

**URBAN RENEWAL OF A COMMERCIAL
DISTRICT AROUND MRTS TERMINAL
(CASE APPLICATION - HOWRAH MAIDAN)**

An Urban Design Thesis Report

*A Thesis Report
Submitted In Partial Fulfillment Of The Requirements
For The Post Graduate Degree Of
Master Of Architecture(Urban Design)
Of The Jadavpur University, Kolkata*

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CHAPTER 1: INTRODUCTION

1.1 BACK GROUND-

With the rapid development of the national economy and the speeding up of urbanization, the rail transport is gradually becoming the main way of the urban public transportation.

India is urbanizing at a rapid pace with urban population rising much faster than its total population. Level of urbanisation has increased from 17.29% in 1951 to 31.6 % in 2011.



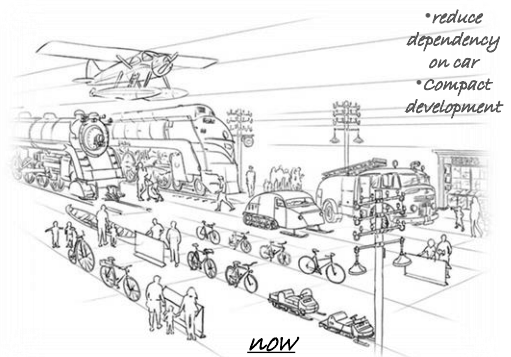
Fig 1:Urbanisation

The topic of my thesis research has originated from my personal experience and interests in the urbanization of my home town Howrah, an industrial city of India. Because of the industrial prosperity the city used to be called 'The Sheffield Of The East'.

Although that prosperity did not match with the urbanization and infrastructural development with time. Moreover the current trend of market driven unplanned urbanization is leading to the further decaying of the spatial, social, environmental and economic context of the city. Moreover, a metro is coming up in the city and will work as catalyst to development, specially in commercial market. So, in my thesis I am trying to propose some design proposals for the commercial development by considering the impact of MRTS(mass rapid transit system)



then



now

Fig 2:Then And Now Perspective Of Transportation System



Fig 3:Jharkhand present condition

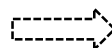


Fig 4:Jharkhand's Vision 2026

1.1 BACK GROUND-

1.1.1 DEFINITION

1.1.1.1 URBAN RENEWAL

Renew - 'give fresh life or strength to'

Urban renewal- Rebirth or regeneration of a city'
 A catalyst for the enhancing of key areas in the city
 A tool for improving less developed urban areas



The fundamental object of urban renewal is the applying of several principles resulting the revitalization of any or all portion of the urban structure which are not fulfilling the functions for which they are designed (by miller).

The process where an urban neighborhood or area is improved and rehabilitated. The renewal process can include demolishing old or run-down buildings, constructing new, up-to-date housing, or adding in features like a theater or stadium. Urban renewal is usually undergone for the purposes of persuading wealthier individuals to come live in that area. Urban renewal is often part of the gentrification process. (source:businessdictionary.com)

Urban renewal, comprehensive scheme to redress a complex of urban problems, including unsanitary, deficient, or obsolete housing; inadequate transportation, sanitation, and other services and facilities; haphazard land use; traffic congestion; and the sociological correlates of urban decay, such as crime. Early efforts usually focused on housing reform and sanitary and public-health measures, followed by

growing emphasis on slum clearance and the relocation of population and industry from congested areas to less-crowded sites, as in the garden-city and new-towns movements in Great Britain. Late 20th-century criticisms of urban sprawl prompted new interest in the efficiencies of urban centralization. Each country approaches urban renewal according to its means and its political and administrative systems.

One of the chief activities of urban renewal is redevelopment, which is achieved through the clearance and rebuilding of structures that are deteriorated or obsolete in themselves or are laid out in an unsatisfactory way. (source:britannica.com)

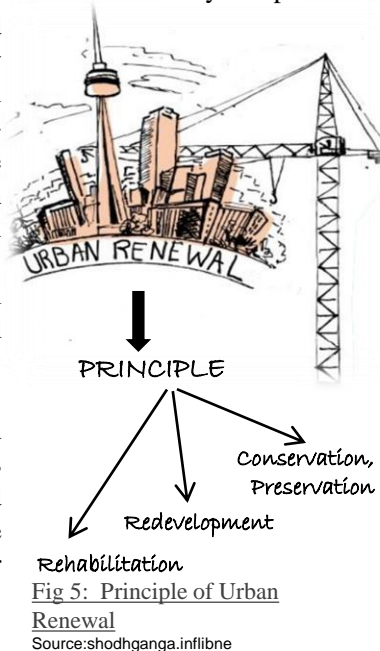


Fig 6: Melbourne Docklands urban renewal project
 Source:www.development.vic.gov.au

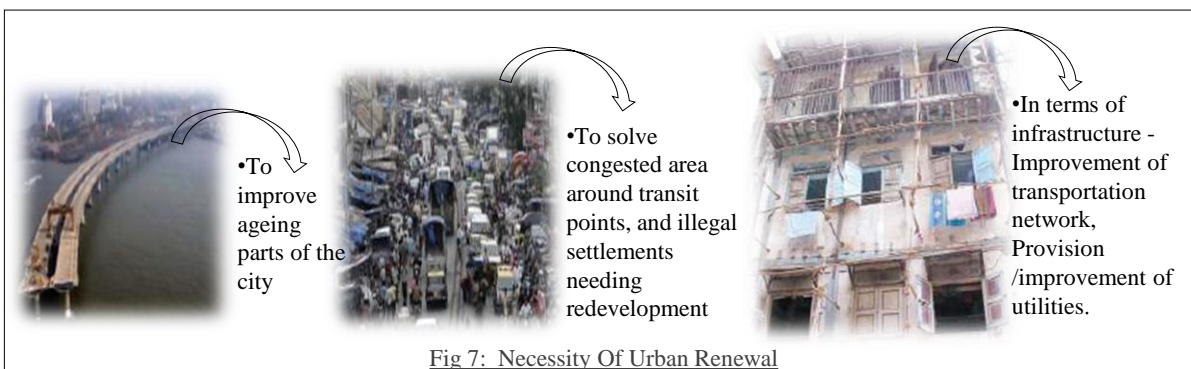


Fig 7: Necessity Of Urban Renewal

1.1 BACK GROUND-

1.1.1 DEFINITION

1.1.1.2 COMMERCIAL DISTRICT

A commercial district or commercial zone is any part of a city or town in which the **primary land use is commercial activities**, as opposed to a residential neighbourhood, an industrial zone, or other types of neighbourhoods



Commercial Activities In Howrah Maidan -

Howrah Maidan is a one of the main commercial market in the district Howrah. it has a main wholesale market (mangala hut)

Type of Commercial Activities in Howrah Maidan-

- Retails Shops
 - Garments Shops
 - Stationery Shops
- Office/Bank
- Malls
- Wholesale Market

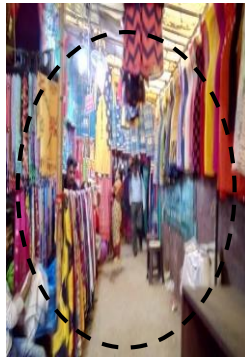


Fig 8 : Retail Shops



Fig 9: Retail Shops

1.1 BACK GROUND-

1.1.1 DEFINITION

1.1.1.3 MRTS (MASS RAPID TRANSIT SYSTEM)

•MRTS is a bus or rail-based public transport mode operating on fully or partially exclusive rights-of-way—also known as the “alignment.” This alignment can be at-grade (i.e., surface based), elevated, or underground. Some of the most common forms of MRT are metros, streetcars, tramways (sometimes referred to as light-rail transport, or LRT), and bus rapid transit (BRT).

MRTS TERMINAL

Transport modes require **assembly and distribution** of their traffic, both passenger and freight. Terminals are **essential links** in transportation chains with many representing substantial infrastructure and capital investments

Terminal. Any location where freight and passengers either originates, terminates, or is handled in the transportation process. Terminals are central and intermediate locations in the movements of passengers and freight. They often require specific facilities and equipment to accommodate the traffic they handle.

Three major attributes are linked with the importance and the performance of transport terminals:

✓ 1.Location-

The major locational factor of a transport terminal is obviously to serve a large concentration of population and /or industrial activities,representing a terminal’s market area.

✓ 2.Infustructure-

The main function of a terminal is to handle and transship freight or passenger since modes and physically separated

✓ 3.Accessibility-

Accessibility to other terminals(at the local,regional,and global scale)as well as how the terminal is linked to the regional transport system is of importance

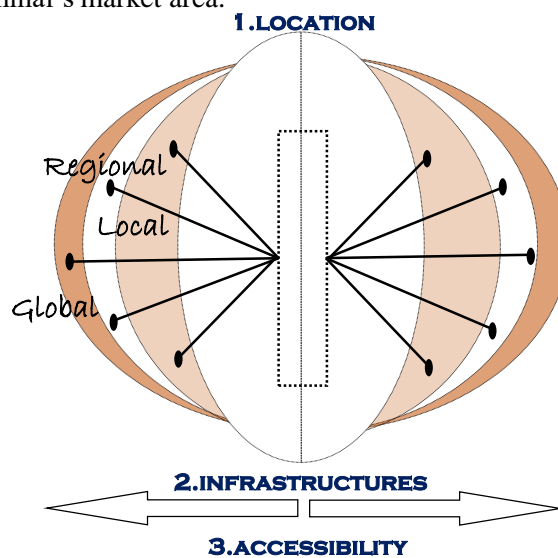


Fig 11: major attributes of transport terminal

Benefits of MRTS-

- High carrying capacity
- Energy efficiency.
- Reduced air pollution
- Encourage higher density development and better use of scarce, expensive urban space
- Promote greater equity and mobility for a larger segment of the population.

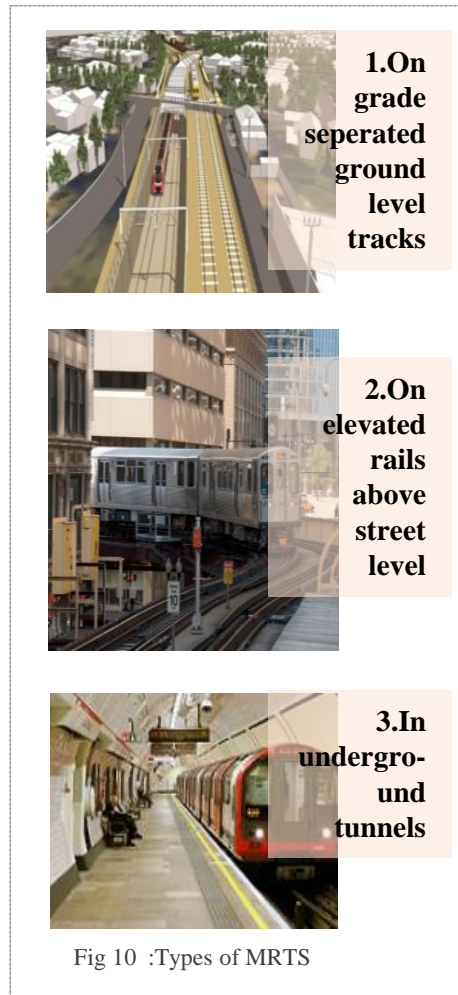


Fig 10 :Types of MRTS

1.1 BACK GROUND-

1.1.1 DEFINITION

1.1.1.4 HOWRAH DISTRICT



Howrah district is a district of the West Bengal state in eastern India. Howrah district is one of the highly urbanized area of West Bengal. The urbanized sectors gradually increase the slum populations. The Howrah city called “Glasgow” of India and "Sheffield of India". Howrah is the second largest city and second smallest district after Kolkata. It has thousands of years of rich heritage in the form of the great Bengali kingdom of Bhurshut. The district is named after its headquarters, the city of Howrah.



WEST BENGAL, a state of eastern India. This is located between the Himalayas and the Bay of Bengal

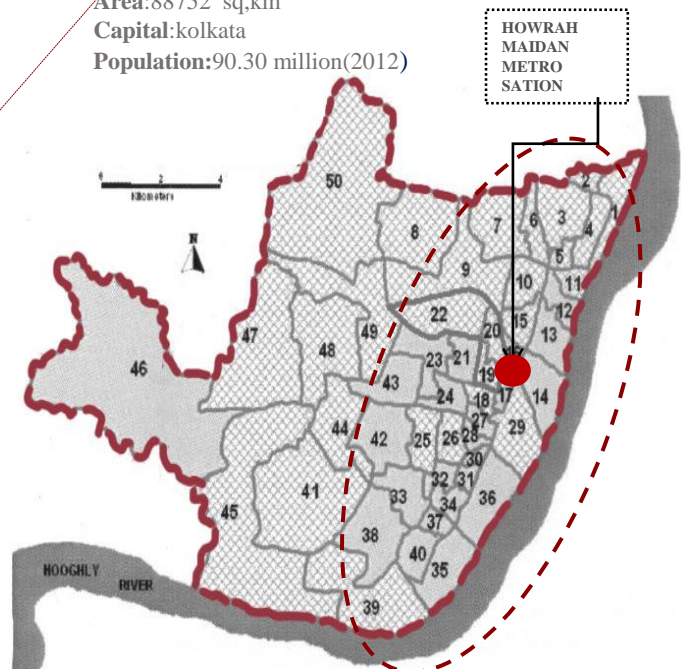
Area: 88,752 sq. km

Capital: Kolkata

Population: 90.30 million (2012)



Howrah Map



Howrah Municipal Corporation Area (Ward Divisions)

HOWRAH, is an industrial city located on the west bank of river Hooghly and is a twin city of Kolkata and the head quarter of Howrah district

Area: 95 sq. km

Population: 1,072,161 million (2011)

Density: 730/sq. km

Official language: Bengali & English

PROFILE OF HOWRAH MUNICIPAL CORPORATION

Total Area- 64.55 Sq. Km

Total Population - 14.71 Lakhs

Number of Household - 274672

Number of Slums - 660

Slum Population - Canal 530 Km

Surface Canal - 60 Km

Sewerage System - 70 Km

Water Treatment Plant - 1 with 70 MGD capacity

Roads Length - 930 Km

1.1 BACK GROUND-

1.1.1 DEFINITION

1.1.1.5 METRO IN HOWRAH

East-West Corridor is a rapid transit line of the Kolkata Metro currently under construction. It will connect Salt Lake in Kolkata with Howrah by going underneath the Hooghly River/Ganga in the Indian state of West Bengal. It would consist of 12 stations from Salt Lake Sector V in the east to Howrah Maidan in the west, of which 6 would be elevated and 6 would be underground, with a total distance of 16.6 km

Howrah Maidan Metro Station is a station of the Kolkata Metro in Howrah Maidan, Howrah, India. The underground station is located near the Howrah Municipal Stadium and the Howrah Sarat Sadan. It is the terminus of Line 2 of the Kolkata

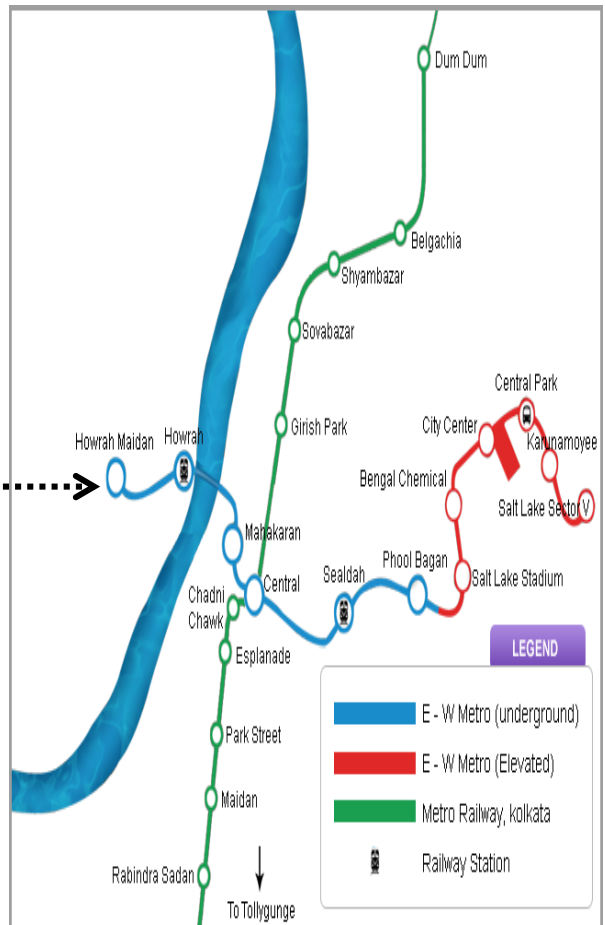


Fig 12: Metro Corridors Of West Bengal

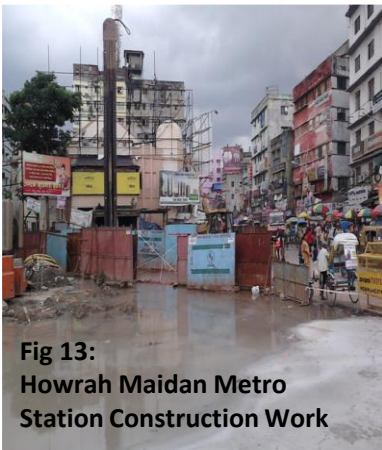


Fig 13: Howrah Maidan Metro Station Construction Work

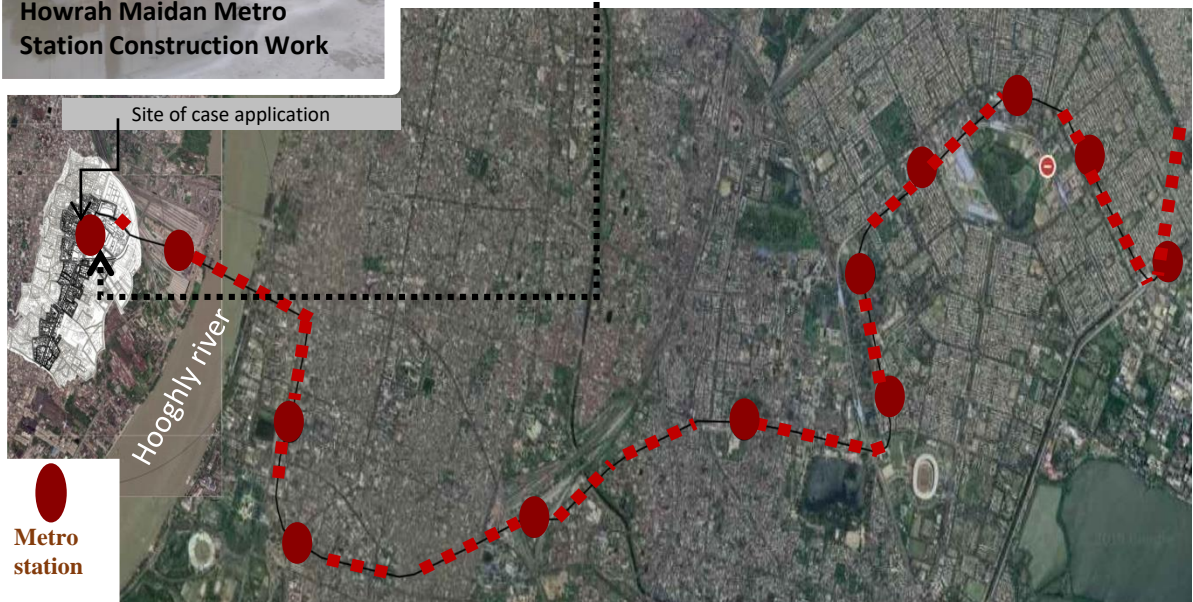


Fig 14: East West Metro Corridor

1.1 BACK GROUND-

1.1.2 EXISTING THEORY

TRANSIT ORIENTED DEVELOPMENT(TOD)

TOD integrates land use and transport planning and aims to develop planned sustainable urban growth centers, having walkable and livable communes with high density mixed land-use..

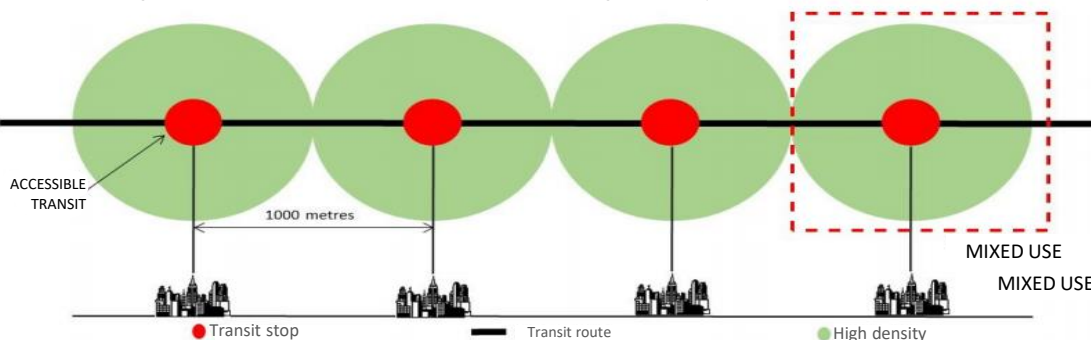


Fig 15: TOD along transit stations

FAR and Density:

TOD norms of FAR and density may be availed through the preparation and approval of comprehensive integrated scheme of minimum size 1 Ha,

- a. Maximum ground coverage of 40%. In case of MRTS/ Government Agencies, the minimum plot size for development shall be 3000 sq.m.
- b. For Integrated Scheme, a max. FAR of 400
- c. A maximum density of 2000 persons per hectare (PPH).
- d. The entire amalgamated plot will be considered for calculating the FAR and density.
- e. Mandatory EWS FAR of 15% over and above the maximum permissible FAR shall be applicable. Additional FAR may be availed through TDR only, for schemes larger than 1 Ha.
- f. All residents residing in that scheme area shall have to be accommodated within the same scheme

Landuse as per ZDP (At Least 50% of total FAR to be as per ZDP Use)	Indicative Mix of Uses within FAR Utilization			
	Minimum Residential*	Minimum Commercial**	Minimum Facilities**	Indicative Mix of Uses within remaining 50% FAR, as per ZDP landuse
RESIDENTIAL	30%	10%	10%	<ul style="list-style-type: none"> • Of the remaining FAR, at least 20% or more (upto 70% of total) is for Residential use. • Other uses are permitted upto 30%.
COMMERCIAL	30%	10%	10%	<ul style="list-style-type: none"> • Of the remaining FAR, at least 40% or more is to be for commercial use. • Other uses are permitted upto 10%.
INDUSTRIAL	30%	10%	10%	Remaining 50% of FAR to be for Industrial use.
GOVERNMENT	30%	10%	10%	Remaining 50% of FAR may be for any Government use.
TRANSPORTATION	30%	10%	10%	Remaining 50% of FAR may be for any use after meeting all operational requirements for transportation facilities. Additional norms as per Table 12.7 are applicable.
PUBLIC AND SEMIPUBLIC FACILITES (PSP)	30%	10%	10%	Of the remaining FAR, at least 40% or more is to be for PSP use. Other uses are permitted upto 10%.
MIXED-USE	30%	10%	10%	Remaining 50% of FAR may be for any use.

Fig 16: FAR Utilization In TOD

Source: National Transit Oriented Development (TOD) Policy

1.1 BACK GROUND-

1.1.2 EXISTING THEORY

APPROACH FOR TOD

➤ Influence Zone of transit oriented project

- The area in the immediate vicinity of the transit station, i.e. within a walking distance, having high density compact development with mixed land use to support all basic needs of the residents is called the influence zone of a transit station/ corridor.
- Influence zone is either established at a transit stations or along the transit corridors. It is generally up to a radius of nearly 500-800m of the transit station.
- Where the distance between the transit stations is less than 1 km and there is overlap in the influence area, it can be identified as a delineated zone (around 500m) on either side of the transit corridor within 10 - 12 minutes walking distance.
- The area of influence, where the TOD is planned for implementation, should be demarcated and notified through master plan and local area plans before implementation. If in any case the TOD is to be implemented in a phased manner, the influence area of the TOD can also be notified in phases. The principles for delineating the influence area should be clearly indicated so that there is no speculation or confusion regarding the influence zone.

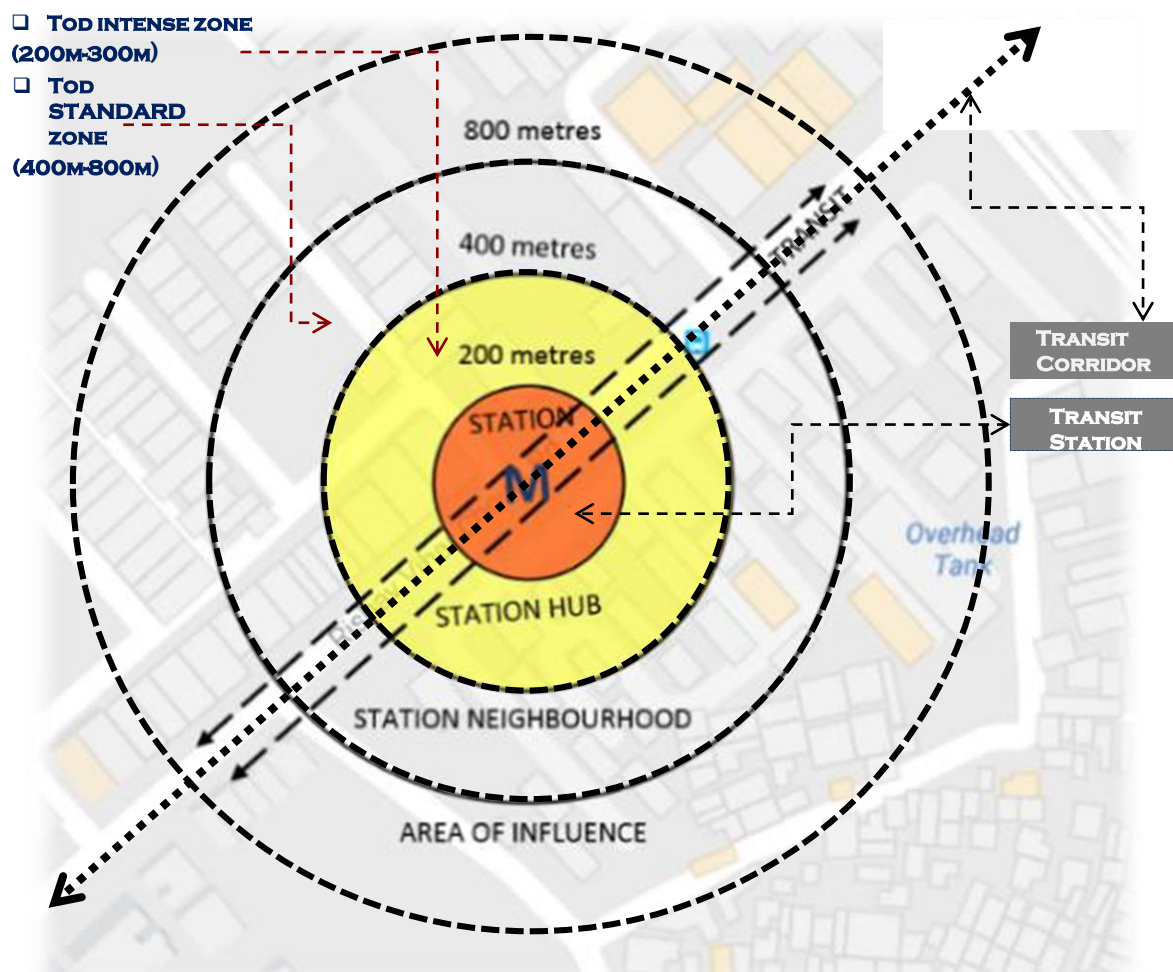


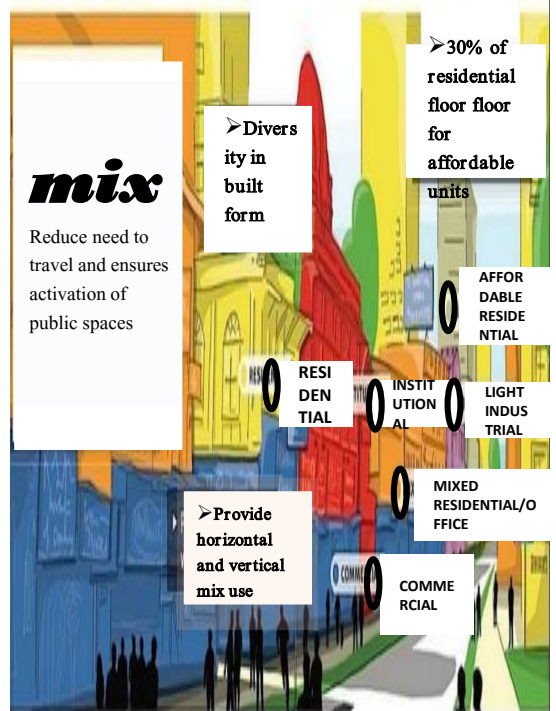
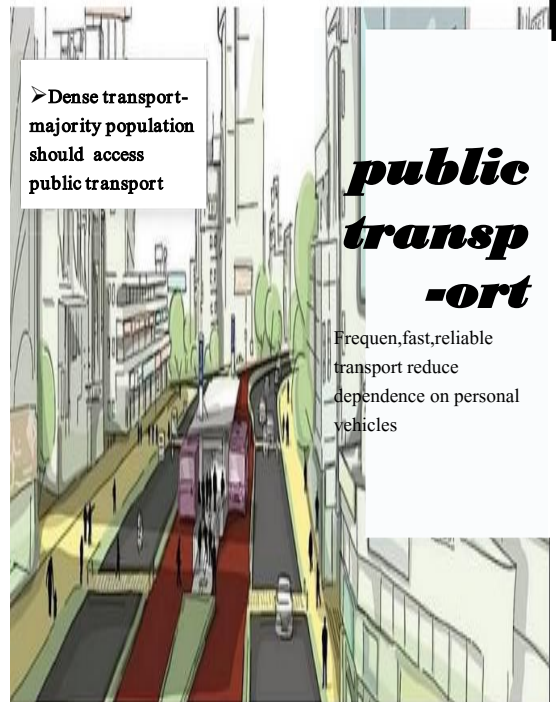
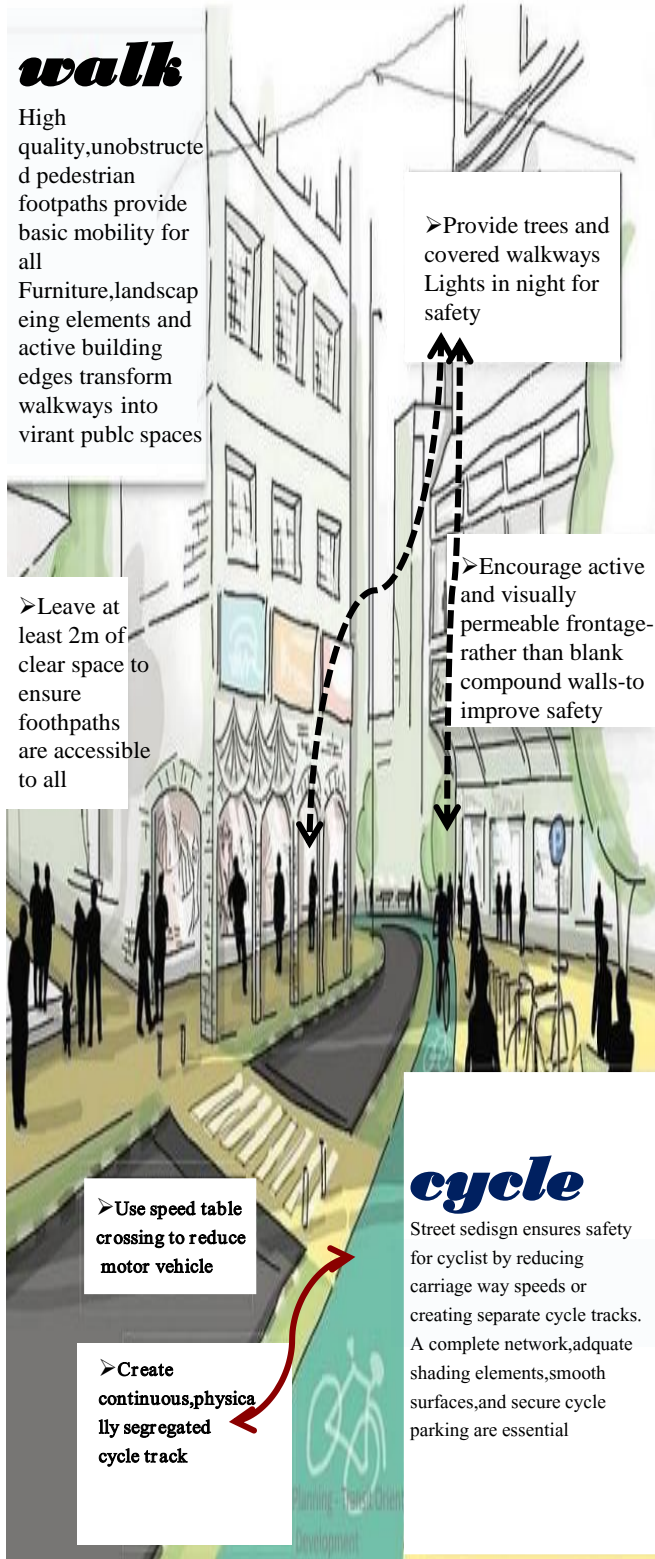
Fig 17 Approach For TOD Implementation-
Source: National Transit Oriented Development (TOD) Policy

1.1 BACK GROUND-

1.1.2 EXISTING THEORY

APPROACH FOR TOD

➤PRINCIPLE OF TOD POLICY

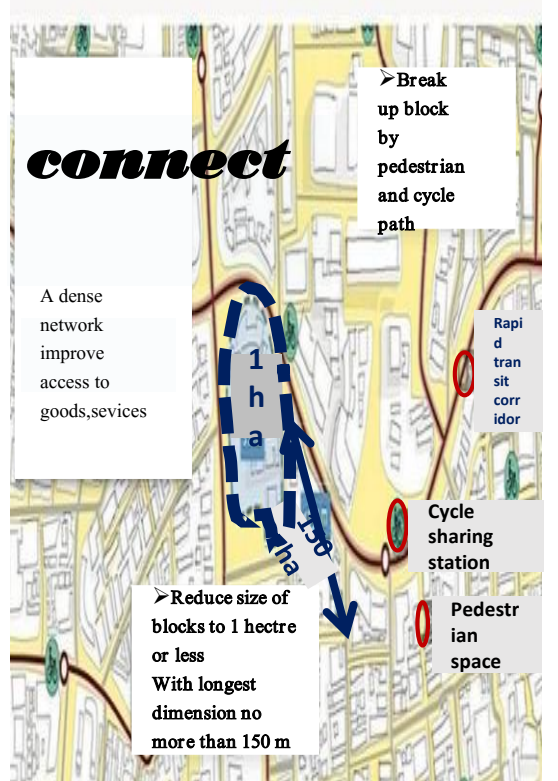
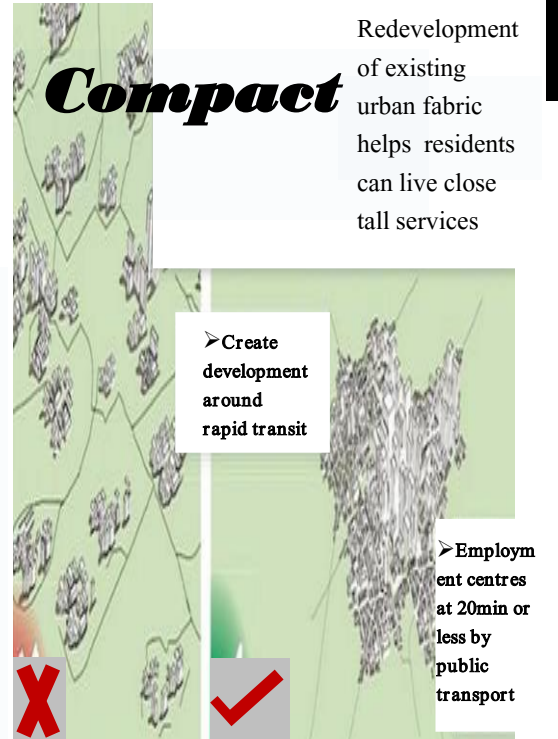
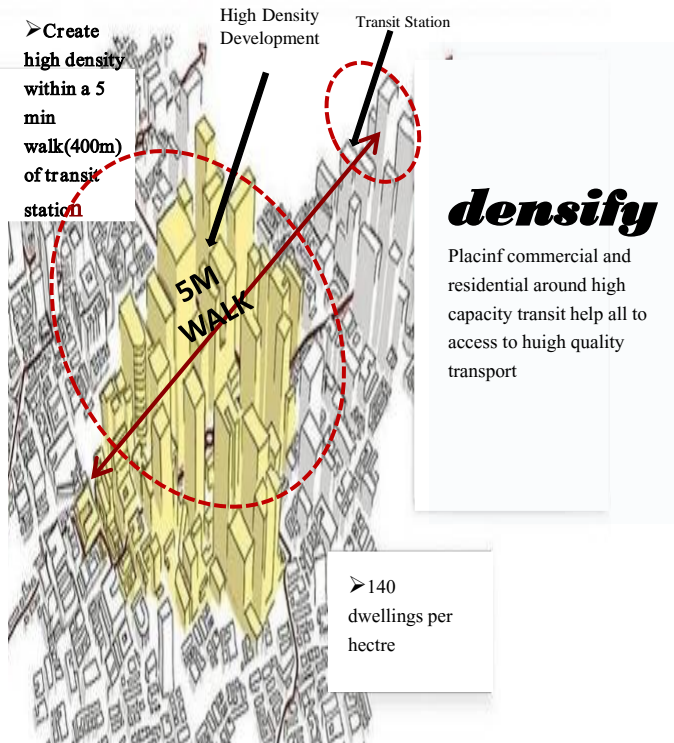


Source: National Transit Oriented Development (TOD) Policy

1.1 BACK GROUND-

1.1.2 EXISTING THEORY
APPROACH FOR TOD

➤PRINCIPLE OF TOD POLICY



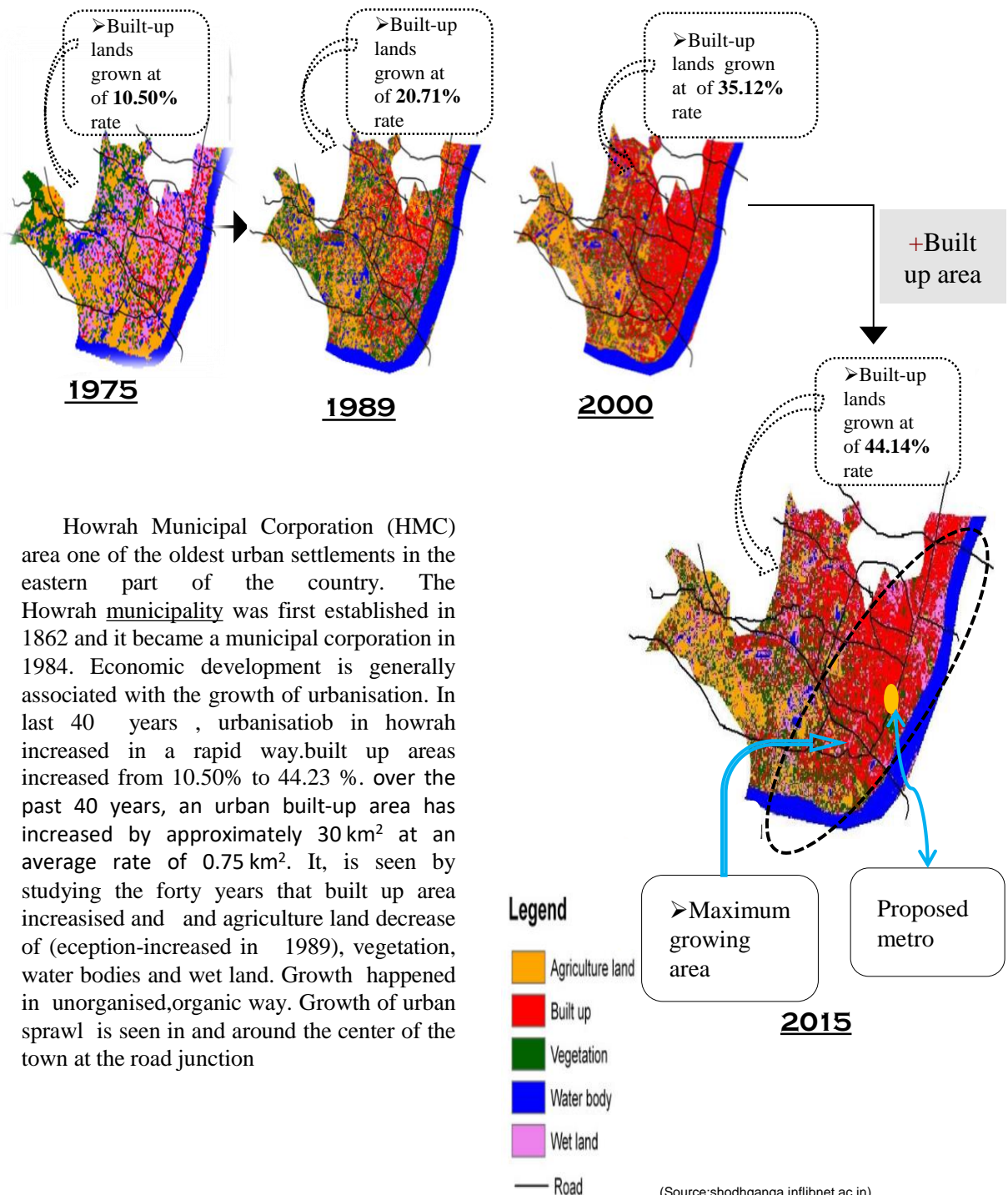
Source: National Transit Oriented Development (TOD) Policy

1.1 BACK GROUND-

1.1.3 JUSTIFICATION

Growth Of Urbanisation In Howrah Municipal Corporation Area-

The Howrah district is currently going through a phase of rapid industrialization and urbanization. For the purpose of realization of a dream of healthy living and prospered life, a large mass of people shift their base from rural to urban areas either with their family or more commonly leaving them behind. The Howrah Municipal Corporation has the number of population (23.58% of total population) among all C.D. Blocks, Municipalities and Municipal Corporation.



Howrah Municipal Corporation (HMC) area one of the oldest urban settlements in the eastern part of the country. The Howrah municipality was first established in 1862 and it became a municipal corporation in 1984. Economic development is generally associated with the growth of urbanisation. In last 40 years , urbanisatiob in howrah increased in a rapid way.built up areas increased from 10.50% to 44.23 % . over the past 40 years, an urban built-up area has increased by approximately 30 km² at an average rate of 0.75 km². It, is seen by studying the forty years that built up area increasised and and agriculture land decrease of (eception-increased in 1989), vegetation, water bodies and wet land. Growth happened in unorganised,organic way. Growth of urban sprawl is seen in and around the center of the town at the road junction

1.1 BACK GROUND-

1.1.3 JUSTIFICATION

Accessibility-

Kolkata and Howrah carry a rich and profound legacy of nothing less than a few thousands of years. The East-West Metro corridor will truly redefine the age-old marriage of these two cities making the prospects of their growth multiple in the near future.

Accessibility of the place will increase with the proposed metro as the place will connect with the most important places of Howrah and Kolkata easily



howrah Station



Airport



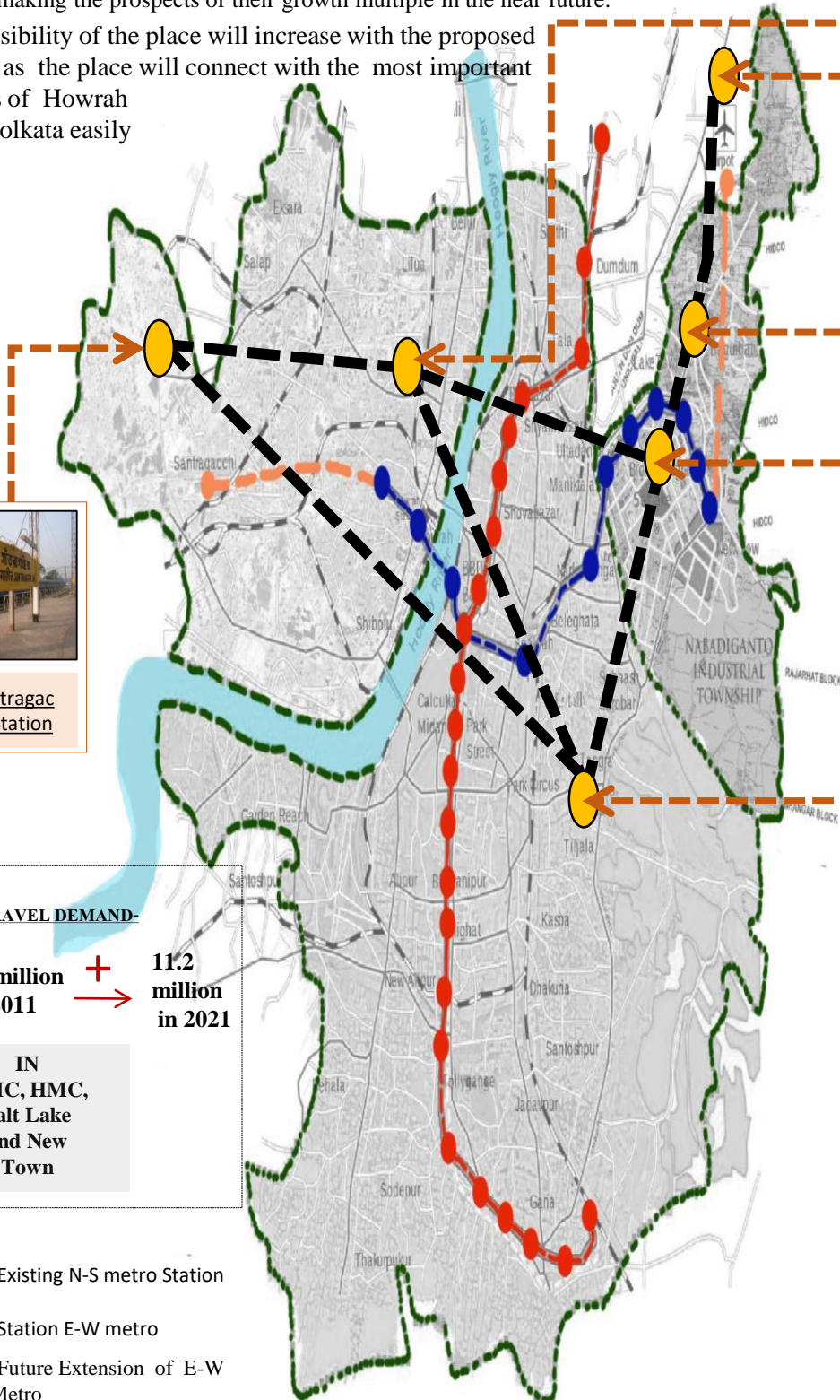
Newtown



Salt lake



Sealdah Station



Santragachi Station

➤ TRAVEL DEMAND-

6.5 million in 2011 + 11.2 million in 2021

IN KMC, HMC, Salt Lake and New Town

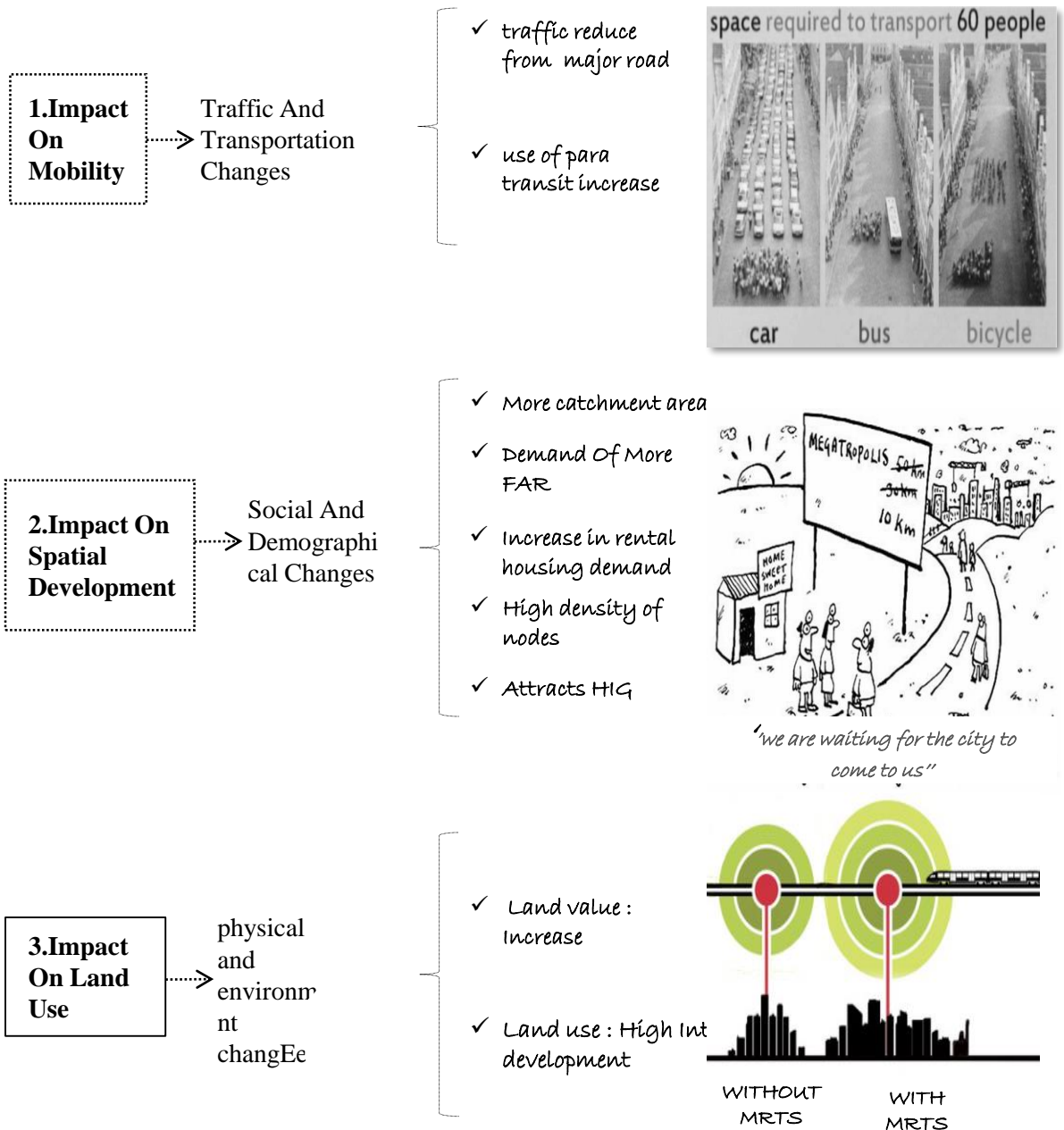
- •Existing N-S metro Station
- •Station E-W metro
- •Future Extension of E-W Metro

1.1 BACK GROUND-

1.1.3 JUSTIFICATION

Assessing Impact Of Metro Stations Integrating Commercial Landuse & Transport-

Land use and transportation interaction is a dynamic process that includes spatial and temporal Changes between the two systems. Changes in land use system can cause modifications in the travel demand patterns and induce changes in transportation systems while transportation system evolution, increases accessibility levels and thus stimulate changes in land use patterns (aravatinos, 2000 and zhao et al.,2003). There have been numerous studies the objective of which was to identify the interaction between the two systems in spatial level and in terms of the degree of impact. This study revealed that proximity to rail infrastructure has a positive impact on land value in the vast Majority of case studies.It has been seen that impact due to metro can seen in mobility,spatial development,.land use.



(Source:Impacts of a Metro Station to the Land Use and Transport System: The Thessaloniki Metro Case)

1.1 BACK GROUND-

1.1.3 JUSTIFICATION

HOWRAH IN NEWS

METRO BLUEPRINT

- ▶ Howrah Maidan metro station will be the deepest in the country at 30-metres
- ▶ It will have three concourses for which five slabs will be laid
- ▶ The roof slab for the station has already been laid
- ▶ The diaphragm is complete, the concourse slabs will be laid
- ▶ It will be directly connected to the Howrah station to help passengers

The Howrah Maidan station

The underground Howrah station will be the deepest in the country. Its base from this depth dip further as they enter the Hooghly riverbed. While passage will be 37-metres.

"This station is being built below platforms 16 and 17 and will be one of 11 levels to accommodate the large number of people expected to make it. The total floor area will be nearly three times that of a normal station. There are overhead one to facilitate movement of suburban commuters," a K

10/02/19
Printed from THE TIMES OF INDIA
Howrah to become a mega city
TNN | Jul 12, 2014, 04:07 PM IST

KOLKATA: Howrah is all set to become a growth in a planned manner and to have...
The district of Howrah is witnessing a development. Nabanna that was earlier earmarked as a garden, the last 30 years that has resulted in various civic problems including water logging problems due to the government will preparing a blueprint for the district's

TBM Prerna's journey ends as Metro tunnel reaches Esplanade

STATION AT THE END OF THE TUNNEL

Dec 2016: Alcon-Trans-tunneling starts work
July 2017: Stops for row over route alignment
Nov 2015: Jica agrees to...
April 2016: TBM Prerna starts digging below Howrah Maidan
April 2017: Starts cutting through hooghly river bed
March 2018: Prerna's journey ends

According to...
Printed from THE TIMES OF INDIA
Coordination committee to utilize land in Howrah
TNN | Jul 19, 2016, 03:21 PM IST

Sheffield of India dying an untimely death

KOLKATA: Several land related projects have... to lack of coordination between... land. Prodded by...
TNN | Sep 20, 2009, 02:18 AM IST

East-West Metro to run full course by 2021: MD of KMRC

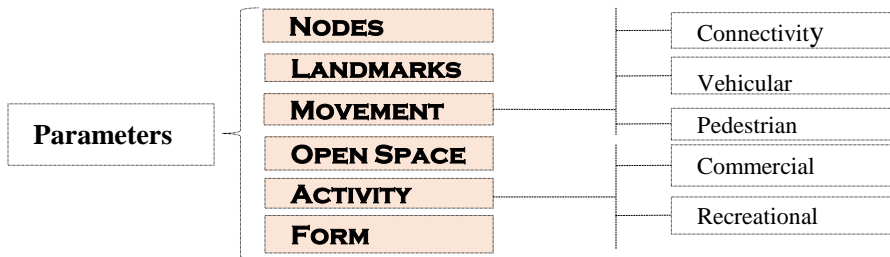
PROJECT WATCH
Stadium To Phoolbagan Service In Early 2019
KMRC to start repairs of school
No compromise on passenger safety

Earlier, Howrah used to be known as the "Manchester of India" for its industrial activities. Location of a number of jute mills and dockyards were other important sources of economic activities in the area. The twin city of Kolkata had grown in an unorganised, organic way. The upper collage of the newspaper gives a view of the situation and the government's initiatives in the recent time to uplift the condition. And also, as the metro is coming up, it may be concluded that the implementation of the MRTS not only improves linkages and mobility but also triggers quality urban development which is seen as a reflection of urban structure and form. This line of thought further strengthens the justification of taking a metro project.

1.1 BACK GROUND-

1.2 PARAMETERS OF STUDY

The study parameters below are some major issues that needed to be observed and studied in an urban area, specially for commercial area around MRTS station or terminal.



1.3 AIM

Renewal of commercial district considering the impact of MRTS terminal on surrounding area

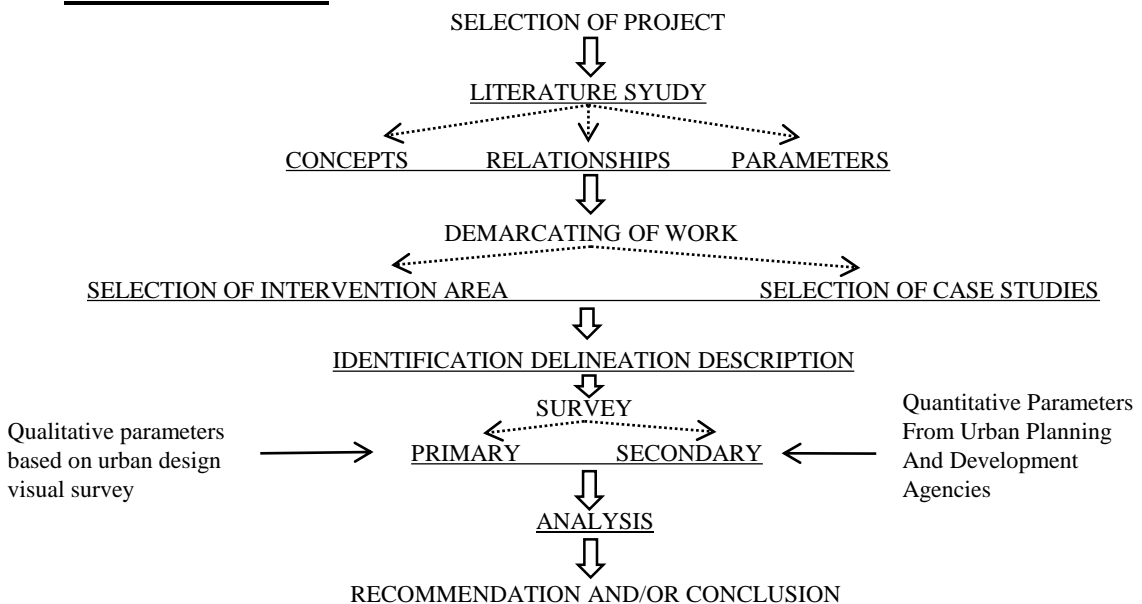
1.3 OBJECTIVE

- To understand the relationship between MRTS and urban commercial area
- To understand the issues of congestion and try to solve the problem with design intervention
- To intervene the commercial area
- To achieve efficiency in terms of function, layout, and circulation

1.4 SCOPE OF WORK AND LIMITATION

- To provide adequate public facilities and services.
- To provide adequate facilities for informal activities.
- To make the condition mapping.
- To make proposals for modification, replacement, improvement work.
- To design proper side walk.
- To ensure visibility of permanent shops.
- To provide smooth traffic flow.
- Furthermore, there are limitations such as,
 - Time limits
 - Budget limit

1.5 METHODOLOGY





CHAPTER 2: CASE EXAMPLES

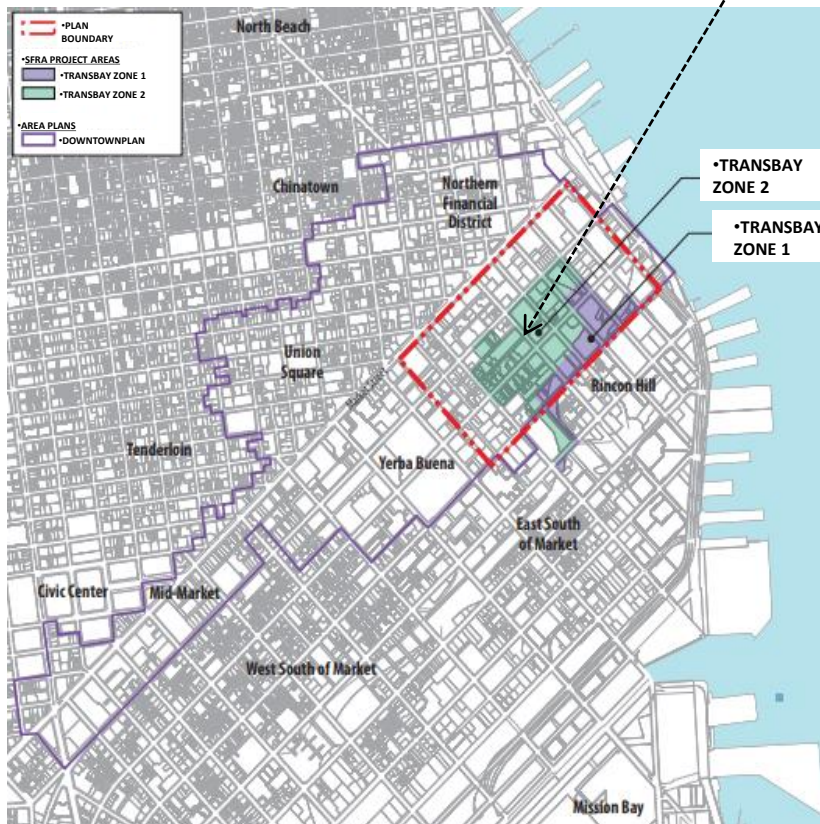
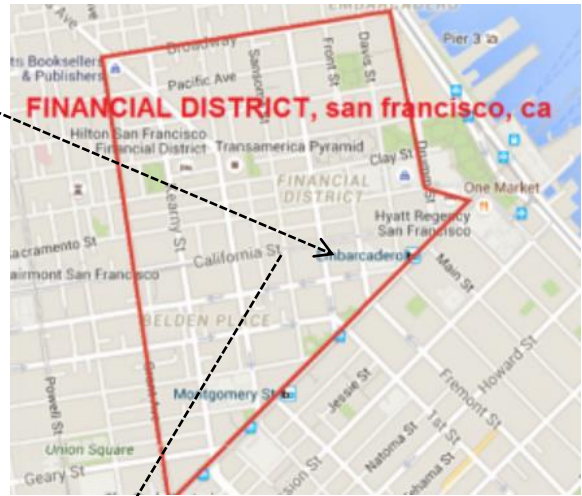
2.1 SAN FRANCISCO-TRANSBY TERMINAL REDEVELOPMENT PROJECT



- Location: San Francisco’s Financial district
- Project Area: approx.40 acre

Description:

The Transbay Transit Center project is a visionary transportation and housing project that transforms downtown San Francisco and San Francisco’s regional transportation system by creating a ‘Grand Central Station Of The West’ in the heart of a new transit-friendly neighborhood. The \$4 billion project will replace the current Transbay Terminal at first and mission streets in San Francisco with a modern regional transit hub connecting eight bay area counties and the state of California through 11 transit systems: AC Transit BART, Caltrain, Golden Gate Transit, Greyhound, Muni, Sam Trans, west Cat Lynx, Amtrak, paratransit and future high speed rail from san francisco to Los Angles/Anaheim.



The project consists of three interconnected elements:

- Replacing the former transbay terminal at first and mission streets
- Extending caltrain and california high speed rail underground from caltron’s current terminus at 4th and king streets into the new downtown transit center
- Creating a new neighborhood with homes, offices, parks and shops surrounding the new transit center

Fig 18: Intervention Site Of Transbay Terminal Project

Source: www.transportation.gov/tifia/financed-projects/transbay-transit-center

The revamped Transbay Transit Center in downtown San Francisco broke ground earlier this week, a project that will introduce a 1.5 million square foot development that will be part transportation hub, part public park and urban space, and part offices and retail establishments. The massive undertaking, designed by renowned architecture firm Pelli Clarke Pelli will bring together 11 systems of local and national transportation, serving 45 million people per year. In addition to securing access to myriad transit lines, the project will also provide downtown San Francisco with a 5.4-acre rooftop park, designed by PWP Landscape Architecture, along with numerous cultural programs. The project is budgeted at 4.2 billion dollars and is projected for completion in 2017. It is funded in part by the construction of a 1,070-foot tower that is adjacent to the Transbay Transit Center. It is also designed by Pelli Clarke Pelli and is slated to be the tallest tower in San Francisco. The tower will secure 60 stories of office space and jobs and will contribute to the projected \$87 billion of revenue through 2030.

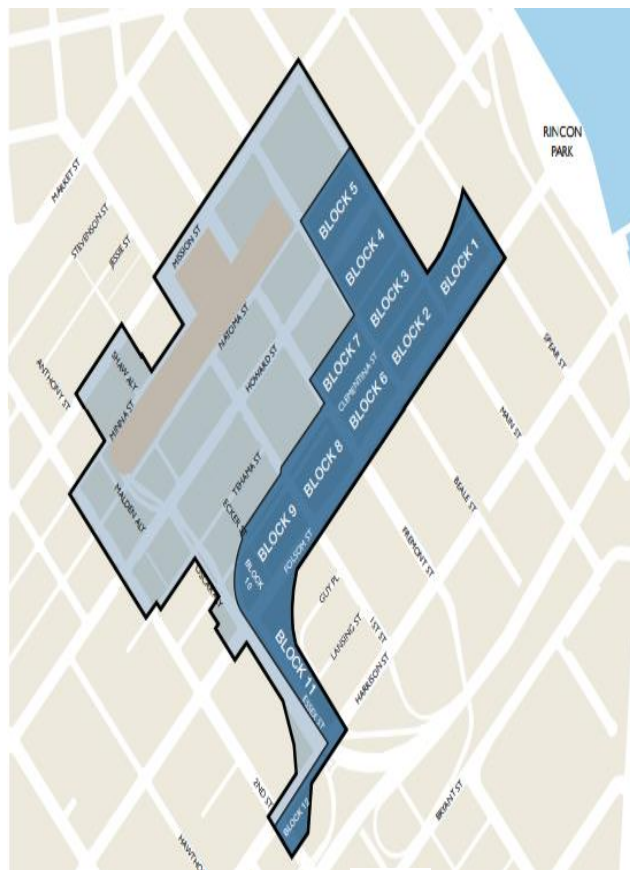


Fig 19 : Transbay Redevelopment Area land use zones

- Zone 1: Transby downtown residential
- Zone 2: Transby C-3



Fig 20 :Grand hall-Conceived as a celebratory space with a sculptural ‘light column’ supporting a skylight



Fig 21 :The terminal as seen from Beale Street

Source:www.transportation.gov/tifia/fiananced-projects/transbay-transit-center

The Transbay Transit Center will span five city blocks, housing a variety of programs that will attract many different types of users to the downtown site. After all, this development is not just a transportation hub. The 5.4-acre rooftop park will include green spaces with diverse and native bay area plants, a 1000-person amphitheater, a cafe, playground, and an art and educational cultural center as well as a variety of cycling and pedestrian paths. The halls of the transportation hub below will be illuminated by natural light, penetrating through skylights within the park.

In the renderings provided by Pelli Clarke Pelli, the hub is seen as having an undulating, translucent facade that creates airy, light-filled spaces within the plazas below. The interior will cater to a variety of users. Commercial spaces - providing both retail and food - will likely offer convenience and recreation for travelers and visitors to the transit center and ensure use of the site by local residents and those passing through.



Fig 22 :View of transbay terminal



Fig 23 :The roof garden as it will appear above the center's façade, from First And Mission Streets looking south

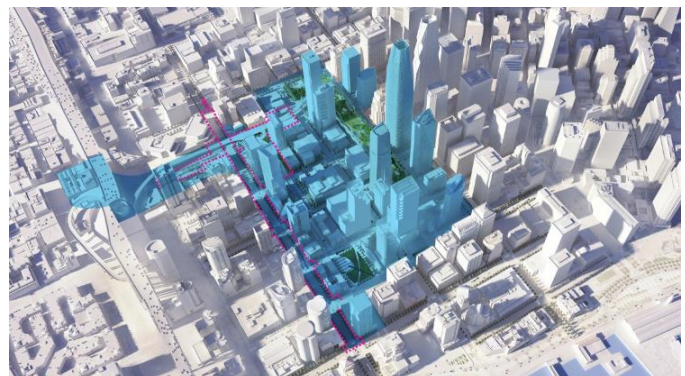


Fig 24 :redevelopment area

Source:www.transportation.gov/tif/ia/financed-projects/transbay-transit-center

Survey and analysis:

The transbay terminal aims to achieve the following changes:

- Eliminating blighting Influences and correcting environmental deficiencies in project area, including, but not limited to, abnormally high vacancies, deficient and unsafe buildings, incompatible land uses poor economic performance of retail business, underutilized and vacant land, high crime rates, and inadequate or deteriorated public improvements, facilities and utilities.
- Assembling land into parcels suitable for modern, integrated development with improved pedestrian and vehicular circulation in the project area
- Strengthening the economic base of the project area and the community by strengthening commercial functions in the project area.
- Providing land for a variety of publicly accessible open spaces.
- Facilitating additional public transit opportunities to and within the project area

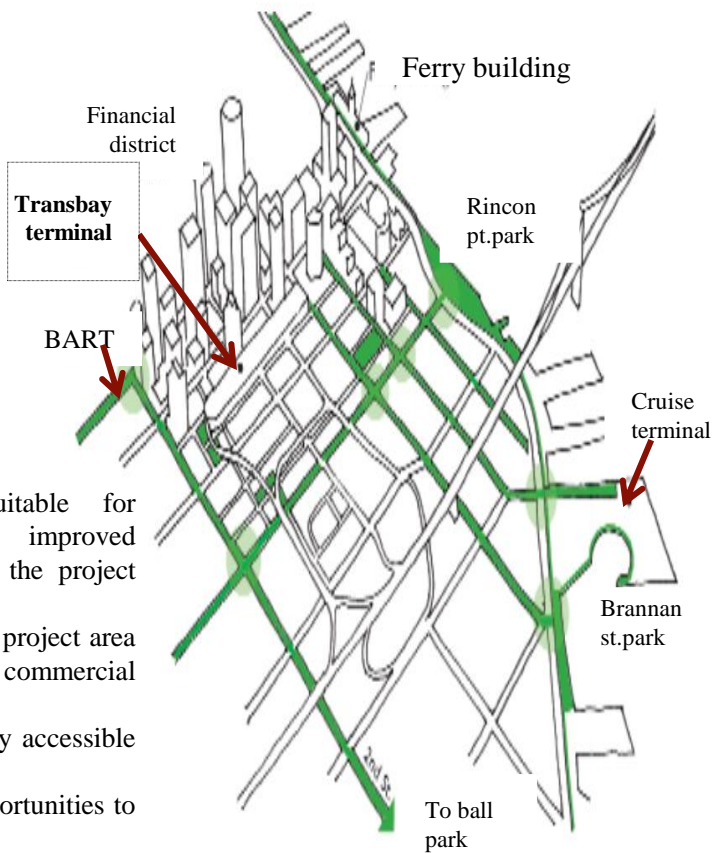


Fig 25 :View of Transbay Terminal

Redevelopment project has impacted the following areas:

- The ground floor of the terminal is accessible to all nearby streets and retail has been provided to pedestrian streets as well as mission square. The access areas to the terminal are designed with information and ticketing kiosks, with sustainable design features including a living 'green' roof, thermal mass and night ventilation to allow passive cooling to the building natural daylight, lead energy efficiency and other green building techniques, apart from retail and public areas a public art space has been created in order to encourage people's activities.
- 'City park', a 5.4 acre rooftop park on top of the transit center has been provided, which will include an open air amphitheater, gardens, a trail for running/walking, open grass areas for picnics, lily ponds and more
- By building the new Transbay Transit center, property value within a ¼ mile radius of the transit center are projected to increase an estimated 10% or more
- A transit tower designed by Pelli Clarke pelli architects and developed by Hines will be built adjacent to the transit center, providing additional financing for the project. The transit tower will transform the San Francisco skyline and is planned to be tallest building on the west coast.

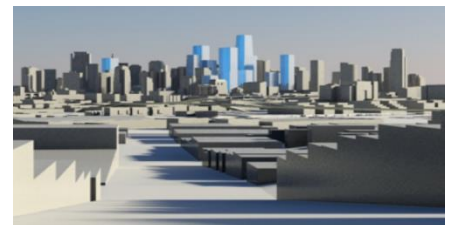


Fig 26 : View from Potrero Hill



Fig 27 :View of 'Green' roof

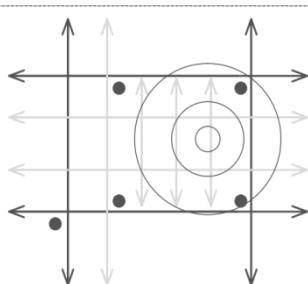
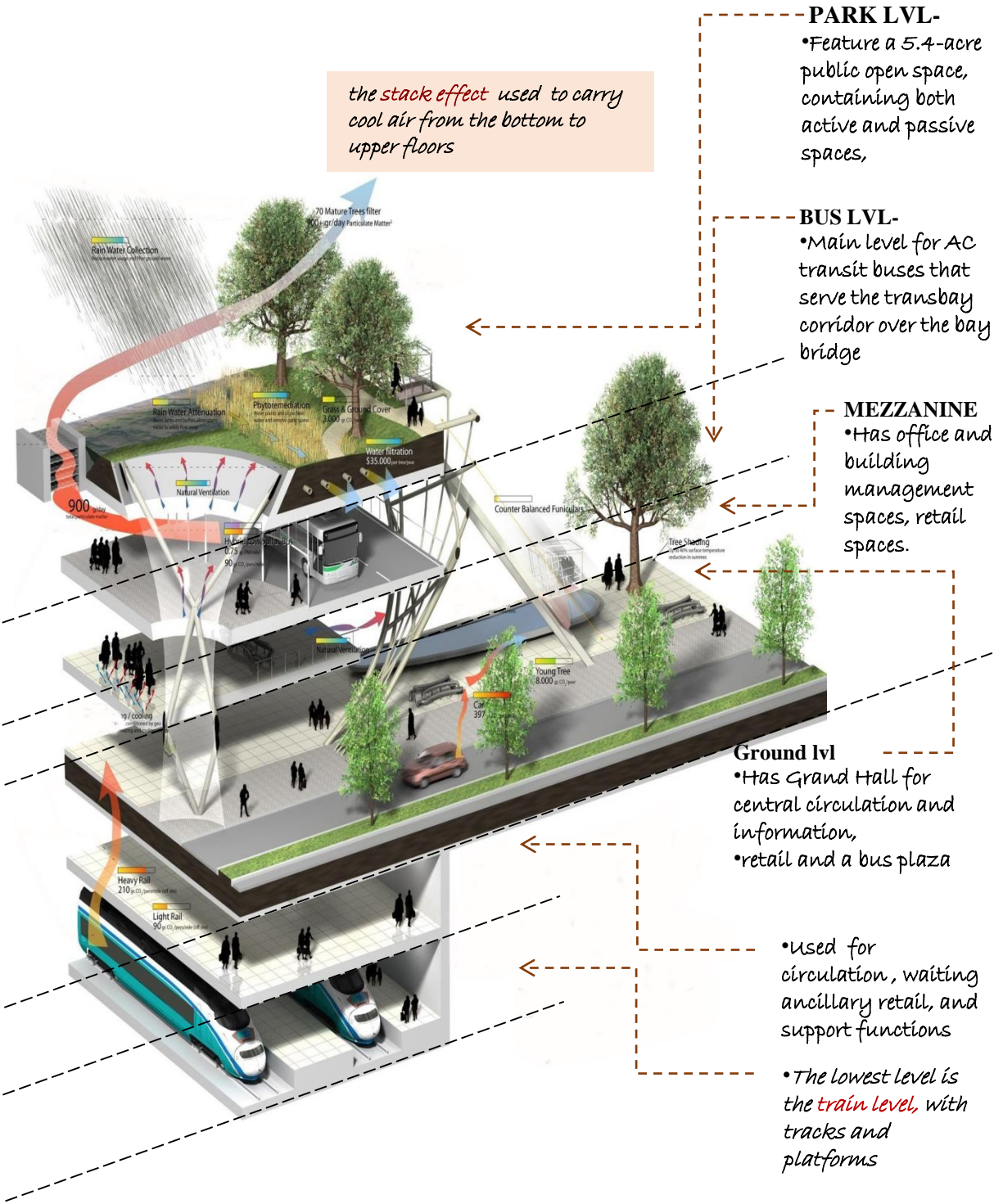


Fig 28 :Movement Analysis Of Transbay Terminal Area

- New commercial and residential development around several suburban BART stations
- Supportive land use policies such as density bonuses and ancillary infrastructure improvements are reaping significance dividends
- Office developments is concentrated within a quarter-mile of downtown BART stations, preventing intrusion into residential neighborhoods.
- New retail development seen adjacent to BART station
- High occupancy rates observed for buildings near BART

•It will bring 11 different transportation systems under a single roof and create a pedestrian and bike friendly community where residents and workers have convenient access to rapid and safe public transit, shopping, open space neighborhood amenities. These features will allow residents to live closer to work reducing commute times and increasing productivity

the stack effect used to carry cool air from the bottom to upper floors



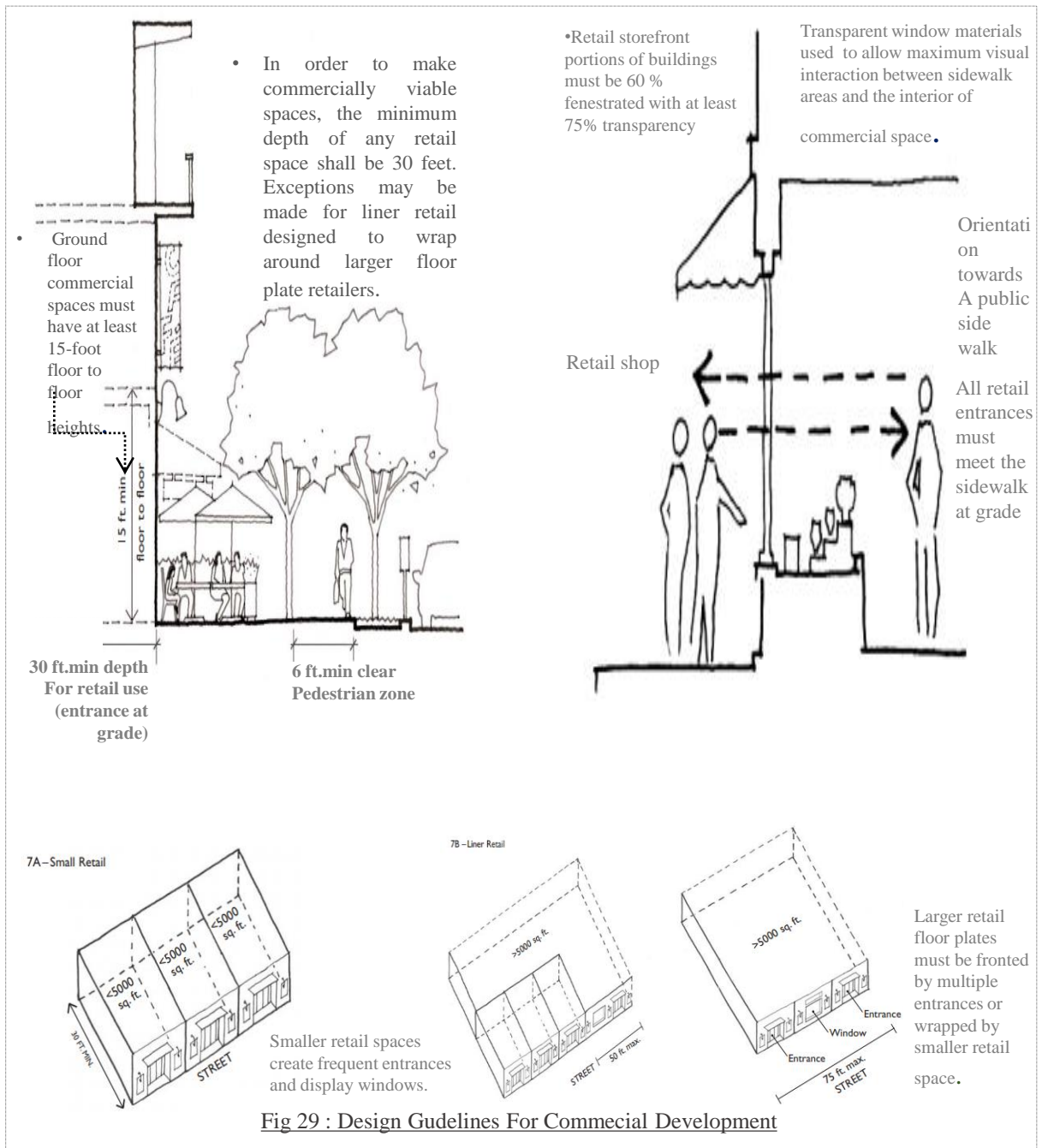
SECTION OF TRANSIT TERMINAL

Source:www.except.nl/en/projects/73-salesforce-san-francisco-transbay-center

•Ground Floor Commercial Design

Design Guidelines

- All buildings on Folsom and Howard Streets should place **-a prominent retail use at the corner(s)**.
- commercial spaces expressed with **facade treatments, scaled to human activity** on the street.
- **Lower levels of the building** shall be treated with changes in **materials, cornice lines, or changes** in fenestration scaled to create a comfortable pedestrian zone.
- Commercial and storefront entrances should be easily identifiable and distinguishable from residential entrances.
- Blank walls at the ground floor are to be minimized



Conclusion:

➤ **Movement-**

- BRT corridor along and away from metro terminus at an access distance of 1 km, connected to metro terminus by feeder ramps
- Arterial roads accessible at inner as well as core areas
- Well connected system pedestrian walkways connected to feeder as well as arterial systems

➤ **Forms-**

- High rise high density in inner impact area
- Medium rise with green open spaces in core impact area
- Medium rise medium density beyond radius of 1 km

➤ **Activities-**

- Higher order retail and office spaces in core impact area
- Ground floor for lower order retail and upper floor for residential.
- Green spaces connecting institutional activities to residential ones

➤ **Landmark-**

- The Transbay Transit Center Project will construct a landmark multi-modal transit facility in downtown San Francisco, connecting the city's urban core with 11 local, regional, and statewide transit systems

➤ **Open space-**

- The project will create a vibrant urban community by catalyzing nearby development, while reserving green space for a 5.4 acre rooftop park.
- Mid-block pedestrian ways
- Connections to Transit Center rooftop park



Fig 30 : Movement Pattern Of The Development Area

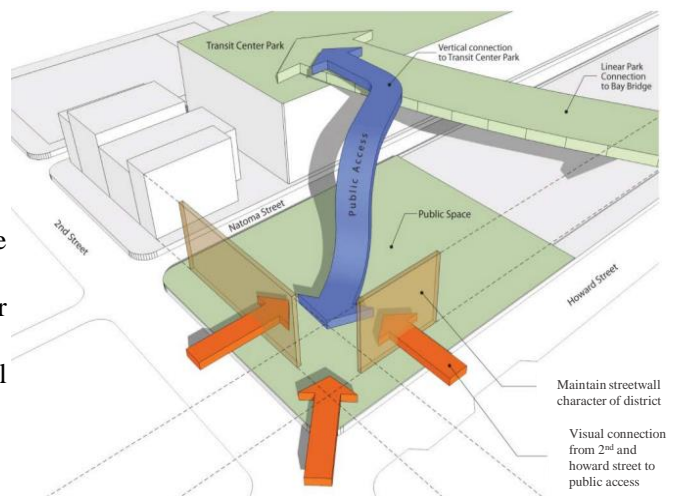


Fig 31 : Public Realm: Open Space

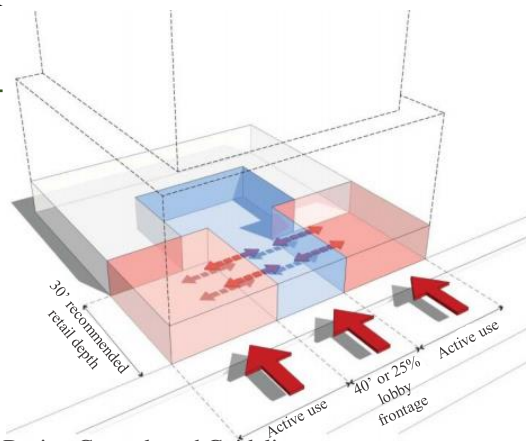
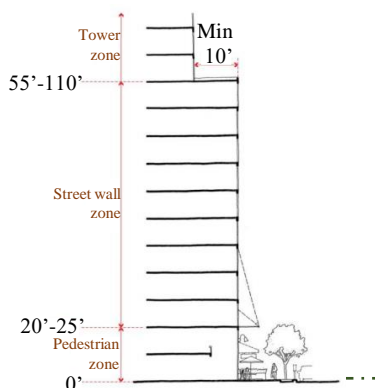


Fig 32 : Urban Design Controls and Guidelines

2.2 SINGAPORE-JURONG EAST MRT STATION AREA DEVELOPMENT

Description:

Singapore, or the republic of Singapore, is an island country made up of 63 islands. Singapore is the world's fourth leading financial center, and its port is one of the five busiest ports in the world. The country is highly urbanised with very little primary rainforest remaining, although more land is being created for development through land reclamation projects. There are ongoing land reclamation projects, which have increased Singapore's land area from 581.5km(224.5sq.mi) in the 1960s to 704 sq km (772 sq.mi) today; it may grow by another 100 sq.km(40 sq.mi) by 2030. Some projects involve merging smaller islands through land reclamation to form larger, more functional islands, as with Jurong island.

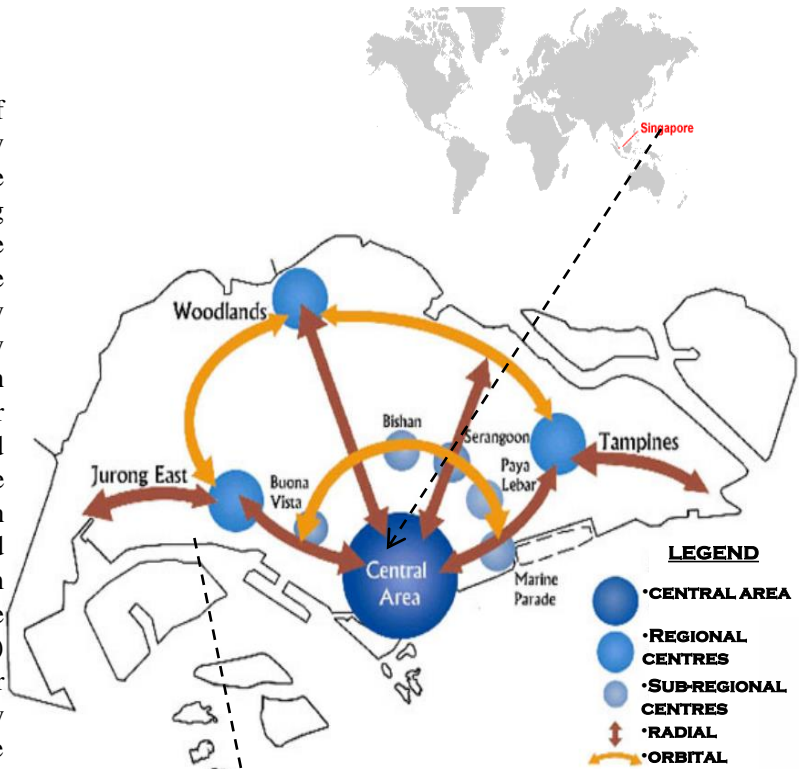


Fig 33: Concept Plan Of Singapore

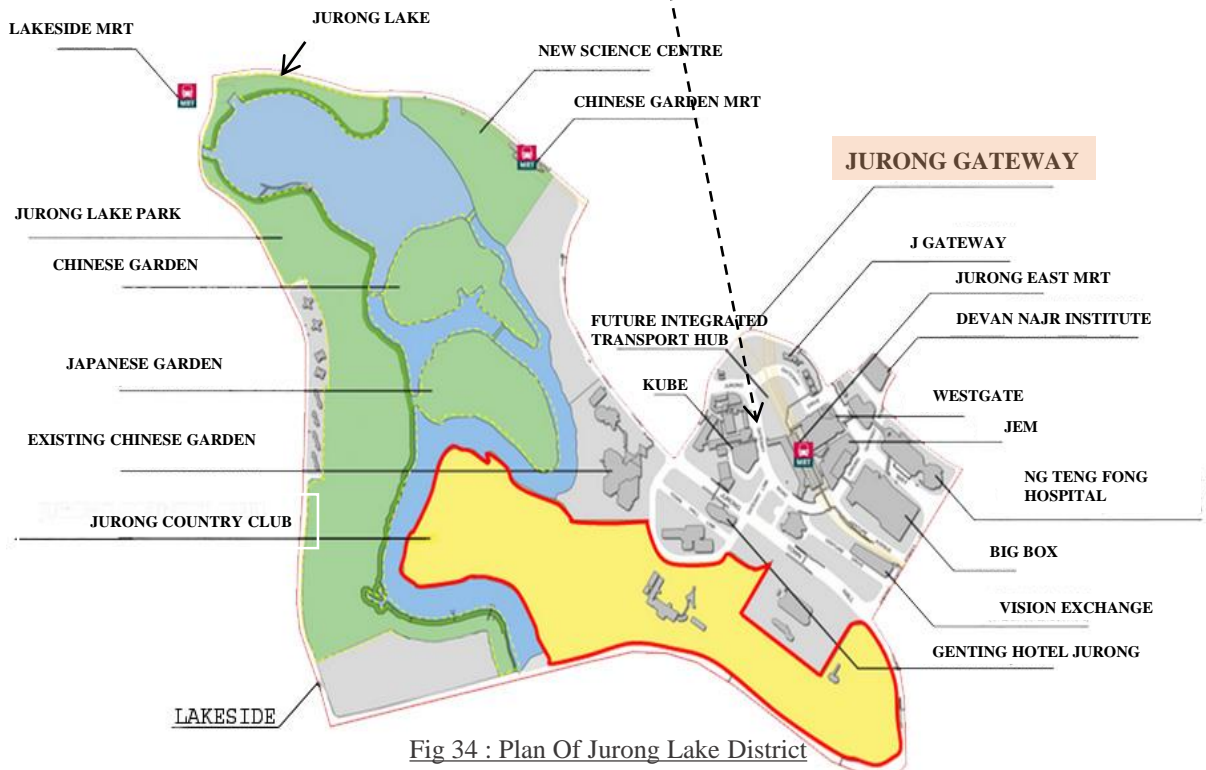


Fig 34 : Plan Of Jurong Lake District

(Source:urban redevelopment authority)

Concept plan

Singapore has a population of five million and a limited land area of 710 sq.km (274 sq.miles). This concept plan will create:

- More intensification : industries and businesses close to MRT stations to optimize the use of land around these important transport nodes.
- More jobs will be provided in the North, North East, and East regions. In addition, housing in the West and the city so that more can live to their workplace.

In Singapore development between land use and transport are already considered since 1970s in some cities as much as 60% of overall space is dedicated to road infrastructure (in Singapore 12%).

Singapore currently most prefer and adapted Type IV of the metropolitan scale, where commonly in the central area is dominated by public transport. This situation also supported by given several penalties through road pricing in certain corridors which will be effective in reducing the travel needs of the people by the private car.

Jurong East MRT Station (NS1/EW24) is an above ground Mass Rapid Transit (MRT) station that is part of the North South Line (Branch line before 1996) and the East West Line in Singapore, and serves as interchange station between the two lines. It is located at the eastern end of Jurong, linking residential precincts Yuhua and Teban Gardens, as well as the international Business Park and Toh Tuck to the rest of the island through rail. Passenger volume is expected to rise when the sites in the neighbouring Jurong Lake District project are developed.

The 360ha Jurong lake district is one of the new growth areas in URS's Master Plan 20118 to support economic growth for the next 10 to 15 years, and to decentralise commercial activities out of the city center to bring jobs closer to where people live, and reducing the commute. Jurong Lake District comprises two distinctive but complementary precinct which will be seamlessly integrated : Jurong Gateway, the commercial precinct; and Lakeside, the leisure precinct.

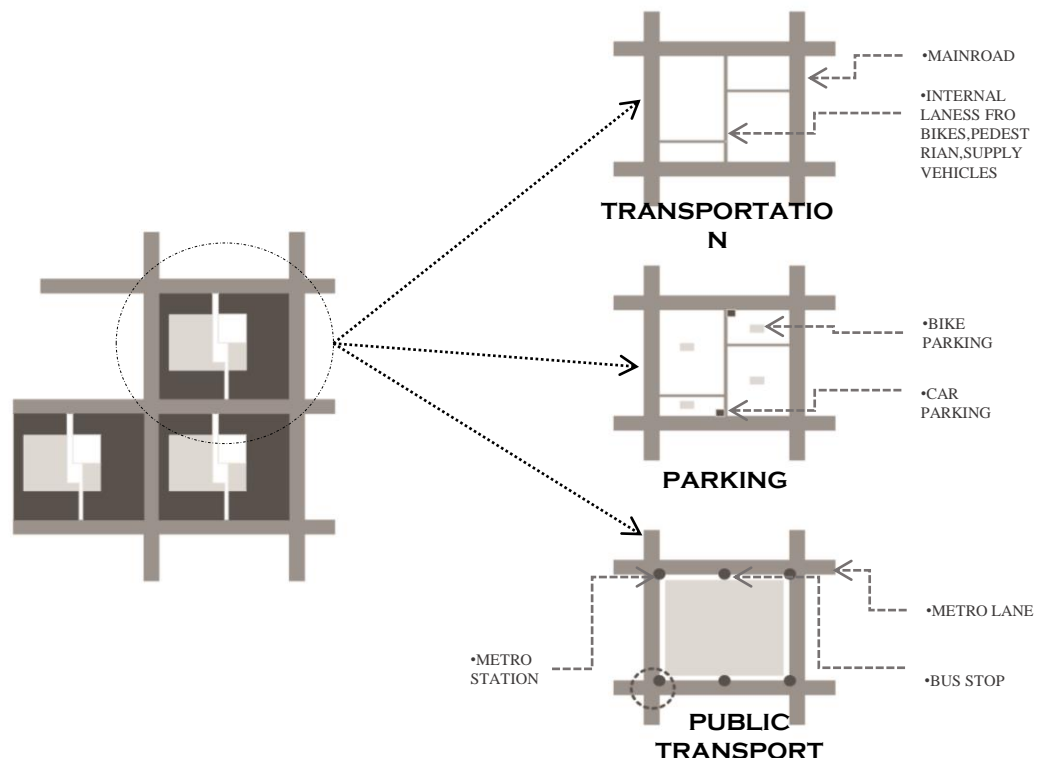


Fig 35: Analysis Of Movement For Singapore

Survey and analysis:

The Jurong East MRT station area has been designed with the following considerations:

- Centred around the Jurong East mass rapid transit interchange station,the 70 ha jurong Gateway has a mix of office, retail hotel residential,F&B,entertainment and other complementary uses.
- Comprehensive network of street-level and elevated pedestrian links are to connect developments seamlessly to MRT station and bus interchange.
- Designed to be commercial hub with many new developments currently under construction.
- A hotel site will also be made available for development in mid-2012 to cater to business travellers .
- Lakeside leisure precinct, which covers 220ha of land around Jurong Lake and 70ha of water body, will be developed into an exciting leisure destination for local residents and tourists •

•Jurong Gateway - New Business Location by the Lake

The MRT access and dispersal areas are seamlessly connected to commercial and business centers , so as to provide public spaces and amenities for MRT users ,while sharing these facilities with the retailers. The ground floors are connected to Bus Interchanges,parking for private vehicles and bicycles,and provide other modes of transport.Green spaces are provided for atleast a distance of 500m along the MRTS corridor with high rise residential apartments.Offices and higher order retail are concentrated around station areas. With a network of inter-connected pedestrian walkways between buildings and public amenities. Create new and unique leisure destinations around jurong lake with edutainment attractions for the whole family. Bring the lake closer to jurong gateway through the introduction of new waterways and pedestrian linkages .

Heighten the sense of greenery with new landscaped malls, open spaces, park connectors and skyrise greenery .

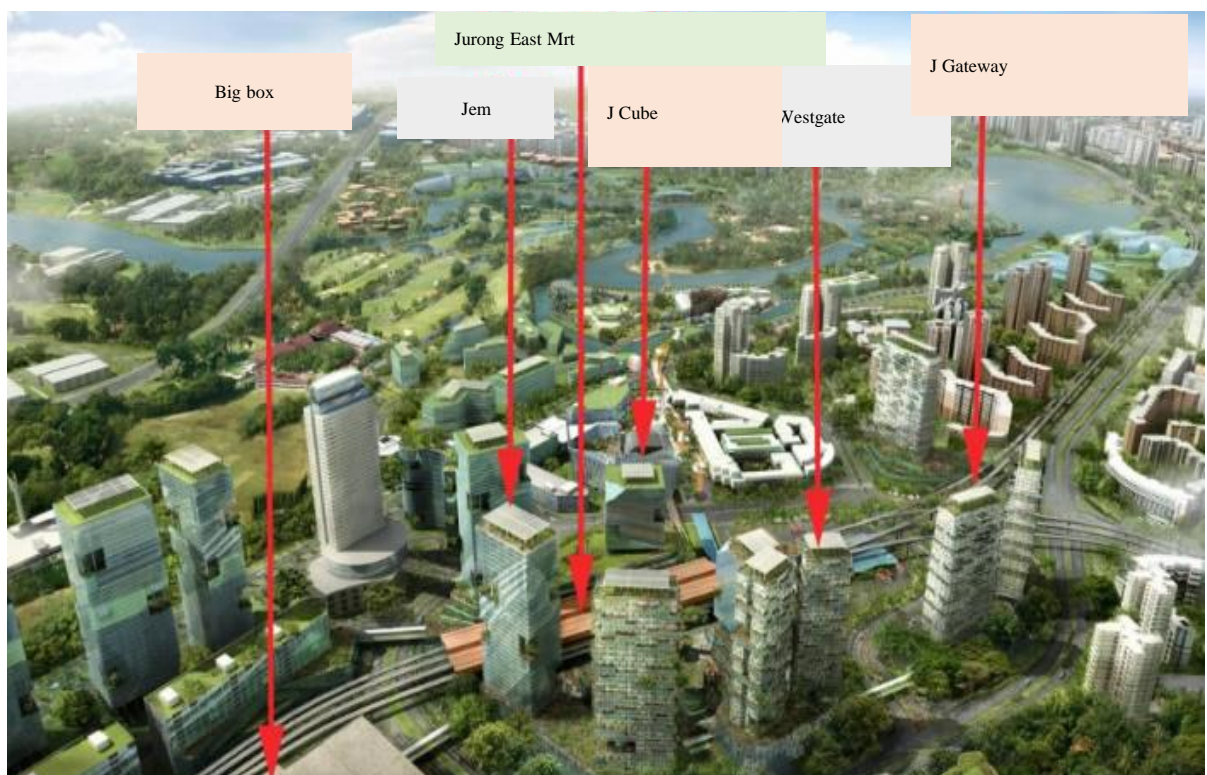


Fig 36: View Of Jurong Gateway

Survey and analysis:

Redevelopment Strategies have achieved the following changes :

- Development along the strategic location of Jurong Gateway which is well served by road and rail, and in the midst of a large population and customer catchment.
- Injecting business, commercial and the recreational activities along with instiutions like hospitals and schools, science centre.
- Residential provision to accommodate the new growth in population away from city centre in Lakeside Village.
- It will be the biggest commercial hub outside the city center providing.
- 500,000 sqm of office space.
- 250,000sqm of retail ,F&B and entertainment space
- About 2,800 hotel rooms introduced at the fringe of Jurong Gateway,next to Lkeside ,to meet the increasing demand for hotel rooms and to cater to the new leisure attraction and businesses that will be introduced around Jurong lake and Jurong Gateway.
- In addition to the commercial space,at least 1,000 new homes will be added around the Jurong East MRT station, providing more oportunites to live and work in the area.

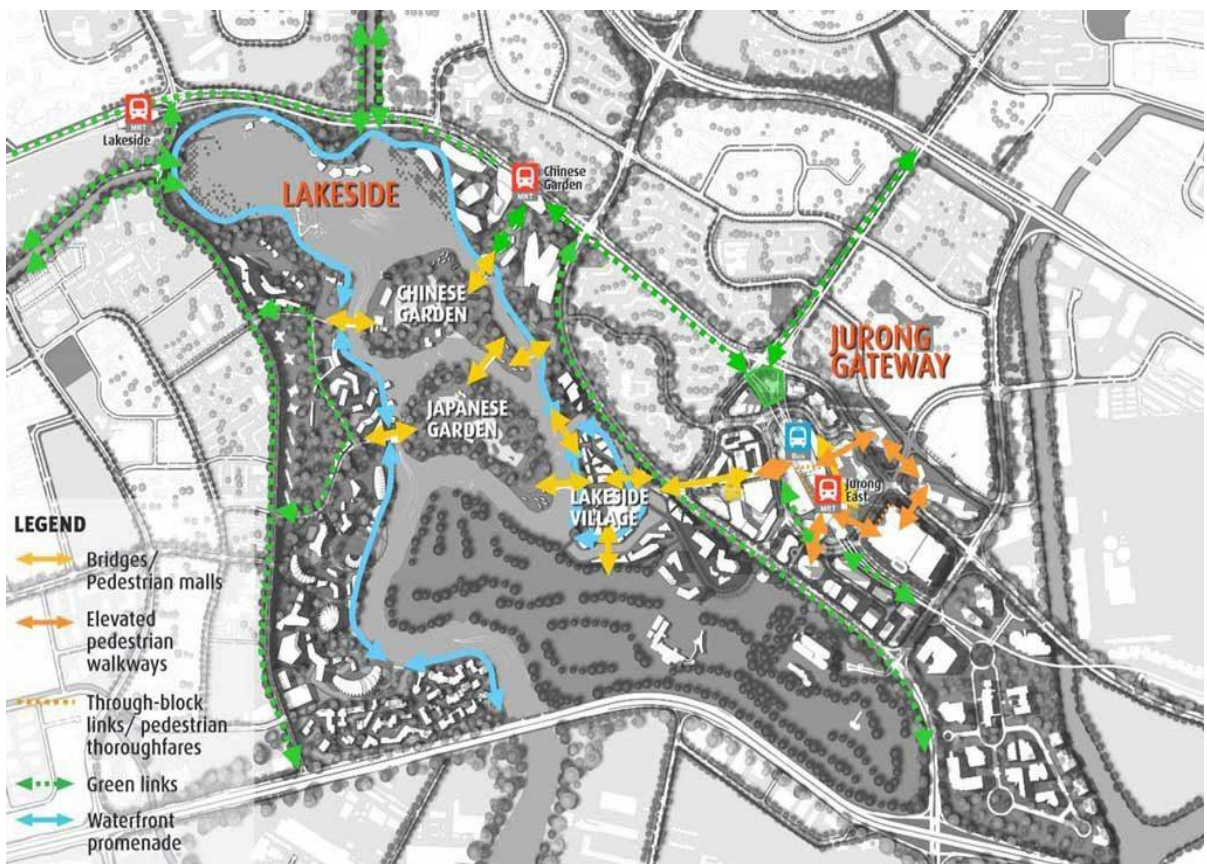


Fig 36: Movement Pattern Of Jurong East Station Area

Source:www.ura.gov.sg

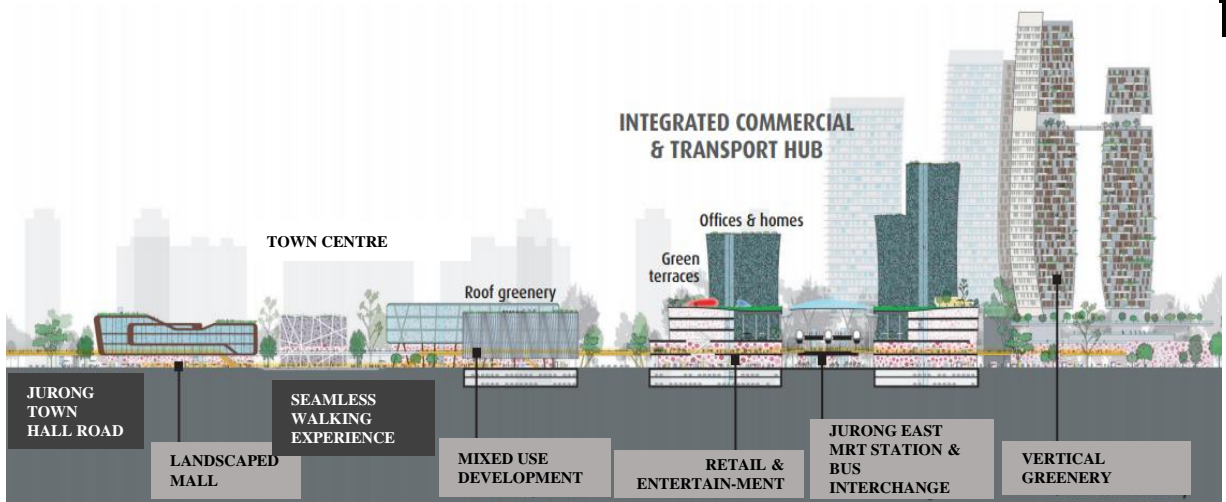


Fig 37: Development Of Jurong Gateway Station Area

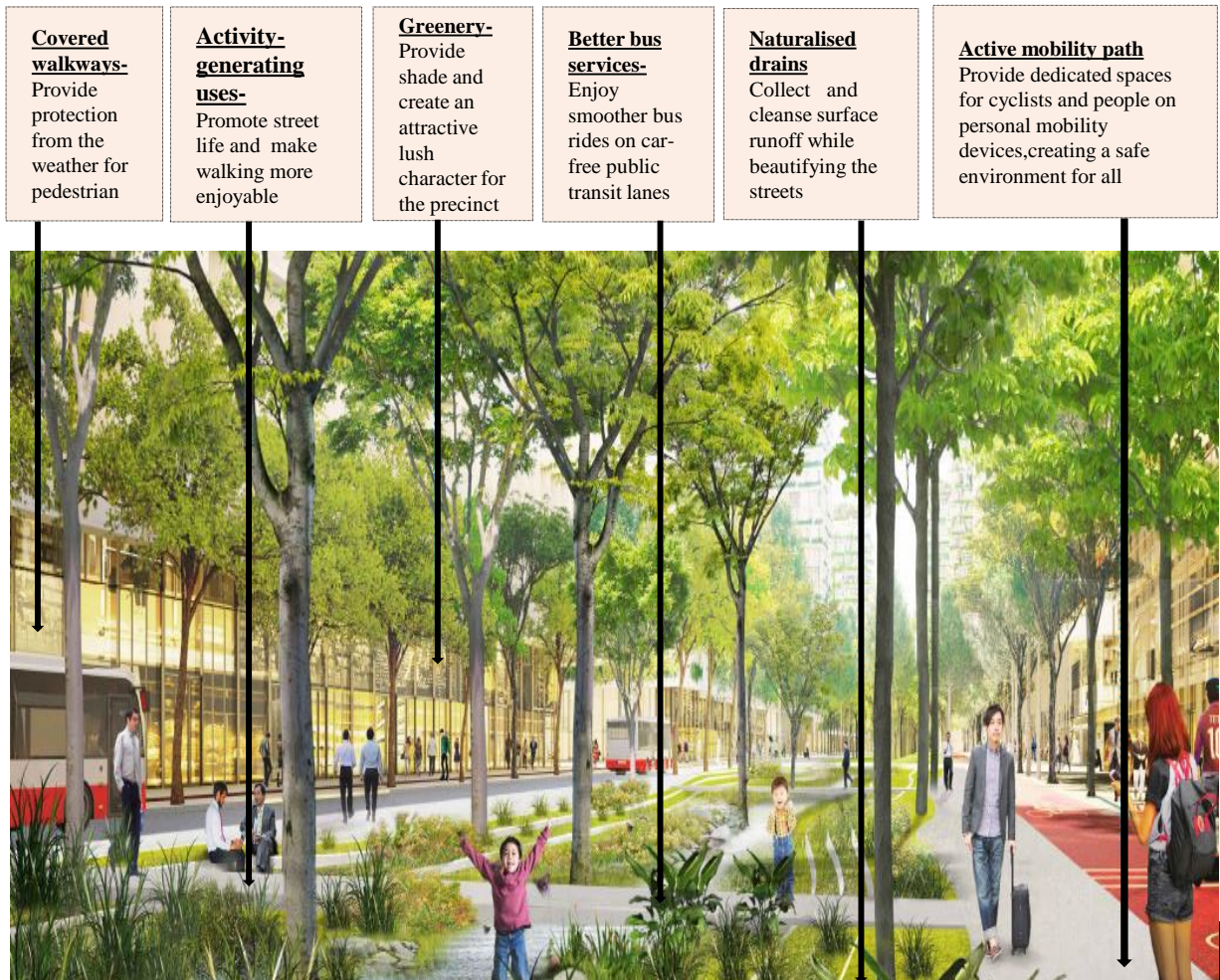


Fig 38: Proposals For Future Development Near Jurong East Station Area

Source:www.ura.gov.sg

•Conclusion-

Effect on parameters due to development of Singapore Jurong east MRT Terminal Area

➤Movement-

- Large volume of trips diverted to MRTS
- Large volume of trips generated from MRTS
- Trips diverted from MRTS mostly work-based, or recreational
- Major arterial movement parallel to MRTS
- Feeder routes perpendicular to MRTS
- Elevated pedestrian walkways connect different activities and spaces

➤Forms-

- Intensity of development more in plots closer to MRT on the basis of 'base plus bonus'
- High rise high density built areas close to metro station area
- Medium to low rise form in outer areas.
- Areas of low rise low density used for creating recreational hubs for attracting tourists at terminal station area.

➤Landmark-

- Important buildings function as a landmark

➤Activities-

- Decentralisation of land use
- Business and residential offices within distance of 500m
- Residential and entertainment centres with hotels within inner impact area of 1 km
- Outer area provided with lower density residential use with recreational facilities

➤Open space-

- Different kind of open space make the area greenery
- Green and blue network-create a variety of spaces for the community



Fig 39: Movement Analysis Of Jurong Gateway



Fig 40: Artistic Impression Of Lakeside Village



Fig 41: Skywalk Movement



Fig 42: Seamless connection between Jurong Gateway and to lakeside

2.3 EAST DELHI HUB- KARKARDOOMA TOD PROJECT

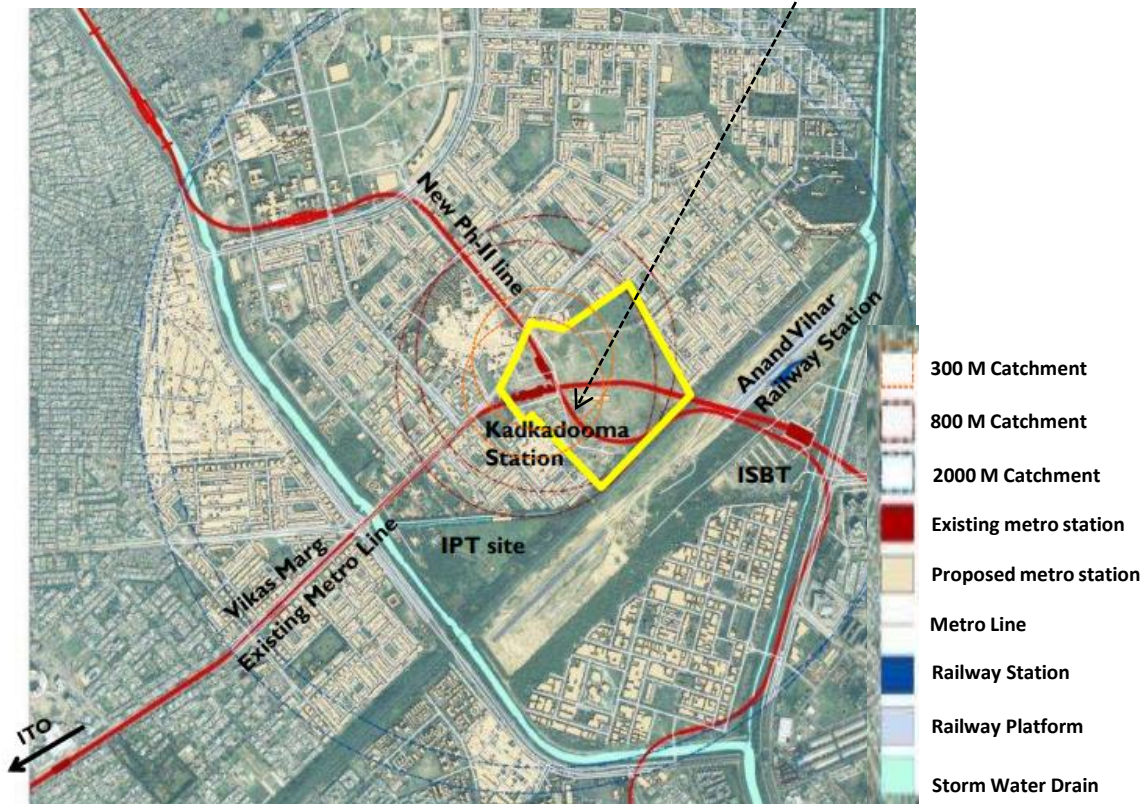
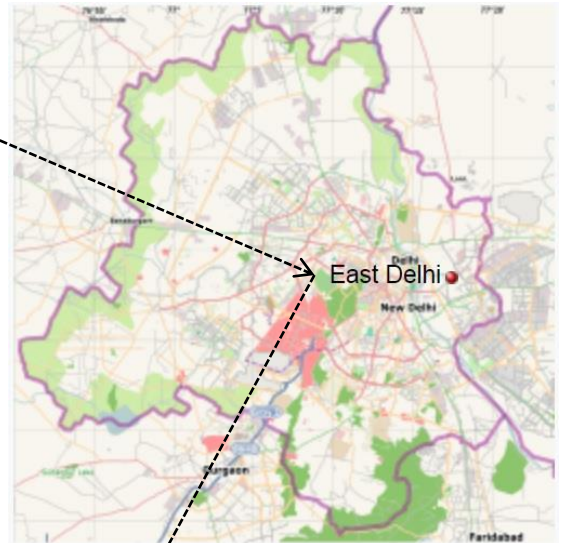
Description:



- Location: Karkardooma, New Delhi, India
- Site Area: 74 acres
- Built up Area: 15 million sq.ft

The Karkardooma project is proposed on a land parcel of 30 hectares located in East Delhi, adjacent to the Karkardooma Metro Station..

East Delhi Hub was conceptualized to be a new Transit Oriented Development that imbibes the core values of a sustainable “Smart City”. As a pilot project that experiments with the new TOD policy drafted by DDA, This includes commercial, residential, medical and recreational facilities and an iconic 100 storey LEED Platinum rated tower that will be a new landmark in Delhi.



Source: UTTIPEC, DDA

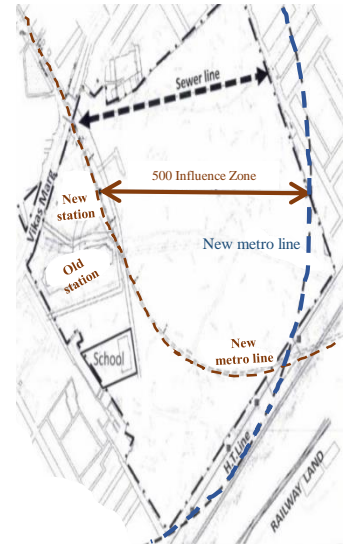
Survey And Analysis:



• **Convenience shopping**
Scattered in small proportions throughout the development

• **Frontage criteria** for locating commercial retail & towers

• **Service market** along Secondary road



ZONING OF USES IN RELATION TO CONTEXT-COMMERCIAL

- HIGH END RETAIL
- SHOWROOMS
- COMMERCIAL TOWERS & SERVICE APARTMENT
- SERVICE MARKET
- CONVENIENT SHOPPING
- LIVE WORK

LIVE WORK



• Shop frontage to live/work units create commercial street

• Deck access to flats above

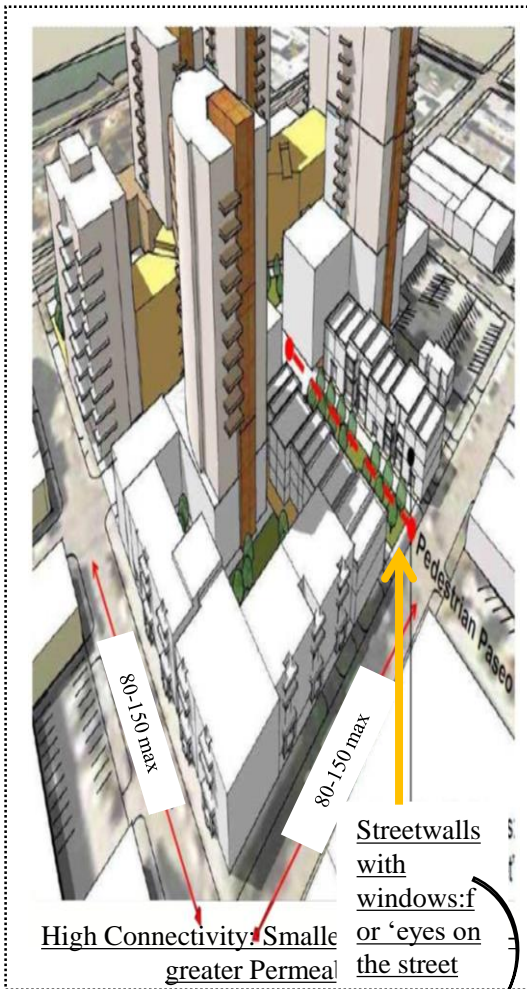
• Mews-style live/work space can be configured as part of dwelling or work space or both

Source: UTTIPEC, DDA

•The project claims to have strong urban design features reflective of TOD development such as:

Block design-

- ✓ Smaller block size for greater connectivity
- ✓ Safety through mixed-use & ‘eyes on the street’
- ✓ Min. 2-hour winter-sun access to homes



For connectivity & walkability-

- ✓ Maximum permissible block size regulation;
- ✓ Making public passages exempt from FAR



Safety-

- ✓ Boundary wall elimination
- ✓ Safety ‘eyes on the street & park’

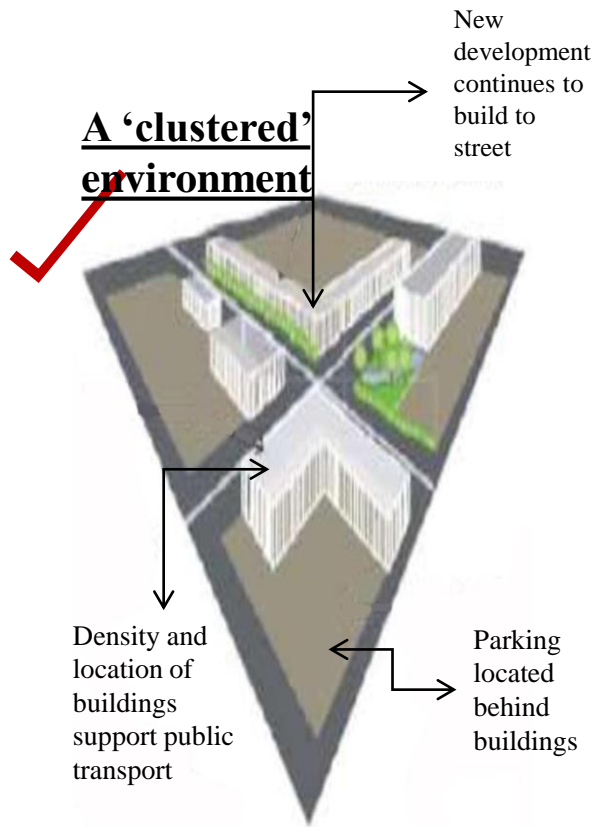
•The project claims to have strong urban design features reflective of TOD development such as:

Isolated development



•Buildings too far from street resulting in long walks through parking areas

A 'clustered' environment



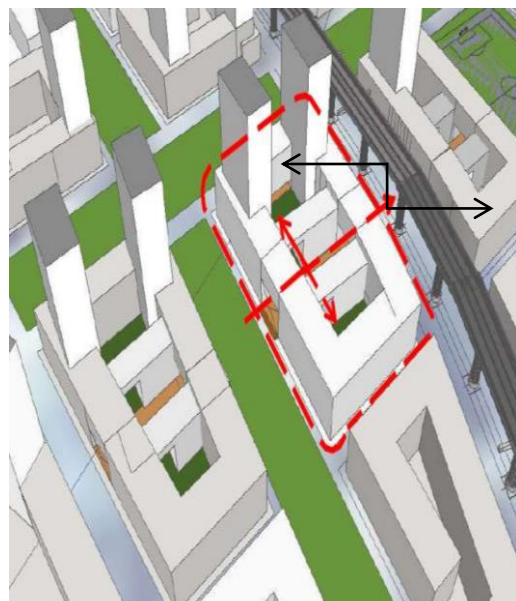
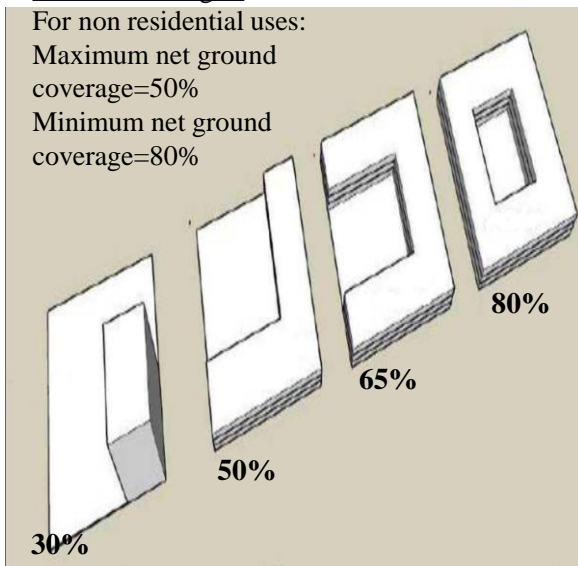
•Orienting buildings along the street helps establish a 'park once' environment where people are encouraged to walk between buildings

Ground coverage--

For non residential uses:

Maximum net ground coverage=50%

Minimum net ground coverage=80%



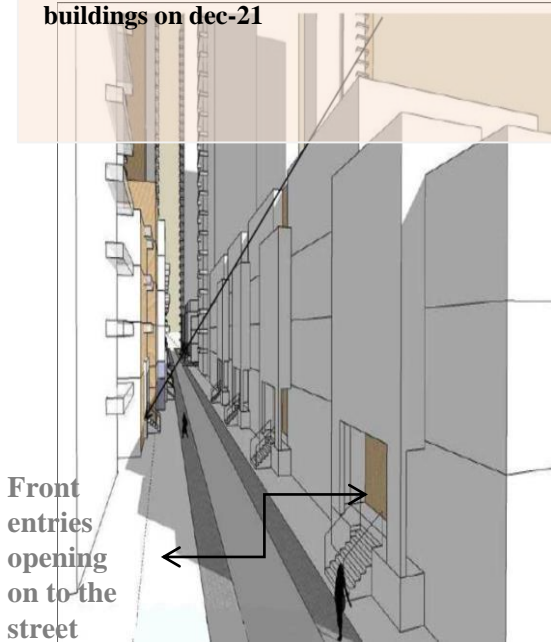
Proposed parking & fire access in absence of setbacks

Source: UTTIPEC, DDA

•The project claims to have strong urban design features reflective of TOD development such as:

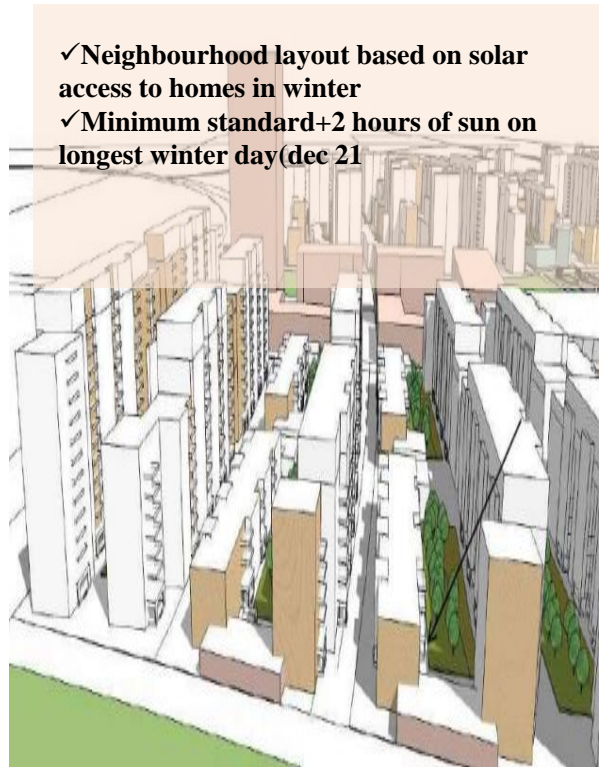
Solar access--

- ✓ On residential street: minimum setbacks and front entries opening on to the street
- ✓ Buildings heights along streets must ensure min.2hr daylight access to all buildings on dec-21



Front entries opening on to the street

- ✓ Neighbourhood layout based on solar access to homes in winter
- ✓ Minimum standard+2 hours of sun on longest winter day(dec 21)



Commercial /mixed use street-

- ✓ Create with zero setbacks for safety and comfort for pedestrians



•Street with: setbacks, boundary wall, narrow side walks = unsafe



•Street with setbacks : bilt-to-edge buildings, wide side walks, eyes on the street walks =safe



➤ Circular skywalk connecting the project to metro



- Mix of low rise and high rise- high density development including
- an iconic 60 storey tower,

Source: UTIPEC, DDA

Conclusion:

➤ **Forms-**

Mixed use development , including vertical mixing in the 500m radius of transit station

➤ **Activities-**

The high-rise blocks are proposed with retail at lower floors, commercial on middle floors and residential on the higher floors

➤ **Movement-**

- well connected internally and externally
- Improved accessibility within the site by network planning for reducing walking time to major facilities, and
- Circular skywalk connecting the project to metro

➤ **Landmark-**

60 stried high rise iconic building can be worked as landmark

➤ **Open space-**

Planned open space has been provided

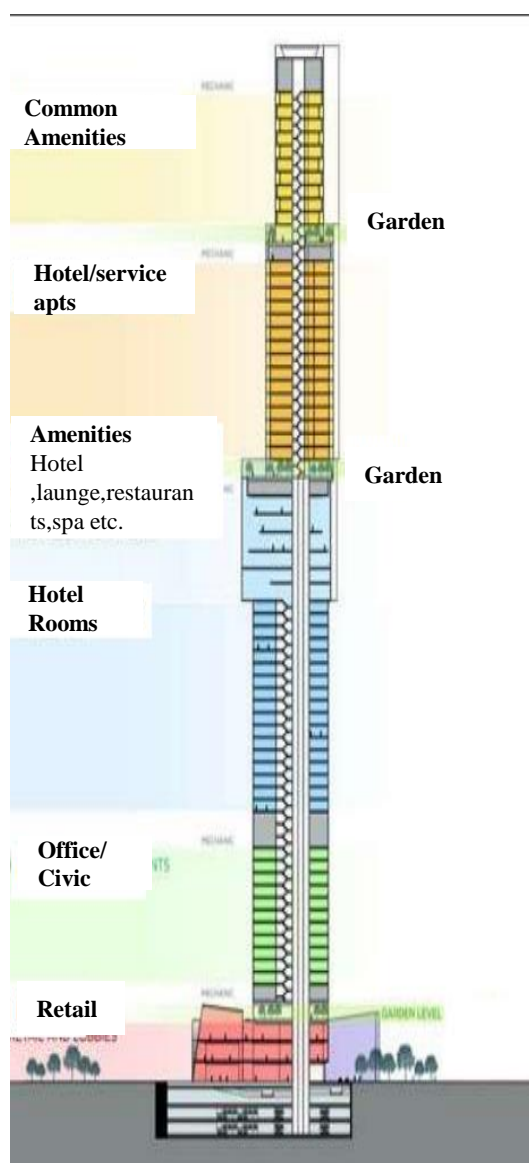


Fig 43:Section Of High Rise Mixed Use Building

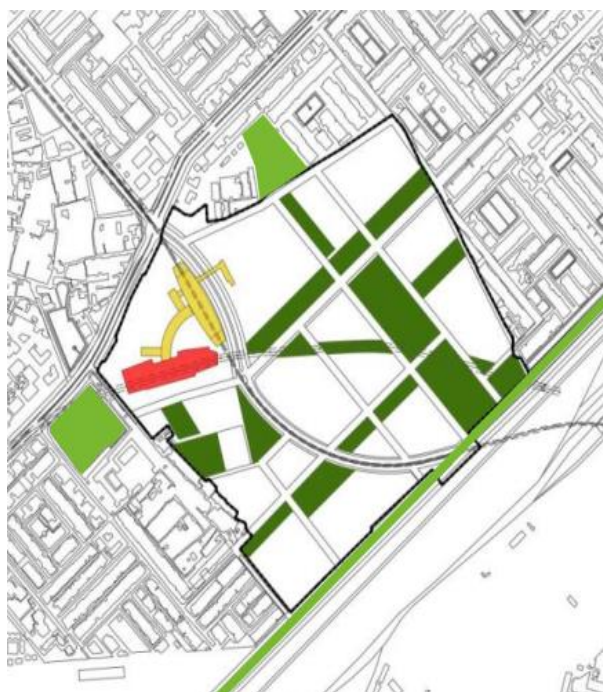


Fig 44:Open Space Network Of Karkardooma TOD Project

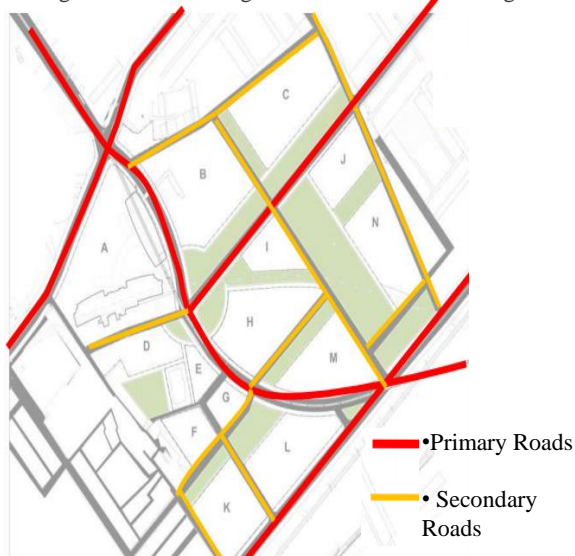


Fig 45:Road Network Of Karkardooma TOD Project



CHAPTER 3: CASE APPLICATION

3.1 DESCRIPTION-

Selection-

Kolkata metro Line 2, also known as the East-West Corridor of the Kolkata Metro is a rapid transit system under construction which will connect Salt Lake in Kolkata with Howrah by going underneath the Hooghly River/Ganga in the Indian state of West Bengal. It consists of 12 stations of which two stations, named Howrah Maidan and Howrah Station are in Howrah District. Since the research work is concentrated on the impact of MRTS on the urban development, mainly on commercial area, it is important to limit the study area to such peripheral or transition areas. For the purpose of delineation, such edges have been identified on the basis of commercial

area zone. Study area has been chosen as the influence area of Howrah Maidan metro terminal, and focusing mainly on commercial area of that influence area. As Howrah Maidan is one of the main commercial area of the district, so the influence area of the Howrah Midan Metro Terminal is taken as the study area

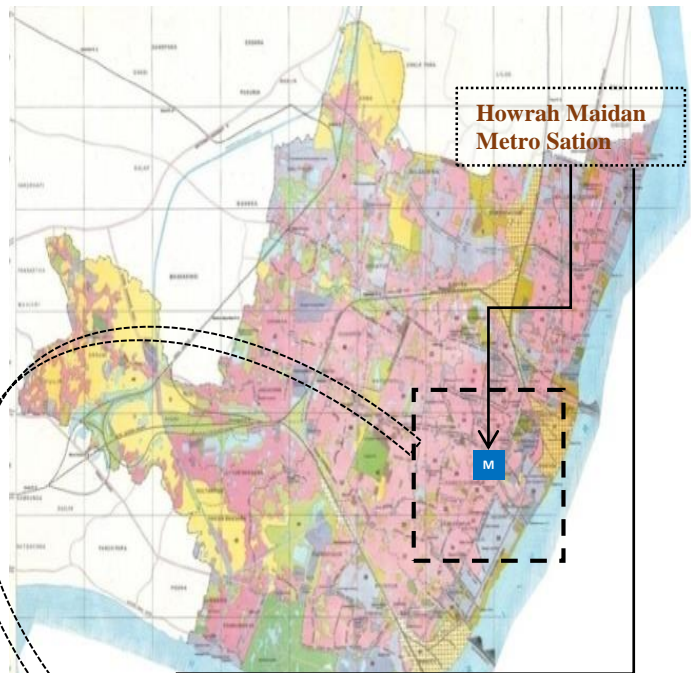
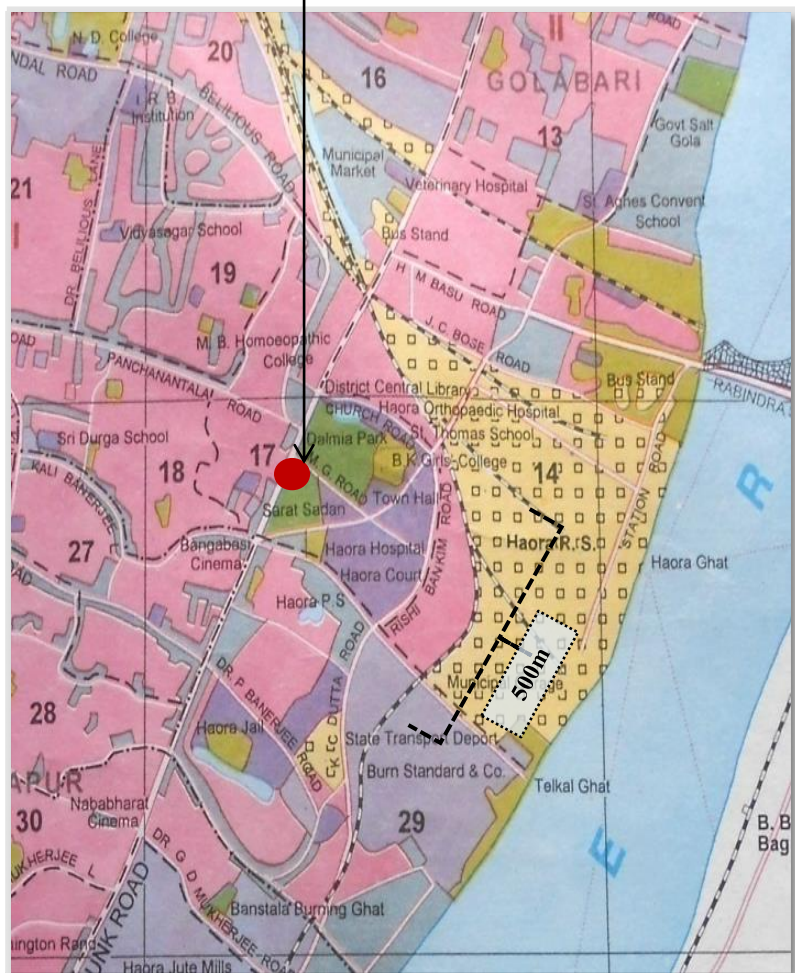


Fig 46: Howrah Municipal Area (Land Use Map)



- COMMERCIAL
- INDUSTRIAL
- TRANSPORT
- ORGANISED OPEN
- VACANT LAND
- ARABLE LAND
- MIXED USE (RESIDENTIAL & COMMERCIAL)
- PUBLIC & SEWNI PUBLIC & UTILITY & SERVICES

URBAN RENEWAL OF COMMERCIAL DISTRICT AROUND MRTS TERMINAL (CASE APPLICATION- HOWRAH MAIDAN)

3.2 DEMARCATATION OF STUDY AREA-

According to URDPFI Guidelines-

- **Zone 1: Intense TOD Zone**
300m influence zone of all MRTS Stations
- **Zone 2: Standard TOD Zone**
800m* (10-min walking) influence zone of all MRTS stations
- **Zone 3: TOD Transition Zone**
2000m** (10-minute cycling distance) influence zone of all MRTS Stations

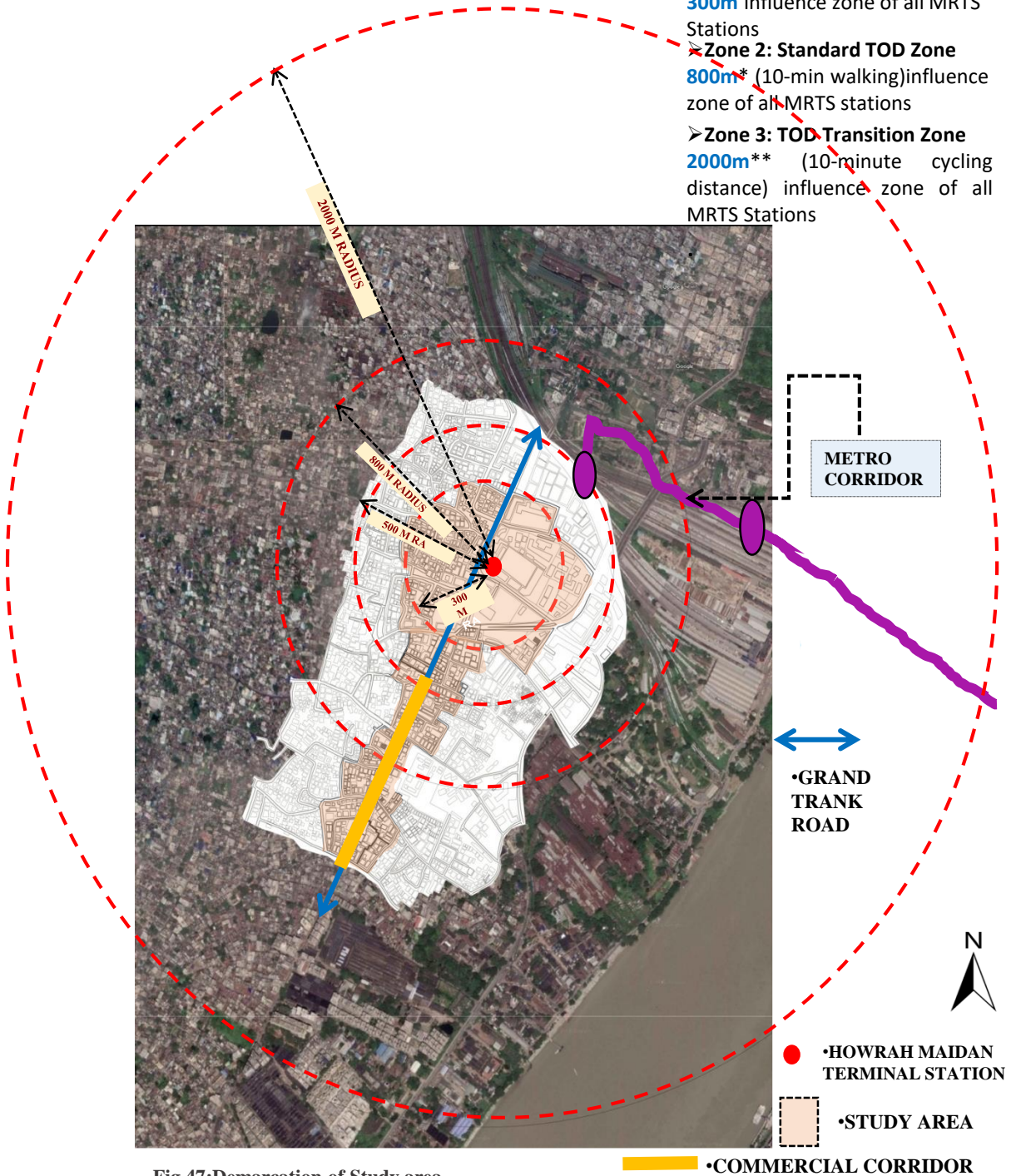


Fig 47:Demarcation of Study area

Observation-

- From the transit oriented development intense zone is 200m-300m(5 min walking distance)
- It is seen from the survey and existing landuse map that Commercial activity is on the both side of the G.T.Road

Conclusion-

- Study area has been taken as the 300m radius of metro terminal and commercial activity zone of the both side of G.T.Road upto road boundary

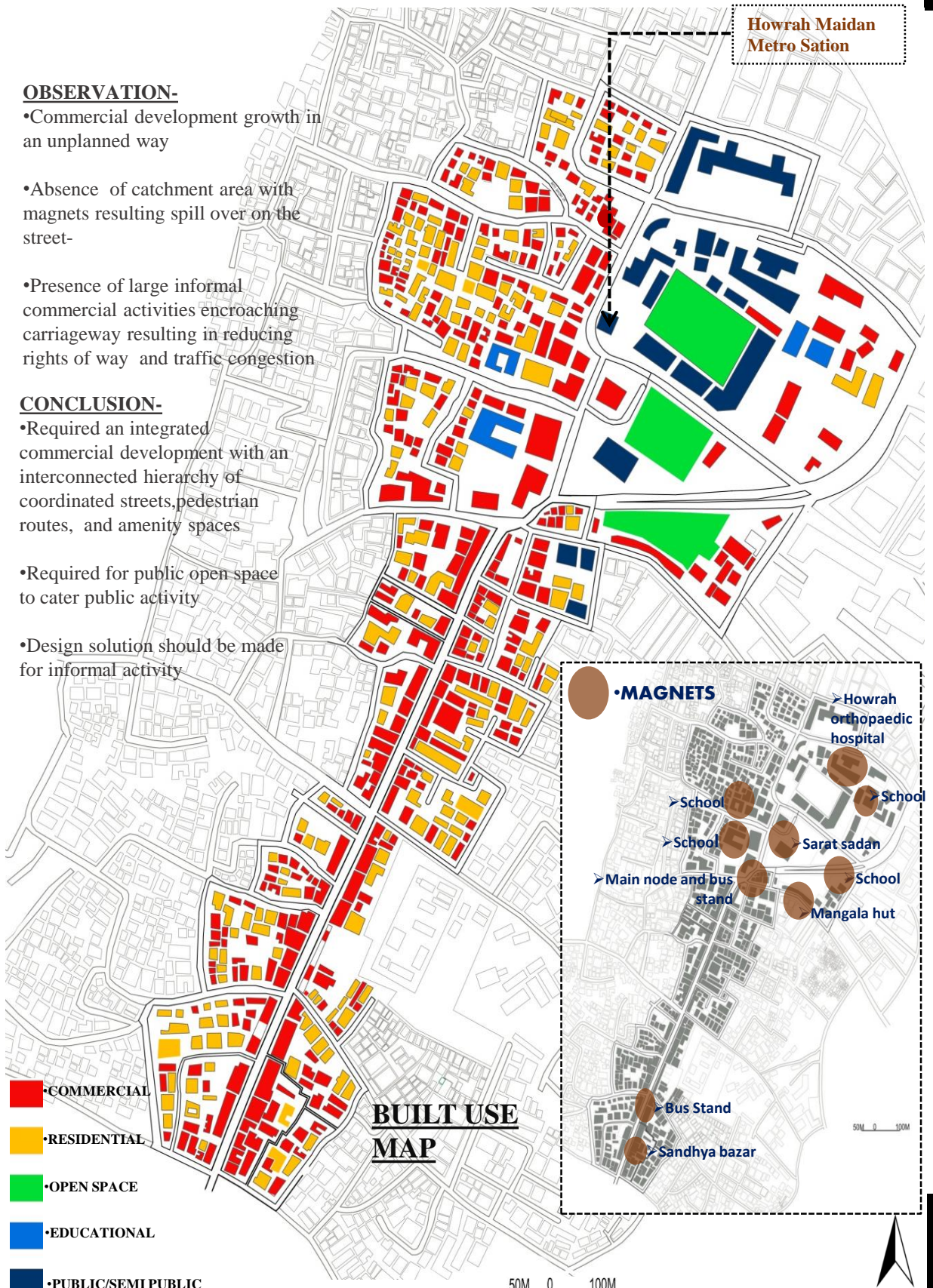
3.3 ANALYSIS AND CONCLUSION-

OBSERVATION-

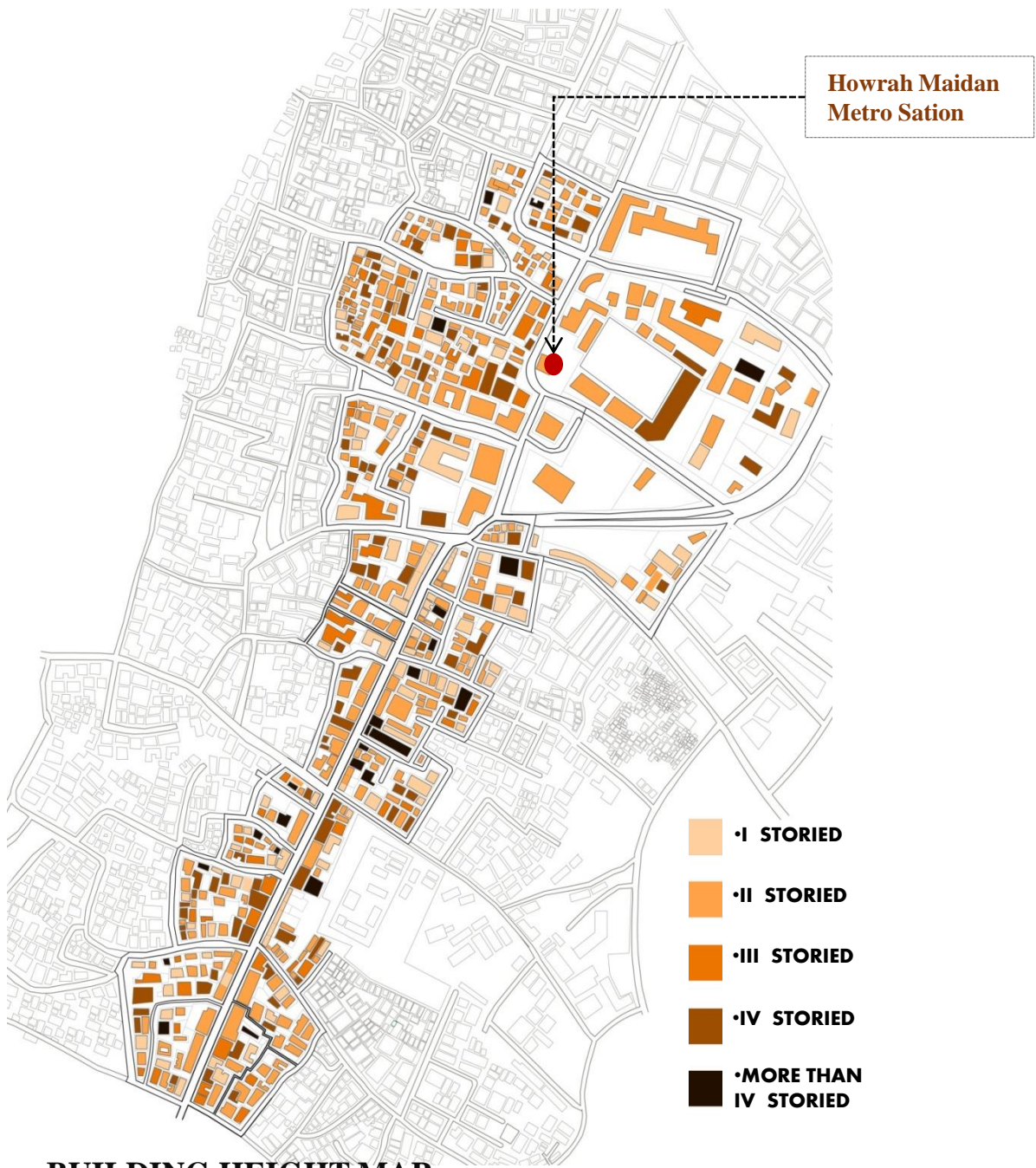
- Commercial development growth in an unplanned way
- Absence of catchment area with magnets resulting spill over on the street-
- Presence of large informal commercial activities encroaching carriageway resulting in reducing rights of way and traffic congestion

CONCLUSION-

- Required an integrated commercial development with an interconnected hierarchy of coordinated streets, pedestrian routes, and amenity spaces
- Required for public open space to cater public activity
- Design solution should be made for informal activity



3.3 ANALYSIS AND CONCLUSION-



BUILDING HEIGHT MAP

OBSERVATION-

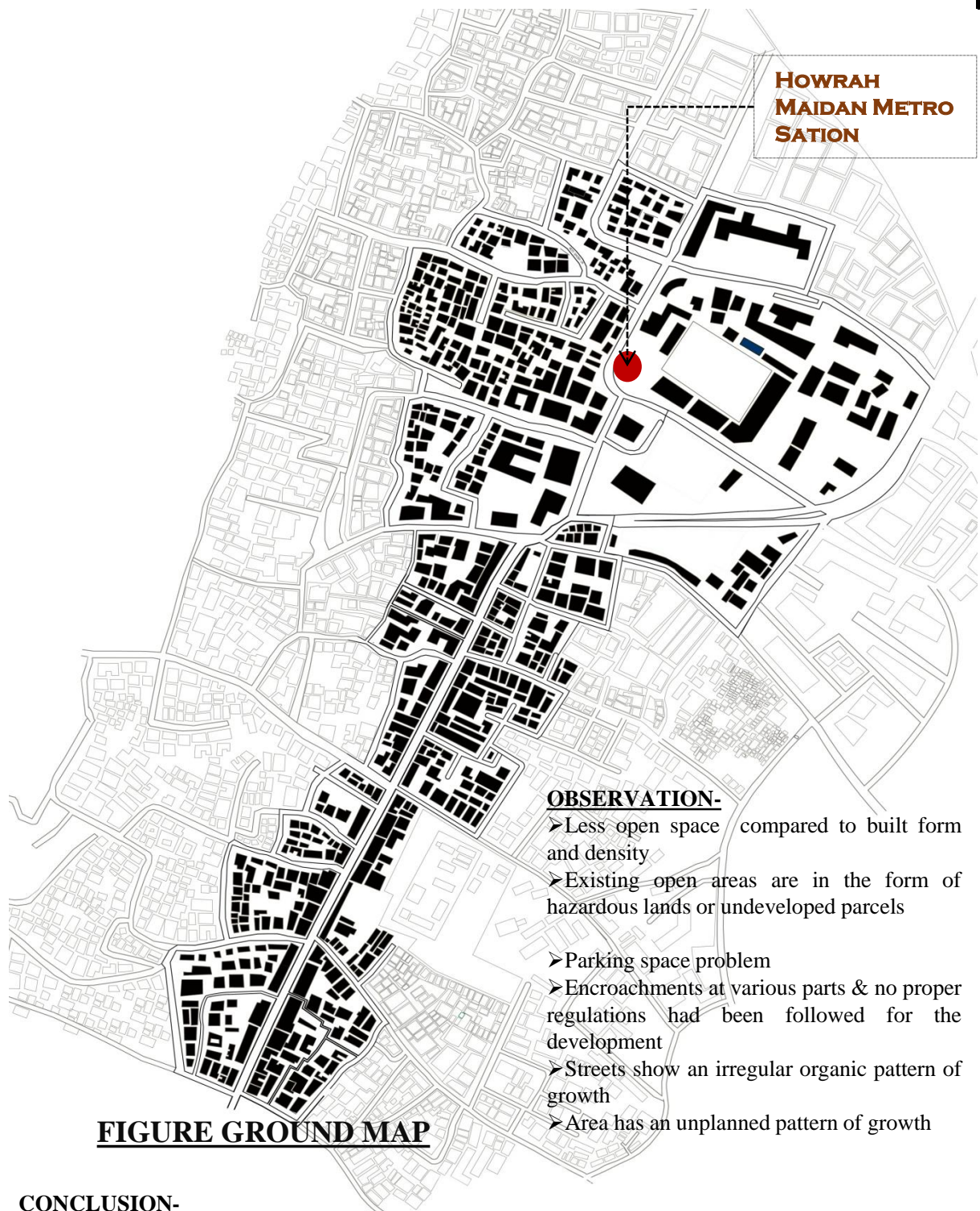
➤ Unevenly placed and varying sizes built forms creates visual clutter in the area-

CONCLUSION-

➤ provision for uniform building set back, appearance and massing

50M 0 100M

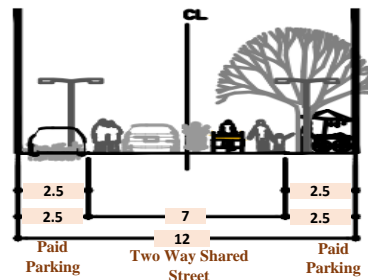
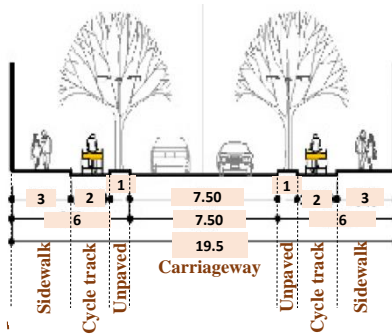
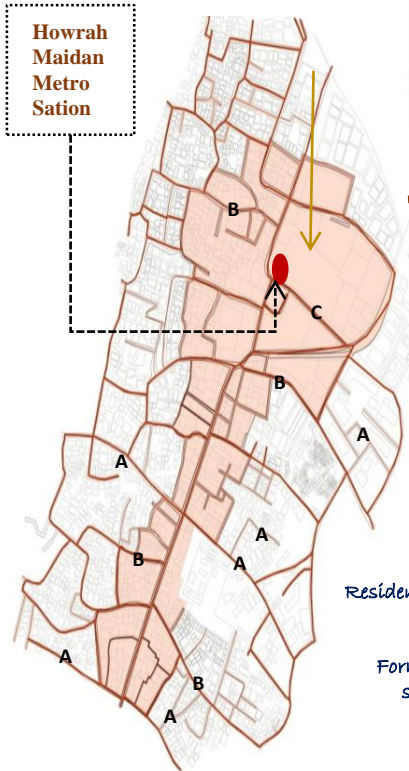


3.3 ANALYSIS AND CONCLUSION-**FIGURE GROUND MAP****CONCLUSION-**

- Hierarchy of spaces needs to be created
- No areas designated as public open spaces in the overall area
- Parking requirements generated by the commercial usage shall be accommodated by provision of designated parking spaces
- Proper Regulation Has To Be Made

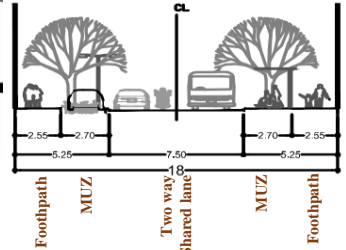
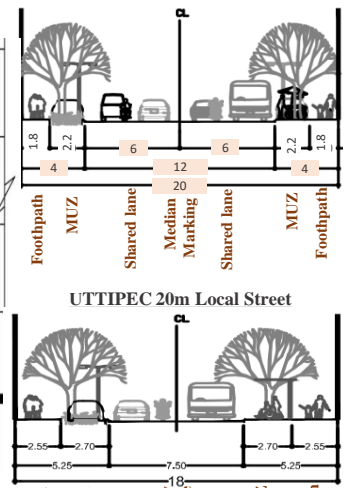
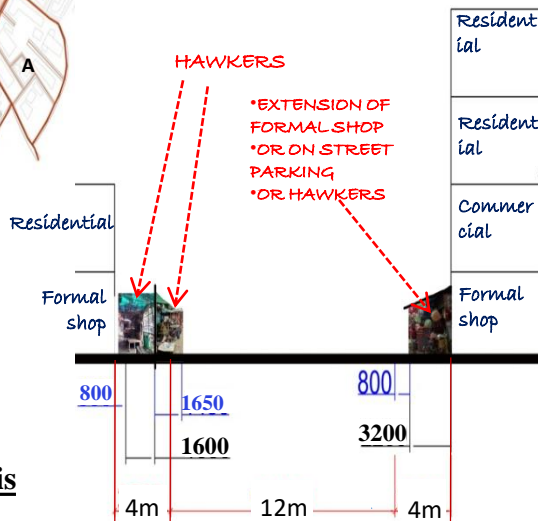


3.3 ANALYSIS AND CONCLUSION-

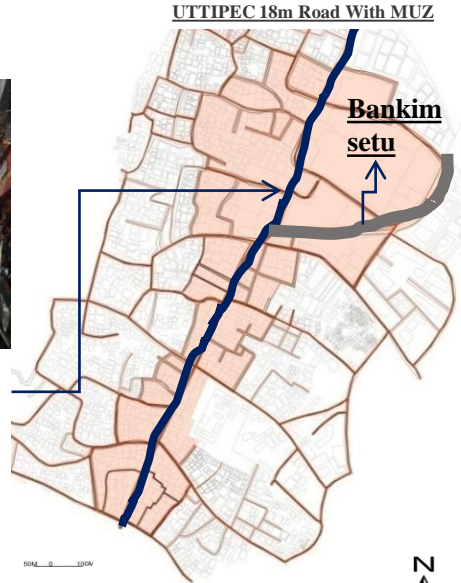


SECTION OF COLLECTOR ROADS (SOURCE-URDPFI)

SECTION OF LOCAL STREET (SOURCE-URDPFI)



Movement analysis



3.3 ANALYSIS AND CONCLUSION-

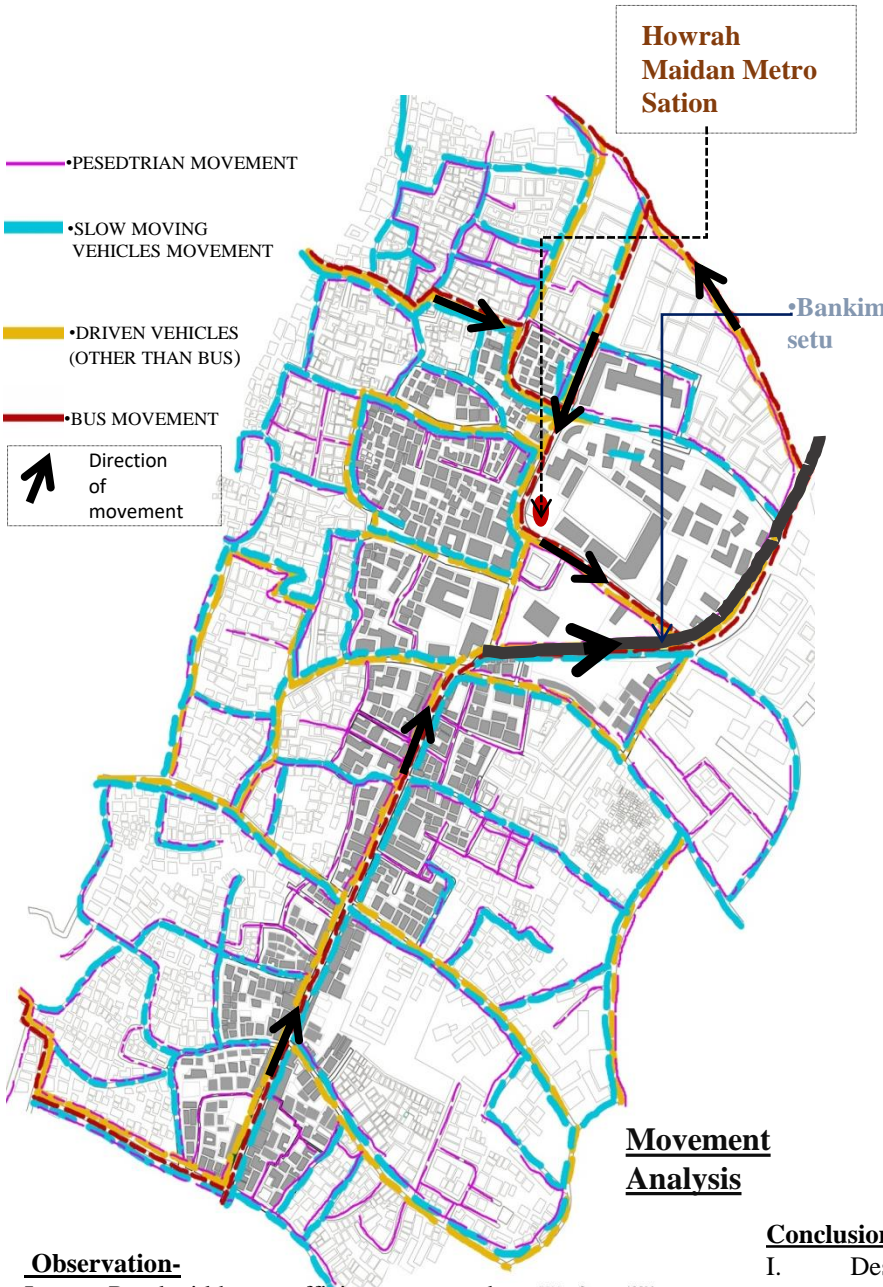


Fig 48: View Of Local Road

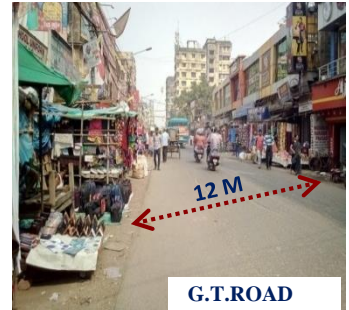


Fig 49: View Of Collector Road



Fig 50: View Of Collector Road

Movement Analysis

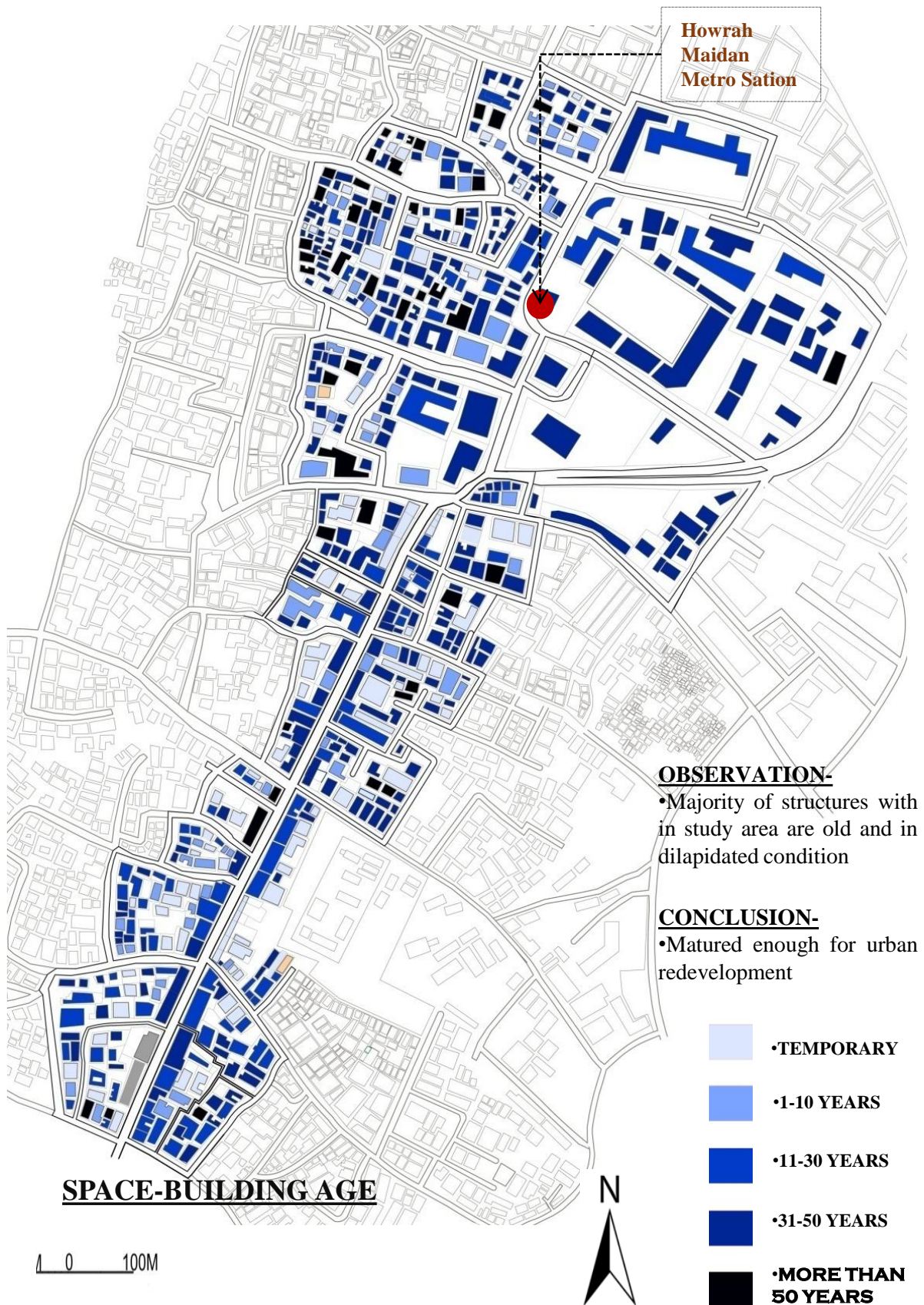
Observation-

- I. Road width not sufficient to cater the traffic
- II. Conflict between pedestrian & vehicular movement-encroachment of hawkers & non existence of sidewalk forces people to walk on roads
- III. Unauthorized & unplanned on road parking-creates congestion by reducing effective capacities of right of way-
- IV. Bus stoppage not designated-people board on bus from any point of movement corridor as there are no proper bus stoppages
- V. Uncontrolled movement of slow moving vehicle on main traffic corridor-problems in pedestrian and vehicular circulation of the overall area due to bicycle ,van ricksaw and cycle ricksaw stc
- VI. Insufficient street lighting in the overall area-provision for lighting along sidewalk of all the movement corridors.

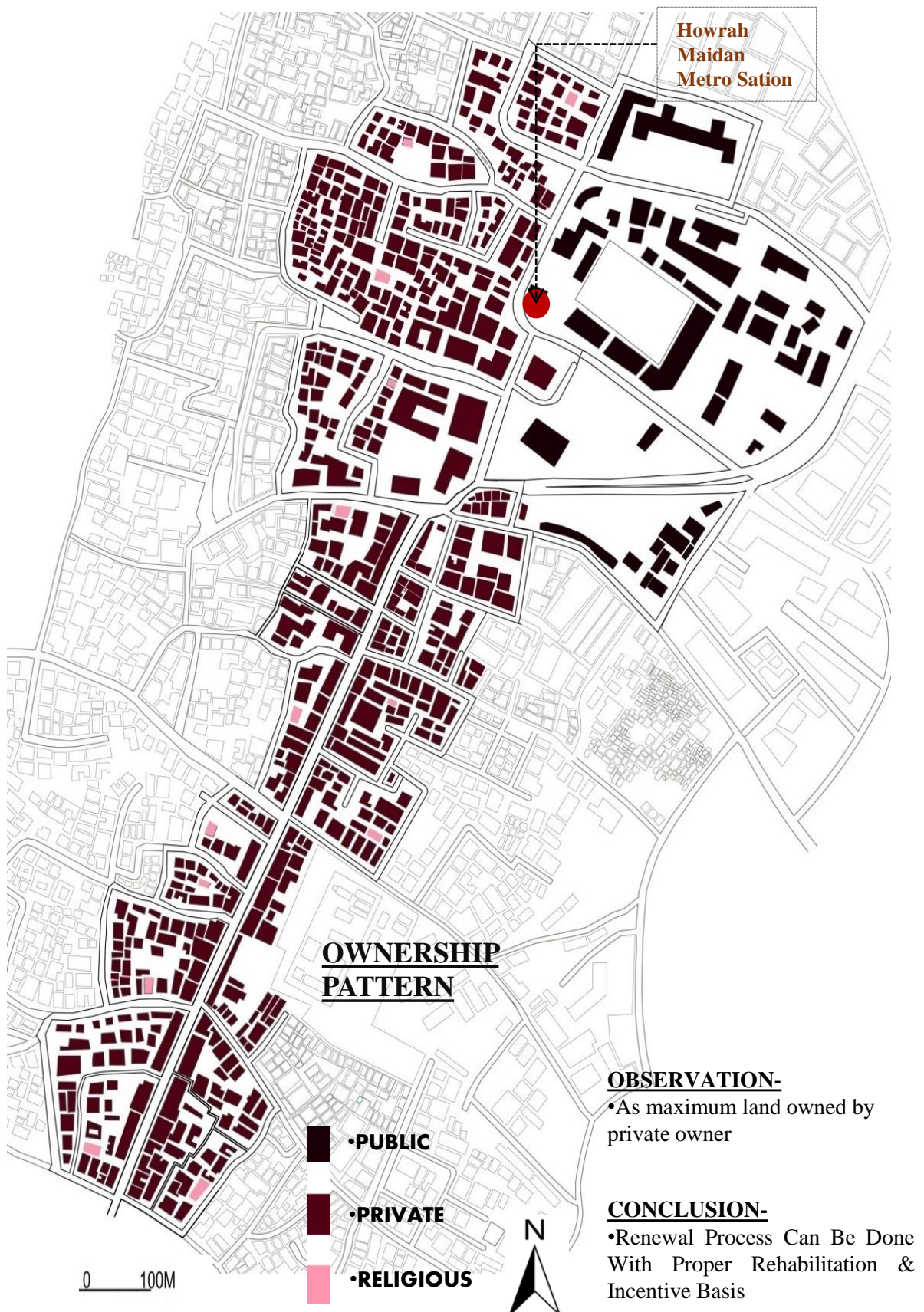
Conclusion-

- I. Design of the street right-of-way through road alignment should balance the requirements for vehicles while providing pedestrian amenities
- II. Try to design the street
- III. Parking space need to be introduce
- IV. In traffic congestion-provision for proper location of bus shelters needed
- V. Given a different way for small vehicles
- VI. Pedestrian scale lighting is provided in areas with a high volume of pedestrian activity.

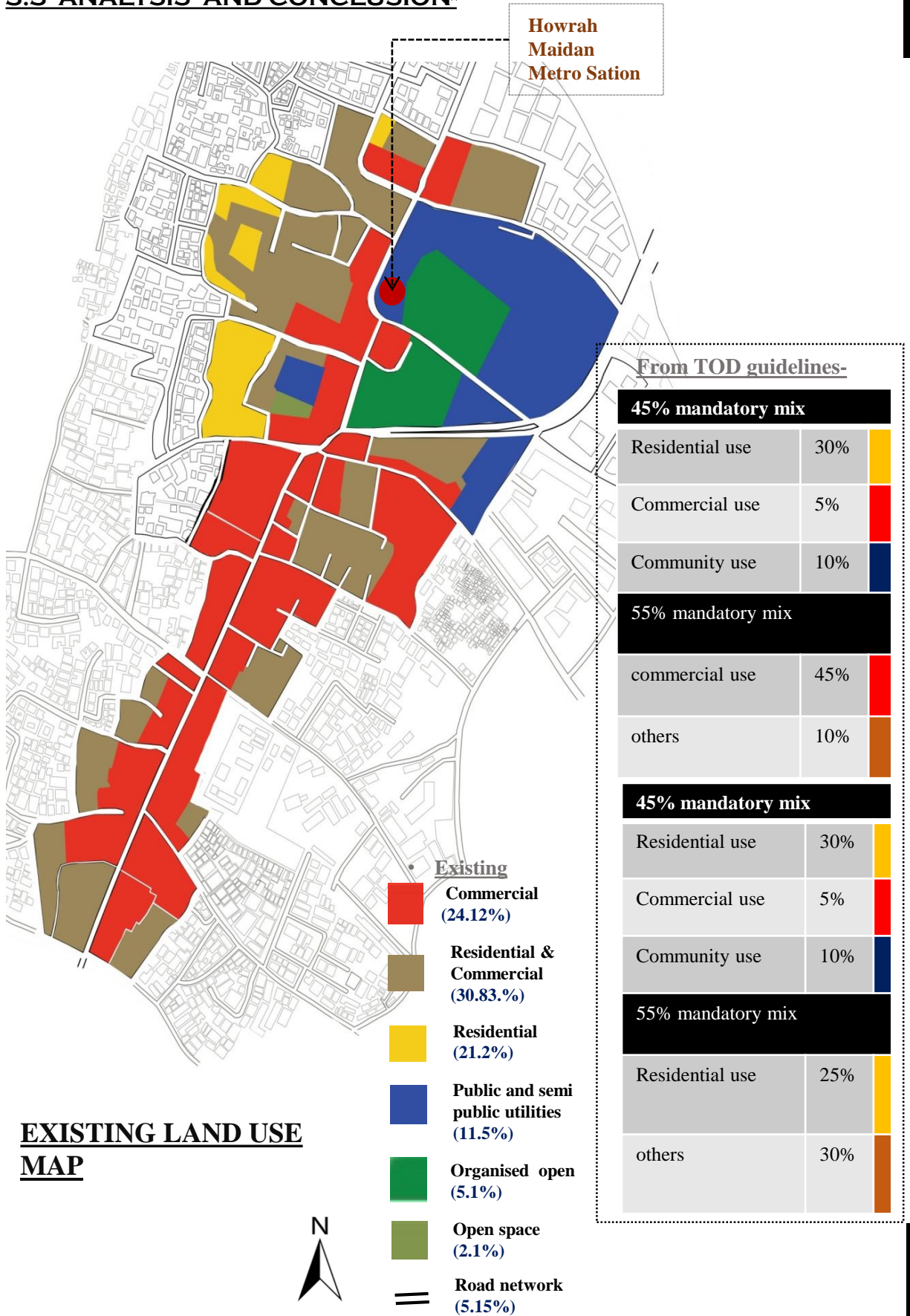
3.3 ANALYSIS AND CONCLUSION-



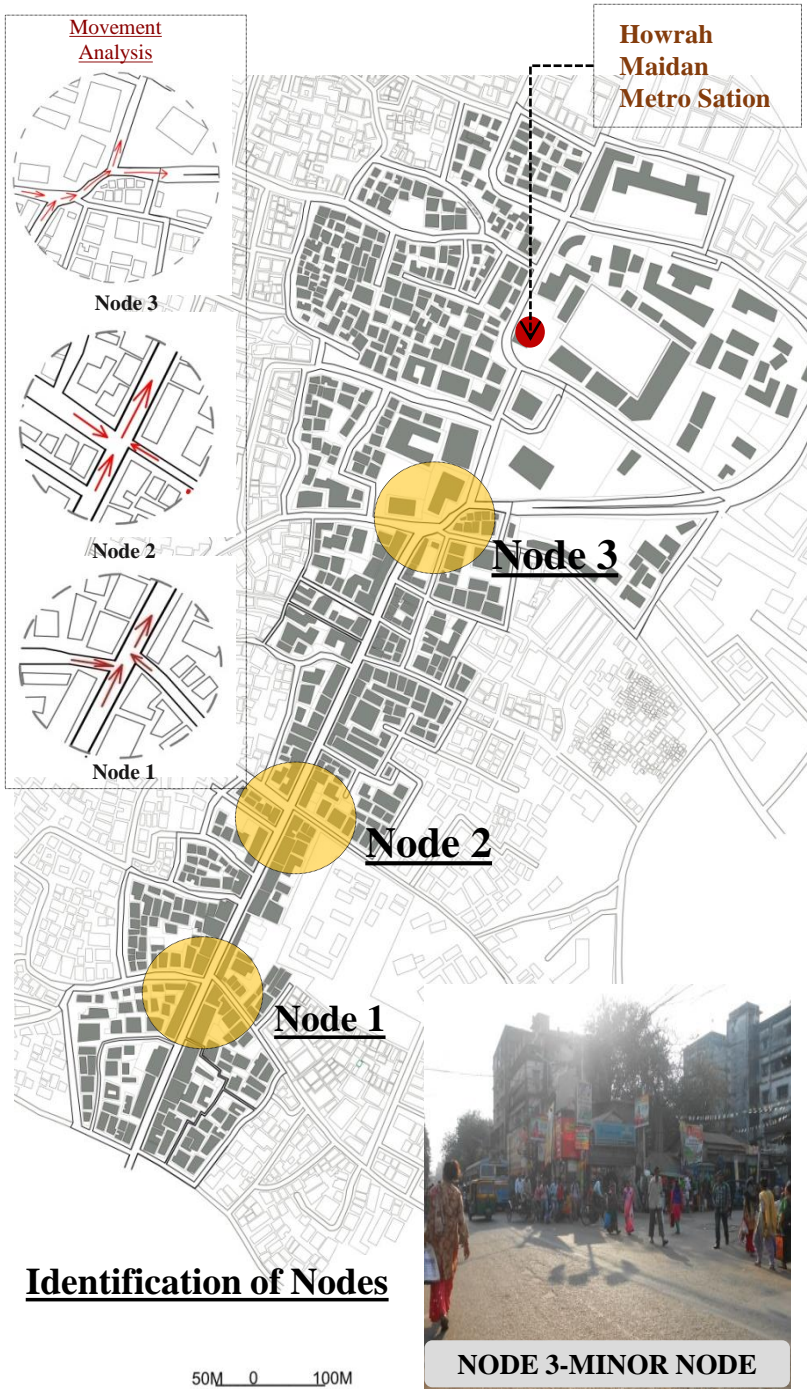
3.3 ANALYSIS AND CONCLUSION-



3.3 ANALYSIS AND CONCLUSION-



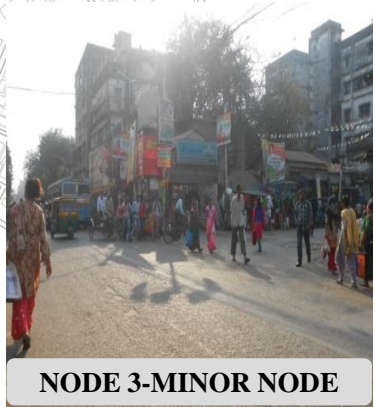
3.3 ANALYSIS AND CONCLUSION-



NODE 1-MAJOR NODE



NODE 1-MAJOR NODE



NODE 3-MINOR NODE



NODE 2-MINOR NODE

Identification of Nodes

Observation-

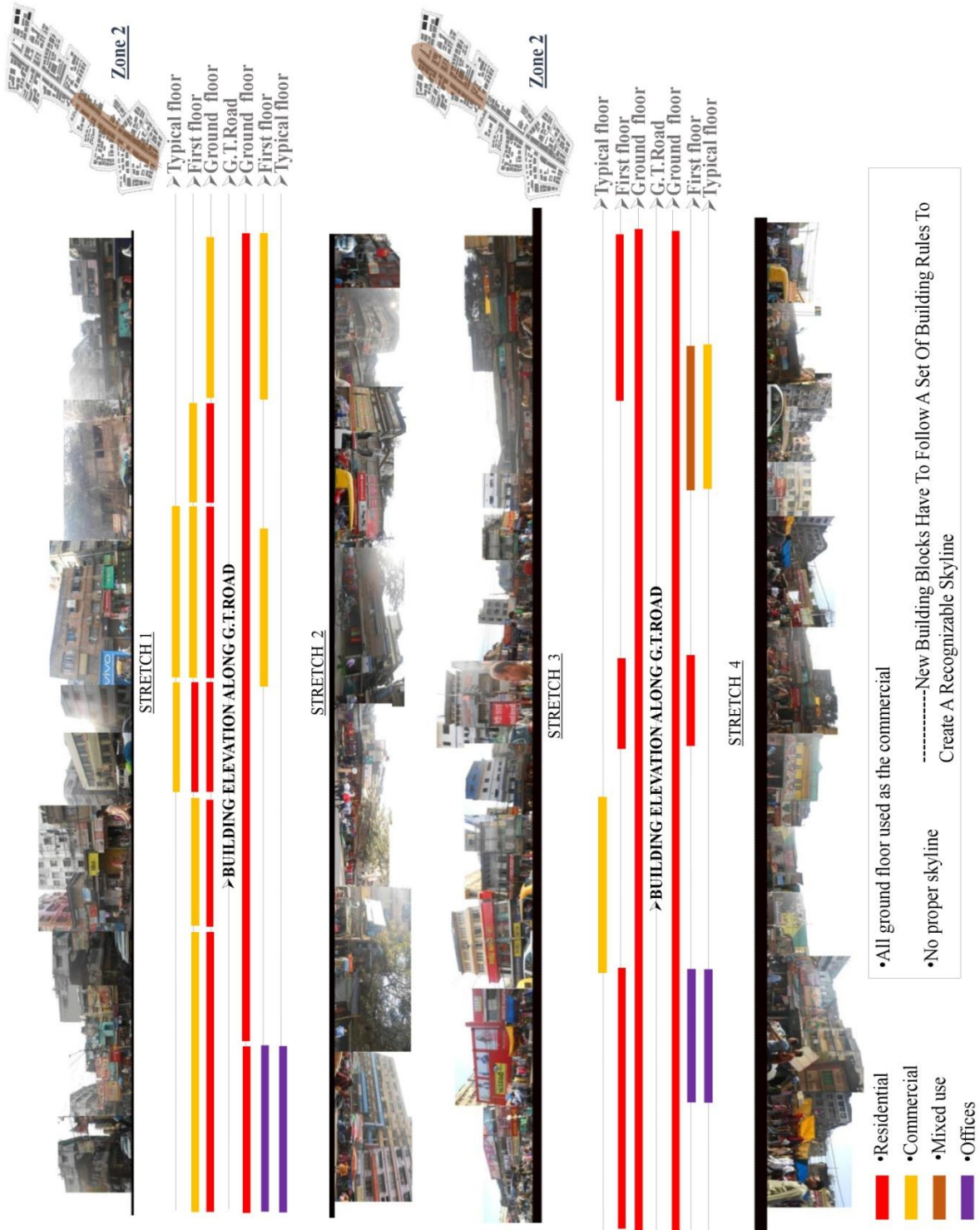
- Node 1** -Crossing Of G.T.Road,chinatamani Rod,and Nityadhan Mukherjee Road
- Node2** -Crossing Of Dr.P.k Banerjee Road And Netaji Subhas Rd
- Node 3** -Crossing Of Dr.Gangadhar Mukherjee Rd And G.T.Road

Conclusion-

- Mixed use and commercial development is around the major node which are in dilapidated condition
- Commercial development around minor nodes
- Nodes does not work as a significant landmark

3.3 ANALYSIS AND CONCLUSION-

ELEVATION

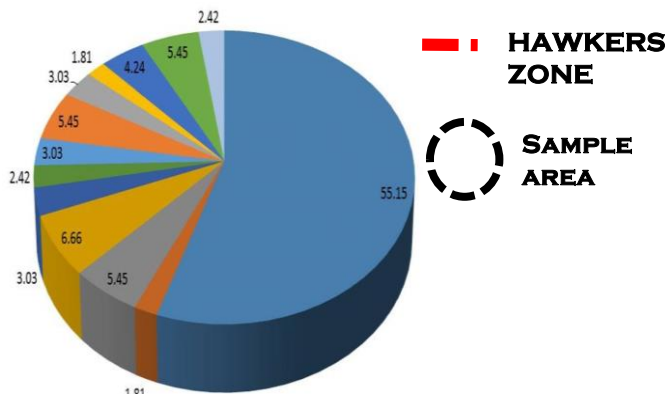


3.3 ANALYSIS AND CONCLUSION-

HAWKERS NUMBER CALCULATION

Congestion due to hawkers is a main problem in study area. So,for the calculation of the number of hawkersof the whole area,

Total numbers and type of hawkers have been identified for the a sample area.form theis the total number of hawkers of whole area has been identified



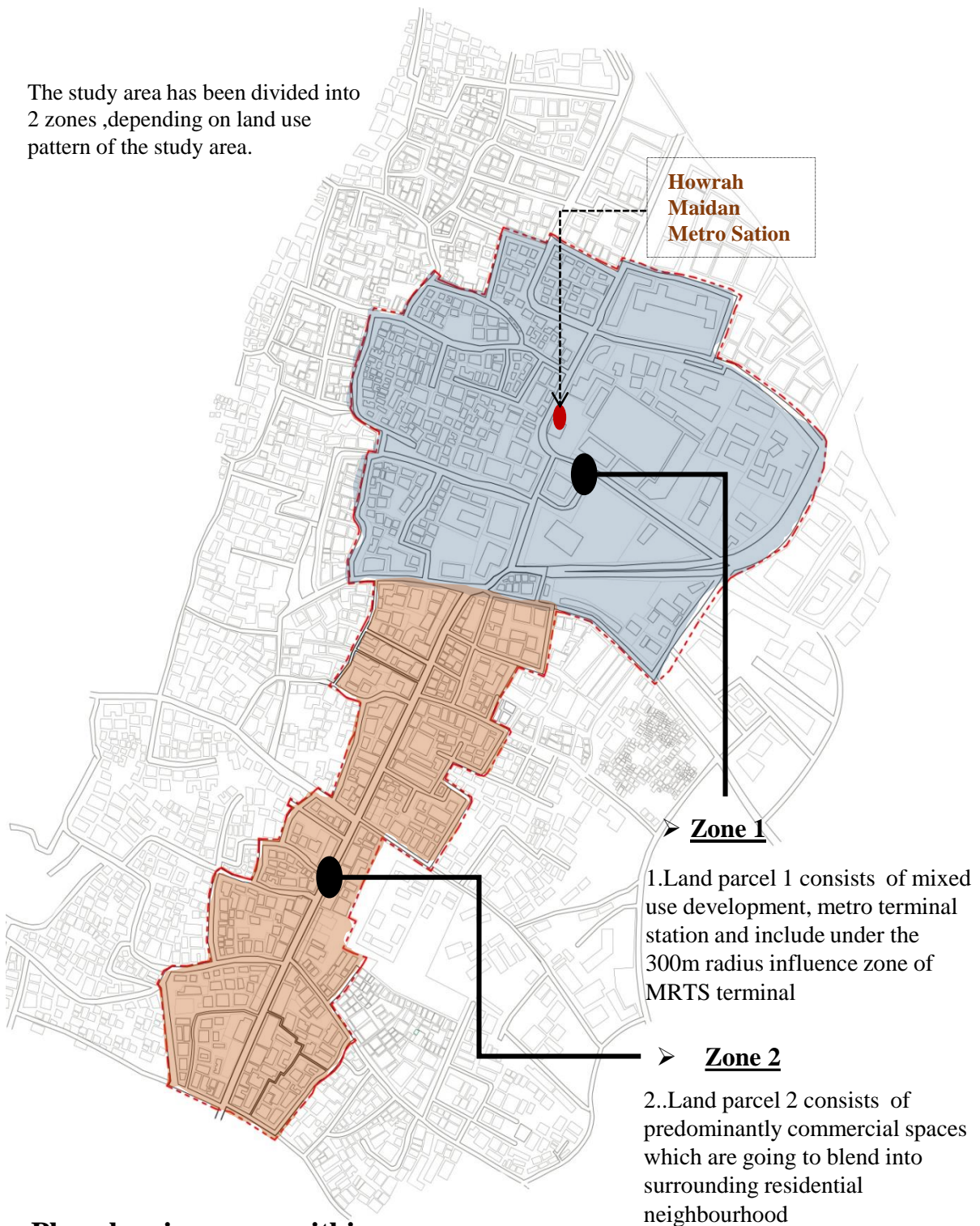
Key plan

		For 16M		For 54M FOR TOTAL HAWKER ZONE		PROPOSED RELOCATED POSITION
Sl.no.	Type of hawkers	Number of shops	Area (sq.m)	Number of shops	Area (sq.m)	
1.	Garments	91	275.6	380	1150	Upper
2.	Magazine	3	9.3	12	37.2	Ground
3.	Watch, Sunglass, Belt	9	28.1	37	115	Upper
4.	Food Items	11	32.52	45	145	UPPER
5.	Puja Items	5	14.8	20	59.2	Upper
6.	Household Items	4	13.4	16	53.6	Ground
7.	Bags	5	15.81	20	63.24	Upper
8.	Shoes	9	26.9	37	110	Upper
9.	Toys	5	14.56	20	58.24	Upper
10.	Bangles	3	10.12	12	40.47	Upper
11.	Plastic Items	7	18.69	29	77	Upper
12.	Vegetable	9	15.96	37	65	Ground
13.	Accessories	4	12.12	16	48.48	Upper
				Total area-1970 sq.m		

Fig 56: Table Showing The Number Of Hawker In The Sample Area And For The Total Study Area

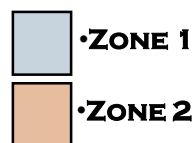
3.4 DIVISIONS OF ZONE-

The study area has been divided into 2 zones ,depending on land use pattern of the study area.



Plan showing zones within study area

50M 0 100M



3.5 ANALYSIS AND CONCLUSION-

ZONE 1

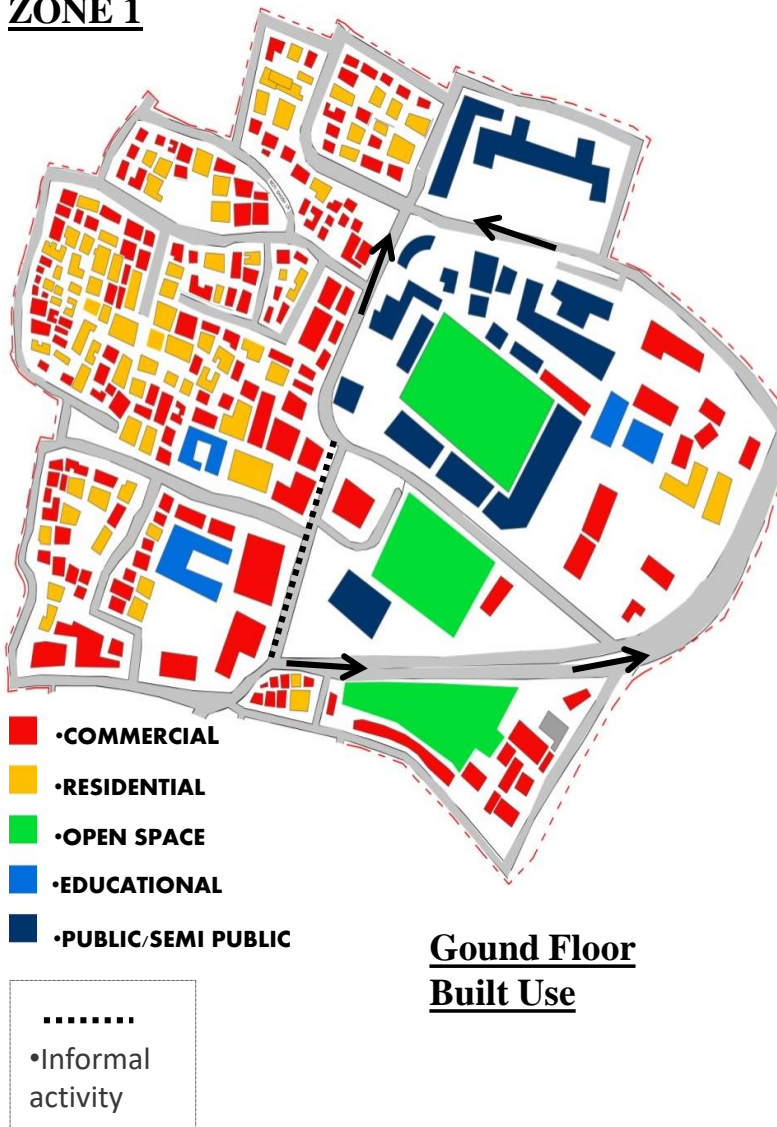


Fig 51: Informal Commercial Activity On G.T.Road



Fig 52: Commercial activity in the ground floor

➤ **ACTIVITIES-**

- commercial activities ground floor of road side building
- Upper floor uses mainly for residential purpose
- No public space for activity
- Informal commercial activities encroach G.T.Road

•**OPEN SPACE-**

- No formal or informal open space found at the area



Fig 53: Activity Due To Mangala Hut

50M 0 100M



3.5 ANALYSIS AND CONCLUSION-

MOVEMENT-

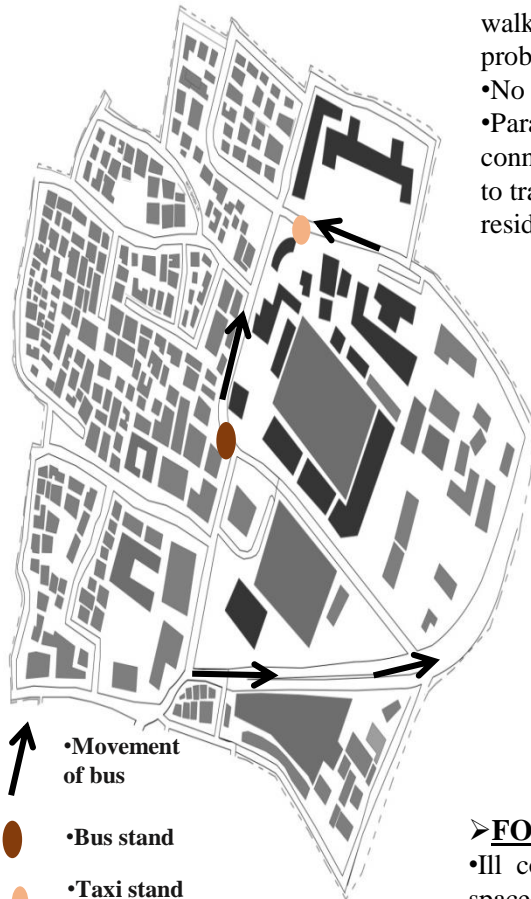
- No proper pedestrian walkways due to hawker problem
- No proper parking place
- Para transit can be found connecting residential areas to transport corridors or non residential areas



•No proper pedestrian pathway

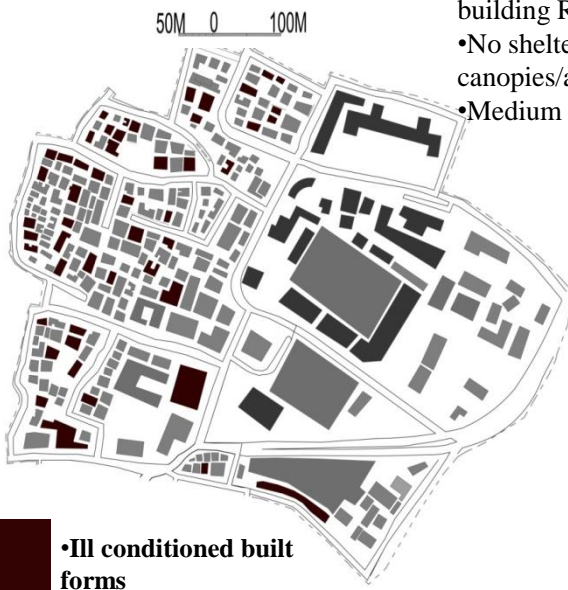


•No proper bus stop
•No parking place



➤FORMS--

- Ill conditioned built forms-potential for renewal with better space and form related guidelines
- No proper skyline-new building blocks have to follow a set of building Rules to create a recognizable skyline
- No shelter for pedestrian along commercial facing frontage-canopies/awnings should be provided
- Medium rise mixed use building for new development



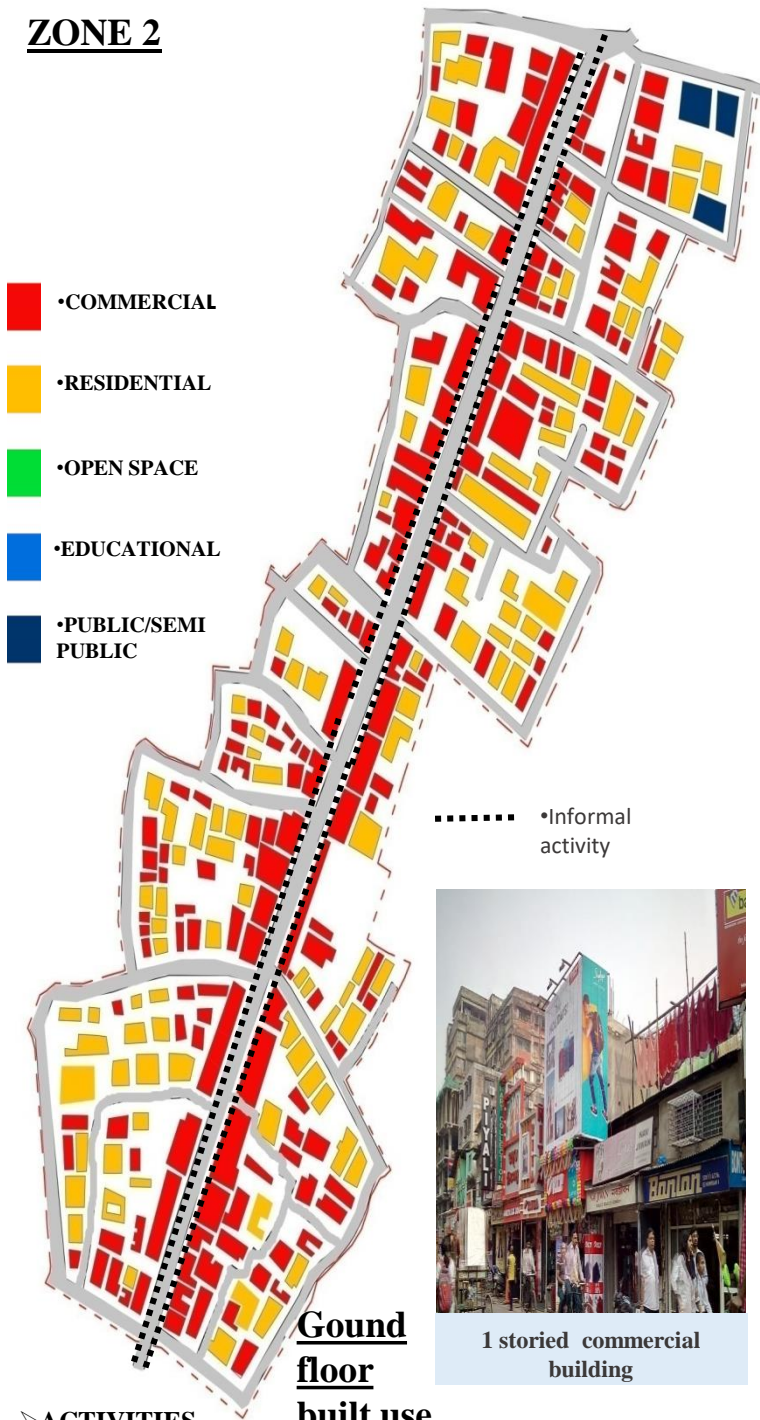
•Unutilized of F.A.R



•Poor condition of building

3.5 ANALYSIS AND CONCLUSION-

ZONE 2



➤ ACTIVITIES-

- Informal commercial activities on the both side of the road Between road and commercial development
- Encroachments of the pedestrian way obstructing pedestrian activity
- Retail shops for 1 storied building
- Ground floor for retail and upper floor for residential for 3 to 4 storied building
- Commercial activity found from 9am to 9 pm
- Peak hour-12 pm to 8 pm
- In adequate lighting
- View of formal shops Obstaced by the informal shop's activity



1 storied commercial building



•View of formal shops Obstaced by the informal shop



•Visual obstacle due to informal shops



ROAD
PEDESTRIAN (NOW ENCROACHED BY TEMPORARY SHOP)
OPEN SPACE (NOW ENCROACHED BY TEMPORARY SHOP)
TEMPORARY SHOP
FORMAL SHOP

50M 0 100M



3.5 ANALYSIS AND CONCLUSION-

•Ill conditioned built forms



50M 0 100M

> FORMS--

- Ill conditioned built forms-potential for renewal with better space and form related guidelines
- No proper skyline-new building blocks have to follow a set of building Rules to create a recognizable skyline
- No shelter for pedestrian along commercial facing frontage-canopies/awnings should be provided
- Low rise commercial building at the both side of street
- Medium rise mixed use building for new development

•OPEN SPACE-

- No formal or informal open space found at the area



Informal Structure



•Medium rise mixed use building for new development

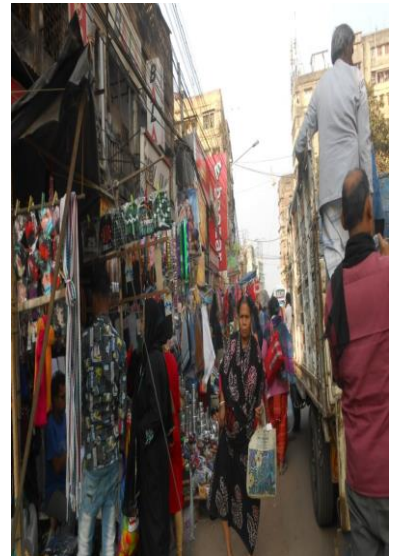


•LOW RISE COMMERCIAL BUILDING

•UNDERUTILIZED OF F.A.R



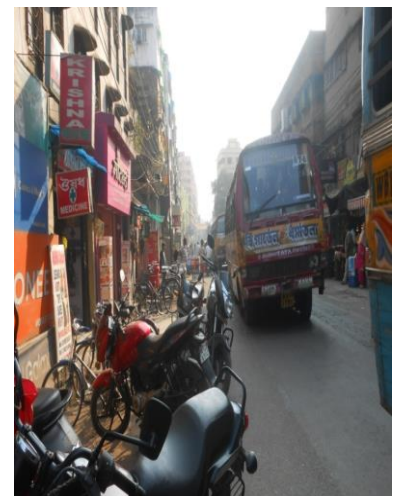
3.5 ANALYSIS AND CONCLUSION-



Informal activities obstruct the smooth movement of buyer



Obstacle in accessibility of formal shop due to Informal activity



Parking on the road



Informal activity encroached the road



Parking on the road & extension of formal shop's activity

MOVEMENT-

- No proper pedestrian walkways due to hawker problem
- No proper parking place
- Permanent and temporary parking are clustered on the road and pedestrian way
- Lack of parking space encroach the road and make obstacle for other movement
- Para transit can be found connecting residential areas to transport corridors or non residential areas
- People board on bus from any point of G.T.Road which in terms aiding in traffic congestions- bus stop location must minimized
- No designated crosswalk

3.5 ANALYSIS AND CONCLUSION-

Activity-

- Intervention necessary for the informal shops and hawkers
- To Ensure Visibility Of Permanent Shops.
- Intervention required for the problems due to informal activity
Road encroached
Poor illumination to the formal shop
Accessibility decreases

Movement-

- proper pedestrian walkways can be designed
- Formal and informal parking space has to given parking place

➤ Forms-

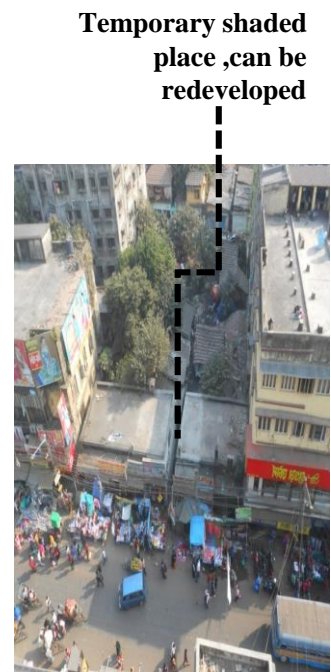
- Low rise commercial building can be changed into planned rise building
- Intervention can be done in informal and dilapidated structure

Landmark-

- Important office building,shops,bank fuction as a land mark

Node 1-

- Try to decongested and make vibrant with proper intervention



Elevation Of Building Obstructed By Different Wire

Towards metro station

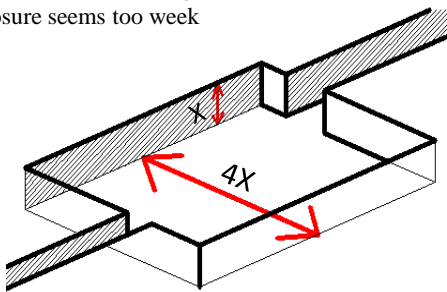
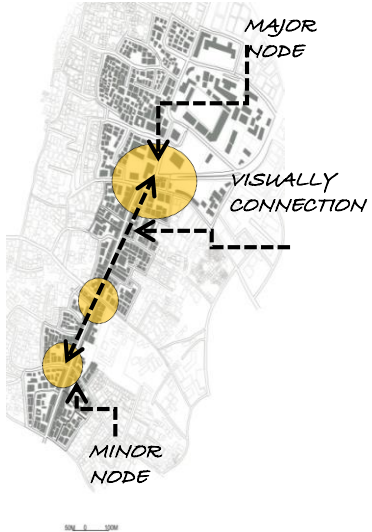
- Vehicle movement in both direction
- Direction of bus movement



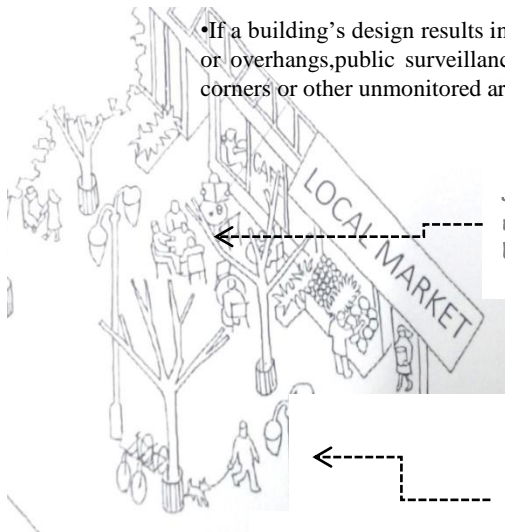
CHAPTER 1: DESIGN GUIDELINES

URBAN DESIGN GUIDELINES:

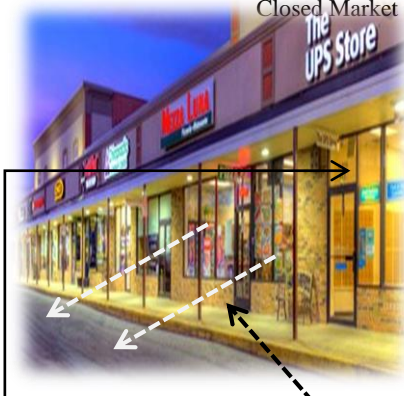
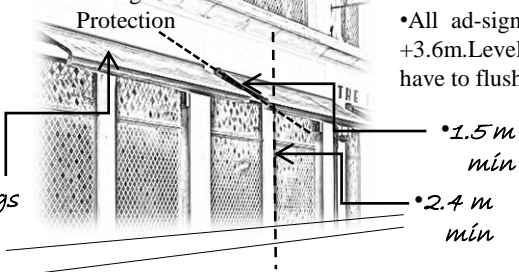
	<u>OBJECTIVE</u>	<u>POLICY</u>	<u>URBAN DESIGN GUIDELINES</u>
NODE	To organize commercial activities along street corridors	<ul style="list-style-type: none"> •On street parking areas would not be provided •Pedestrian plazas area encouraged around the node •Maintained the width and height ratio 	<ul style="list-style-type: none"> •Node should be act as a landmark for the area •Create a hierarchy of nodes •Create open /semi open circulation and resting plazas surrounded by built forms •Parking plaza is provided near nodes •Provide Width and height ratio to 4:1 before the enclosure seems too week

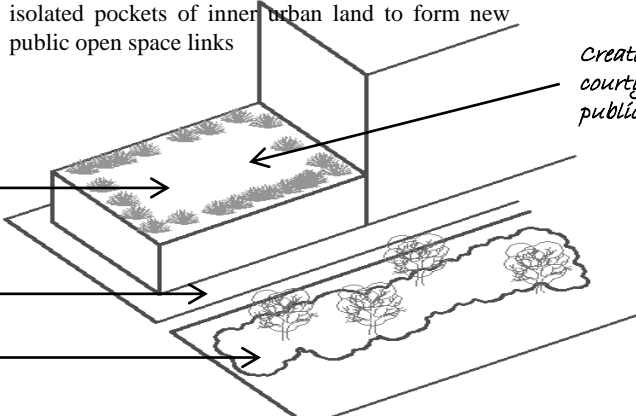


	<u>OBJECTIVE</u>	<u>URBAN DESIGN GUIDELINES</u>
ACTIVITY	To define the activity of the area	<ul style="list-style-type: none"> •Retail and other commercial spaces shall be expressed with facade treatments that are scaled to human activity on the street •Lower levels of the building shall be treated with changes in materials, cornice lines, or changes in fenestration scaled to create a comfortable pedestrian zone •Commercial and storefront entrances should be easily identifiable and distinguishable from residential entrances. Recessed doorways, awnings, transparencies, changes in color or materials, and/or alternative paving are encouraged to identify and enhance retail entrances. •Blank walls at the ground floor are to be minimized. •If a building's design results in recessed ground floor use to accommodate arcades or overhangs, public surveillance should be provided in order to minimize dead corners or other unmonitored areas along the sidewalk.



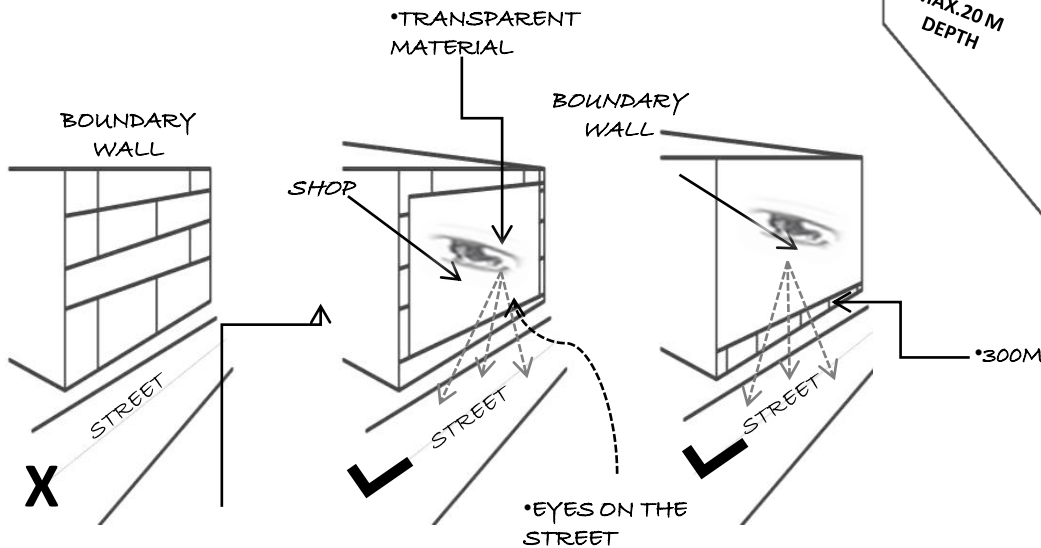
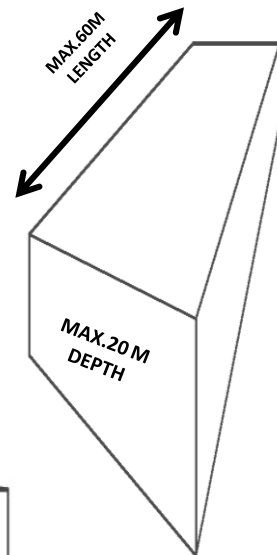
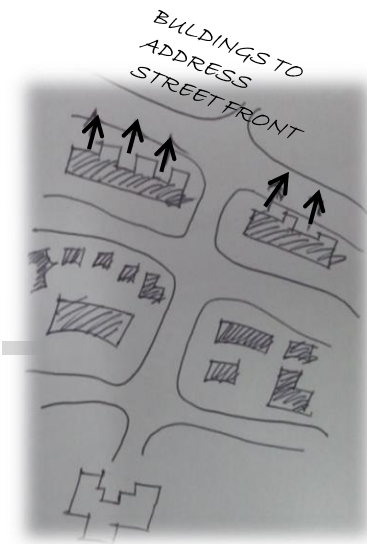
URBAN DESIGN GUIDELINES:

	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
<p>COMMERCIAL</p> 	<p>To Organize Commercial Areas While Providing Both Open And Closed Market</p>	<ul style="list-style-type: none"> •The Ground Overage Of The Commercial Areas Should Be Max 45% And Minimum F.A.R Of 150 And Maximum F.A.R 400 •The Relocated Street Side Shop Should Be Given A Reduction In Rent/Tax •The Commercial Areas Providing Spaces For Ground Floor Colonnades Should D Be Provided With An Extra F.A.R •Commercial Frontages Facing Main Streets Should Incorporate Architectural Details Such As Covered Walkways,canopies Or Awings To Provide Weather Protection 	<ul style="list-style-type: none"> •Pedestrian spaces separated into movement and rest spaces • Require commercial facades to have Minimum 30% transparency. •8. Create commercial/ hawking zones at Regular intervals (10 minute walk From every home in the city) to Encourage walkability •Awnings can be placed into public right-of-way provided a minimum of 2.4 M of vertical clearance and can be projected max 1.5 from building line •Corner buildings at the intersections should emphasize the focal mature and visibility through elements such as projections,recesses,special materials •All ad-signboards need to placed at +3.6m.Level from the road level and have to flushed with front facade 

	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
<p>OPEN SPACE</p> 	<p>To increase the quality of the existing open spaces and to create new pockets wherever possible</p>	<ul style="list-style-type: none"> •In every new development there should be minimum 20 % open space and tree plantation •Encourage the creation of internal courtyards,terraces and/or roof decks in new buildings •Rationalize leftover spaces,linear corridors or isolated pockets of inner urban land to form new public open space links 	<ul style="list-style-type: none"> •Squares and plazas frequently in nature and regular in their geometry,with well defined building edges and a tradition of open public access

URBAN DESIGN GUIDELINES:

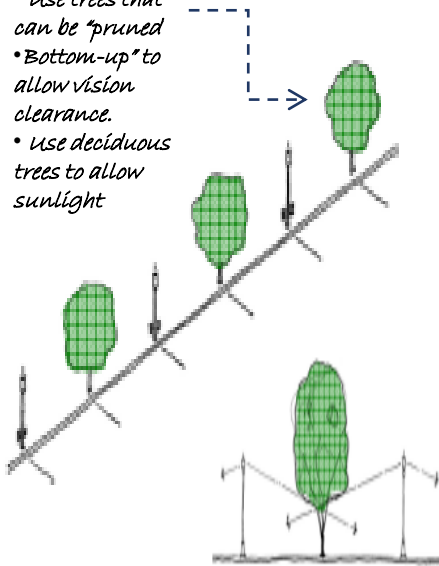
	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
BUILT FORM	To reinforce the building front setback and orientation of built structures to give a livable and quality environment for the pedestrian	<ul style="list-style-type: none"> •Ground coverage o 40% •Provide incentives for private development to provide green open spaces,including roof gardens •Whenever any construction is to be made in the project area,it has to follow, a front setback of 45deg,measured from a point mid way width of the road.This setback angle will help in allowing daylight into the space at ground level •Create “eyes on the street” – by Removing setbacks and boundary 	<ul style="list-style-type: none"> •Encourage active frontage at ground floor •Encourage built form setbacks at upper levels,above street frontage height of 4-6 storeys approx. •Provide F.A.R 4 •Entry to the important buildings should be visible from the street and oriented to wards the sidewalk so that access by foot is clear and convenient •In case enclosure of sites is Required, transparent fencing should Be used above 300 mm height from Ground level. •Block depth max of 20 metersand leight should nor exceed 60 m(harmonic rule for length $L-H/H-W=L/W$)



URBAN DESIGN GUIDELINES:

	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
<p>PUBLIC AMENITIES</p>	<p>To provide street furniture and signage</p>	<p>Provide adequate street lighting for Pedestrians and bicycles.</p> <p>•Proper lighting during the night time to make the area more likely and to restrict vandalism</p> <p>•Provide dustbins, postboxes, Signage and other public amenities At street corners for high usability.</p> <p>•Trees must be placed such that they do not obstruct street lighting</p>	<p>•Providing appropriate directional informational and regulatory signage</p> <p>•Light to be mounted not less than 1.5 m</p> <p>•Improving the quality and distribution of toilet facilities and drinking fountains throughout the city. Provide a range of options for seating</p> <p>•Provide accessible public toilets at Every 500 -800 M distance – Preferably located close to bus stops For easy access by pedestrians and Public transport users</p>

- Narrow "columnar" trees to be used
- Use trees that can be "pruned bottom-up" to allow vision clearance.
- Use deciduous trees to allow sunlight



Tree planting plan and Lighting plans must be prepared in conjunction – so that tree canopies do not obstruct lighting for road users.

- A variety of Full Cutoff light fixtures can meet required site-specific standards
- For Wide Streets with high pedestrian/commercial activity,
- Mid-Mast lighting may be combined with Pedestrian to create adequate sense of security and comfort

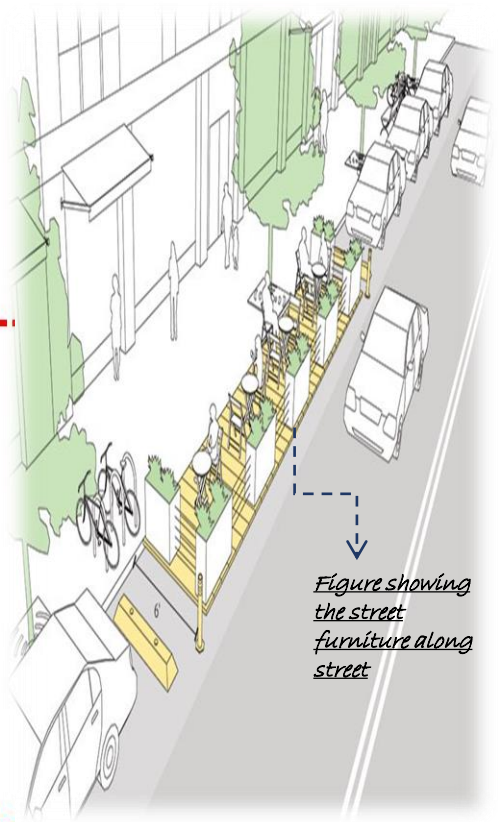


Figure showing the street furniture along street

URBAN DESIGN GUIDELINES:

	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
MOVEMENT NETWORK	To provide proper accessibility to the site as well as legibility within the site	<ul style="list-style-type: none"> •Use street closure,partial closure roundabouts and other traffic-calming techniques to protect local streets from the impact of through traffic •Follow universal accessibility design Standards to make public streets & Crosswalks fully navigable by the Physically handicapped. •Hawkers must be accommodated within the road row – approximately every 500-1000 m On a public street. 	<ul style="list-style-type: none"> •Provide at-grade crosswalks (and overpasses on highways) at maximum intervals of ~70-250 M, aligning with location of transit stops, type of street / landuse activities and neighboring building entries and destinations. •Width of the kerb ramp should not be less than 1.2 M. •A distance of 600-800mm to be maintained from the edge of footpath/ boundary wall



Signage Pedestrians Street furniture/ Utilities

Fig 56 :Section Of Road In Commercial Area

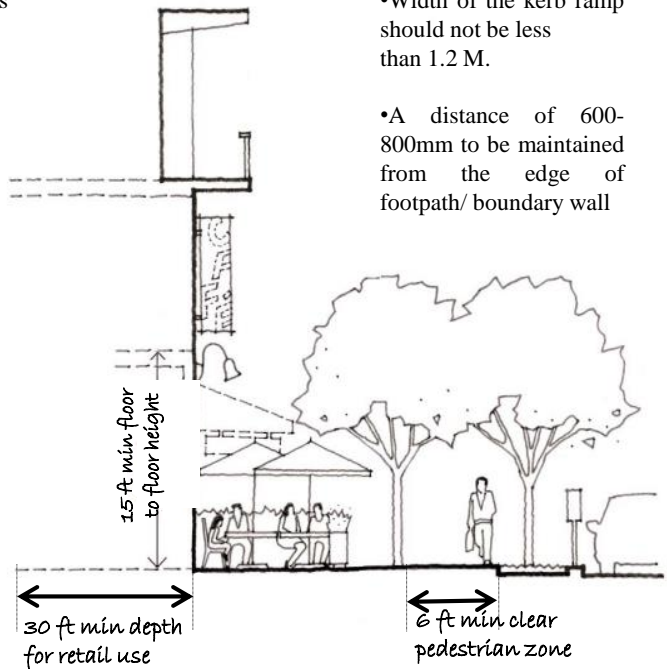
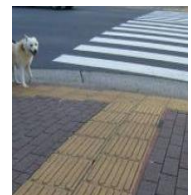
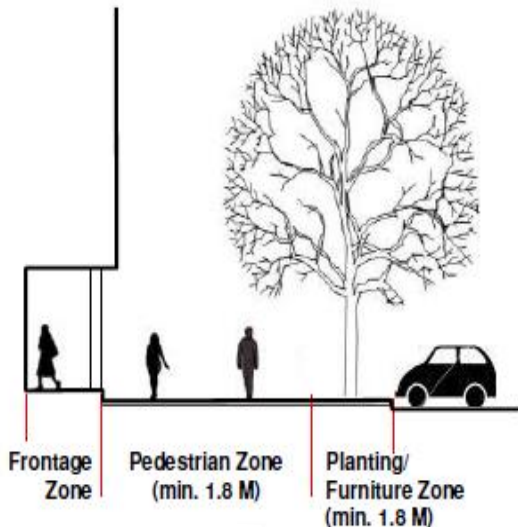


Fig 56 :Pedestrian Movement And Street Activity

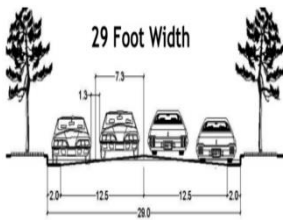


Handicapped Ramps, Tactile Paving

Fig 56 :Section Of Road In Commercial Area

URBAN DESIGN GUIDELINES:

	OBJECTIVE	POLICY	URBAN DESIGN GUIDELINES
<p>PARKING</p>	<p>To provide organized parking spaces</p>	<ul style="list-style-type: none"> •Parking plazas should be provided •On street parking is to be provide for short term parking •Parking on public space anywhere in the city at any time,by any mode,needs to be charged a price.The objective of pricing are to <ul style="list-style-type: none"> •Generate revenues •Provide employment •Especially poor •Restrain demand •Encouraged private sector investment •Rationalize parking duration 	<ul style="list-style-type: none"> •On street parking facilities area to be provided in the local streets with a minimum width of 9m •For a transit -rich area, project sponsors are encouraged to minimize the number of spaces provided for individual parking. •Individual parking spaces are not required to be independently accessible. Mechanical lifts, valvet parking and other methods of reducing square footage dedicated to parked vehicles area encouraged •The project design should minimize the visual impact of parking entrances and exists to the building’s façade. •Where feasible, multiple buildings within the same block should share off-street loading facilities and



29 foot/9m width

Fig 56 :Pedestrian

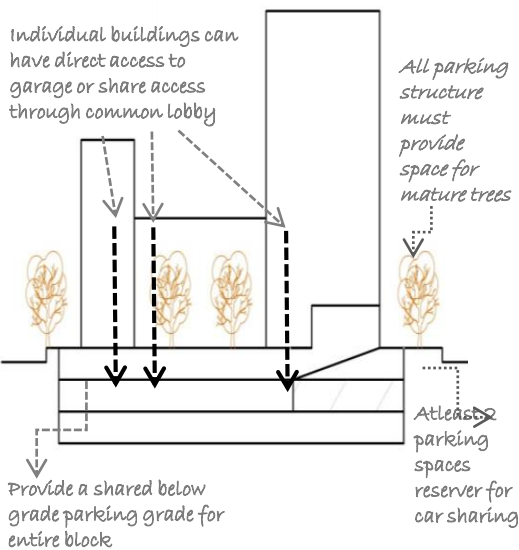


Fig 56 :Pedestrian Movement And Street Activity

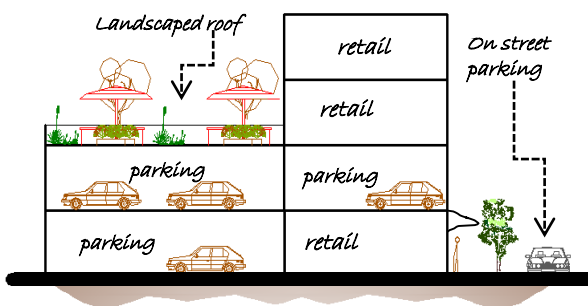


Figure showing the parking plaza combined with retail and other ground floor activities

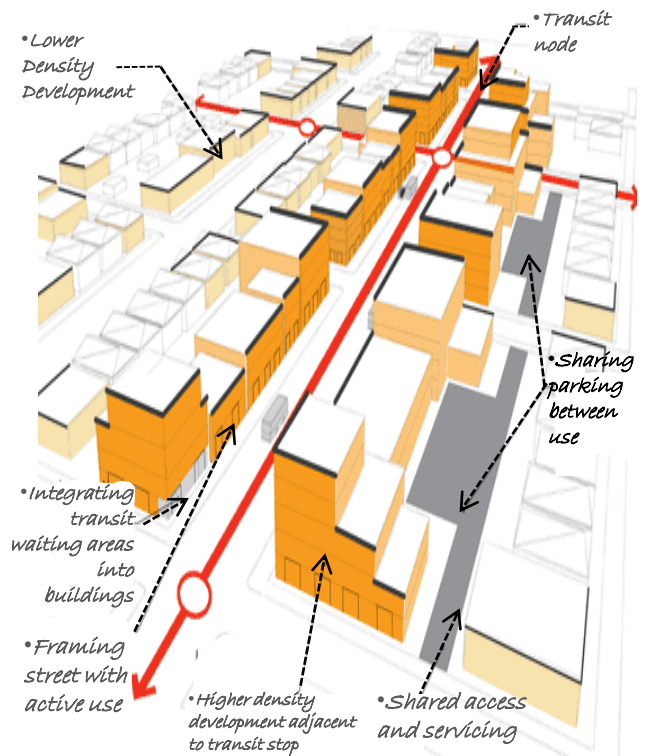
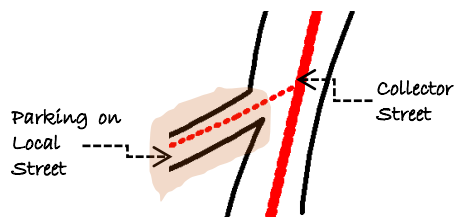
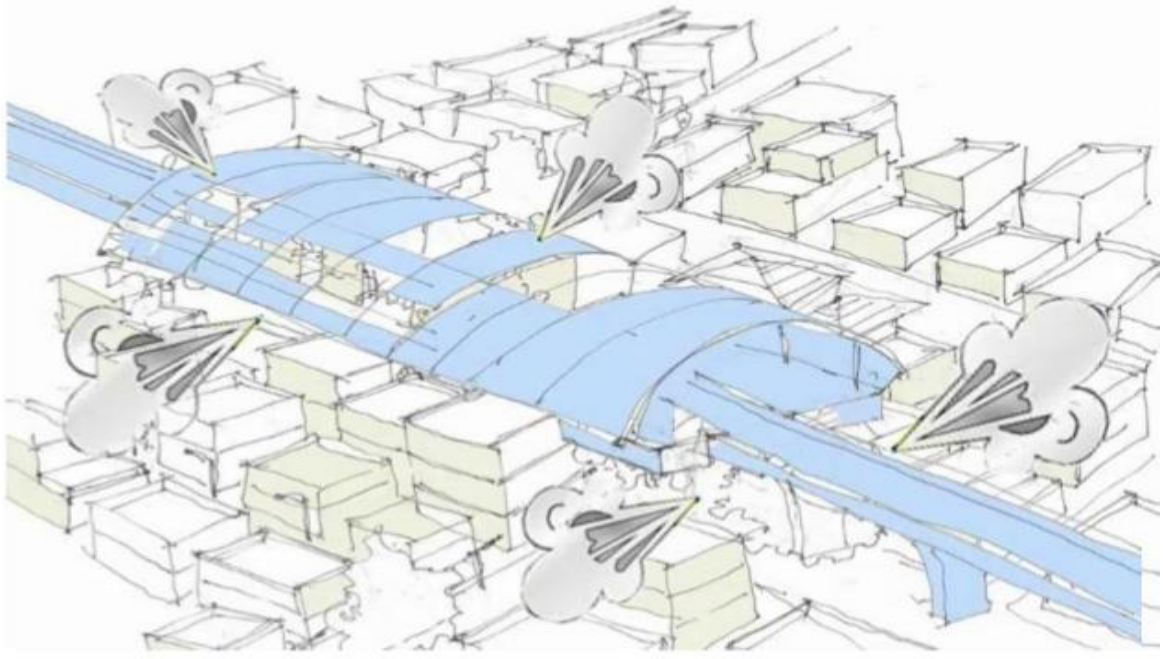


Fig 56 :Pedestrian Movement And Street Activity





CHAPTER 1: DESIGN IMPLEMENTATION

Issues

- Cost-The cost of large scale redevelopment project is matter of concern,in the sense that it is difficult to determine the role of different stakeholders.For funding metros the government should provides infrastructure but the operating cost and cost of rolling stock must met by users and beneficiaries.
- Connectivity- The project is situated in the prime location of Howrah District, near the Howrah Station and also being a main commercial area of the district.In this regard several travel options should be considered along several trip pattern
- Public space- It is important to create public spaces within and around the project site,not only to invite people to participate in the development but also in order to provide required recreational and open space that are sorely lacking in the study area.
- Aesthetic and scale-The Scale of architecture should be urbane keeping in mind the landmark value of the project
- Human scale-Intelligent urbanism encourages ground level,pedestrian oriented urban pattern. Walkable,mixed use development should be encouraged

Contributions

The analysis and proposals for the study zones and design for the implementation site intend to provide smart growth along the mass rapid transit terminal to have an sustainable transit oriented development.The approach towards the design and development of general policies, strategies for planning, and concept of urban deign

- Genetral policies
 - Locationg regional attractions in proposed development centers.
 - Creation of developments that expands the divesity,synergism and use of renewal resources in local economics.
- Planning strategies
 - Intergration of land use and and transportation to minimize travel distance
 - Preservation of openspace
 - Maximizing the capacity of existing infrastrucrure by reusing derelict sites,preserving existing fabric and minimizing demolition.
- Urban design concepts
 - Creationg compact,walkable neighbourhood,catering to requisite trips as well as for leisure
 - Integration of retail and business along with community facilities
 - Using compact designs of buildings to minimize land consumption

Future Application

The MRT technology is an environmental friendly,non polluitong transportation system that can relieve congested and unhealthy transportation environment.The thesis was taken up with the idea of developing a commercial area by considering the impacts of Mass Rapid Transit system.Firstly,the methodology or the process of study from an urban design perspective may be utilised in order to understand local impacts of MRTS on commercial districts.Secondly,the models of development proposed in the thesis may be used and improved upon,in order to create an idea of the proper relationship between people and their movement patterns, their requirements in designated spaces and their physical correlation with their urban forms.

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