REGULATING URBAN DEVELOPMENT OF A PERIPHERAL STRETCH IN A METROPOLIS: CASE APPLICATION AT CHINAR PARK, RAJARHAT, KOLKATA

A thesis report submitted in partial fulfilment of the requirement for the post graduate degree of Masters of Architecture (Urban Design) by Jadavpur University, Kolkata

Supervised by,

DR. SANJIB NAG

PROF. SANGHAMITRA SARKAR

Submitted by,

SAYON PRAMANIK

Roll No- 001410202007

M. Arch, 2nd year

Department of Architecture

Jadavpur University

2014-2016

DECLARATION

I Sayon Pramanik, hereby declare that my thesis titled

"**REGULATING URBAN DEVELOPMENT OF A PERIPHERAL STRETCH IN A METROPOLIS: CASE APPLICATION AT CHINAR PARK, RAJARHAT, KOLKATA**"

Is my own work and any information/data I have incorporated has been duly acknowledged.

SayonPramanik

Roll No- 001410202007

M. Arch, 2nd year

Date: 29th May, 2016

Place: Kolkata

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Chapter 1

INTRODUCTION

1.0 INTRODUCTION

The eclectic history of diverse immigrant communities shapes and leaves an indelible imprint on a city. **Kolkata is a 'melting pot' of migrants** like Armenians, Chinese, Jews, Anglo-Indians, and Greeks.

Their traditions, reflected through cultural and occupational practices, food habits, dressing, and architecture, lend **identity to the broader landscape of the city.**
Passage of time and altered socio-economic circumstances threaten to erode this shared cultural heritage.
Corrosion of urban character due to over development of neighborhood areas is an issue that must be addressed immediately.
In this abode of transformation and rapid urbanization of the settlement, institutions, living practices and community interactions, we must **consider methodologies** to address key issues threatening the place and community that can potentially trigger **holistic revitalization** processes.

1.1 BACKGROUND

The built environment serves as the structural framework for societal activities such as production, consumption, and reproduction (Stein, 2001).

The concept of urban design dictating planning methods is not rooted in the belief that it determines subsequent human behavior but rather in the idea that **deliberated and good design can have positive influences on the people that occupy those spaces.** If we historically examine human settlement, we can identify underlying thematic characteristics of every city that distinguish it from the rest of the world. **Every city needs focus and identify traits that let it hold on to its past while adapting for the future.**

The monumental scale of the city beautiful movement and world fair buildings which give a legacy value through tourism, and the more human scale development as followed by Lynch and his contemporaries which is accepted by the citizens due to it's improved living standards need to be consolidated into an integrated design approach.

However, urban design principles help the built environment to fulfill these needs and uses to function efficiently in that space. Economic principles of allocating resources to its best possible utilization help define uses but at the same time adhering to urban design guidelines **serves the purpose of providing the living environment of people that help them flourish and innovate**. Kevin Lynch's elements of city form – paths, edges, districts, nodes, and landmarks – are good starting points for understanding how people perceive city form. Urban design effectively works with these elements by creating more psychologically satisfying urban environments.

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1.1.1 DEFINITIONS

1.1.1.1 URBAN DEVELOPMENT

The purpose of urban development is to improve **specific** areas of a city **that are** poorly developed or underdeveloped. These areas can have old deteriorated buildings and bad streets and utilities or the areas can lack streets and utilities altogether.

- **Construction or improvement** of streets, utilities and other public uses.
- Rehabilitation or conservation **of existing buildings**
- **Acquisition and improvement** of property (The Committee has recommended that the Agency have no condemnation authority)
- Re-sale or lease **of property**

1.1.1.2 PERIPHERY

A periphery means the **outside edge of an area:** the area that surrounds a place or thing.

1.1.1.3 STRETCH

A **continuous area** or expanse is called a stretch.

1.1.1.4 METROPOLIS

A metropolis is a large city or **urban area** which is a significant **economic, political, and cultural center** for a country or region, and an **important hub** for regional or international connections, commerce, and communications.

1.1.1.5 PERIPHERAL STRETCH

A **continuous edge** of an area can be called the peripheral stretch.

1.1.1.6 PERIPHERAL STRETCH OF METROPOLIS

The continuous outside edge of a central urban area.

1.1.1.7 URBAN DEVELOPMENT OF A PERIPHERAL STRETCH IN A METROPOLIS

1.1.1.8 REGULATING URBAN DEVELOPMENT OF A PERIPHERAL STRETCH IN A METROPOLIS AT CHINAR PARK

1.1.2 JUSTIFICATION

Chinar park is emerging as an important node in the northern gateway of Kolkata.
This node acts as one of the exit points of New Town Salt Lake.
The design consideration for New Town has been up to City Center 2: beyond that the peri-urban area is well distinguished.
The sprawl and the change in land-use pattern has put a lot of impact in this stretch - the road is being expanded to 40m width from 14m.
Immediate action must be taken for its sustenance so that it can perform well when New town will be fully functional in the near future.
Significant rise in public vehicles along with other movements create a chaos at this junction.
The suburban area of Rajarhat, from which there is a daily influx of city workers, is connected to the rest of the city through this intersection.

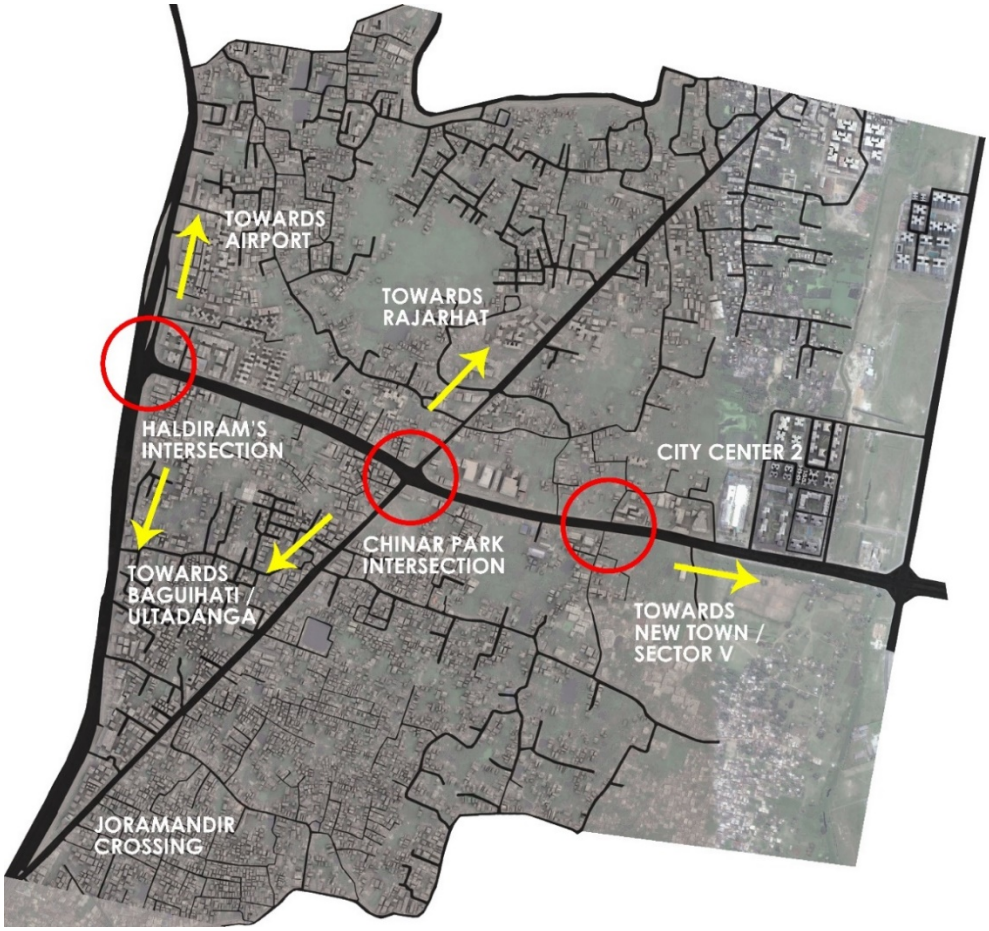


Fig 1.1 *Area access plan*

1.1.3 LITERATURE STUDY

1.1.3.1 HISTORY

The basic tenets have always existed in history of man's city building exercises. The ancient civilizations of Mohenjo-Daro & Harappa circa 2000 BC utilized public amenities such as delineated drainage systems and water supply systems. The Greek and Roman civilizations used public spaces (agoras and piazzas respectively) for cultivating a sense of community and urban life. Their monumental structures, often for religious and recreational (Acropolis and Colosseum) purposes served as focal points in their cities around which the urban fabric of their civilizations was woven.

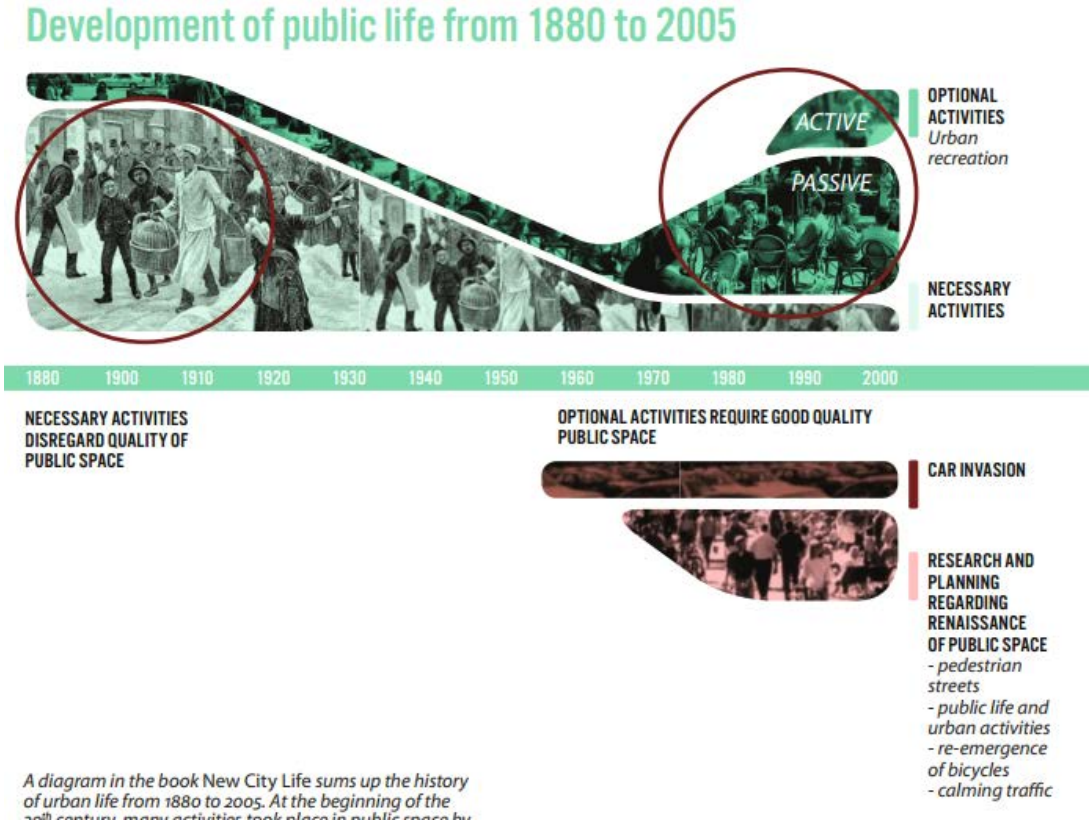


Fig 1.2 *Public Life Analysis by Jahn Gehl*

This chart shows how the quality of the public space started to become important as public activities turned from a necessity to an option.

"How to study public life", Jahn Gehl

1.1.3.2 EXISTING CONCEPTS

“Cities for people”, Jan Gehl

The basic elements of city architecture are movement space and experience space. The street reflects the linear movement pattern of feet and the square represents the area the eye can take in.

Low buildings are in keeping with the human horizontal sensory apparatus, but high buildings are not.

Our horizontal field of visions means that when we are walking along building façades, only the ground floors can offer us interest and intensity. **If ground floor façades are rich in variation and detail, our city walks will be equally rich in experience.**

Pedestrians must have priority in mixed traffic.

The light from buildings along city streets can make a significant contribution to the feeling of security when darkness falls.

If ground floors are friendly, soft and — in particular — populated, pedestrians are surrounded by human activity. Even at night when little is happening in cafés and front yards, furniture, flowers, parked bicycles and forgotten toys are a comforting witness of life and proximity to other people. **Light streaming from the windows of shops, offices and dwellings at night helps increase the feeling of safety in the street.**

Pedestrian overpasses are used as a last resort and only function as in-tended if pedestrians are physically prevented from crossing the street.

Known as the **edge effect, the edges of public space hold a magnetic attraction for people.** Here our senses can master the space, we are facing what is happening and our backs are covered

Good city space should offer **primary seating in the form of benches and chairs, as well as many secondary seating options: stairs, bases of statues, monuments, etc.**

“The Image of the City”, Kevin Lynch

From field-research, what evidently arises is that each individual image constitutes a connection between urban forms and what is, on a more global extent, the public image. Each of those images is constructed and relying on the 5 elements already mentione. which are:

-paths: the channel of the observer

-edges: breaking in continuity with the surrounding areas
-districts: 2-dimensional elements within which we spot a common character
-nodes: strategic points
-landmarks: external references

Cities for people", Jan Gehl

SCALE AND RHYTHM

5 km/h – 3 mph

or 60 km/h – 37 mph scale

DISPLAY

Open

or closed

SENSE APPEAL

Interactive

or passive

MIXED FUNCTIONS

Varied

or uniform

FAÇADE

Vertical

or horizontal

TEXTURE AND DETAILS

Fig 1.3 *Public Life Illustration by Jahn Gehl*

The death and life of great American cities", Jane Jacobs

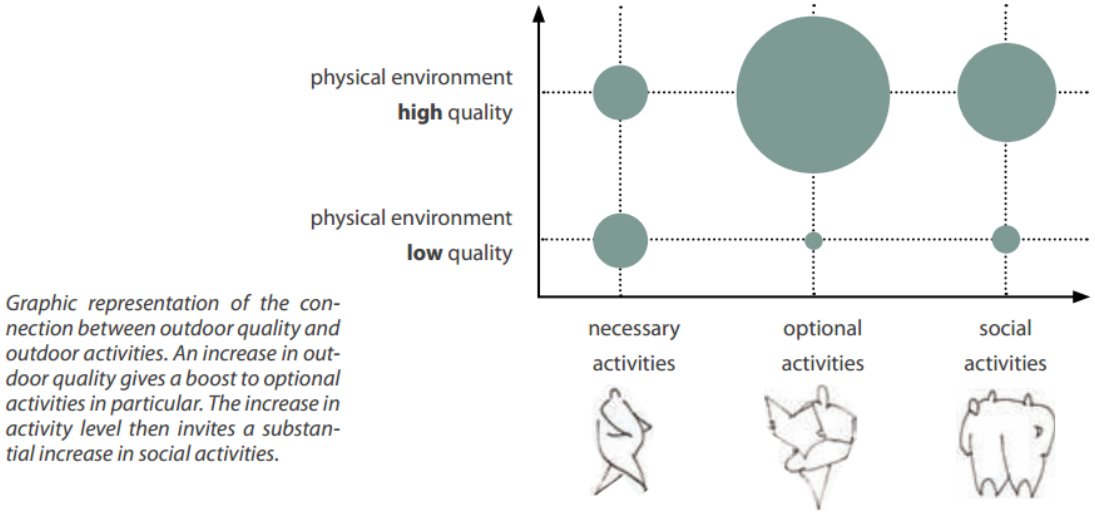
3 factors contribute to street safety:
A clear line between public and private space.
The eyes of the neighborhood must be on the street/sidewalks.
The sidewalks and streets must be in constant use.
Small business must flourish in neighborhoods as it attracts people. **More people means safety.**
Streets need lights. Streets need intersections. This attracts people and safety.
Sidewalks are social—people meet on sidewalks and **trust is crucial for sidewalks to be safe places for contact**. Sidewalk travel ensures that people know each other—from shopping, from bus stops, from windows.
Children are often safer when playing on sidewalks because adults are there.
Many city problems come from automobiles and the systems used to accommodate them. Some have tried to separate pedestrians from vehicular traffic. Jacobs does not see these as workable solutions.
First there is street widening, then route changes. Then there are complete road changes with new bridges and greater areas of land devoted to parking.
Eventually people have to drive because everything becomes spread out. This is the city erosion process. As areas thin out, cars are needed for people to reach places for everyday uses.
Cities could do things to encourage people to walk or take public transportation. Widening sidewalks, not streets, makes driving less attractive in downtown areas.

"How to study public life", Jan Gehl

How: The question of how many or how few comes in several varieties in public life studies, such as before and after urban improvement projects. **If we know how many people are staying in a square, and**

we then improve the square and count the number of people again, we can evaluate the success of the renewal project.
What: Mapping what happens in city space can provide specific knowledge of the types of activities in an area, such as staying, commercial or physical activities. **In general, public space activities can be divided into two categories: necessary and optional. When**: The time dimension is essential to understanding life in public spaces, which makes how long a key question.

"How to study public life", Jan Gehl



Graphic representation of the connection between outdoor quality and outdoor activities. An increase in outdoor quality gives a boost to optional activities in particular. The increase in activity level then invites a substantial increase in social activities.

Fig 1.4 *Outdoor life quality by Jahn Gehl*

WALK			
STROLL	WALK • To experience • To work	WALK TO SHOP • Transit	WALK TO DO SOMETHING • To do errands • To do a job
STAND			
TO ENJOY LIFE	TO DO SOMETHING • To drink • To eat • To trade	TO LOOK AT SOMETHING • Displays • Activities	TO DEAL WITH HINDERANCES • Traffic, red light	TO WAIT • For the bus • For someone
SIT			
TO ENJOY LIFE	TO EAT	TO SUPERVISE	TO REST

Sydney: Small region, area study of entire city center done.
London: Too extensive for area study (>1km^2), representative streets, squares, parks and local areas are selected – Acupuncture study.

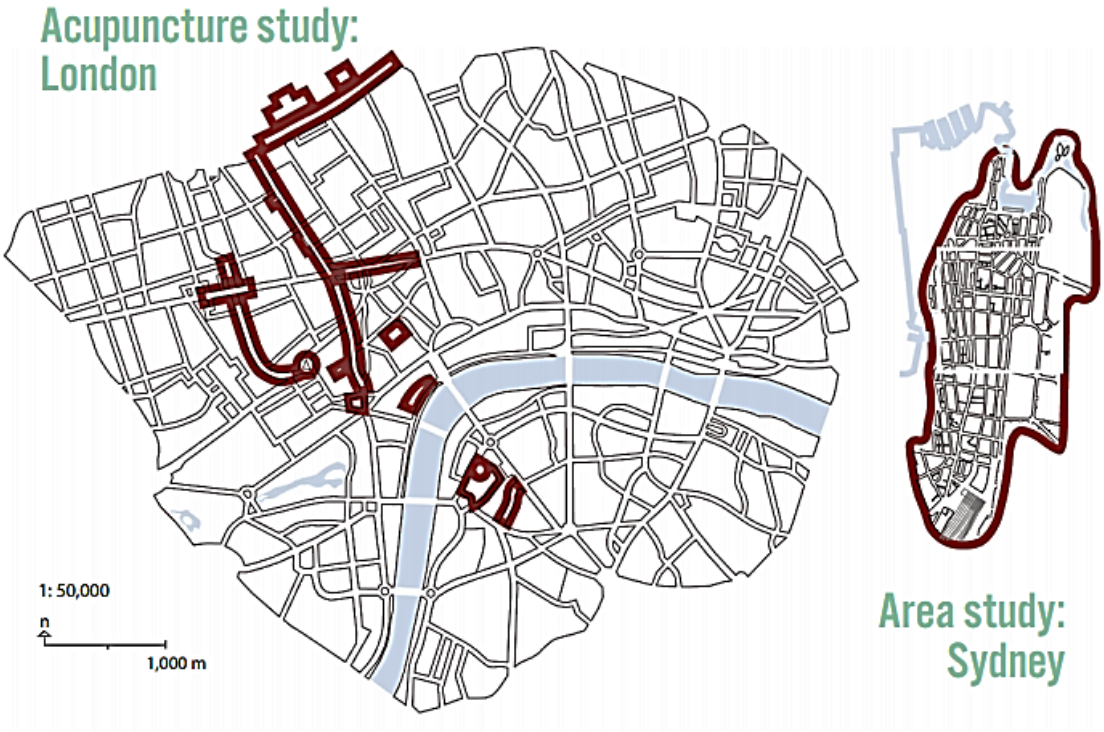


Fig 1.5.a*Acupuncture study of London and Sydney*

City centers have proven to be surprisingly uniform in size: typically 1x1 km (or a bit more), the acceptable walking distance.

Melbourne: From 1994 to 2004, 70% more square meters of public space with staying options were established. In other words, the city made a massive effort to invite the city's residents and visitors not only to walk more in the city, but to stay awhile.

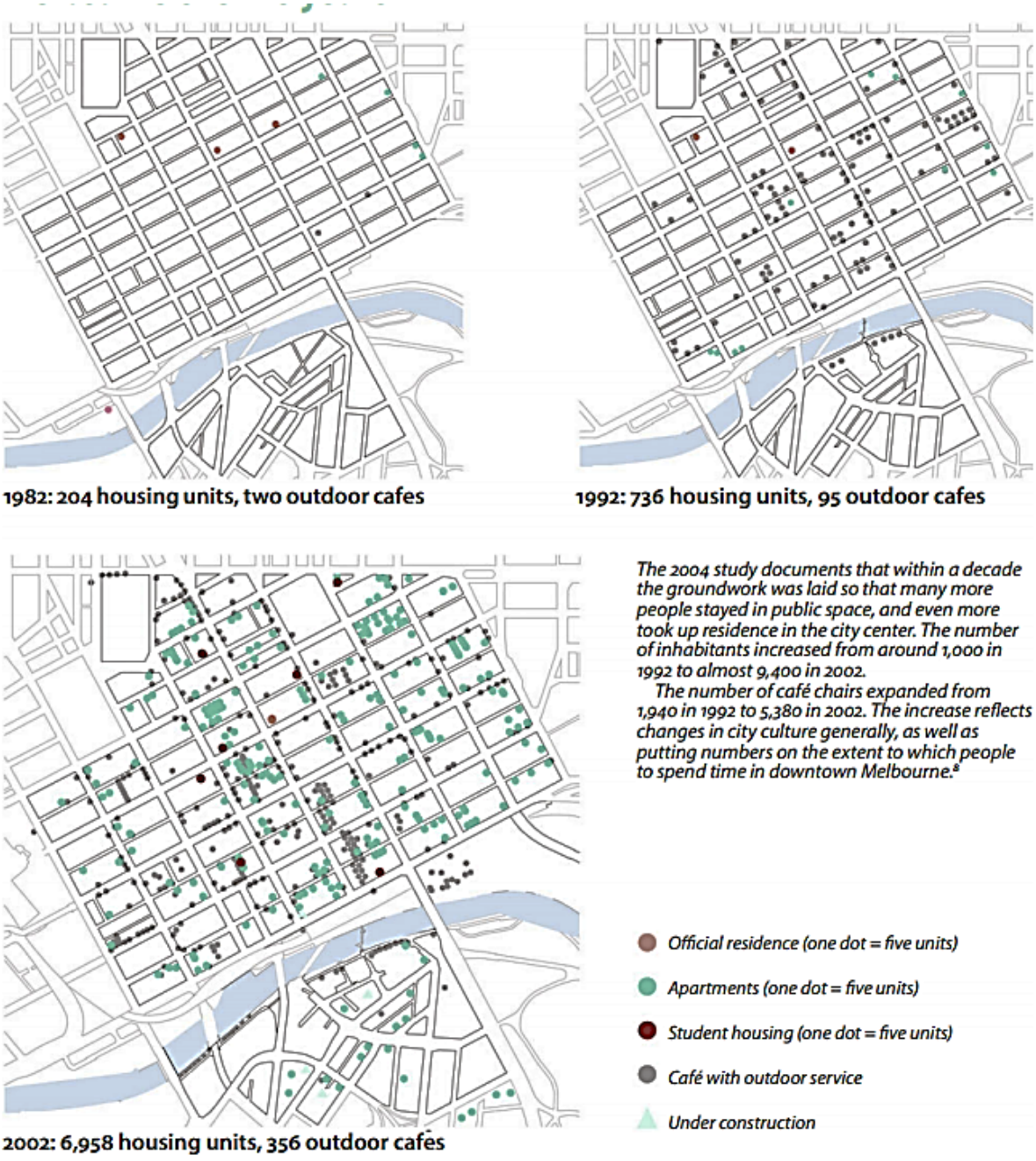
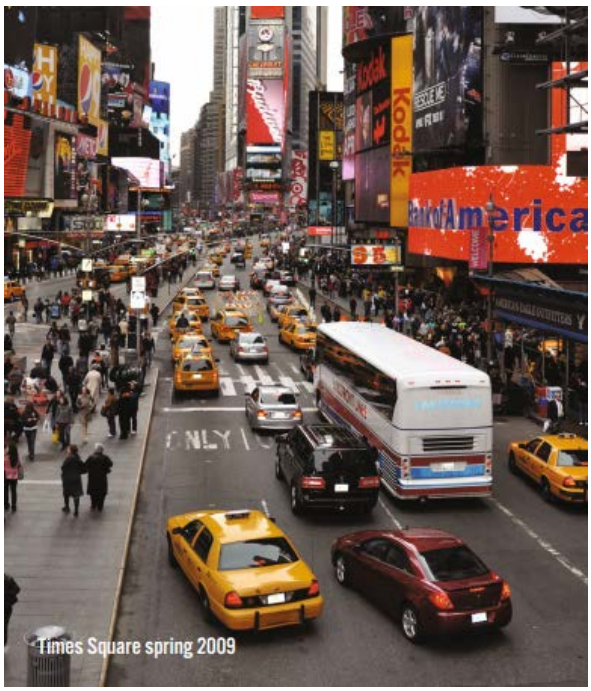


Fig 1.5.b*Growth of activity in Melbourne*

Times Square:

Broadway was closed at Times square and Herald Square as an experiment, but the change is now permanent.
A total of 35,771 m2 of public space have been returned to people, **while transport time for vehicular traffic has improved by 17%.** There are also far fewer pedestrians walking in the street, and the number of **pedestrians injured in traffic has fallen by 35%**.

Headcounts before and after the changes show that Times Square has become a place for stationary activities in the city. While the **increase in number of pedestrians is slight, 11%,** there has been an **84% increase in the number of people standing and sitting at Times Square.**



Times Square: Before

Times Square: After

Fig 1.6 *Growth of activity in Time Square*

Copenhagen:

In the 1996 study of Copenhagen, **lighted windows at night were registered as an indicator of life in the inner city.**
It was a problem at the time that so many city centers were unpopulated and therefore empty once the working day was over. Observers biked through the streets of inner Copenhagen registering the number of lighted windows and compared their findings to the statistical data on number of inhabitants.
The result was a very concrete way of recording one of **the benefits of residences in the inner city, namely the sense of safety.** A decade

later the increasing number of inhabitants in the heart of Copenhagen was reflected in the increased number of lighted windows at night.

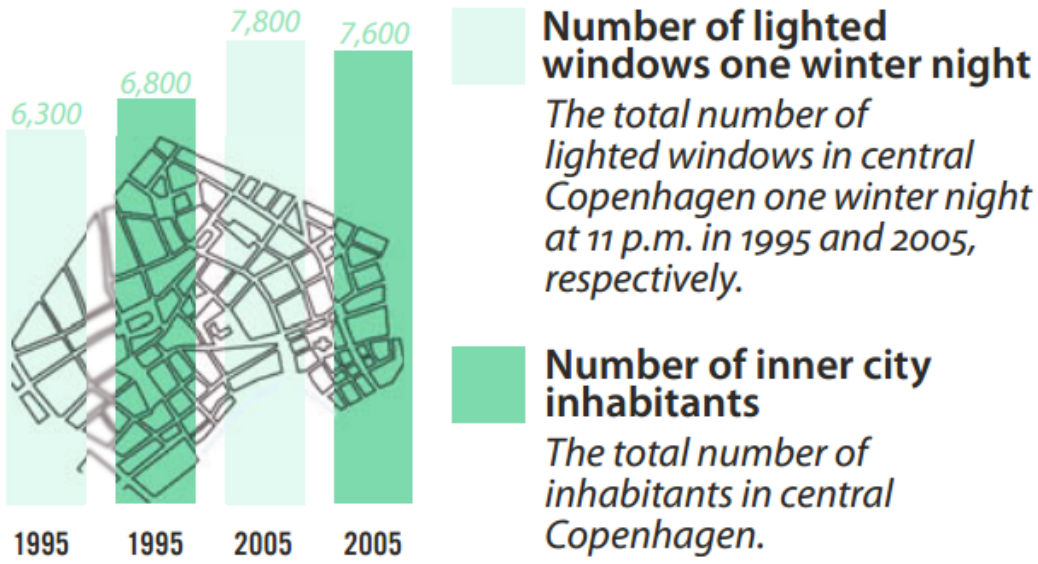


Fig 1.7 *Study of data at Copenhagen*

“Cities for people”, Jan Gehl

Traffic planning principles:

Los Angeles, California
Traffic integration on the terms of fast-moving traffic A straightforward traffic system with poor traffic safety. The streets are virtually unusable for anything but vehicular traffic.

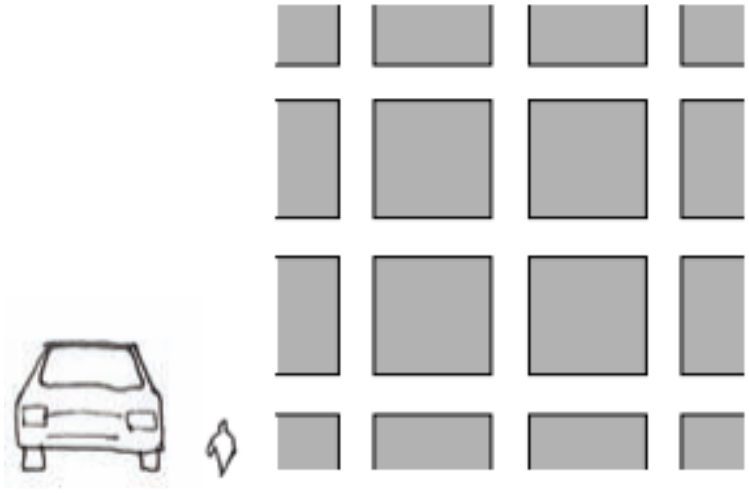


Fig 1.8 *Traffic Planning principles at LA, CA*

Radbum, New Jersey

Traffic separation system introduced in Radbum in 1928. A complicated, expensive system of many parallel roads and paths and many costly pedestrian tunnels. Surveys show that it functions poorly in practice because pedestrians take the shortest route rather than the safest.

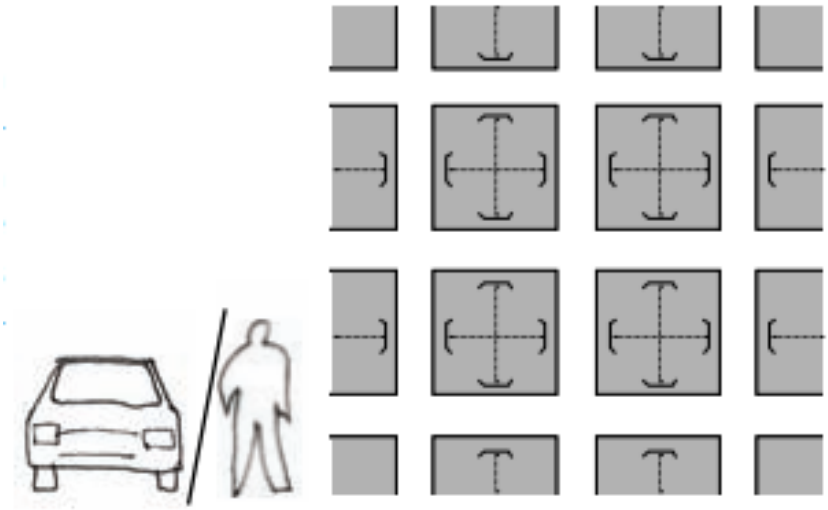


Fig 1.9 *Traffic Planning principles at Radbum, NJ*

Delft, Holland

Introduced in Delft in 1969. A straightforward, simple and safe system, which maintains the street as the all-important public space. When cars must be driven up to a budding, traffic integration with priority for pedestrians is clearly the best system.

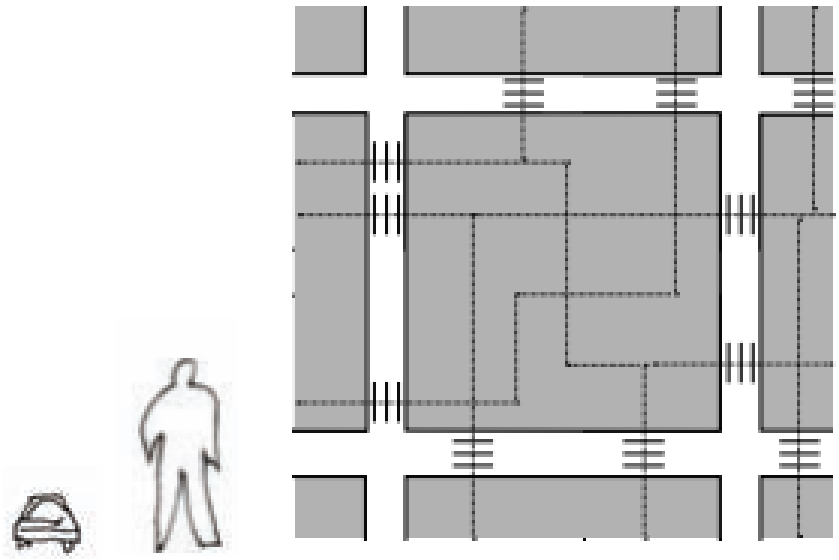


Fig 2.0 *Traffic Planning principles at Delft, Holland*

Venice, Italy

The pedestrian city, with the transition from fast to slow-moving traffic occurring at the city limits or edge of residential area. A straightforward and simple system with a considerably higher safety level and better security than any other traffic system.

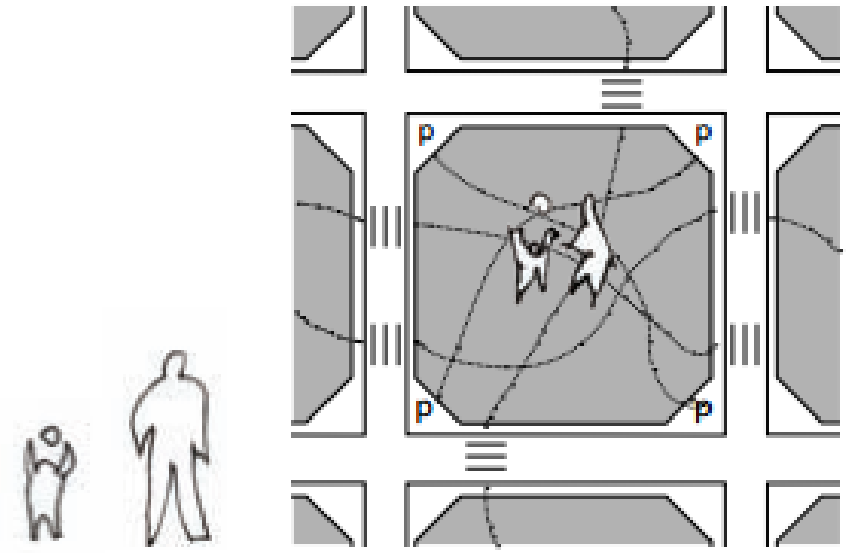


Fig 2.1 *Traffic Planning principles at Venice, Italy*

1.1.3.3 PARAMETERS CONSIDERED

- **Paths**

The streets, sidewalks, trails and other channels through which people travel.

-Lynch, Kevin (1960), *The Image of the City*

- **Landmarks**

Readily identifiable prominent visual features which serve as reference points.

-Lynch, Kevin (1960), *The Image of the City*

Fig 2.2 *Sketches by Kevin Lynch*

Nodes
A center of activity at focal points, intersections or loci.
-Lynch, Kevin (1960), *The Image of the City*

Pattern
A regular or irregular geometry formed by routes, open spaces and buildings.-
Dr. Shivashish Bose

Density
The intensity of use of land by people and buildings
-Spreiregen, Paul (1965), *Urban Design: The Architecture of Town and Cities*

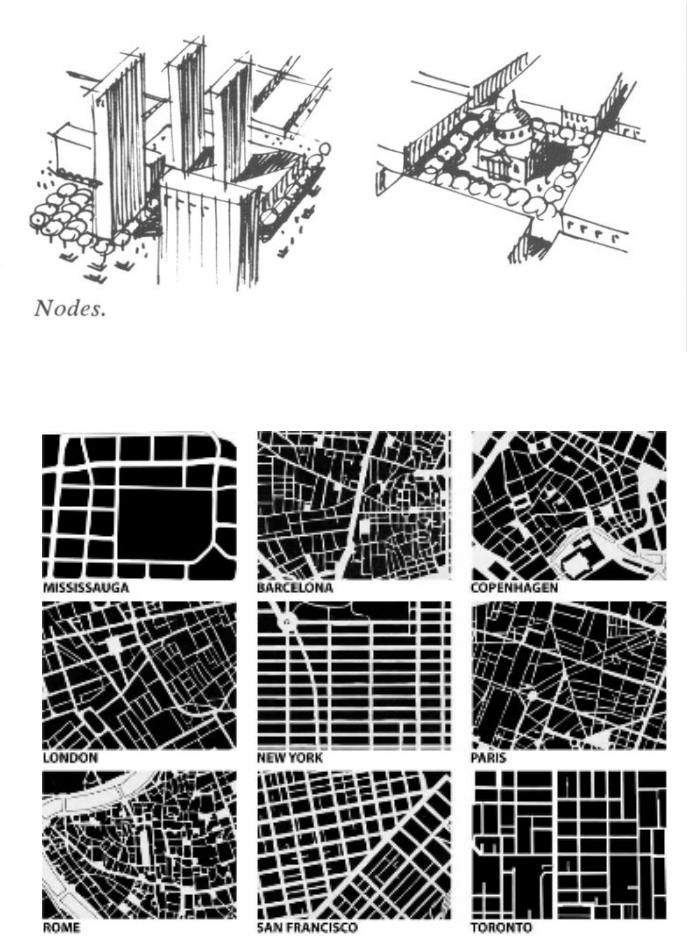


Fig 2.3 *Sketches by Kevin Lynch and Spreiregen*

Grain and Texture
Grain is measured by the degree of fineness and coarseness in an urban area.
Texture is the degree of mixture of fine and coarse elements.

- Dr. Shivashish Bose

Movement
The routes through which people and vehicles travel.

Activities
Landuse, location, pattern, magnets and generators.
-Dr. Sanjib Nag

Form
The spatial pattern of the large, inert, permanent physical objects in a city.
-Lynch, Kevin (1960), *The Image of the City*

Space
Typology, Hierarchy, floor areas and patterns of usage.
-Spreiregen, Paul (1965), *Urban Design: The Architecture of Town and Cities*

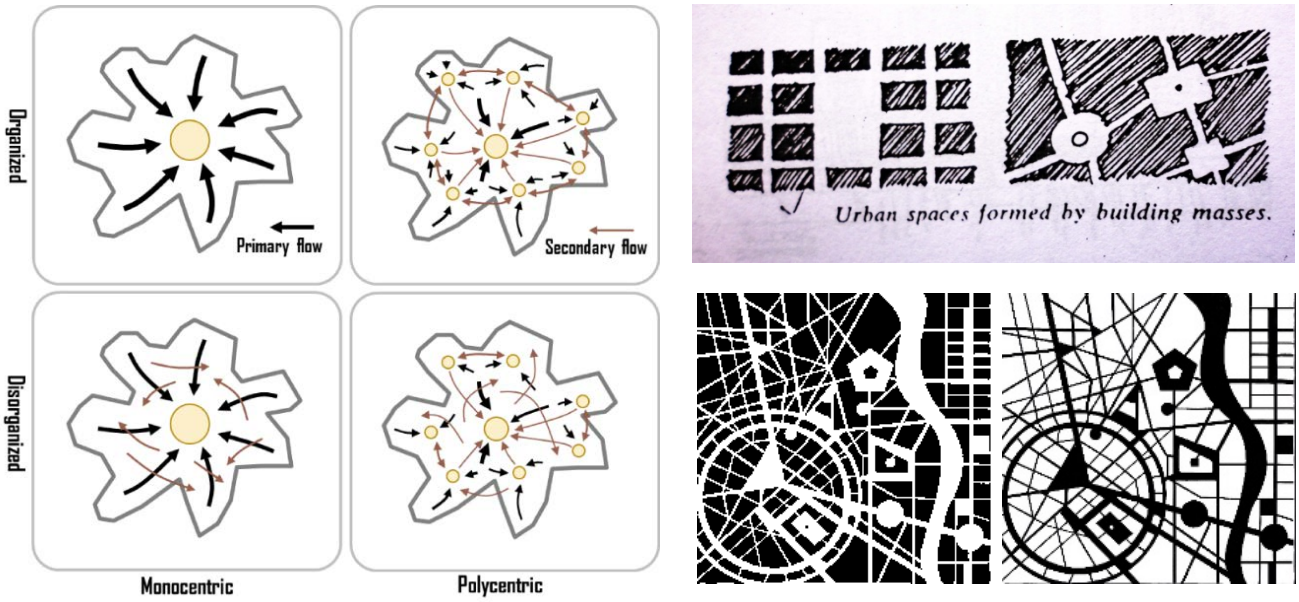


Fig 2.4 *Illustrations showing various parameters*

1.2 AIM

ENSURING PROPER URBAN DEVELOPMENT TO GENERATE A CHARACTER OF A GATEWAY TO THE CITY.

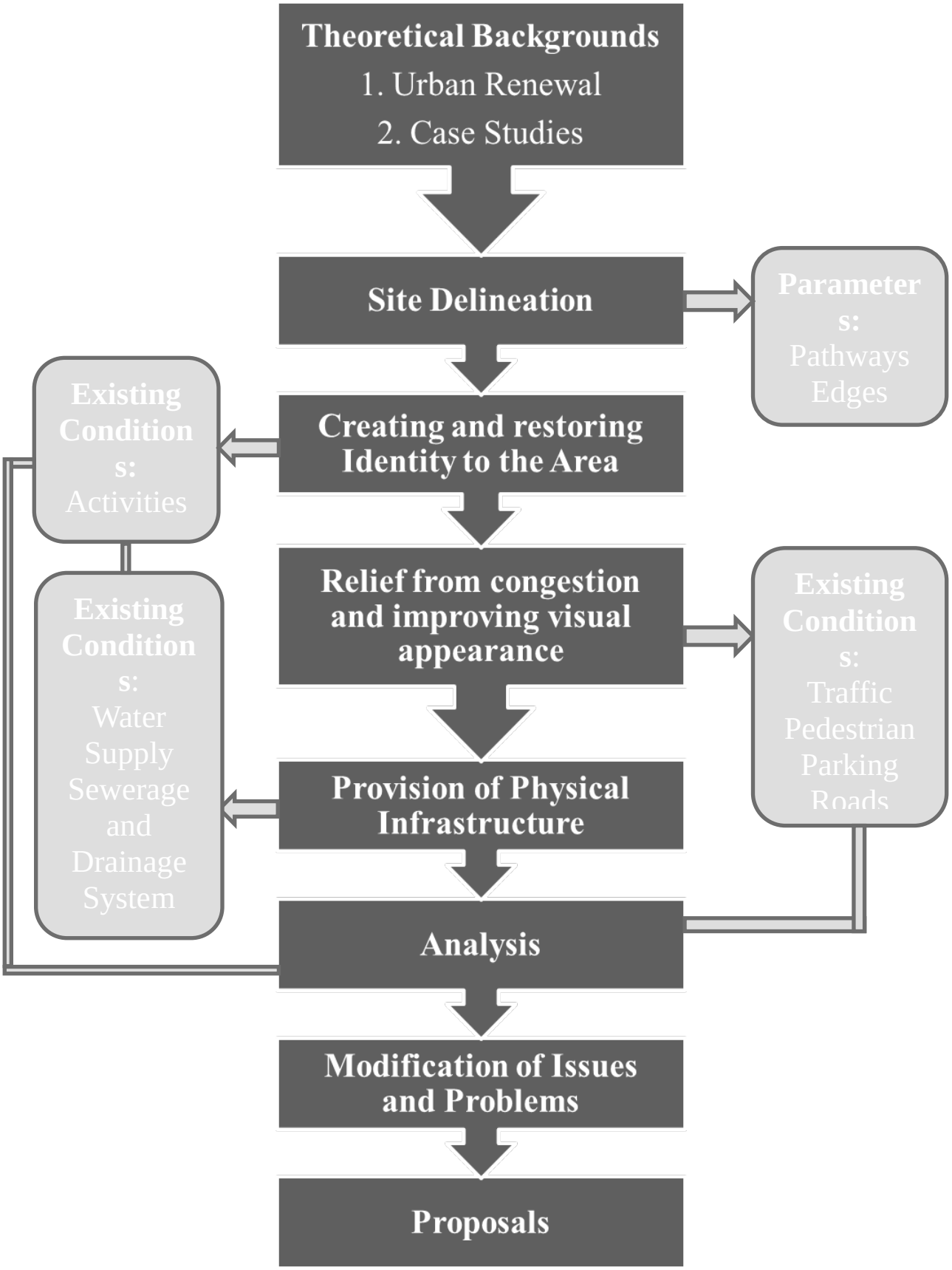
1.3 OBJECTIVE

- **To promote convenient and connected open space networks with built forms.**
- **To create an identity and sense of place.**
- **To develop an iconic landmark acting as a magnet.**
- **To decentralize and promote integrated public transit.**
- **To generate a safe and secure public realm.**

1.4 SCOPE AND LIMITATIONS

- The stretch acts as one of the major gateway for the city creating an impression in the minds of people, the activity and place thus defined will improve the public realm.
- Characterization of the place can create identity.
- Building height restrictions for a part of the stretch as it falls under airport runway funnel.
- It also lies outside the proposed New town and have different statutory body with different buildings regulations.
- Socio- political issues have not been considered

1.5 METHODOLOGY



Chapter 2 SITE STUDY

2.1 SELECTION OF SITE:

- The area has uncontrolled development due to absence of proper guidelines and bye-laws leading to chaotic situations.
- The area has been undergoing rampant construction of multi-storied buildings based on its location and IT hub.
- The stretch acts as the peripheral area and gateway to the city.

2.2 ZONAL LEVEL STUDY

2.2.1 DESCRIPTION

- The area lies at the peripheral edge of an upcoming annexure satellite township of greater Kolkata.

- The area is located near Airport and acts as a major gateway to the core of the city.
- The development of IT hub at Salt Lake and New Town has put tremendous pressure in this area.
- Rapid urban growth forced this area to create its own character.
- Chinar Park appears to be an upcoming hub because of it's physical location and activities.
- If it is not attended to create a guided development, it might lead to further chaotic conditions, degrading the quality and image of the place.

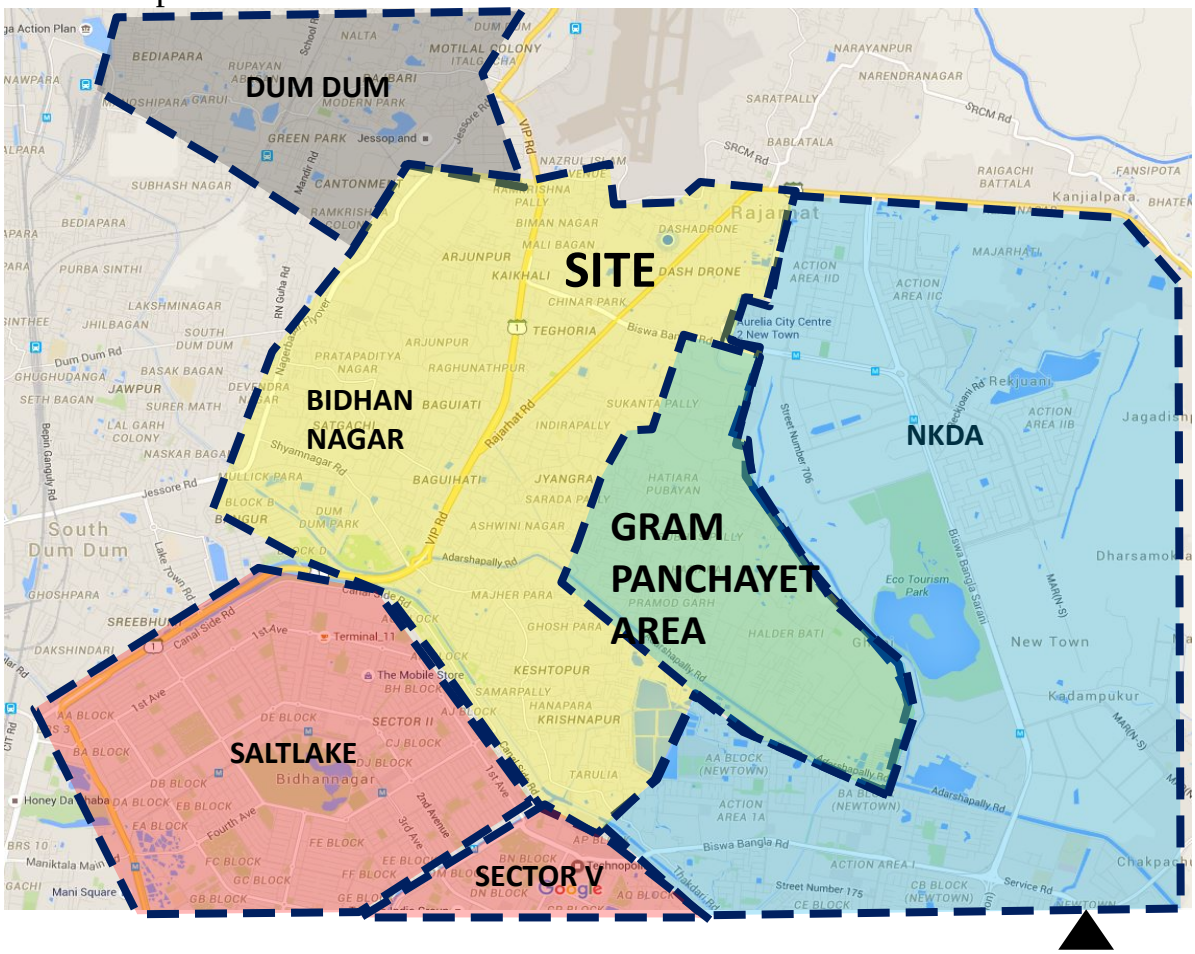


Fig 2.5 *Land Allocation under Governing bodies*

PATHS

2.2.1 OBSERVATION

The three main roads act as city connectors, while many meandering side roads connect them to each other.

2.2.2 ANALYSIS

Vehicles from Airport and Rajarhat travelling to the city core passes through the zone resulting in high traffic.

2.2.3 CONCLUSION

High traffic - both pedestrian and vehicular - must be controlled through proper channels.

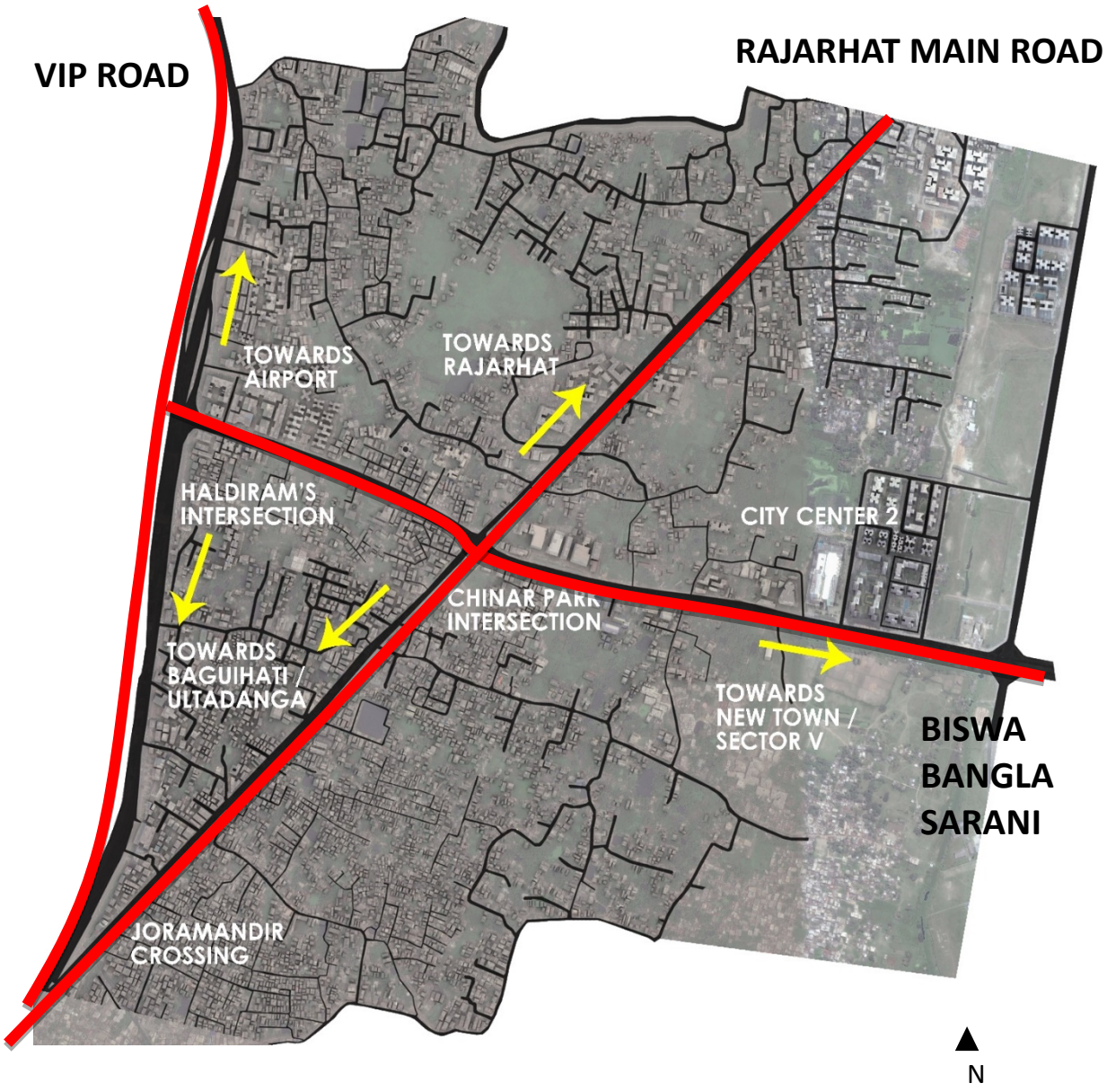


Fig 2.6 Main Axis and *connectivity*

MOVEMENT

2.2.1 OBSERVATION

A number of lanes connect the main roads with each other is generally used by pedestrians and private vehicles as shortcuts.

2.2.2 ANALYSIS

Since the three main roads have heavy traffic and are hostile to pedestrians, they take the lanes.

2.2.3 CONCLUSION

The main stretches must be made more pedestrian friendly with grade separation.

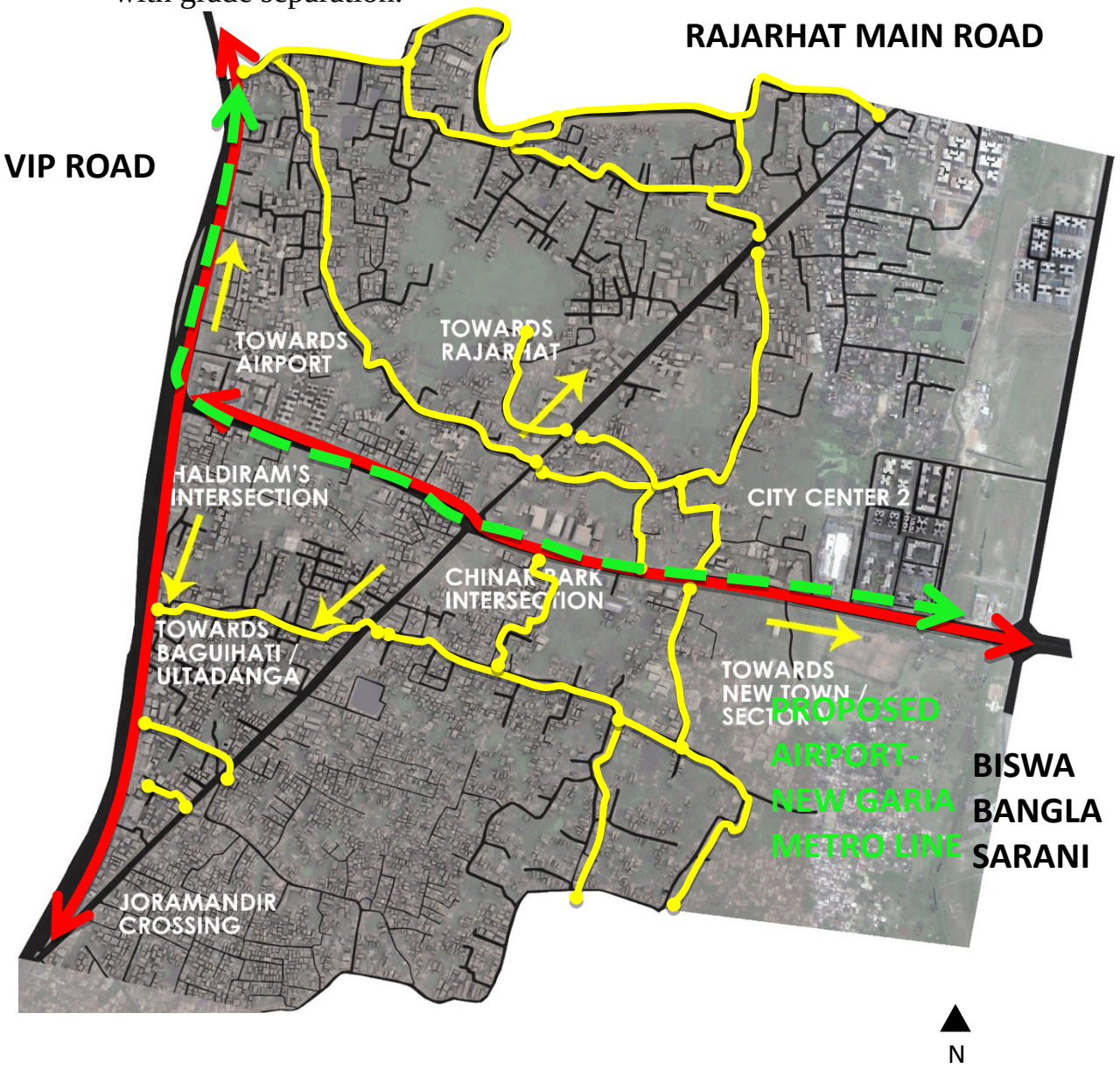


Fig 2.7 *Movement pattern through lanes and roads*

LANDMARKS

2.2.1 OBSERVATION

Landmarks are present mainly on the demarcated stretch.

2.2.2 ANALYSIS

Landmarks are based on brand value (spencer's, haldirams) and physical location (VIP Apex) rather than their physical character.

2.2.3 CONCLUSION

Activity based iconic landmarks with integrated public places may be incorporated providing proper parking spaces and reducing risk of accidents.

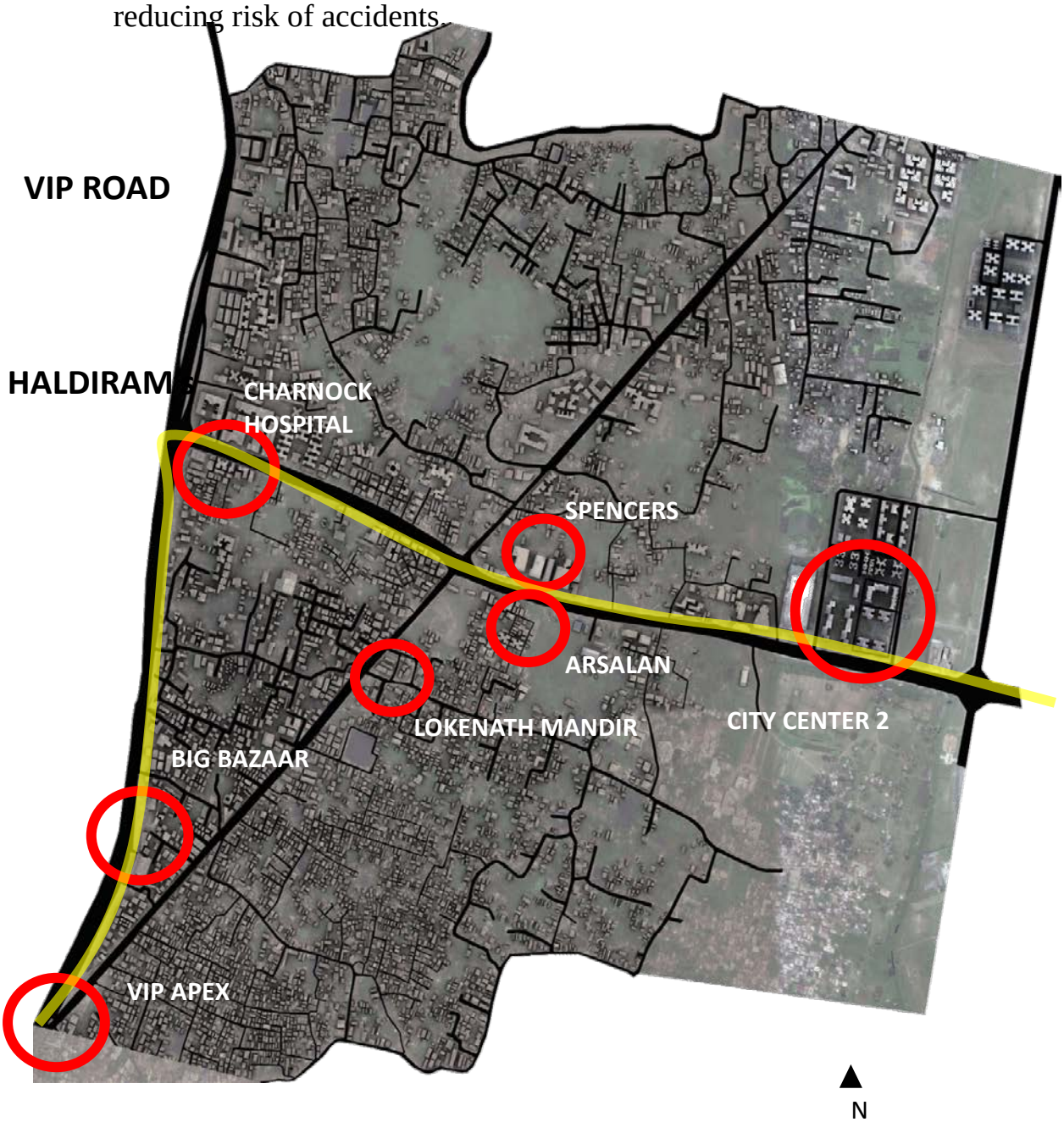


Fig 2.8 Major *landmarks in area Level*

NODES

2.2.1 OBSERVATION

Three major nodes- Haldiram's, Chinar park and Joramandir.

2.2.2 ANALYSIS

Haldiram's and Joramandir nodes have a designed grade separator.

2.2.3 CONCLUSION

Chinar Park intersection must also be designed with a grade separator. Of the more important minor nodes, Kaikhali and Teghoria are already congested, but design intervention is possible on the Noapara intersection.

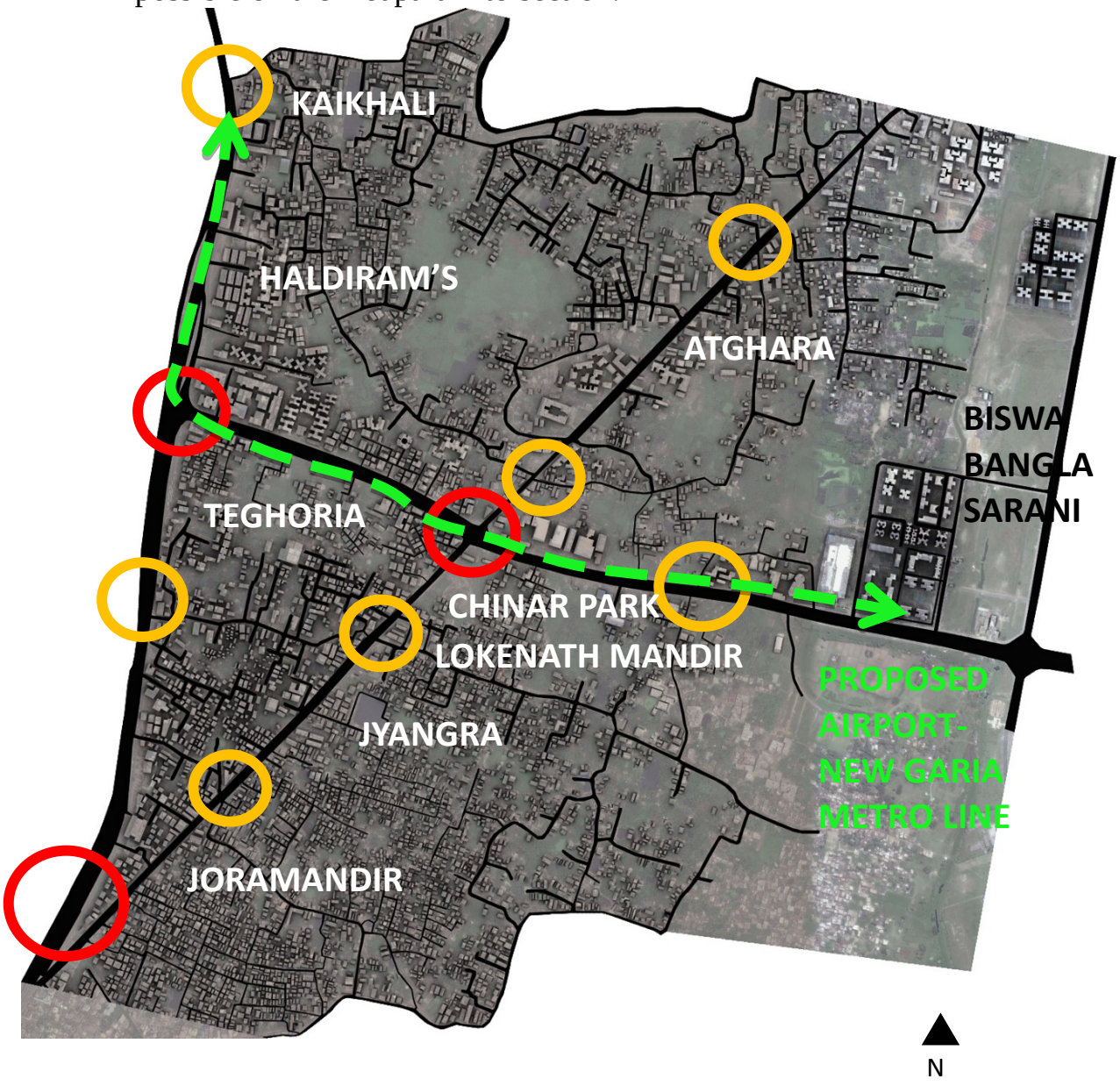


Fig 2.9 *Major nodes and intersections in area level*

PATTERN

2.2.1 OBSERVATION

Organic pattern throughout the entire zone.

2.2.2 ANALYSIS

The three major roads form a grid which is filled by organic growth with a few intermediate pockets of open spaces.

2.2.3 CONCLUSION

The organic pattern of the existing fabric can be retained in the designed spaces.

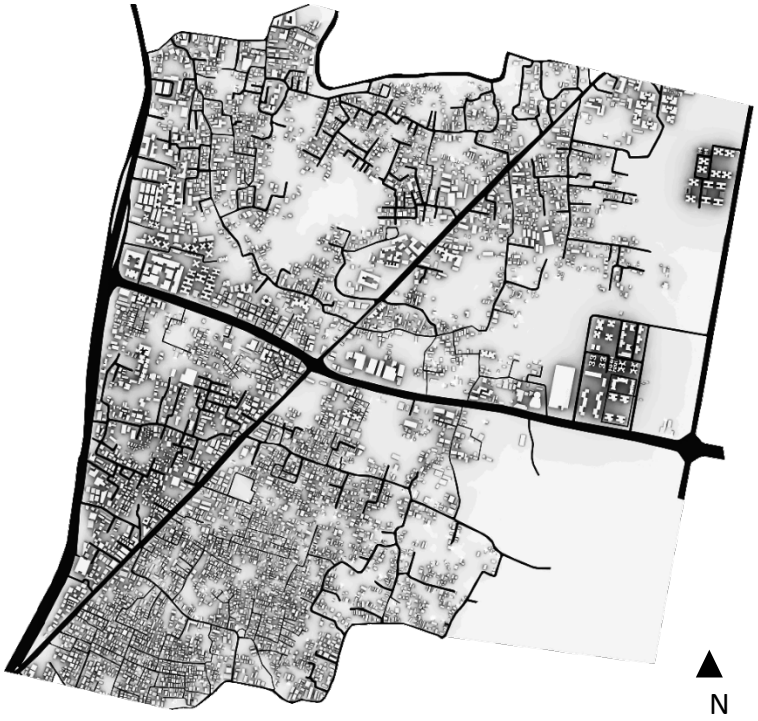


Fig 3.0 *Showing pattern and density*

ACTIVITIES

2.2.1 OBSERVATION

Major activities occur along the three main roads – long and short distance travel, functions, political gatherings, etc.

2.2.2 ANALYSIS

A very high density commercial and mixed use belt is present on both sides of the three major roads.

2.2.3 CONCLUSION

The commercial belt must be properly managed to reduce the chaotic nature of the roadside by adding transition spaces in between the buildings and access points.

2.2.2 ANALYSIS

The zone is a primarily multi-cultural residential area with commercial and mixed use development along the major roads.

Low percentage of green area and open spaces.

Community parks and interactive area can be found sparsely.

2.2.3 CONCLUSION

Developed public open space can help growing a community feeling.

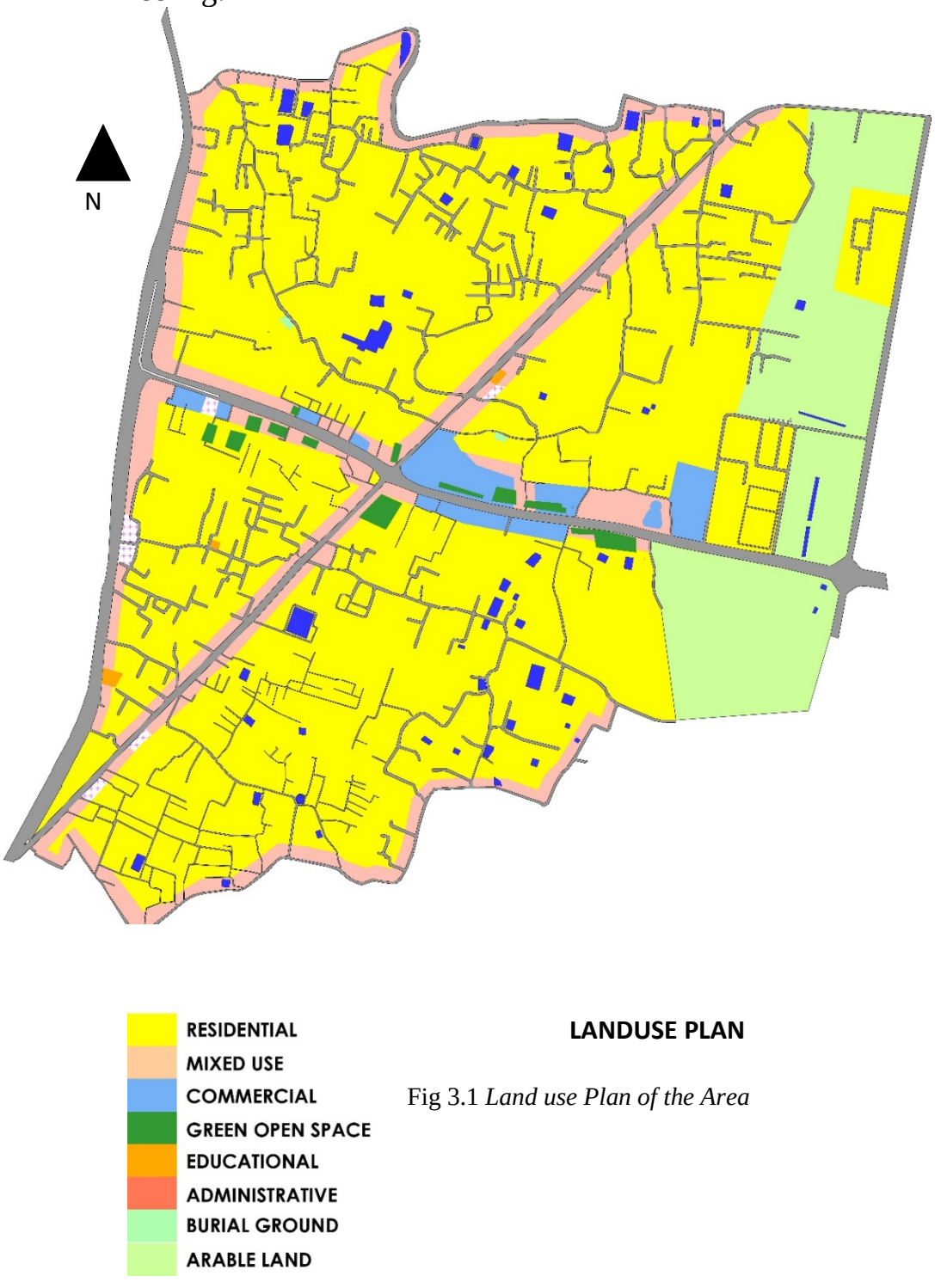


Fig 3.1 *Land use Plan of the Area*

FORM AND SPACE

2.2.1 OBSERVATION

Organically spread high density of built form.

2.2.2 ANALYSIS

Spatial continuity is achieved and the buildings look disconnected though it has a uniform grain because of the scattered development i.e. buildings or built forms.

2.2.3 CONCLUSION

Integrated development will generate a sense of relief from the compactness and lack of open space.

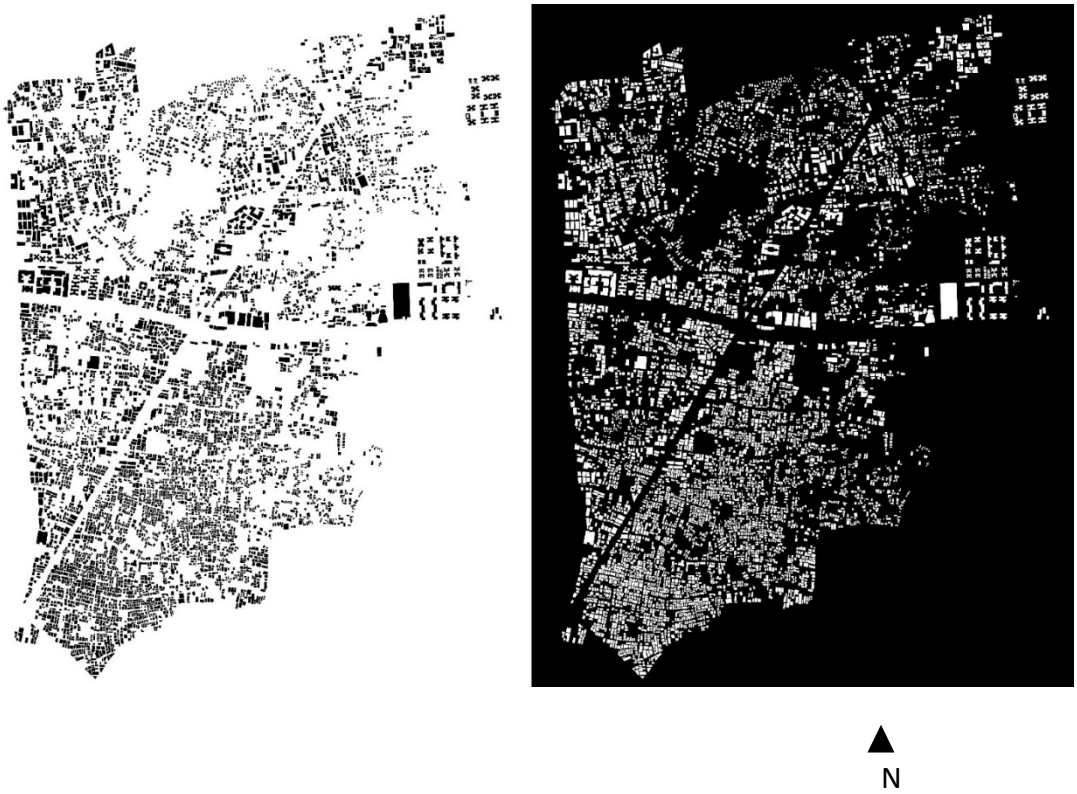


Fig 3.2 *Figure Ground map of the area*

DENSITY, GRAIN AND TEXTURE

2.2.1 OBSERVATION

High density of structures as compared to open spaces.

2.2.2 ANALYSIS

Fine grain in each quadrant.

Coarse texture.

2.2.3 CONCLUSION

A magnet can be generated using structures that create coarse grain complimenting the fine grain prevalent in the zone.

Fig 3.3 *Density, grain and texture of the area*

2.2.3 CONCLUSIONS

- High traffic - both pedestrian and vehicular - must be controlled through proper channels.
- The main stretches must be made more pedestrian friendly with **grade separation**. Of the more important minor nodes, Kaikhali and Teghoria are already congested, but **design intervention is possible on the Noapara intersection.**
- **Activity based iconic landmarks with integrated public places** may be incorporated providing proper parking spaces and reducing risk of accidents.
- The **organic pattern** of the existing fabric **can be retained** in the designed spaces.
- The **commercial belt** must be properly managed to reduce the chaotic nature of the roadside by adding **transition spaces in between the buildings and access points.**
- **Developed public open space** can help growing a community feeling.
- **A magnet can be generated** using structures that **create coarse grain complimenting the fine grain** prevalent in the zone

2.3 SITE LEVEL STUDY

2.3.1 DESCRIPTION

The stretch taken is a part of the Biswa Bangla road connecting Haldiram's VIP road to City Center 2. There are three major intersections on the stretch, one across VIP road from Airport and the other across Rajarhat Main Road.

TOP LEFT TO RIGHT: CHINAR PARK INTERSECTION

MIDDLE LEFT TO RIGHT: CHINAR PARK TO HALDIRAM

BELOW LEFT TO RIGHT: CHINAR PARK TO CITY CENTER 2

Fig 3.4 *Pictures of site and current conditions*

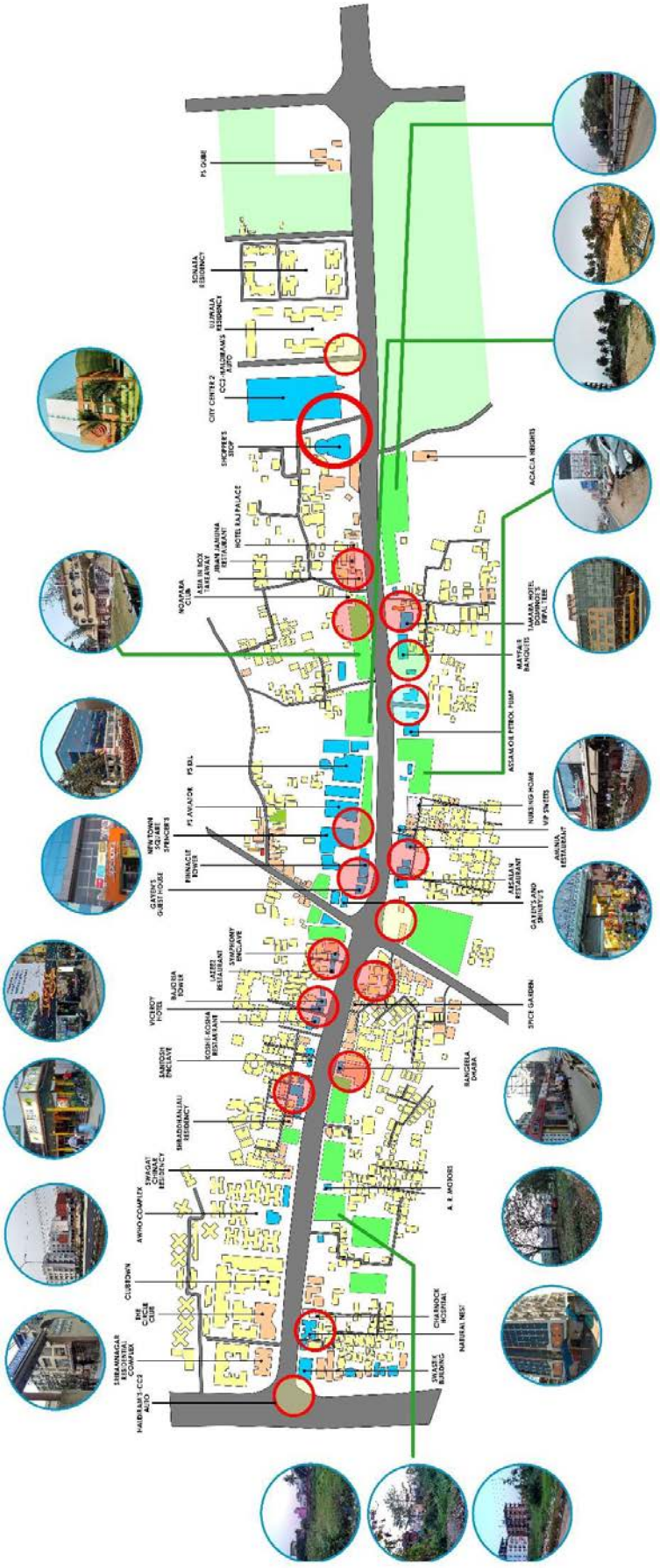


Fig 3.5 *Existing major Building on the Site*

ACTIVITIES

2.3.1 OBSERVATION

Chinar Park has the densest activity, with both sides full of restaurants, hotels and other active commercial fronts. Parking facilities absent – vehicles parked along service lanes according to use and time. Significant number commercial and mixed-use development are present along the stretch, concentrated around Chinar Park.

2.3.2 ANALYSIS

- By Activities:

Activities converge around two nodes, Chinar Park and CC2.

- By Land use:

Dense residential sprawl with mixed use buildings along the road, which extends to the 2nd and 3rd frontage through the lanes. Commercial buildings start after Chinar Park intersection to the Gated communities and City Center 2, arable land covering the rest. Green open spaces consist mainly of disputed lands.

2.3.3 CONCLUSION

Sparse space has been kept and development can be done by unifying them creating a singular identity.

Fig 3.6 *Photographs of Major Activities at node*

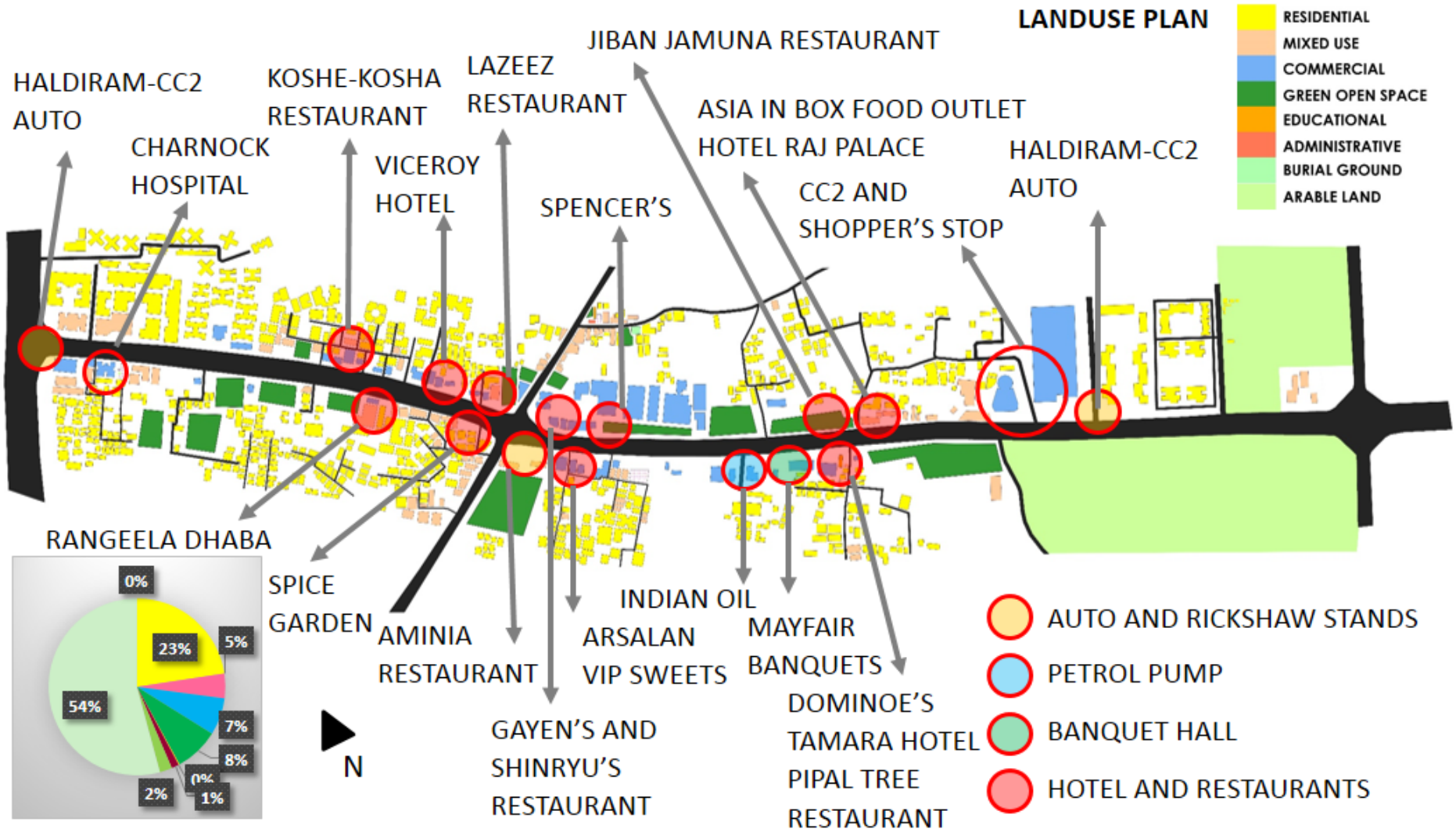


Fig 3.7 *Land Use plan and Activity along the site*

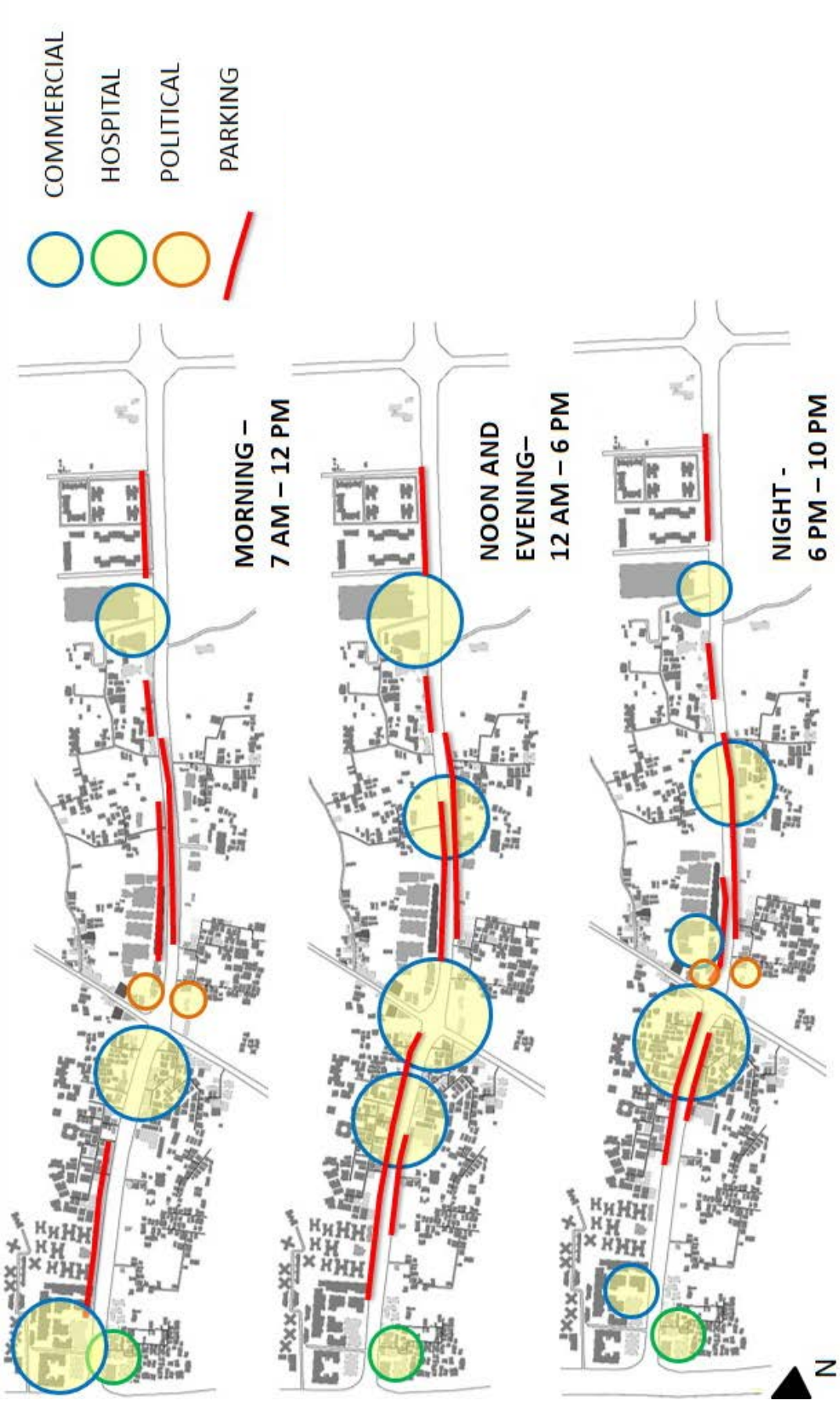


Fig 3.8 *Activities during the whole day*

Activity Time Line- Chinar Park

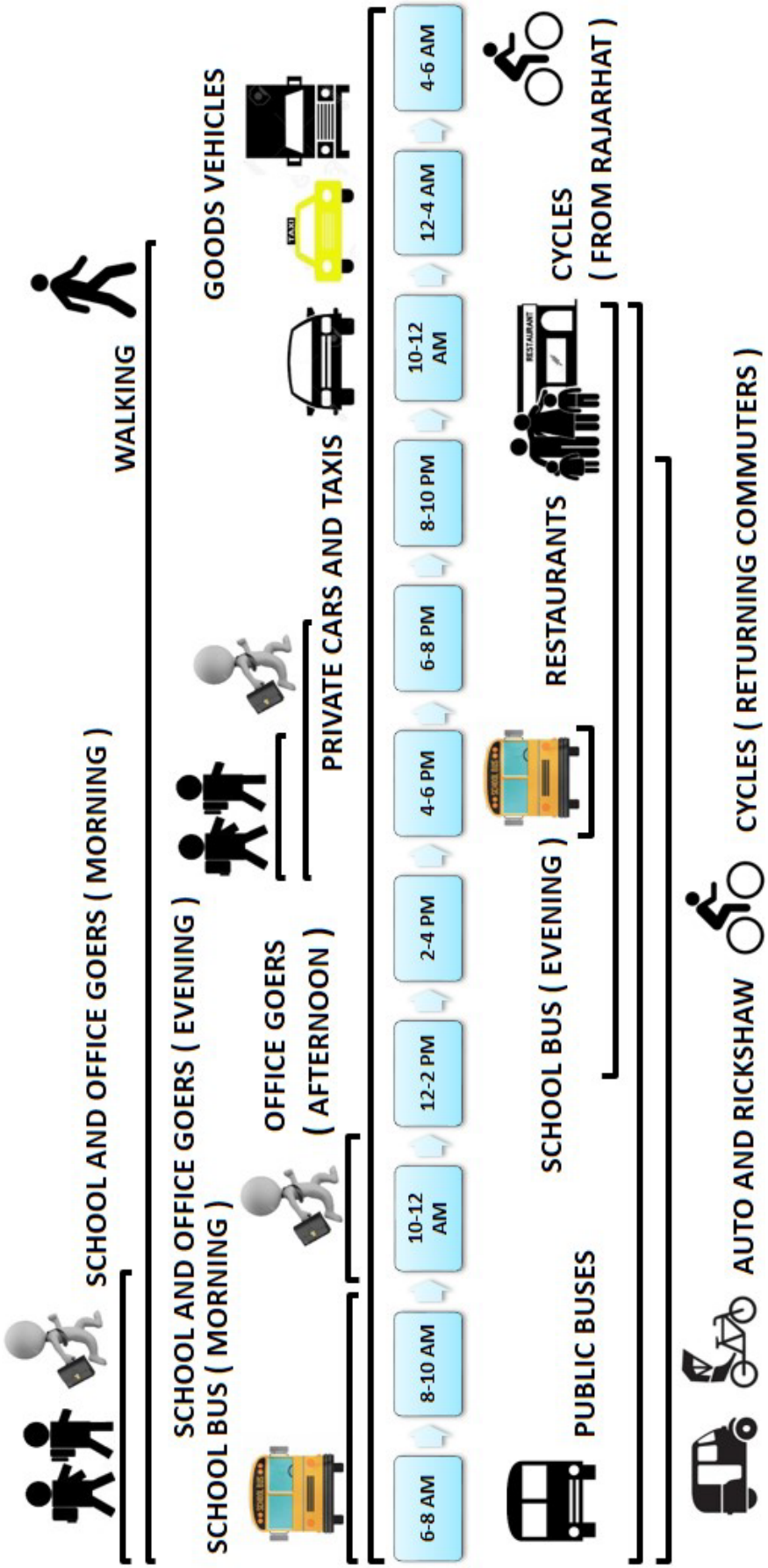


Fig 3.9 *Activity Timeline during a day*

Movement Statistics: Haldirams'

		6-8 am	8-10 am	10-12 pm	12-2 pm	2-4 pm	4-6 pm	6-8 pm	8-10 pm	10-12 am	12-4 am	4-6 am
Pedestrians and People-Driven	No of People	100	175	120	50	80	250	300	75	12	0	20
	No of Cycles	120	100	50	20	20	100	150	50	80	10	50
	No of Rickshaws	10	40	30	50	50	40	20	30	10	0	0
Private Transport	No of Private Cars	60	350	300	120	80	80	250	150	120	50	30
	No of Bikes	5	60	40	10	40	60	50	20	15	10	5
Public Transport	No of Autos / Totos	10	10	10	0	0	5	20	10	0	0	0
	No of Shuttles	15	80	100	50	40	100	50	30	10	5	3
	No of Taxis	10	20	50	10	10	20	50	20	20	10	20
	No of Buses	30	200	150	150	100	150	100	75	10	0	10
Commercial Transport	No of Goods Vehicles	50	75	50	100	50	30	50	100	75	100	50

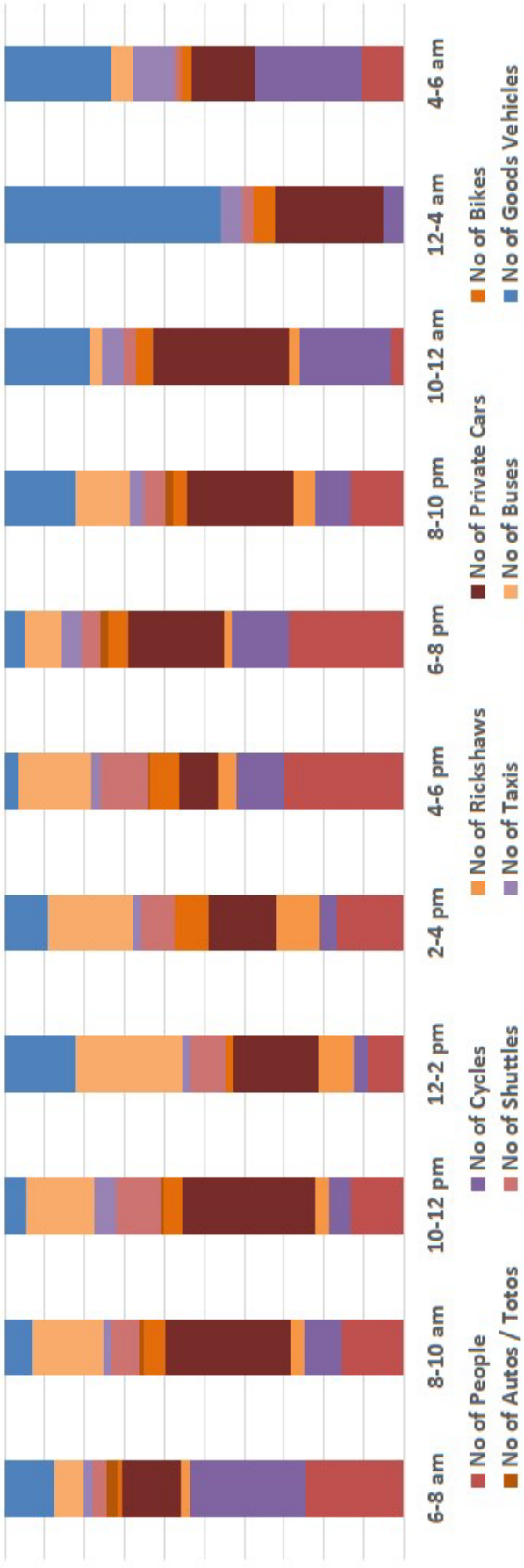


Fig 4.0 *Movement Statistics of vehicles at Haldirams'*

Movement Statistics: Chinar Park

		6-8 am	8-10 am	10-12 pm	12-2 pm	2-4 pm	4-6 pm	6-8 pm	8-10 pm	10-12 am	12-4 am	4-6 am
Pedestrians and People-Driven	No of People	200	500	400	400	200	600	500	200	100	80	100
	No of Cycles	250	200	150	50	40	100	150	100	100	40	100
	No of Rickshaws	30	120	100	150	100	120	60	60	20	0	0
Private Transport	No of Private Cars	200	500	600	300	200	250	500	500	400	100	100
	No of Bikes	20	150	100	50	120	100	250	150	50	10	10
Public Transport	No of Autos / Totos	150	200	180	75	100	150	150	100	20	0	10
	No of Shuttles	20	100	120	60	50	120	75	45	10	5	3
	No of Taxis	20	40	75	20	20	50	120	50	40	15	25
	No of Buses	60	400	300	300	200	300	200	150	20	0	20
Commercial Transport	No of Goods Vehicles	150	200	150	200	150	100	120	150	200	150	200

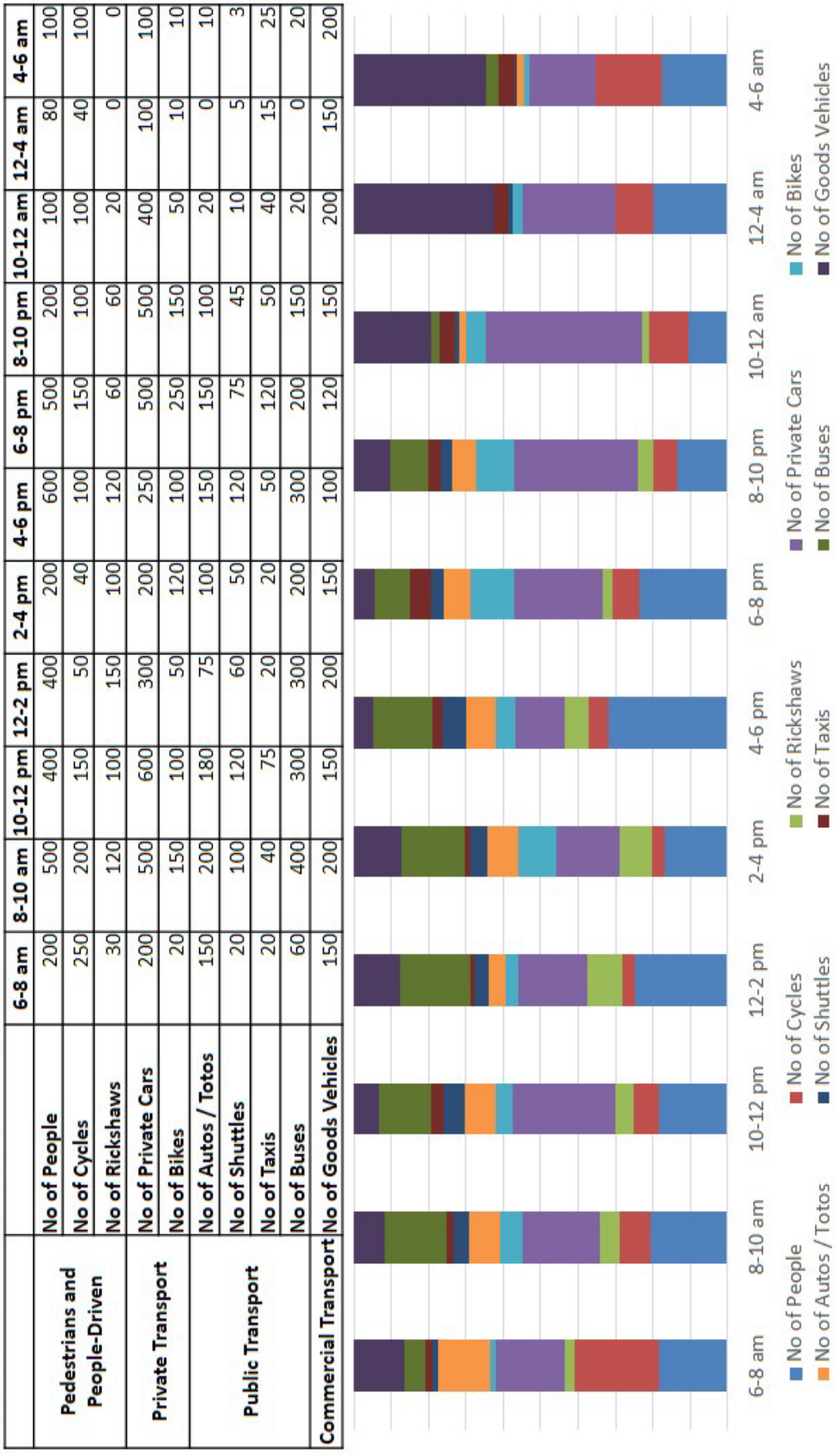


Fig 4.1 *Movement Statistics of vehicles at Chinar Park*

Movement Statistics: Noapara

		6-8 am	8-10 am	10-12 pm	12-2 pm	2-4 pm	4-6 pm	6-8 pm	8-10 pm	10-12 am	12-4 am	4-6 am
Pedestrians and People-Driven	No of People	100	100	80	20	20	150	200	30	20	10	40
	No of Cycles	200	150	100	50	50	150	200	150	100	15	75
	No of Rickshaws	5	20	10	25	25	20	10	20	5	0	0
Private Transport	No of Private Cars	60	350	300	120	80	80	250	150	120	50	30
	No of Bikes	10	120	80	30	100	120	100	50	30	20	10
Public Transport	No of Autos / Totos	10	10	10	0	0	5	20	10	0	0	0
	No of Shuttles	30	100	150	100	80	150	100	60	25	5	15
	No of Taxis	20	30	75	20	20	30	75	30	30	25	30
	No of Buses	30	200	150	150	100	150	100	75	10	0	10
Commercial Transport	No of Goods Vehicles	100	150	100	200	100	60	100	200	150	200	100

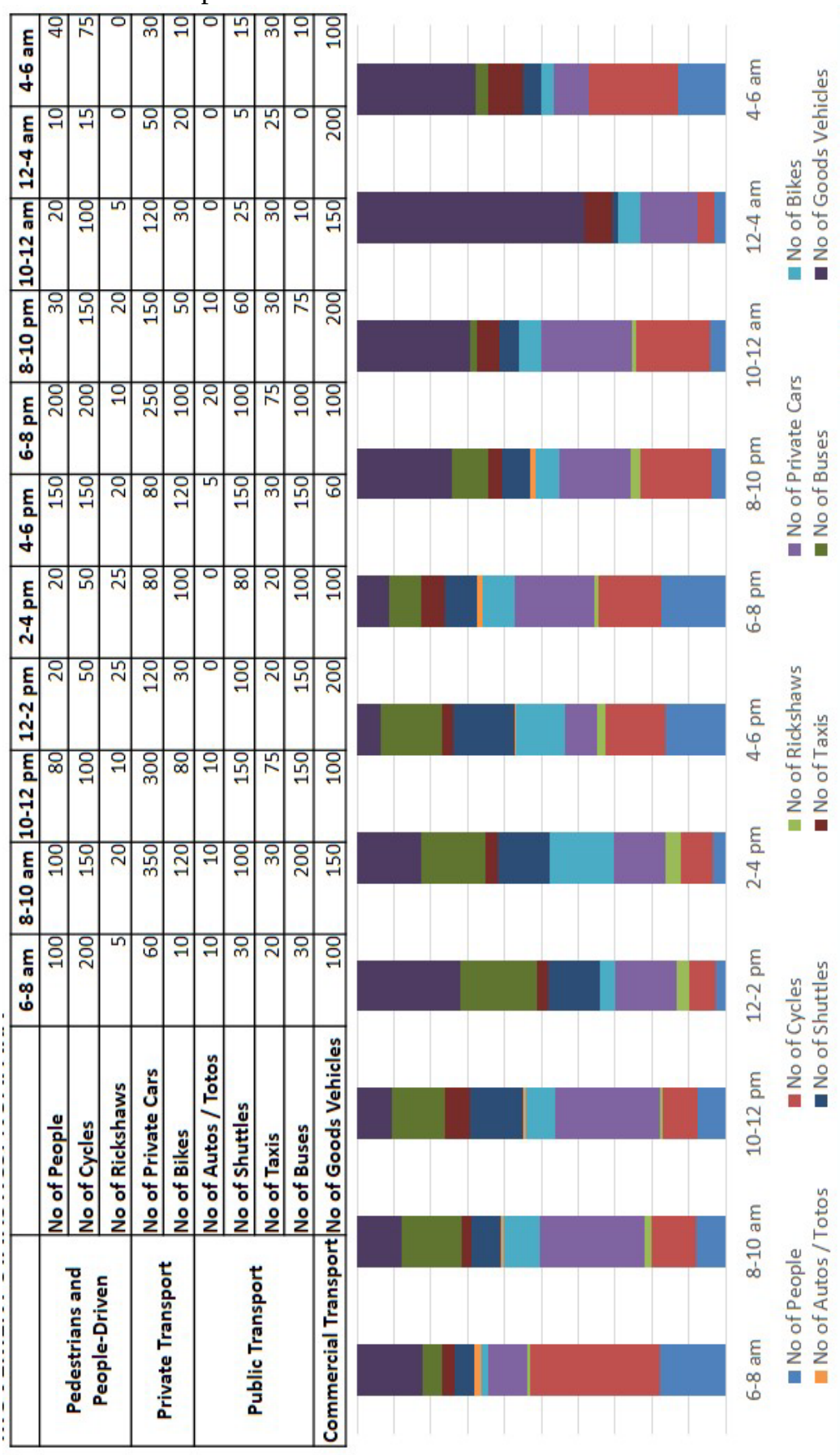


Fig 4.2 *Movement Statistics of vehicles at Noapara*

PATHS

2.3.1OBSERVATION

significant number of side roads enter the stretch.

2.3.2 ANALYSIS

Biswa Bangla Sarani connects the Airport to NKDA area, and Rajarhat Main Road connects semi-urban and rural areas to the city proper.

2.3.3 CONCLUSION

Existing pedestrian roads must be revitalized.

Pedestrian flow must be widened.

Vehicles and parking need to be separated from pedestrian flow.

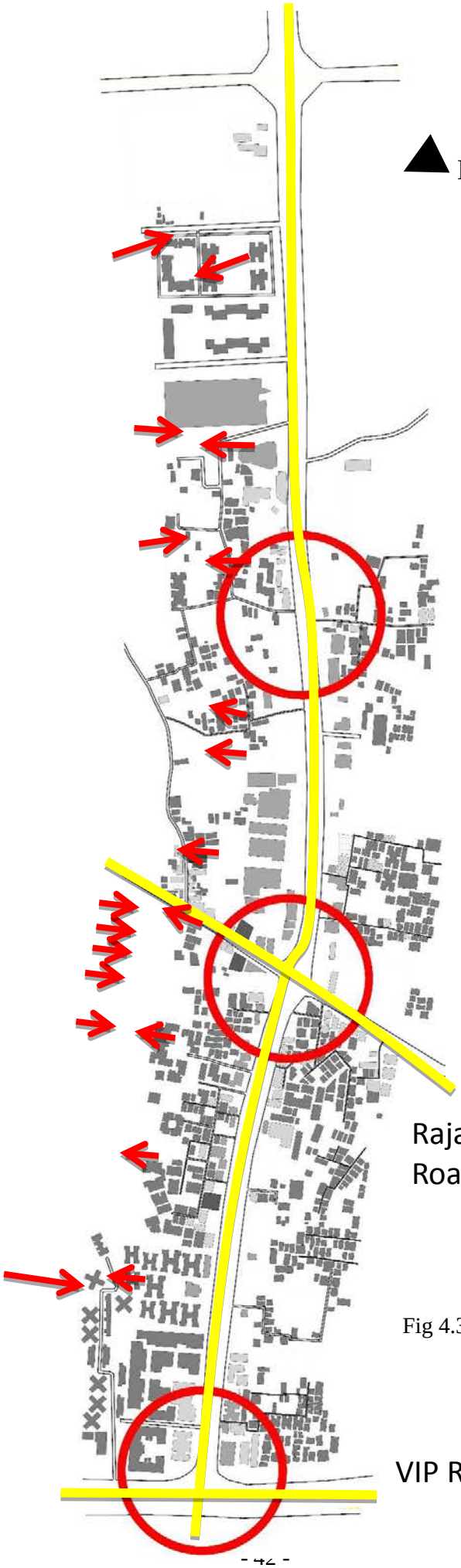


Fig 4.3 *Paths leading to the major Axis*

LANDMARKS

2.3.1OBSERVATION

City Center 2 is the main landmark of the whole stretch defining the total locality of this area. Charnock Hospital is the anchor healthcare facility of this area, with a grade separation.

2.3.2ANALYSIS

Landmarks are important for their brand value. Charnock Hospital acts as a landmark because it also acts as a bus stop because of the defined vehicular route along with the grade separator.

2.3.3CONCLUSION

Iconic landmark with integrated public spaces may be incorporated which will give a sense of place to the whole si

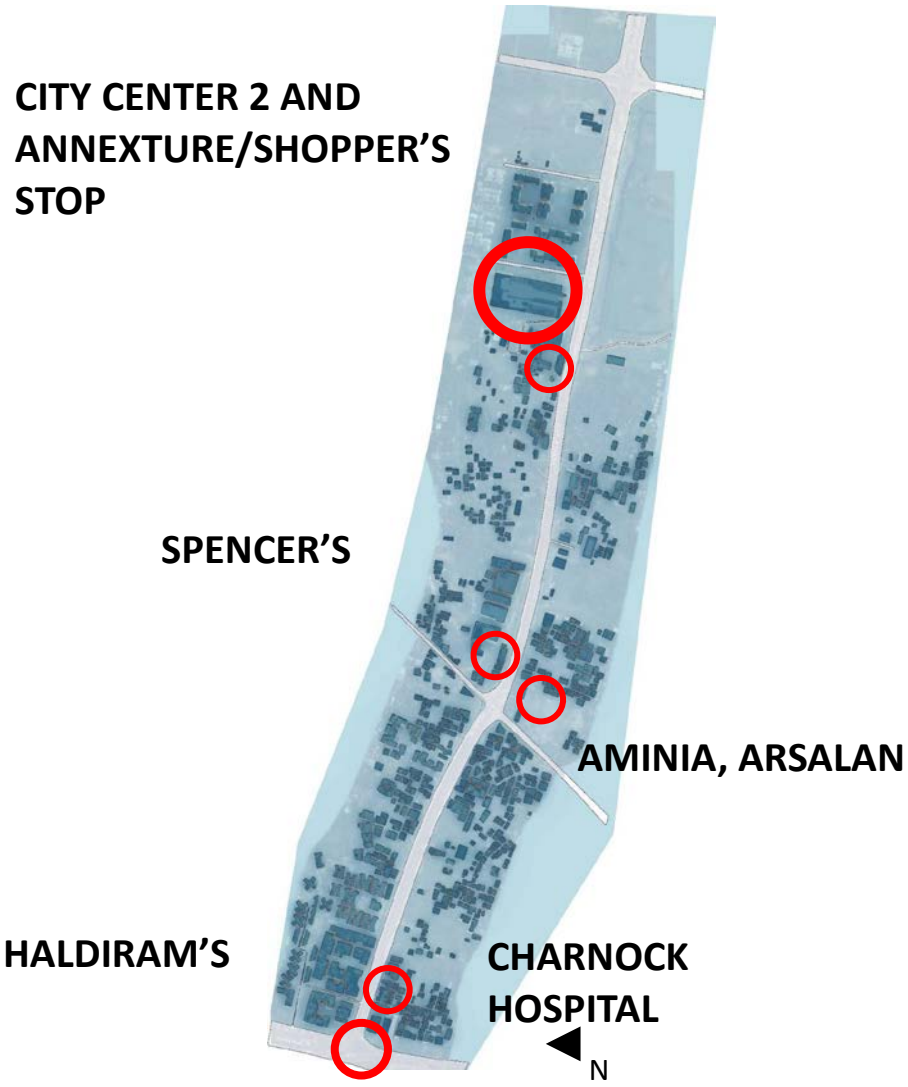


Fig 4.4 *Paths leading to the major Axis*

NODES

2.3.1OBSERVATION

Three main nodes.

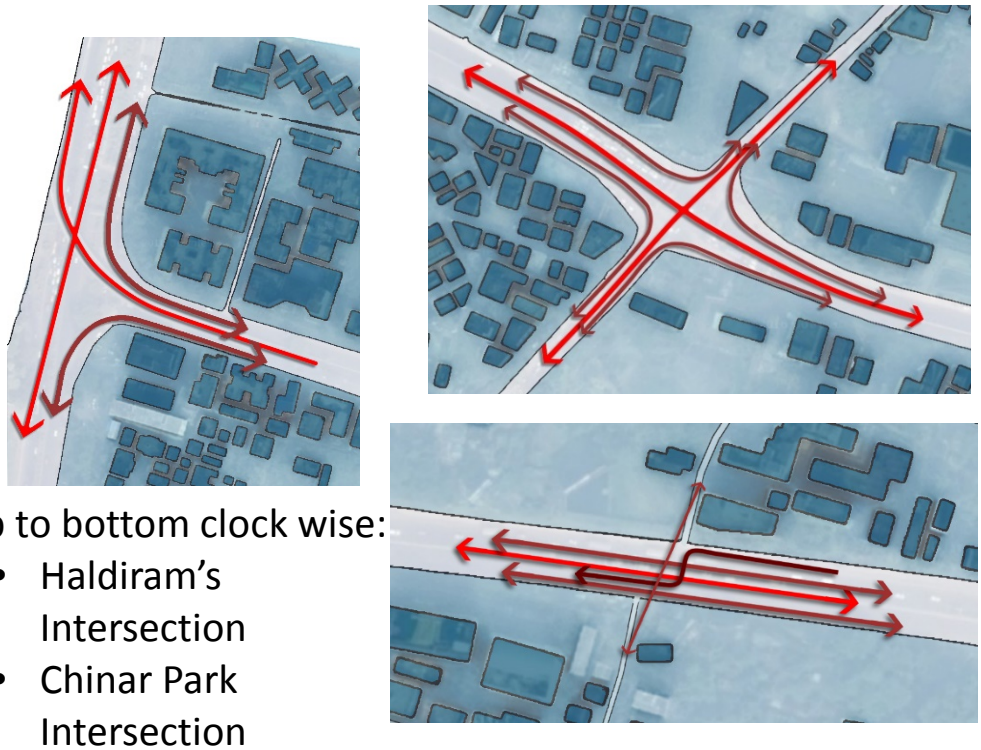
2.3.2 ANALYSIS

Haldiram's and Chinar park nodes form because they connect two main roads.

Noapara intersection becomes a node since vehicles from cc2 and other areas take U-turns from that intersection.

2.3.3 CONCLUSION

The chaos present at these nodes must be channelized properly.



Top to bottom clock wise:

- Haldiram's Intersection
- Chinar Park Intersection
- Noapara Intersection

Fig 4.5 *Movement along nodes*

Major road

Side road

Fig 4.6 *Major nodes at Site level*

MOVEMENT
HALDIRAM'S INTERSECTION
2.3.1 OBSERVATION
Connects the Airport to NKDA area. Vehicles take long routes to reach the opposite lanes.
2.3.2 ANALYSIS
Restricted vehicular movement due to flyover, acting as a grade separator.
2.3.3 CONCLUSION
Vehicular movement must be properly channelized.

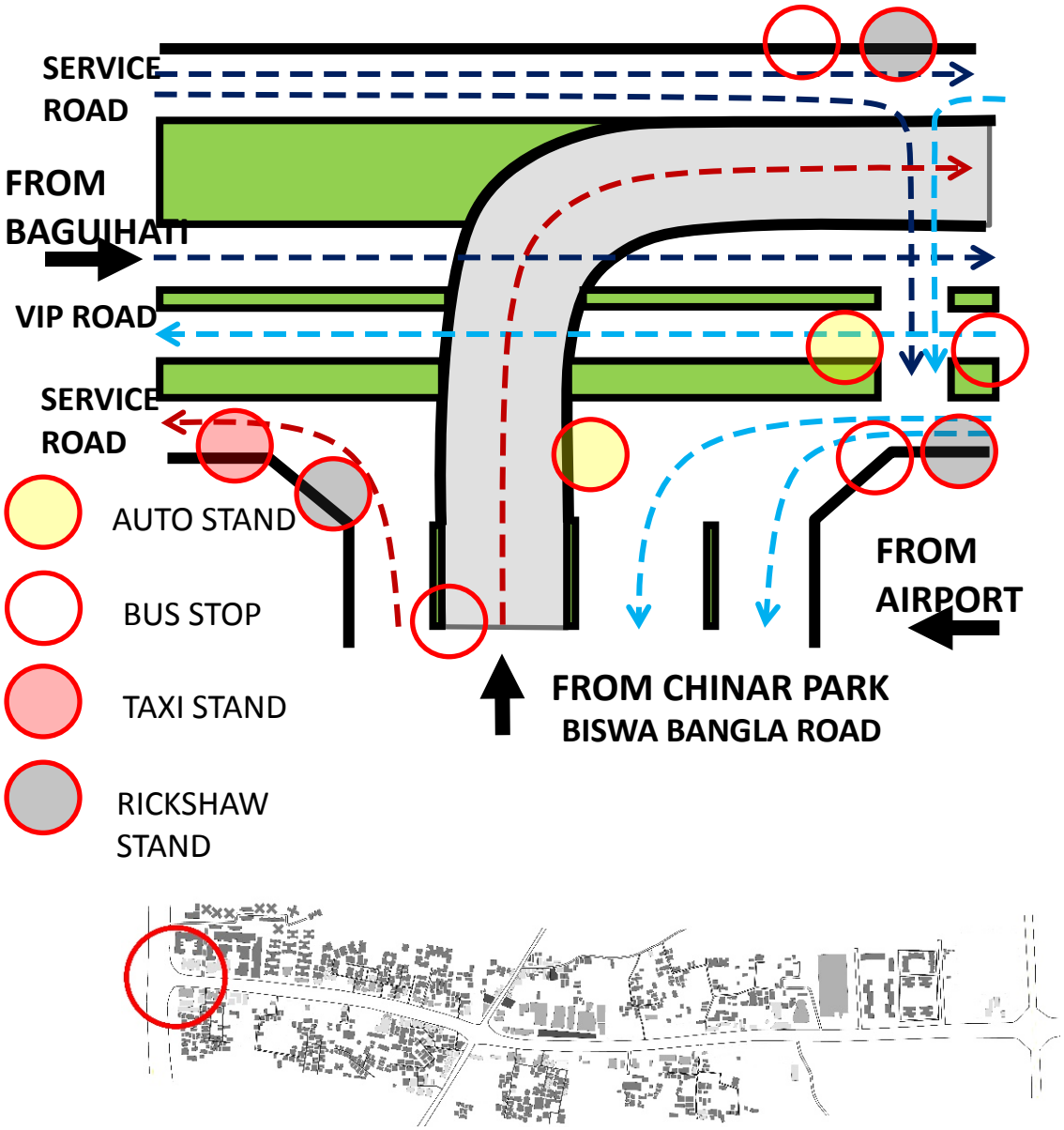


Fig 4.7 *Detailed vehicular movement at Haldiram's Intersection*

MOVEMENT
CHINAR PARK INTERSECTION
2.3.1 OBSERVATION
Chaotic movement throughout the intersection.
2.3.2 ANALYSIS
Absence of separators and roundabouts causes the chaotic movements.
2.3.3 CONCLUSION
Pedestrian flow must be widened.
Service lanes must be made accessible to cars instead of parking.

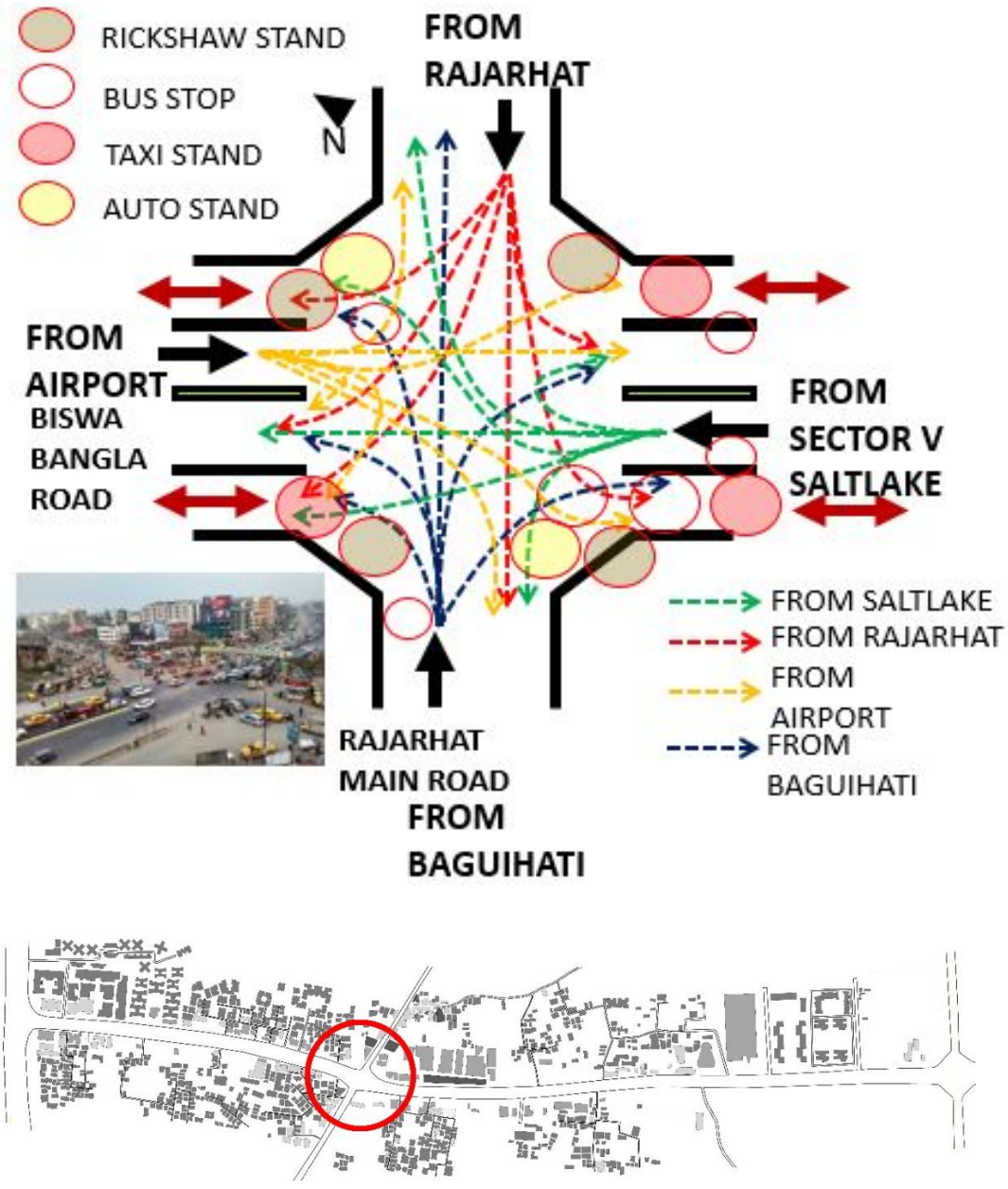


Fig 4.8 *Detailed vehicular movement at Chinar Park Intersection*

NOAPARA INTERSECTION

2.3.1 OBSERVATION

Service lanes used by private vehicles from spencer's and cc2.

2.3.2 ANALYSIS

Absence of pedestrian pathways, major node for local vehicles.

2.3.3 CONCLUSION

Safe pedestrian pathways must be added.

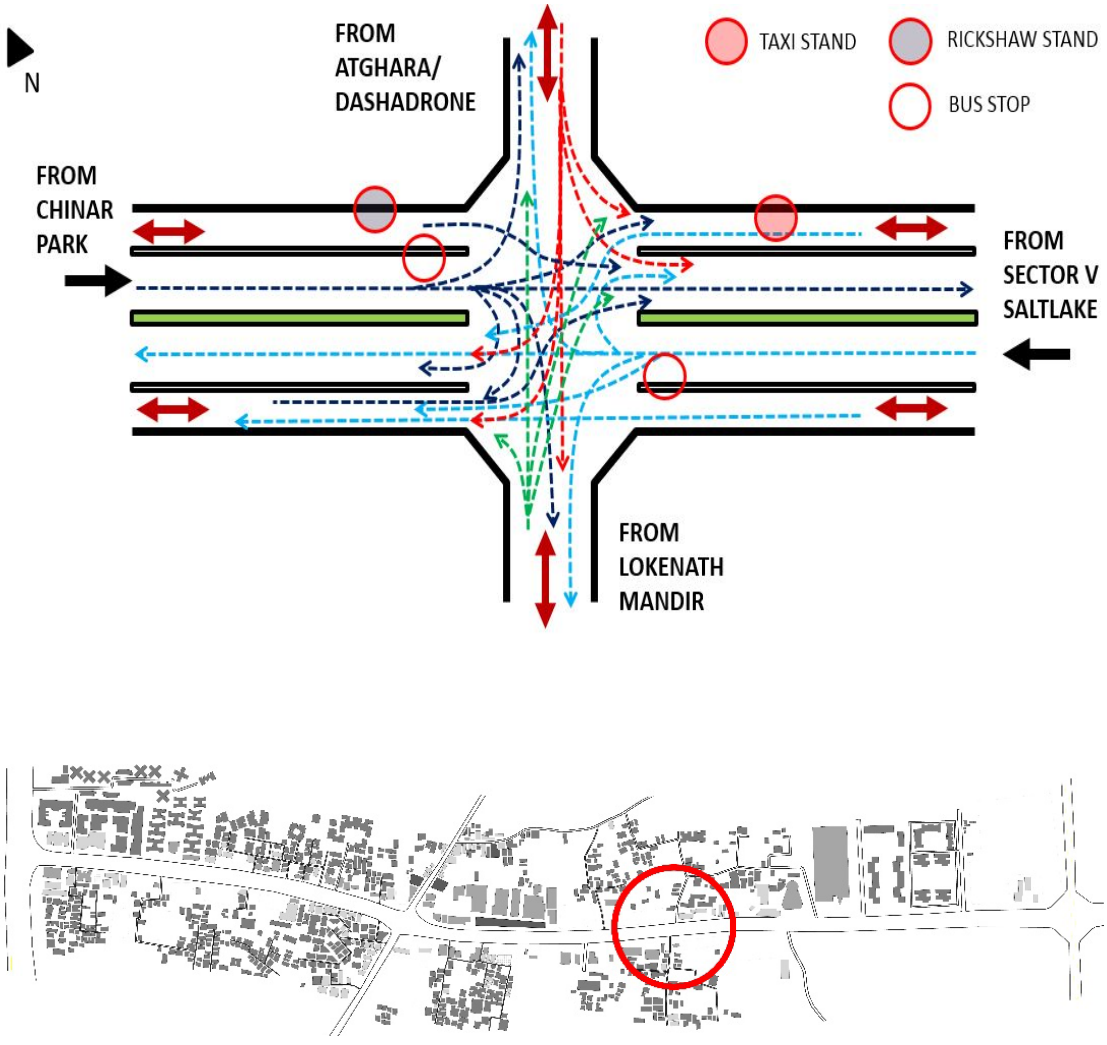


Fig 4.9 *Detailed vehicular movement at Noapara Intersection*

FORM AND SPACE

2.3.1 OBSERVATION

Organically spread high density of built form.

2.3.2 ANALYSIS

Compact built forms from Haldiram's to Chinar park.

A line of high built forms form a barrier between the streets and the more communal and low-height built forms in the site.

2.3.3 CONCLUSION

Vacant space must be properly utilized.

The barriers must be removed or altered to integrate the streets with the neighborhood.

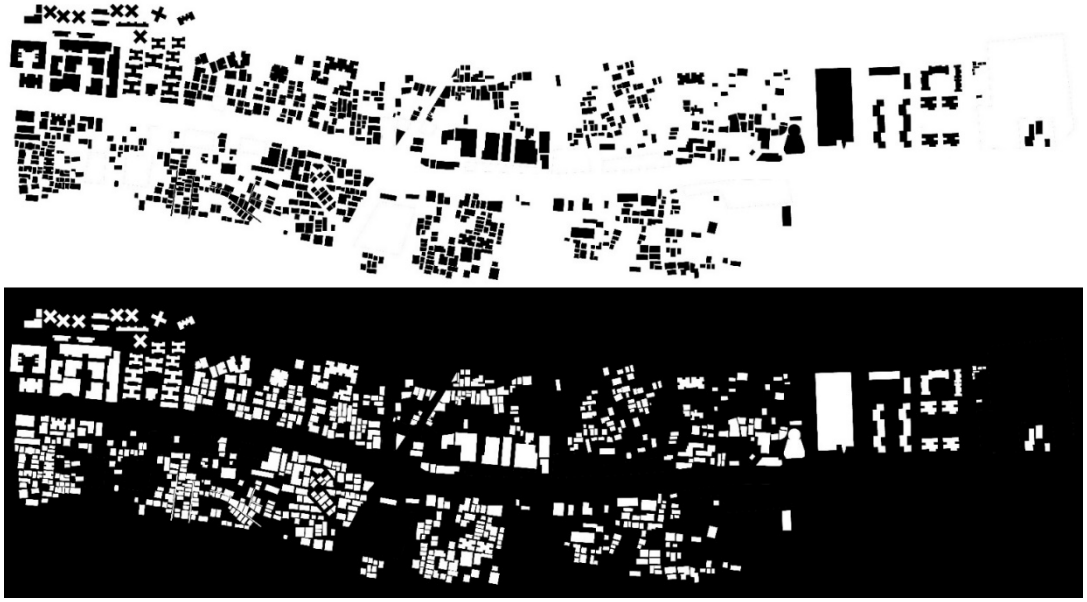


Fig 5.0 *Figure Ground Map at site level*

Unutilized Spaces

1. GOVT LAND
2. FIELD
3. CONSTUCTION
4. CLUB GROUND
5. UNUSED GROUND

Fig 5.1 *Images and location of unutilized spaces*

DENSITY, GRAIN AND TEXTURE

2.3.1 OBSERVATION

High density of structures as compared to open spaces.

2.3.2 ANALYSIS

Uniform grain in each quadrant.

Coarse texture.

2.3.3 CONCLUSION

The texture of the stretch can be made smooth by utilizing the spaces created by the coarse grain.

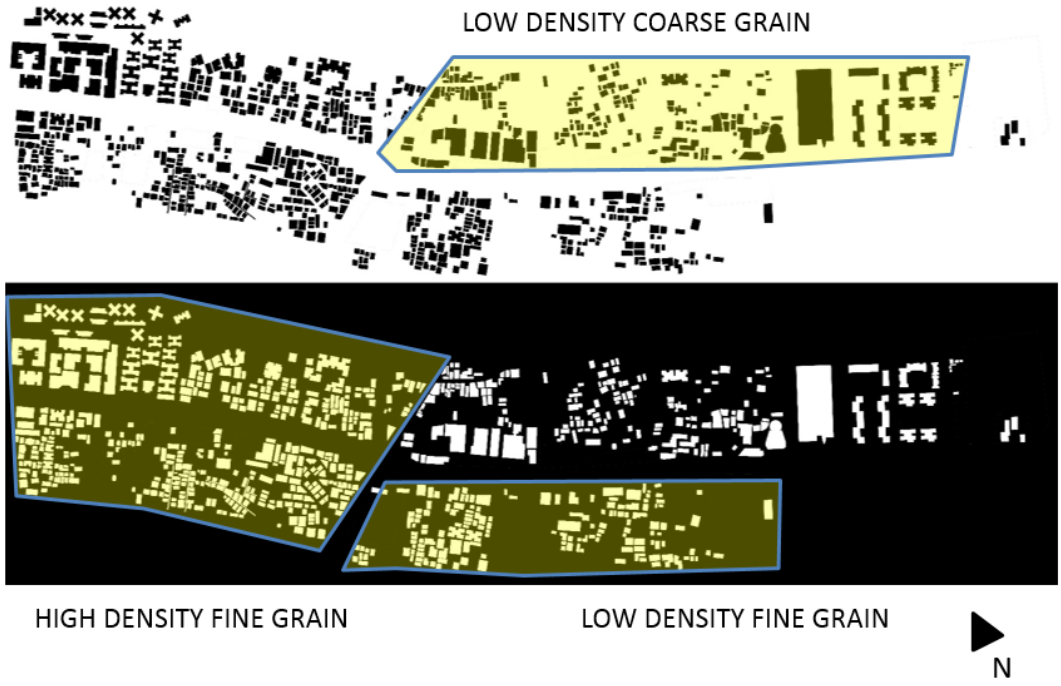


Fig 5.2 Density, *grain and texture at site level*

SWOT ANALYSIS –

STRENGTHS

1. High density of commercial facilities within a relatively small geographical area.
2. High level of interconnectivity with the neighborhood throughout the stretch by means of lanes and sub-lanes.
3. Lanes and sub-lanes are pedestrian friendly and at a human scale.
4. Heavy footfall present at Chinar Park and City Center 2.
5. City Center 2 is well connected with the stretch by all kinds of vehicles.
6. Unutilized spaces can be converted into well planned urban places.

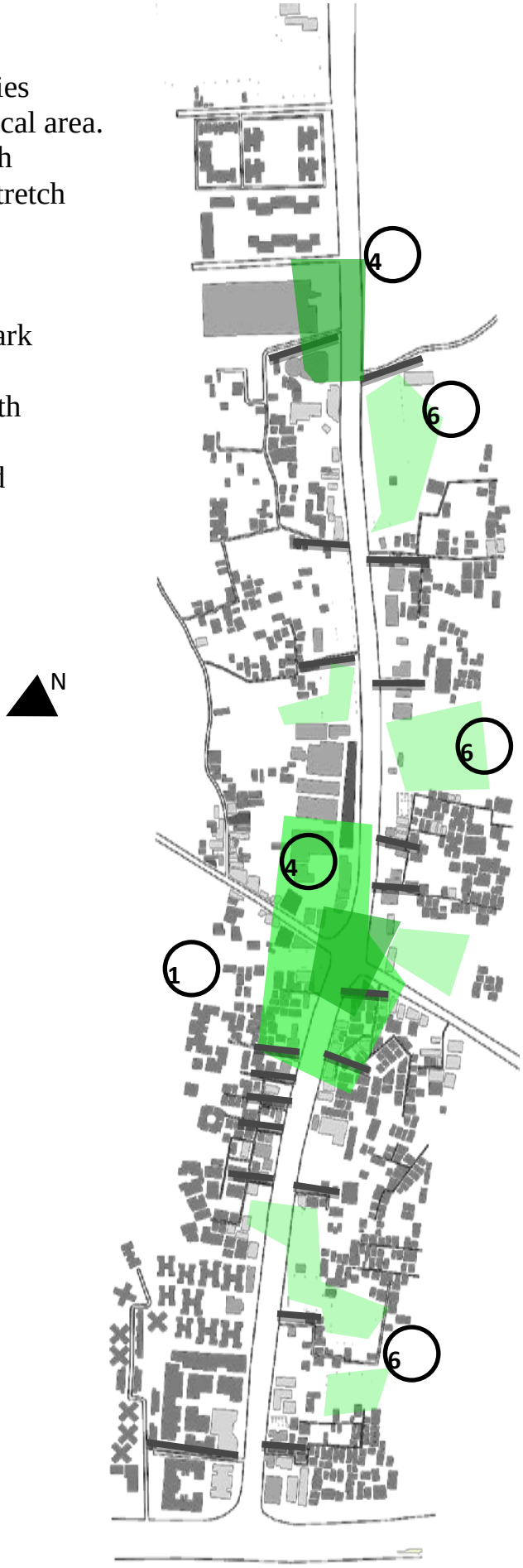


Fig 5.3 S*trength along the site*

WEAKNESSES

1. The road acts as a barrier due to high-speed traffic.
2. Lack of quality amenities which can serve the adjoining communities.
3. Cluttered and hostile stretch due to unplanned parking areas on the shopfronts.
4. Lack of pedestrian footfall, even though there are plenty of commercial anchors.
5. Lack of recreational activities throughout the stretch.

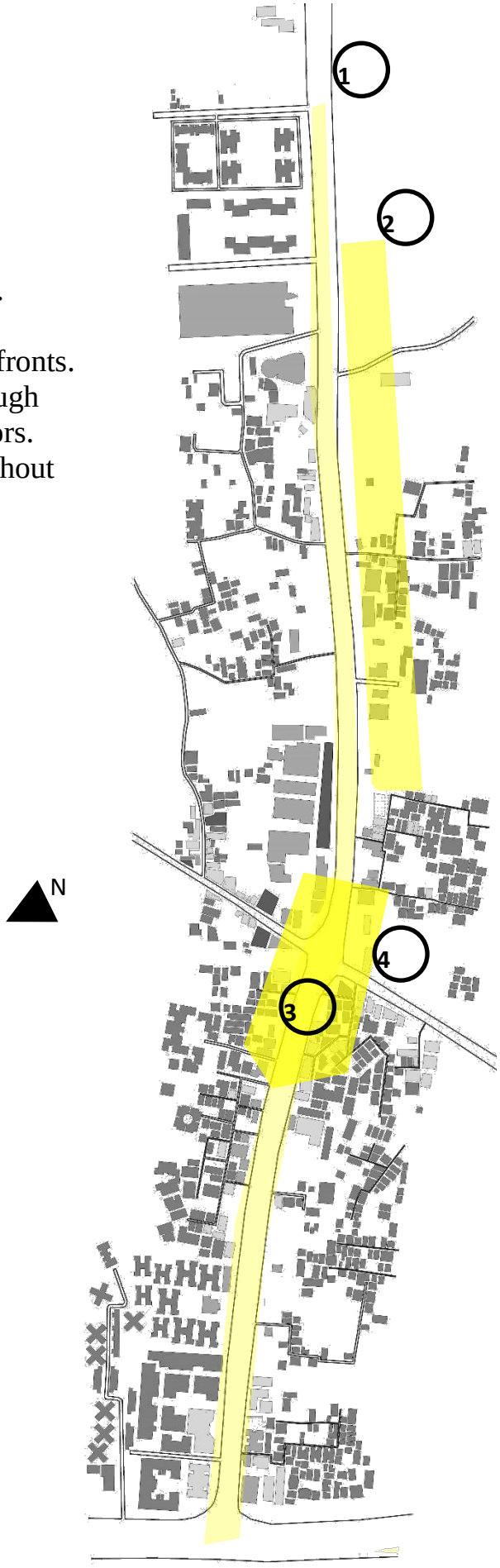


Fig 5.4 Weakness over *the site*

OPPORTUNITIES

1. The nearest open space to VIP road is visible from a considerable portion of the stretch. An iconic urban space can work as an anchor and attract people from all sides and any vehicle coming from the airport, irrespective of their destination.
2. Unutilized spaces are capable of being transformed into urban public spaces.
3. Service lanes might be graded to become a pedestrian friendly stretch.
4. Chinar park can be transformed into a properly planned transport hub.
5. The comprehensive economic potential through creating attractive environments will encourage future commercial and business investment

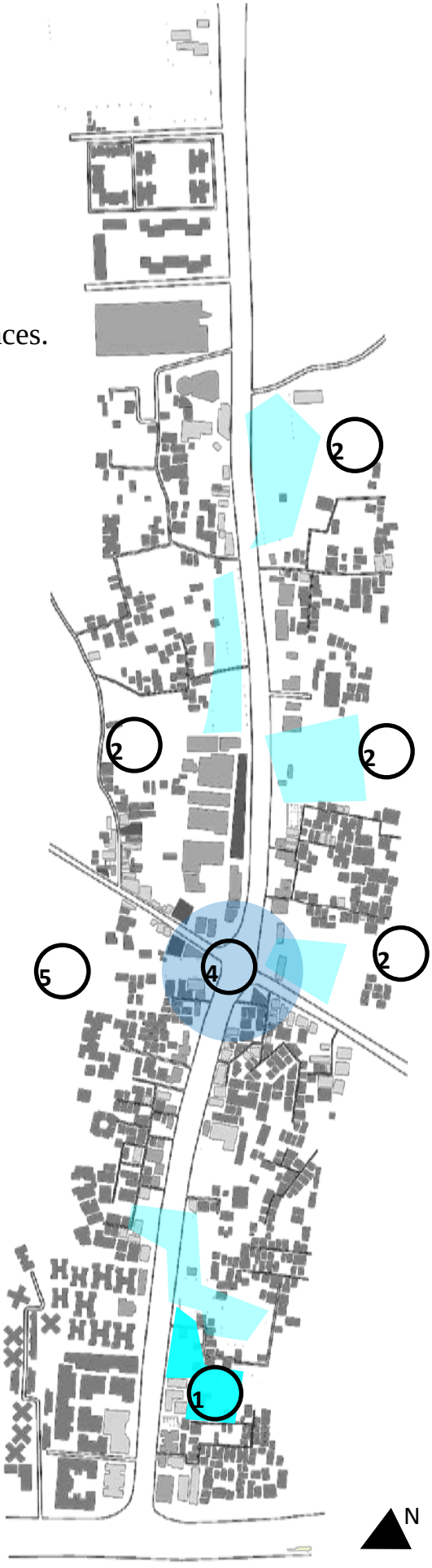


Fig 5.5 *Opportunities in the site*

THREATS

The stretch is hostile to pedestrians due to

1. high-speed vehicular movement and
2. Undeveloped open spaces.
3. The upcoming metro will be a very disruptive physical barrier to the stretch.
4. Waterlogging is a key problem throughout the stretch, especially from Haldiram's to Chinar park.
5. High level of congestion, irregular traffic movement and misdirection due to parking at the service lanes.
6. Uncontrolled usage of advertisement hoardings creates a visual chaos.

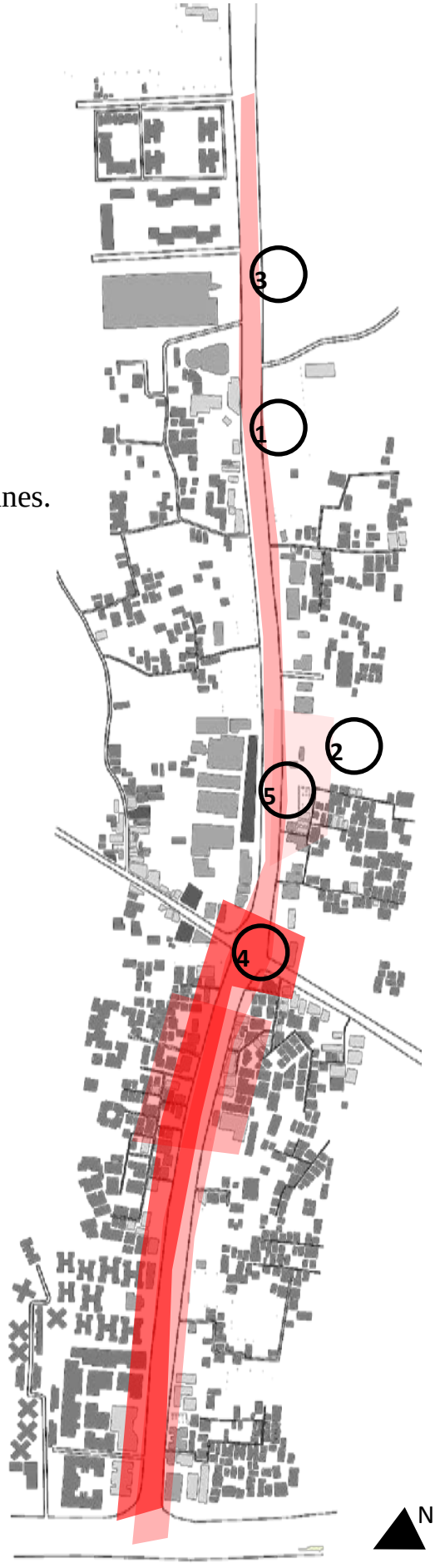


Fig 5.6 *Threats in the site*

	STRENGTH	WEAKNESS	OPPORTUNITIES	THREATS
Unutilized spaces	Unutilized spaces are capable of being transformed into urban public spaces.	`	The nearest open space to VIP road is visible from a considerable portion of the stretch. An iconic urban space can work as an anchor and attract people from all sides and any vehicle coming from the airport, irrespective of their destination	Unutilized spaces are overgrown with vegetation and mainly used up for garbage dumping
Waste management		Poor waste management is remarkably perceptible on the stretch		Waterlogging is a key problem throughout the stretch, even after low rainfall
Road network	High level of interconnectivity with the neighborhood throughout the stretch by means of lanes and sub-lanes	The road acts as a barrier due to high-speed traffic	Service lanes might be graded to become a pedestrian friendly stretch. Chinar park can be transformed into a properly planned transport hub	The stretch is hostile to pedestrians due to high-speed vehicular movement and undeveloped open spaces
Social infrastructures	High density of commercial facilities within a relatively small geographical area	Lack of recreational activities		
Parking		Cluttered and hostile stretch due to unplanned parking areas on the shop fronts		High level of congestion, irregular traffic movement and misdirection due to parking at the service lanes
Urban block	Lanes and sub-lanes are pedestrian friendly and at a human scale	Strip of high-rise buildings create negative edge with the street, with limited porosity	Can be made more porous	
Public realm	Heavy footfall present at Chinar Park and City Center 2	People don't walk on the stretch	The comprehensive economic potential through creating attractive environments will encourage future commercial and business investment	Risk of accidents

2.3.3 CONCLUSIONS

- Sparse space has been kept and development can be done by unifying them creating a singular identity.
- Existing pedestrian roads must be revitalized.
- Pedestrian flow must be widened.
- Vehicles and parking need to be separated from pedestrian flow.
- Iconic landmark with integrated public spaces may be incorporated which will give a sense of place to the whole stretch.
- Chaos at the nodes should be channelized properly.
- Vacant space must be properly utilized.
- The barriers must be removed or altered to integrate the streets with the neighborhood.
- Sparse space has been kept and development can be done by unifying them creating a singular identity.
- Existing pedestrian roads must be revitalized.
- Pedestrian flow must be widened.
- Vehicles and parking need to be separated from pedestrian flow.
- Iconic landmark with integrated public spaces may be incorporated which will give a sense of place to the whole stretch.
- Chaos at the nodes should be channelized properly.
- Vacant space must be properly utilized.
- The barriers must be removed or altered to integrate the streets with the neighborhood.

Chapter 3 CASE STUDY

3.1 SELECTION:

PRIMARY CASE STUDY:

Manek Chowk, Ahmedabad

One of the best examples of transformable streets in India active for almost 20 hours a day with a historical backdrop showcasing the potential of that place.

SECONDARY CASE STUDY:

Kuala Lumpur Metropolitan City Center Street

A study of responsive streetscapes in four different streets in an area.

Khajoo Neighborhood, Isfahan City, Iran

A study of conscious application of Urban Pedestrianization in a neighborhood.

3.2 Primary case study:

MANEK CHOWK, AHMEDABAD

3.2.1 DESCRIPTION

Manek Chowk is located close to the main spine of Ahmedabad and is historically considered an important commercial centre in the city. Manek Chowk is demonstrative of an excellent urban public space developed on traditional city planning principles and thrives as a vibrant anchor community space in the contemporary context.

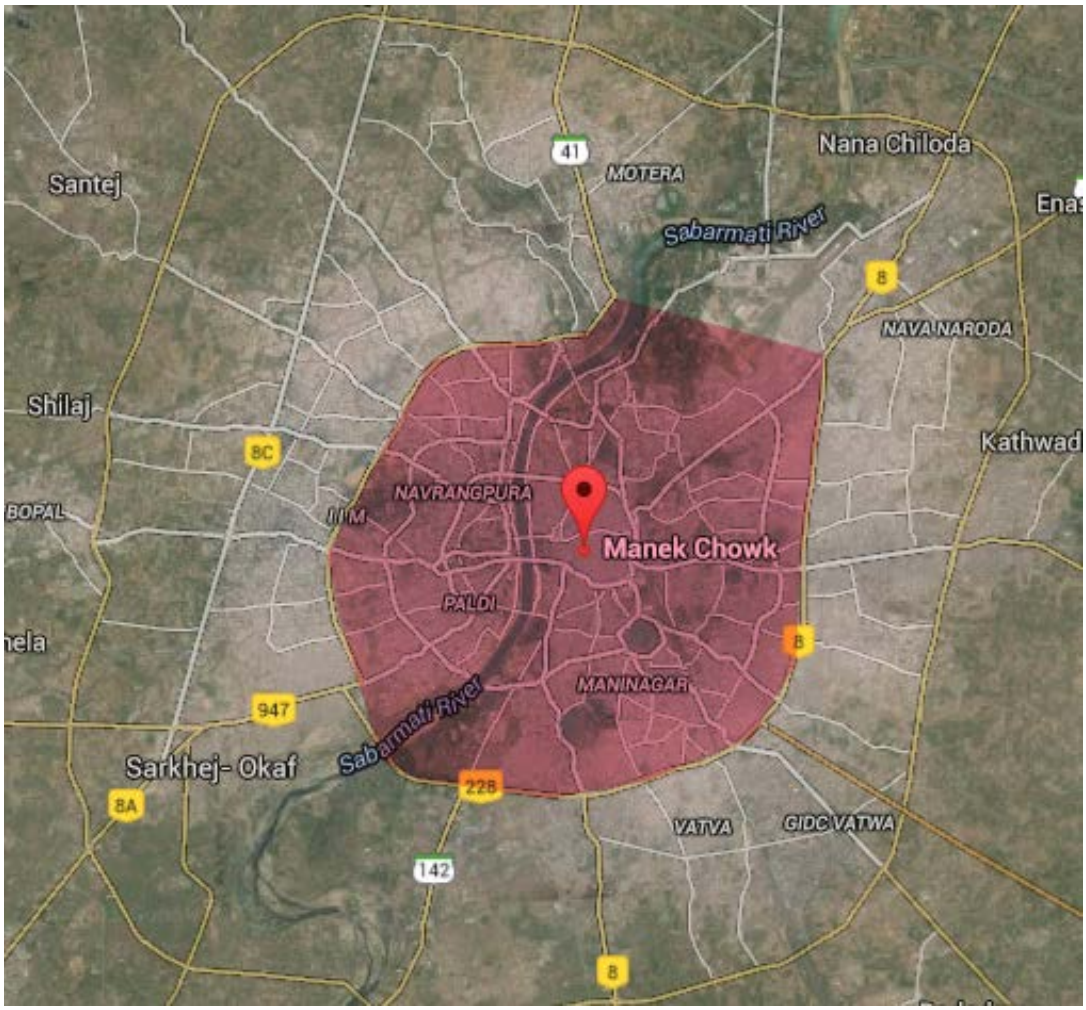


Fig 5.7 *Location of Manek Chowk*

3.2.2 OBSERVATION

A large percentage of visitors at Manek Chowk are pedestrians or non-motorized transit users

On an average, 1 person per second enters or exits Manek Chowk during peak business hours;

Only a third of the visitors are women and the percentage of old people and children in the area is also very low.

Cyclists, hand-carts, vendors and pedestrians negotiate the square dodging vehicles.

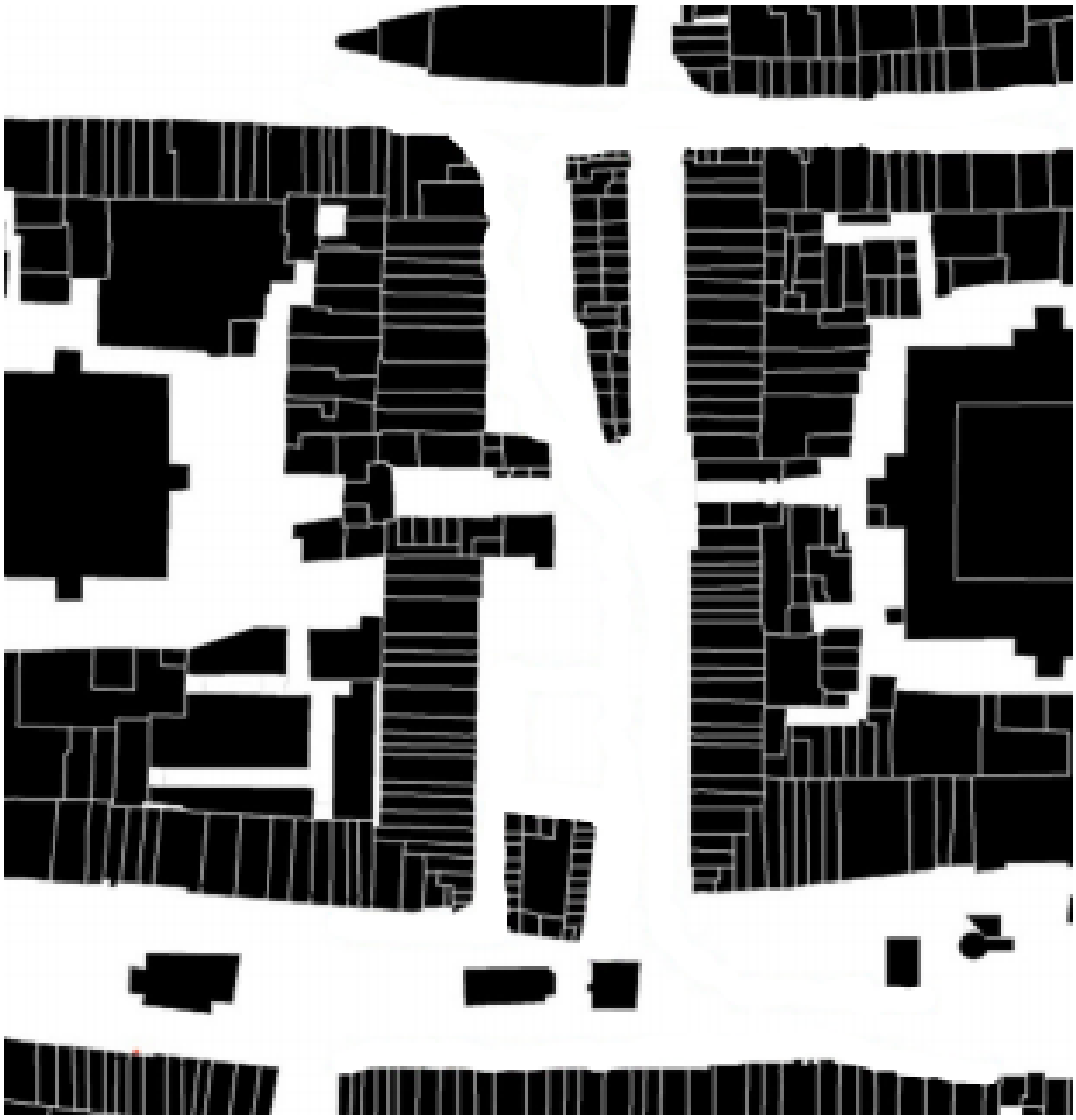


Fig 5.8 *Building blocks of Manek Chowk*

Manek Chowk remains active for 20hrs a day

From cattle grazing activities in the early morning hours, heavy commercial and business activities through the day, to a vibrant street food market that is active late into the night;

Unorganized vending activities cause congestion and bottlenecks for movement;

Shop extensions on to footpaths and streets

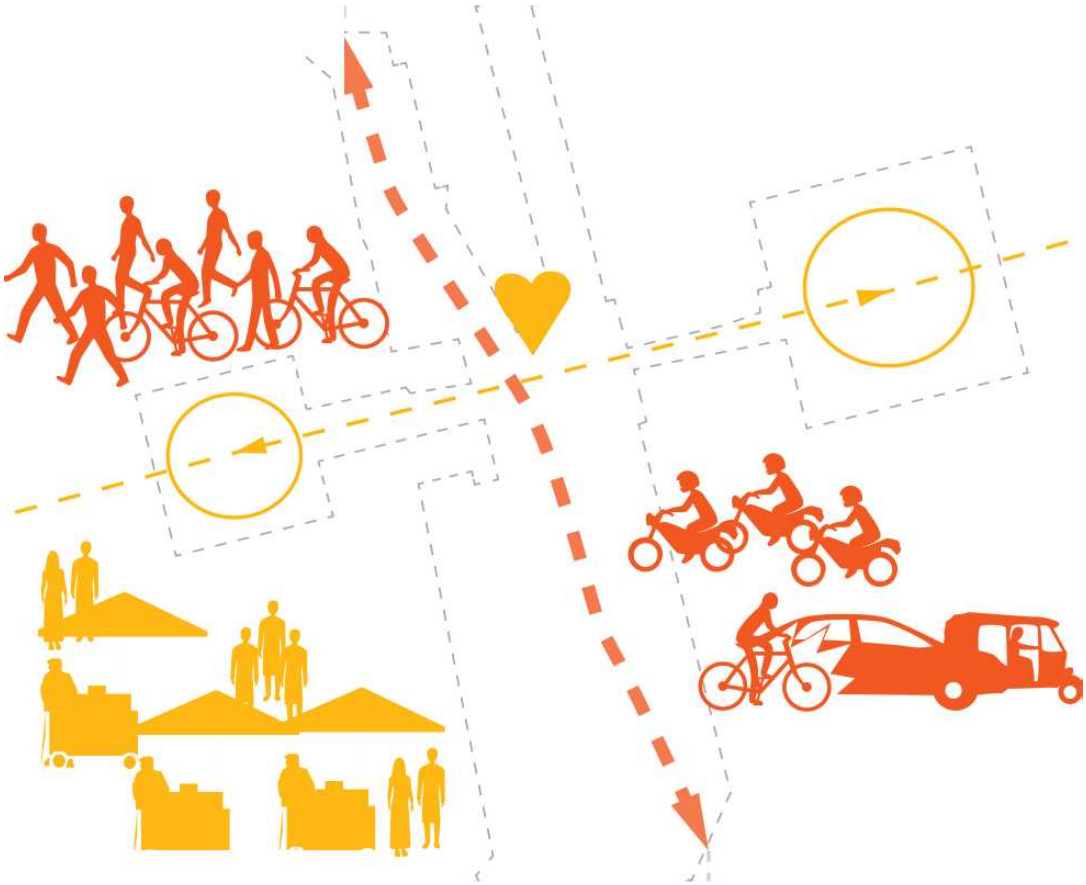


Fig 5.9 *Activities across Manek Chowk*

Manek Chowk is the heart of the Historic walled City of Ahmedabad

It forms the core of the walled city, housing formal and informal commercial activities, religious and cultural sentiments, and a vibrant public life.It is located between two nationally protected monuments, the Tombs of the King and Queen of Ahmedabad.

Vehicles dominate Manek Chowk

Manek Chowk is a mixed traffic zone, with high two-wheeler and auto-rickshaw counts; private four wheelers are few in number, but add to the congestion within the area.

About 50% of the central space of Manek Chowk is occupied by parking during business hours.

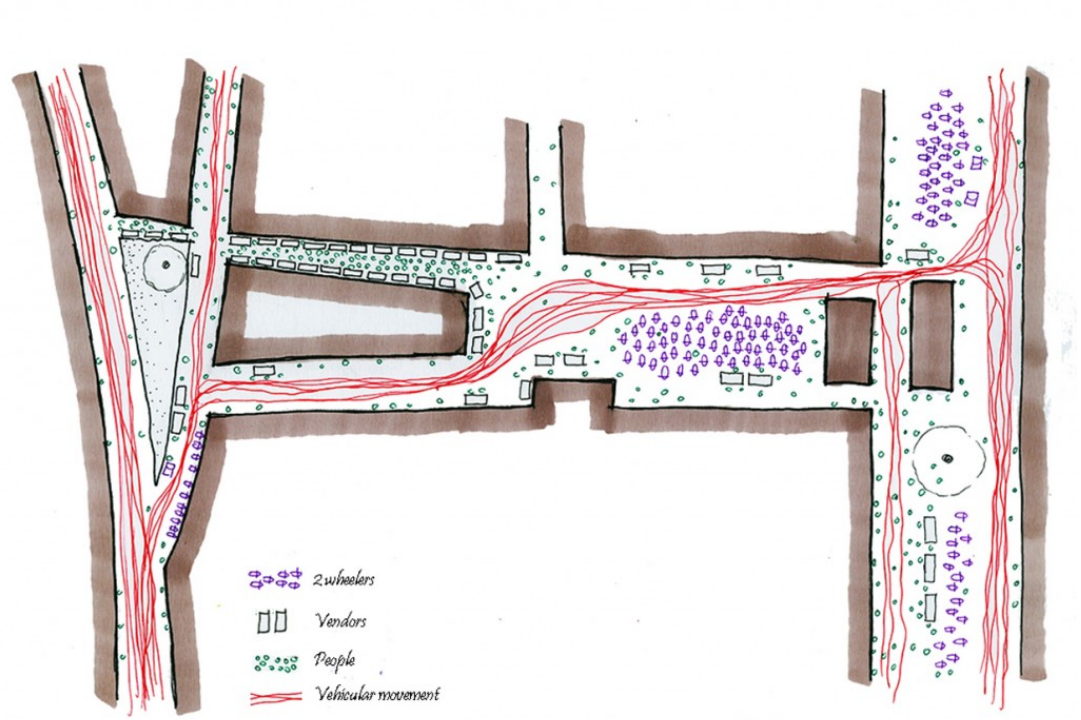


Fig 6.0 *Movement through Manek Chowk*

3.2.3 ANALYSIS

PROTECTION

- ***Situation for Pedestrians***

  Even though traffic movement is one-way, due to lack of segregation between traffic, extension of shops on to walkways, parking and presence of hawkers reduce Walkability.

- ***Condition of Surveillance***

  Manek Chowk is a lively urban space, with several activities and a constant thoroughfare of people providing a feeling of natural surveillance and safety but there are some dark areas that feel unsafe.

- ***Existing Condition of Air and Noise Pollution and Heat***

  Air and noise pollution and extreme heat are some of the major problems affecting public life in Manek Chowk. Temporary shades help in reducing heat.

ENJOYMENT

- ***Human Scale of Public Spaces***

  Manek Chowk is fairly a small public square of about 2500 sq. m. The public places are of the human scale.

- ***Cultural Heritage***

  The historic precinct has multiple layers of heritage resources, whereas in the existing context they are hidden and the heritage elements are forgotten

- ***Green Cover and Design***

  Presence of garbage, dust, animal waste, waste water and insect repels enjoyment of the Chowk.

Fig 6.1 *Condition of Manek Chowk during inactive hours*

COMFORT

- ***Walkability***

  Manek Chowk has a high number of pedestrians. However, the space available for pedestrians is highly limited.

- ***Opportunities to Stand/stay***

  The people who spend most of their time in the Chowk use the edges of buildings and/or other secondary opportunities as standing spaces.

- ***Predominantly Secondary Seating***

  There are very few formal seating opportunities for the public in the present context. People tend to use limited secondary seating options to rest.

- ***Sight Lines***

  People prefer to have interesting sight lines and vistas while in the public spaces. While Manek Chowk is a historic precinct with monuments of rich architectural heritage, the presence of the monuments is not felt due to lack of clear views.

- ***High noise levels***

  As per the survey conducted in Manek Chowk, it is observed that day time noise levels are higher than permissible comfort standards.

- ***Variety of Activities***

  Manek Chowk provides opportunities for a variety of activities that change with the time of day. While, Manek Chowk has traditionally been a commercial center, it also serves as a recreational center.

Fig 6.2 *Activities at Manek Chowk*

3.2.4 CONCLUSION: GUIDELINES FOLLOWED

• **Reduce parking** and introduce options of other modes such as cycling. **Public transport system** also could be augmented to connect with the square

• Segregate **vehicular traffic from pedestrian areas by introducing a level difference.**

• Hawking activity contributes towards vibrancy of the place; however they need such that they augment the pedestrian experience. **Appropriate space needs to be found** in case of resettlement **of hawkers**

• Encroachments **on the public space** and in surroundings of the monuments **need to be removed**

• Conduct scientific **study and research to establish archaeological importance** of the place and document history

• Conservation **and adaptive reuse** of old Stock Exchange building. A museum on Ahmedabad's history could be developed in the stock exchange building, this would also help with the maintenance of the historic structure;

• Pedestrianizing the Manek Chowk square

3.3 Secondary case study:

3.3.1 KUALA LUMPUR METROPOLITAN CITY CENTER STREET

3.3.1.1 DESCRIPTION

Contemporary Kuala Lumpur is a major urban centre in Southeast Asia. The city administrative area has a population of 1.7 million and the population of the Kuala Lumpur-Klang-Seremban Metropolitan Region, covering around 5000 sq.km. The evaluation of **four streets in central Kuala Lumpur** is studied here.

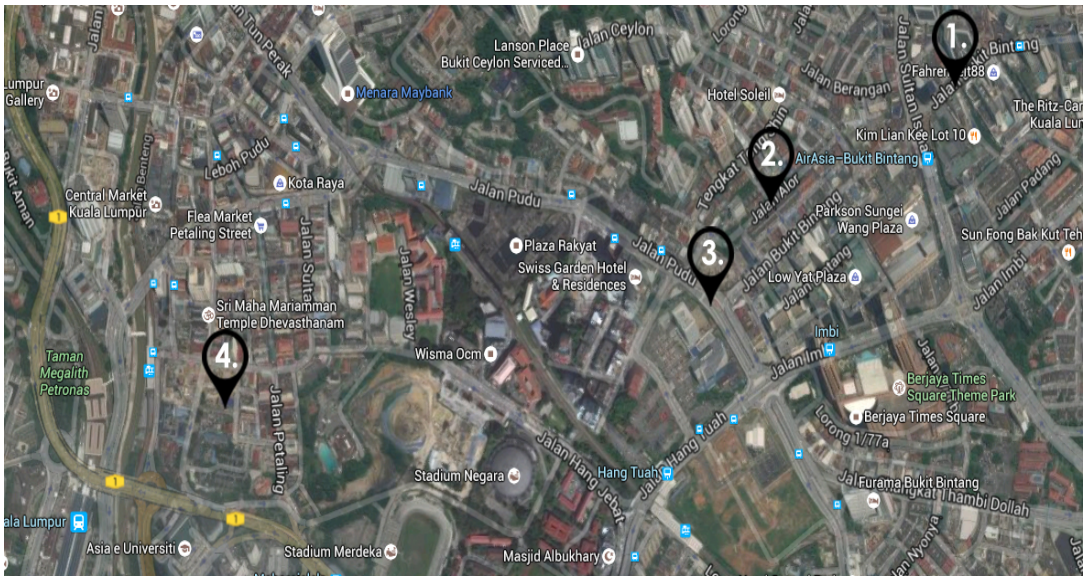


Fig 6.3 *Kuala Lumpur Central Street*

1. Jalan Pudu (Pudu Street - **a local connector**)
2. Jalan Bukit Bintang (Bukit Bintang Street –**the main shopping street**)
3. Jalan Alor (Alore Street -**both character and market street**)
4. Jalan Lorong Panggung (Lorong Panggung Street- **an alley and character street**).

3.3.1.2 ANALYSIS

- Jalan Pudu is **a local connecter linking major activity nodes** within central parts of Kuala Lumpur.
- The street has a **substantial pedestrian sidewalk** especially on the eastern side.
- However, the **street operates as a transition zone lacking in vibrancy and activities** of Bukit Bintang and Jalan Alor.
- There are also **a limited number of active street frontages** at ground level.
- The street frontage along the Pudu Transit Station **is completely devoid of any active uses spilling put into the street.**
- The majority of **building setbacks are utilized only for pedestrian circulation** and there are no plazas and pedestrian resting areas.
- Jalan Lorong Panggung is a **typical alley and a character street.**
- It is lined with old traditional buildings and Chinese shop houses.
- **The Chinese lanterns and traditional shop-house building contribute in creating a local sense of place and identity.**
- The street caters **both for pedestrian and vehicular movement.**
- There is a lack of active uses along the ground level of buildings which **reduces the level of vibrancy throughout the day and in the evening hours.**
- Jalan Lorong Panggung with its **unique character and heritage traditional buildings** reflects a **unique sense of place and identity** typical for a traditional Malaysian urban settlement.

Fig 6.4 *Kuala Lumpur Central Street views*

3.3.1.3 CONCLUSION

The analysis of the streets and public spaces in the Kuala Lumpur Metropolitan Region identified a few distinct stereotypes.

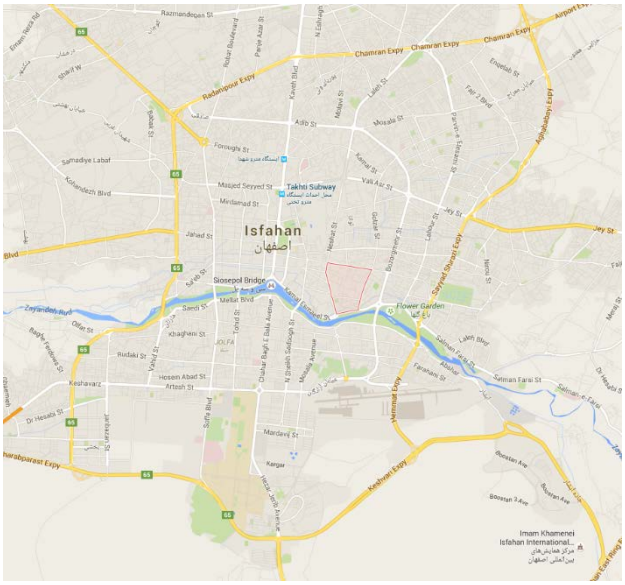
- Firstly, the streets in the remaining **older parts of the city retained some form of sense of place and identity.**
- Secondly, there are the **transition zones** such as Jalan Pudu which cater mainly for vehicular and pedestrian movement and **where little attention has been given to the local surrounds and climate.**
- Thirdly there are the **globalized spaces** (Jalan Bukit Bintang) where the **physical design is mainly aimed at creating high-end shopping precincts to attract visitors** (international and domestic) and business operators.
- The majority of streets lack in the provision of street furniture including shaded resting areas and benches for siting.
- **Elements such as water features and public art are also absent from the street environment.**
- Most of the streets **do not provide a pedestrian friendly environment** and are dominated by the cars and motorcycles.
- There is often an **absence of extended and shaded comfort zones along the pedestrian sidewalks so much needed in a tropical climate.**

3.3.2 KHAJOO NEIGHBORHOOD, ISFAHAN CITY, IRAN

3.3.2.1 DESCRIPTION

Khajoo is among the oldest and historical neighbors of Isfahan. Historical resources confirmed that the neighborhood existed in the 5th century and also it was thriving. The neighborhood was one of the most prosperous areas and the place of nobility and courtiers. Long history of neighborhoods shows that there are strong cultural traditions and social customs.

Isfahan City



Khajoo neighborhood

Fig 6.5 *Satellite images of Isfahan City and Khajoo*

3.3.2.2 ANALYSIS

- Poor quality of Pavement
- Lack of Public Space
- Road traffic and pedestrian traffic overlap – lack of safety
- Local waterfronts unutilized
- Lack of a specific neighborhood core
- Human Scale absent
- Lack of active frontages
- No vistas
- Obstructive Street Elements

Fig 6.6 *Condition of Khajoo neighbourhood*

3.3.2.3 CONCLUSION

Strategies applied to respond to the observed Issues

- **Urban furniture with identifiable symbolic elements**
  - Proximity to riverbank – use of local fish as a symbol
- **Mobile active retailers in the urban space**
  - Mobile retailers attract customers to create diversity
- **Pavement Design**
  - Pavement texture mentioning history of neighborhood
- **Canopy design for sidewalks**
  - Shelter for pedestrians against warm and dry climate
- **Design fountains and Artificial Pools**
  - Water based furniture reminds the river flow

Fig 6.7 *Improvised Condition of Khajoo*

Chapter 4 STUDY CONCLUSION

4.1 LITERATURE STUDY

- **Ground floor** façades must be **rich in variation and detail.**
- Ground floors must **also be friendly, soft and — in particular — populated.**
- **Pedestrians must have priority in mixed traffic.**
- **Pedestrian overpasses are used as a last resort** and only function as in-tended if pedestrians are physically prevented from crossing the street.
- **Primary seating's** must be in the form of **benches and chairs**, as well as many *secondary seating* options: **stairs, bases of statues, monuments, etc.**
- Cities need to encourage viable solutions to using **cars—better public transportation routes, reliable service, make the city more conducive for walking.**
- Mapping what happens in city space can provide specific knowledge of the types of activities in an area, such as staying, commercial or physical activities.

Five key aspects:

- **Paths:** the channel of the observer
- **Edges:** breaking in continuity with the surrounding areas
- **Districts:** 2-dimensional elements within which we spot a common character
- **Nodes:** strategic points
- **Landmarks:** external references

4.2 SITE STUDY

- The main stretches must be revitalized and made more pedestrian friendly with **grade separation**. Of the more important minor nodes, Kaikhali and Teghoria are already congested, but **design intervention is possible on the Noapara intersection.**
- **Activity based iconic landmarks with integrated public places** may be incorporated giving a sense of space providing proper parking spaces and reducing risk of accidents.
- The **organic pattern** of the existing fabric **can be retained** in the designed spaces.
- The **commercial belt** must be properly managed to reduce the chaotic nature of the roadside by adding **transition spaces in between the buildings and access points.**
- **Developed public open space** can help growing a community feeling and act as a magnet.
- Vacant space must be properly utilized.
- **The barriers must be removed or altered to integrate the streets with the neighborhood.**
- **A neighborhood center can be established with the following concepts: recreational destination, road safety, grocery and family lifestyle destination and a transportation hub.**

4.3 CASE STUDY

- **Reduction of parking** and introduce options of other modes such as cycling. **Public transport system** also could be augmented.
- **Segregate vehicular traffic from pedestrian areas by introducing a level difference.**
- Hawking activity contributes towards vibrancy of the place; however they need such that they augment the pedestrian experience. **Appropriate space needs to be found** in case of resettlement **of hawkers.**
- **Transition zones** cater mainly for vehicular and pedestrian movement.
- **Globalized spaces physical design is mainly aimed at creating high-end shopping precincts to attract visitors** (international and domestic) and business operators.
- **Mobile active retailers in the urban space.**
- **Canopy design for sidewalks.**

Chapter 5 GUIDELINES

5.0 DESIGN GUIDELINES

- **Introduction of multiple level parking, preferably underground.**
- **Ground floor** façades must be **rich in variation and detail and seem visually connected with extended frontage spaces.**
- **A transportation hub may be created near a node.**
- **Activity based iconic landmarks with** public open spaces should be created.
- **Covered walkways** should be provided for a better pedestrian experience.
- Unused land of vacant, litigated, vested properties with non-functional buildings should have an **integrated private public partnership model-based development.**
- Built forms in the development **should not be more than 4-5 stories high** to give easy access to overhead design elements like green roofs, etc.

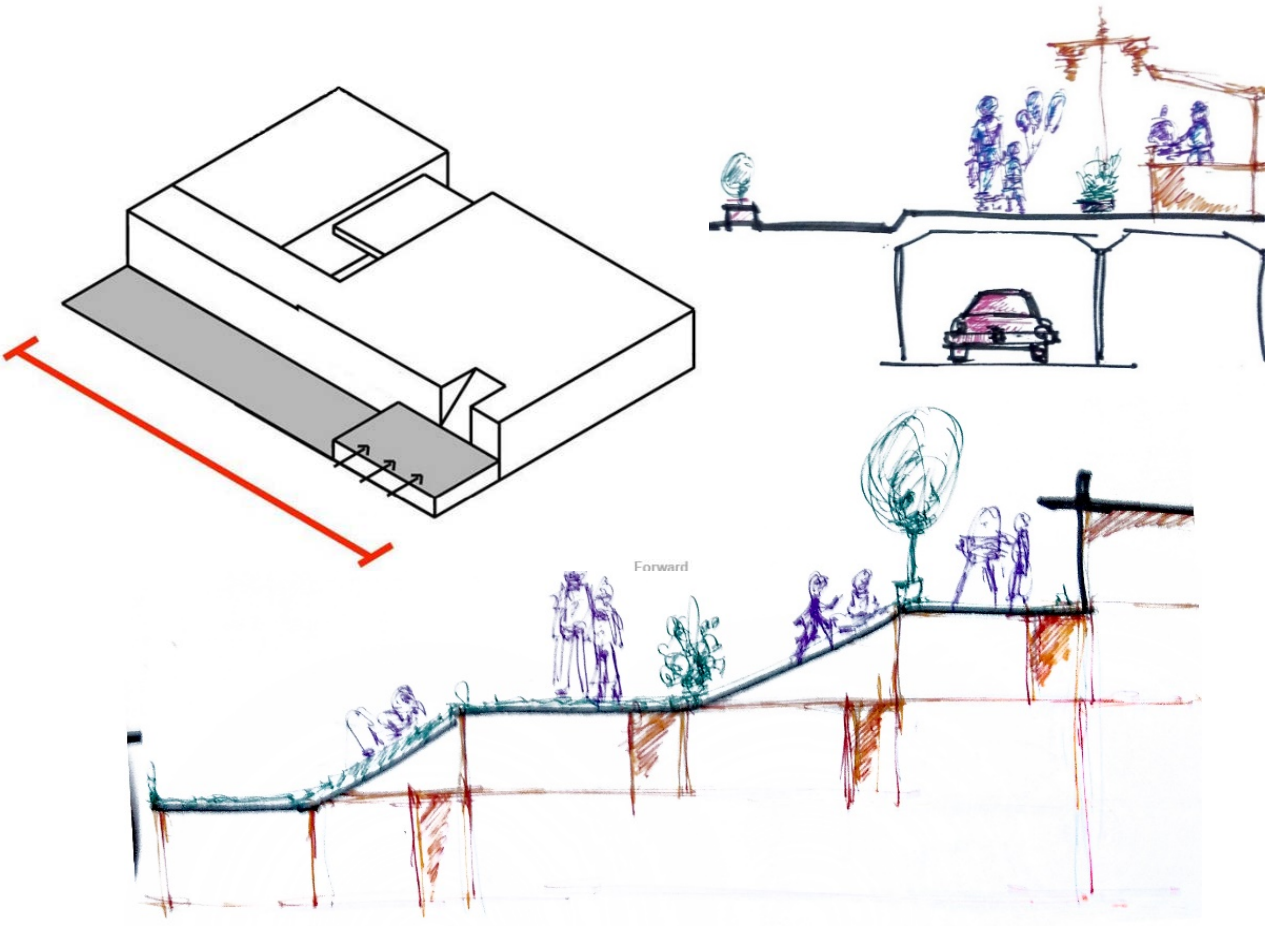


Fig 6.8 *Sketches showing variation in streetscape*

- **Multi-level accessibility**
  To build-forms will improve permeability and safety taking advantage of the upcoming metro route.
- Ensure that urban street activities do not lead to overcrowding and unsanitary conditions of public spaces, areas and streets and not impede the movement of the general public.
- Promote a **supportive environment for** the vast mass of **urban street vendors** to carry out their vocation.
- **Types of planning intervention that may provide space:**
  1. Use of incidental (or left-over) space.
  2. Allocation of vending space in housing schemes and in statutory/formal local plans and planning schemes.
  3. Space sharing over time.

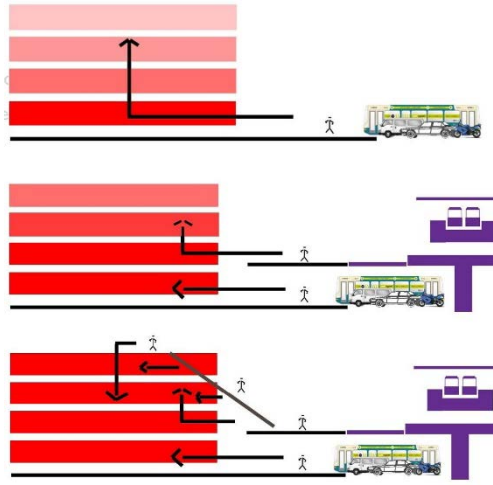
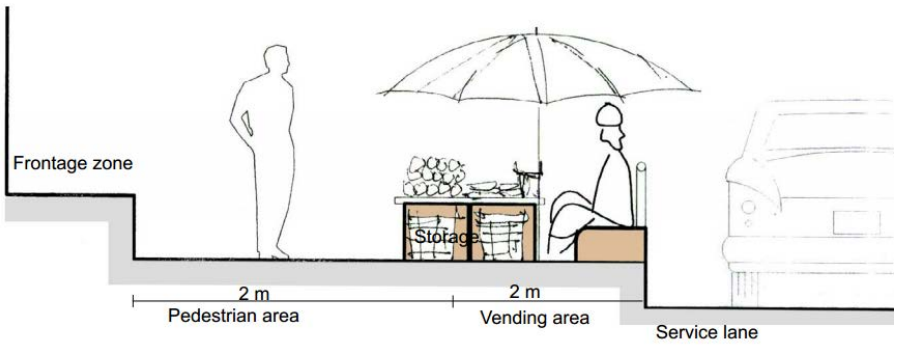


Fig 6.9 *Multi level accessibility*



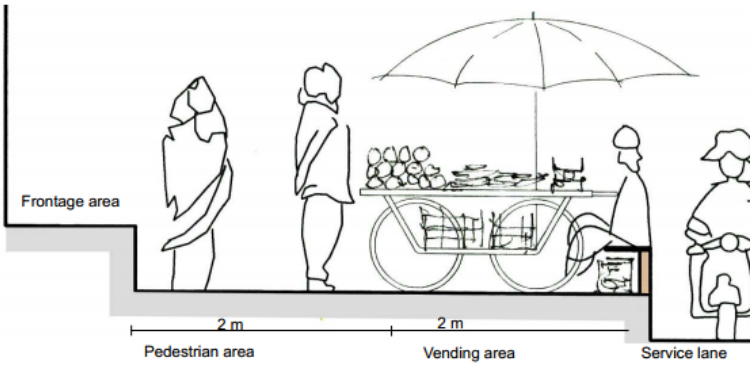


Fig 7.0 *Space sharing and street frontage*

For major roads:

- Guided by two phases, the first consisting solely of **striping** and a center turn lane, and the second, of **medians and plantings to complement the center lane.**
- **Dedicated loading zones to be provided.**
- Curbside parking spaces demarcated with **parklets**.
- Boulevard: Traffic calming at intersections and midblock as well as pedestrian-scale lighting and street trees.

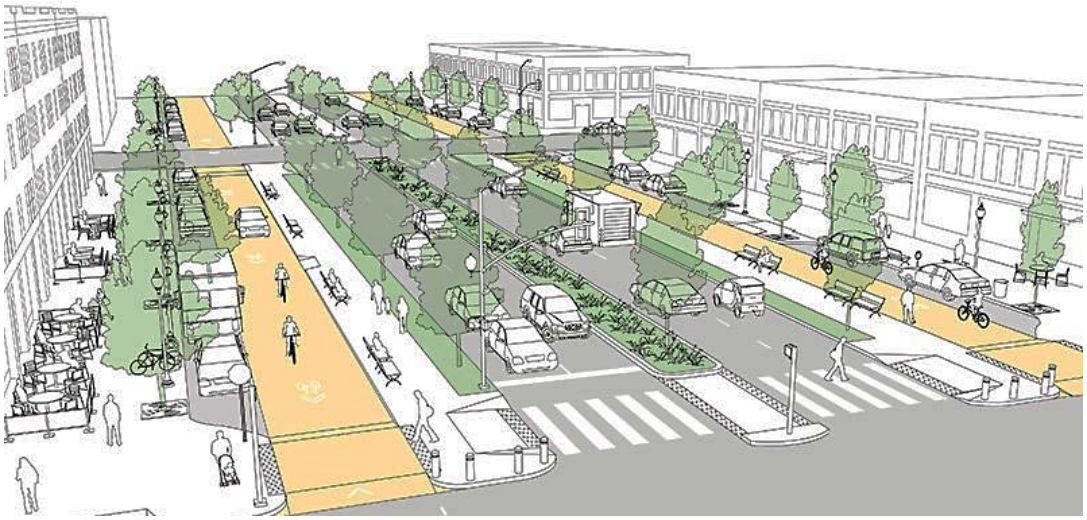


Fig 7.1 *Primary and secondary street scape*

- Addition of shared use paths, seating,
- and recreational amenities. Installation of curb extensions or midblock crossings

Fig 7.2 *Shared Street concept*

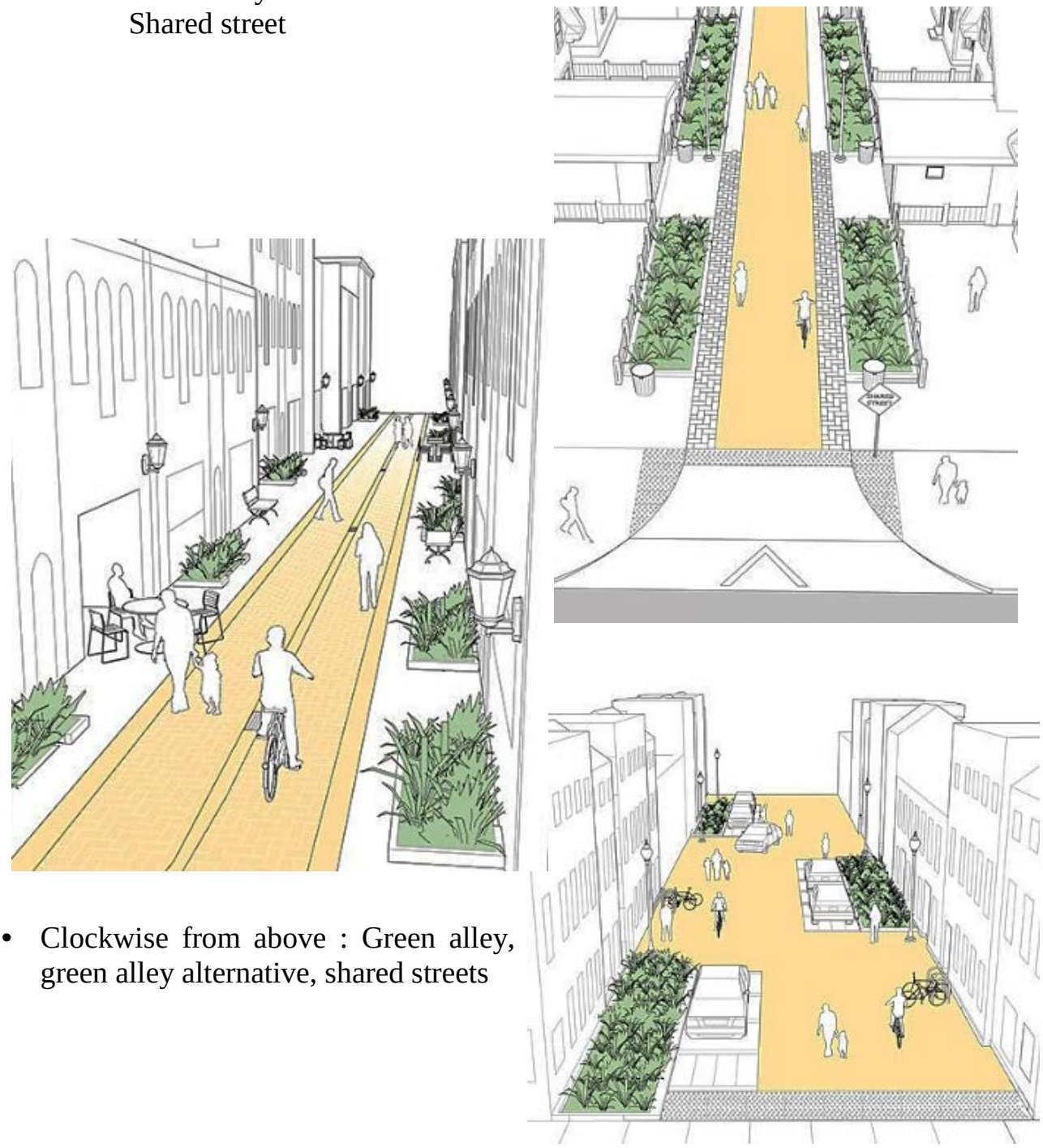
For internal roads:

- **Street furniture**, including bollards, benches, planters, and bicycle parking, can help **define a shared space**, subtly delineating the traveled way from the pedestrian-only space.
- **Permeable paving and rain gardens** to address waterlogging.
- **Pedestrian scale light fixtures.**

Design options for internal roads:

Green alleys

Shared street



- Clockwise from above : Green alley, green alley alternative, shared streets

Fig 7.3 *Green Alley and Shared Street Concept*

Sidewalks:

Providing sidewalks which are divided into four major zones:

1. **Frontage Zone** - Consists of both the structure and the facade of the building facing the street, as well as the space immediately adjacent to the building.
2. **Pedestrian through Zone** - Primary, accessible pathway that runs parallel to the street.
3. **Street furniture/curb zone** - Lighting, shading, benches, newspaper kiosks, utility poles, tree pits, etc.
4. **Enhancement/buffer zone** - Curb extensions, parklets, storm water management features, parking, etc.

Fig 7.4 *Concepts of Sidewalks*

Curb Extensions:

Bus bulbs – Align the bus stop with the parking lane or the service lane, allowing buses to stop and board passengers properly.

Fig 7.5 *Bus bulb and Pinch Point*

1. Pinch point - Applied at midblock to slow traffic speeds and add public space.

Rainwater management strategies:

1. **Bioswales -** Vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate rainwater runoff into the groundwater table as it moves downstream.
2. **Flow-through planters -** Hard-edged rainwater manager facilities with an impermeable base, treating water by allowing runoff to soak through its soil matrix and filter into an underdrain system.
3. **Pervious Strips -** Long, linear landscaped areas or linear areas of pervious pavement that capture and slow runoff.
4. **Pervious Pavement -** For pedestrian and bike-only areas.

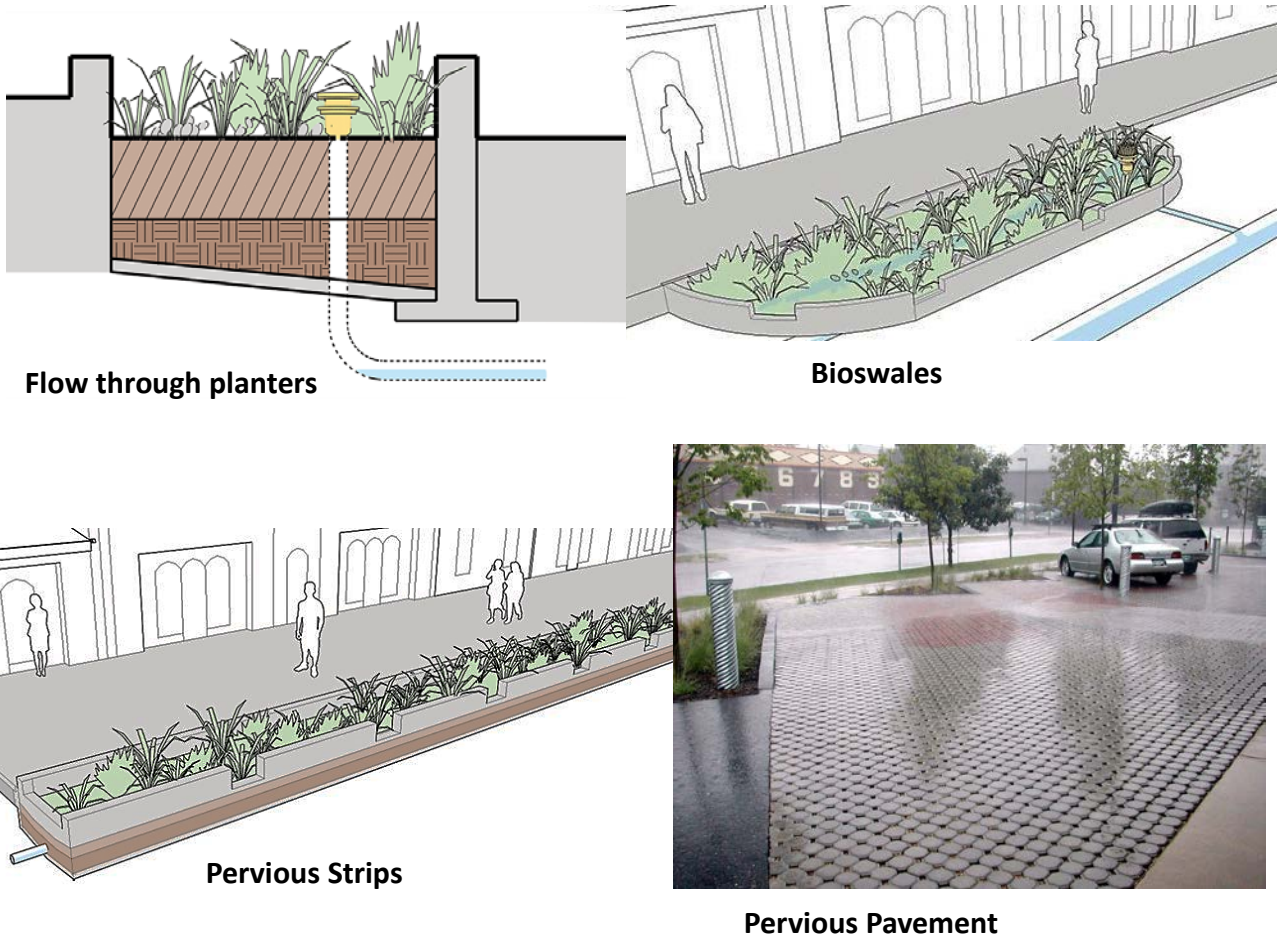


Fig 7.6 *Rainwater Management Strategies*

Intersection design guidelines:

- **Pedestrian Safety:** Curb extensions, tight corner radii, and **pedestrian safety islands** force drivers to navigate intersections cautiously.
- Align lanes through an intersection and **enforce turning lanes with curb extensions** to reduce merging and weaving. Delineate **guide markings** through intersections to reduce conflicts and guide turning vehicles.
- **Bus bulbs** near intersections improve transit travel times and provide a dedicated space for waiting passengers.

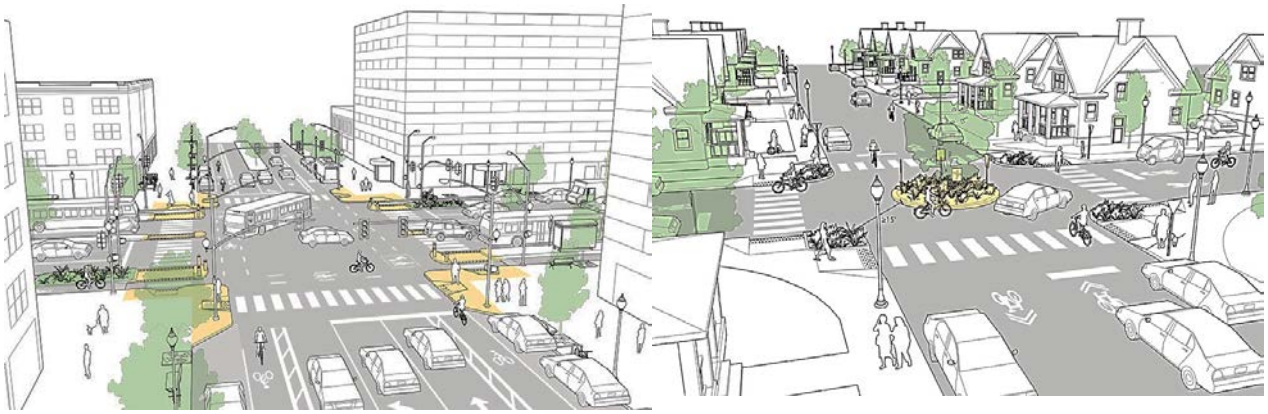


Fig 7.7 *Node Development Strategies*

Roundabouts:

- Mini roundabouts to increase safety at intersections**. Crosswalks should be marked** to clarify where pedestrians should cross and that they have priority.
- **Shrubs or trees in the roundabout** can be used to further the traffic calming effect and beautify the stretch, but need to be properly maintained so they do not hinder visibility.

Fig 7.8 *Node Development Strategies*

Form based Codes:

- **A form-based code is a land development regulation that fosters predictable built results and a high-quality public realm by using physical form (rather than separation of uses) as the organizing principle for the code.**
- **Form-based codes address the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks.**

A. Site

Sites larger than 4 acres shall be subdivided further to create additional blocks.

B. Introduce Streets

Sites being subdivided into additional blocks shall introduce streets.

C. Introduce side streets

Access to blocks is allowed only by side streets. The intent is to maintain the integrity and continuity of the streetscape without interruptions such as driveway access.

Therefore, although residential development allows minor interruptions along the primary frontage, the introduction of rear service thoroughfares such as alleys and lanes is required.

D. Introduce Lots

Lots for each block based on blocks and their thoroughfare.

E. Introduce Projects

The allowable building types are combined with the allowable frontage types in which the lot is located, in order to generate a particular urban form and character.

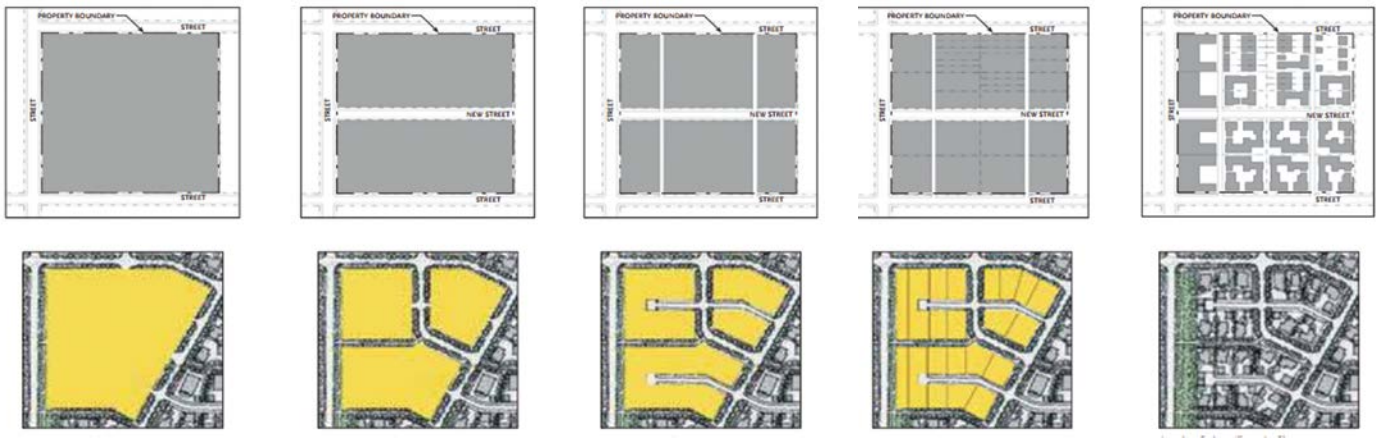


Fig 7.9 *Form Based Code Development*

Chapter 6 DESIGN PROPOSALS

6.1 Design Approach – Intervention area selection

The stretch from haldiram's to city center 2, with biswa bangla road as it's spine, consists of two important district gateways and has not been yet touched at the urban level. thus, this stretch is in urgent need of regulations for controlling it's growth as an important future hub.

Fig 8.0 *Proposed stretch of intervention*

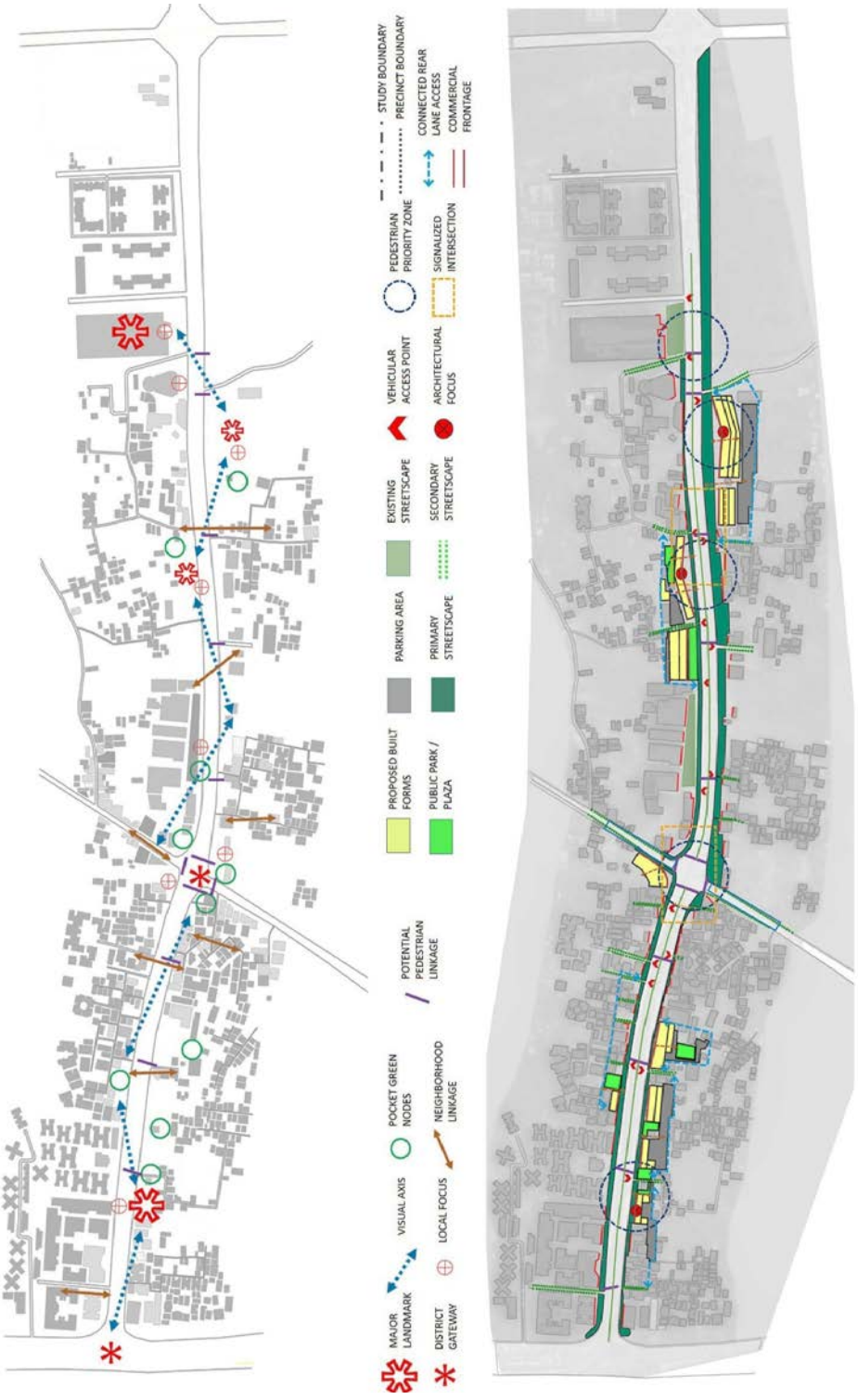


Fig 8.1 *Major Proposals at site level*

Form Based Codes

Addressing the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks.

1. Streets

Site subdivided into additional blocks.

2. Side streets

Access to blocks is allowed only by side streets.

3. Lots

Lots for each block based on blocks and their thoroughfare.

4. Projects

Generation of a particular urban form and character.

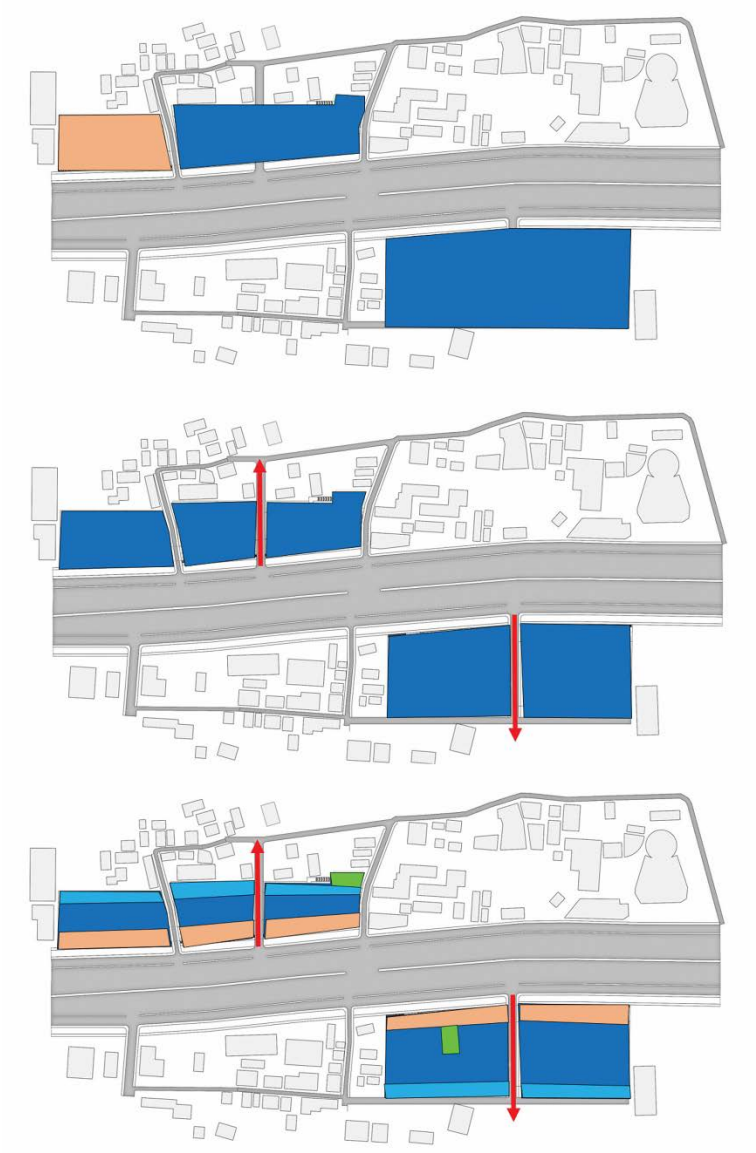


Fig 8.2 *Application of Form based Code Development*

Road and Streetscape Development

Stages of Streetscape Development:

- Existing Condition
- Grading
- Street Furniture
- Green Cover

(Clockwise from top left)

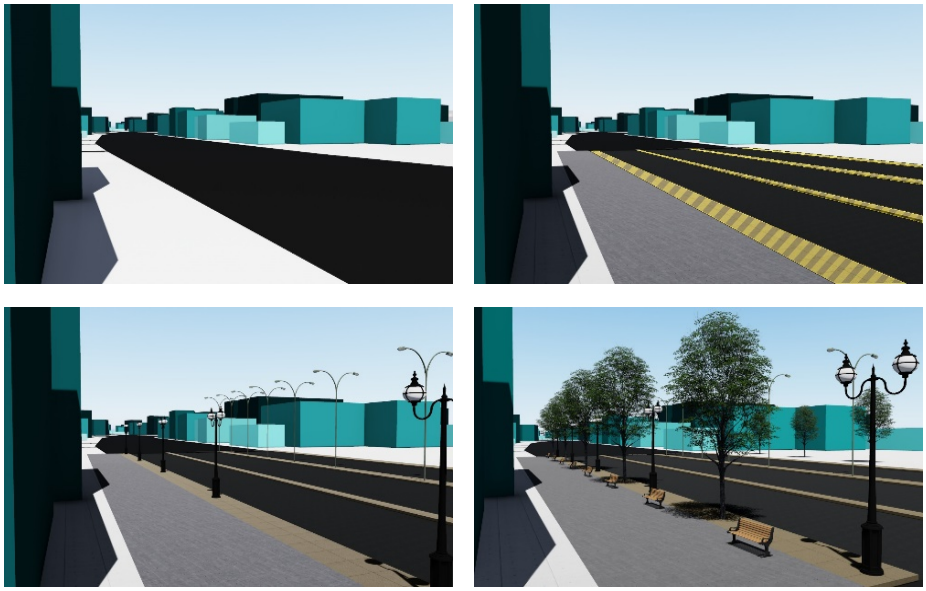


Fig 8.2(a) *Streetscape Development*

Below: Typical Road Section, Typical Plaza Section

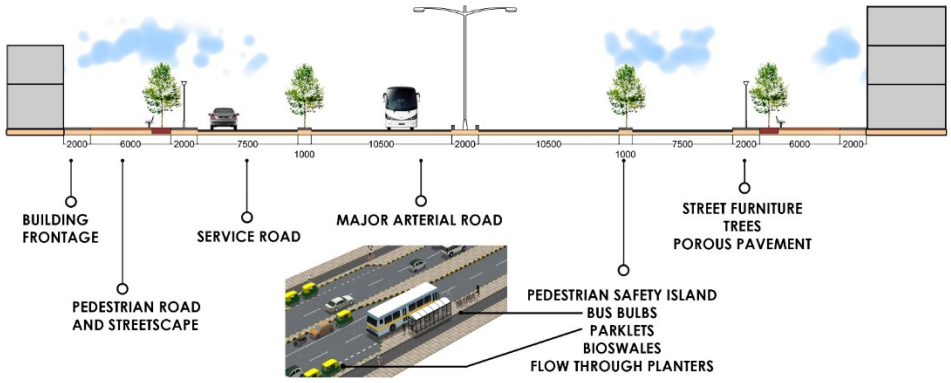


Fig 8.3 *Section through road and public Plaza*

6.2 Design Proposals

6.2.1 Chinar Park Intersection

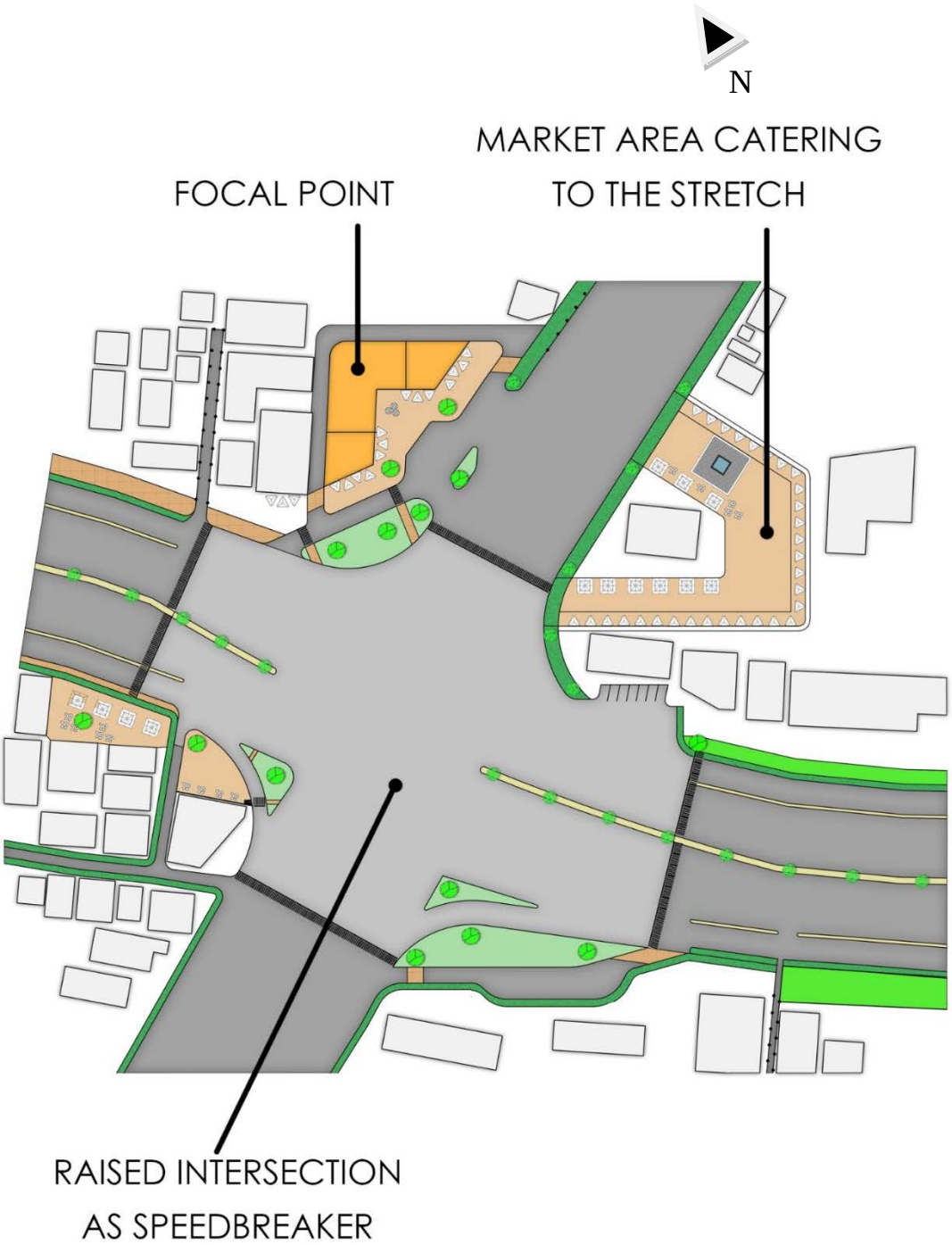


Fig 8.4 *Proposed Development at Chinar Park*

6.2.2 Noapara Intersection

Fig 8.5 *Proposed Development at Noapara*

6.2.3 Gateway Stretch

Chapter 7 Conclusion

7.1 ISSUES

- Sparse space has been kept and development can be done by unifying them creating a singular identity.
- Existing pedestrian roads must be revitalized.
- Pedestrian flow must be widened.
- Vehicles and parking need to be separated from pedestrian flow.
- Iconic landmark with integrated public spaces may be incorporated which will give a sense of place to the whole stretch.
- Chaos at the nodes should be channelized properly.
- Vacant space must be properly utilized.
- The barriers must be removed or altered to integrate the streets with the neighborhood.

7.2 CONTRIBUTIONS

STRUCTURE OF PEDESTRIAN SYSTEMS – BY MOVEMENT	**DIRECTIONS**	**ALTERNATE ROUTES**	**ALTERNATIVE TRANSPORT SYSTEMS**	**STRUCTURABILITY**
STRUCTURE OF PEDESTRIAN SYSTEMS – BY FUNCTIONS	**DISTANCES BETWEEN FUNCTIONS / BUILDINGS**	**NUMBER OF LEVELS / STOREYS**	**ORIENTATION OF BUILDINGS / FUNCTIONS**	**RELATION BETWEEN MOBILE AND STATIONARY PEDESTRIAN ACTIVITIES**
DESIGNING THE SPACES DESIGNING THE EDGES	**DIMENSIONS – LENGTH, WIDTH, AREA**	**STRUCTURE / FORM**	**INTERFACE BETWEEN PUBLIC AND PRIVATE SPACES**	**DEGREE OF TRANSPARENCY BETWEEN PUBLIC AND PRIVATE SPACES**

DESIGNING / DETAILING THE PUBLIC SPACES	PROTECTION AGAINST TRAFFIC AND ACCIDENTS	PROTECTION AGAINST CRIME AND VIOLENCE	PROTECTION AGAINST UNPLEASANT CLIMATE	PROTECTION AGAINST UNPLEASANT SENSE EXPERIENCES
	POSSIBILITIES FOR WALKING	POSSIBILITIES FOR STANDING	POSSIBILITIES FOR SITTING	POSSIBILITIES TO SEE
	POSSIBILITIES FOR HEARING / TALKING	POSSIBILITIES TO PLAY / UNWIND	POSSIBILITIES FOR OTHER ACTIVITIES	POSSIBILITIES FOR PEACE / ISOLATION / INACTIVITY
	PHYSIOLOGICAL NEEDS	SMALL SCALE SERVICES – FRIENDLY GESTURES	DESIGNING FOR ENJOYING POSITIVE CLIMATIC ELEMENTS	DESIGNING FOR POSITIVE SENSE EXPERIENCES

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- **A transportation hub IS created at Chinar Park node.**
- **Activity based iconic landmarks with** public open spaces is created.
- Unused land of vacant, litigated, vested properties with non-functional buildings arranged have an **integrated private public partnership model-based development.**
- Built forms in the development **not more than 4-5 stories high** to give easy access to overhead design elements like green roofs, etc.
- **Dedicated loading zones to be provided.**
- Curbside parking spaces demarcated with **parklets**.
- **Street furniture**, including bollards, benches, planters, and bicycle parking, can help **define a shared space**, subtly delineating the traveled way from the pedestrian-only space.
- **Permeable paving and rain gardens** to address waterlogging.
- **Pedestrian scale light fixtures.**
- **Pedestrian Safety:** Curb extensions, tight corner radii, and **pedestrian safety islands** forcing drivers to navigate intersections cautiously.

- **Crosswalks marked** to clarify where pedestrians should cross and that they have priority.
- **Shrubs or trees in the roundabout** used to further the traffic calming effect and beautify the stretch, but properly maintained so they do not hinder visibility.

Rainwater management strategies used:

1. **Bioswales** - Vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate rainwater runoff into the groundwater table as it moves downstream.
2. **Flow-through planters** - Hard-edged rainwater manager facilities with an impermeable base, treating water by allowing runoff to soak through its soil matrix and filter into an underdrain system.
3. **Pervious Strips** - Long, linear landscaped areas or linear areas of pervious pavement that capture and slow runoff.
4. **Pervious Pavement** - For pedestrian and bike-only areas.

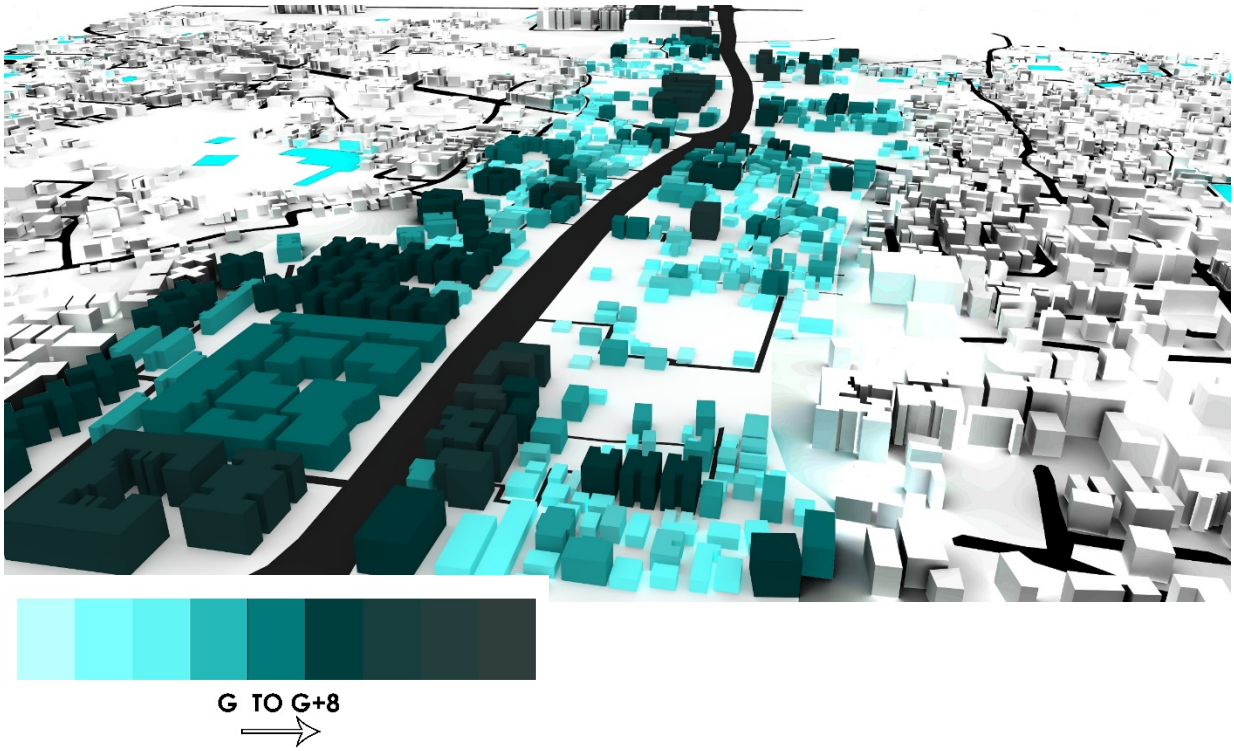
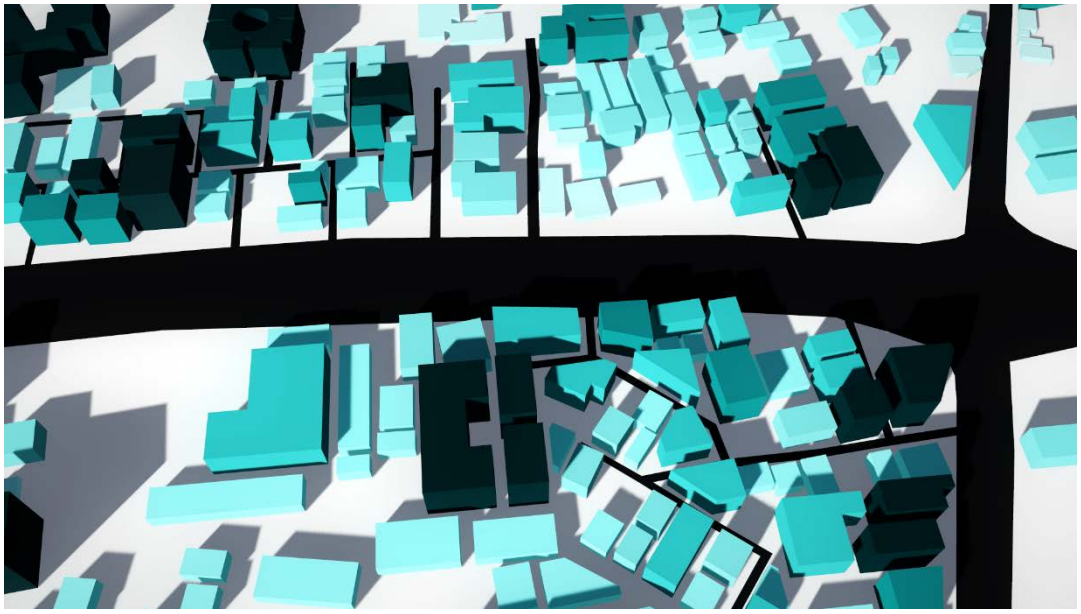
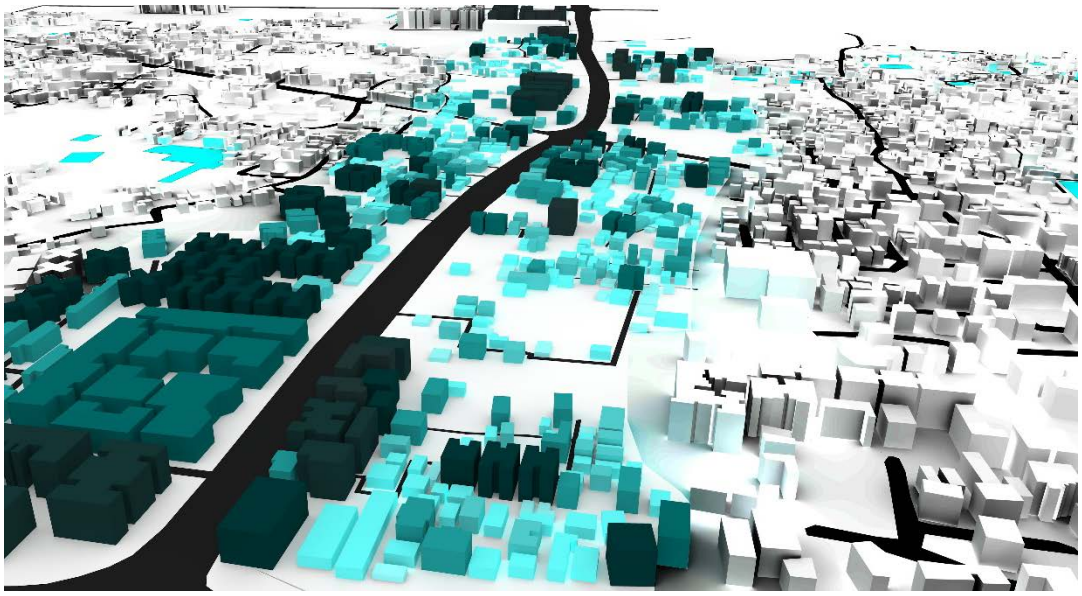
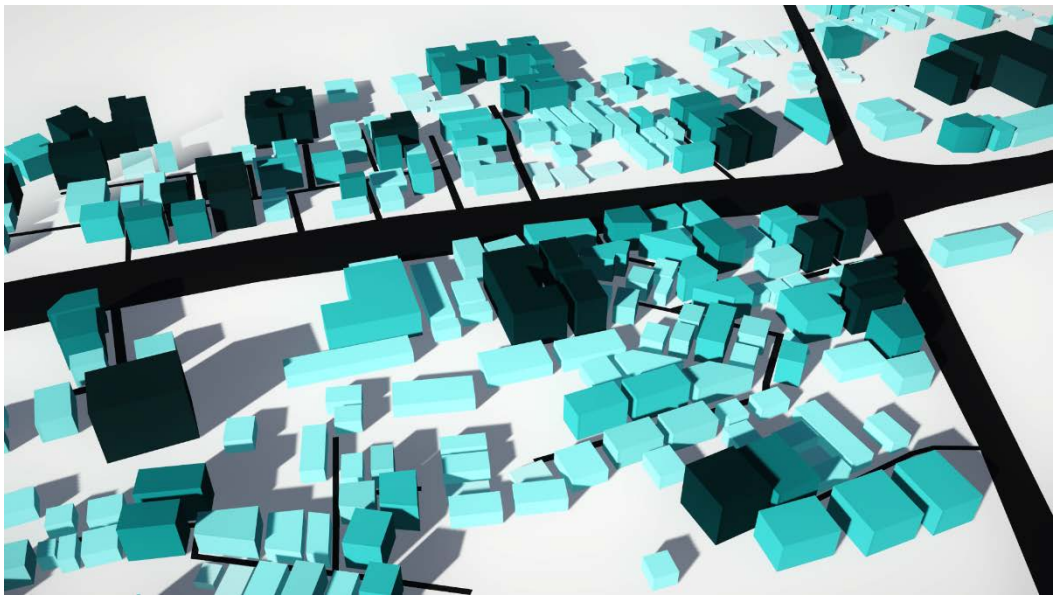


Fig 8.6 *3D Visualization of the site*







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INDEX

APPENDIX

IMAGE COURTESY

1- MOHAMMED, A. MUKTADIR , DEWAN M HASSAN, ***Regionalism in Architecture***.

2- Mr.Prabhat Kumar Pramanik

3- “Cities for people” - Jahn Gehl
4- “How to study public life” - Jahn Gehl
5- “The Image of the City” - Kevin Lynch
6- “The death and life of great American cities” - Jane Jacobs
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