HUMANIZING PEDESTRIAN-PUBLIC REALM IN GURGAON

A DISSERTATION

Submitted in partial fulfillment of the requirements for the award of the degree of

MASTER OF ARCHITECTURE

By

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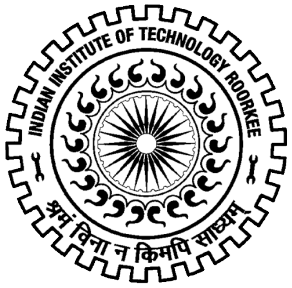

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Abstract

Indian cities are experiencing unprecedented physical, economical, infrastructural and populational growth in the recent years with advent of foreign investment and policy changes which led to the sudden economic surge of the 1990s. But this phenomenon has been of selective up gradation and only certain cities have benefitted from it, including the city of Gurgaon. The economic growth of the city is an urbanization magnet and has attracted a population migration of the classes and therefore the masses leading to demarcated clustered habitation in the form of gated communities on one hand and shanty towns on the other. This study will interpret the idea of 'isolated utopias' embodied by a 'Millennium City' like Gurgaon in terms of a population bias that is created with the social and physical demarcation enforced by the gated communities/walled enclosures/fortified enclaves and its direct impact on the pedestrian realm who are essentially the blue collar migrant workers and are left to fend for themselves in this post-suburbia nouveau-metropolitan city which follows a very automobile oriented development model.

The thesis will attempt to address the various pedestrian related woes that are coexistent in a city that is following a rampant island-to-island movement pattern which is very vehicle oriented and completely outcastes a very significant non-vehicle owning population.

The selected study area of MG Road in Gurgaon is taken as a small scale representation of the larger problem at hand. The various aspects of the area are looked into to help establish the issues that are plaguing the pedestrian population. An in-depth study follows that informs about the street hierarchy, street front and land use while also taking help of Depthmax software to help establish a measure of connectivity and accessibility in the area between the two metro stations. Finally the solutions are suggested in the form of some guidelines for future development in a the city that is promising an enormous surge in gated communities as well as design proposals for the selected areas of intervention.

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Chapter 1 Introduction

Indian cities are experiencing unprecedented physical, economical, infrastructural and populational growth in the recent years with advent of foreign investment and policy changes which led to the sudden economic surge of the 1990s. But this phenomenon has been of selective up gradation and only certain cities have benefitted from it, including the city of Gurgaon. The economic growth of the city is an urbanization magnet and has attracted a population migration of the classes and therefore the masses leading to demarcated clustered habitation in the form of gated communities on one hand and shanty towns on the other. This research will interpret the impact of the piecemeal development on the pedestrian population with the bias that is created with the social and physical demarcation.

1.1 Area and topic

The westernized- professional-nomadic Indians come home with certain expectations and money and both of those new found urges are being eagerly and increasingly satisfied with very western addresses such as Beverly Park, Hamilton Court and Cyber city. The walled compounds are mainly of three types in Gurgaon- institutional, industrial or residential. These compounds do not attempt to establish a co-relation with the built environment and are '**privilege pockets'** of comfort and security that often have a predatory effect on the public places as well as the safety and security of pedestrians. They are unanimously impervious to the general public and therefore segregate the city into various self-sustaining contained mini-cities leading to a spatial as well as social divide.

1.2 Background and context

The word 'Gurgaon' is a synergy of two words from the Hindi language *Guru* and *Gaon,* which translates as the teacher's village. But village it is not, at least not for the new-to-money upper middle class *techies.* The city reports one of the highest per capita incomes in the country and is growing at a rate of about 21% according to Business Today magazine (2009) survey also cited as the best place in India to work and live. There has been a subsequent 73.93% increase in population in the last 10 years (Census of India,2011). This rise in affluent population has led to an increased housing and infrastructural demand which the incumbent Government or its predecessors is not able to provide and that in turn has led to the surge in walled communities by private developers that promise 24 hours water and electricity as well as CCTV surveillance.

1.3 Statement of purpose

The underlying question still remains what are the basic reasons that are leading to this unchecked devouring of public places? What measures can be taken to curb this environment of exclusivity imposed by walled compounds on their immediate surroundings? This research would be an attempt to bring to light the core issues whether **Governmental, physical, architectural or co-incidental** that have played a role in isolating the contained utopias from their neighbouring dystopian reality which the pedestrian population delves in.

1.4 Aim

The aim of the study is to determine viable solutions and guidelines for humanizing the pedestrian- public realm in order to improve the current scenario of segregation and alienation in the city of Gurgaon

1.5 Research Questions

- What are key factors that impact the pedestrian safety, accessibly and placemaking in Gurgaon?

- What measures can be taken to accommodate the interests of the pedestrians who are still to gain from this economic and infrastructural development?
- What measures can be adopted to bring a synergy between the urban public places and walled developments?

1.6 Objectives

- To document and analyze various pedestrian movement related issues.
- To earmark specific area for further elaboration and focusing.
- To analyze the impact of Walled Enclosures on the pedestrians in the earmarked area.
- To develop a suggestive set of design guidelines establishing co-relation of the pedestrian realm with the urban built environment
- To propose a design solutions for humanizing the pedestrian public realm in the identified areas of intervention

1.7 Limitations

No Demolish or Abolish : The scope has been limited to not abolish the idea or demolish the boundaries of various gated communities/walled enclosures/fortified enclaves. The idea is to be constructive and employ some approaches to enhance the urban environment with the GCs intact and to have some recommendations for future developments like this to follow so that the impact on the pedestrian population which gets sidelined be a little less.

1.8 Scope

Topics to be studied

- street network,
- public places,
- accessibility,
- connectivity,
- pedestrian safety

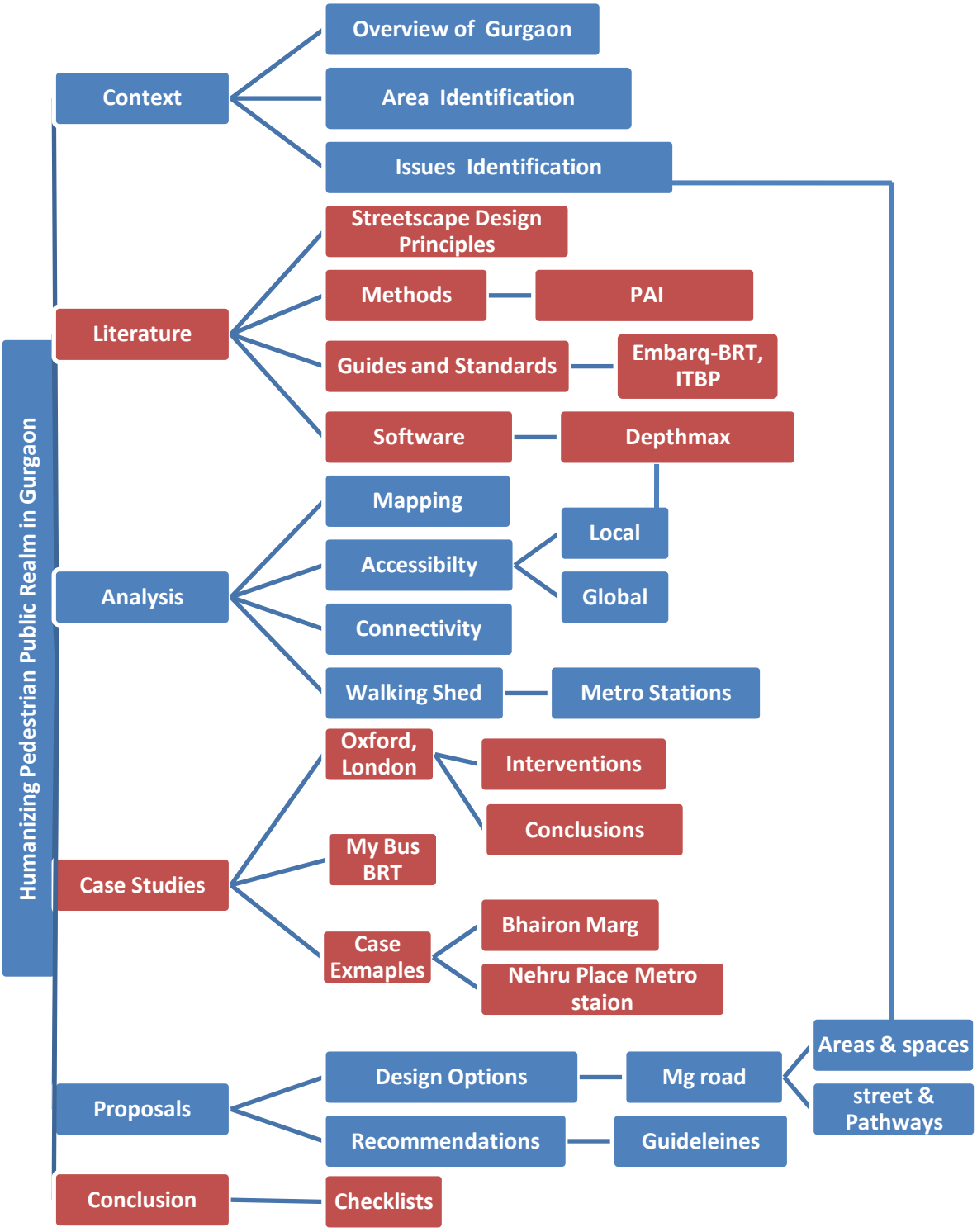
Issues to be addressed for good pedestrian environment based on a study by Untermann and Lewicki (1984 cited by Qing, 2011)

- reducing travel distances
- increasing land-use flexibility
- eliminating pedestrian barriers
- levelling walking routes
- assuring continuity of travel
- increasing character

1.9 Towards Methodology

This part of the study details out all the tools and techniques used and their procedural significance in identifying various issues in the earmarked stretch at MG Road such as

- Pedestrian accessibility Index,
- Walking shed analysis of the two metro stations,
- Analysis of the axial map of the stretch with Depthmax emphasizing accessibility and connectivity.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Chapter 2 Literature Review

2.1 Walkabilty

The term Walkability has various connotations for different organizations. I have tried to understand the various themes behind those and ultimately conclude it with a comprehensive understanding of my own.

Definitions	Themes
The extent to which walking is readily available to the consumer as a safe, connected, accessible and pleasant activity – Transport for London (2004)	Consumer - Activity
A measure of the urban form and the quality and availability of pedestrian infrastructure within a defined area.– Seilo (2004)	Pedestrian Infrastructure
The "idea of quantifying the safety and desirability of the walking routes" – Center for Disease Control (2009)	Safety , Desirability
The extent to which the built environment is walking friendly – New Zealand Transport Agency (2009)	Built Environment
Describes and measures the connectivity and quality of walkways, footpaths, or sidewalks in cities. Livi and Clifton (2004)	Measurable

Table 2.1 Definitions and key themes

(Source: Clean Air Initiative for Asian Cities Centre)

2.2 Understanding

The term Walkability is essentially an assimilation of various pedestrian requirements necessary to cover a certain distance let's say from point 'A' to point 'B'. While providing the shortest route possible is important, it is also essential to provide them with a spectrum of different perceptual as well as physical qualities such as safety, amenities, accessibility and connectivity.

Figure 2.1 Images for demonstrating walkabilty

(Source: www.ipenproject.org)

In the above figures we can see that while '1' has wider streets leess traffic and a general appeasing quality for pedesrtans '2' demonstartes more traffic and appears to be a genuine menace for any walk related activity.

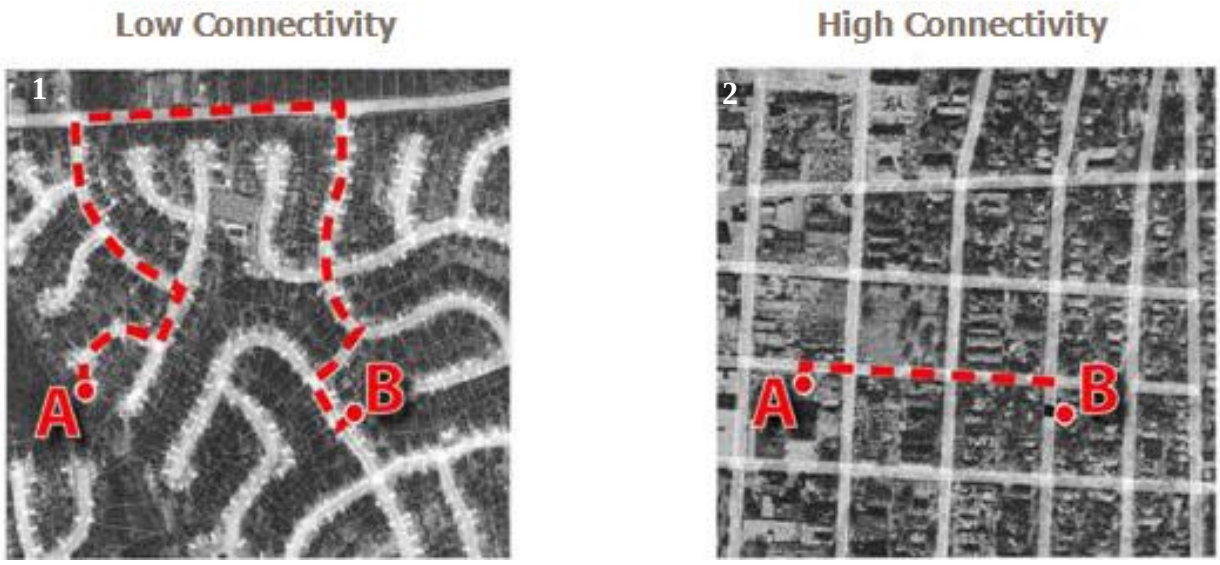


Figure 2.2 Satellite Images for Fig. 2.1

(Source: www.ipenproject.org)

But here(in fig. 2.2) it is highlighted that actually '1' offers long distances to travel and less alternatives while '2' offers least distance possible, variety of choices to commute and a sense of orientation with a grid pattern.

2.3 Need for Walkabilty

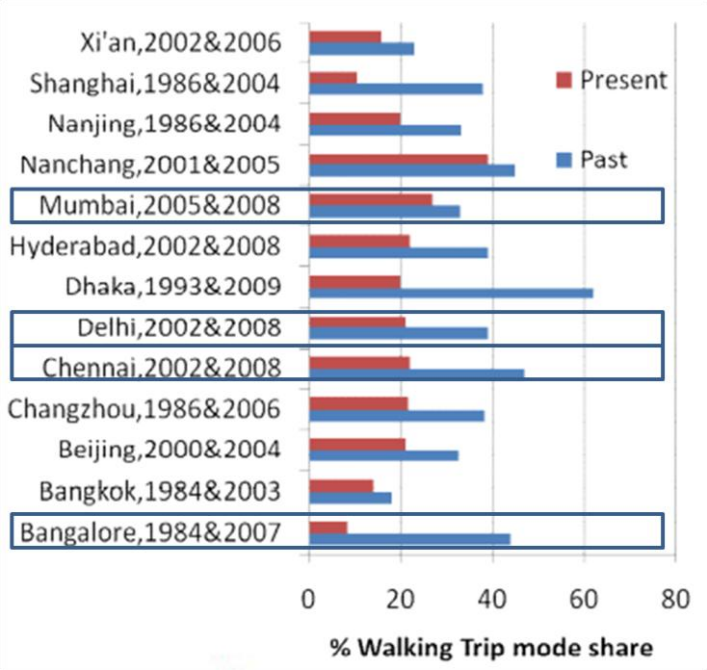


Figure 2.3 Graph highlighting the walking trip mode share of Indian metropolitans

(Source: cleanairinitiative.org)

The above figure demonstrates how Indian cities have shown a drastic change in their percentage of walking trips in the last few years and with increased motorization. This is an alarming sign and signifies how important it is for us a country to realize the severity of the situation and take appropriate measures.

2.3.1 Benefits of Walkabilty

The need for walkabilty is further underlined with the benfits that it possesses namely:

- High urban density : As we make our cities more walkable we would bring about a more dense city core than a thinly spread urban grain.
- Lowering percentage of automobiles
- Shorter trips while commuting
- Mixed land use is encouraged as the amenities have to be at walkable distances
- Urban poor depend on walking hence we would bring about more equity in the city connectivity.
- Healthier choice and provides environmental benefits
- Makes cities vibrant and humane
- Economical

2.4 Walkability Index

Walkability Index of a city is calculated according to MoUD (Singh et al. 2008):

Walkability Index = [(W1 x Availability)+(w2 x Facility rating)]

where , Availability: Footpath length / Length of major roads in the city & Facility Rating: Score estimated based on opinion on available pedestrian facility.

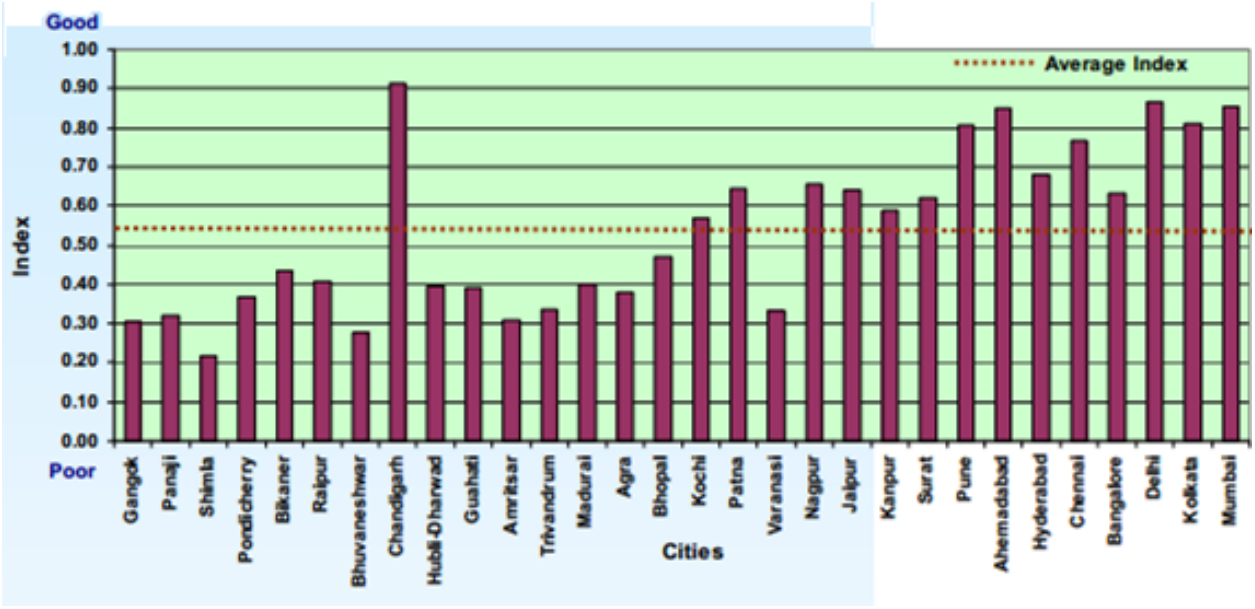


Figure 2.4 Walkability index of Study cities

(Source: Singh et al. 2008)

2.5 Inferences

- Walkability is an amalgamation of various pedestrian requirements, needs and amenities that help them reach from one place to the other safely and comfortably.
- As a developing nation it is very important for India to realize the benefits of making its streets and cities walking friendly
- Walkability is not merely a perceptual quality it is indeed measurable and can be empirically established.

2.6 Identifying Issues

Walkability in urban areas is hindered by a lot issues which if catered to can actually enhance the pedestrian activity in those areas drastically. This section would highlight those issues and then suggest a few good examples where those problems have been mitigated through certain interventions.

2.6.1 Hindrance from Traffic

Motorization brings about various issues which degrade the quality of urban life in a city. The figure below is depicting how traffic and congestion effect a spectrum of aspects whether social, visual, physical, economical and environmental.

Figure 2.5 Problems associated with traffic

(Source: European Commission)

2.6.2. Solutions adopted for enhancing Walkability in congested areas

2.6.2.1 Pedestrain skywalks

The Fig.2.6 depicts a pedstrain skywalk on a traffic crossing in Shanghai that has become a major tourist attraction as it signifies function, activity and safety.

Figure 2.6 Pedestrian skywalk in Shanghai over a crossing

(Source: Google Images)

Whereas Fig. 2.7 shows the Mumbai skywalk project which has been put on hold as it recieved very little footfall and failed to serve its purpose and ended up creating these negative spaces below to keep the pedestrains further away.

Figure 2.7 Pedestrian skywalk in Mumbai

(Source: Google Images)

2.6.2.2 Pedestrian Islands

Creaing perdestrian islands in between wide roads lets the people crsoong the road have less fromaidable experience from the the incoming traffic as weel as give them suffieicnt groungd to stand on before crossing over the next road. as a bonus these parts can also be convetred into on street dining and small street parts for hawkers.

Figure 2.8 Pedestrian Islands in New York

(Source: Google Images)

2.6.2.3 More harmony between the various modes of transport in a city including inland waterways, metro lines, underground train networks brings about a lesser use of vehicles in the city hence less hindrance.

2.6.3 Lack of Public Transport

Public Transport reduces the hindrance from cars and congestion in the urban areas simply because it is more efficient in carrying more amount of people in relatively less space, it enhances the air quality and can also have dedicated lanes like in BRT which can ease confusion at crossings.

2.6.4 Solutions adopted for enhancing Walkability through Public Trasport

2.6.4.1 BRT systems

In this particular example of Curitiba BRT has been successful in enhancing walkabilty in the central businesss districts as thousands of workers commute through BRT sysytems to their places of work.

- It is easier for people to cross the BRT routes as there is usually a gap between the buses' schedules.
- The area for bus stations ultimaely becomes a pedestrain islands while crsooing

Figure 2.9 BRT in Curitiba

(Source: Google Images)

2.6.4.2 Integration through Metro corridors

Integration brought about by the metro corridors such as in this case enhance the walkability and revitalize old dilapidated streets. In Hyderabad Metro a 750m radii has been identified by UDP(Urban Design & Planning Consultants) for being connected to the metro station through various key streets and public spaces.

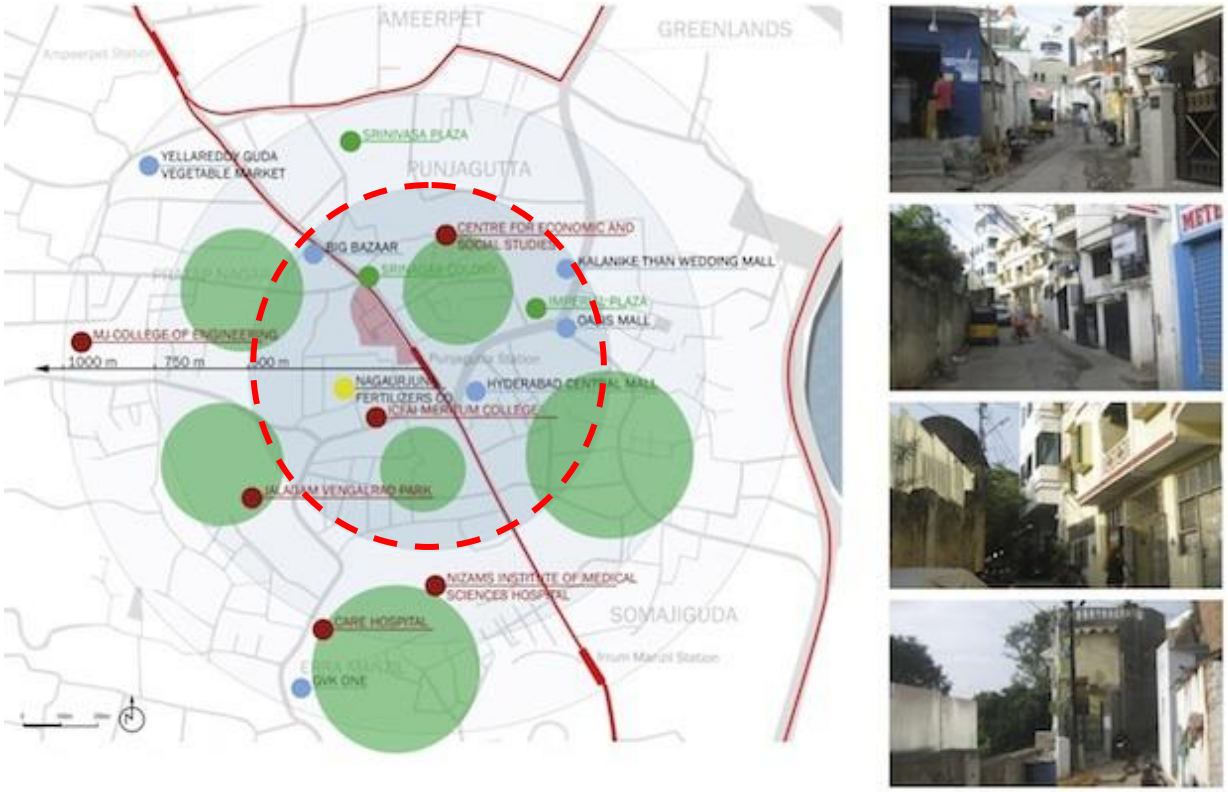


Figure 2.10 Hyderabad Metro corridor: Urban integration Project

(Source: www.udpcltd.com)

2.6.5 Unsuitable Weather

Walking during extreme summers is a menace in tropical climates specially hence there are some directives/guidance and small changes in built environment that can be adopted to make people more attracted towards walking during harsh weather as well.

2.6.6 Solutions adopted for enhancing Walkability during unsuitable weather

(Source: Google Images)

Figure 2.11 Fountains on streets, 2. Mist spraying fans in summers, 3. Trees shading, 4. Street shading

(Source: UTTIPEC, DDA)

2.6.7 Lack of Activity or Entertainment

An active street would project an active city however a dull street would project a dull city. People love to see other people in activity hence by creating any point of entertainment oriented activity we bring more people on the street. Also walkers are shoppers hence any commercial activity would also bring more people to engage in walking.

Figure 2.12 Dull street despite a wide sidewalk and less cars

(Source: Google Images)

2.6.8 Solutions adopted for enhancing Walkability through activity and entertainment

2.6.8.1 Multiple stores

A variety of stores such as restaurants, grocers, outdoor dining altogther make difeerent people cross paths for variety of purposes hence engaging them in variety of activities.

2.6.8.2 Street games/ Activity hotspots

Creating points of attraction such as street arts and street games may make people sit and enjoy on those areas.

Figure 2.13 Street activities enhancing walkability

(Source: targetcrime.ca)

2.8 Safety

- A street must cater to strangers , visitors & residents alike (safe for and from strangers)
- Populate other areas with people that have no value by themselves(isolate routes, stretches)

- Store owners, small businessman are great street watchers.

2.9 Solutions adopted for enhancing Walkability through enhancing safety as described by Jane Jacobs

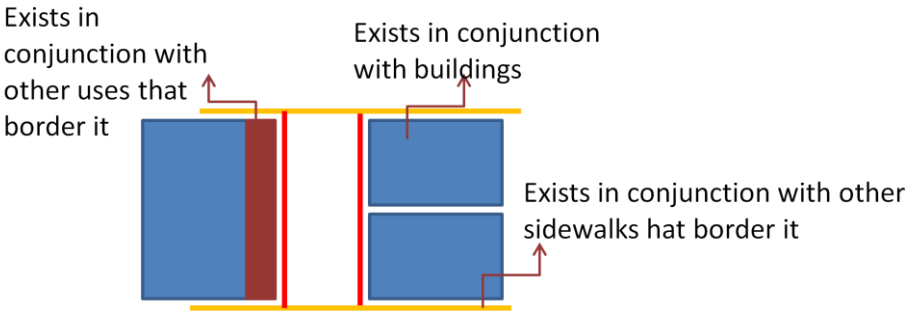


Figure 2.14 Street exiting in conjunctions with its borders

(Source: Author)

2.9.1 Eyes on the Streets

- **Number of stores** and other public spaces along sidewalks that they **stay open late**

Figure 2.15 Removing unnecessary boundaries and hindrances can create eyes on streets

(Source: UTTIPEC, DDA)

2.9.1 Variety

- **Different & frequent** kinds of enterprises on the sidewalks create criss crossing paths hence people frequent areas they would have otherwise avoided henace creating a sense of saftey.

2.9.2 Avoding obstacles on the sidewalks

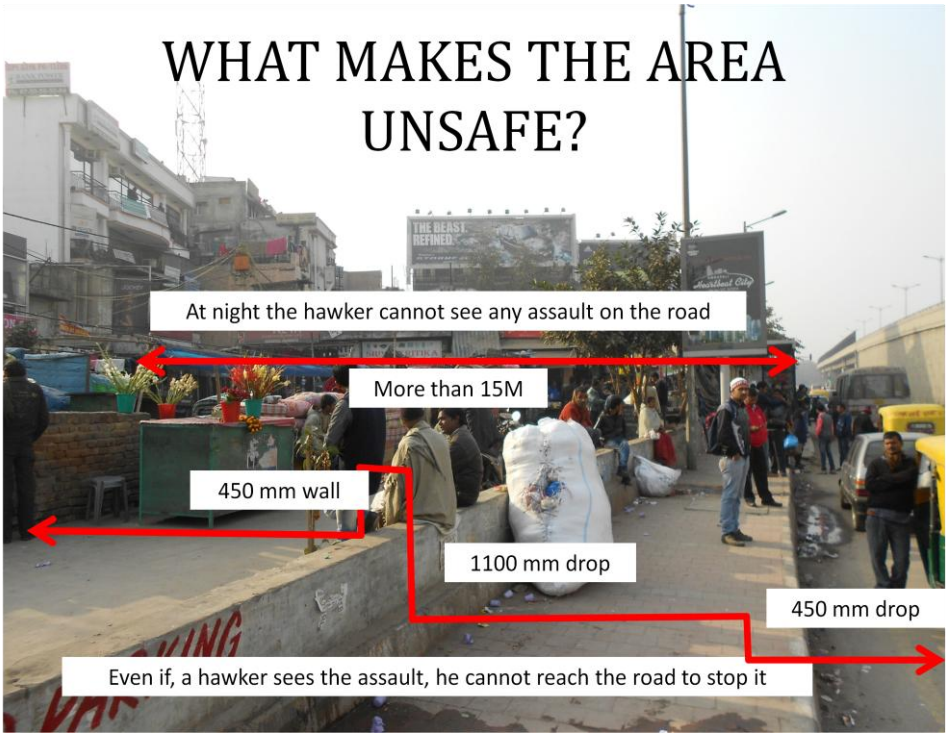


Figure 2.16 Mehrauli area in Delhi and obstacles in the sidewalk

(Source: Safety, Freedom & Respect for Women – in Delhi, UTTIPEC, DDA)

Figure 2.17 Possible design solution for 2.16

(Source: Safety, Freedom & Respect for Women – in Delhi, UTTIPEC, DDA)

2.10 Urban Design Principles

There are 8 principles of urban design (Ewing et al,2005) that can impact walkability which have been elaborated upon with the example of Connaught Place in Delhi.

Imageability
Distinct (columns, Jalis)
recognizable (circular planning, white colour)
memorable
capture attention (Rajiv Chowk, park)
evoke feelings (colonial architecture)
create a lasting impression

Relative Importance in Street Design

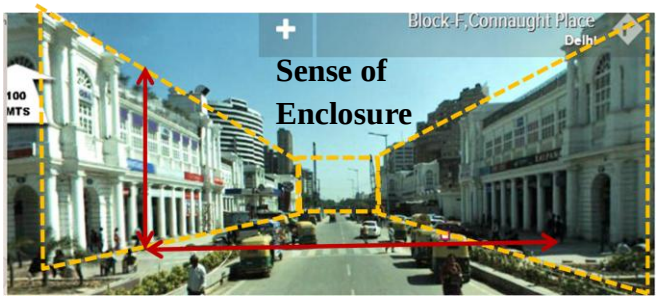
Increasing Speed – Decreasing Imageability

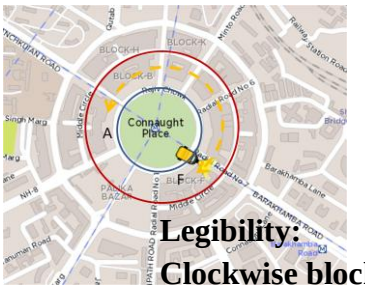
Human Scale
size, texture, and articulation of physical elements that match the size and proportions of humans and
correspond to the speed at which humans walk
Building details, pavement texture, street trees, and street furniture are all physical elements contributing to human scale.

Up to five storey buildings

Enclosure(streets and other public spaces are)
visually defined by buildings, , walls, trees
a room-like quality
the height of vertical elements is proportionally related to the width of the space between them

Legibility
the spatial structure of a place can be understood
navigated as a whole
provides travelers with a sense of orientation
relative location and by physical elements that serve as reference points.





Legibility: Clockwise blocks

(Source: Wonobo Images)

Complexity	Coherence
the visual richness of a place	sense of visual order
specifically the numbers and kinds of buildings,	degree of coherence is influenced by consistency and complementarity in the scale, character, and arrangement
variety of the physical environment.	
architectural diversity	buildings
andornamentation	landscaping
landscape elements. street furniture, signage, and human activity	street furniture
	paving materials

No zebra markings/ stop signs on crossing

Tactile tiles don't cover entire corridors

Linkage	Transparency
Linkage refers to physical and visual connections from	or perceive what lies beyond the edge of a street or other public space
-building to street	influence transparency include walls, windows, doors, fences, landscaping, and openings into midblock spaces.
-or one side of the street to the other	
-space to space	human activity beyond the edge of a street or other public space.
-building to building	
Tree lines, building projections, marked crossings all create linkage.	
occur longitudinally along a street or laterally across a street	

Figure 2.18 Circular pattern initiates transparency, linkage in architectural features

(Source: smartgrowth.umd.edu, Wonobo, Saksham.org, Google images)

2.11 What is humanizing?

In the various texts read for the preparation there is no precise definition of **humanizing** an urban environment so to sum up all the texts read so far it was concurred that it is '**a quasi utopian idea of a an egalitarian society, where the built environment is responsive to not only all sections of society but ages as well as abilities**.' As a rule whenever we introduce a development project in India the first intention is to always eliminate the undesirables, be it slum dwellers or hawkers but humanizing an urban environment however designates a place for all. The Indian city therefore should tentatively follow these pointers as a mantra in attempting to humanize its streets :

- Create a 'complete street' (sustainability & accessibility)
- Maximize public right of way
- Create desirable destinations
- Exercise tactical urbanism techniques
- Collaborate with local communities to refine design solutions
- Employ context-sensitive design
- Improve the urban realm & enrich the urban life
- Make the street a destination in itself
- Insist on egalitarian approach that caters to the pace and capacity of everyone

2.12 The phenomena of Nouveau (riche) Metropolis in India

As we comprehend the new age Indian cities it is clear that the level of interaction with the passerby is slowly decreasing. The old towns were more organic and complex with buildings designed as visual experiences for a steady patient eye. That organic design sense has given way to what the west calls as a cookie-cutter design sensibility where an inane replication leads **to homogenization of abodes a well as public places that dissuades social heterogeneity**.

Automobile oriented development shuns the essential character that prevailed when the cities' designs were based on human sensibilities, mobility, accessibility as well as pace. The distances in the new cities like Gurgaon are incomprehensible to cover on foot, the basic amenities are strewn all across the town and these distances are only expanding.

In Gurgaon the metaphorical central boulevard i.e. MG road is a curious conundrum of walled enclosures of various kinds from office complexes to malls and residential neighbourhoods. Privatization of the public realm with the advent of gated communities is making the urban surroundings of M.G Road rather incoherent for the pedestrian population. The buildings are not designed for slow speed encounters with intricate details but for fast paced automobiles as a fleeting experience with monumental attributes that do not exhibit the human scale. Hence, cars take precedence over other modes of conveyance available consequently shunning the pedestrian in oblivion.

Reasons behind why the city is forging its boundaries

- Desire to live/play/work/shop among equals
- the fear of crime
- 24/7 power & water

- Lack of responsible (Municipal) Government
- Association of easy home loans with private real estate developers
- City is mostly expanding in terms of providing highly specialized services which only privileges the intellectual population

2.13 Gated Communities/Fortified Enclaves/Walled Enclosures

The westernized- professional-nomadic Indians come home with certain expectations and money and both of those new found urges are being eagerly and increasingly satisfied with very western addresses such as **Beverly Park, Hamilton Court and Cyber city**. The walled compounds are mainly of three types in Gurgaon- institutional, industrial or residential. These compounds do not attempt to establish a co-relation with the built environment and are '**privilege pockets'** of comfort and security that often have a predatory effect on the public places as well as the safety and security of pedestrians. They are unanimously impervious to the general public and therefore segregate the city into various self-sustaining contained mini-cities leading to a spatial as well as social divide.

2.14 Inferences

This chapter has been instrumental in understanding the two very important aspects of this study i.e. the concepts of humanizing as well as walkability also the urban design principles relevant in an pedestrian-public environment are understood in depth with the example of Connaught Place. The afore mentioned topics help in establishing a formative base for the chapters to follow where the technical aspects of all pedestrian amenities are adjudged with the Case of MG road in Gurgaon in context therein the basic information comes to use in explaining the small concepts better.

Chapter 3 Methodology

3.1 Connectivity

Well connected place would mean that there are multiple as well as shorter(direct) routes to reach that desired destination. Node junctions as well as modals (transport) exchanges should also have the benefit of being extremely well connected i.e. located at intersections to give pedestrian the advantage of choosing to commute further without travelling great distances. Connectivity also referred to as Permeability helps in making a place well equipped for short term trips and a well connected precinct would have a higher density of routes (options), many intersections and less dead ends and/or cul-de-sacs.

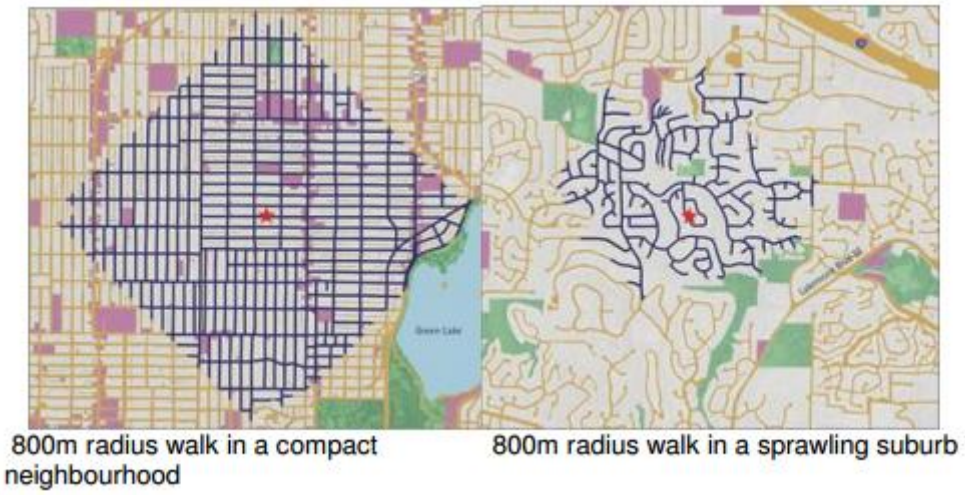


Figure 3.1 Figure Displaying the disparity between well connected place with an area with dead ends

(Source: www.healthyplaces.org.au)

With the concept of New Urbanism and smart growth, more urban planners have paid attention to street network connectivity in recent years. However, how to measure connectivity is a complex problem. In this research an axial map of the MG Road streets is fed into Depthmax software by University college of London to ascertain the level of connectivity of all streets.

3.2 Accessibility

Accessibility is widely regarded in urban design as a measure which regards a place as conducive to various interactions where each of the users regardless of their abilities could chose to enjoy movement from one place to the other whether that is through movement or to movement.

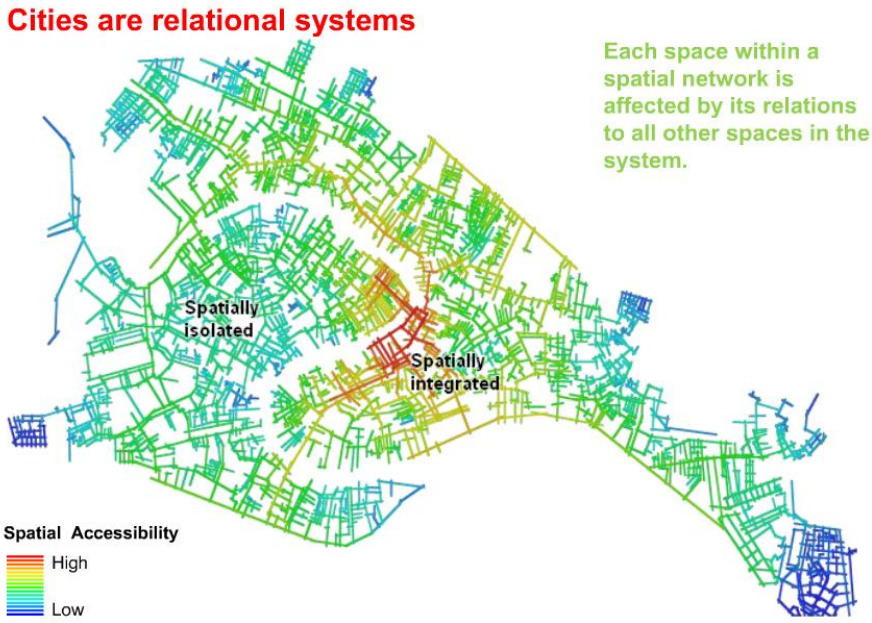


Figure 3.2 Figure displaying spatial Accessibility in a city

(Source: Space Syntax, Tim Stonor)

3.2.1 Global Accessibility - Through Movement

We can graphically depict which areas are more suitable for through movement by increasing the HH value to n in the Depthmax software

Through this analysis we can predict which areas should be more suitable to develop the vehicular traffic or bus/metro tracks and hence those can be made into nodal junctions for pedestrian movement from which they can easily go on to another form of transport.

Important Connectors

The most frequented routes where there is constant overlapping of various commuters covering various distance long or short would show a dark red hue(in Depthmax) symbolizing high global accessibility for example thoroughfare and highways passing through an area

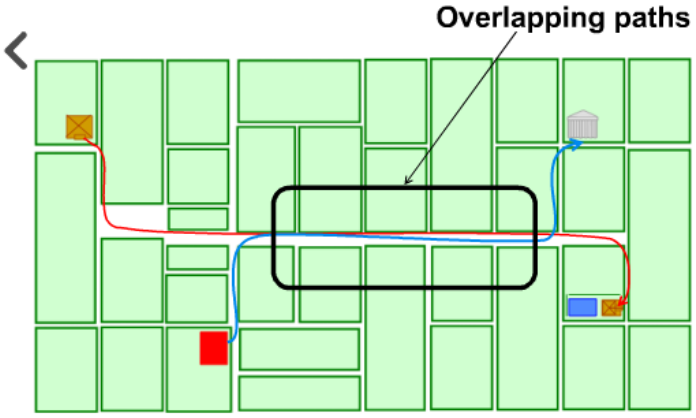


Figure 3.3 Through Movement

(Source: Space Syntax, Tim Stonor)

3.2.2 Local Accessibility - To Movement

Local accessibility highlights the areas that should be appropriately developed for short term distances i.e. for slow paced commuters like pedestrians and cyclists or routes which are easily accessible to commute 'to' as it depicts areas that are more conducive to internal movement. When we take the HH(integration value) value as 5 or 6 in Depthmax for any axial map it generated an output displaying high and low local accessibility respectively.

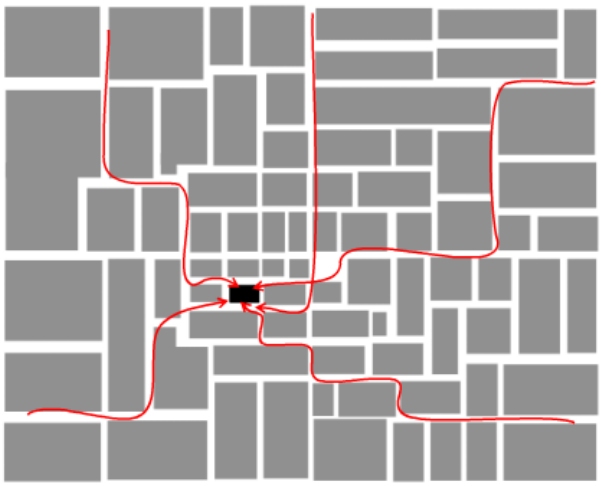


Figure 3.4 To Movement

(Source: Space Syntax, Tim Stonor)

3.3 Walking shed

Walking shed method is another way to identify the connectivity of major transit station in any precinct for a 5 minute or 400 m radii as well as 10 minutes or 800 m radii.

This is also widely referred to as ped-shed or pedestrian catchment area aa it helps in determining how convenient it is to walk to and fro from a major modal exchange for e.g. a metro station to other commercial areas.

The figure below clearly demonstrates how to go about creating a ped-shed by following these steps:

1. Draw a 800m radii circle around the transport junction that is chosen to demonstrate walking shed.

2. Trace the walking distance of 800 m on the major pedestrian routes and streets.

3. trace the edges of the area covering the farthest and the nearest point and create a polygonal solid shape and colour it to highlight the afore mentioned shape.

4. highlight any major open or green areas to assess whether they

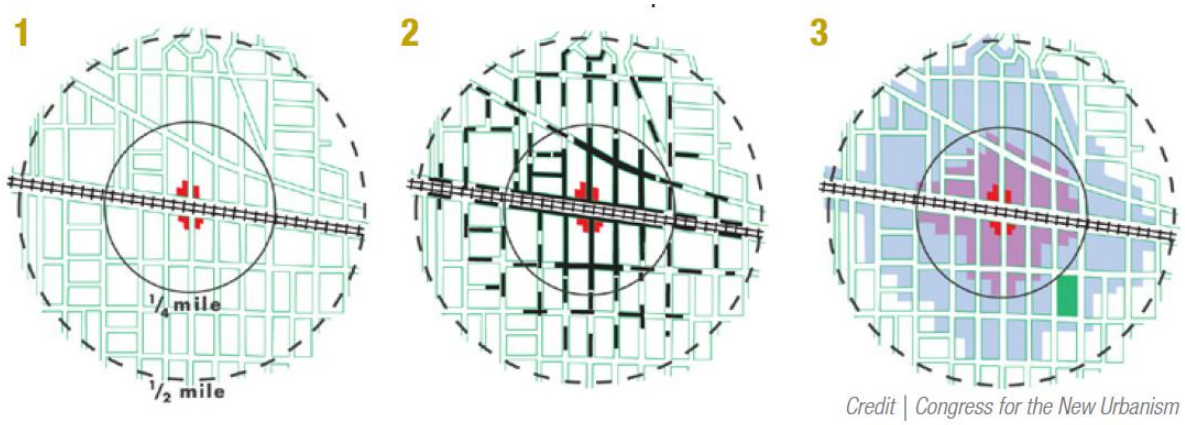


Figure 3.5 Walking shed analysis procedure

(Source: Congress for New Urbanism)

3.4 Pedestrian Accessibility Index

The Pedestrian accessibility index is a numerical measure for establishing the various positives and negatives of a transport junction to help identify the type of issues to be worked on. It is also a great comparative tool through which we can establish what could be the ideal example that could be borrowed from and implemented into a weaker example. These indexes are conducted to evaluate the two metro stations on the M.G Road stretch i.e. MG road Metro station and Sikandarpur Metro station for various facilities they offer for an approaching pedestrian to make it more convenient for them.These scores are then calculated based on a binary system and the scores are compared for the various criteria to draw the strengths and weaknesses as mentioned before.

The various criteria on which the index is evaluated are **Accessibility, Safety, Security, Comfort and Convenience, Imageability and Human Scale** with various subdivisions establishing each criteria in deeper detail. The first five components are taken from the Pedestrian Accessibility Index developed by Dr. Neog(2012) while the last two are added by the author to help make the index more responsive towards the current study area.
The results of this method clearly establish that the Sikandarpur Metro station needs attention in creating a more safe and secure built environment as the current scenario is not able to make it more attractive to pedestrian population.

Components	Variable	Yes	No
		MG	Sik
Accessibility	Location/siting	1	0
	Street network-connectivity	1	1
	Street network –availability	0	0
	Disability infrastructure - Crossings level	0	0
	Disability infrastructure - Curb ramps	0	0
	Disability infrastructure - Crossings signal	0	0
	Disability infrastructure - Surfaces	1	1
	Disability infrastructure - Signage	0	0
Accessibility - total		3	2
Safety	Walking Modal conflict	1	0
	Crossing availability	0	0
	Crossing signalised	0	0
	Medians and Refuge islands	0	0
	Motorist Behaviour	0	0
Safety - total		1	0
Security	Lighting	0	0
	Eyes on street	1	0
	Perception of security	1	0
Security - total		2	0
Comfort and convenience	Location	1	0
	Entrance orientation	1	1
	Multiple entrances	1	1
	Continuity and integrity of sidewalks- sidewalk width		
	Continuity and integrity of sidewalks - missing sidewalk		
	Continuity and integrity of sidewalks - obstructions		
	Continuity and integrity of sidewalks - sidewalk cleanliness and maintenance	0	0
	Trees and shade	0	1
	Amenities- public toilet	1	0
	Amenities- furniture/trash bins	1	1
	Signage	1	1
Comfort & convenience - total		6	5

Imageability	courtyards, plazas, and parks	1	0
	major landscape features	1	0
	buildings with identifiers	1	1
	outdoor dining/activity	1	0
Imageability - *total*		4	1
Human Scale	small planters	1	1
	street furniture and other street items	1	0
Human Scale - *total*		2	1
Total		18	9

Table 3.1 Pedestrian Accessibility Index

(Source: Neog 2012, Modified by Author)

3.5 Isovists

An isovist is essentially a 2D or 3D figure binding a series a points connected with each other as they are visible from one vantage point.

They are crucial in determining the view or visibility potential of any particular space (essentially public space) in an axial map. In Depthmax it can be used to assess the development potential of various faces/edges in an urban area that were neglected so far.
In this example of Trafalgar Square reopening in London the isovist method was used to estimate which side the area would most pleasurable and identifiable for pedestrians.

Figure 3.6 Axial Map of Trafalgar Square in London Depicting Isovists Formation at the heart of the space as well as the south side

(Source: Space Syntax, Tim Stonor)

3.6 Inferences

This chapter has contributed to a better understanding of the various methods employed beyond the area analysis and has helped in employing a software to corroborate the findings i.e. Depthmax. With this clarity now we can attempt to how to relate the important thoroughfares(Global accessibility) with local streets(local accessibility) as well as public places(isovists) and simulate them for better results while also understanding the better connectivity of two important transport nodes to help streamline the pedestrian movement while giving them various route options and recreational barrier free spaces.

Chapter 4 Case Study

4.1 Case Study - Cambridge Street, London

4.1.1 Strategies:

- Encouraging greater use of public transport, walking and cycling.
- Removal of through-traffic
- Parking restrictions
- (charges making a stay of two hours cost more than a park-and-ride day
- return ticket (‘sticks’))
- Infrastructure for cyclists and pedestrians(carrots)
- Improving streetscape

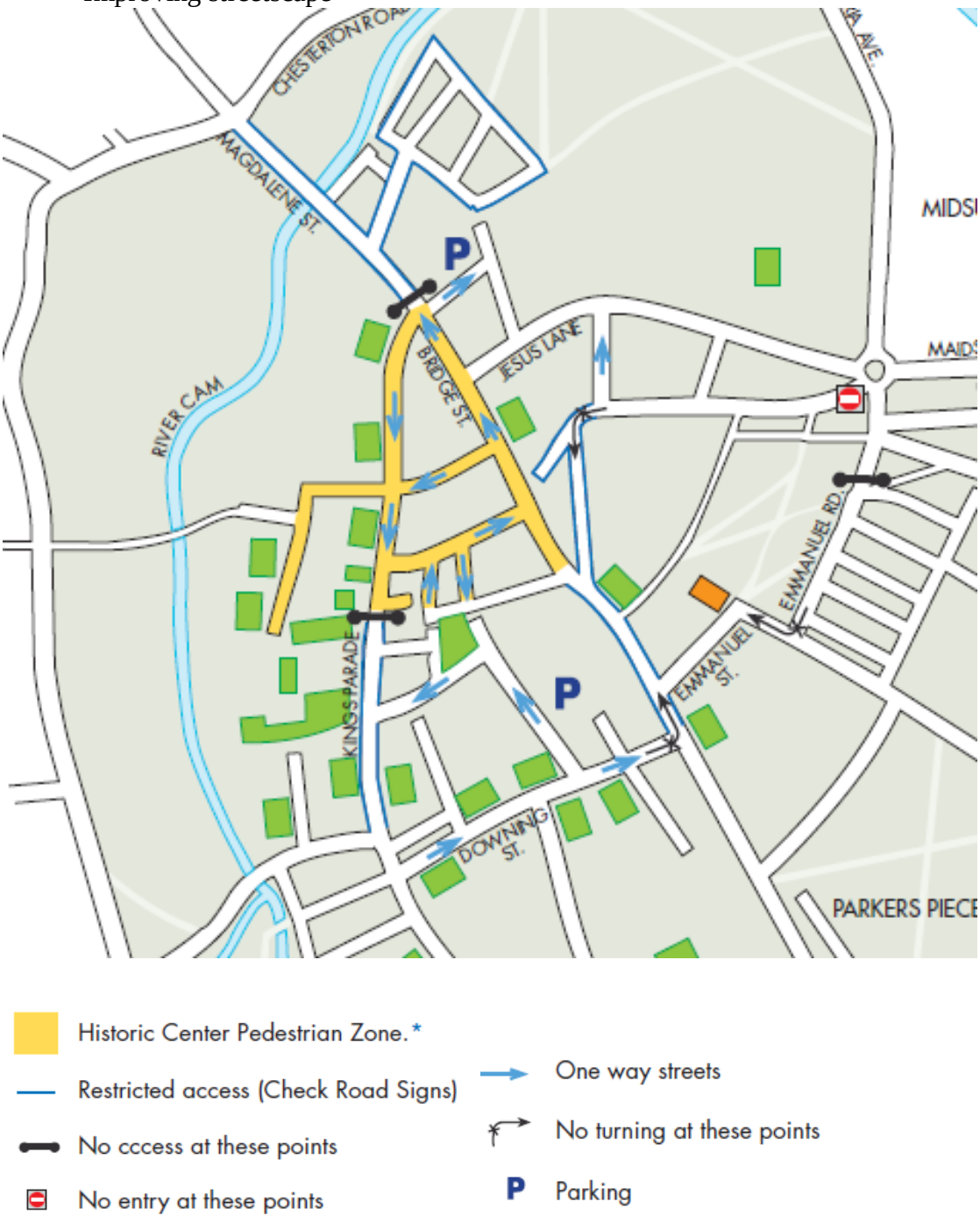


Figure 4.1Cambridge city street map

4.1.2 Interventions

Complete stop on private vehicles on historic streets

Park and Ride: Services for parking and riding introduced in the place where accesses have been stopped.

Automatic Bollards: Time Restriction from 9am to 4pm allowing public vehicles only.

Figure 4.2 Automatic bollards

Figure 4.3 Access to Pedestrians

4.1.3 Conclusions

• It is vital to understand how **the road closure fits into a wider longer-term picture.**

• need to survive in the **short term to secure the long-term benefits.**

• Involve stakeholders and residents in the development of the scheme through **extensive public consultation.**

4.2 Case Examples

Chapter 5 Context Analysis

5.1 Gurgaon - Urban Development Context

5.1.1 Hyper Growth Phenomena

The two key factors that led to the hyper growth seem to be the development of the Maruti automotive company that transformed the vast chunk of rocky difficult farmlands into a satellite town, proving haven for the vast migrating population targeting Delhi and secondly the reformed tax laws that attracted the private players. Other ancillary reasons that could be cited are the lack of district wide government resulting in less red tape capable of chocking development, the proximity to the Indira Gandhi International airport, the ever increasing real estate costs in Delhi and lately the much relaxed building bye laws encouraging a very vertical gleaming architecture, quite new to the Indian builtscape.

5.1.2 Gated Community Development

Gated community can be described as "walled or fenced housing developments to which public access is restricted, often guarded using CCTV and/or security personnel, and usually characterized by legal agreements (tenancy or leasehold) which tie the residents to a common code of conduct" (Blandy, Lister, Rowland & Atkinson, 2003).
This definition points out that the psychological drive the affluent people of society experience in choosing this living situation seems to be influenced by the security and quality of life that the gated communities offer.
Qing in his study of the Chinese gated communities highlights that most contemporary residential communities are developed as a large size block, the length of which could reach 500m or even longer. Also he states that most residential communities are mainly surrounded by walls so sometime public facilities can be only shared by members living inside (Qing, 2011). It can be therefore safely concluded from his study that they directly or indirectly hamper, restrict or discourage the existing street network, public places, accessibility, connectivity, community interaction, pedestrian safety and future expansion.

In Gurgaon's context the rapid private development has propagated mall culture and gated communities created as 'privilege pockets' which are walled, closed and impervious to pedestrians and passersby. Alongside this, the incumbent Government as well as its precedents has been unable to cope up with the infrastructural boom that the last two decades have brought upon them. The city administration fails to fulfil basic requirements such as power, water and sewage system. The public transport except for the Delhi Metro is unable to cope with requirements of the techie demographic and a lot of people resort to private vehicles as well as shared cab pooling leading to jammed roads at peak hours. The safety and security aspects are also a question as the CCTV engaged 24 hour surveillance guarded communities do not rely on the services of the local police. Gurgaon has 3,026 policemen for 15 lakh residents — lower than the national average but 35,000 private guards. (Polanki, 2012)

The utopian ideas fail to leave these gated communities which are quite self-sufficient and elitist with special sidewalks cut out (Sengupta, 2008) refusing to walk with the domestic help that support their lifestyles. These contained utopias have little effect on the shanty towns that surround them that struggle with the day to day reality outside of the walls from electricity shortages to hustles with the law enforcement and even lack of proper medical care.

5.1.3 Corporate Architecture

The major private players DLF, Unitech and Ansal's Sushant have fast become a brand providing high end office, residential and entertainment spaces. DLF is now venturing into building its very own Rapid Metro Rail linking its prime properties but mainly its crown jewel, the Cyber City. The Hafeez Contractor designed buildings from DLF have often been criticized for their overt adherence to very western format of glass façade buildings with little connection to their context and surroundings. The concepts of urban branding and place marketing are also becoming synonymous with the hyper development in Gurgaon as the targeted multi-national clientele has to be impressed with entrepreneurial caliber.

The facade treatment, corporate edifices and gleaming superficiality of all is rather antagonized by the unclean potholes filled roads with jam packed traffic and honking cars. While the mini-cities work efficiently in their self created oasis of wasteful exuberance the city on the whole fails to live up to the expectations. These representational practices are important because interactions with the city are not limited to actually visiting: the images and stories of the city considered here are projected around the world and actively shape the imaginaries of visitors and non visitors alike (Koch, 2012). The emergence of entertainment centers such as the Kingdom of Dreams with its authentic Indian theme, now being projected as tourist destination and with exorbitantly prized tickets it, is rather ironically inaccessible to the general public it is themed after.

5.2 Issues with Streets of Gurgaon

The Integrated Mobility Plan for Gurgaon Manesar Urban Complex by the Department of Town and Country Planning (DTCP), Government of Haryana published in December 2010 has brought out a lot of facts about the mobility situations in Gurgaon.

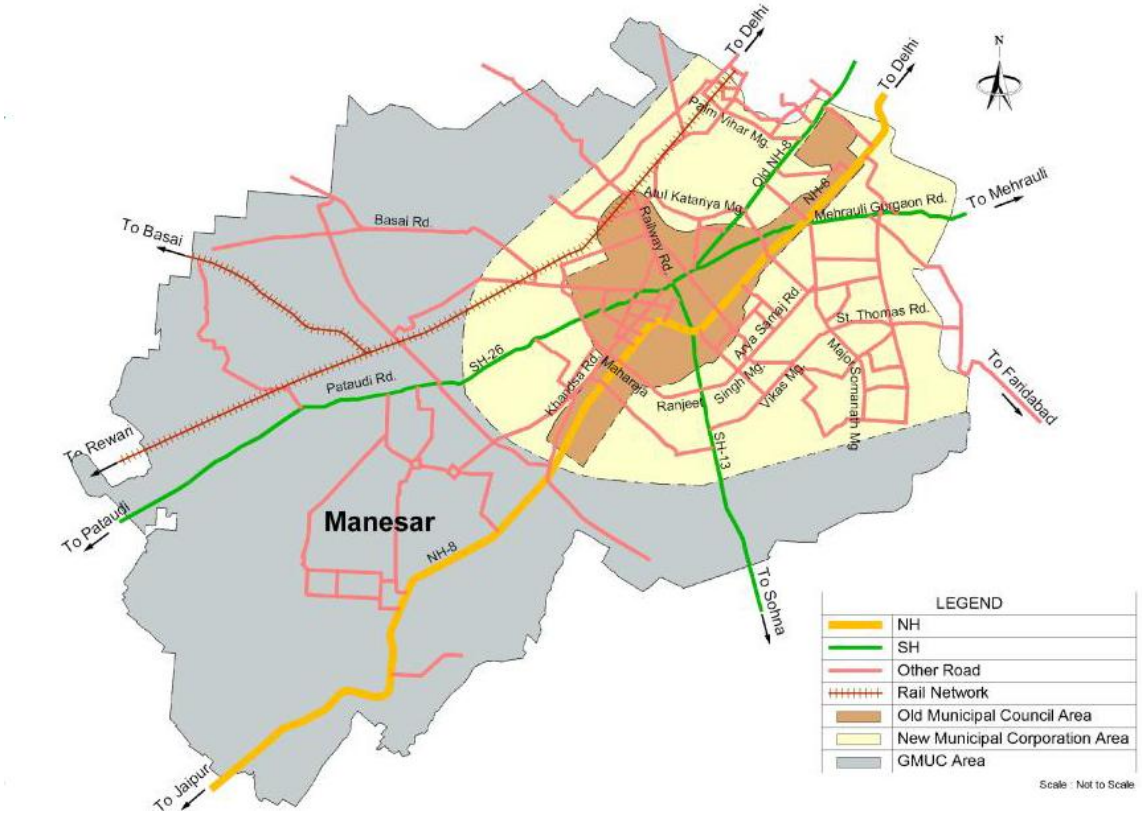


Figure 5.1 Map showing the road network in Gurgaon Manesar Urban Complex

(Source : IMP Gurgaon)

5.2.1 Footpath and Streetlight: There is no footpath available to pedestrians in the major portion of Gurgaon roads. Only 25% of roads have walk able foot path.

Streetlight - only 22% of roads have street lighting which brings the safety issue for pedestrians as a major concern on dark and unlit roads. a fear of crime and their safety often keep them away.

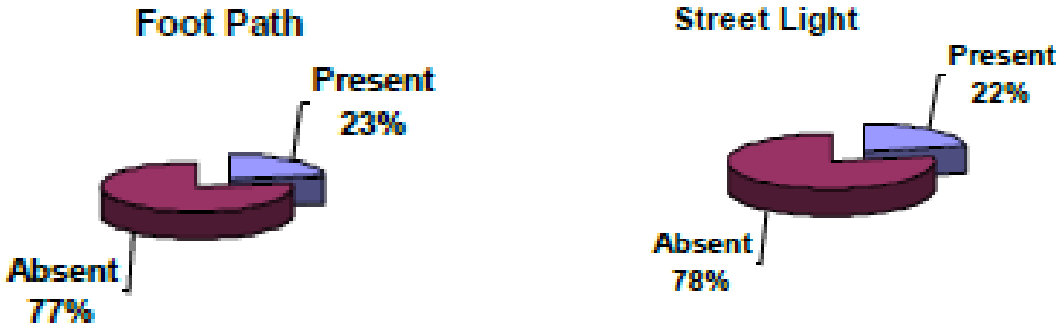


Figure 5.2 Percent wise Representation of Footpath and Streetlight availability

(Source : IMP Gurgaon)

5.2.2 Public Transport

- Gurgaon doesn't have an organised Government run public transport for local/intra - city transport.
- For intra-city movement on Delhi-Gurgaon, Gurgaon Faridabad route there are buses plying which also help in movement of local Gurgaon commuters but no designated bus stands make the situation very hard for a public bystander and create accident prone situations often.
- Private auto rickshaws are connecting many important routes and places in the city. However there is a lack designated locations for parking and stopping.

With minimal public transport and facilitates for a local commuter there is a very high usage of personalized modes. Vehicle ownership of residents in Gurgaon is 0.81. (IMP)

5.2.3 Road Infrastructure

- Unorganized and haphazard parking and encroachment on roads leads to further reduction in road capacity.
- Street lights are available only on 20% of roads in Gurgaon.
- Water logging is acute on roads.
- Proper marking and signage are absent on many roads making navigation hard.
- Many footpaths lack continuity.

5.2.4 Traffic

- Traffic volume being high leads to several oversaturated junctions and links.
- Journey speed is particularly low on Mehrauli- Gurgaon road.
- Delays on traffic flow are mainly due to junction delay, uncontrolled pedestrian movement, improper location of bus stops and bad road condition.

5.2.5 Intersections

- Severely congested junctions during peak hours that suggests high use of personal vehicles during peak hours.

- Signalised junctions at IFFCO chowk - MG Road are also operating without a pedestrian phase though pedestrian movement/crossing is very high at this point.
- Junctions are lacking at grade safe pedestrian crossing facilities leading to a high fatality ratio during peak hours.
- Metro stations as overhead bridges are considered as the alternative to at grade crossing that further leads to a lot of random crossing and jaywalking.

5.2.6 Non-Motorized Transport Facilities

- The share of non- motorised vehicles (NMVs) on Gurgaon roads varies between 5% and 20% during peak hours
- No separate lanes available for NMVs which forces them to share the main stream and leads to unsafe traffic conditions on the roads.
- Foot path is not available throughout the road length and is unusable on many roads.
- Footpaths are also encroached by hawkers and vendors or with obstructions like transformers and trees.

5.2.7 Parking

- Parking demand due to high vehicle ownership is huge in Gurgaon, but off-street alternatives are missing and building basement are quite pricey.
- Vehicles are parking on streets haphazardly interfering with the traffic
- Short- term parkers i.e. less than 3km are predominant at commercial areas.
- **Maximum on street parking on M.G. road**.

5.2.8 Safety

- Fatal accidents account to about half of the total accidents recorded.
- Number of accidents are increasing at the rate of 6% per annum.
- Accident prone locations include almost all the major junctions.

5.2.9 Through traffic

- More than 70% of commercial vehicle trips and about50% of passenger trips are bound between places beyond Gurgaon
- Ring roads/bypasses are absent forcing through traffic to use state highways like MG Road.

5.2.10 Connectivity with New Delhi

The three roads connecting Delhi and Gurgaon are the NH8 expressway, MG road and Old Gurgaon road.

5.2.11 Delhi Metro Stations Integration

The two stations i.e. M.G. Road and Sikandarpur lack additional benefits for helping the visiting pedestrian population such as park and ride a continuous and comfortable connectivity in the 800 m radii.

5.2.12 Transport indicators 2008 - 2031

The following tables depict the various indicators of the issues plaguing the transport system in Gurgaon.

Average Journey speed	23 kmph
Public Transport Mode share	10%
Walkability (Footpath length/Road Length)	23%
Cyclability (Cycle path/Road Length)	0%
Fatality Index (No. of fatalities per lakh population)	18

Table 5.1 2008 Traffic Indicators

The following tables depicts the scenario that would be prevalent if there is no action taken by 2031 also highlighting the benchmark that should be set.

Average Journey speed	11 kmph	30 kmph
Public Transport Mode share	4%	70%
Walkability (Footpath length/Road Length)	5-10%	100%
Cyclability (Cycle path/Road Length)	0%	30-50%
Fatality Index (No. of fatalities per lakh poulation)	20	Reduce by 50%

Table 5.2 2031 Transport indicators as well as benchmark

Source (IMP Gurgaon)

5.3 Criteria for Selection of the Study Area

It has been established from the various studies that so far that the MG road area with its mixed land use and important transport junctions such as metro stations as well state highway status is an important point of assimilation of a variety of issues ranging from pedestrian to vehicular to building type. In the process of carrying out the PAI (Pedestrian accessibility

Index) it was highlighted the stretch between two metro stations has much to be desired and a walking shed analysis would throw more light on the various aspects of the design issues. Hence the most suitable area bearing in mind the context of the study would be the 1.9 km stretch between MG Road Metro station and Sikandarpur Metro station at MG road.

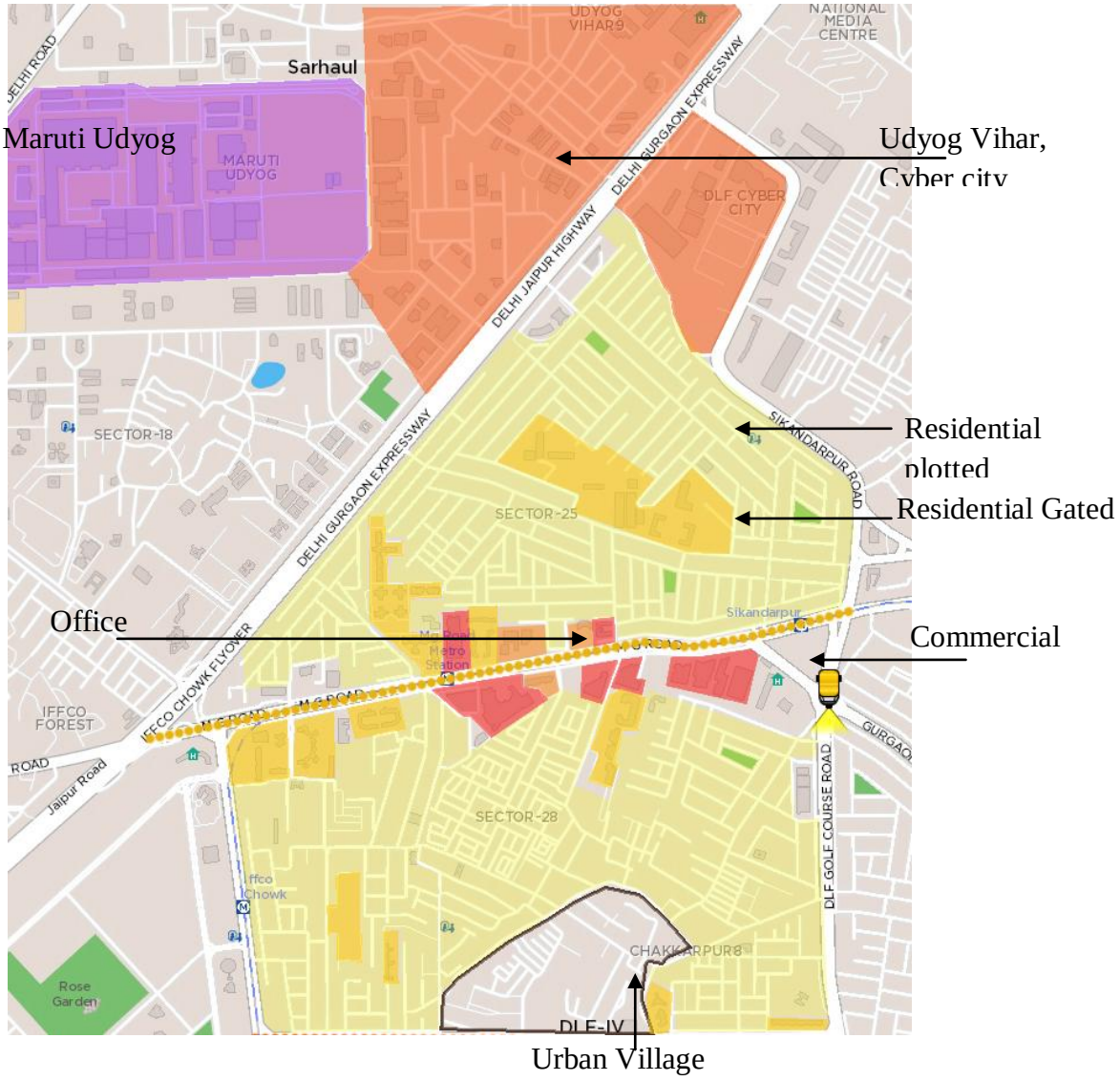


Figure 5.3 Map highlighting the Study area and the surrounding Land use

(Source: Wonobo, Overlay by Author)

The MG road area is the unanimous central boulevard for the Gurgaon residents as it has a mixed use land use with residential, commercial and office use around it attracting all kinds of users and it also acts like a conduit for transportation for people from Gurgaon to Delhi as well as the population travelling from residential areas of Gurgaon to the employment generators i.e. Maruti Udyog and Cyber City.

5.4 Land Use at MG Road

5.5 Street Hierarchy at MG Road

5.6 Street Front analysis at MG Road

5.7 Walking shed analysis at MG road Metro station and Sikandarpur Metro station

5.8 Sections at MG road Metro station and Sikandarpur Metro station

5.9 Figure Ground Mapping at MG Road

Figure 5.4 Figure Ground Mapping

These maps are a true representation of the various buildings on ground on the 1.9 km stretch of MG road depicting a stark difference between the openness of the DLF areas to the Maruti Vihar and Chakkarpur village area, which is an urban village with highest pedestrian and NMT using population.

5.9.1 Open spaces vs Closed spaces

The following map is representing the buildings or closed spaces vs the open and unconstructed spaces.

Also represented is the possibility of approaching the major metro stations from Chakkarpur village to the MG Road.

Figure 5.5 Map highlighting the available options for Pedestrians at Chakarpur village

The straight most path is not possible as it is being restricted by a huge block size. the possibility of the simplest path being followed is always the highest as it is easy to navigate.

De -humanizing aspects of M.G. Road for a pedestrian

- Tinted Glass facades of buildings do not enthuse a passerby with a sense of familiarity
- The lack of bus stops or no precedence given to options for public transport
- No designated lanes for NMT
- The expanse between the either side of street reduce any interaction with the people on the other side
- Fenced up greens
- Parking over sidewalks that takes away the walking space
- Lack of at grade crossing people are expected to take the foot over bridges
- The available sidewalks are inundated with various obstacles physical and otherwise
- Lack of street furniture
- No eyes on the street due to building and street distances
- The constant recarpeting has made some areas into a series of interrupted and uneven movement places that challenge the ability to walk in continuous straight lines.

5.10 Connectivity and Accessibility

5.11 Isovists and Public Places

5.12 Buildings at MG Road

5.13 3D Modelling

5.14 Inferences

Chapter 6 Design Guideline and Proposals

Our hi-tech and highway cities are following a stereotype in their design that has indefinitely stopped revolving around human capabilities and sensibilities. The buildings are going taller and the city is bursting at the seams all based on the mechanical triumph of vertical and horizontal transportation. Ideally the pedestrian should take precedence in any street design followed by **NMT** then **Public Transport** and then **Private vehicles**. But at M.G road the scenario is completely reversed but there are also various other elements like poor maintenance and the insensitive building design that is contributing further degrading the pedestrian-public realm.

Problem At MG Road the ancillary roads are being further gated by various residential welfare societies as they see their gated counterparts being more inclusive and the temptation has shown its fruits with various of these doing the same practice with different results. While they do not really hamper any pedestrian movement but they do create a secluded roadway that can have high speed vehicles therefore indirectly effecting the pedestrian population.

Solution creating Traffic Calming Measures on these roads in order to let the speed of vehicle decrease at these points

Problem Metro stations have not got any parking facilities and therefore a lot of short term trips of personal vehicles have been parked on the service roads that as well as the street pathways.

Solution Provision to connect the collectors on foot or through non motorized transport a lot these trips could have been avoided. Introduce congestion Pricing and automatic bollards for restrictive entry. employ the concept of Raahgiri day on the service roads from 10am to 7pm.

Problem While people travelling from Delhi and far have now started to take metro which is a good sign but there is a serious lack of connection of metro stations to major public places in a desirable manner.

Solution The metro rail in Gurgaon is so far linking only commercial buildings at MG road which is lacking in public buildings and institutional spaces. the empty overbearing real estate buildings could be leased out to private or public education institutions creating some equality in land uses hence also bringing in student population which is in majority a pedestrian population and would also enhance the sales and quality of spaces for local markets, hawkers. Bringing in more equity to the land use distribution.

Problem Lack of continuity in the pathways

Solution Opening up the green areas which have been fenced. Creating table top at grade crossings at the entrance of each and every commercial building with 100+ parking spaces. Delegating the responsibility of maintenance of the spaces in front of all commercial area to a residents committee to make it more participatory.

6.1 Recommendations

6.1.1 Vision

Prior to design guidelines and proposal there needs to be a clear vision in mind that has to be established in accordance with the literature review and as well as the context analysis of the MG road stretch. The basic goals that would be embodied in the final design solution are:

- Employ the concept of green streets
- Improve user experience
- Create a culture walk
- A green ring
- Accommodate commuters with short trip (less than 3km) with good alternatives(NMT) than private vehicles
- Explore MG road's calibre for tourism as Gurgaon lacks a credible tourist destination
- Bringing in student population which is in majority a pedestrian population as MG road is lacking in public buildings and institutional spaces
- Quality of spaces for local markets & hawkers
- Designated spaces for Public Transport

For street

- A street must cater to strangers , visitors & residents alike (safe for and from strangers)
- Populate other areas with people that have no value by themselves(isolate routes, stretches)
- Store owners, small businessman are great street watchers.

6.1.2 Strategies

- Continuous footpath on the entire stretch
- NMT lanes on all mainly service lanes at MG Road and other mobility corridors
- Create at grade Crossing.
- delegate supervision of maintenance of footpaths to commercial and residential committees
- At high speed turn create a safe crossing for the Pedestrian
- Reduce block size by creating walking trails
- Discourage blocking pathways by creating a space for vendors, pavement dwellers, vehicle parking
- Increase intersection and walkway networks connectivity
- Create bicycle parking at metro stations, encourage malls to create a park and ride model
- Integrate cycling with public transport
- Provide rickshaw stands also consider Eco-cab like Models
- Improve user security by installing CCTV at new crossings, encourage lane travelling by clear demarcation.

6.1.3 Parking Management

MG road is suffering from a parking crisis. There needs to be a clear set of goals

- multiple storey parking structure that has a clear future usage in mind with advent of feeder buses and better public transport
- create clearly marker parking bays
- introduce congestion pricing
- provide clear parking for auto rickshaws, rickshaws bicycles at metro stations

6.2 Design Interventions: Proposed land use

6.3 Design Interventions: Transit Intersections

6.4 Design Interventions: Public Spaces

6.5 Checklists

After studying various guidelines and all the prevalent theories I have come to conclude my report with a set of checklists for gauging a neighborhood on the basis of its conduciveness to pedestrian movement that can be helpful in evaluating the walkability of a street and further the whole area itself the various measurements and criteria are from various guidelines published by the ITPI as well as UTTIPEC.

Checklists Sidewalks	
Frontage zone	
Pedestrian zone >1.8m	
Planting / street furniture zone	
Sidewalk height	
Continuity/ straight	
buffer between pedestrians and moving vehicles	
consistent rhythm (street furnishings)	
Clear walking zone (Ht.)>2.4m	
Barrier type (150 mm high) where pedestrian volumes are high and traffic volumes and speeds are less (<25 km/hr)	
On roads of design speeds 2**5-50 km/hr -** protection of Pedestrians and	

Table 6.1 Checklist for sidewalks

Checklists Crossings	
Bump outs	

Shortest possible crossing	
Kerb ramp slope 1:10	
Kerb Ramps (X+2R) > 1.2m	
Accessibility Features	
Continuous pavement	
Lesser curb radii <12m	
Tactile Paving	
Raised Table-Top Crossings	
Auditory Signals	
Accessible Signage	

Table 6.2 Checklist for crossings

6.6 Conclusion

The Final design intervention at the Precinct level, Street level, building level if adopted would innumerably help the situation at MG Road. The transit would be better and efficient, the nodal junctions or metro stations would attract more people and it would also help in boosting the economic benefits enjoyed by the hugely commercial areas.

The main goal of this entire study is to create a more safe, secure precinct for people to enjoy walking and leisurely activities while having boundaries and enclosed space around them. also to create a space for people and not vehicles and claim what is rightfully theirs on the Indian road. The final design solutions aim at delivering precisely the same by opening up the variety of land use, Introducing Pedestrain population and creating a space that can be enjoyed by people of all ages and abilities.

Appendix

Interview with Expert

Sarika Panda Bhatt

'Raahgiri Day' Team Member

Urban planner, EMBARQ

Why this particular stretch of Gurgaon for Raahgiri Day?

This particular stretch is mixed use yet primarily residential zone but also has some urban villages (Chakkarpur) in the vicinity out of which most of the population is dependent on NMT. Sensitizing people to the needs and predicaments of others could not have been achieved unless there was a mix of classes and masses.

Is it a citizen based initiative entirely?

It started two years ago when studies were undertaken by Gurgaon traffic police and it was found out that there are about 480 deaths every year in Gurgaon that involved people on NMT and on foot. It was then started as a an initiative on a personal level by some concerned 6-7 citizens that was attended by teachers from 'Heritage School' who already led cycle expeditions. A cycle rally was organized and a report submitted to MCG.. What started then has now transformed into Raahgiri day.

What changes would you suggest for Gurgaon's pedestrian realm (though the event)?

There is an awareness and great sense of change in people already. I know of 10-15 people who cycle or walk to work despite owning a car. But this idea has not spread as infectiously as one would hope due to lack of supporting infrastructure, this event is about sensitizing people about an alternative lifestyle. The demand and supply concept is what played into our minds once we gathered a sufficient base for action. Whether to ask the Government to build all the infrastructure or create a demand through the concept of '**Ciclovía**' as done in **Bogotá,** where we let people experience the benefits of this lifestyle themselves and then demand it from the concerned authorities.

Is an automobile oriented planning degrading our pedestrian-public realm?

30 meter wide roads are a norm in Gurgaon's planning dominated by private developers. In such a situation we are not able to provide even 3m, a meagre 10%, for our pedestrians and cyclists, despite the statistics showing that 33% population(in the neighbouring area)

relies on NMT for their day to day commuting and more than 50% own bicycles but are not using them due to lack of safety and necessary tracks.

Has the pedestrian safety concern been a major drive behind 'Raahgiri day'?

As specified earlier the alarming level of road deaths was a key factor behind 'Raahgiri day' initiative also the air quality is depleting, which makes it harder for people to willingly step out of their cars. Hence they choose to take motorized transport for even short distance chores, add to that today's sedentary lifestyle. All of these were contributing factors as far the drive behind the event goes. Also the Gurgaon example would become a benchmark for other commercial or mixed use areas to follow such as Connaught Place, which have been reluctant in going the pedestrianzation way and not tapping into this huge market that an event like this would bring them.

This area is particularly surrounded by residential gated communities, has that been a contributing factor in depleted pedestrian day to-day environment, if at all?

There is a lack of community beyond the gates and people were not aware who they were living next to, this initiative however has brought people out in the open as equals from Hamilton court residents to Chakkarpur village. There are themes and awareness drives undertaken with purposes such as road safety, emergency medical procedures, recycling wastes, gender equality. As people are involved in activities such as aerobics, dance, yoga, street plays, outdoor games etc. the gaps of classes are bridged and a more humane side of community bonding is witnessed each Sunday.

Would 'Raahgiri Day' ultimately aim for a more pronounced change on a daily basis?

There is a proposal for streetscape enhancement and creating infrastructure for NMT that has been under design stage for a while and would be made public(through web portals) in some time after its submission to MCG.

Have there been any subtle or prominent changes from the first 'Raahgiri day' in November?

Attitudinal changes in people are the most prominent ones. There are BMW's that are halting for people on cycles to cross. The energy on these days is palpable. People are now increasingly demanding infrastructures that supports a 'Raahgiri Day' each day. the initial peripherals have also been extended to include additional streets. the attend ding and participating population has also been close to doubled. The Commercial markets (Ansal's Super Mart and DLF Galleria) have also shed the initial hostility and scepticism and their tripled revenue collection on Sunday's is also a reason for that. There is also a genuine demand to not discontinue the event which was planned to be held until 31st March.

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