



CITY LEVEL PROJECTS

NETAJI SUBHASH PLACE METRO STATION

Planning, Landscape and Pedestrian Connections
Ward Number 53





Delhi Urban Art Commission

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Acknowledgements

It is said that for an artist to join establishment is a kiss of death. I was fully aware of this aphorism when the Minister of Urban Development, Mr. Kamal Nath, asked me to be the Chairman of the Delhi Urban Art Commission. I had three conditions before accepting the assignment and one of these was that DUAC should be allowed to carry out site specific studies for improving slums and unauthorized colonies. Subsequently, the Minister along with the then Lieutenant Governor of Delhi, Mr. Tejendra Khanna, and Secretary, Ministry of Urban Development, Dr. Sudhir Krishna, approved the proposal to carry out three dimensional studies for improving slums and unauthorized colonies. I am grateful for their support.

I would like to thank other members of the Commission, Eric P.Mall, Satish Khanna, Sonali Bhagwati and D. Diptivilasa for helping to make success of problematic urban design exercises and charting new paths.

I take this opportunity to thank senior consultants, architects, urbanists and planners as well as younger colleagues who have been working full time. DUAC Secretary, Vinod Kumar, and other permanent staff have enthusiastically supported us and guided us through government procedures. Many thanks to all of them.

Raj Rewal

Chairman

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Preface

Half of Delhi lives in ramshackle slums and shabby unauthorized colonies. This state of affairs is a serious blot on the face of the city which has great historical monuments and aspires to be a world class city. The centre of New Delhi is lined with leafy trees and can boast of superb example of contemporary architecture but its growth under exploding population has disintegrated into shanty towns.

My first memory of Delhi is that of a child going in a tonga from the railway station to our government quarter in New Delhi around a square which became our home for several years. The squares were built near Birla temple and when my father was promoted in the government hierarchy, he was offered an independent house with a larger area but my mother refused to move as she had developed kinship with families around the square. This was my first lesson in neighbourhood "mohalla" as an urban phenomenon.

In fact the word 'urb' in Latin stands for neighbourhood space. It was a period when Connaught Place was the leisurely centre for social, shopping and cultural activities and the Old Delhi was lively and still gracious, dominated by Jama Masjid and Red Fort. Delhi's monuments like Humayun's Tomb, Qutab Minar and Lodhi Garden were favourite places for picnics.

Seventy years have passed since the tonga ride, Delhi has dramatically changed as the population of Delhi has exploded from under a million before partition in 1947 to about twenty million today.

As a Professor in the School of Planning and Architecture in Delhi, I had ample scope of studying typology of Indian cities which helped me to design Asian Games Village in my mid-career around 1980 as a series of clusters (mohalla neighbourhood) woven around pedestrian pathways, segregated from road networks. This was a low rise high density housing built within the framework of 150 FAR (FSI 1.5).

Delhi has changed even more drastically during the last thirty years since the Asian Games Village was built, but the idea of a city as a series of sympathetic, humane interconnected neighbourhood building blocks interspersed with social, cultural and educational facilities has remained embedded in my mind.

Delhi Urban Art Commission was established to preserve, develop and maintain the aesthetic quality of urban and environmental design within Delhi. During the last 40 years of its existence, DUAC has not received any three dimensional exercises which visualizes neighbourhoods, wards etc. The emphasis has often been only appraising individual

buildings and complexes submitted through local municipal agencies. After taking over the direction of DUAC in 2011, members of the Commission arranged meetings with wide spectrum of advisors and formulated principles on which a building can be automatically and speedily approved and decided to take over the job of visualization and three dimensional planning for various aspects of the site specific designs which need to be urgently developed if Delhi has to maintain standard as a world capital city.

A large part of Delhi lives in unauthorized colonies and slums and even the Master Plan of Delhi had suggested a detailed design proposal to augment the Master Plan based on ground realities.

In order to fulfil the requirements of neighbourhoods, wards, the DUAC has undertaken a few pilot projects which can be eventually developed in a manner that the local municipal agencies can implement them. In order to carry out these studies, DUAC developed in its own office a core group of architects and urban planners. This was done on the basis of DUAC mandate that "the Commission may suo motu promote and secure the development, re-development of which no proposals in that behalf have been received from any local body".

The studies involve the visual tools for ground studies combined with extra assistance of Google images. It is hoped that the proposals and their conclusions would be evolved to such an extent that a process can be worked out with the resident welfare associations to make meaningful designs for the neighbourhood upgradation for the different kind of wards.

The DUAC's site specific designs are the seeds which can grow and it is hoped that economic principles would be evolved to implement the meaningful neighbourhood upgradation for the different kind of slums and wards. India cannot remain shabby and ramshackle forever and solutions have to be found for shanty towns.



Raj Rewal
Chairman, DUAC

January 2014

Contents

1	Context	6
1.1	Zonal Plan 'H'	6
1.2	Location and Connectivity	7
2	Mapping and Site Analysis	8
2.1	Movement and Development around Site	8
2.2	Site	9
2.3	Existing & New Proposals	10
2.4	DDA Land Use Proposal	11
2.5	Alternate Land Use Proposal	12
2.6	Conclusion	13
3	Design Proposal	14
3.1	Design Concept	14
3.2	Landscape Strategy and Possible Spatial Components	16
3.3	Design Proposal	18
3.3.1	Entrance Park	24
3.3.2	Shopping Arcade	26
3.3.3	Pedestrian Entrance Plazas	30
3.3.4	Crescent Walkway	32
3.3.5	Amphitheatre Plaza	34
3.3.6	Tree Avenue	36
3.3.7	Aerial View	38
3.4	Conclusion	40
3.5	Urban Design Guideline	42
4	Annexure	
4.1	Physical Characteristics of Pedestrian	44
4.2	Spatial Standards	46

Summary

It is commonly observed that most public spaces in Delhi around commercial areas as well as residential areas, lack provision for the safe and efficient movement of people on foot.

Providing proper pedestrian movement space is even more important in the vicinity of Transport Interchanges, for example near Metro stations, railway stations, bus stops, etc.

In the best examples worldwide, pedestrian movement is integrated with landscape and recreation and informal commercial spaces, for example parks, riverside walk-ways, promenades, etc.

It is important to design these kinds of spaces taking into account the special needs of people on foot. Pedestrians include a variety of people like older people, children, students, who use the space in their own ways. Children need safety barriers, older people need respite and spaces where they can walk at their own pace.

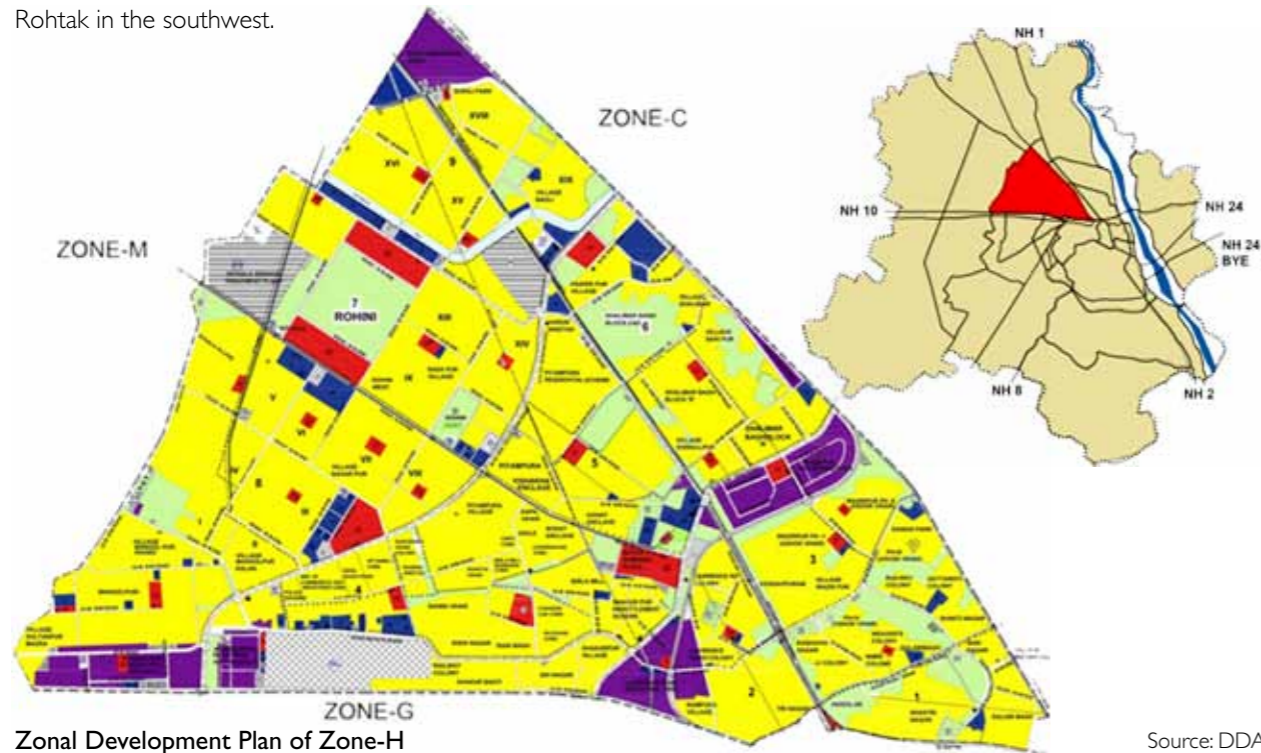
We have used this small site to demonstrate how this can be made possible by providing proper pedestrian spaces where there are transport interchanges and also a variety of land uses in the site. With the provision of appropriate widths and ancillary facilities for the pedestrian walks, the design proposal validates that these kind of urban places become attractive to people making them lively and useful.

1.1 Zonal Plan 'H'

Introduction

Under the Master Plan for Delhi-2021, the National Capital Territory of Delhi is divided into 15 Planning zones out of which 8 zones are in Urban Delhi (A to H), 6 are in Urban Extension (J to N and P) and one for the Yamuna and the riverfront area (Zone O), Zone-H (Northwest Delhi-I) covers an area of 5,677 ha.

Zone-H is situated between two major railway lines – railway line to Ambala in the northeast and the other to Rohtak in the southwest.



Source: DDA

Special Characteristic Features

- **T.V.Tower and Dilli Haat:** These are major points of attraction in this zone. The T.V.Tower Complex is in the vicinity of District green and has a dominating feature with tremendous visual and special qualities. Dilli Haat is an organized informal eating place, casual shopping and cultural activities centre forming a significant feature for the area.
- **Netaji Subhash Place Complex and Manglam Place District Centres:** These are the hub of commercial activities with shopping malls, offices, hospitals etc.
- **District Parks & DDA Sports Centres:** There are parks, gardens and orchards as well as international quality sports complexes in Ashok Vihar and Rohini, both run by the DDA.
- **Shalimar Bagh:** Shalimar Bagh, a protected forest falling in this zone, is a historical garden of the Mughal period with Sheesh Mahal as a centrally protected monument under ASI.
- **Western Yamuna Canal:** The Western Yamuna Canal, running parallel to Delhi-Karnal Railway Line divides zone H-4 & H-5 and forms an important feature of landscape.
- **MRTS Corridor:** The 1st Ph. of MRTS passes through the zone covering Inderlok to Rithala.
- **District Courts, Rohini:** It has been accommodated on the junction of Outer Ring Road and Road No.41.
- **Residential Areas:** The area has well-planned colonies such as Ashok Vihar, Wazirpur, Pitampura, Shalimar Bagh and various cooperative societies.
- **Industrial Areas:** There are planned industrial areas such as Wazirpur, Lawrence Road, and Mangolpuri. These are developed as envisaged in the Zonal Plan. As per MPD-2021, the unplanned Industrial areas include Shalimar Village, Haiderpur Village and Rithala Village.



Dilli Haat, Pitampura: Similar to the Dilli Haat at INA market, this is well connected by road and MRTS.



Sheesh Mahal, Shalimar Bagh



Netaji Subhash Place Complex is district Centre for Zone-H, and comprises malls, retail stores, restaurants, offices, banks etc.

1.2 Location and Connectivity

Located in the northwest of Delhi, the place is well-connected by DTC buses and is located between the Inner and Outer Ring Roads. Located near NH-1 (G.T Road) and Rohtak Road.



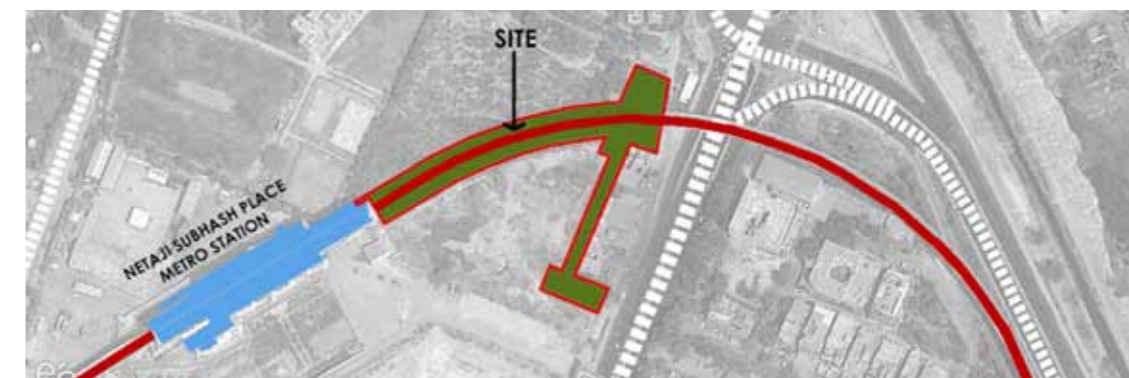
Surrounding Wards



Map Showing Outer and Inner Ring Roads



Pitampura South Ward No. 53



Map showing site

2.1 Movement and Developments around Site

Movement Pattern

The Inner Ring Road forms a major north-south corridor for the ward which connects distant places like Naraina in the south to Azadpur in the north. Since it is a major arterial road, it carries high volume of traffic. The connectivity in the west is via Wazirpur flyover which links to Rohini. Good connectivity through roads and MRTS give commuters the opportunity to reach the destinations.



View showing Ring Road



View showing road in front of Dilli Haat Pitampura

Major Developments

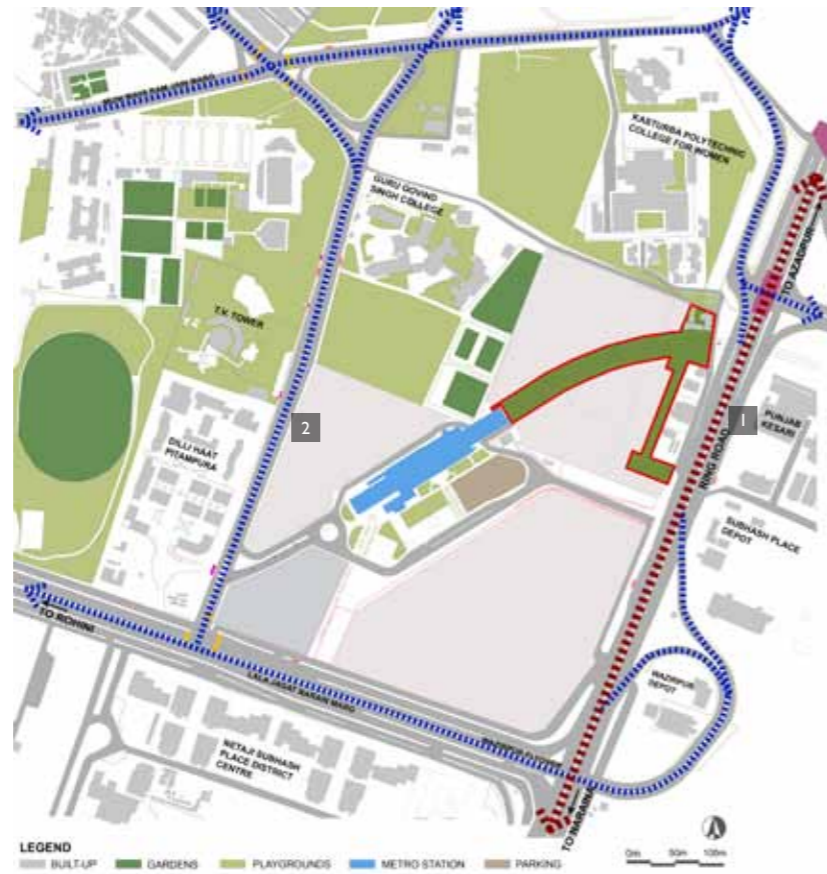
The site is abutted by zonal level functions. Netaji Subhash Place District Centre forms the major economy generator comprising malls, retail stores, restaurants, offices, banks etc.



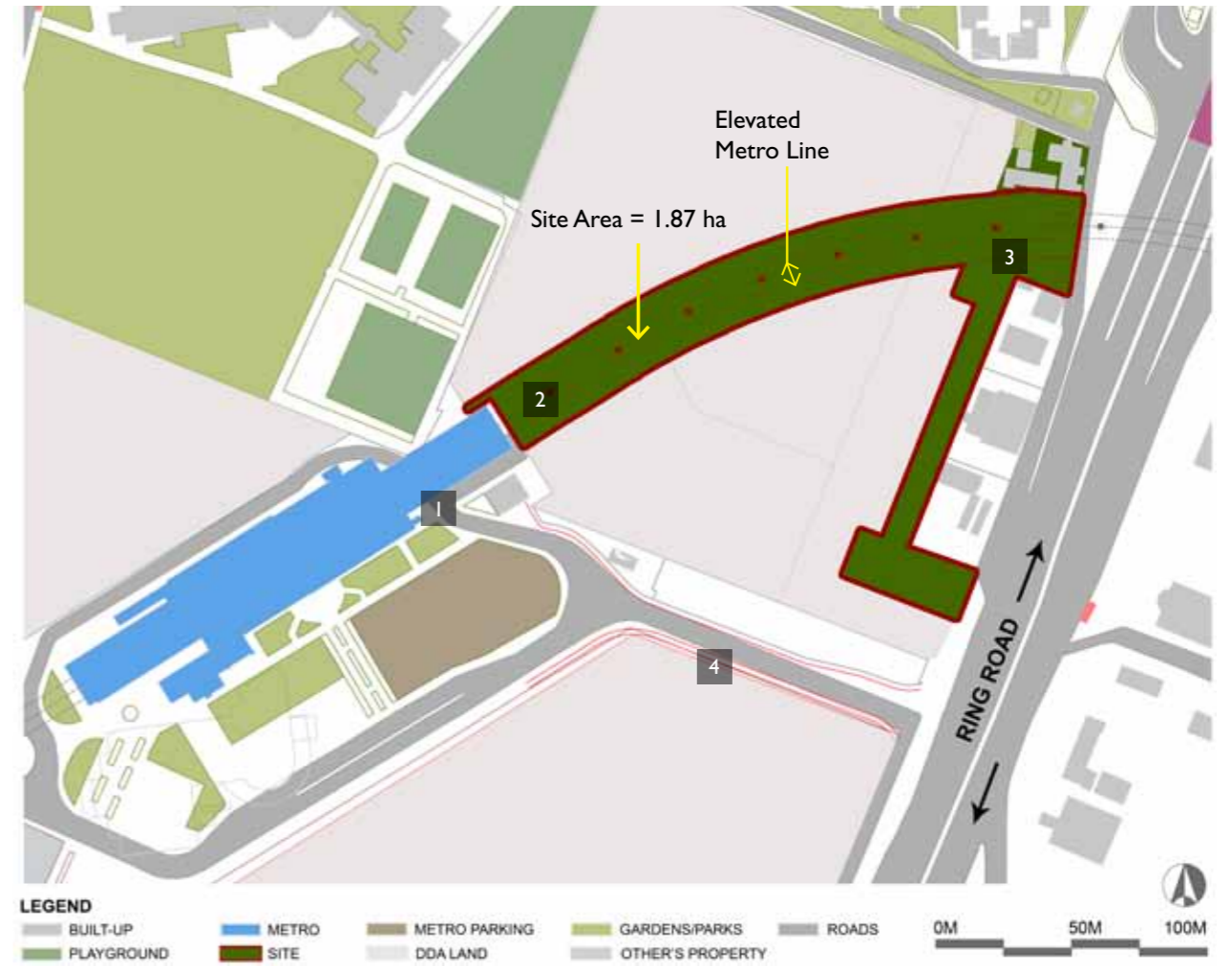
View showing T.V. Tower, Pitampura



View showing Dilli Haat, Pitampura



2.2 Site



Existing Site Plan with surrounding Built-Mass



Entry to Site from Netaji Subhash Place (NSP) Metro station



View showing space below Metro corridor

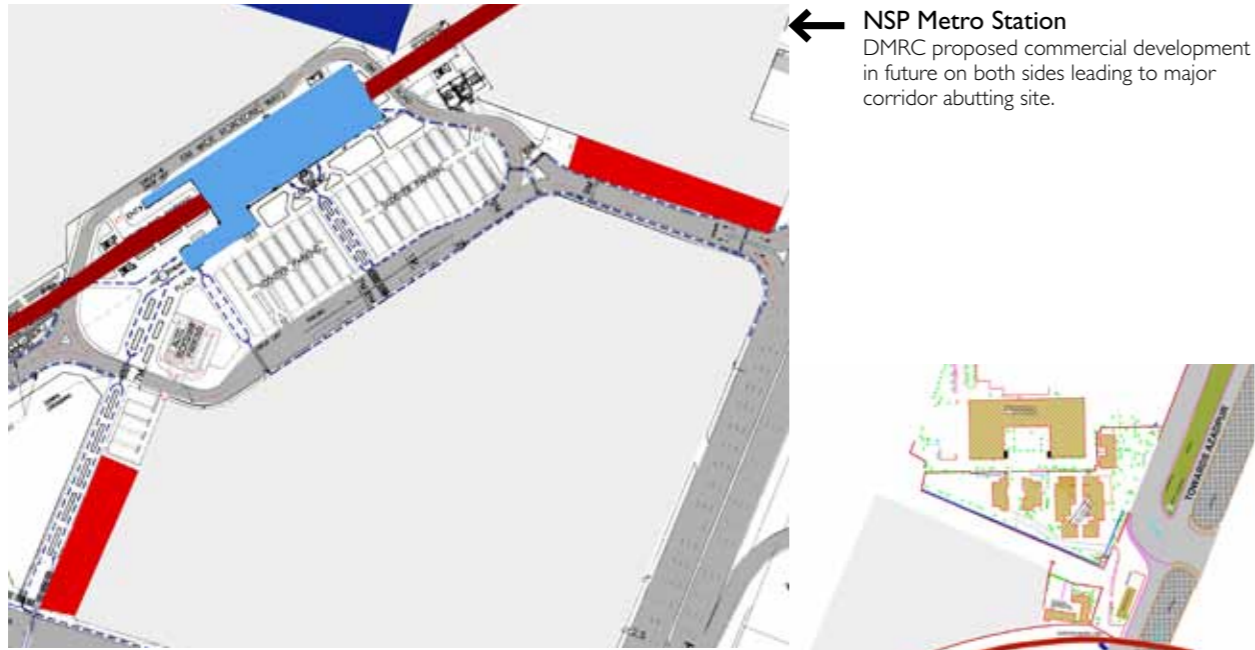


View showing area behind petrol pumps



Pedestrian walk from NSP Metro station to Ring Road.

2.3 Existing and New Proposals



NSP Metro Station
DMRC proposed commercial development in future on both sides leading to major corridor abutting site.

Proposed Underground Metro Station
The proposed underground Metro station will add to the number pedestrians.

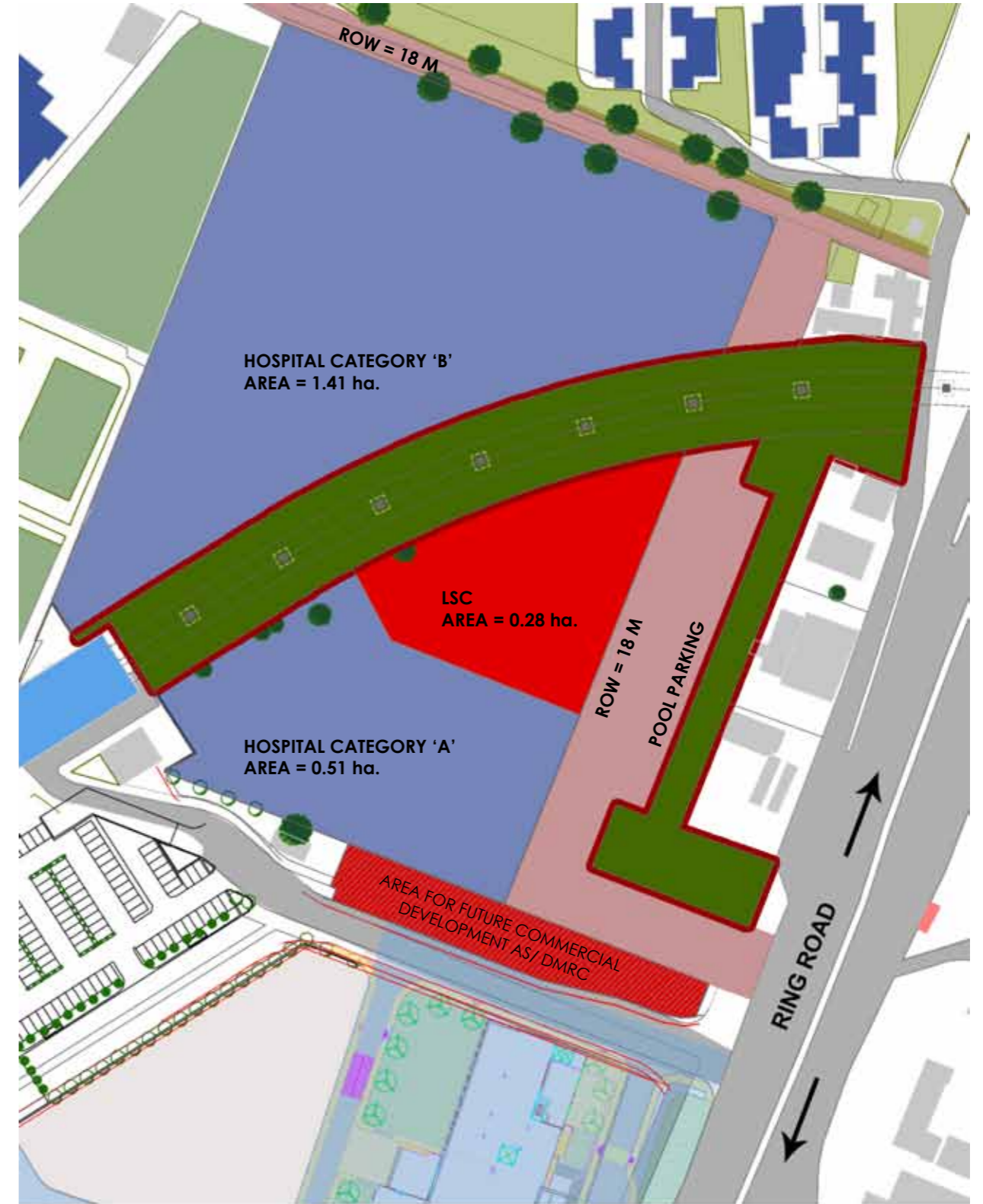


Proposed Mall
The mall in future gives the opportunity to connect to the proposed land uses around the site.



The design proposal will be affected by the existing and new developments around the site.

2.4 DDA Land Use Proposal



LEGEND

BUILT-UP	COMMERCE	EDU. INST.	HOSPITAL
GARDENS/PARKS	PLAYGROUNDS	DDA LAND	METRO
PROPOSED METRO	ROADS	PROPOSED ROADS	SITE

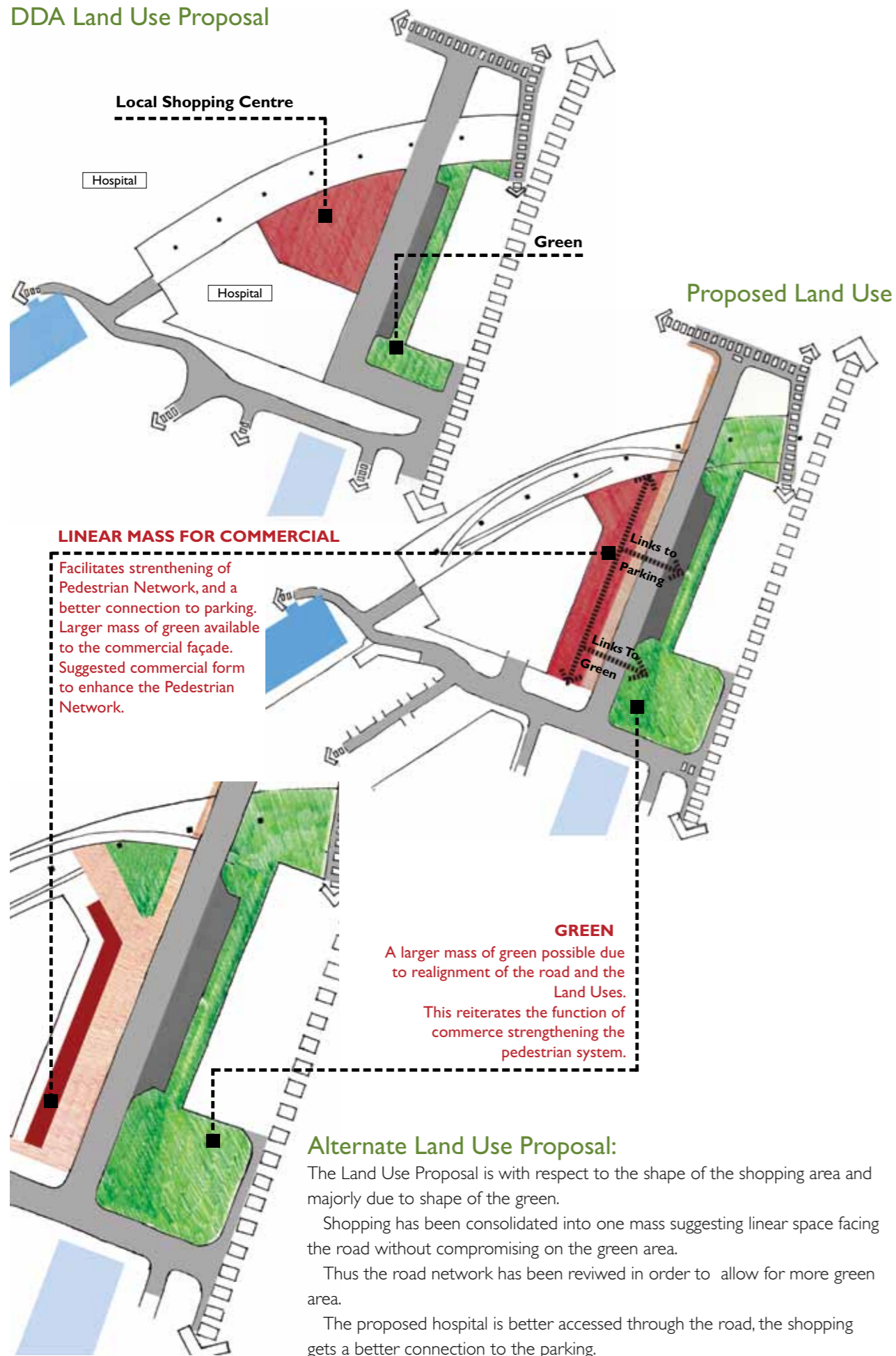
0m 25m 50m

Category	Population/Unit	Plot Area (Approx.)
Hospital "A" (501 & Above)	5.0 Lakh	2.5 ha – 4.5 ha
Hospital "B" (201 & Above)	2.5 Lakh	1.5 ha – 2.5 ha
Hospital "C" (101 to 200)	1.0 Lakh	0.5 ha – 1.0 ha

MPD 2021
The areas mentioned for different category of hospitals as/MPD 2021 vary here.

2.5 Alternate Land Use Proposal

DDA Land Use Proposal



Alternate Land Use Proposal:

The Land Use Proposal is with respect to the shape of the shopping area and majorly due to shape of the green.

Shopping has been consolidated into one mass suggesting linear space facing the road without compromising on the green area.

Thus the road network has been revived in order to allow for more green area.

The proposed hospital is better accessed through the road, the shopping gets a better connection to the parking.

2.6 Conclusion

DDA Land Use Proposal

The Land Use Proposal as per DDA indicates hospitals and a local shopping centre around the site.

Here, the hospital façade conflicts with the commercial.

Future Use

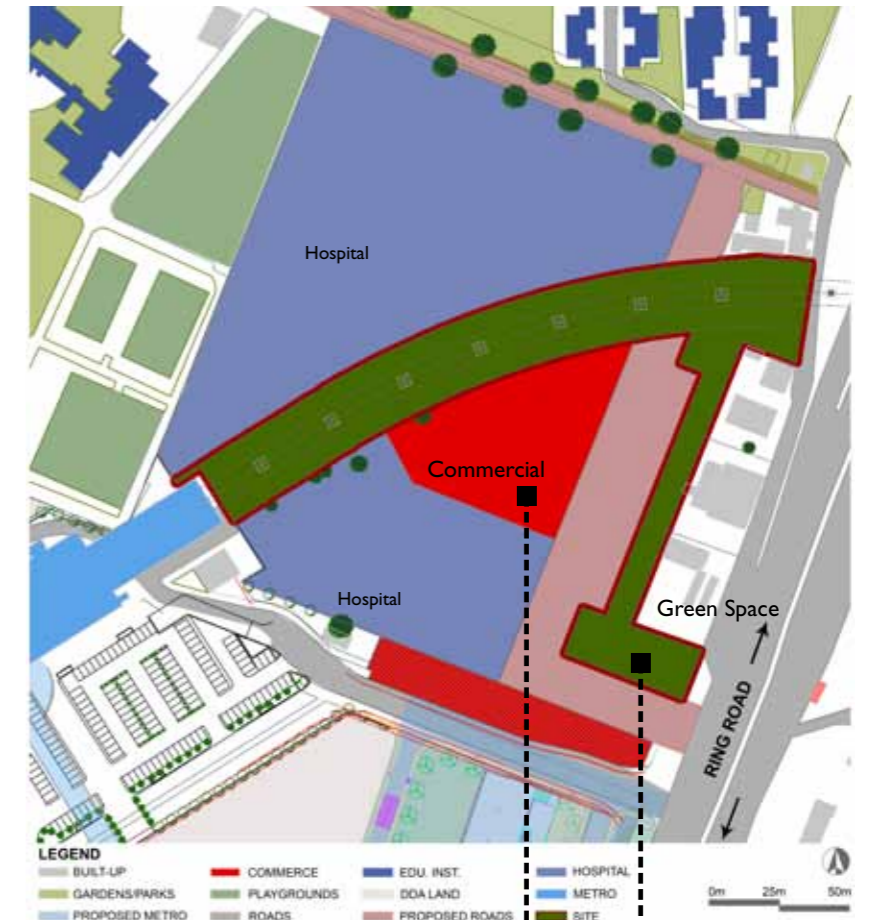
The potential generator of pedestrian movement for the site, Netaji Subhash Place Metro station and the proposed underground Metro station (Mukundpur to Yumuna Vihar Corridor) along with the land use, gives an excellent opportunity to develop this site as an exclusive pedestrian route.

The site thus could be a significant pedestrian area well connected with adjacent land uses and can be designed to demonstrate how spaces below elevated metro corridors here and elsewhere, can be effectively utilized and put to public use.

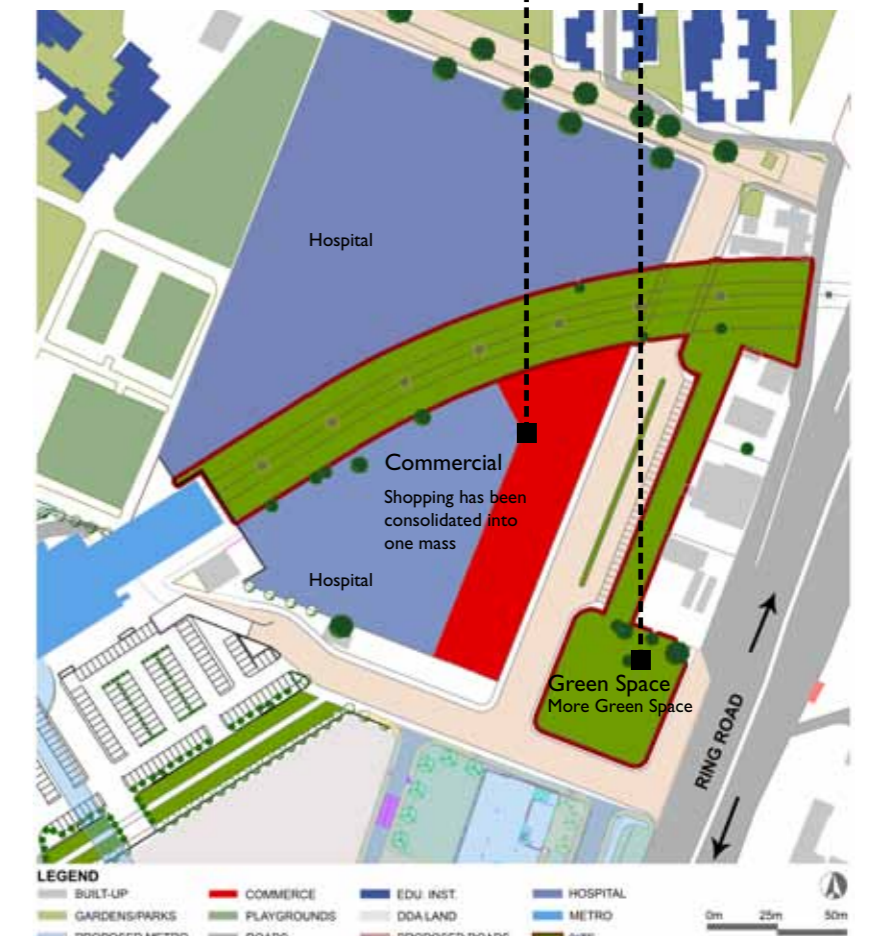
This linear space can be designed for incidental recreation but its major purpose – appropriate to its closeness to the Metro station – would be to serve as an important pedestrian connection.

It is proposed that the local shopping centre be integrated and become part of the landscape design for the open space.

The Urban Design Guideline for the adjacent development would be a part of the landscape proposal.



DDA Land Use Proposal



Alternate Land Use Proposal

3.1 Design Concept

The site is predominantly linear in shape which leads to a linear walk.



The Park at Lakeshore East, Chicago, United States

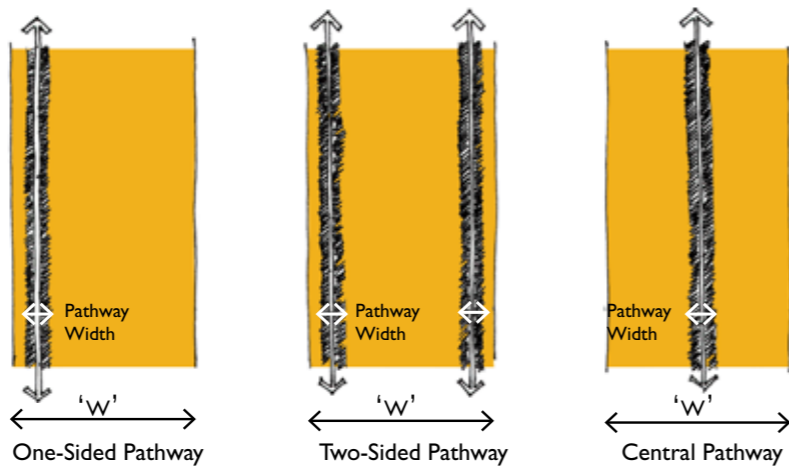


Pathway at Millennium Park, New Delhi



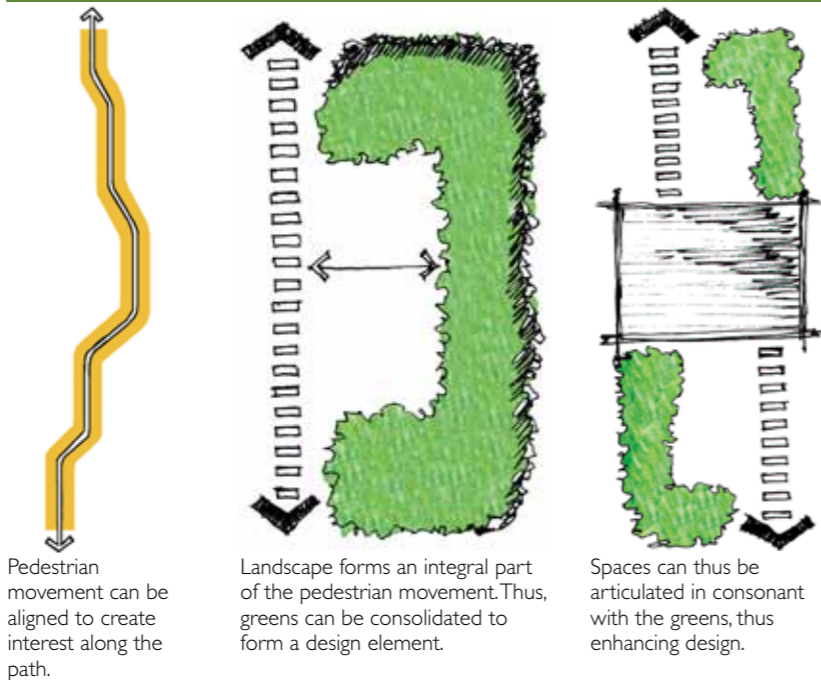
Illustrated here are some concepts about various options for pathways to provide for a linear movement, how linear space can be designed.

Pathway Alignment



The pathway can be designed on one side of the entire width of the space, on two sides of the total width or in the centre of the total width.

Alignment of Movement Consolidating Greens Space Articulation

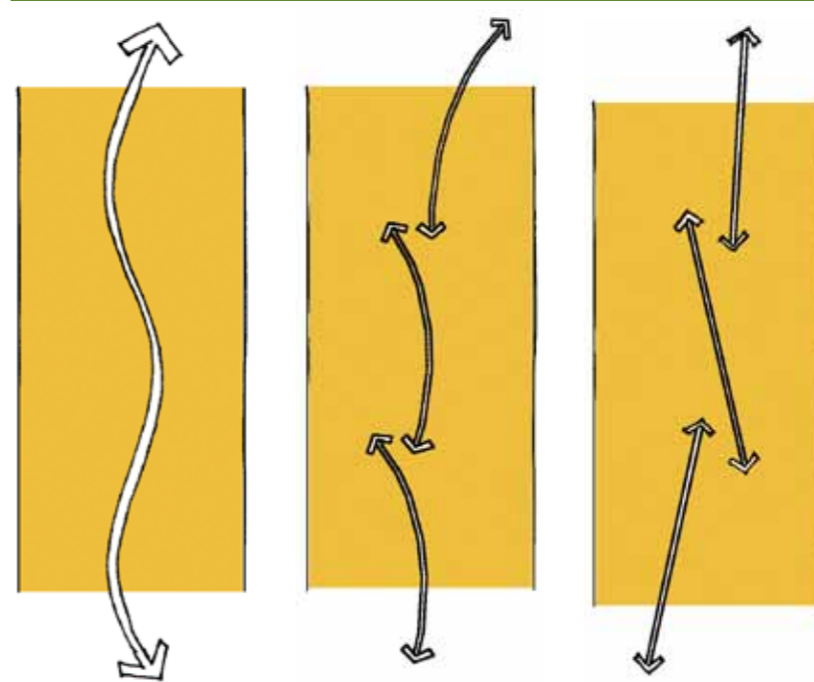


Pedestrian movement can be aligned to create interest along the path.

Landscape forms an integral part of the pedestrian movement. Thus, greens can be consolidated to form a design element.

Spaces can thus be articulated in consonant with the greens, thus enhancing design.

Pathway Pattern



The movement along the path can be made interesting with different patterns.

Curved path with breaks at regular intervals.

Linear movement with breaks at regular intervals.



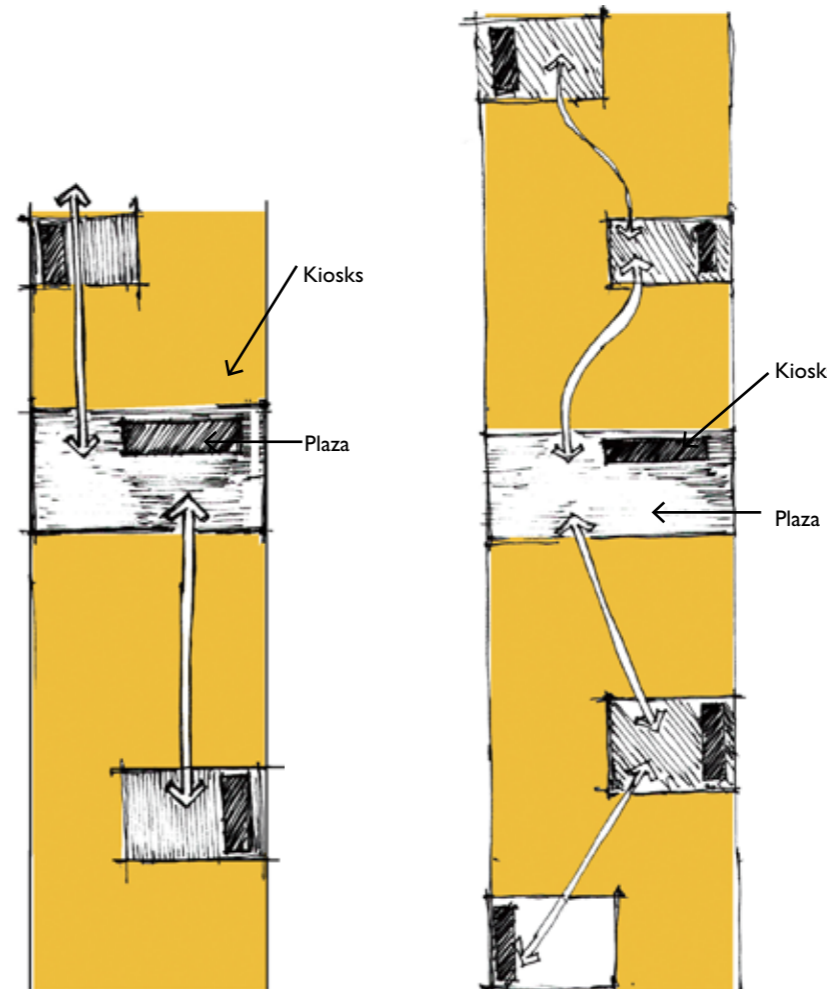
Pathway at Shakti Sthal, New Delhi



Pathway at Millennium Park, New Delhi

To create an interest in the pathway, these can be curved, straight or can be intercepted at certain intervals.

Variation



Multiple interceptions with active pauses.

Combination of pathway patterns and active pauses.

The pathway can be interjected with the plazas and kiosks along the way.

The path can thus be made interesting with the combination of linear and curved alignments.

3.2 Landscape Strategy and Possible Spatial Components

Entrance Plaza

An entrance marker for the site.



Garden of Five Senses, New Delhi

Pedestrian Link

Major link to the Metro and location for public amenities.

A broad walkway leading to the destination entrenched with seating and gathering spaces.



Khan Market, New Delhi



Janpath Market, New Delhi

Public Plaza/ Shopping Arcade

An anchor to pedestrian movement.



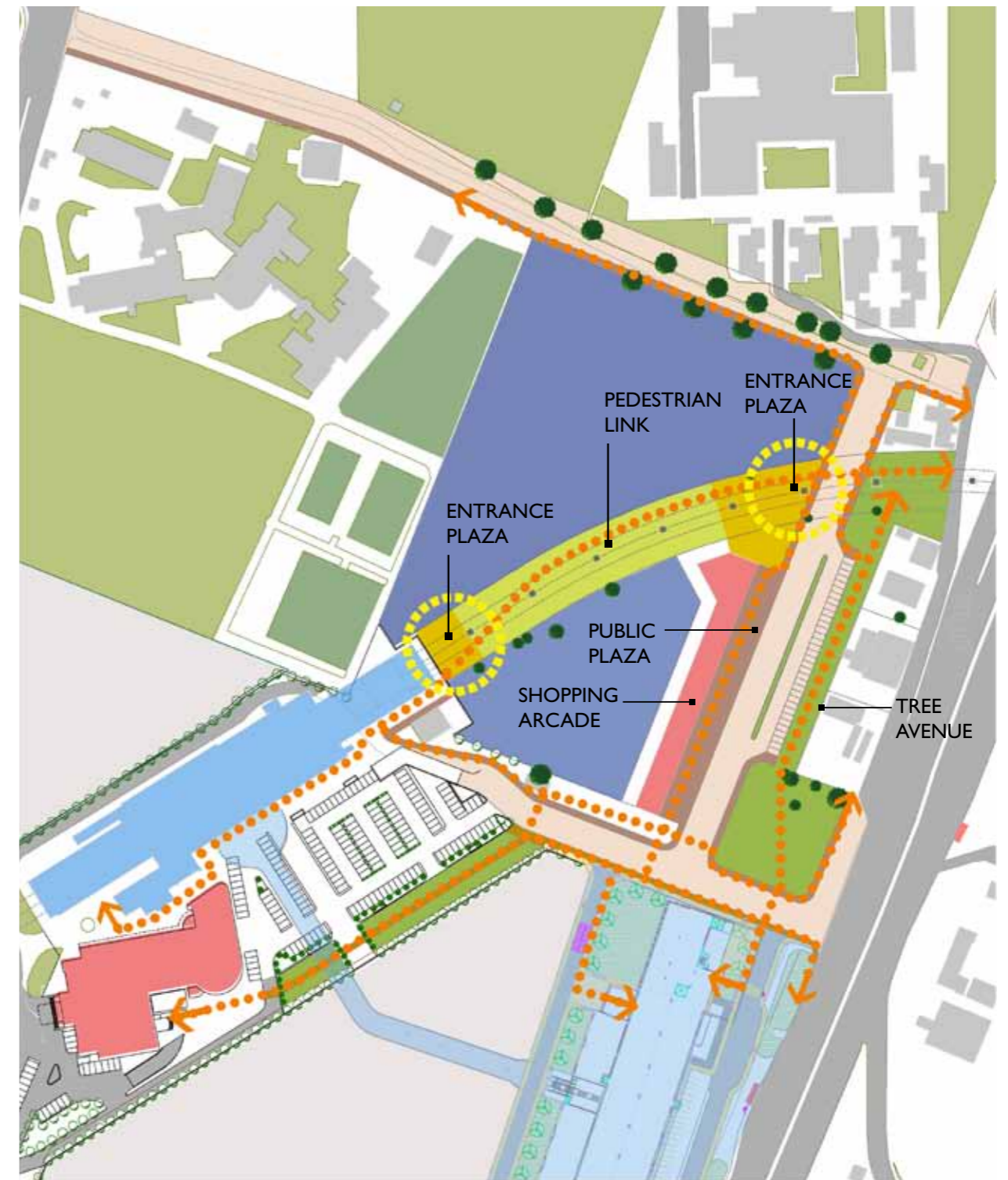
Connaught Place, New Delhi

Tree Avenue

A visual and physical connection between the two major plazas.



School of Planning and Architecture Campus, New Delhi



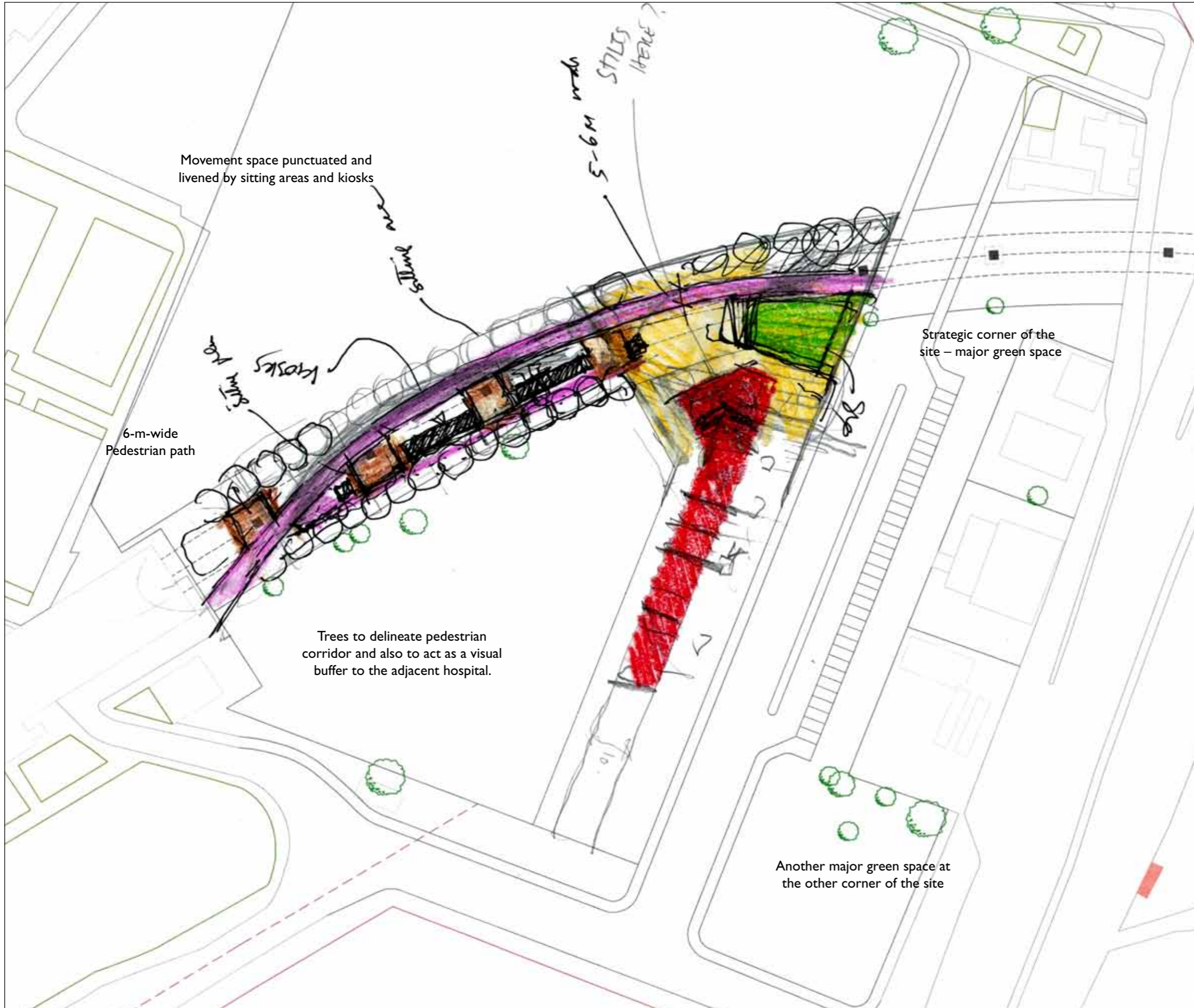
LEGEND

BUILT-UP	PROPOSED METRO ST.	COMMERCIAL	ENTRANCE PLAZA
PROPOSED COMMERCIAL	OTHER'S LAND	HOSPITAL	PEDESTRIAN LINK
PLAYGROUNDS	ROADS	GREEN	PUBLIC PLAZA
METRO ST.		ROADS	PEDESTRIAN ROUTE

0m 25m 50m 75m

Landscape strategy and possible spatial components

3.3 Design Proposal





Site Plan

- 1 Entrance Park
- 2 Shopping Arcade
- 3a Pedestrian Entrance Plaza - I
- 3b Pedestrian Entrance Plaza - II
- 4 Crescent Walkway
- 5 Amphitheatre Plaza
- 6 Tree Avenue



3.3.1 Entrance Park

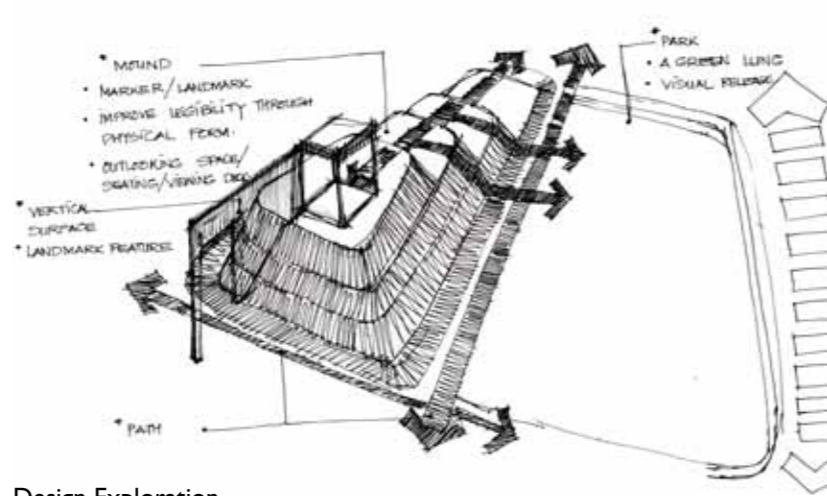
Rationale for location, access to the area, identification, movement pattern perceived and anticipated:

The park has been conceived as the symbolic gateway to this small area of shops and greenery.

This function is reinforced by the insertion of an actual gateway, which would serve as a kind of landmark identifying the site.

This architectural feature (View 2) would also be used for information/advertisement display and as a site for the signage indicating the name of this open space complex.

It would be lit up at night and be visible from the arterial road.



Design Exploration



View 1



Section through mound and park



View 2



Conceptual design for mound and park



Initial Conceptual Sketch

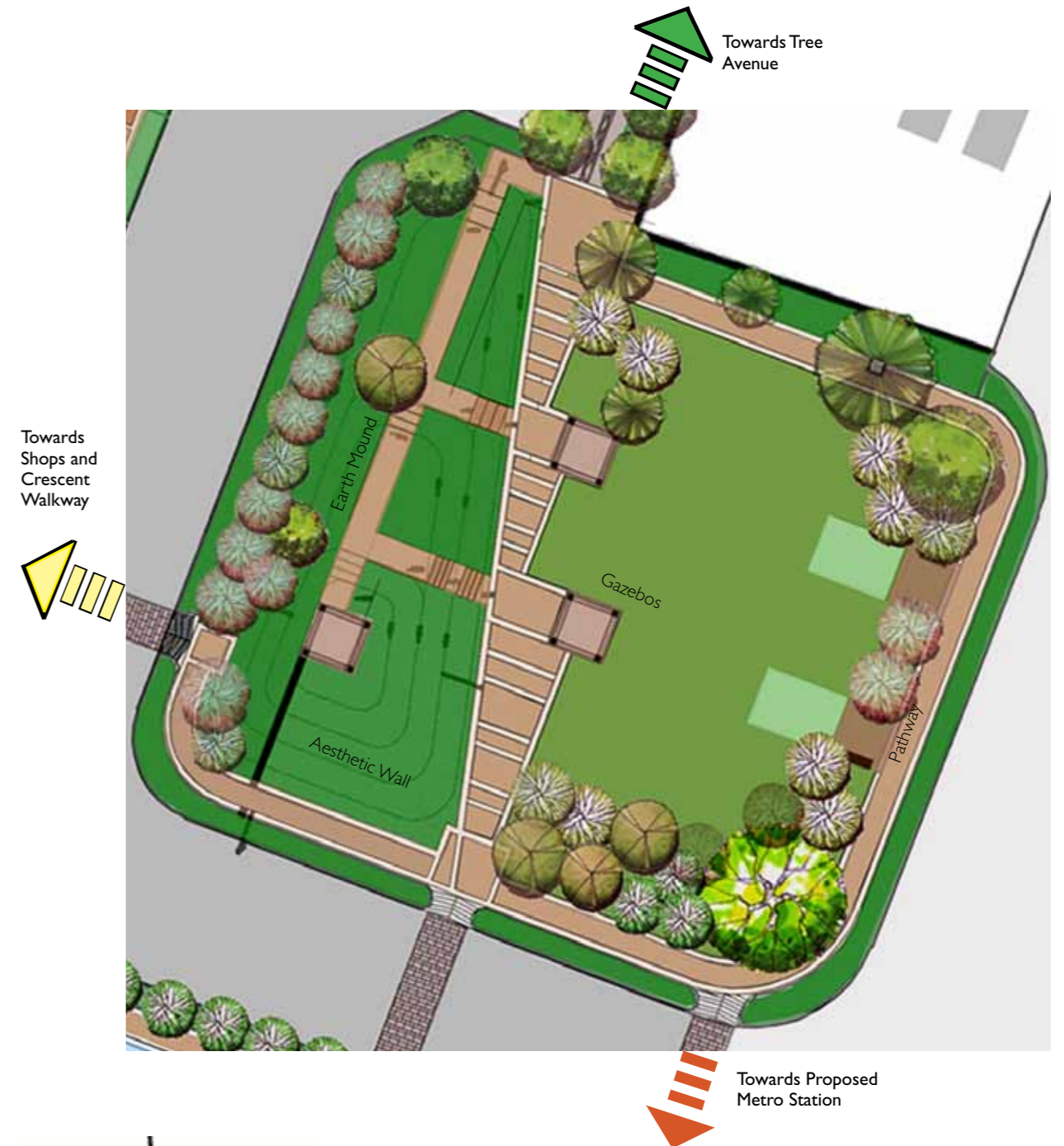
Spaces which are active, attractive and safe provide focal points where people can gather and interact. Pedestrian pocket parks and plazas are examples of such spaces.

The mound acts as a marker for users within the pedestrian system and gives a sense of reaching at particular place. Thus it is a landmark for the area which gives identity, legibility and visual character.

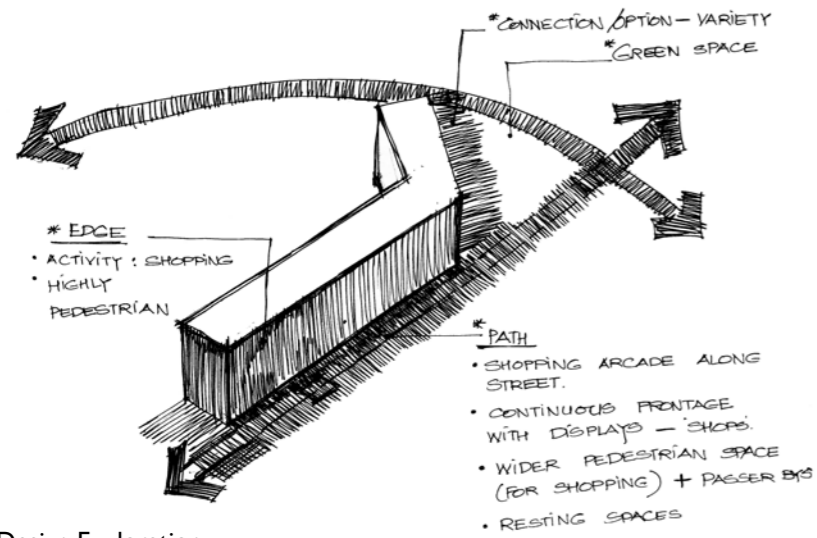
The park serves as the entrance to the site and acts as an green lung and a large public space.



Key Plan



3.3.2 Shopping Arcade



Design Exploration



View I



Section through shopping, street, mound and entrance park

Shops

The pedestrian experience is strengthened by the introduction of shops forming an edge.

Shopping activity acts as magnet. These could be in the form of large stores or smaller and compact markets.

Thus shopping activity is directly proportional to the concentration of pedestrians and extensive pedestrian movement.

A designated space for shopping in the form of an arcade gives shoppers an opportunity to shop without interfering with the regular pedestrian flow.

A spill-out space in the form of a public plaza invariably gives a design guideline to integrate the pedestrian movement.

Shops

Rationale for location, access to them, identification, movement pattern perceived and anticipated:

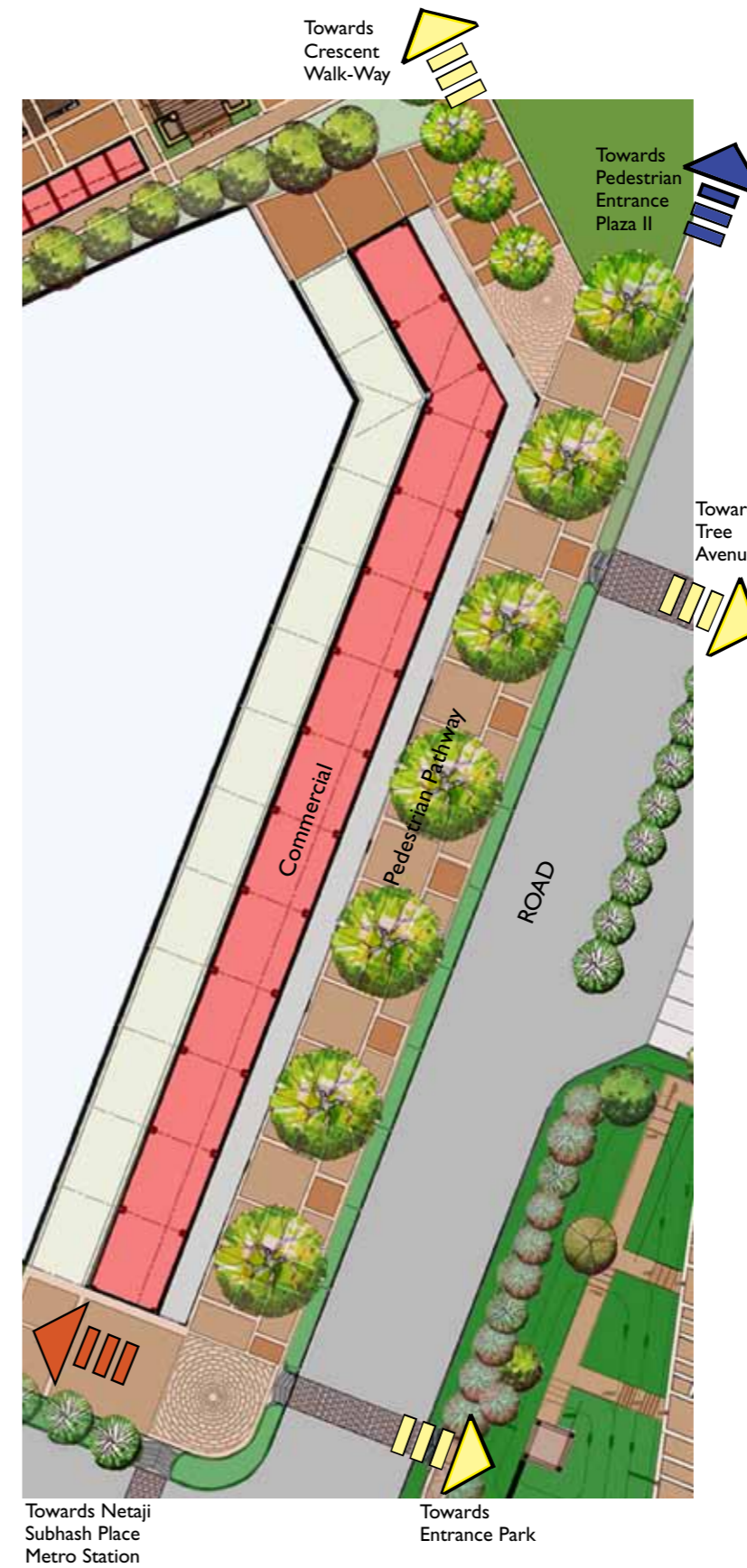
The shops form the commercial element of the design scheme which invites people.

This gives an opportunity to exclusively detail the pedestrian features making it safer, attractive and convenient for the users, thus helping the commercial area to thrive in future.

The placement of the commercial form just outside the proposed underground Metro station strengthens the function and reiterates the significance of the pedestrian scheme.

Hence, a continuous frontage with displays along the arcade gives accessibility to shoppers.

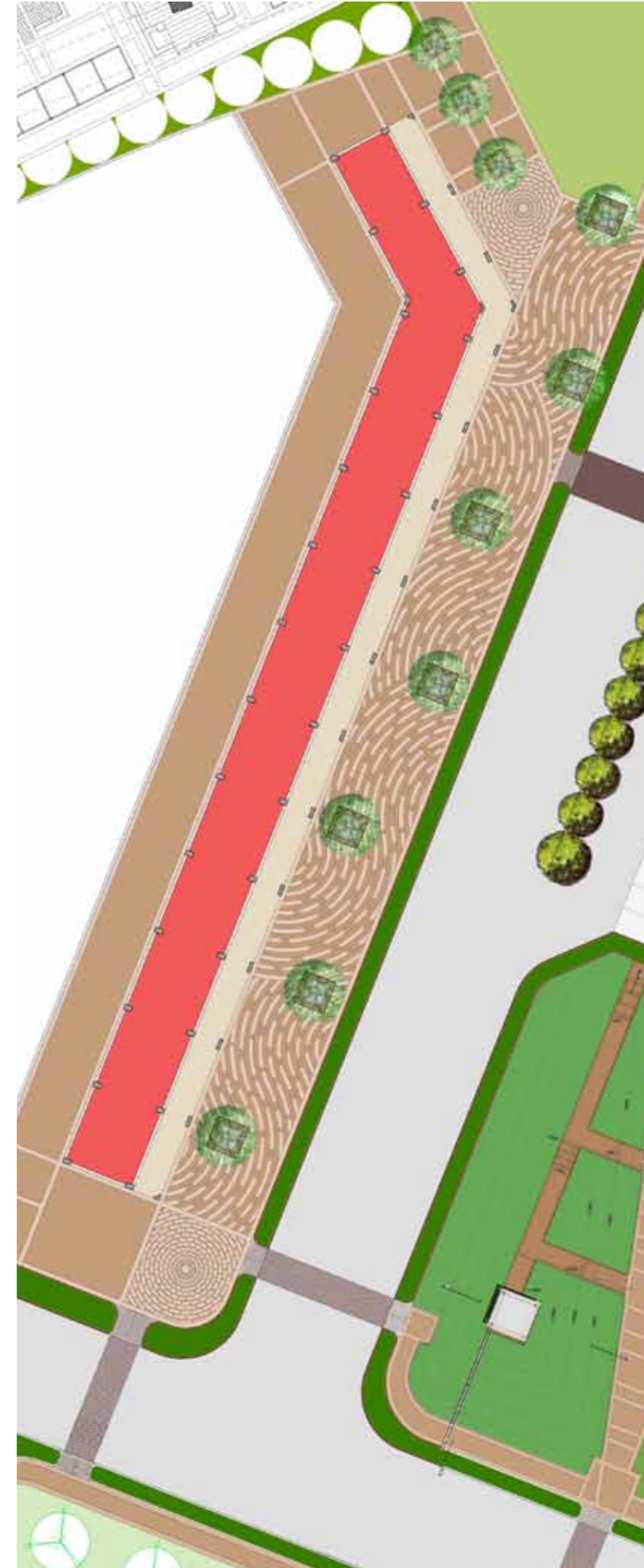
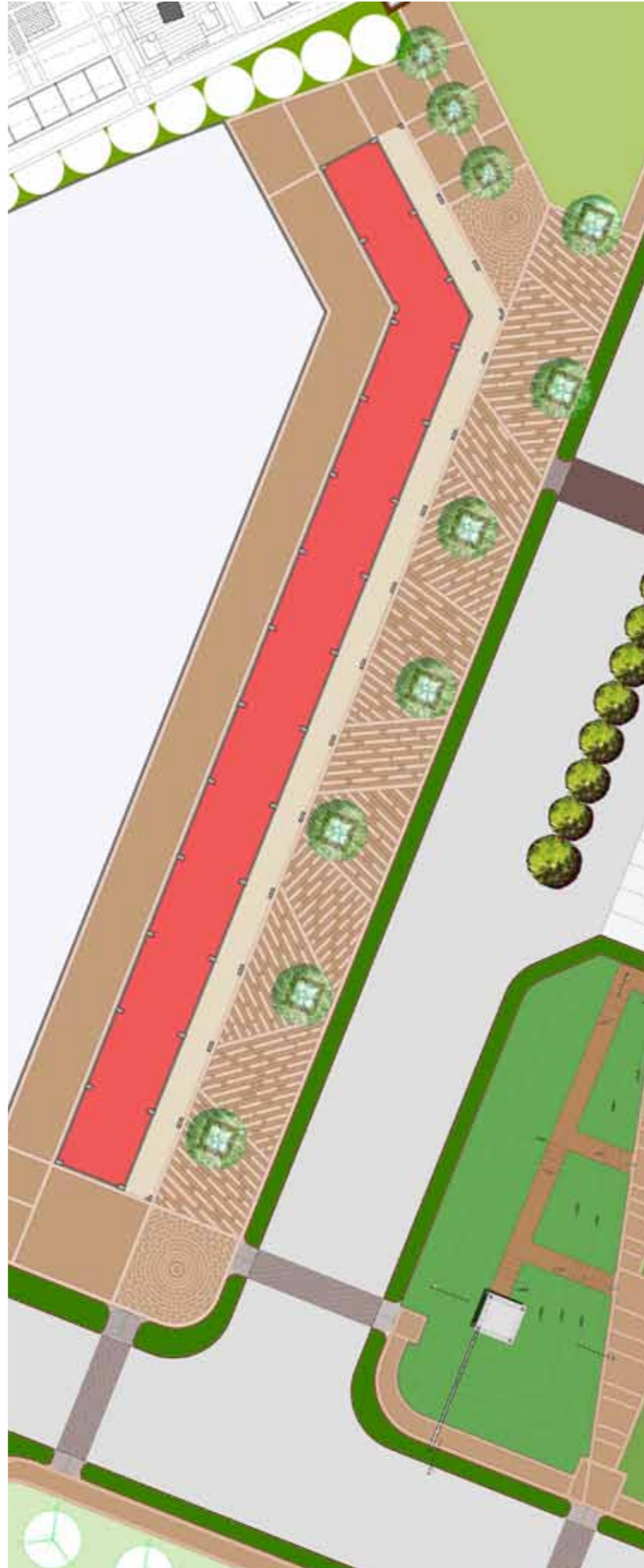
A wider pedestrian space enhances experiential quality and gives continuity to the pedestrian flow.



Key Plan

Flooring Options

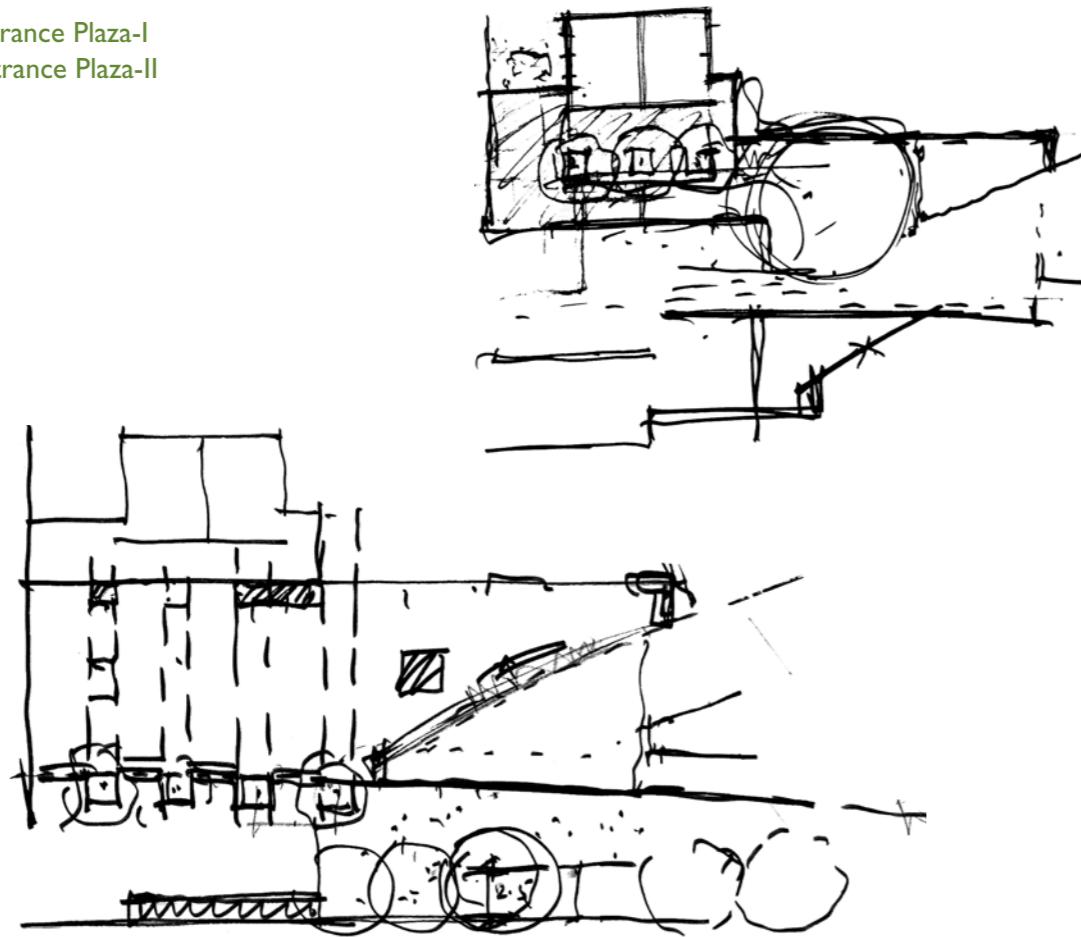
There can be variety of flooring options for the Shopping Plaza, two of the options are presented here.



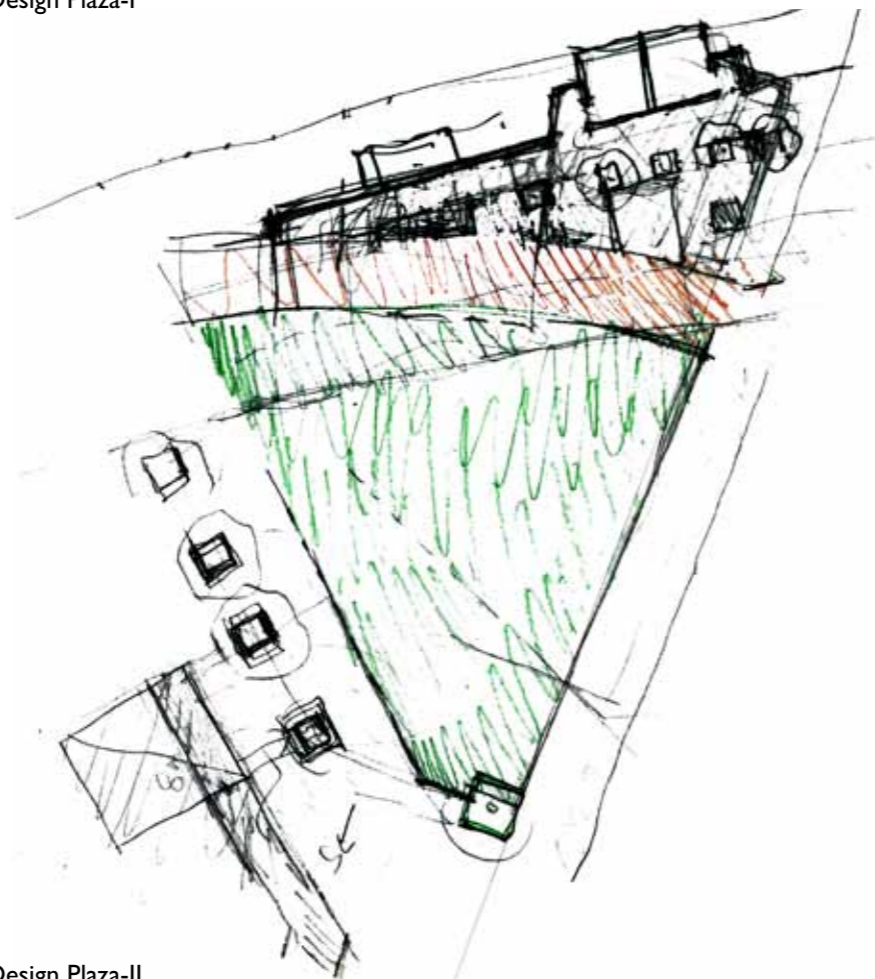
Key Plan

3.3.3 Pedestrian Entrance Plazas

- 3a Pedestrian Entrance Plaza-I
- 3b Pedestrian Entrance Plaza-II



Conceptual Design Plaza-I



Conceptual Design Plaza-II



Pedestrian Entrance Plaza-I



Pedestrian Entrance Plaza-II

Drinking Fountains and Toilets
 Rationale for location, access to them, identification, movement pattern perceived and anticipated:

For effective functioning and vitality of pedestrian network it is important that the system is reinforced with public amenities ancillary to the movement of pedestrians.

Locating these requirements forms a significant part of design. Thus the public facilities like toilets and drinking water arrangements are provided at the entrance plazas of the Crescent Walkway.

In public places, toilet entrances require a sensitive design approach to avoid any unease and events of eve-teasing.

3.3.4 Crescent Walkway

Seating Places

Comfort and shelter are essential characteristics of pedestrian needs and these need to be proficiently catered.

Seating places provide support for people to colonize the centre of the space, thus these are located parallel to the pedestrian flows.

Landscape plays a vital role in making spaces interesting and attractive, thus increasing the usability of space.

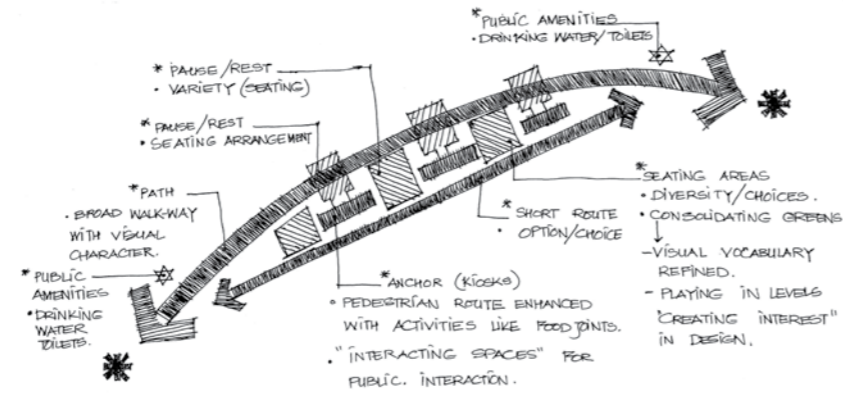
Shade and proper street furnishings improve the quality of the pedestrian environment.

Rationale for location, access to them, identification, movement pattern perceived and anticipated:

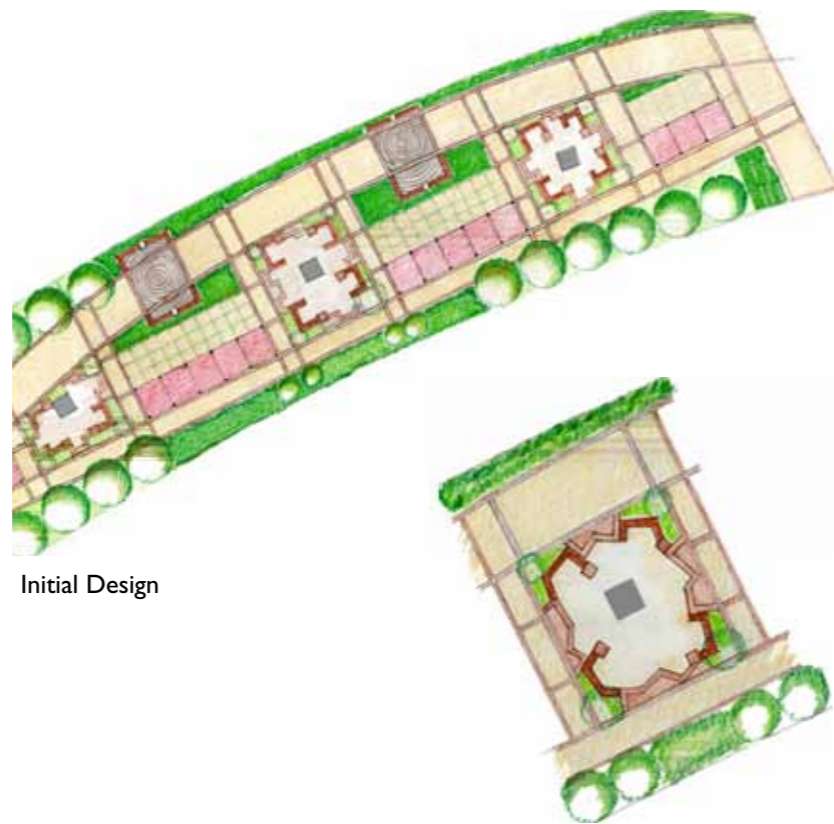
The functioning of a pedestrian route largely depends on the resting spaces provided for the users.

The Crescent Walkway thus has multiple interjections to create a sense of pause and provide seating spaces.

The linear pathway along the shops also designates resting places integrated with landscaping elements for the public.

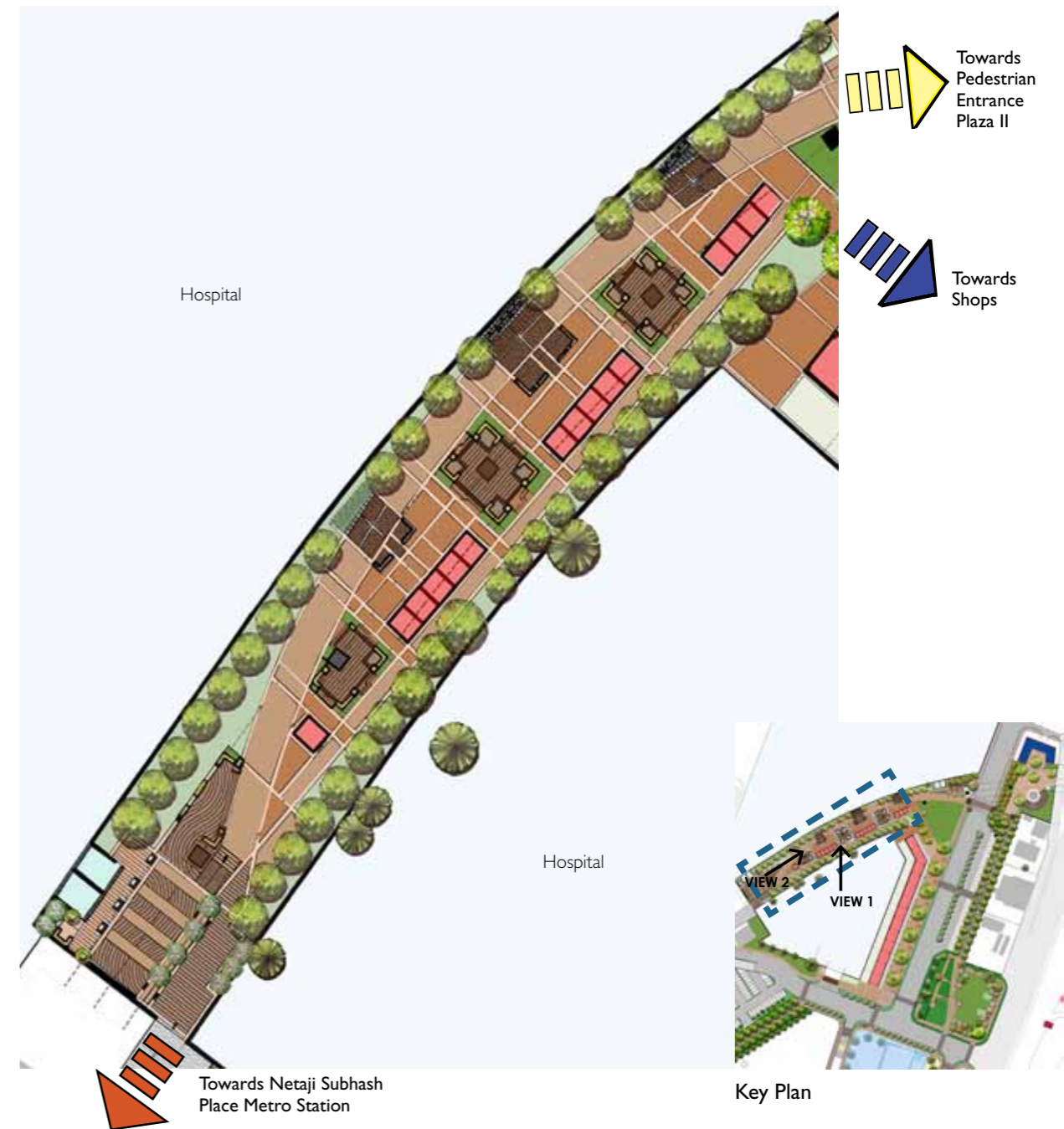


Design Exploration



Initial Design

Seating Alternative



Key Plan



View 1



View 2

Kiosks

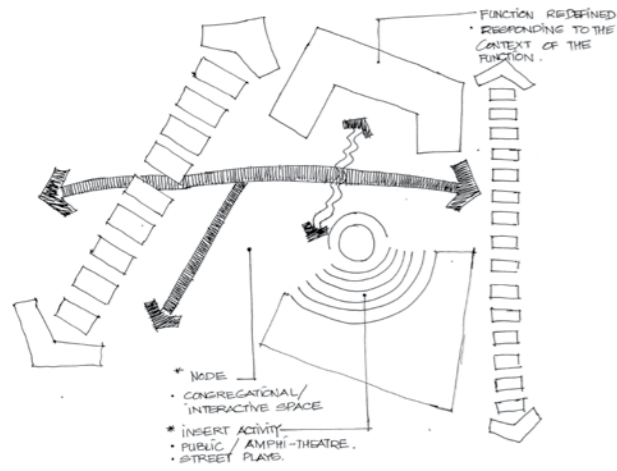
The rationale for kiosks underlies to reinforce the pedestrian movement.

The activities relevant to pedestrian movement like food, magazine stalls, etc. constitute as the element of the Crescent Walkway, adding an interest in the pedestrian journey.

These are on the path leading from one destination to another making it more rejoicing.

Thus it anticipates the existing and future developments in and around the site to strengthen the pedestrian structure.

3.3.5 Amphitheatre Plaza



Design Exploration

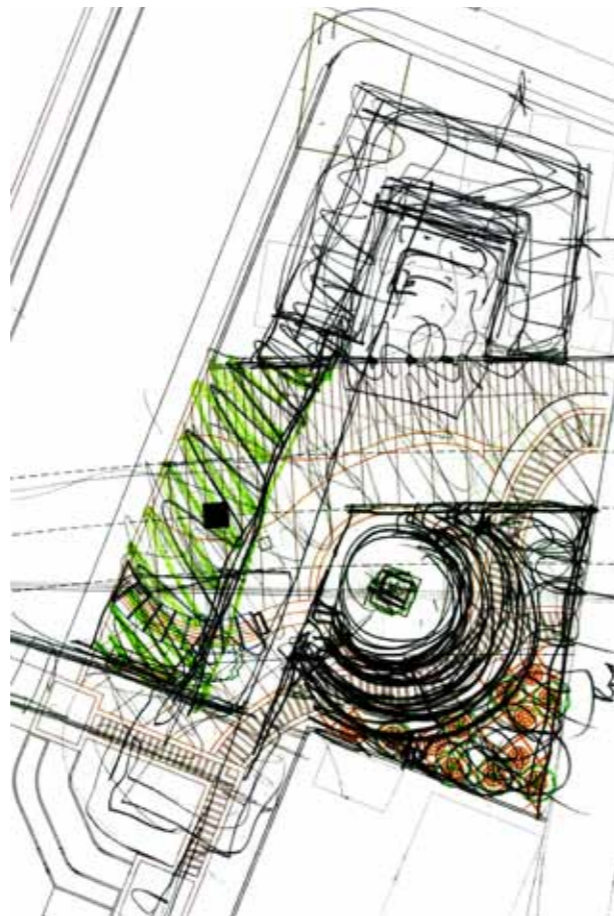
There is an opportunity to revitalize the part of the site by redefining the function through form of the built mass.

By modifying the Delhi Tourism office form and inserting public activities will act as another anchor.

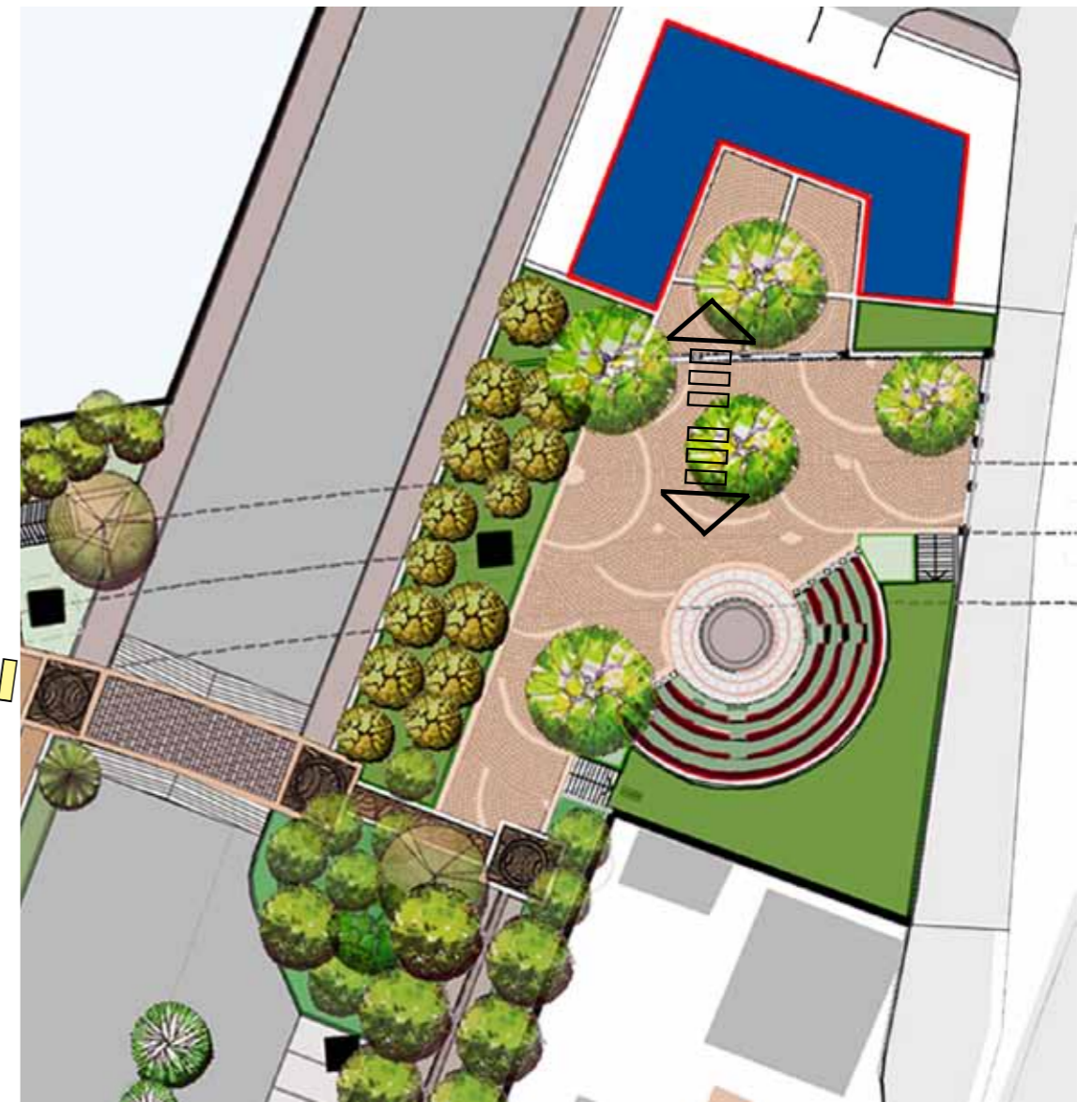
Rationale for location, access, identification, movement pattern perceived and anticipated:

The Delhi Tourism office has been modified in order to have a more outward looking form, which responds to the larger open space thus created through design intervention.

The Amphitheatre responds to the existing function which also holds a key in forming an interactive space with seating arrangement where impromptu street plays can be held.



Conceptual Design



View 1



Section through Delhi Tourism office (Proposed Form) and Amphitheatre Plaza



View 2



Key Plan

3.3.6 Tree Avenue

The linear space has been seen as a Linear Walkway leading to Entrance Park.

A shaded walkway with seating arrangements.

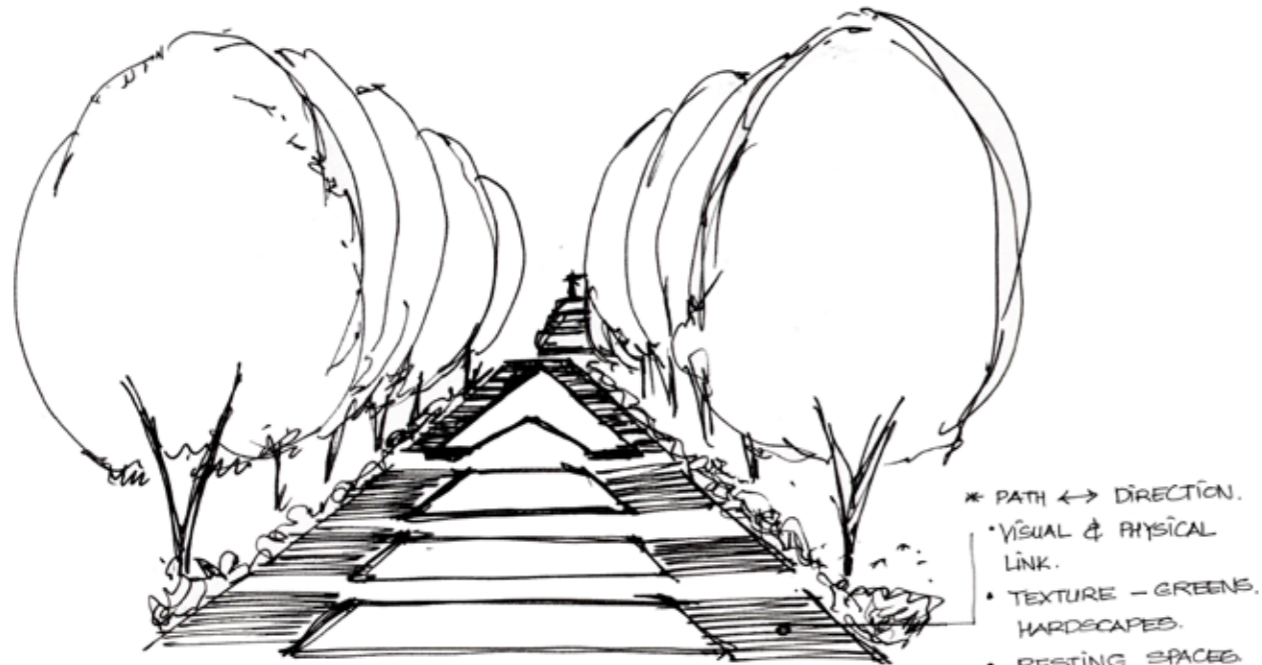
Medium to tall-sized shady trees constitute Tree Avenue.

The suggested tree species are:

- Peltophorum.
- Casia cyanea
- Ficus virens (pilkhan)



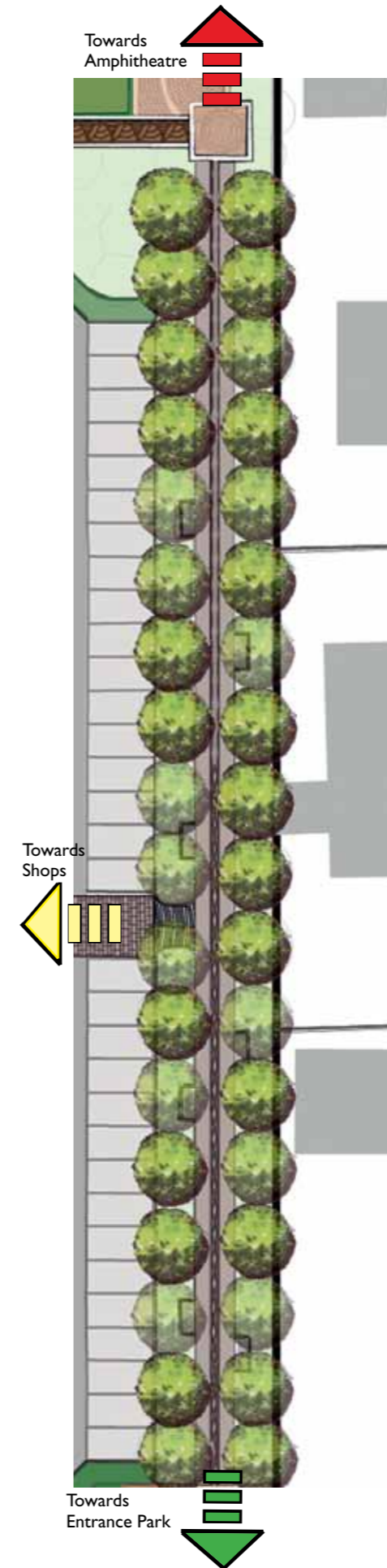
View 1



Design Exploration



Section through Shopping Plaza, street and Tree Avenue



Tree Species

A large deciduous tree, with a spreading canopy, height approximately 18 m.



Pilkhan (*Ficus virens*)



Bu Halima's Gate (Humayun's Tomb), New Delhi



A medium-sized deciduous tree, with a spreading canopy, height approximately 12 m.

African wattle (*Peltophorum Africanum*)



Key Plan

3.3.7 Aerial View



View 1

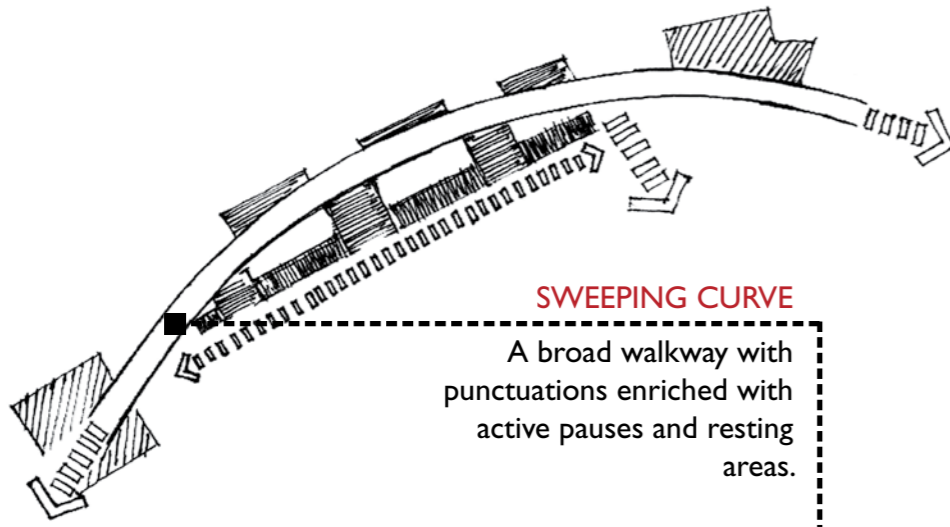


View 2



Key Plan

3.4 Conclusion

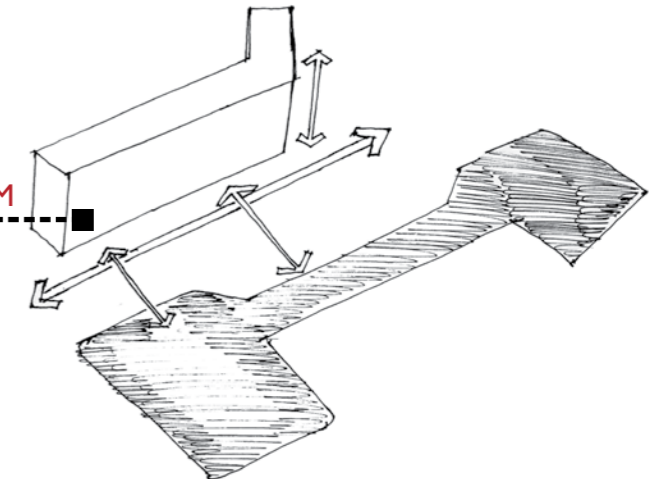


SWEEPING CURVE

A broad walkway with punctuations enriched with active pauses and resting areas.

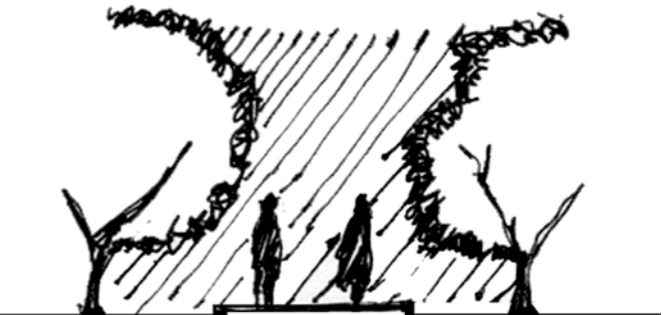
LINEAR COMMERCIAL FORM

Shopping consolidated into one mass resulting in a linear façade with a larger green space. It is better accessed to parking and the Green Area.



TREE AVENUE

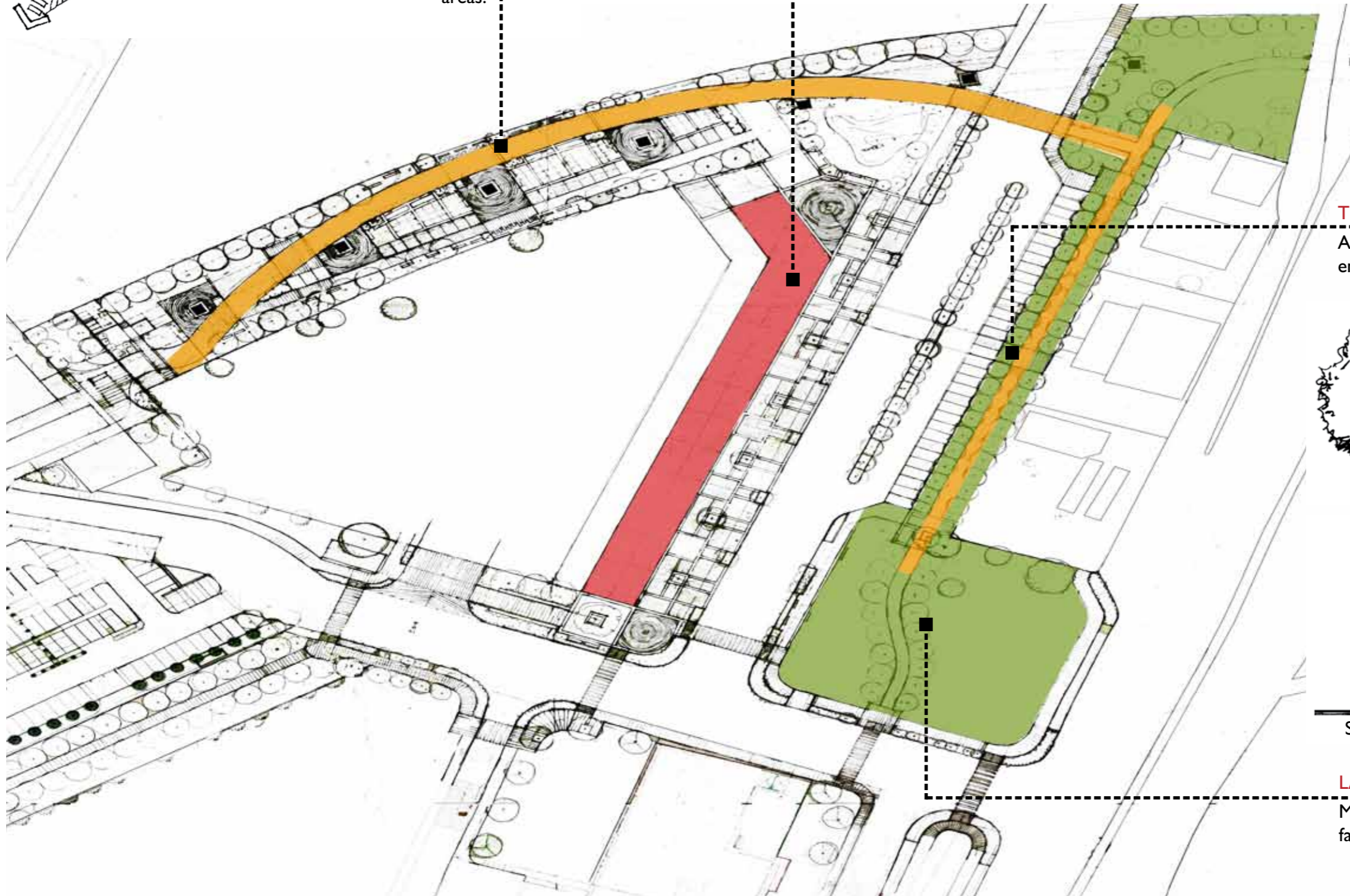
Accentuates the path giving directional emphasis – physical and visual.



Spatial Enclosure

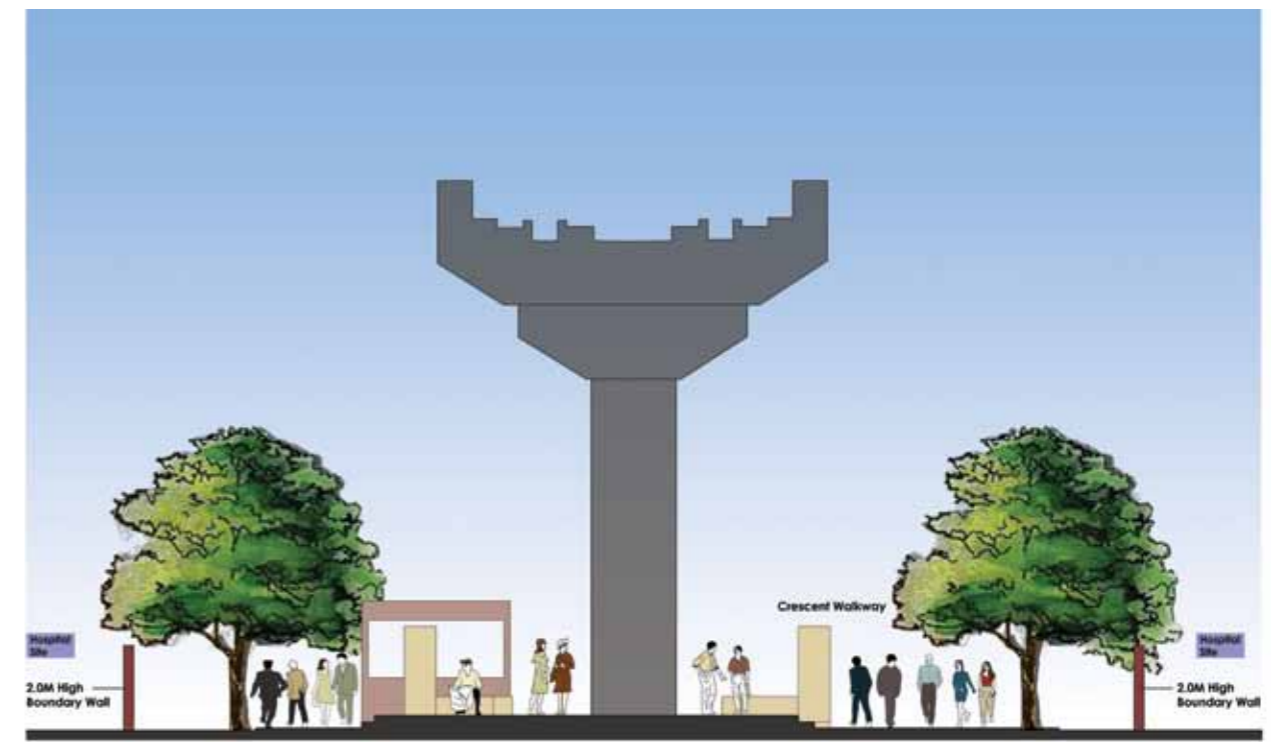
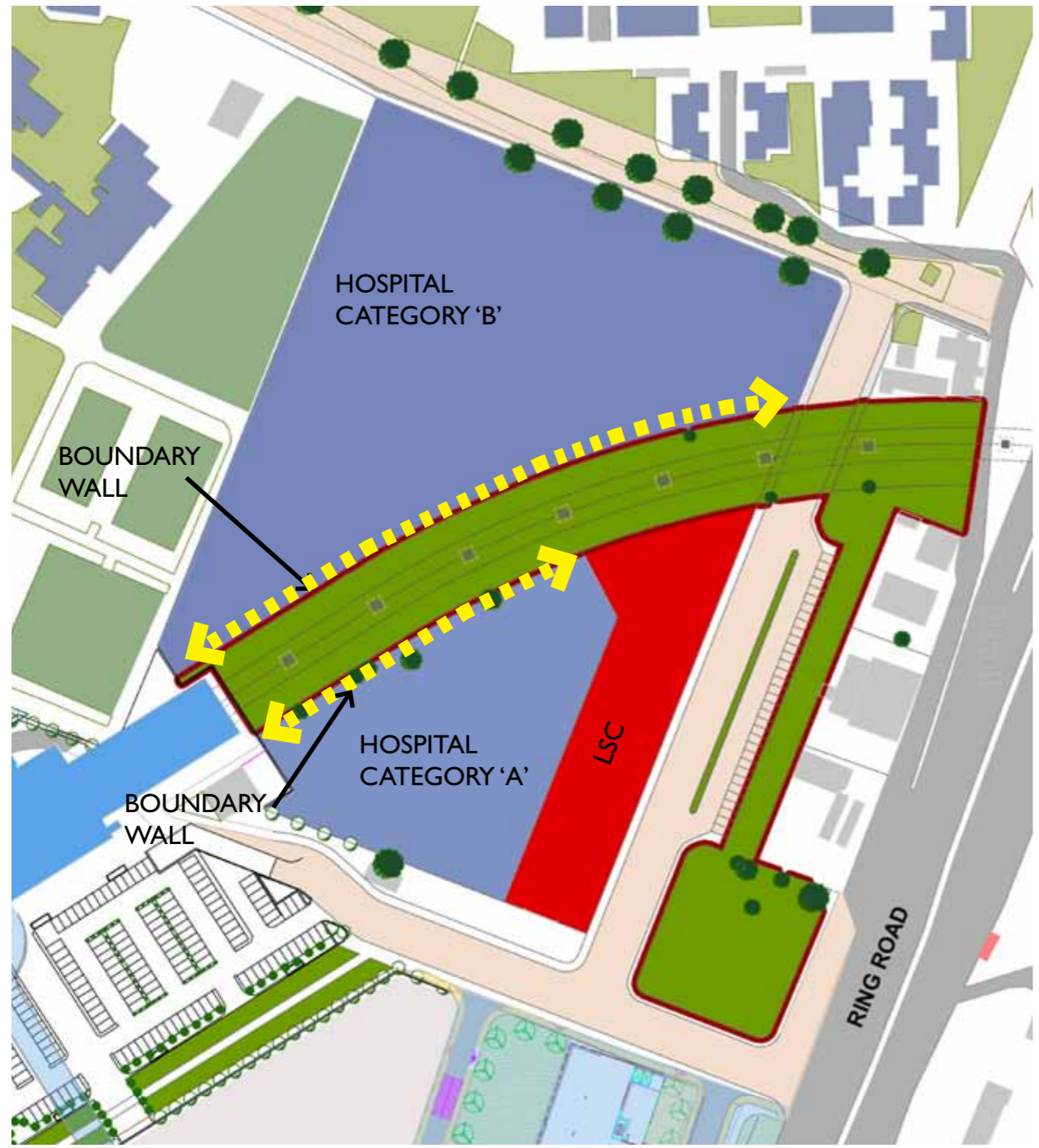
LARGER GREEN SPACE

Modification in road network facilitated in larger green mass.



3.5 Urban Design Guideline

The adjacent land uses as proposed by DDA mentions hospitals on either side of the linear site. This gives an opportunity to give guidelines for the boundary walls for the hospitals which can be integrated with the proposed design for the site.



Section through boundary wall and Crescent Walkway

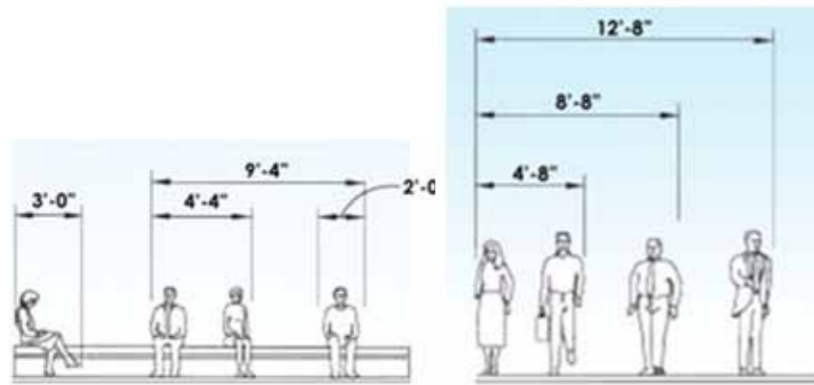
4.1 Physical Characteristics of Pedestrian

Source: Excerpts from Time Savers Standards Landscape Architecture.

Dimensional Criteria

Human Dimensions and Activity

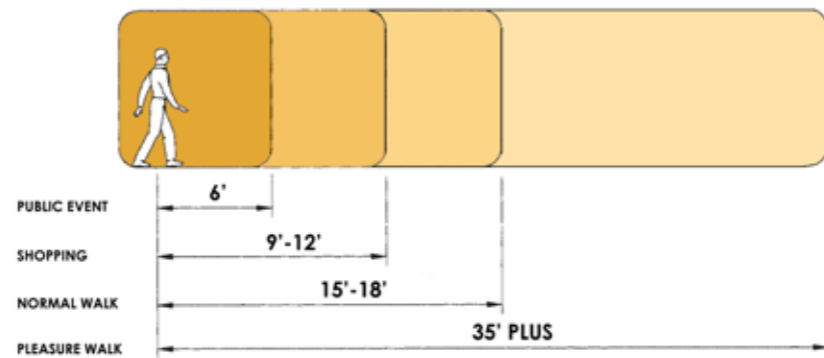
Spatial requirements differ in various regions and between different cultures as a function of accustomed densities of people, heritage and social and environmental values.



Forward Spatial Bubbles

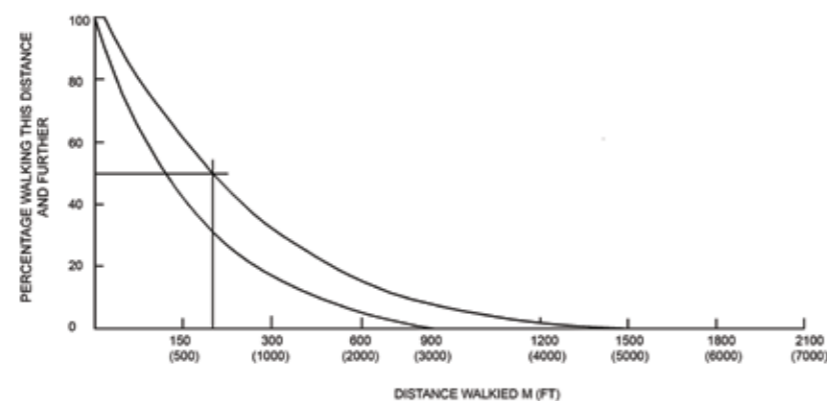
Forward spatial bubbles refer to the extent of unobstructed forward vision held to be psychologically comfortable for the average pedestrian under various circumstances.

The spatial requirements for psychological comfort will differ across regions and cultures.

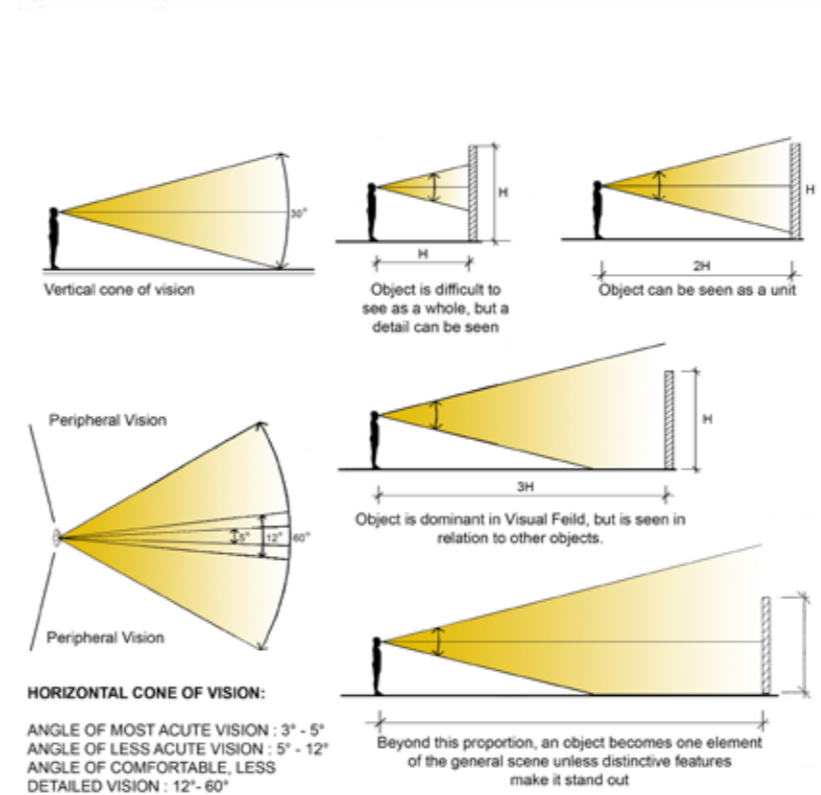
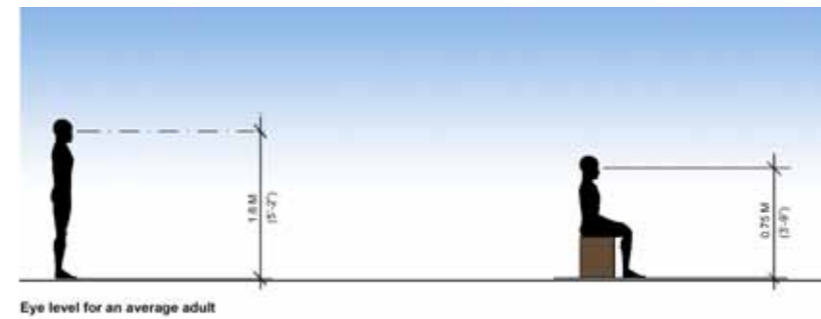


TYPE	mm/min.	ft./min	km/hr.
Average adult	78000	260	4.3
Elderly (75yrs)	64500	215	4
Bunching	60000	200	3.7
Stairways (going down)	45600	152	2.8
Stairways (going up)	33900	113	2

Table-1



Range of acceptable walking distances (U.S. cities). Most people are not willing to walk distances greater than about 220M (700 ft).



HORIZONTAL CONE OF VISION: ANGLE OF MOST ACUTE VISION : 3° - 5° ANGLE OF LESS ACUTE VISION : 5° - 12° ANGLE OF COMFORTABLE, LESS DETAILED VISION : 12° - 60°

Visual Criteria

Eye Levels and Cone of Vision

The eye-level of an average adult in a standing position as well as sitting position is illustrated on the left.

Pedestrians will focus most of their attention at eye level and below during normal perception of their surroundings.

The human cone of vision (i.e., the fixed eye) is approximately 30 degrees vertically and 60 degrees horizontally, with angles of acute vision somewhat less than this, as illustrated on the left.

Eye levels and cone of vision are especially important in terms of the placement and orientation of pedestrian signage.

Visual Perception

Sense of Spatial Enclosure:

An external enclosure is most comfortable when its vertical planes are one-half to one-third as high as the width of the space enclosed.

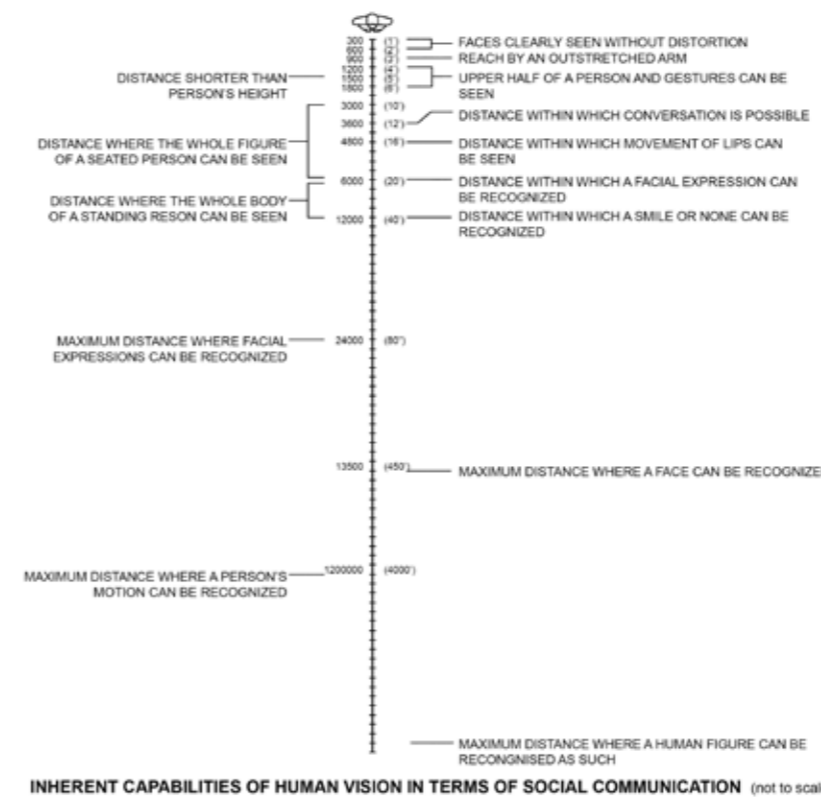
If the ratio falls below one fourth, the space begins to lack a sense of enclosure.

Social Communication

For a variety of reasons, the scale and form of a space will influence pedestrian behaviour and the type of social communication that may occur within that space.

Physical distances that bring people into close proximity, or separate them, are important design considerations.

Settings meant to be conducive to active social communication, or those meant to allow a certain degree of eye contact possible, and probable, within the scale and layout of the setting.



INHERENT CAPABILITIES OF HUMAN VISION IN TERMS OF SOCIAL COMMUNICATION (not to scale)

4.2 Spatial Standards

Pathway Width and Slope Criteria

Widths of pedestrian pathways vary depending on the purpose and the existing or expected intensity of use. In general, a 600 mm (24 in) width for each pedestrian is necessary, which suggests a minimum pathway width of 1,200 mm (4 ft) for public walkways.

Pedestrians as a group usually do not use the entire width of most of the pathways.

The edge of the walkway adjacent to a curbed roadway, i.e. 750 mm (30 in.) from the street edge, is avoided by pedestrians, as is the edge of the building façade i.e 450 to 750 mm (18 to 30 in.).

These edges are used only under conditions of high pedestrian density.

The presence of street furniture and features, such as fire hydrants, trees, parking meters, telephones, trash receptacles, fountains, sculpture and kiosks also reduces the effective width of a pathway.

Walkway

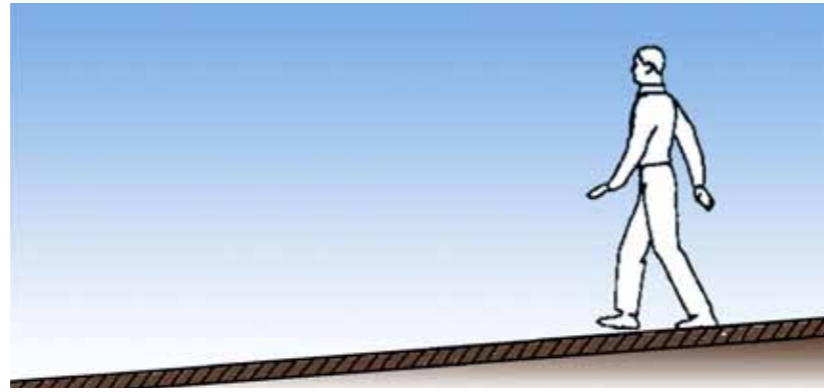
Longitudinal slope criteria are based on user abilities and design objectives, and cross-slope criteria are based on the need for positive drainage, depending on paving material.

Porous paving material thus won't require as much of a cross-slope for drainage as would non-porous paving material.

Stairways

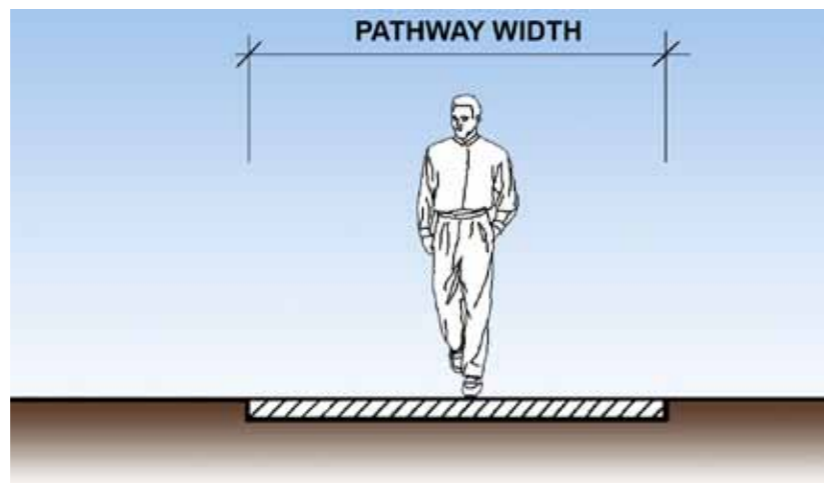
Widths

- Minimum width for public stairways should be 1,500 mm (60 in.).
- Minimum width for private stairways should be 1,050 mm (42 in.)



LONGITUDINAL SLOPE

0% to 3% slopes preferred
5% slopes maximum
5% to 10% slopes possible if climatic conditions permit
5% to 8% slopes are considered ramps



CROSS SLOPE

1% cross-slope minimum. (Depending on material).
2% cross-slope typical.
3% cross-slope maximum.

Tread-Riser Ratios

Tread-riser ratios are always constant within any particular stairway or set of stairways, for ease of ascent or descent, and for safety reasons.

On rare occasion, riser heights in stairways will vary (e.g., stairways built obliquely into a slope), but these are hazardous and should be avoided whenever possible.

On very gentle slopes of 0.5 to 2.0 %, a stairway can be built to slope with the grade rather than remain level, in order to keep the bottom riser at a constant dimension.

The bottom of stairway grade (B.S) can be wrapped to maintain a constant along the edge of the bottom tread.

Tread widths also vary for aesthetic reasons, as in case of terraced plazas when these are used as informal gathering places rather than as purely utilitarian transitional spaces.

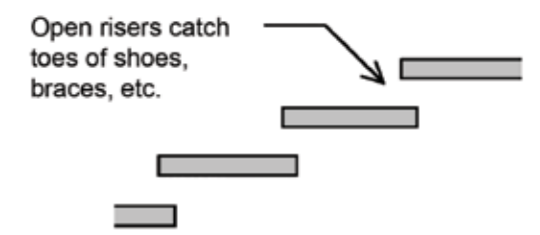
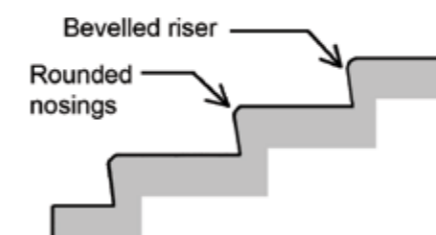
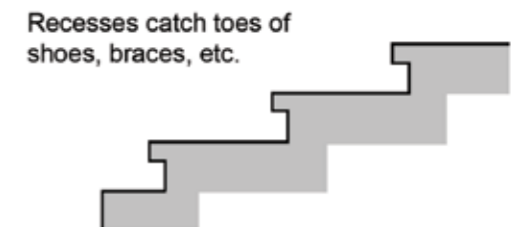
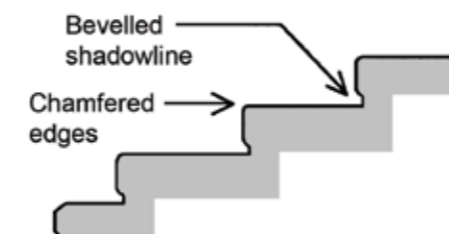
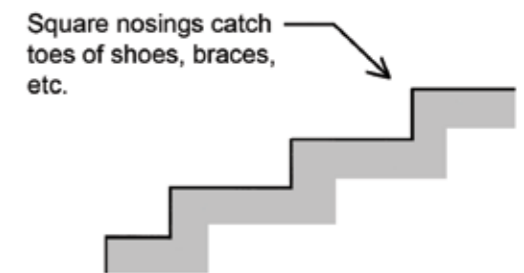
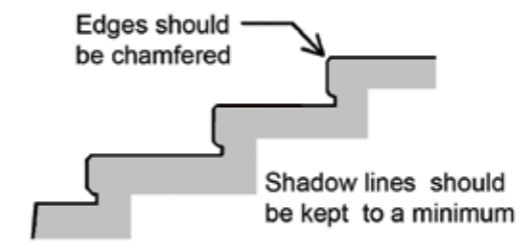
Additional Considerations

Outdoor stairways should be made easier to ascend than interior stairways. People tend to move at greater rates outdoors than they do indoors.

Single steps in walkway are dangerous and should never be specified. At least two steps, but preferably three, should be specified, and their presence should be announced conspicuously with railings, plantings or lighting.

Risers for outdoor stairways should be a minimum of 115 mm (4.5 in.) and a maximum of 150 mm (6 in.). A 175 (7 in.) riser may be considered for utilitarian purposes.

Tread should be pitched downgrade 2 % for drainage.



These profiles are considered relatively safe

These profiles can be hazardous

Height Between Landings

The height between landings is an important criteria for psychological reasons as well as for human endurance.

Abrupt changes in ground levels, even as little as 300 to 500 mm (1-1 1/2 ft.) can decrease incentive to proceed.

Changes of 1,800 mm (6ft) or more are found to be strongly discouraging.

Thus, heights between stairway landings are best designed so that an adult of average height standing on one landing can see the ground plane of the next higher one, ie 1,500 mm (5 ft.) or less.

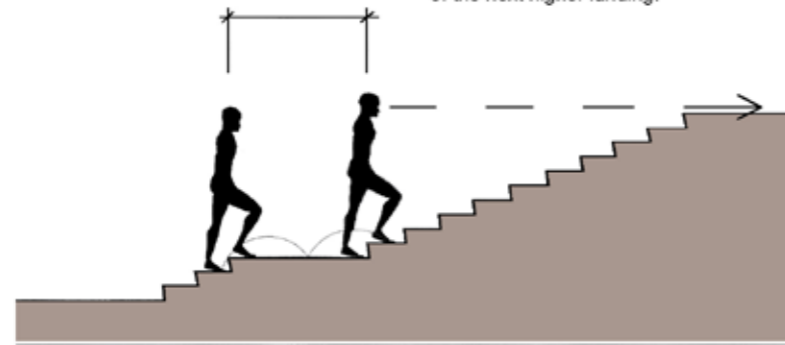
A minimum of two steps should be provided. Three steps are preferred to ensure clear legibility of the grade change

Landings should be long enough to allow an easy cadence with a minimum of three strides on the landing.

A 1500mm (5') length landing is a typical Minimum.

Longer landings are typically multiples of 1500mm (5') i.e. 1500 (5'), 3000 (10'), 4500 (15') Etc.

The Height between landings should be kept to a maximum of 1500mm (5') to allow a view of the next higher landing.



Stairway height and landing proportions. Check state codes where applicable.

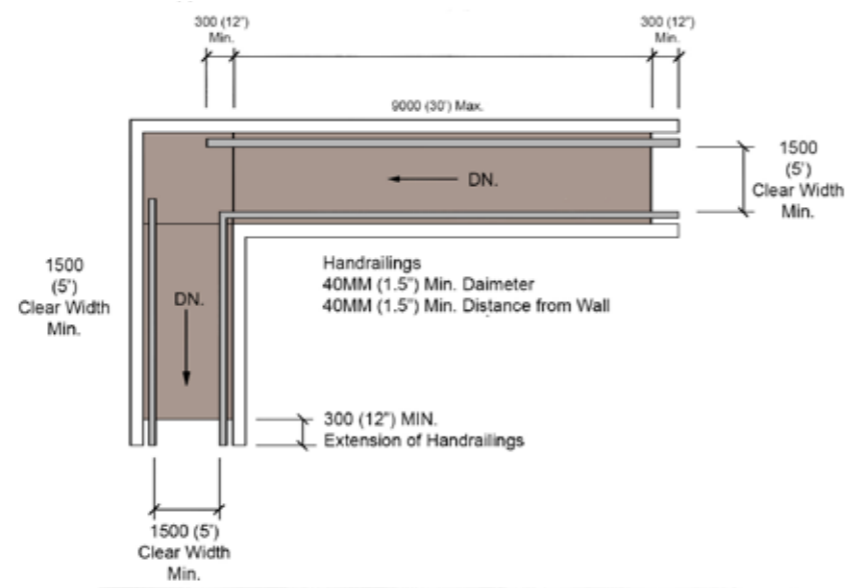
Ramps

Widths

Ramp widths are determined according to the type and intensity of use.

One-way travel requires a clear minimum width of 900 mm (3 ft.), whereas two-way travel requires a clear minimum width of 1,500 mm (5 ft.).

If turns occur at landings, adequate space for manoeuvring wheelchairs must be provided.



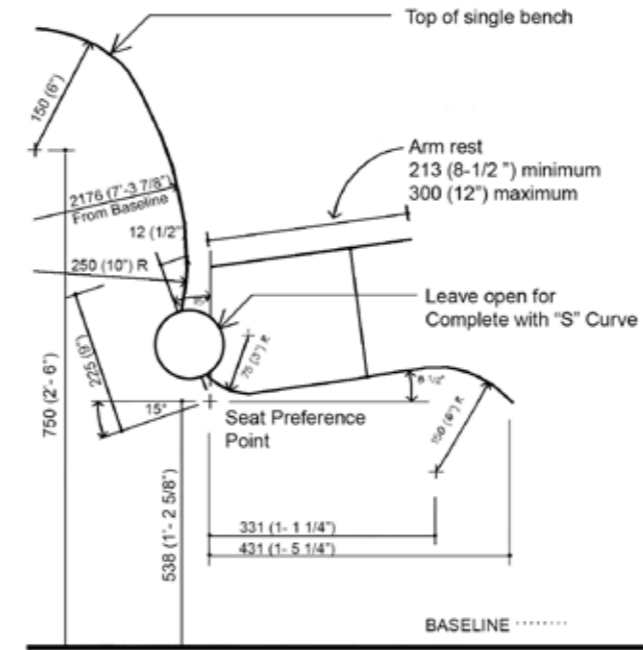
Dimensional criteria for two-way handicap ramp. Minimum clear width for one-way travel is 900mm (36 in.). Check state codes where applicable.

Slope Criteria

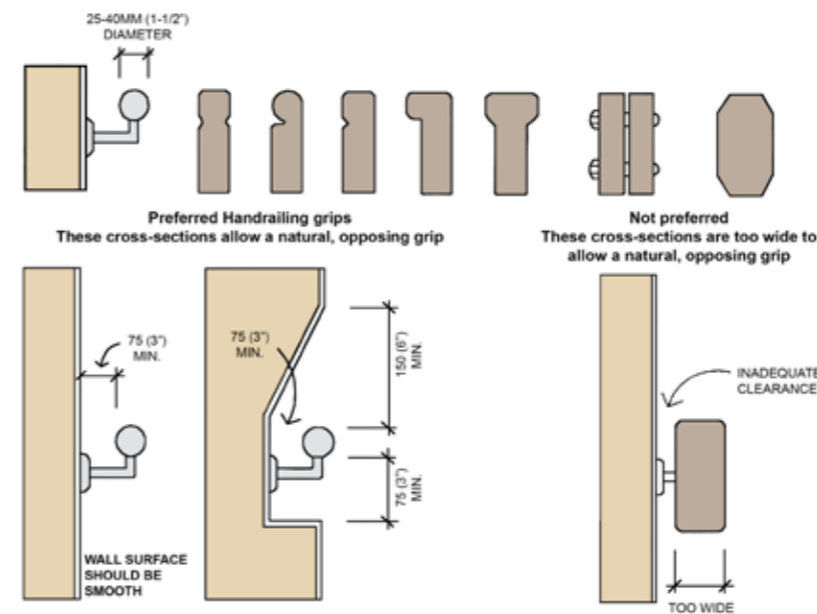
Ramp slopes must not be greater than 1:12 or 8.33%. Curb cuts are an exception: 1:8 or 12% being acceptable if the running distance is less than 900 (3 ft.)

Distance between Landing:

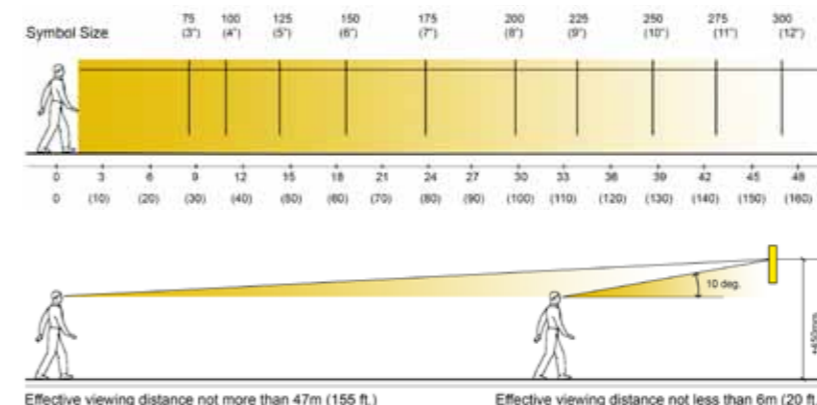
- Landings should be provided within every 9,000 mm (30 ft.) or less of ramp length.



Preferred Height and Seating Angle for Outdoor Benches



Preferred Handrailing Profiles



Effective viewing distance not more than 47m (155 ft.) Effective viewing distance not less than 6m (20 ft.)

Seating Criteria

Benches should be designed to ensure greatest comfort for the individual.

Seat walls are typically 400 to 450 mm (16 to 18 in) wide and between 400 to 450 mm (14 and 18 in) in height, 400 mm (16 in) being most preferred.

Handrailings

Handrailings are important on all stairways and ramps, and should allow a secure and comfortable grip for maximum support.

Handrailing heights for outdoor stairways and ramps typically range from 750 to 850 mm (30 to 34 in).

The ends of the railings should extend beyond the top and bottom step by 300 to 450 mm (12 to 18 in.) and should be rounded off or turned under for safety reasons.

This detail is important for individuals with impaired vision.

Additional considerations

Handrailings on both sides of a stairway or ramp are important because some people have strength only on one side.

Extra wide stairways should have centre railings for greater convenience. Handrailings should not be 6,000 mm (20 ft) apart.

Railings should continue across intermediate landings.

Handrailings for children, at a height lower than that specified for adults, are sometimes advisable and are also useful on ramps for individuals who use wheelchairs.

Pedestrian Signage

Design and placement of signs for use by pedestrians involves consideration of visual field, scale of letters, proportions of letters and background.

