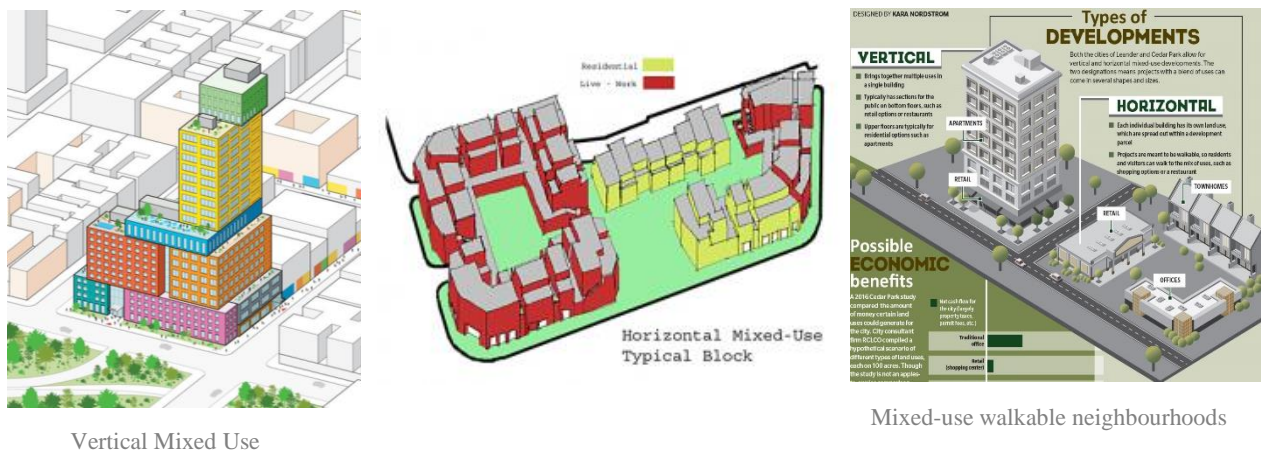


Fig 2.1. Types of mixed use

**Benefits of mixed-use development includes:**

- Greater housing variety and densities, more affordable housing (smaller units), life-cycle housing (starter homes to larger homes to senior housing)
- Reduced distances between housing, workplaces, retail businesses, and other amenities and destinations
- Better access to fresh, healthy foods (as food retail and farmers markets can be accessed on foot/bike or by transit)
- More compact development, land-use synergy (e.g. residents provide customers for retail which provide amenities for residents)
- Stronger neighbourhood character, sense of place
- Walkable, bike-able neighbourhoods, increased accessibility via transit, both resulting in reduced transportation costs.

## 2.3 More about Mixed Use

### Why is Mixed Use in vogue again?

- Market Opportunity
- Public Policy
- Responsible Investing
- Developers Love A Challenge

### What makes GREAT Mixed Use?

- Active Public Realm
- Integrated Uses
- Seamless Operations
- Flexible, Adaptable Design

### What are the benefits of Mixed Use?

- Adaptable + Resilience
- Reduced Parking Requirements
- Increased Yield
- Captured Value

### What are the impediments to Mixed Use?

- Constructability
- Operating Structures
- Core Competencies
- Capital Market

“Mixed use developments are often seen as too risky by many developers and lending institutions because economic success requires that many different uses all remain in business”

(Wikipedia)

**Constraints of mixed use developments:**

- Extraordinary planning, management and capital resources required as land in neighbourhoods which are rail stops or close to heavily travelled commercial corridors in much more expensive than underdeveloped tracts in suburban locations. Each of the desirable amenities creating the walkable environment needs money to build.
- From the point of urban environment and aesthetics, the design requires much more skilful urban design gestures.
- There can be conflicts between different uses due to noise, traffic, circulation and sharing of resources.
- Issue of separate access to each use is very difficult as walkability is major aspect of mixed use developments.
- Implementation difficulties as housing and commercial use require different design gestures, different financing tools and different management skills. In some cases, these demands have conflict. The vacant commercial space can adversely impact a housing project that would have otherwise been successful.

**2.4 Transit Oriented Development (TOD)**

As the built part of the site will come under transit oriented development. So this is the manual frame out of Delhi Development Authority (D.D.A).

**What is Transit Oriented Development?**

Transit Oriented Development is essentially any development, macro or micro that is focused around a transit node, and facilitates complete ease of access to the transit facility thereby inducing people to prefer to walk and use public transportation over personal modes of transport. It results in the creation of compact, walkable, liveable community with easy access to amenities and is centred around high quality mass transit station (MPD 2021).

TOD focuses on creation of high density mixed land use development in the influence zone of transit stations, i.e. within the walking distance of (500-800 m) transit station or along the corridor in case the station spacing is about 1km as shown in Figure .

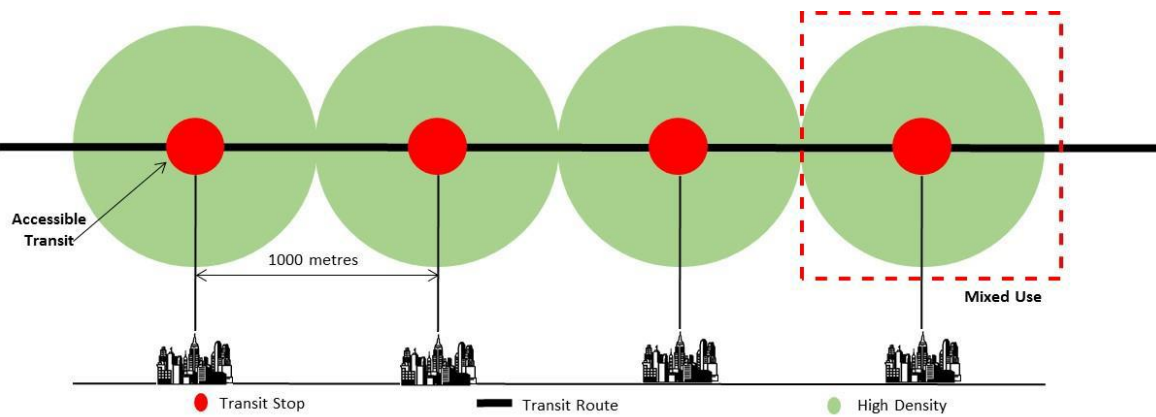


Fig 2.2. Transit oriented development

TOD aims on:

- Reduce/ discourage private vehicle dependency and induce public transport use – through design, policy measures & enforcement.
- Provide easy public transport access to the maximum number of people within walking distance – through densification and enhanced connectivity.

Principles:

The impact of TOD through various land uses mixes, street network, characteristics, urban design parameters could be seen on the ground through the following principles:

**PRINCIPLE 1:** Pedestrian and Non-Motorised Transport (NMT) friendly environment.

- The policy design for pedestrian safety, comfort and convenience.
- Create street-level activity and vibrant urban spaces.
- Provide amenities and infrastructure for pedestrians, cyclists, NMT and public transport users.
- All streets and public spaces shall be universally accessible.

**PRINCIPLE 2:** Connectivity and network density

- Disperse high traffic volumes of traffic over a network of streets rather than concentrating traffic on few major streets and junctions.
- Provide the shortest direct route to pedestrians and non-motorized modes to station as well as between individual buildings/ complexes.

- Integration of infrastructure development and travel demand management (TDM) strategies e.g. bus lanes, station plaza, intersections improvements etc.

**PRINCIPLE 3: Multi-modal Interchange**

- Minimize travel time and cost for majority of commuters. Provide multiple mode options for all sections of society with safety and affordability. Ensure reliable, frequent commuters.
- Prioritize pedestrians, public transport, and Intermediate Public Transport (IPT) and NMT mode over private modes in design and management of urban spaces.

**PRINCIPLE 4: Inducing Modal Shift**

- As far as possible, locate public transport stations, homes, jobs and civic facilities within easy access of each other to incentivize walking and cycling/NMT use especially for short distance.
- Dis-incentivize private motor vehicle use. Limit supply and appropriately price private parking spaces to discourage private vehicle use in TOD Zones.

**PRINCIPLE 5: Place making and Ensuring Safety**

- Create a safe, vibrant, comfortable urban “place”, by providing round-the-clock active street and incidental spaces to relax. Introduce mixed land use and other informal street activities like vendors, etc. to promote round-the-clock activity and also promote informal surveillance.
- Minimize boundary walls and setbacks of compounds, and build to the edge of the street ROW, Street walls with transparency, built-to-edge buildings, minimum setbacks and non-opaque fences help provide natural surveillance of public spaces.

**PRINCIPLE 6: High Density, Mixed Use, Mixed Income Development Near Stations.**

- Maximize densities within TOD, in order to facilitate maximum number of people walking or cycling, or use NMT or feeder services easily to access public transit facility.

- In green field development, higher the density, lower the per kilometre infrastructure cost.
- Enable a balanced mix of jobs and higher housing affordability through design and technology options, and improved efficiency and equity in the resulting developments.

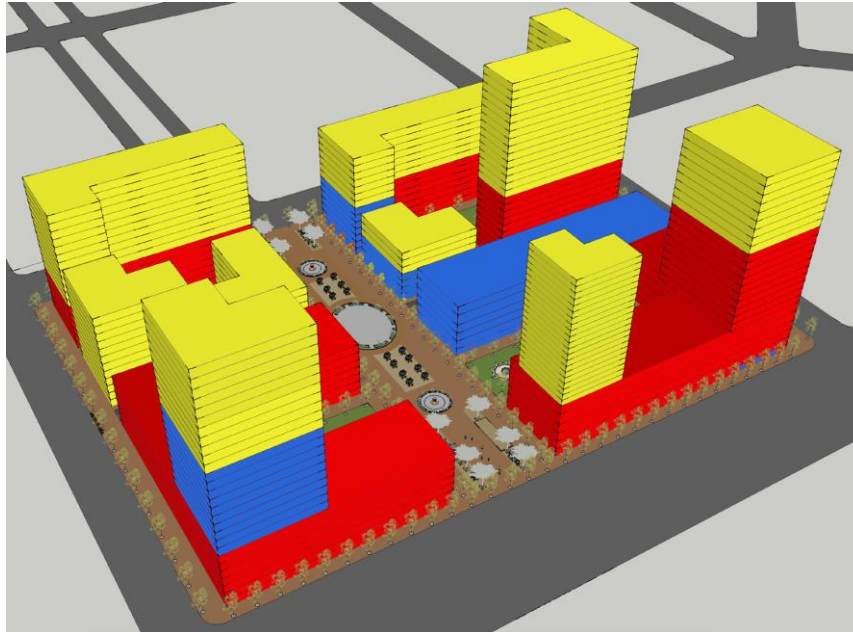


Fig 2.3. High Density, Mixed Use development



Fig 3 (source: UTTIPEC)

## 2.5 Advantages Of TOD

- **Mobility Options for all** - Change the paradigm of mobility by enabling a shift from use of private vehicles towards the use of public transport and alternative modes, as explained in 4.2. Help in achieving Clean-Air Quality targets for Delhi and the targeted 70-30 (public-private transport) modal share in favour of public transportation by 2021, as envisaged in the Transport Demand Forecast Study for 2021.
- **Better Quality of Life for All** - Provide a variety of high-density, mixed-use, mixed-income housing, employment and recreation options within walking/cycling distance of each other and of MRTS stations - in order to induce a lifestyle change towards healthier living and better quality of life. Integrate communities rather than segregating them and reduce social stigma and dissent.



- **Give Everyone a Home** - Increase the supply of housing stock and commercial space in the city which would bring down prices and make living and working in Delhi more affordable. (Current Need as per Table 18.1 is to provide approx. 3 lakh new dwelling units per year, with more than 50% of the new housing in the form of 1 and 2 room units with average plinth area of about 25 - 40 sq.m.)
- **Market Participates in Better City** - Open up development opportunity to the private sector to bring in investment into the city's growth and revenue, and also help cross-subsidize social amenities, affordable housing and public transport, using a variety of possible development models. Low-income groups can be provided space and shared amenities in integrated mixed-income communities, thereby reducing further proliferation of gentrified slums and unauthorized colonies.
- **Cheaper Public Transport** - Provide a significant source of non-fare box revenue for a public transport fund, which may help reduce ticket prices and increase provision of public transport facilities.
- **Reduce Environmental Degradation** - Set a clear vision for the growth and redevelopment of the city in a compact manner, by minimizing sprawl (low density spread out development). Help save environmentally sensitive lands and virgin lands through high-density compact development.

(TOD, polices, norms and guideline-2012)

## 2.6 The 5D's for TOD

### Density:

- Population density: population per development acre.
- Employment density: employment per development acre

### Design:

- Street design and connectivity.
- Site design

### Distance:

- Measures the short route form the home and workplace to the nearest transit.

**Diversity:**

- Vertical mixture
- Proximity to commercial-retail uses.

**Destination Accessibility:**

- The Chosen locations distance, or ease of access, to the most common destination. This can be both regional and local destination.

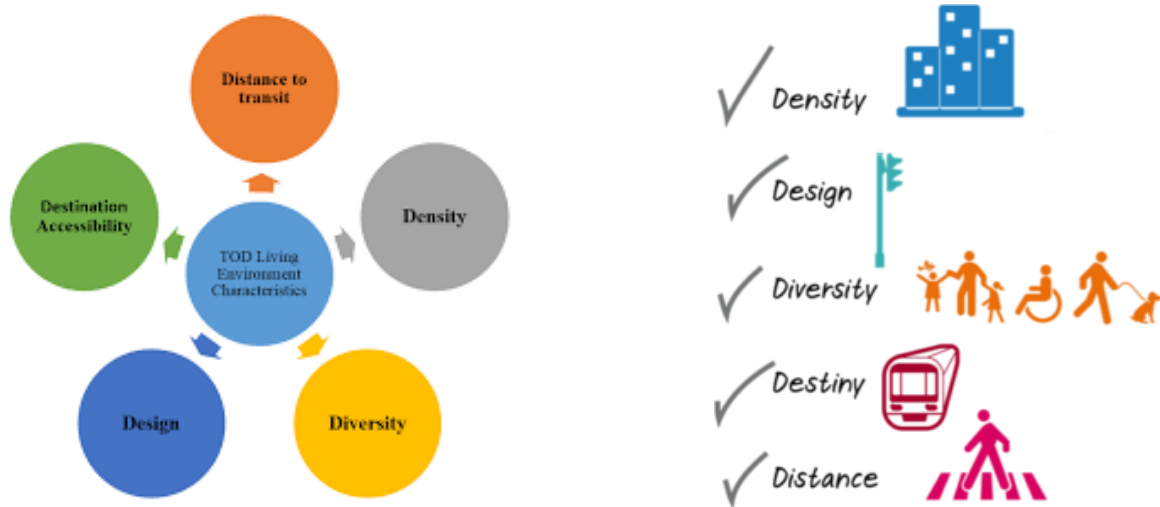


Fig 2.4. High Density, Mixed Use development

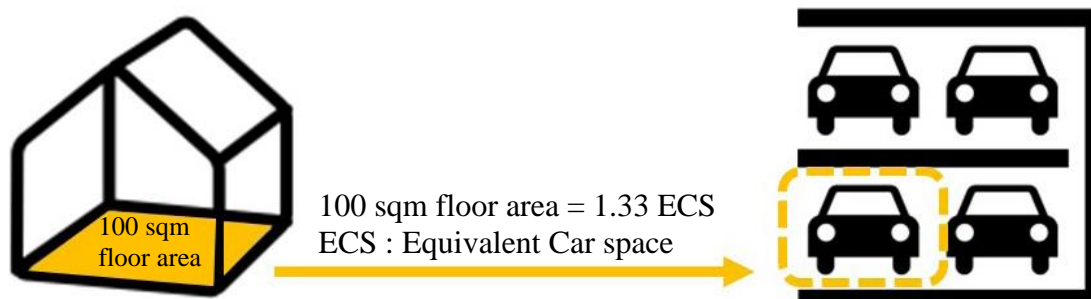
**2.7 TOD policy and development control norms**

- Pedestrian & cycle/cycle-rickshaw friendly environment
- Connectivity: create dense networks of streets and paths
- Multi-modal interchange: mass transportation modes well integrated to affordable and comfortable modal transfers.
- Modal shift measures: shift to sustainable modes by using design, technology and mixed-use.
- Place making and safety: urban places should be designed for enjoyment, relaxation and equity.
- High density, mixed-income development: compact neighbourhoods for shorter commutes.

(TOD, Policies, norms and guidelines, 2012)

## 2.8 Parking standard according to TOD

In TOD zones, the permissible ECS (Permissible Equivalent Car Spaces) per 100 sqm. of floor area is 1.33.



Equivalent Car Space (ECS) is the land required to park a car including the space occupied by the vehicle as well as the minimum space needed to move it into and out of the space.

- In the use premises, parking on the above standards shall be provided within the plot.
- In case, where the building (except hotel) with sanctioned plan is existing/ under construction and where building plans stand sanctioned as per MPD-2001, the parking is to be provided for additional FAR availed, shall be as per the parking standards prescribed in MPD- 2021.
- Parking is one of the utilities permitted in all use zones except in regional park / ridge, Recreational Open Space and parks as per the approved Zonal Plan/ layout plan.
- The standards given in Equivalent Car Space (ECS) shall include parking for all types of vehicles i.e. cars, scooters, cycles, light and heavy commercial vehicles, buses etc. Parking adequacy statement / study for large projects like Stadia, Shopping Malls, and Multiplexes will be desirable. Mode-wise parking spaces are to be marked on drawings to be submitted for approval.

Parking space for different modes of travel in relation to ECS

Distribution by mode per 1 ECS / 100 sq. m of built up area within TOD Zone

## **CHAPTER 3:**

### **BYE-LAWS**

## **Chapter 3.0 Bye-Laws**

### **Entrance Width and Height Clearance**

Section: As per section 4.6(c) of part iii & 7.4.1(d) of part iv of N.B.C.

Every mixed use building should have at least 2 means of access, one remote to the other, of minimum width 4.5 m with height clearance of 5 meter. This minimum width is essential to facilitate free movement of fire units.

### **Car Parking**

Section: As per section b/8 of appendix 'b' of part iii of N.B.C.

Car parking shall have to be done at the basement with provision for minimum 2 ramps one remote to other

### **The Refuge Area**

Section: As per section 12.3 of part iii of N.B.C.

The refuge area shall be provided on the periphery of the floor and open to air at least one side protected with suitable building

- A. For floor above 24m and up to 39m one refuge area on the floor immediately above 24m
- B. For floor above 39m one refuge area immediately above 39<sup>th</sup> floor and so on after 15m refuge area shall be provided

### **Set Back and Open Spaces**

Section: As per table 2 of section 8.2.3.1 of part iii of N.B.C.

Sufficient open space around residential building: as indicated alongside, is essential to facilitate free movement and operation of fire service vehicles.

Section: as per section 4.6 (b) of appendix b of part iii of N.B.C.

If the setback area is more than 12m, the provision for car parking can be done in the setback at the periphery of the courtyard leaving the 6 m motor able road.

## **LIFTS**

Section: As per section 18 of part iii & 6.18 & appendix a.15 of part IV of N.B.C.

- Minimum 1 lift capable of carrying minimum 8 persons weighting 545 kg shall be provided for every high rise building
- Landing doors of lifts shall open to ventilate lobby & shall have a fire resistance of 1 hour
- 1 lift shall be designed as a ‘fire lift’
- ‘Fireman switch’ shall be provided for each lift
- Lifts shall not be used as means of evacuation
- Collapsible gates shall not be provided for the lift
- If more than 1 lifts are installed the partition wall should be of minimum 2 hour fire resistance.

## **FIRE DETECTION SYSTEM**

Section: As per section 7.9 of part IV N.B.C. (8 of appendix a)

- Different types of detectors are provided as per the risk involved in the area
- Zones are made as per the risk or as per the floor
- Two way communication system to be provided which help to contact from ground floor to specific floor
- Mike on every floor has to be provided
- On mike instruction can be given as per situation
- Manual call point, automatic detector & public address system shall be interlinked
- Detectors shall be installed as per is 2189/1988

## **SERVICE DUCTS**

As per appendix d 1.9 part IV of N.B.C

All the service ducts, if provided, should have to be enclosed by walls of at least 2 hour fire resistance and should have to be sealed at every alternate floor with non-combustible materials having at least 2 hour fire resistance. The sealing of floor level of smoke to the upper floor through these ducts.

## **SPRINKLER SYSTEM**

Section: As per section 7.10.7 of part IV of N.B.C.

- Sprinkler system is must for basement parking & other risk areas where large quantities of combustible materials are stored
- Each sprinkler should cover 6.96 sq.m area.
- Normally a separate sprinkler should be provided for a separate car.
- Sprinklers may connect to main water tank & pump, but capacity of the tank & pump shall be increased in that proportionate
- The capacity of water tank shall be calculated on the basis of sprinklers.

## **STAIRCASES**

Section: As per section 12.18 of part iii, 8.5.1 (table 24), 8.6.2, 8.9.10, 8.13, 9.3.5(a), 10.4.1, 11.3.2 of part IV & appendix d1.3, d1.4 of part iv of N.B.C.

- Every high rise building have minimum 2 number of staircase
- Width of staircase varies from 1 meter to 2 meter.
- For residential building width of staircase should be 1 meter
- Out of 2 staircase, 1 can be used as a fire escape staircase
- Width of fire escape should be minimum 0.75 meter
- Number of staircase shall be given as per the travel distance
- Staircase shall not be extended to basement to prevent smoke, heat & gases. From the basement smoke, heat & gases can be travel to upper floors.

- Access to the basement from the ground should be through a separate staircase, which is not connected to main staircase (i.e. it should be remote to each other)
- Staircase shall be of enclosed type to prevent entry of smoke & fire to the staircase
- Spiral staircase shall be provided up to 9 meter height
- External staircase shall not be allowed.

### **ALTERNATIVE POWER SUPPLY**

As per appendix d-15 of part IV of N.B.C.

A standby generator should be installed to supply power for staircase lighting, corridor lighting, fire pump, pressurization fan and blowers, in the event of disconnection of failure of main supply.



## **CHAPTER 4:** **THEORIES**

## Chapter 4.0

### 4.1 The Concept

TODs offer alluring options in contrast to the utilization of individual modes - pleasurable strolling encounters, in all respects effectively open and agreeable mass transportation with simple, helpful and agreeable multi-purpose exchanges for last mile availability and other minimal effort, agreeable, non-mechanized transportation choices furthermore, most elevated conceivable populace densities (according to neighbourhood setting), improved road network multimodal arranges around travel stations and minimized blended use advancement giving lodging to the travel framework offers:

- enhanced dimension of openness by non-mechanized modes,
- reduced trip length to the normal suburbanite, and
- Economic reasonability of the open transportation framework through generous non passage box incomes.

"Improvement inside a predetermined topographical territory around a travel station with an assortment of land utilizes and a variety of landowners"

(Salvensen 199G)

"A blended use network that urges individuals to live close travel administrations and to diminish their reliance on driving"

(Still 2002)

### 4.2 Design Principle

One of the urban plan standards which cuts crosswise over numerous urban territories around the world is the rule of blended use advancement. Blended use improvement is the act of permitting more than one kind of utilization in a structure or set of structures. In arranging terms, this can mean a blend of private, business, mechanical, workplaces, institutional or other land employments. This will in general make shorter separation between work, living arrangement and amusement and goes far to improve the employment of the occupants.

'Blended use venture have at least three income delivering utilizes that in all around arranged tasks are commonly supporting'

(Urban Land Institute, 1976)

"Blended use makes for three-dimensional, person on foot arranged spots that layer perfect land utilizes, open conveniences, and utilities together at different scales and powers"

(Place makers, 2013)

### 4.3 Related Theories

Defenders of blended use advancements as an urban structure approach, for example, James Howard Kunstler additionally advocates certain related hypotheses and ideas. There speculations were gotten from examination into effective old and new urban communities.

- Transit-situated improvement (TOD)
- Smart development
- New urbanism
- Intelligent urbanism

Life



Space



Buildings



Fig 4.1. Life, Space and Buildings

### 4.4 Need of Research

#### 4.4.1 Interpretation of Mixed use

Blended use improvements change in assortment and scale. Regarding scale, they run from blended use spaces, blended use structures and blended use improvements. They fluctuate from the individual who uses lounge room as workspace (blended use spaces) to the businessperson who lives on the principal floor and works a shop on the ground floor (blended use structures) directly through to immense blended use advancements covering a few sections of land of land.

Additionally as far as assortment, they extend from the travel situated (TOD) directly through to the satellite towns.

#### **4.4.2 Emergence of Transit Oriented Development**

Despite Delhi's interests in open transport framework which incorporate a world class metro framework and DTC transport arrange, Delhi has been unfit to convey effective, agreeable and moderate travel framework, the present absence of network (specifically to metro stations), plenteous sponsored stopping alternatives just as an absence of wellbeing for walkers, cyclists and ladies in the city has brought about open transportation being consigned to second or even last choice for movement.

This has brought about the notwithstanding expanding number of private vehicles in the city. The city has a long history of vehicle driven arranging which organized isolated fellow utilizes, low thickness spread and huge un-walkable square sizes. The supply of additional wide streets with intensely infringed pathways/cycle tracks, demoralize non-mechanized travel modes. The outcome has been an exponential development in engine vehicle proprietorship, and hence increment in contamination and blockage.

(National Urban Transport Policy)

The traffic matrix lock has supported the development of flyovers and grade isolated exchanges inside city limits. Clog is still all things considered, and such framework has really caused a turnaround modular move, by making travel mode hard for walkers and open transport clients, subsequently adding them to private-vehicle utilizing populace.

(UTTIPEC, December 2011)

## 4.5 KEY FEATURES IN OFFICE DESIGN

Flexibility to meet a scope of room and adjusting prerequisites Amount of cellularisation  
 Contact with the outside world Need for mechanical ventilation

Better, more beneficial and increasingly gainful interior ecological quality. In the entirety of its angles: heat, light, stable, shading, and air quality

Client control. Analysts have seen that the human factor-for instance, the operable window is lopsidedly critical to saw prosperity

### DEPTH OF BUILDING

Building depths are generally described as being predominantly 'glass to core' or 'glass to glass'.

- Glass-to-core depths of 9-12 m allow room for cellular office space or open plan plus storage.
- Glass-to-glass depths of 13.5-18 m allow two or three zones of office and support space.

### PLANNING GRID

These determine how the organisation uses its space. The size of the planning grid is less important in a completely open-plan office. If part of the space is enclosed, however, the planning grid will determine the size of the office modules and the overall efficiency in the use of space.

- A 1.35 m grid allows 2.7 m wide offices; a 1.5m grid will provide 3 m wide offices, and relates better to building components in 600 mm modules.

### FLOOR-TO-FLOOR HEIGHTS

Related to floor depth and floor plate size, this has a major effect on air conditioning, cable distribution, ability to use natural ventilation and light, and on visual comfort.

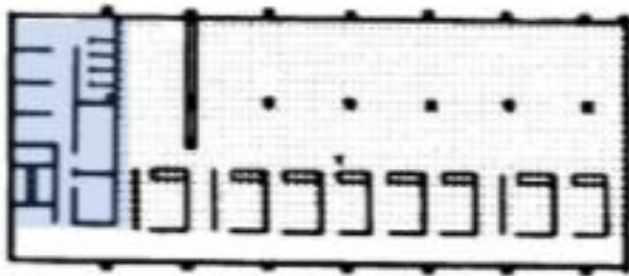
- Floor-to-floor heights of 4-4.5 m provide maximum flexibility and good visual comfort.

### FLOOR SIZE & SHAPE

These influence inward interchanges and flow courses around the structure. Little floors are wasteful as far as the proportion between centre space and usable floor territory. Enormous offices must be part over various floors, which is likewise wasteful. Large floors, then again, produce course courses with long separations between offices.

- Contiguous floor sizes between 500 m<sup>2</sup> and 2500 m<sup>2</sup> give the most usable spaces.

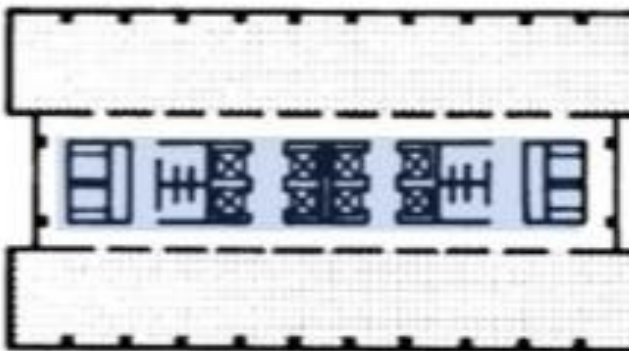
<b>Depth of building</b>	<ul style="list-style-type: none"> <li>• Flexibility of layout options</li> <li>• Amount of cellularisation</li> <li>• Need for mechanical ventilation</li> <li>• Spatial efficiency</li> </ul>
<b>Location of cores</b>	<ul style="list-style-type: none"> <li>• Ease of sub-letting</li> <li>• Security</li> <li>• Spatial efficiency</li> </ul>
<b>Floor-to-floor heights</b>	<ul style="list-style-type: none"> <li>• Method of cable distribution</li> <li>• Type of servicing</li> </ul>
<b>Floor size and shape</b>	<ul style="list-style-type: none"> <li>• Spatial efficiency</li> <li>• Planning flexibility</li> <li>• Size of working groups</li> </ul>
<b>Perimeter detail and planning grids</b>	<ul style="list-style-type: none"> <li>• Flexibility of sub-division</li> <li>• Efficient use of space</li> <li>• Solar gain/heat loss/condensation</li> </ul>
<b>Construction</b>	<ul style="list-style-type: none"> <li>• Ease of adaptation</li> <li>• Space for services</li> <li>• Image.</li> </ul>



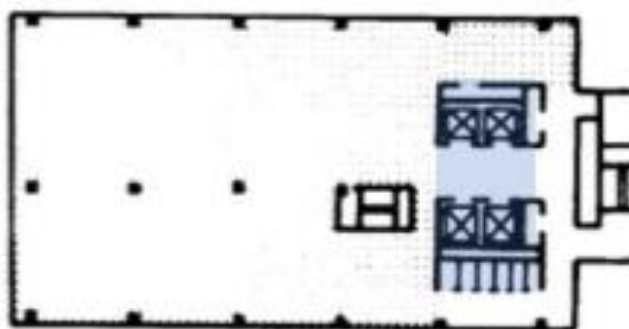
- Core at one end
- One-row layout
- Uneconomical
- Only justified for deep office spaces where daylight is a problem



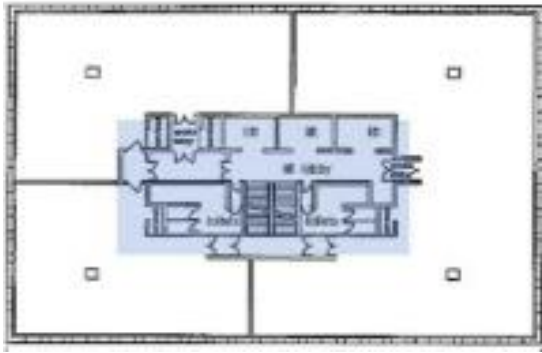
- Core on the periphery
- Double-row layout
- Small office spaces
- Ample daylight for all
- Less depth of plan
- Previously used in most office buildings



- Core in the middle
- Three-row layout
- Ample daylight for all
- Common in high rise office buildings
- Ease of access to service space. Thus, better fire escape plan



- Core on the periphery/centrally located
- Layout without corridor
- Daylight mostly for those on the periphery

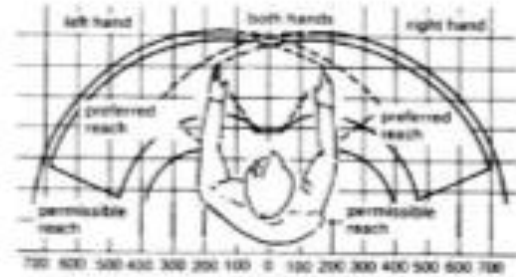
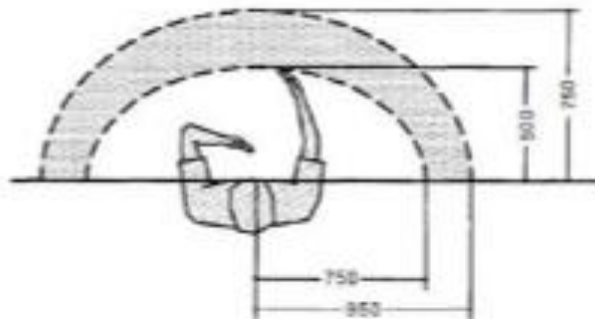


- Core centrally located
- Floor plan allows for more than one office space
- Ease of sub-letting
- Daylight for those on the periphery

Fig. 4.2 Layouts and location of core

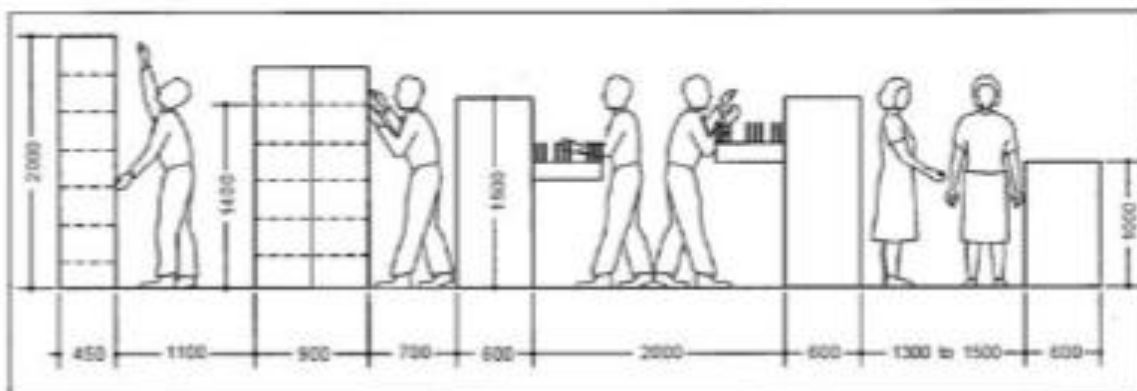
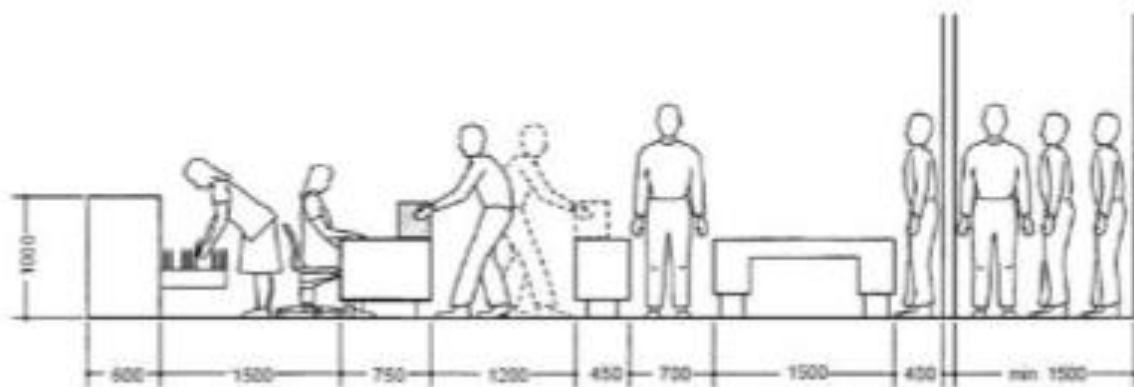


## 4.6 Anthropometrics

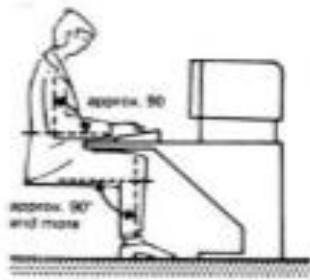


Reach of a person while sitting.  
Outer area marks reach when bent (not standing)

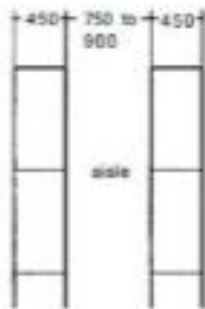
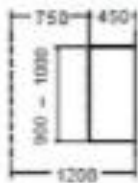
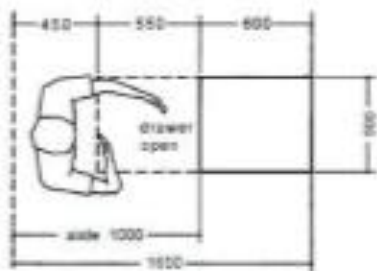
Preferred & permitted area of reach



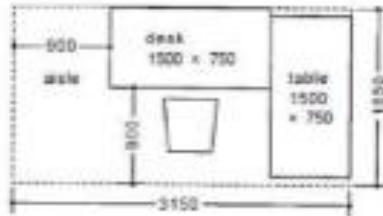
Space and circulation requirements of filing and other office equipment



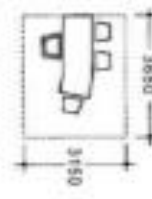
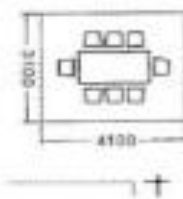
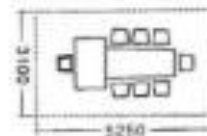
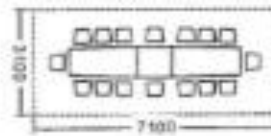
Correct ergonomic position



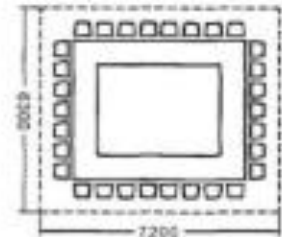
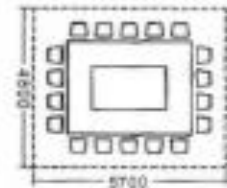
Space requirements of lateral filing units



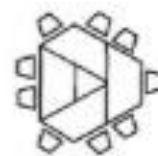
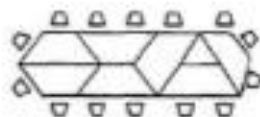
Desk with adjacent table, spacing and layout



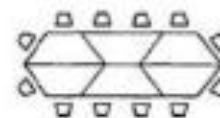
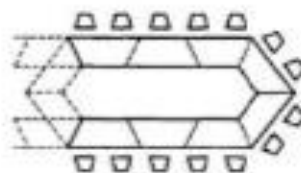
Space requirements for formal meetings



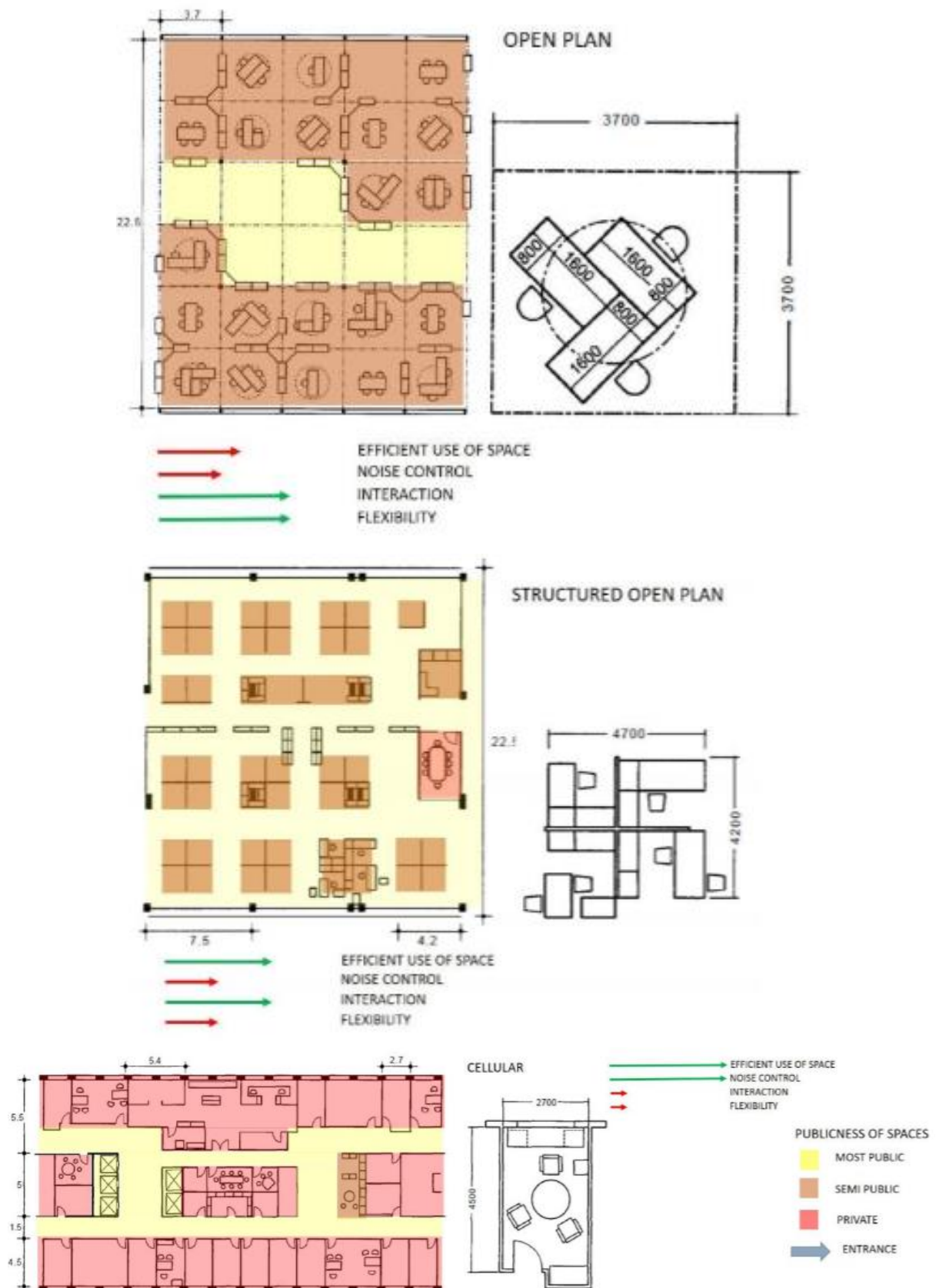
Space requirements for informal meetings



Layouts using modular furniture



## Office Layout Analysis



## **CHAPTER 5: CASE STUDIES**

## 5.1 Kohinoor Square

### INTRODUCTION

**Location:** Dadar West. Mumbai, India.

**Type:** Mixed use building

**Height:** 203 m Main building 142 m Residence Building.

**Floors:** 52 stories, 32 stories count

**Selection:** First Mixed use high-rise criteria in Mumbai

### CLIMATIC CONDITIONS

- Climate of Mumbai is a tropical wet and dry climate.
- Mumbai's climate can be best described as moderately hot with high level of humidity.
- Its coastal nature and tropical location ensures temperatures won't fluctuate and much throughout the year .
- The mean average is 27.2°C

### ACCESSIBILITY

- Nearest Railway Station: Dadar Railway Station (1.7 Km)
- Nearest Airport: Chhatrapati Shivaji International Airport (0.9) Km
- Hospital: Thakur Hospital (200 m)

### NEED OF PROJECT

Since the 1990s, mixed-use zoning has once again become desirable as the benefits are recognized. These benefits include

- Greater housing variety and density.
- Reduced distances between housing, workplaces, retail businesses, and other destinations.
- More compact development.
- Stronger neighbourhood character.

- Pedestrian and bicycle-friendly environments Mumbai currently faces space shortage issue and various social issues one of which is travelling from one end to another. A resilient mixed-used complex is an attempt to address these issues.

**SITE PLAN**



**AREA DISTRIBUTION**

The first five floors of the main building is used for a high-end shopping mall and the remaining 47 floors of the main building is utilized for a commercial offices and five star hotel. The main building is crowned by five star hotel on top 5 floor.

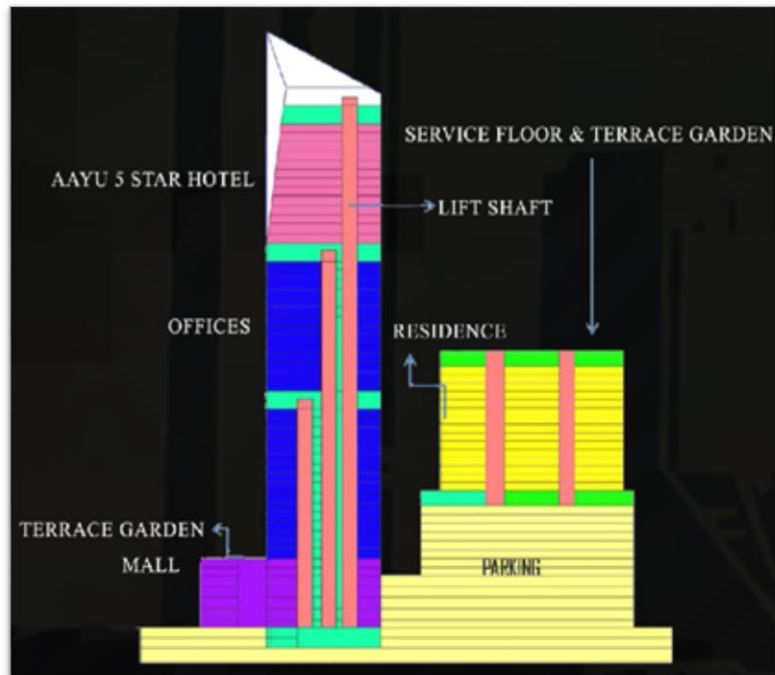
The first 13 floors of the residential building is used as a parking garage for both the building and the remaining 19 floors is residences.

Parking provided for about 2000 buildings and the remaining cars with superefficient driveways and personalized access controls.

### CENTRAL CORE

Central core consist of

- 3 Lobbies of 6 Lifts serving levels 25th to 39th
- Spaces between the lifts where a lift lobby is not provided are used as toilets with dust at either side: 2 lifts from this pack of 6 are assessable to lower floors as well
- 1 lobby of 4 lifts serving levels 1st to 24th
- There is a lift bank at 24th floor.
- 2 services lifts travelling throughout the building
- 2 Stair cases are also placed in the core
- The Central Core is surrounded by the office spaces and refuge areas (at 24 meter of height)
- There are segregated office space from 2nd to 24th floor with toilets to each office and a common toilet also provided on all these floors.



### RESIDENTIAL TOWER

- 132 units from 14th to 26th floor
- 13 Stories of Parking below
- PARKING-3500 (brought from BMC)
- Central core serves 3 lifts and 1 services lifts
- There are 8 units on each floor 6 on 17th floor which is refuge floor
- UNITS- 2.5 bhk 3bhk 3.5 bhk



FLOOR PLANS





## 5.2 Wave One, Noida

**Location:** in the heart of sector 18, the premium central business district of Noida.

Wave one is a 41 storied structure spread over more than 2 million sq.ft. of built-up area and located in Sector 18, Noida. This venture is a heady mix of retail, corporate offices and multiplexes. This iconic development will be the tallest building in Delhi NCR.

**Floor-wise categorization of the structure:**

- G-3 Retails shops  
(min. area: 400 sq.ft.)
- 4-5 Multiplex
- 6-12 Parking Spaces
- 13 Service floor
- 15-41 office spaces  
(min. area: 496 sq.ft.)



**Office spaces have three layouts:**

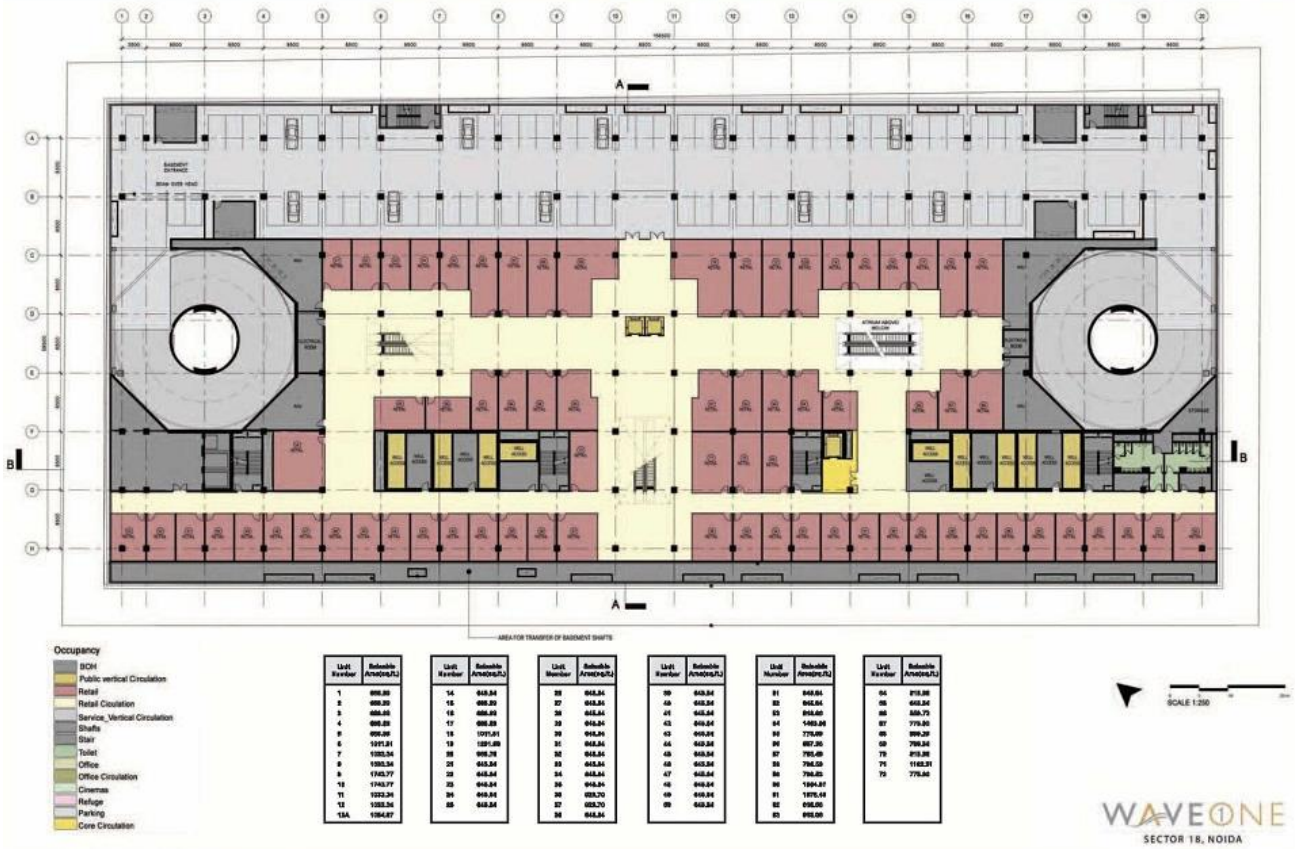
**Platinum:** Exclusive elevation access, dedicated car parking, Sky gardens, Membership to Czarea, Double height business lounge

**Gold:** Exclusive Elevator Access, Membership to Czarea

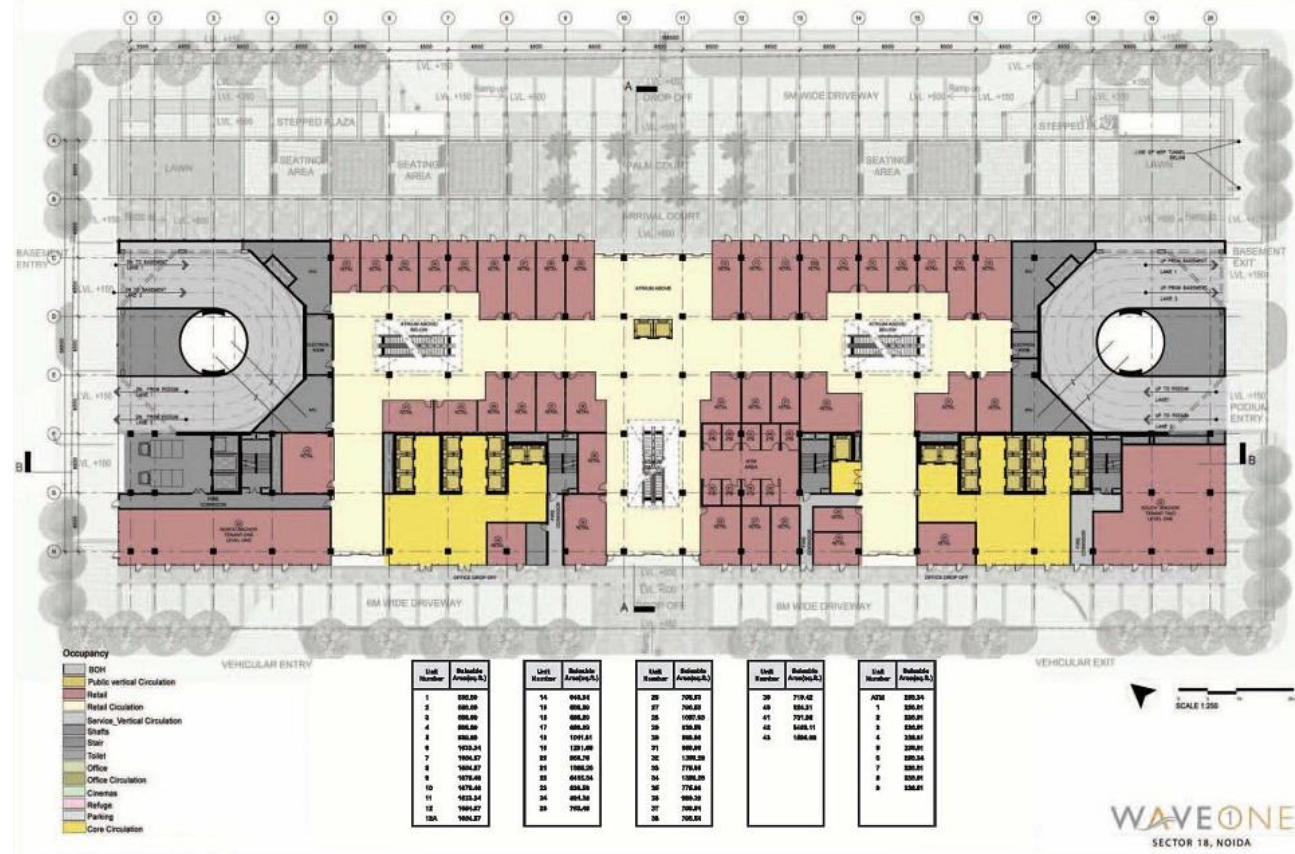
**Silver:** Functional Space.

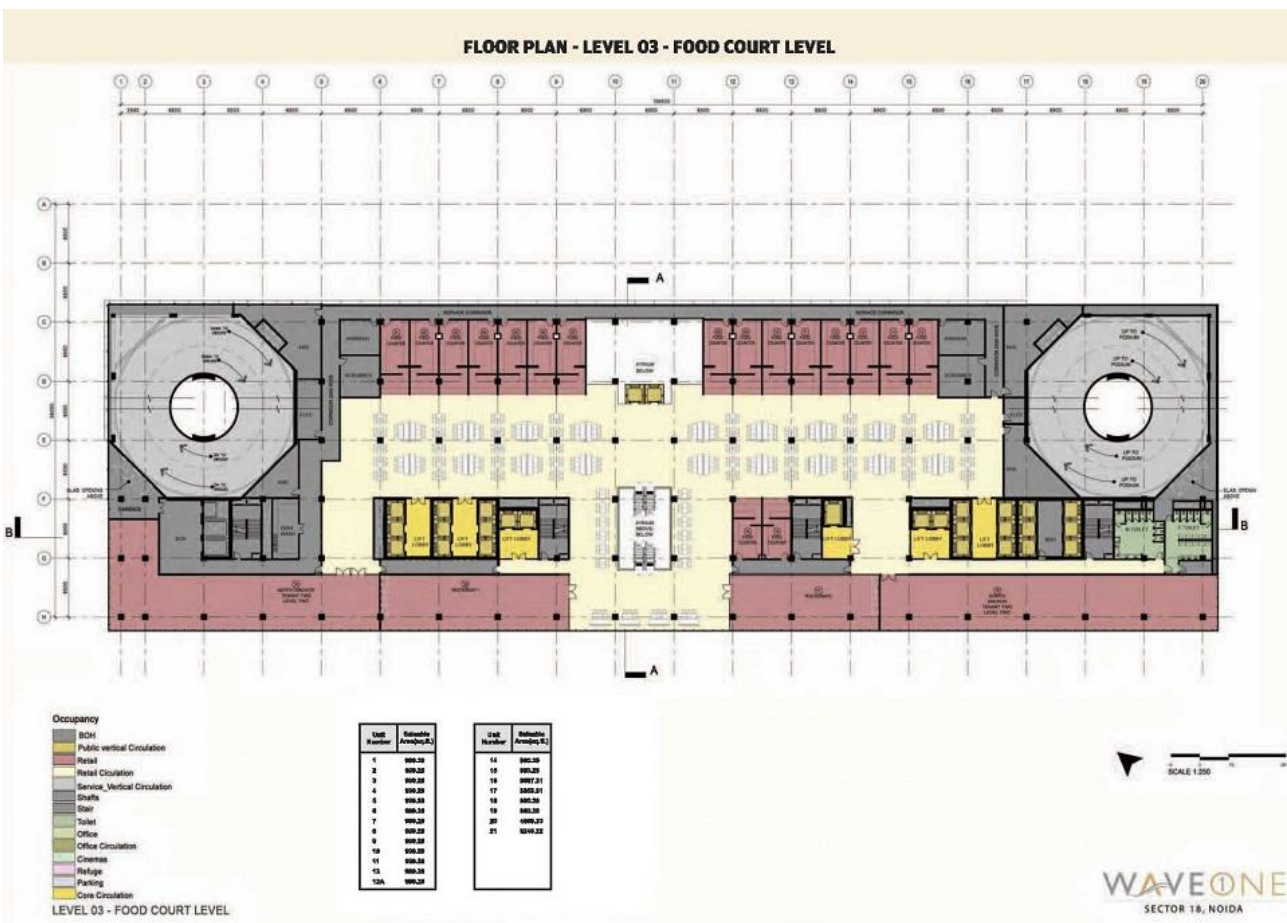
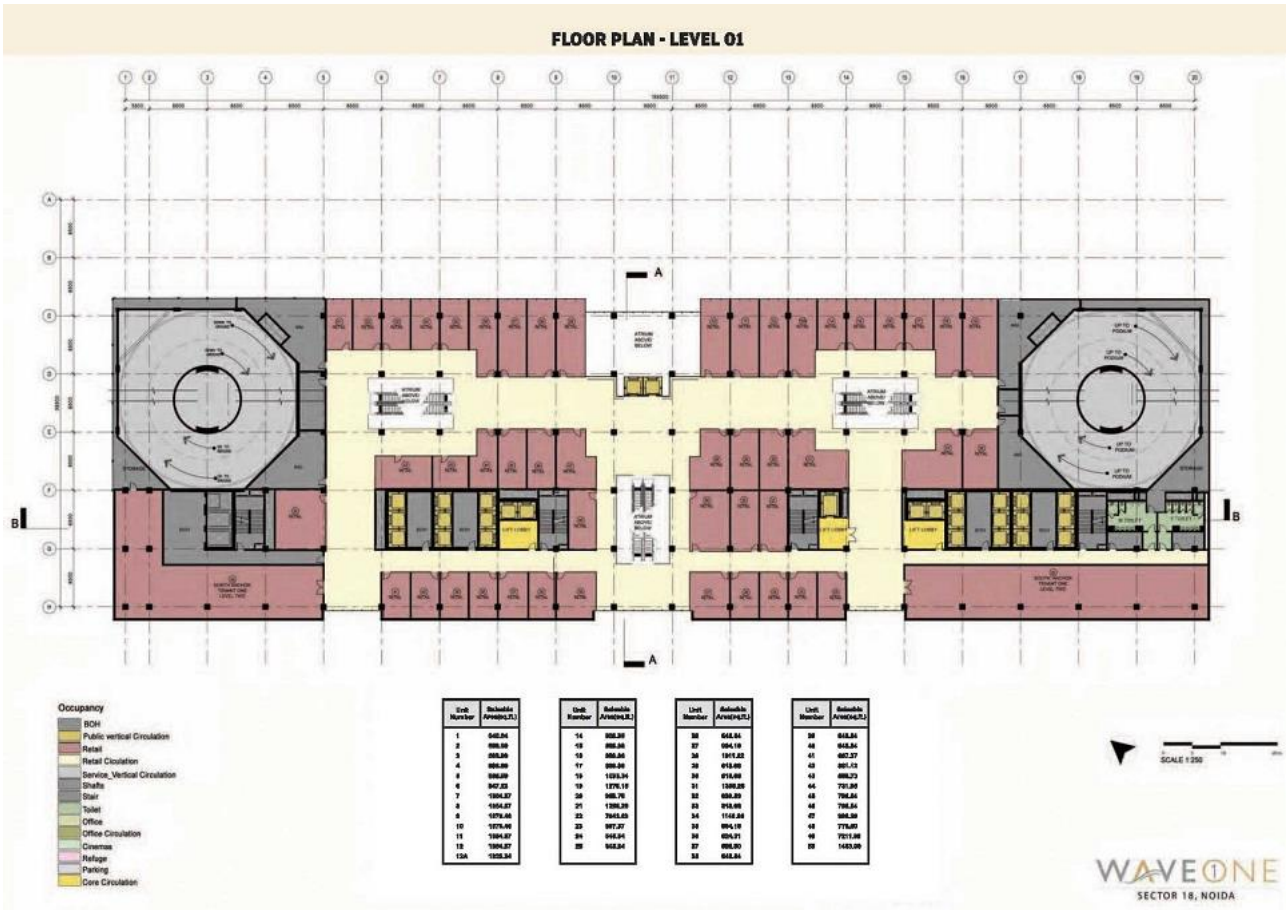
150 m far from the Noida Sector 18 metro station, furnishing incredible availability with Delhi NCR four-side open site, along its 165 m facing, with four-path wide street on three sides and a six-path wide street on the West, giving openness and perceivability to retail spaces and different organizations. The developed space will aggregate up to 2 million square feet, putting it in the august classification of the time AOL Warner Center, Petronas Tower and other notable properties. At 140 m (460 ft.), it will be taller than any current structure in NCR. Leaving office of more than 2600 autos, in this way guaranteeing guests a much needed development from their stopping stresses.

FLOOR PLAN - LEVEL LOWER GROUND - RETAIL & PARKING



FLOOR PLAN - LEVEL GROUND - RETAIL









Level 34 –Platinum office level



Level 38 –Platinum office level



### 5.3 Indian Habitat Centre

Delhi, India (1989-92)

(Sourced form Habitat World’s website  
 “Building in the Garden and Authors”)

**Architect:** Joseph Allen Stein- Stein, Doshi & Bhalla  
 Architects.

**Client:** Indian Habitat Centre Society

**Site area:** 4 Ha

**FAR:** 1.4

**Built-up Area:** 53,000 sq.m

**Super built-up:** 97,000 sq.m

**Program:** Office, Convention Centre, Auditorium, Theatres, Art Galleries, Library &  
 Resource Restaurants, Member Facilities.



The INDIA HABITAT Centre (IHC) was considered as gathering for taking care of multi-disciplinary issues associated with the improvement of human settlements. The task meshes urban structure into a synergetic between connection between establishments working in assorted living space related fields to advance their all-out adequacy. It blends work, business and social spaces to result in an incorporated urban physical structure, with normal offices for data scattering.

#### Site Conditions

Plain site located on Lodhi Road, New Delhi. The L-shaped site has frontage on three sides, all bounded by roads. The fourth side is flanked by Bal Bharthi School. The area is predominantly institutional along Lodhi Road and residential as one moves deeper inside.



Fig.5.1 Satellite image of India Habitat Centre

**Climate**

- Humid sub-tropical
- Average temperatures range from 19- 32 depending on the weather
- Summers are hot, winters are quite cold, with most amount of rain during Client India Habitat Centre

**Connectivity and Access**

The site can be accessed from the three sides bounded by roads. Lodhi Road on the north serves as pedestrian entrance. Roads on the west, Max Mueller Marg. and south, Vardhman Marg serve as direct access roads to different areas of the complex and entry by vehicle is allowed. The site lies 1 km from the main road connecting I.T.O and A.I.I.M.S.

**Building Program**

IHC is programmed as a moderately dense complex with institutional and office work spaces, conference and library facilities, including a diverse range of facilities for the members.

- 40,000 sq.m. of office accommodation Offices
- Conference rooms with a total capacity of 1000 in various configurations holding 30 to 450 people.
- 60 guest rooms, 5 suites, 5 service apartments.
- Conference rooms, cafeteria, restaurants and private dining rooms can handier around 1500 persons at a time.
- 700 sq.m. of exhibition space
- 420 capacity auditorium, 250 capacity amphitheatre.
- Parking for 933 cars and 2000 two-wheelers
- 25 % of the total area goes into landscaped courts

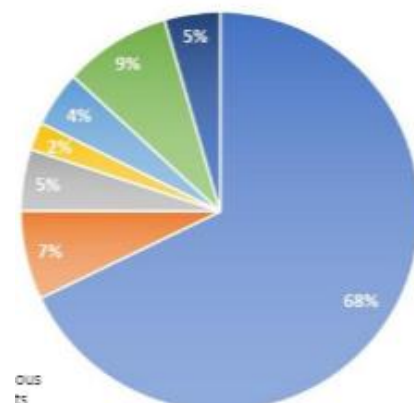
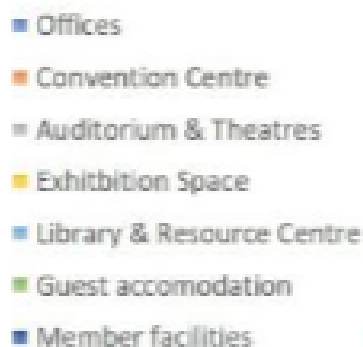


Fig.5.2 Distribution of various building program



**Architectural Vision and implementation**

The genesis of the design, according to Stein, is rooted in the fact that he is a "horizontal architect with a profound dislike for automobiles and the need for climate modification, the application of these with the co-operation of the client led to a conscious decision to under build". Thus, the complex is realised as an oasis of quiet and greenery in the midst of the chaos of the city.



Fig. 16 Shaded courtyard



Fig. 17 Lotus pond



Fig. 5.3 Landscaping courtyards serve as interaction spaces

**Response to Site**

The area is set apart by free streaming traffic and very little open movement. The structures here don't cooperate with one another or the road and this outcomes in next to no person on foot development and is basically vehicular in nature. IHC, in this manner, is an internal looking complex, whose open movement is expelled from the environment.

The complex is divided into two main blocks.

- The North Block along the main roads is made of seven storeyed office spaces. Lower floors remain public.
- The South Block along the Lodhi Housing Colony holds functions like auditorium, theatres, library, member facilities and guest rooms. The height decreases progressively from the North to the South Block in response to the housing. The built 5B is also set further back from the plot line on this edge.



Fig.5.4 Brick cladding and ribbon windows

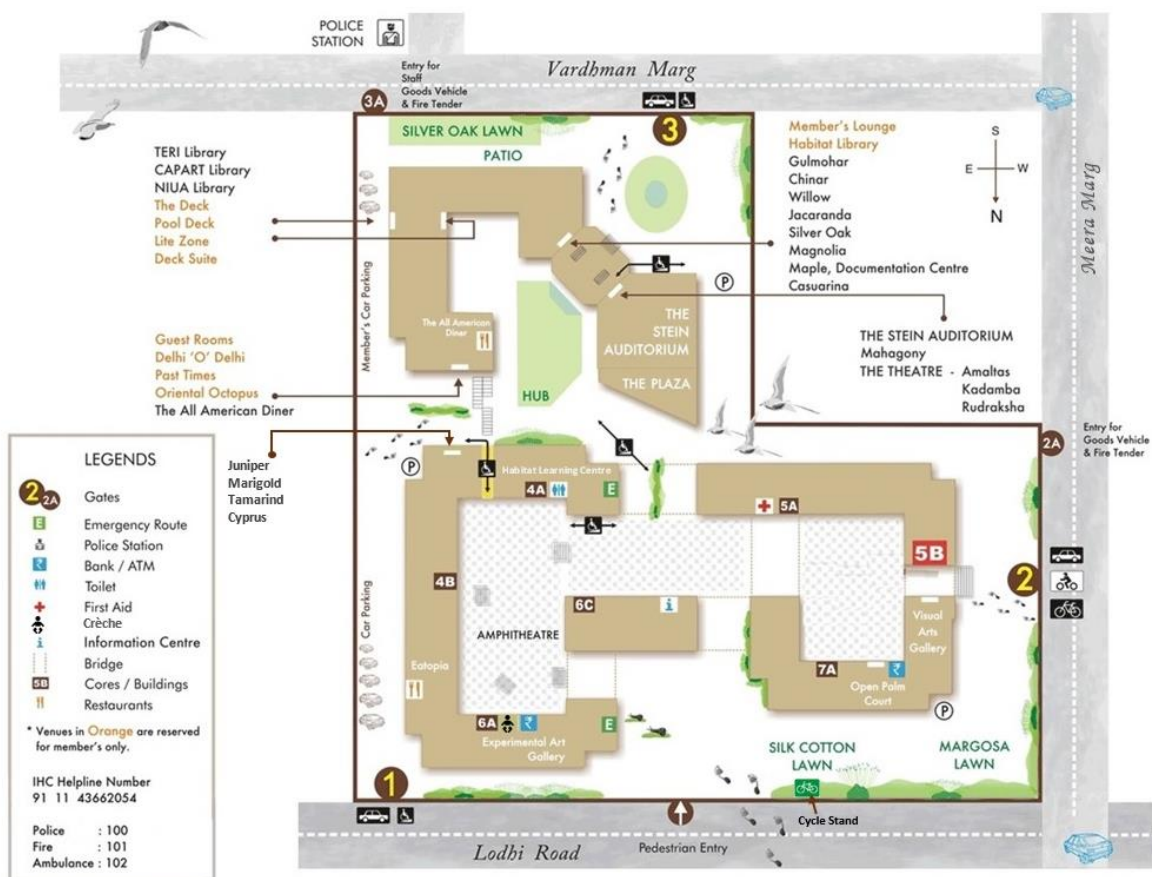


Fig.5.5 Diagram showing the segregation of functions in the North & South

**Spatial Organization**

The natural surroundings focus is sorted out as a progression of four to seven story hinders around connected shaded yards. The assembled structures are gathered around atmosphere tempered courts, shaded by overhead sunscreens and are charged by vertical nurseries. Spaces are isolated based on their dimension of publicans. All territories which are relied upon to encounter huge and standard inflow of open have been put near the passages. Workplaces are gotten to from the yards.



Fig. 5.6 view of the interior courtyard from office.

Courts and landscaped areas connect the public with the semi-public areas. However, there is limited engagement between the office workers and the activity in the courtyard due to horizontal windows where vertical would have suited better

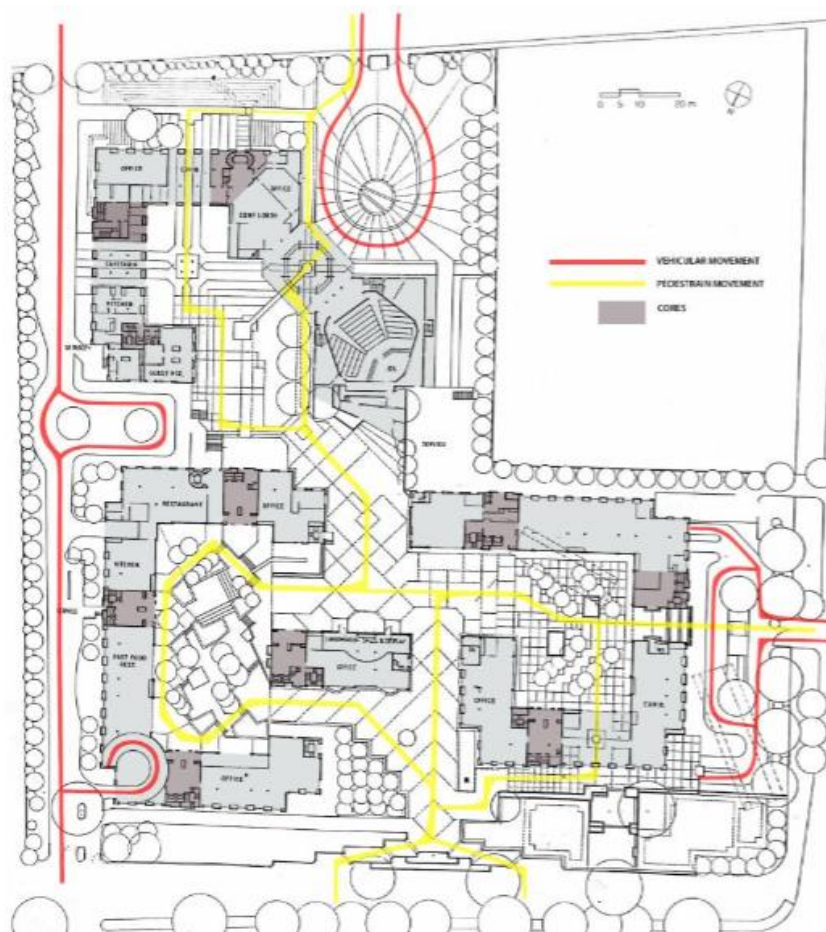


Fig 5.7. Plan of IHC showing circulation pattern

### Sustainability Features

- The intriguing blue sunshade gave between two structures in court keeps up an agreeable domain and has a cooling impact.
- The trees help keep up a green situation.
- Fountains make the earth cooler and give an impact of delicacy.
- The building is arranged so that greatest piece of the floor appreciates daylight.
- Sunlight is likewise permitted in the cellar through fascinating glass and metal structures with regards to the yards.



Fig 5.8. Shaded courtyard

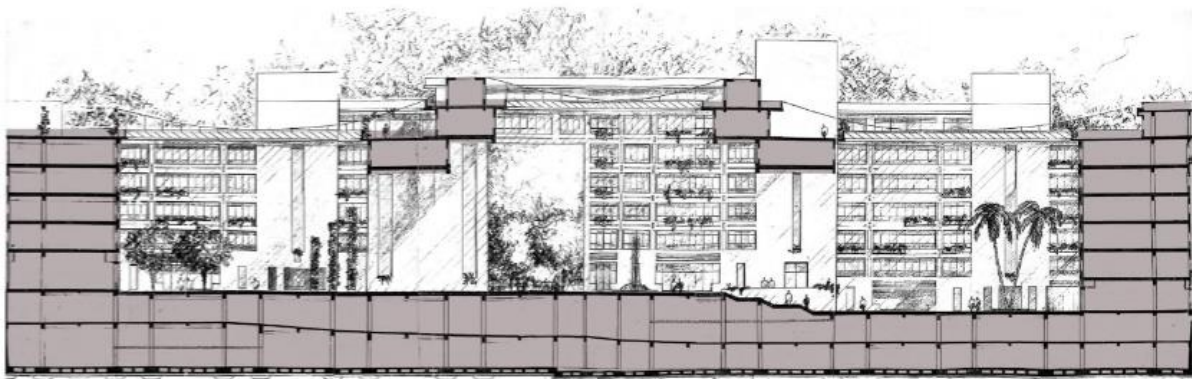


Fig. 5.9 section through bridging masses

### Services

The whole structure is cooled, the storm cellars are precisely ventilated, sprinkler frameworks are introduced in every usable territory and the complex has its very own water cleaning plant. Emergency exit staircases and entryways are pressurized to forestall the spread of flame along vertical shafts.

All office spaces have the adaptability of giving their very own wet regions, aside from those gave in the focal centres, and a story matrix gives customizable associations with power and phones that can be coordinated with the apportioning. Modernized structure the board frameworks have been intended for the effective activity everything being equal, including watering of window boxes and the identification of shortcomings. The dimension of detail that has been connected to the administrations is in fact exceptional.

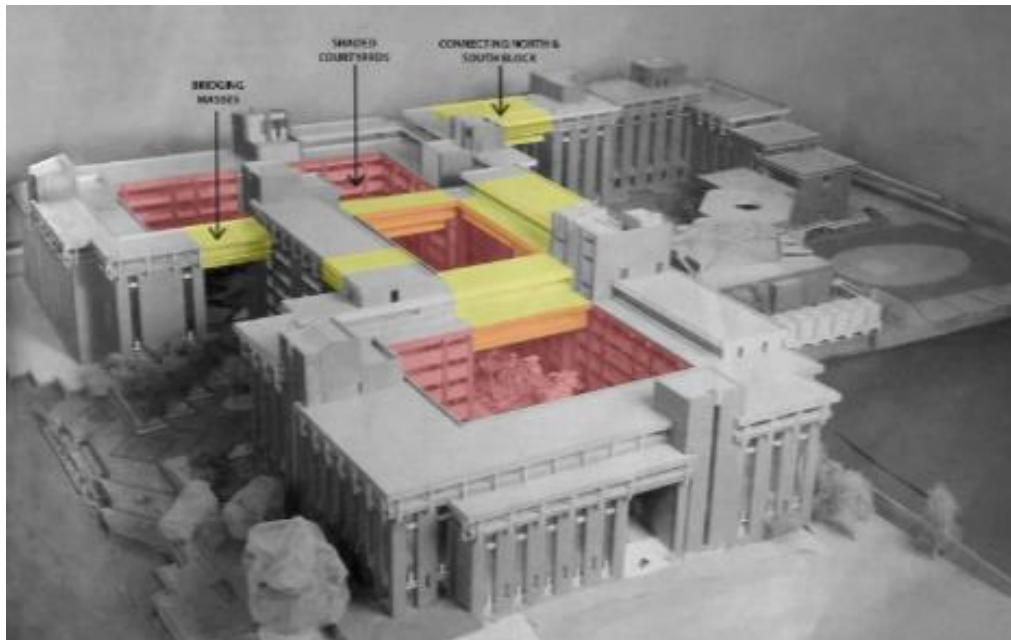


Fig. 5.10 Massing achieved

### Inferences

- As the first plan is demonstrated on this structure, numerous parallels can be drawn between the projects, and the investigation straightforwardly advises the proposition.
- The undertaking is exceptionally effective as far as compositional articulation, and as a spot for enjoying social and relaxation exercises.
- Validation of the proposed territory program, as comparative capacities have been accommodated here and are known to work.
- Effective zoning for taking care of groups.
- Vehicular flow is confined to the outskirts, making the site person on foot cordial.
- Landscaping integrates the plan and is basic for making the mood and smaller scale atmosphere that encourages open air action.
- Courtyards likewise go about as significant restricting components and devices for spot making.
- The nature of open space made is internal looking, with volumes containing within all things considered.
- Hampered person on foot movement out and about outside because of comparative internal looking-structures along the street.
- The premises is dynamic around evening time on account of the numerous occasions it has. This action is limited to inside the site and the streets outside stay betrayed.

## 5.4 Cyber Hub

(Sourced from DLF CyberHub’s website, Urban Design Studio, 2016, SPA, Delhi and author

**Architects:** M. Paul Friedberg and Partners + Hafeez Contractor AWA Lighting Designers

**Developer:** DLF

**Site Area:** 10.6 Ha

**FAR:** 3.75

**Built-up Area:** 4,00,136 m<sup>2</sup>

**Ground Coverage:** 39,332 m<sup>2</sup>

**Program:** Offices, Restaurants, Retail,  
Exhibition Hall, Media Room,  
Amphitheatre



Fig. 6.1 Satellite image of Cyber

DLF CYBER HUB is a top notch mingling zone, some portion of the corporate park, DLF Cyber City which is viewed as one of the biggest center points of IT action in Delhi-NCR, obliging over 2.5 lakh employees. The site is long and straight with different doors and three dimensions to take into account a normal footfall of 25,000. Digital Hub not just obliges the general population working in corporate and business centers in the region yet in addition to the catchment in and around Gurgaon. Other than being a nourishment and stimulation zone, it additionally has craftsmanship and social shows, Delhi-NCR, India (2013) media dispatches, shows, way of life shoots, TV programs.

### Site Conditions

The site is deliberately situated on the fundamental supply route associating Gurgaon to Delhi, NH-8. Udyog Vihar, a thickly populated modern zone lies on the contrary side of the expressway. The site is additionally encompassed by business and Private Cyber Hub is situated at a prime corner of Cyber City.

### Climate

- Humid sub-tropical.
- Average temperatures range from 19- 32 depending on the weather.
- Summers are hot, winters are quite cold, with most amount of rain during monsoons.

## Land Use

High, medium and low density industrial, residential and public & semi-public uses established without clear definition or relevant scales between individual buildings. Buildings contain a vertical mix of uses, often with office on the ground level with car parking occupying the rest of the plinth. This reduces the public presence and passive surveillance on the street. Very few areas of green spaces present in precinct, thus forming no hierarchy in green.



Fig. 6.2 Land Use Plan



## Connectivity and Access

Rapid Metro runs around Cyber City and connects to the Yellow Line Metro. Multiple entries are available into the site from the stations on this privatized line. Free shuttle services and auto-rickshaws serve as last mile connectivity for the vicinity.

Access by public bus service is inadequate in comparison to metro, rickshaw and private vehicles.

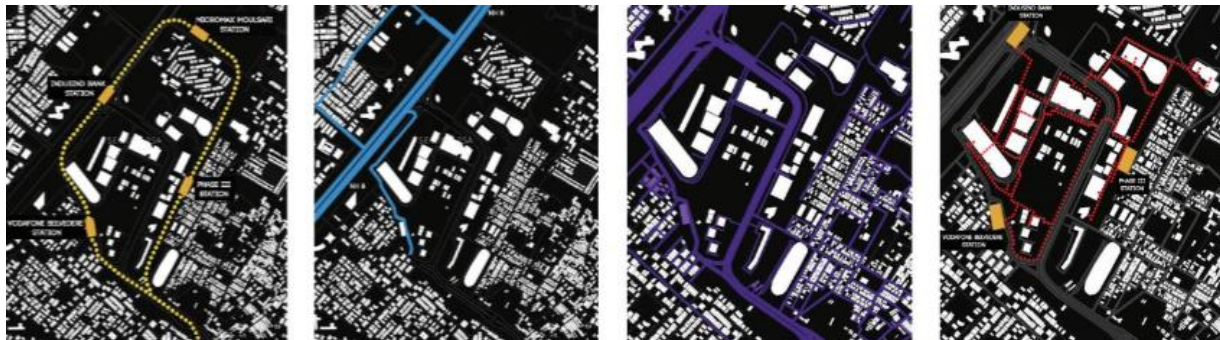


Fig. 42 Movement Systems. Left to Right- Rapid Metro, Public Bus, Private vehicles, Pedestrian

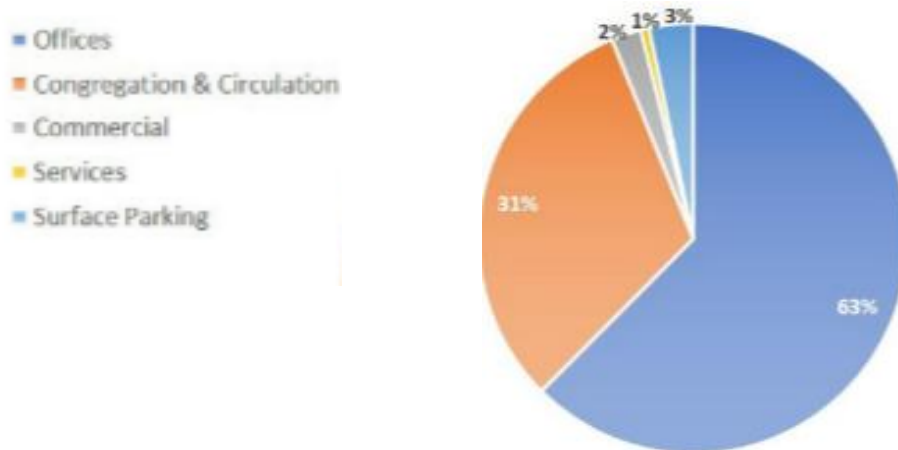
## Building Program

The main component of this corporate park are 2,71,400 sq.m. Of offices of top IT and Fortune 500 –companies.

Cyber Hub allows varied experiences to users through 1,36,150 sq.m. of congregation and circulation space besides commercial activity of 9770 sq.m.

- F& B with indoor and outdoor seating

- Retail opportunities
- Exhibit area that offers space for design and display of products
- Amphitheatre with digital sound and projection system, air screens and weather-proof sound system
- Open terraces for socializing



These are supported by 2670 sq.m. of services and 14,360 sq.m. of surface parking, besides generously provided basements.



### Architectural Vision and Implementation

The plan brief was to make a space for stimulation of the representatives so as to elevate the work beneficial experience. The complex is based on the global thought of eating and diversion.

Cyber Hub is India's share of the glamorous corporate life that has been obtained from the West.



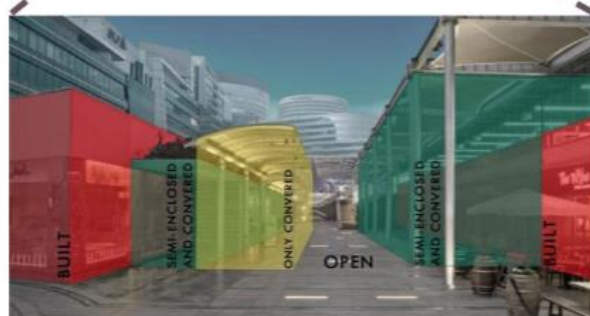


Fig. 6.3 Aerial view of cyber City

### Response to Site

The buildings are intricate steel and glass constructions that seem to exist outside time, representing a distant future and have little to do with contemporary Gurgaon. The volumes open and rise up from the highway. The terraces thus seem like a welcoming gesture to the oncoming traffic. The building. The hub is ideally located to attract the IT crowd in the neighbourhood as well as people from Gurgaon.

Facades on the outer edge are blank or covered in advertisements, leading to decreased pedestrian movement.



## Spatial Organization

There are various doorways along the length of the complex. The lower floor is essentially committed to open capacities, while the upper floors house workplaces, in this way accomplishing vertical zoning.

Positive visual hubs are made for guest direction and gathering, which during the evening are associated by a lighting embroidered artwork. The fervor of the retail facades loans a natural development example to the site, joining the thoroughness of a well-arranged evening urban condition with the kinds of a nearby souk or bazaar

The road flanked by F&Bs is energetic with walker movement which is advanced by the adapting scale and suitable treatment of the walkways with seating accessible at different interims. The open space is sorted out to such an extent that the limit from open to constructed is steady, with semi-secured zone connecting the two. Stunned veneer keeps the person on foot intrigued. Be that as it may, as the way closes suddenly, the business movement toward the end is lesser.



Fig. 6.4 Tensile roofs shade the walkway



Fig 6.5 Terrace level



Fig 6.6 Activity at night

## Inferences

- Project lives up to the goals of TOD.
- The undertaking is a case of a widespread engineering that is placeless. It takes into account the yearnings of globalizing India.
- Scheme functions admirably in the corporate IT setting, where late hours and requirement for unwinding are normal.
- Validation of the proposed territory program, as comparative capacities have been accommodated here and are known to work.
- Vehicular development is limited to the fringe, leaving the inside open with the expectation of complimentary person on foot development.

- The undertaking has prevailing with regards to making an open space that remaining parts dynamic late into the night.
- The nature of open space made is outgoing, welcoming the outside into the buzz of action by luxurious lighting and the assortment of encounters it offers.
- Treatment of the person on foot walkways with seating at normal interims, sufficient shading, and regard for all inclusive access, stone clearing, and patches of green and lively customer facing facades, makes is agreeable and safe. Same isn't valid for section and leave focuses, which prevent development by walking.
- Food is understood an incredible method to initiate open spaces, however the top of the line idea of the F&Bs limits the group radically.

**CHAPTER 6:**  
**THESIS PROPOSITION**

## Chapter 6.0 Thesis proposition

**Developing mixed-use buildings, incorporating Transit Oriented development policy and site driven factors which can also provide context sensitive functions with creating social vibrancy as well as civic pride.**

### 6.1 Design Project exemplifying the research

The D.D.A has desired to develop this project based on Transit Oriented Development (TOD) as the project is intended to show-case the Sanjay Lake Park through mixed use development of Lake View Complex on 10.26 hectares land having residential, hospitality and public oriented uses. The development shall comprise service apartments, old age houses, hostels, convenient corporate and commercial components, public plazas and other recreational facilities. Lake View Complex is envisioned to enhance footfall of visitors the lake and its surrounding better used and more active round the clock.

- The project is an activity based-commercial development on green field site, thus responding to multidimensional context will play a crucial role.
- How this development will not be like any other estate development, thus focus will be on pedestrian oriented planning, emphasizing on local employment, services, environmental value and usability of lake.

### 6.2 City, precinct and surroundings

- Land admeasuring 10.26 hectares at Trilokpuri, near Mayur Vihar phase-II, Delhi as per the site plan showing the location, extent and boundaries of the land is fully entitled to develop the said land. The land is almost flat and located near NH-24 Trilokpuri.
- The site is bounded on eastern and southern side by 30 m Zonal plan roads. On the western side, is bounded by approx. 170 acres Sanjay Lake Park, which includes approx. 40 acres of lake area. The site has an station of Trilokpuri. The Metro viaduct pass through the scheme area. There is one Fire station, Petrol pump existing on site, plot for proposed Police port within the scheme boundary.
- The plot enjoys excellent linkages with other parts of city and is situated in close proximity to Mayur Vihar phase- II, Kalyanpuri in East Delhi and approx. 5 km from Anand Vihar Railway station, Delhi.

- The DDA has desired to develop this project based on Transit Oriented Development (TOD) which shall be named "Lake View Complex" on this 10.26 hectares land in Trilokpuri

**CHAPTER 7:**  
**PROJECT AND PROGRAM**  
**ANALYSIS**

## **Chapter 7.0 PROJECT AND PROGRAM ANALYSIS**

### **7.1 Project scope and profile**

The Delhi Development Authority imagines Planning, Design s Construction of the Lake View Complex in the Capital Trilokpuri metro station, an area in the eastern piece of Delhi. This Complex would take into account the capital capacity as well as incorporate multi-sectorial offices in exchange and business, private and different territories so as to make it an energetic and dynamic complex which ought to act naturally contained and self-supporting, with condition of workmanship physical, social and financial framework. This centre point would be eco-accommodating and incorporated existing scene, effective, solid, present day and furthermore receptive to the conventional qualities,

### **7.2 Major functional components**

The task is planned to demonstrate case the Sanjay Lake Park through blended use advancement of Lake View Complex on 10.26 hectares land having private, neighbourliness and open situated employments. The improvement will involve administration condos, seniority houses, inns, advantageous corporate and business parts, open squares and other recreational offices. Lake View Complex is imagined to improve footfall of guests the lake and its encompassing better utilized and progressively dynamic nonstop.



## AREA ANALYSIS

### RETAIL

<b>FACILITY</b>	<b>UNIT AREA (m2)</b>	<b>UNIT NO.</b>	<b>TOTAL AREA</b>
Departmental Store	731	02	1462
Anchor Shore- Large	400	02	800
Anchor Store - Medium	250	08	2400
Book Cafe	420	02	840
Brand/ Boutique Store	300	08	2400
Large Shops	060	12	620
Medium Shops	030	10	300
Small Shops	020	10	200
Restaurant 75 covers	250	02	500
Food courts	1000	01	1000
Large Coffee Shops, Bakery	060	05	300
Stand Alone Food Kiosks	016	25	400
Admin Support	500	01	500

Services (12%)

1358.6

Total

12580.6

Circulation (40%)

5072.2

Grand total

17552.2

### OFFICE

<b>FACILITIES</b>	<b>UNIT AREA (m2)</b>	<b>UNIT NO.</b>	<b>TOTAL AREA</b>
Large offices	1200	14	16800
Medium offices	750	40	32000
Cabins	10	360	3600
MD room	35	80	2800
Conference halls-large	400	01	400
Conference halls- small	200	01	200
Meeting room- large	80	04	320
Meeting room- small	40	08	320
Furniture storage	100	03	300

Other stores	100	06	600
Printer shops- support	100	06	600
Reception and seating	100	06	600
hospitality	-	-	4050
Office support	-	-	2660
Pantry	10	36	360
Admin support	-	-	500
Manager support	-	-	500

Services (12%)

7753.2

Total

72363.2

Circulation (40%)

38030.72

Grand total

10138.48

## RESIDENCES

<b>FACILITIES</b>	<b>UNIT AREA (m2)</b>	<b>UNIT NO.</b>	<b>TOTAL AREA</b>
Service apartment	100	264	26400
Fitness center	-	-	750
Admin support	-	-	900
Manager support	-	-	900

Services (12%)

3474

Total

32424

Circulation (40%)

12969.6

Grand total

45393.6

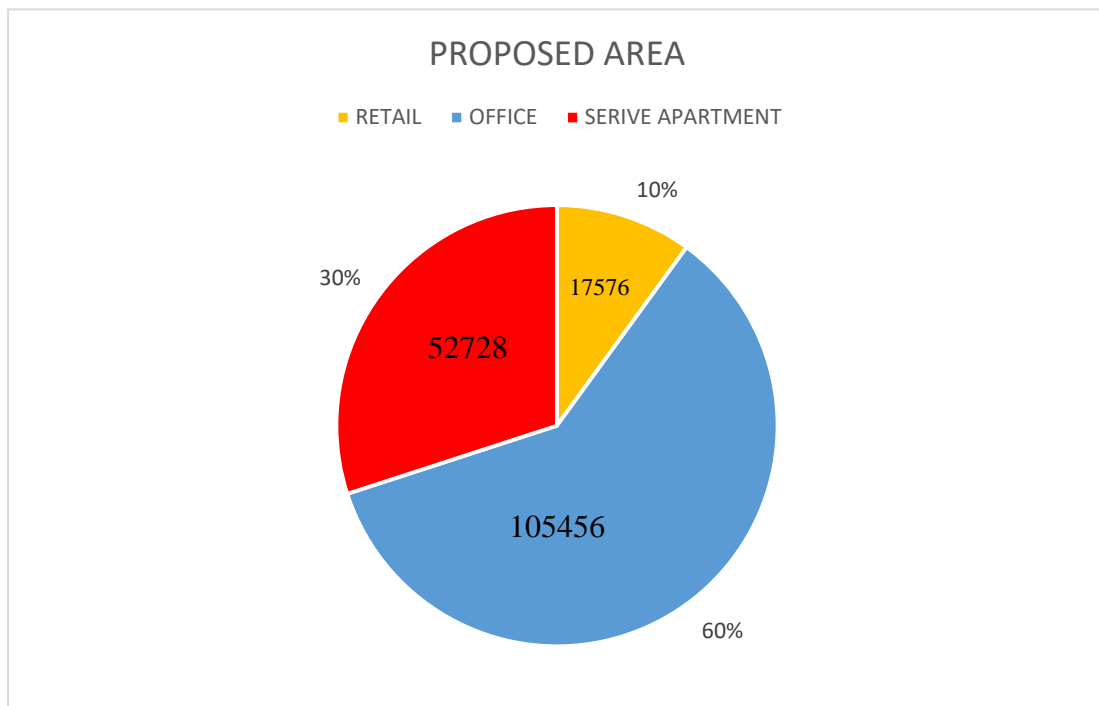
Plot area = 9.76 hectare = 97,645 m<sup>2</sup>

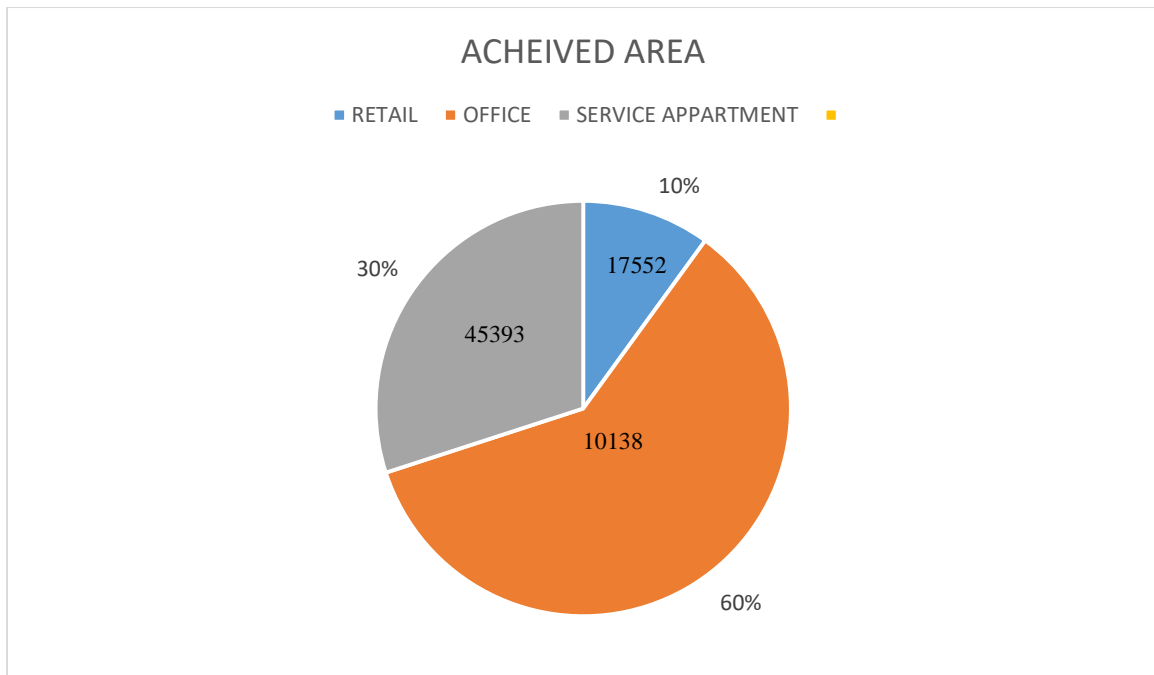
45% of plot area = 10.8 acre = 43,940.25 m<sup>2</sup>

Permissible FAR = 4

Total built-up = 175,761 m<sup>2</sup>

Ground coverage @ 40% = 17,576 m<sup>2</sup>





# **CHAPTER 8:**

# **SITE ANALYSIS**

## Chapter 8.0 Site Analysis

### 8.1 About site

The site for proposal which is part of the Sanjay Lake precinct contains two type of land uses commercial and recreational according to Eastern Delhi zonal master plan 2021.

Fire Station, Petrol Pump and Trilokpuri Sanjay Lake Metro Station is present on the site.

A temple and shop also present on the site with large number of Eucalyptus and Keekar trees which considered as the wild trees.

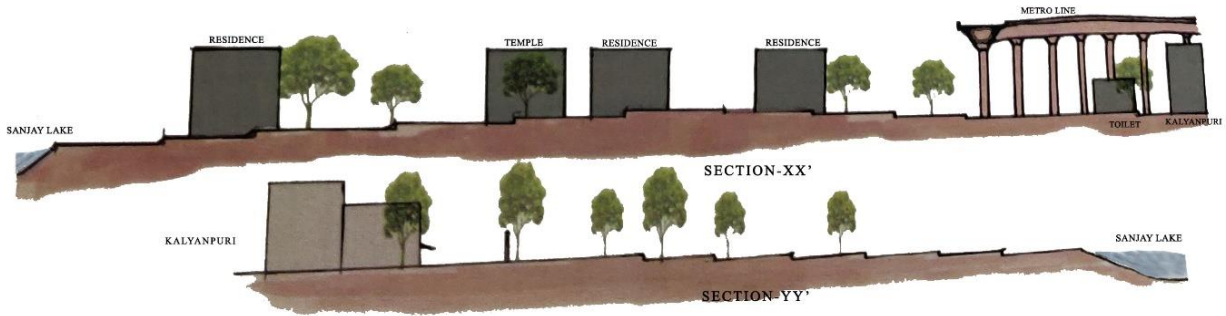
### Existing Site Plan

SITE AREA:25 ACRES

MINIMUM HEIGHT: 200M above sea level

MAXIMUM HEIGHT: 207M above sea level



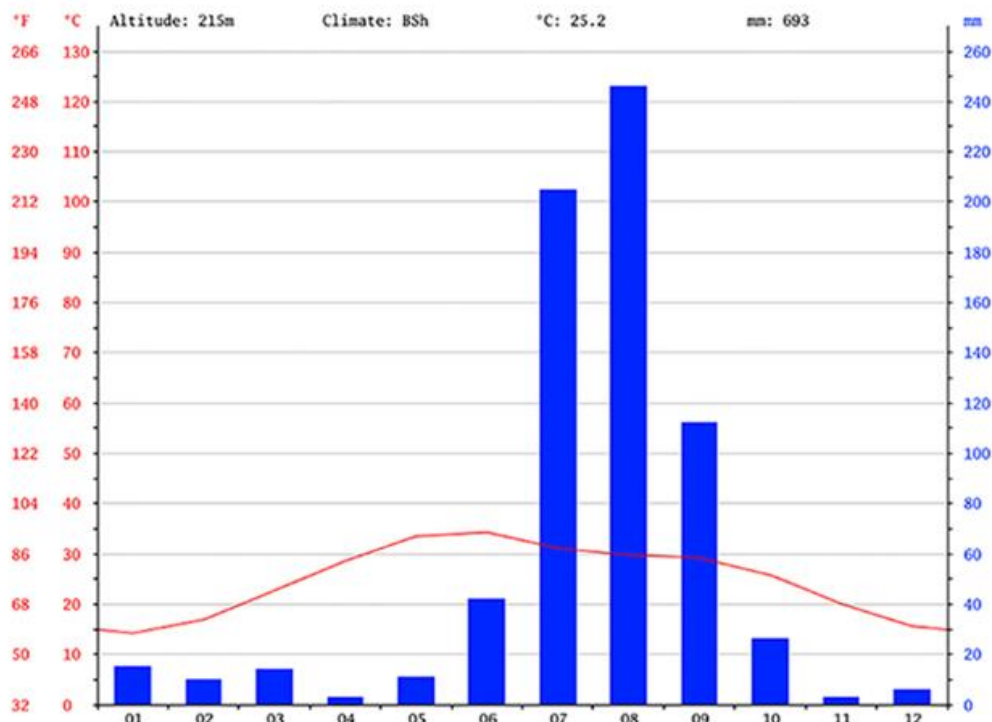
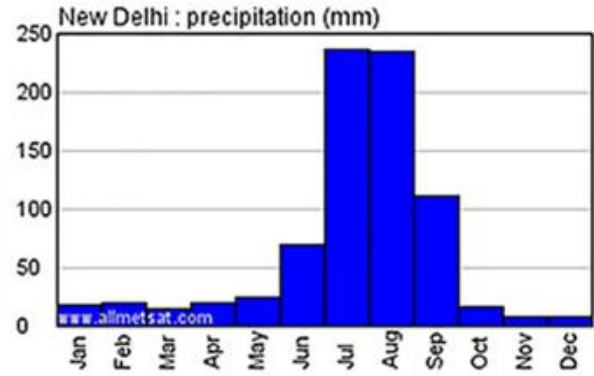
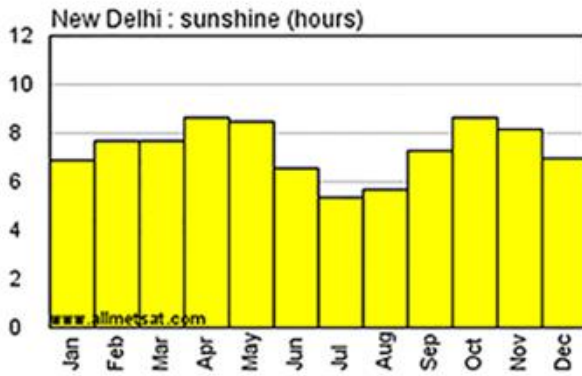


## 8.2 Climatology

The climate of Delhi is monsoon-influenced humid subtropical bordering semi-arid with high variation between summer and winter temperatures and precipitation.


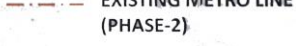
Latitude 28°38'57.2"N

Longitude 77°18'18.9"E



### 8.3 Accessibility And Circulation

**LEGEND**

-  DADRI ROAD
-  GHAZIPUR ROAD
-  NATIONAL HIGHWAY 24 BYPASS
-  INTERNAL CONNECTIVITY FROM DADRI ROAD
-  INTERNAL CONNECTIVITY FROM GHAZIPUR ROAD
-  INTERNAL CONNECTIVITY FROM NH 24
-  PROPOSED METRO LINE (PHASE -3)
-  EXISTING METRO LINE (PHASE-2)
-  PROPOSED METRO STATION
-  EXISTING METRO STATION



### 8.4 Seismic zone

Seismic Zone: Zone 4

Soil Condition: New Alluvial soil

Water Level: -8M from ground

Natural Slope: Toward Sanjay Lake





## 8.5 ECOLOGY

Vegetation:

A large number of trees and plants present in Sanjay lake precincts as it lies in recreational zone. The Sanjay lake park area where the number of green areas are higher than any other part of the precinct. Major types of trees present in the precinct area are Kikar, Eucalyptus, Ashoka, Ficus, Gular, Neem, etc.

### Types of trees:

**EUCALYPTUS** Otherwise called Gum tree is a various variety of blossoming trees and bushes in the myrtle family, Myrtaceae. Individual from family command the tree verdure of Australia, and incorporate Eucalyptus regnant, the tallest realized blossoming plant on earth.



On location: the most elevated number of trees present there on location is Eucalyptus about 40% on location is in number.

**KIKAR TREE** Vachellia nilotca (logical name) is the little prickly tree. It develops to the tallness of 7-12 meter. It has yellow round head blossoms which are nectar less. The bark is red-dark colored to blackish and harsh. The leaves are light green and plant like up to 12mm log and 50mm wide.



On location: The second most elevated number of trees present there on location is Kikar which present for the most part along the lake shore.

**ASHOKA TREE** *Polyanlthia longifolia*, the False Ashoka local to India, is an elevated evergreen tree, generally planted because of its viability in easing commotion contamination. It shows symmetrical pyramidal development with dainty sobbing pendulous branches. The tree is known to develop more than 30 ft. in tallness.



On location: It is utilized along the pathways to make the back road which is certain utilization on location.

**FICUS TREE** *Ficus Benjamin*, usually known as sobbing fig, Benjamin or Ficus tree, and regularly sold in stores as just ficus, is a types of blooming plant in the family Moraceae, local to Asia and Australia.



On location: It is available in the Sanjay park region and on the section of park which give the enormous shade on the space.

### Types of birds:

There are various kinds of fowls can be seen here till February end each year. As per nearby birders, the lake has 90 assortments of fowls. Shovellers, Pintails regular pochard, tufted pochard, basic greenish blue, spot-charge, yellow headed wagtail and pied wagtail are a portion of the winged creatures that usually visit lake. The transitory flying creatures generally go toward the eastern piece of the lake, as the water is more profound and the region is free from human aggravations.

### DUCKS

The large number of birds that is present is precinct is now ducks which has even the duck house or “Battak Ghar” for their habitat. It plays the important role to attract the visitors as they went to the shore people enjoy the time there, after spending time with them and feeding them food. Duck is the common name for a large number of species in waterfowl family Anatidae, which also includes swans and geese.



### HOUSE CROW

The house crow (*Corvus splendens*), otherwise called the Indian, dim necked, Ceylon or Colombo crow, is a typical winged animal of the crow family that is of Asian cause however at this point found in numerous pieces of the world.



### MYNA

Logical name: *Acridotheres tristis*. Myna are a standout amongst the most widely recognized greenhouse winged creatures of India, which are anything but difficult to distinguish as a result of its particular yellow-fix around the eyes which stretches out to its mouth.



### Shake PIGEON

The local pigeon (*Columba livia domestica*) is a pigeon subspecies that was gotten from the stone bird (likewise called the stone pigeon). The stone pigeon is the world's most established tamed feathered creature.



## Types of animals:

### STREET DOGS

Street dogs can be easily spotted at any corner of Delhi. In park they came for rest and shade as there is hot outside in summers on the road.



### COWS

Cows are present near the garbage on the site where they find food to eat. It also scared animals in India so it can find near the temple in the precinct.



## 8.6 ACTIVITY MAPPING

- Jogging/ walking
- Exercise
- Adventure sports

- Cricket
- Leisure activities
- Illegal activities

### JOGGING / WALKING

As the park located mostly near the residential localities like Mayur Vihar phase-II, Patparganj, kalyanpuri, etc. the people of these areas comes to the park for jogging, walking and running to maintain their health. The problem with park that there is no proper tracks for these activities present in the precinct. It is the largest type of activity among the others which is done in the precinct in present scenario.

### EXERCISE

Exercise is any bodily activity that maintains physical fitness, overall health and wellness. There is only one lace located on the site with some outdoor equipment's which are not sufficient and well maintained. It attracts young age group to keep their health and fitness well. It can be increase by creating more spaces lie open gym.



### ADVENTURE SPORTS

EOD (Every Other Day) adventure park located in precinct which contains the park offers soft adventure activities such as water sports, tree house course, archery, beach volleyball and many more, divided into two sections with each catering to kids and adults the park has been developed by the Delhi Tourism corporation in collaboration with the DDA.



### LEISURE ACTIVITIES

It includes different type of activities like sitting on the grass, benches and near the lake. Some people spending their time by sleeping on the benches and some are enjoying the lake view. The grass mounts also playing major roles as fun time for children on which they are rolling and resting on them. A small plaza present near the lake which attracts more people to spend time where the people feel calm and serene.



### CRICKET

Cricket is only sport that is played by children in the precinct. There are no proper area present for the children which is the one major sport played in India. Children plays cricket on the barren land located in the Sanjay Lake precinct. It is played near the Mayur Vihar residential areas and near the EOD adventure park.



### ANTI-SOCIAL ACTIVITIES

It is one of the largest activities happening on the site which is the biggest issue of the precinct that has to be resolve. The activity happening in the form of liquor consuming, snatching and gambling. People made the groups and start playing the cards. There are large number of groups present on the site. This happens mostly the undeveloped area of precinct and some part of Present Park which decreases the footfall of site.



## 8.7 SWOT ANALYSIS

### Strengths

- The land parcel is in 300 m radius of the metro station, thus become intense TOD zone with FAR 400
- TOD norms provide more flexibility in the uses for a design scheme, therefore development can be market friendly and responsive to changing local needs.
- Development would benefit from unhindered views of lake.
- Larger footfall due to presence of high density residential area around the site.
- The Sanjay lake park will maintain the micro climate.

### Weaknesses

- Local market is depressed and thus no takers for single use (commercial) development in the area.
- The area is neglected and ridden with crime, thus making it unsafe at night.
- One other recreational element, Chand cinema had shut down due to crime and other social problems.
- Excessive anti-social crowd around the land parcel.
- Unhygienic and dirty conditions of the lake due to waste disposed by squatters, kalyanpuri and Trilokpuri area.

### Opportunities

- High density development for large footfalls.
- Development of mixed use buildings would cater to different function requirements thus maximizing revenue.
- The park would benefit from being watched over by public uses along the lake edge.
- This will help in making entire area safer, socially vibrant and better used by providing passive visual surveillance.
- Creation of a city level destination will enhance the local economy and help catalyse change of the area.

## Threats

- Only high end commercial developments might pop up, there may be no opportunity for small scale activities.
- Commercial development might increase traffic congestion, appropriate parking measures must be followed.
- Lack of civic pride and social vibrancy in the area due to presence of many anti-social elements.
- Issues of safety, security and encroachments from neighbouring slums.
- Creation of a city level destination will enhance the local.

**CHAPTER 9:**  
**INFERENCES & CONCLUSION**



## 11.0 Inferences and conclusion

- The site surrounding are the driving force for the proposed development. The facilities and functions to be provided on the land parcel are apt with the huge residential area around.
- The major aspect here is the Trilokpuri Sanjay lake metro station, thus making If a TOD zone where FAR is 400 and all policy, norms and guidelines will apply.
- This makes the fact very clear that there will be huge footfall towards proposed offices and retails.
- A high density development is envisioned to accomplish the required FAR of 400, hence high-rise buildings are a solution.
- Proposal for mixed use buildings including service apartments, offices and retail is very crucial at this point of time for utilising the TOD zone and FAR.
- Utilising the opportunity of having retails at ground and first floor level because of the metro station.
- The site is surrounded by predominantly residential area, therefore the proposal must have facilities to cater to them.
- As of now the residential developments have their backs facing the lake The park is surrounded by boundary wall and places where connections area there, are not met will care. Steps should be taken to link these areas to the Sanjay Lake.
- Landscaping of the entire lake complex should be dealt with utmost care. This should link al the recreational facilities spread across the complex and the lake.
- Vehicular and pedestrian entries must be kept apart. Here in this proposal vehicular movements can run along edges to a certain point and pedestrian movement through the site across the ground floor retails.
- The plot enjoys excellent linkages with other part of city and is situated in close proximity to Mayur Vihar phase I, Kalyanpuri, NH-24, 5 km from Anand Vihar Railway station, Delhi and 4 km from the Akshardham temple, a well-known tourist spot.
- Steps need to be taken to revive the lake by floating plant beds and other scientific plantation strategy like bios wales.

# **CHAPTER 9 :**

# **DRAWINGS**