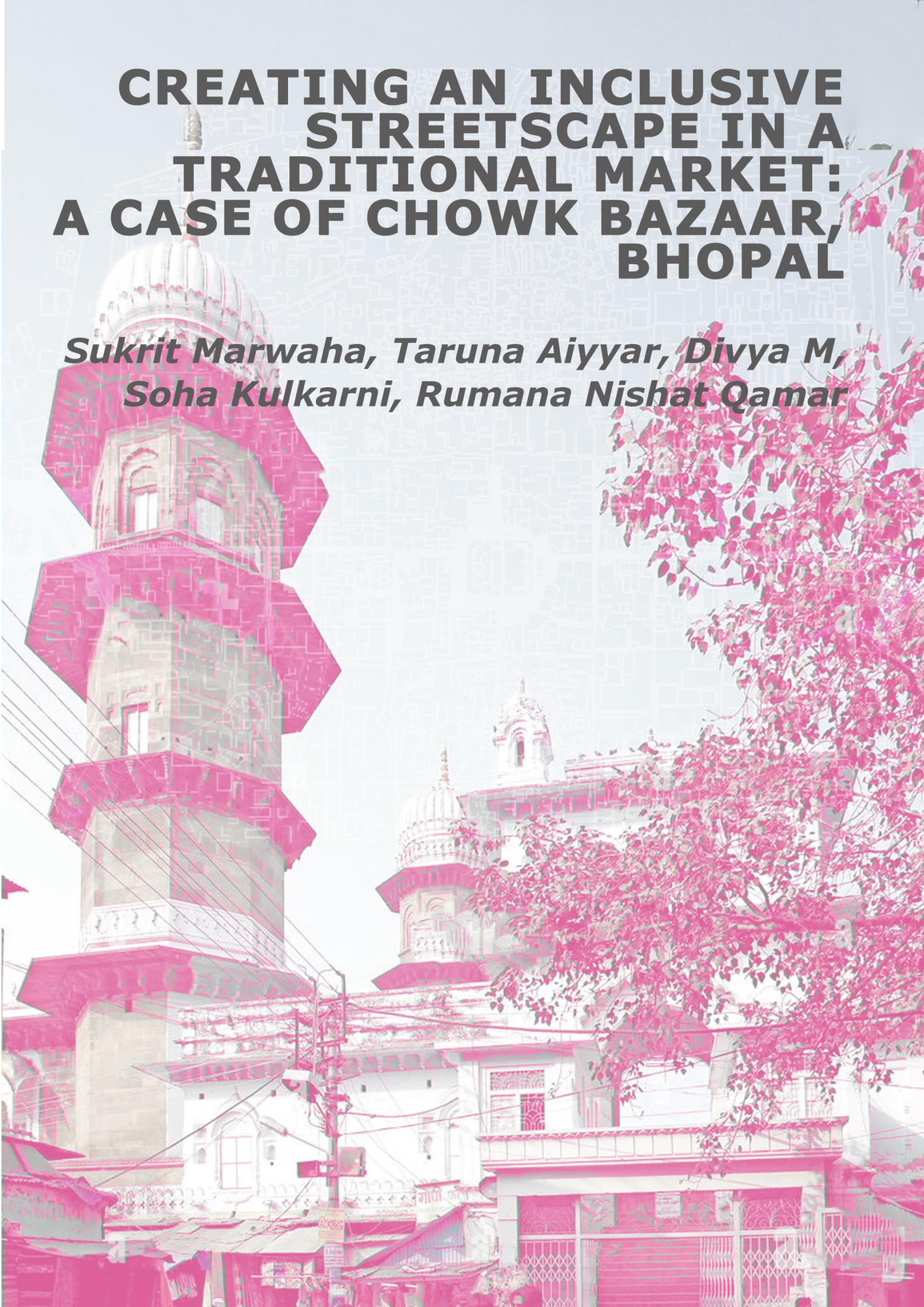


CREATING AN INCLUSIVE STREETSCAPE IN A TRADITIONAL MARKET: A CASE OF CHOWK BAZAAR, BHOPAL

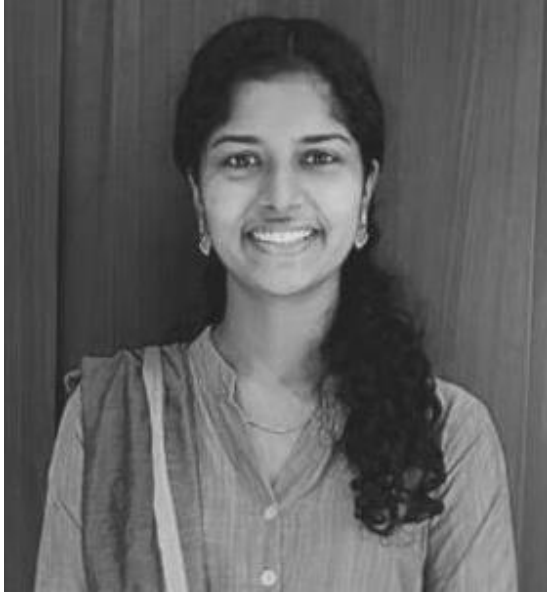
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Sukrit Marwaha, Taruna Aiyyar, Divya M, Soha Kulkarni, Rumana Nishat Qamar.

Abstract

Streets are the living rooms of our cities where we experience the city up-close and personal. They are not just a means to get to the desired location but a window into the life that lies on either side. Indian streets experience a plethora of activities, festivities and general day to day interactions which shape our city. Chowk Bazaar is one such market square located in the heart of the then walled city of Bhopal. Now the central historic core, the market is the epicenter of Bhopali culture, cuisine, traditions, and commerce. Under the guidance of our Urban Design studio as well as our Inclusive Design studio in the ninth semester, we explored the streetscape of one of the cardinal axes of the market square. With the aim to observe, analyze the street through various parameters and deduce various ways to make the streetscape inclusive to the identified user groups.

Introduction

Chowk bazaar or the hub for all markets, is an integral part of old Bhopal. Located in the heart of Bhopal, it hosts varied communities that together create 'a mosaic of subcultures.' As one of the oldest markets of Bhopal, this grid-iron pattern bazaar has a high heritage value with Jama Masjid at its center acting as an anchor point that attracts a large footfall. The market grows, accommodates, and adapts to the current trends; it is restricted by the area of an old city. This leads to haphazard growth of buildings, shops, marketing and so on, that creates conflicts between the users and their movement

patterns. This results in the unavoidable situation of over spilling onto the streetscape thus, making it inaccessible to all.

The research aims to identify the diverse user groups and the physical obstacles they face while accessing and interacting with the East-West cardinal axis street of Chowk Bazaar, Bhopal. The study embodies the notion of a barrier-free streetscape that promotes inclusion while stimulating the community to respond favourably to its urban setting.

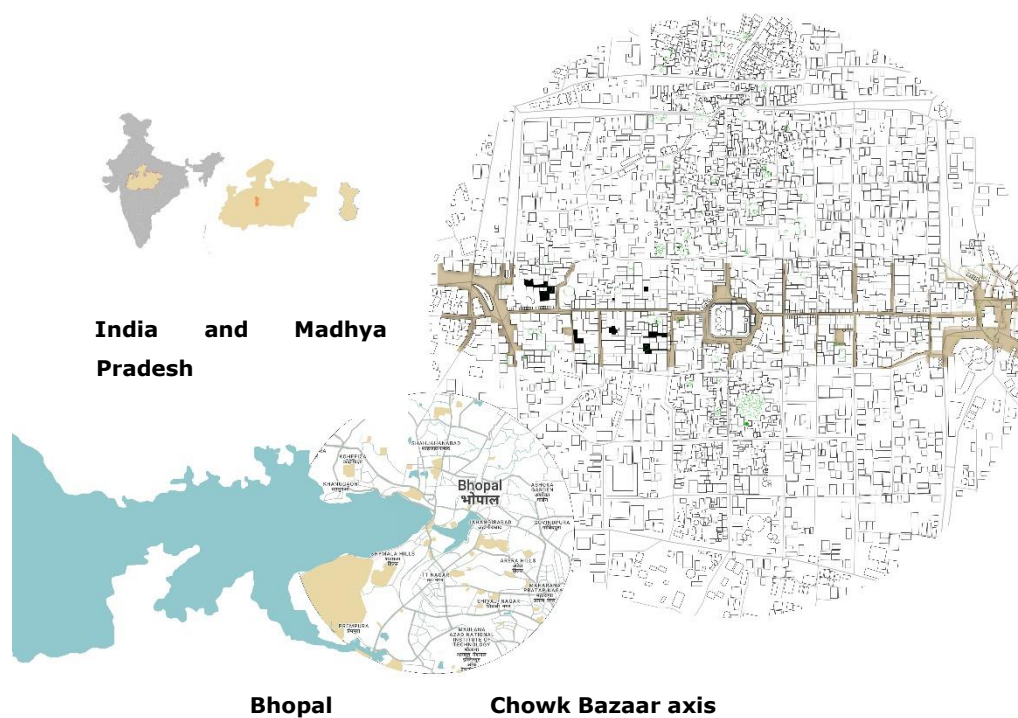


Fig 1. Location of Chowk Bazaar

Scope:

- The research paper focuses on the study of the traditional market streetscape of Chowk Bazaar in Bhopal, covering the stretch from Peer Gate to Itwara Gate.
- The main objective of the study is to identify the existing barriers to accessibility and to propose inclusive design

solutions to create a barrier-free streetscape in the traditional market.

- **The study being a product of both urban design and inclusive design studios, analyzes the streetscape from a macro to micro level.**
- **The research covers various aspects such as physical, sensory, and cognitive barriers faced by all including people with disabilities, elderly people, and parents with strollers.**
- **The study also evaluates the current design and infrastructure of the market street and proposes design recommendations to enhance accessibility and inclusiveness.**

Limitations:

- **The study is limited to the specific stretch of the traditional market street in Bhopal and may not be generalizable to other market areas or cities.**
- **The research is based on the observations and analysis conducted during the studio for the past six months and may not cover all aspects of the traditional market street.**
- **The study does not consider the economic feasibility of the proposed design solutions, which may impact their implementation.**

History

The history of Bhopal is primarily divided into three periods.

1. Period of Unrest and Feudal Wars from 1010 – 1870 AD

This period led to the discovery of Bhopal city by Rajabhoj in 1010 AD and to the creation of upper lake with the construction of earthen dam in the southeastern side of the lake. Dost Mohammad Khan ruled from 1720-1726 AD. During his time in power, he contributed to the

creation of the precinct, which included the Fatehgarh Fort. He also fortified the city with six major gates that were named after weekdays: the Imami Gate, the Peer Gate, the Jumerati Gate, the Itwara Gate, the Budhwara Gate, and the Ginnori Gate.

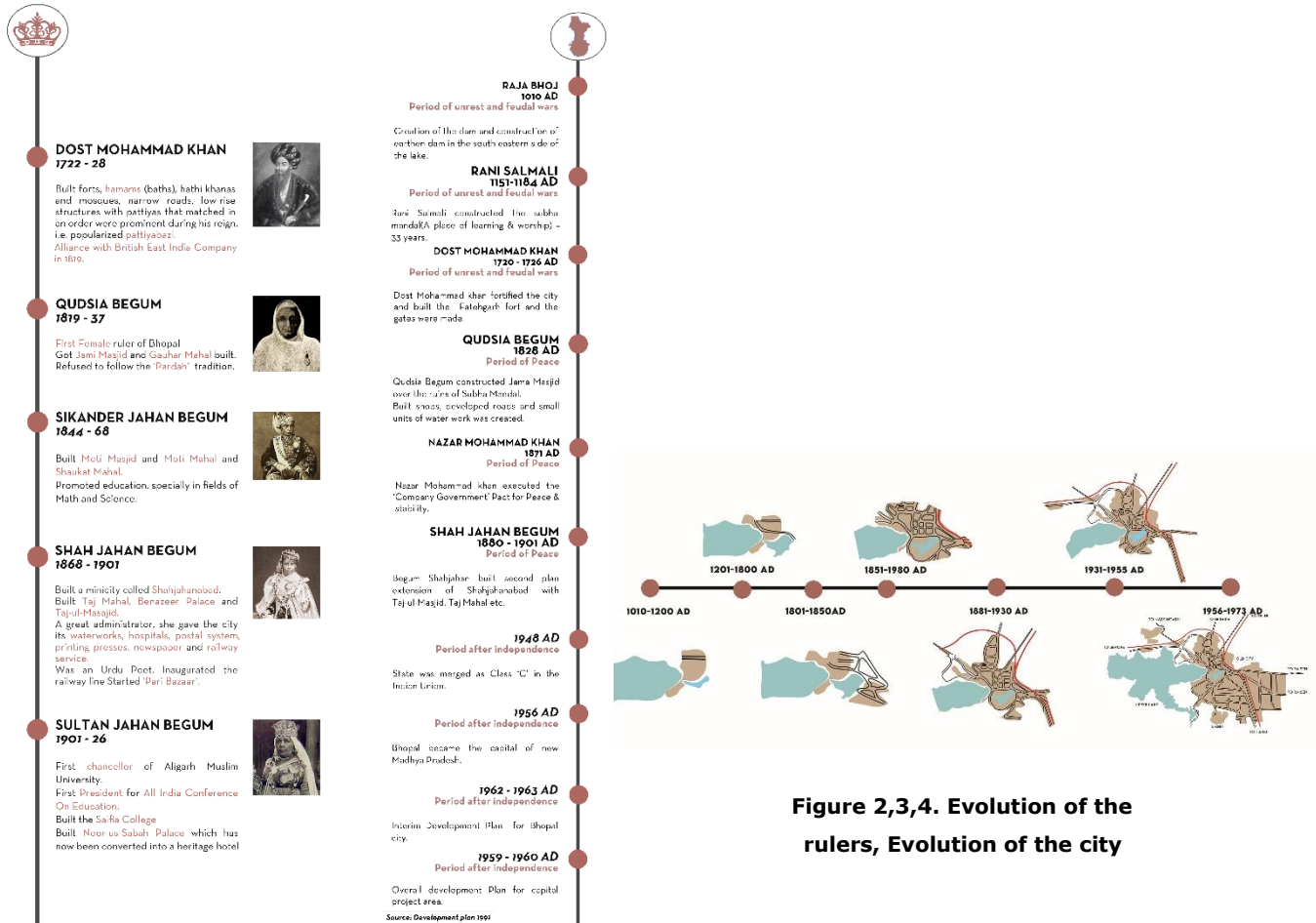


Figure 2,3,4. Evolution of the rulers, Evolution of the city

2. Period of peace from 1828 to 1901 AD:

A total of four begums were in-charge of Bhopal. Jama Masjid was built by the Qudisia Begum over the SubhaMandal ruin. It is said that the Chowk Bazaar was set up by Qudisia Begum for herself. She brought jewelers and traders from different corners of the country and started a small market. The city thrived under the Begums, who built numerous, many palaces, Shops, road development and small units of water work.

3. Post-independence period(1947)

During this period, Bhopal became the Capital of New Madhya Pradesh and hence led to the construction of residential quarters, secretariat, and other office buildings. Planned Townships arose along with better connectivity and services. Markets were shifted from the city center to other peripheral locations.

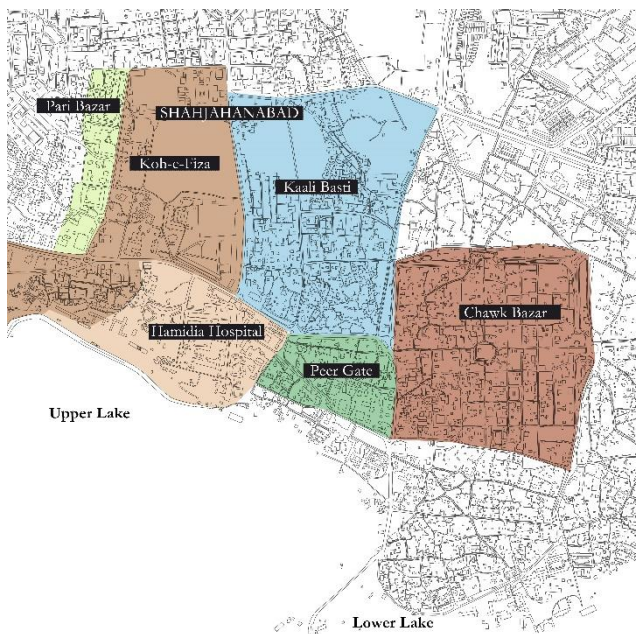


Figure 5. Ward Map of the old city

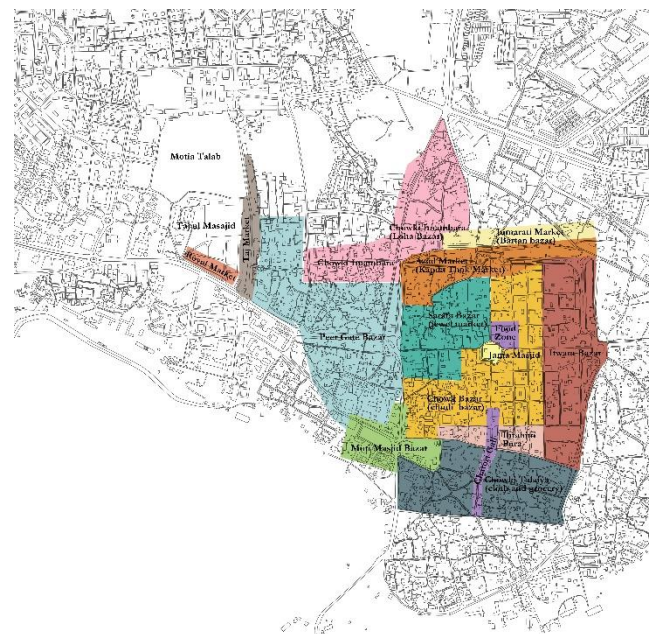


Figure 6. Markets of the old city

Contextual study:

To understand the streetscape in a comprehensive manner, various studies were conducted based on observation and mapping.

Cluster mapping

Cluster mapping allows us to understand the built density and fabric of the built. Deducing the cluster patterns allows us to study the history and evolution of the city and typology of dwellings and their shapes coming up on the street.

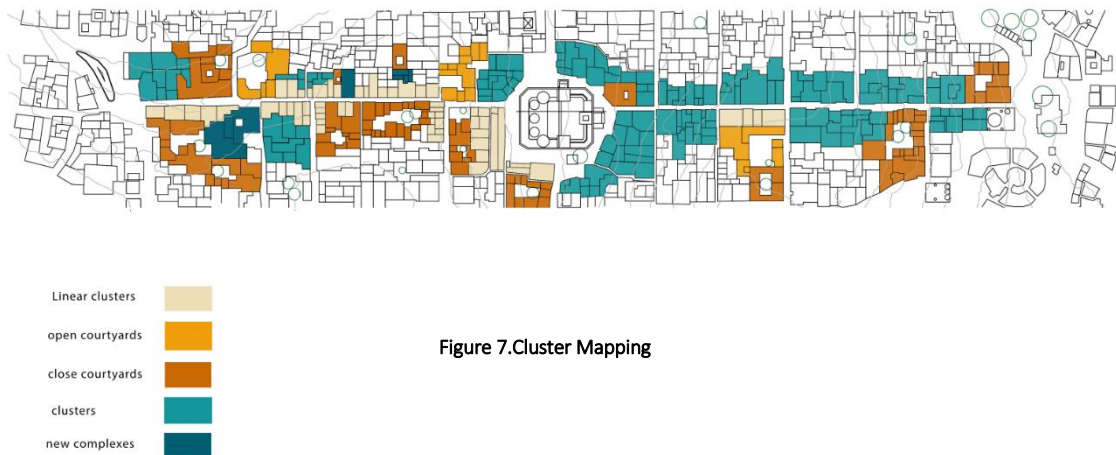


Figure 7.Cluster Mapping

Height Map

The street due to commercialization has higher building heights in the first half between Peer Gate and Jama Masjid as compared to the second portion of the street.

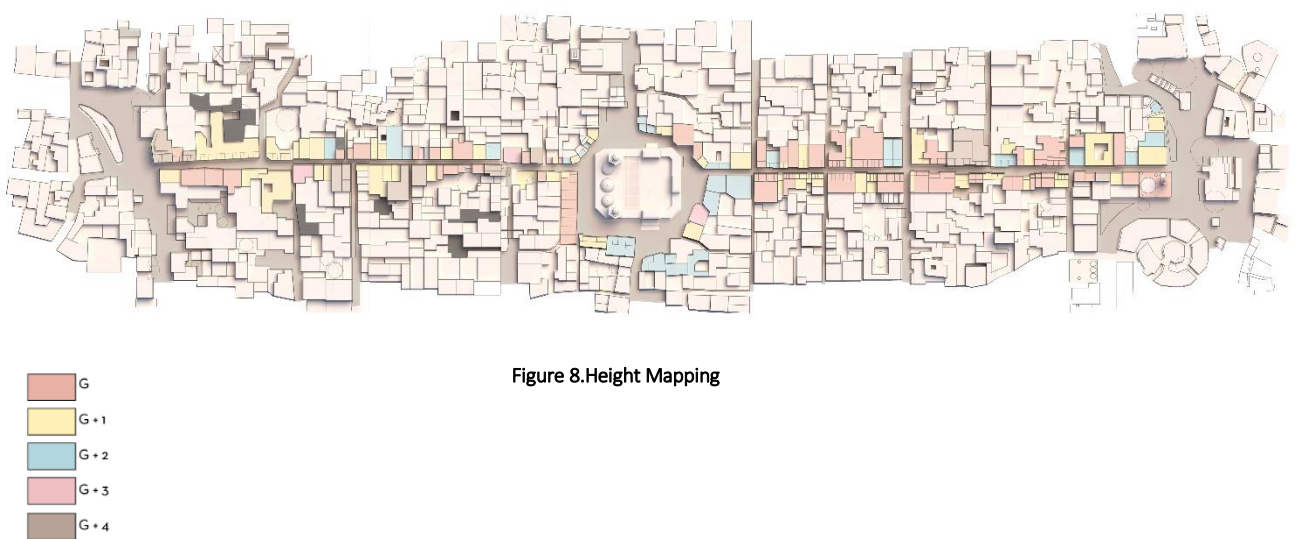


Figure 8.Height Mapping

Typology Map

The street majorly consists of commercial shops as well as big and small religious places. The entire street has a dense fabric of stores. While the first portion of the street has streets catered to clothing and apparel, the second half consists of electronic and hardware stores.

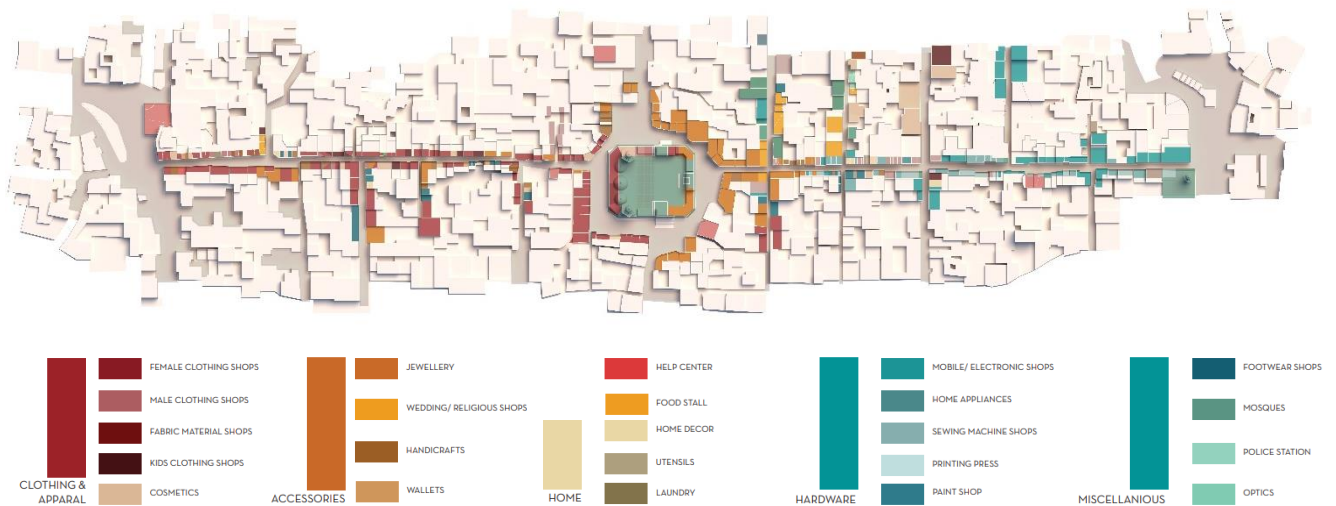


Figure 9. Typology Map

Physical Mapping

The site is flat with a slope and natural drainage towards the main Bhopal Lake. The drop in the contour is of 18m over 875 meters.

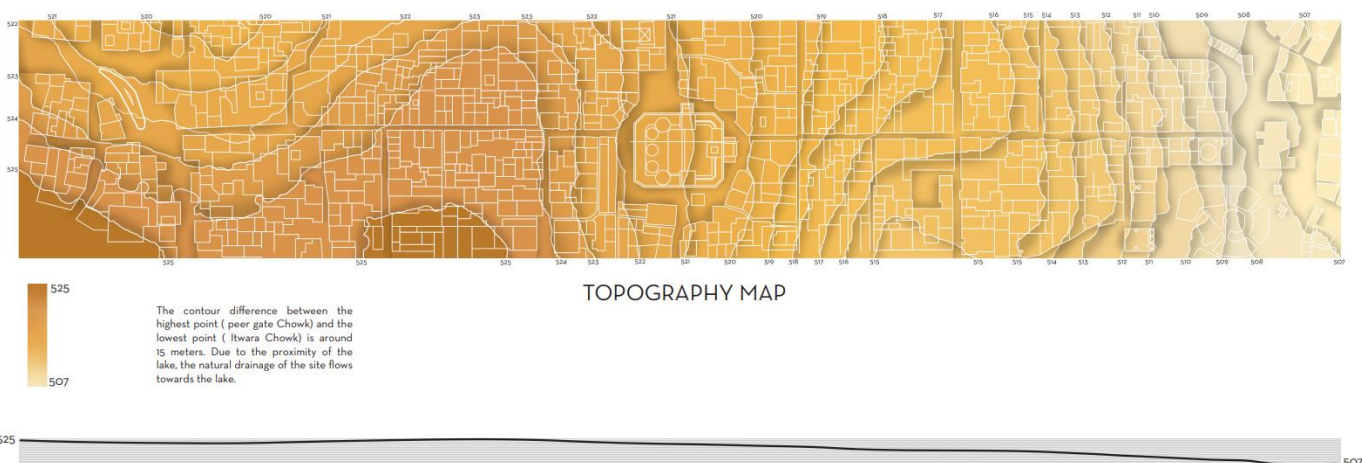


Figure 10. Physical Mapping with section

Figure Ground Map

The map illustrates the density of the built fabric of the area.

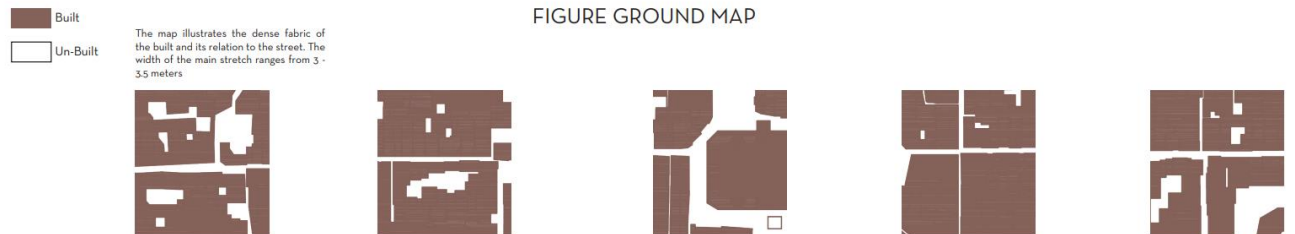
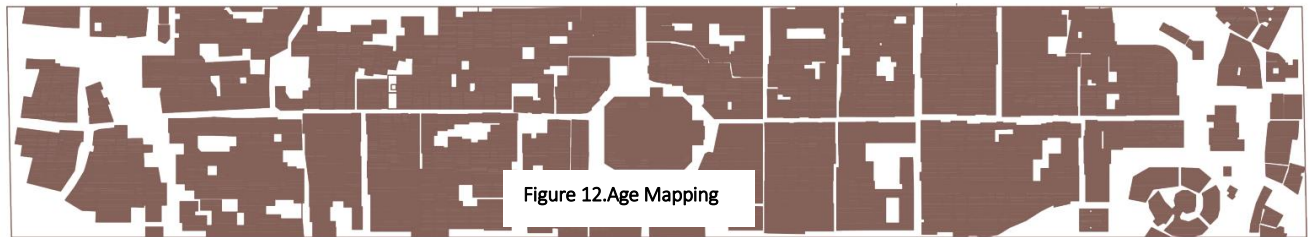


Figure 11. Figure Ground Mapping

Age Map

The map illustrates the historic buildings in the area and the need for protection, conservation or adaptive reuse. The map also illustrated the importance of the streetscape.



Noise Mapping

While the outer main spine is noisy due to the presence of shops, the inner streets are narrow and quiet. The same can be observed in the main spine buildings.

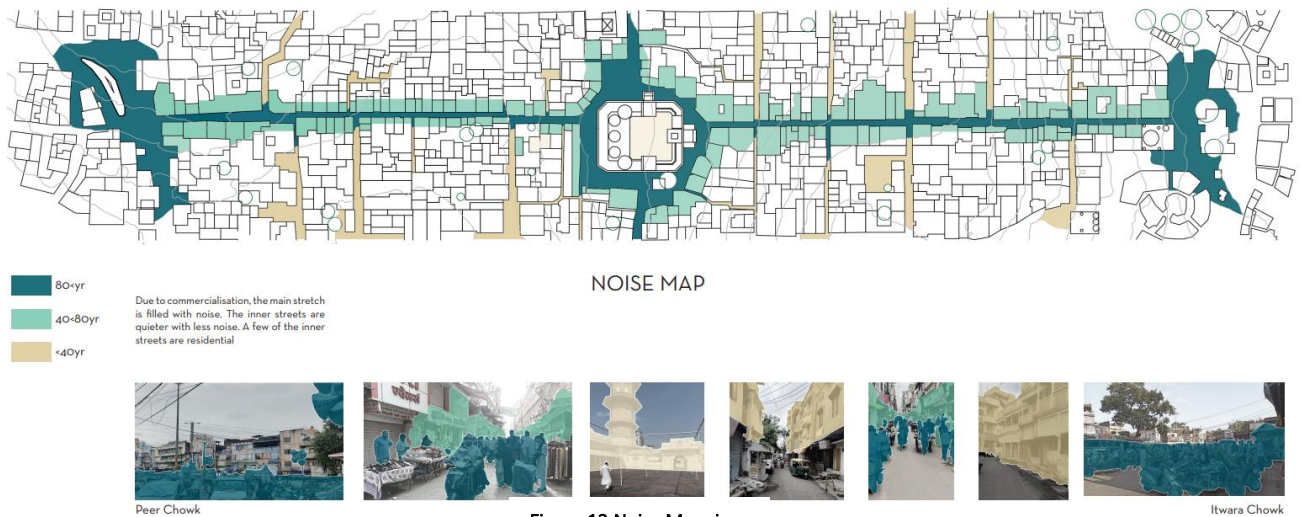


Figure 13.Noise Mapping

Activity and Circulation Mapping

The street is enamoured with a plethora of activities. While the first stretch of the street has more pedestrian movement and overspill due to the typology of activity, the second half of the street observes a more vehicular movement. Religious activities and vegetable markets are the majority of the activities in the morning. In the day, the commercial activities dominate the street while the same continues at night.

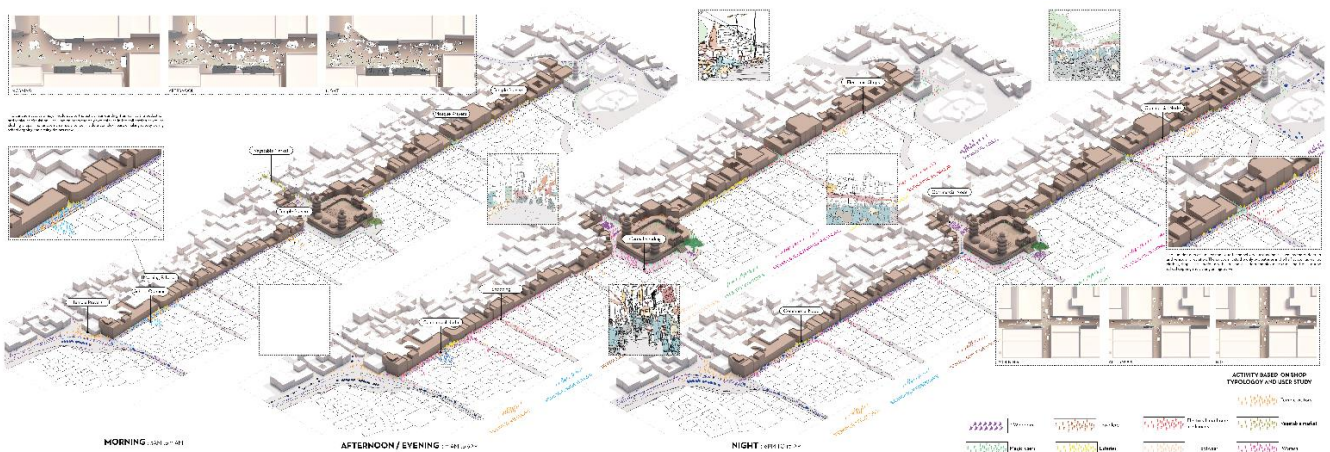


Figure 14.Activity Mapping



Figure 15. Pedestrian Movement



Figure 16. Vehicular Movement

Identifying the users:

To create a barrier free streetscape, one must first identify the barriers and whom all they restrict. The on-ground site documentation showcased the inability of this 3M wide primary streetscape to accommodate even a well-abled person; from open drainages and potholes to uneven thresholds and surfaces, this street is a high-tension experience for everyone who passes through it. To name some of the users who are heavily challenged by the accessibility of this street are:






- Elderly
- Children
- Users with Vision impairment
- Users with Auditory impairment
- Users with Mobility impairment



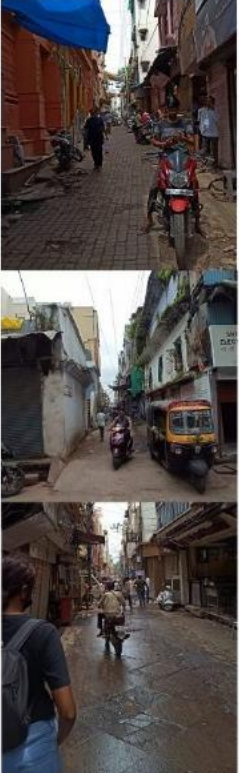
Site Conditions:




Figure 17. On-ground site photos

Access audit:

S.No:	Question	Portable Answer (Y/N)	Existing conditions	Current Images of the Site	Possible Solutions
Entry/exit					
1	Are there sufficient number of accessible entry/exit points to the street?	No	Accessible points are narrow and broken at places with less visibility and signage or demarcation		repair the access point and provide proper signage.
2	Are there signages provided on the street?	Yes	No parking, and other regulation signages present		proper signage has to be provided.
3	Is the width of the entrance to the street sufficient?	No	the width of the entrance is insufficient for the existing circulation of both vehicular and pedestrian accessing the street as two way		
4	Is the surface material slippery?	No	majorly concrete or asphalt is used, however there are plenty potholes prone to accidents		
5	Are the pedestrian and vehicular movements on the street segregated?	No	it's a 3m wide road forced to accommodate both pedestrian and vehicular circulation in two way along with informal vending and vehicles parked in the road which is very chaotic and accident prone		Divider and signages should be installed to segregate the movement.

Staircase					
6	Do the staircases provided have uniform depth of tread and height of riser?	No	several old buildings have narrow and uneven stairs		
7	Is there an angled riser provided?	No			
8	Do we have safety marks at the edge of the treads?	No			install safety marks at the edge of the treads.
Parking provisions					
9	Are adequate number of accessible parking spaces provided?	No	vehicle parked on road edge		parking areas or multi-level parking should be provided.
10	Are vehicular zone and access aisle defined?	No			vehicular zone should be provided with defined accessible aisle.
11	Is there an accessible aisle joining an accessible route?	No			accessible aisle and accessible route should be provided at desired space.
12	Can you identify accessible parking space?	No	No parking space is there to park vehicle		accessible parking space should be there with signages.
13	Is there ramp provided on curbs along the accessible routes?	No	no curbs is present at the site.		curbs should be provided to hold the pavements of walking area, and ramp should be provided at limited interval.
S.No.	Question	Portable Answer (Y/N)	Existing conditions	Current Images of the Site	Possible Solutions
Street furniture					
14	Are street furnitures provided at regular intervals?	No	there is no street furniture. that area is quite busy.		street furniture should be provided at regular interval.
15	Are they an integral part of the design?	No			
16	Are they easily allocated?	NA	no street furniture present. Plinths are used as vernacular sitting places. Patiyabaji		street furniture should there to make that area accessible for all.
Street design					
17	Are sufficient garbage points provided in the area?	No	very poor waste management		garbage points should be installed at regular interval with signages.
18	Is there provision made for pedestrian crossing?	No	As there is no clear demarcation between any zones, pedestrians cross from any space. Being a commercial street, we observe heavy pedestrian crossings		zebra crossing should be designed at minimum interval
19	Are footpaths provided?	No			use non slipry materials to avoid any misshapping.
20	Is there any obstruction on the footpath?	NA	street vendors and people sit there.		design a designated space for street vendors.
21	Is there any differentiation in the grade of the footpath near street interaction?	NA			higher grade footpath should be used near street interaction.
22	Do you find the pavement material slippery?	NA			desired materials should be used for pavement.
23	Are contrasting colours present in the pavement to show change in grade/level?	NA			pavement of different colours should be used if there is any change in grade or level of footpath.
24	Are ramp provided to cater change in level of the building and road?	Yes			ramp should be provided wherever there is change in level of footpath.
25	Are the materials used for construction are durable so as the quality should sustain for longer period of time?	No	No, roads are in a deteriorating state and gets worse during monsoon		good quality materials should be used.

S.No:	Question	Portable Answer (Y/N)	Existing conditions	Current Images of the Site	Possible Solutions
26	Are services provided in a continuous stretch?	Yes	there is no such service is present on any of the stretch.		
27	Is there a free walking lane on the footpath?	No	Absence of footpath. Street itself used for informal vending, pedestrian movement, vehicular movement and everything in between		remove any of such practice and make the footpath clear to walking.
28	Is fencing provided at street intersection over footpath?	NA			
29	Do we have clear height of signages, windows, balcony etc. over the footpath?	Yes	while there's a clear height there is a lot of visual clutter obstructing the view of signages		standard height of 2.3 m should be followed.
30	Are there any vertical obstructions faced by pedestrians on street?	Yes	the shopping style of the area adds overflows and stalls which are visual as well as physical barriers. there are multiple banners as well.		
31	Does the ratio of street width and building heights facilitate good ventilation and natural light?	No	the places feel claustrophobic at certain points due to lack of breathing spaces		
32	Do we have proper street lights on the street with proper illumination?	Yes	Being a commercial street, it is well illuminated with heavy light and hoarding neons and LED	street light should be provided at regular interval.	

Street design - way finding




33	Are traffic signals provided at junction for pedestrian crossing?	NA	absence of any kind of crossing bay on any stretch.		
34	Do we have directional tactile?	No	only exposed concrete and asphalt is used as flooring material.		directional tactile should also be used on footpaths.
35	Are warning tiles provided at change in direction or major halts such as ATM, information pylons, etc?	No	only exposed concrete and asphalt is used as flooring material.		warning tile should be used to warn users on footpath.
36	Are flagsigns with directions provided?	No			flagsign can also be used to notify people about place or activity.
37	Are finger-signs provided to increase legibility from longer distances?	No			fingersigns should be installed near normal sign boards.
38	Are tactile indicators present near the pedestrian crossing?	NA			install tactile indicator at pedestrian crossing to warn users.

Pylons on street

39	Are directional and detailed maps of the area provided on street?	No	no we don't have directional maps provided on streets, some direction signages are also missing		directional maps can be installed near sitting areas.
40	Are emergency contact numbers and website address provided on the map?	No	unsufficient number of maps are there at site.		emergency contact no: and QR code should be provided on map.
41	Is the information provided in the braille/audio format?	No	no we don't have any information present in braille/audio.		install braille and audio information booth near normal maps or sign boards.
42	Are tactile indicators provided on the pavement to identify location of the pylons?	No			tactile indicator along with signage should be installed.

Maps on street

43	Does the map give information about nearest important destinations such as bus stops, phone booths, tourist information bureaus and kiosks?	No	no maps present on site		maps with given information should be installed at site.
44	Are maps provided near bus stops, transit hubs and other important places of the city?	No	no designated bus stop is there.		maps with given information should be installed at important places..

S.No:	Question	Portable Answer (Y/N)	Existing conditions	Current Images of the Site	Possible Solutions
Public Amenities					
45	Are public toilets provided?	Yes	existing but are not used properly by the people		public toilets with accessible standards should be installed at regular intervals.
46	Are the public toilets accessible?	No			
47	Are public toilets provided at regular intervals?	Yes			
48	Are accessible drinking water facilities available on the street?	No	the road is one of the busiest and congested road of that area. there is no place where these installation can be made		accessible drinking water facility should be installed at regular interval.
49	Are basic medical and police services, ATM, available in proximity?	Yes	ATM services are provided near hospitals.		
50	Is the area under natural surveillance?	Yes	hospitals and others shops have personal CCTV cameras for surveillance.		high vision cameras should also installed.
51	Is the area under CCTV surveillance	No			
52	Are thresholds to the shops provided?	Yes			
53	Are the thresholds uniform?	No			
54	Are there inter generational spaces	No			
55	Are all drainages closed?	No			

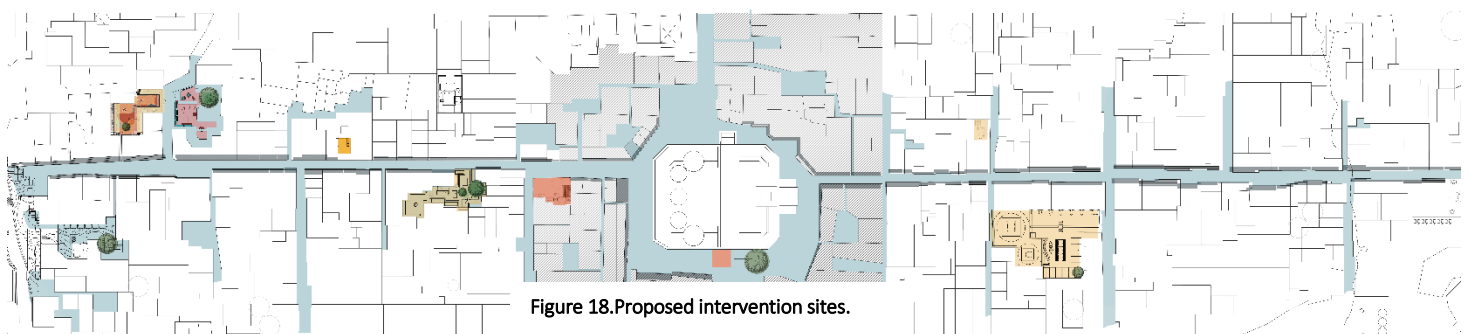
Inferences:

- **Peer gate being the primary access point to chowk bazaar has a massive crowd incoming that further stresses out the selected stretch.**
- **Since the street was originally designed for bullock carts and pedestrians, the 3M wide streetscape struggles to cater to the population it hosts today.**
- **In present, during market hours, the street is choked with shops and their overspills, informal vending, vehicular and pedestrian traffic thus, making it inaccessible even for a fully healthy person.**

- Owing to this and a lack of formal parking forces people to park their vehicles on the street thus, hindering all circulation pathways.
- The stretch is shared by diverse user groups, the residents, shopkeepers, shoppers, students and so on.
- However, rapid commercialization has compromised the needs of the residents and children leaving them with no recreational spaces.
- Public amenities are insufficient or poorly maintained.
- Tarpaulins and shop banners hinder the signages adding to the visual cacophony of the street.
- The individual buildings are inaccessible given the irregularity of thresholds, steps and ramps or lack of elevators.
- Jama masjid being the focal point of the street acts as the only relief point however falls short while catering to people with mobility issues.

Design Solutions:

As a collaborative studio between the disciplines of urban design and inclusive design, the solutions proposed range from micro to macro level that would help make this streetscape barrier-free.



1. Pause Points

a) Sub streets to decentralize the spine:

The inner courtyards are used as storage/dump thus, making them into a dead space which lacks any activity. To help de-

centralize the excessive informal vending occurring as overflows on the main spine, the inner open spaces connected by sub streets are opened up to host flea markets and informal vending. Re-introducing the concept of exploration and curiosity which would lead the people into finding these pockets of vibrancy. These spaces would act as 'Pause points' to this busy street that has the opportunity to host a plethora of activities.

b) **Multiple playing zones and recreational areas:**

Converting an abandoned plot into a playing area for the children of Chowk Bazaar. The entire playing area is designed to be barrier free. The buildings overlooking such playing zones act as 'Eyes on the Street'. Seating and open spaces are given for parental supervision. The same zones also act as recreational spaces that are grounds for socialization for the residents of Chowk Bazaar, even when the market is open.

c) **Chabutra:**

Culturally, Chabutras or bird feeders are the center of community life where the celebration of festivals takes place. Designing chabutras at pause points or cul-de-sacs will act as an information desk to people with visual impairment as a way finding guide. Each Chabutra would have a different artform on it with QR codes explaining them along with the same information written in Braille.



Figure 19. Abandoned plots converted into accessible play area for all



Figure 20. Chabutra or bird feeders with QR code and Braille for wayfinding and information

2. Urban insert and Shreejamandir seating - on the main spine

Re-imagining the front facade of the E-W cardinal axis of Chowk Bazaar, with a 'Pause point' created at multiple spots including the entrance of the Shriji temple to provide shade and comfort to all users in this chaotic street. An 'Urban insert' is proposed (Peer gate to Jama Masjid stretch) that would have some eateries in this heavy commercial and shopping market. Tactile tiles, handrails and information about the space will be given out through braille.



Figure 21. Urban insert



Figure 22 :Shreeji temple seating

3. Underground services

All services must be underground including electrical and telephone poles. All drainages must be covered. This will help in making the street more uniform and smoother for differently abled people.

4. Phase wise pedestrianization; Bollards; Tactile paving

A phase by pedestrianization is proposed in the precinct of Chowk Bazaar for the following reasons:

- a) To avoid further conflicts created by vehicular movement, pedestrian movement, informal vending, overspills and parking on the 3M wide E-W cardinal axis street
- b) To make the precinct user-friendly, the road must be properly paved with tactile markers thus making it devoid of any uneven surface or potholes.

To make the street more accessible, the vehicular movement will have to be re-routed with adequate parking spaces provided thus, achieving pedestrianization. Following the 'Grid-iron' pattern of

Chowk bazaar shall help in using the parallel roads to the cardinal axis for re-routing.

Bollards can also be placed at various strategic locations at a distance of 3-5 feet for allowing wheelchairs to pass by while restricting vehicular movement.

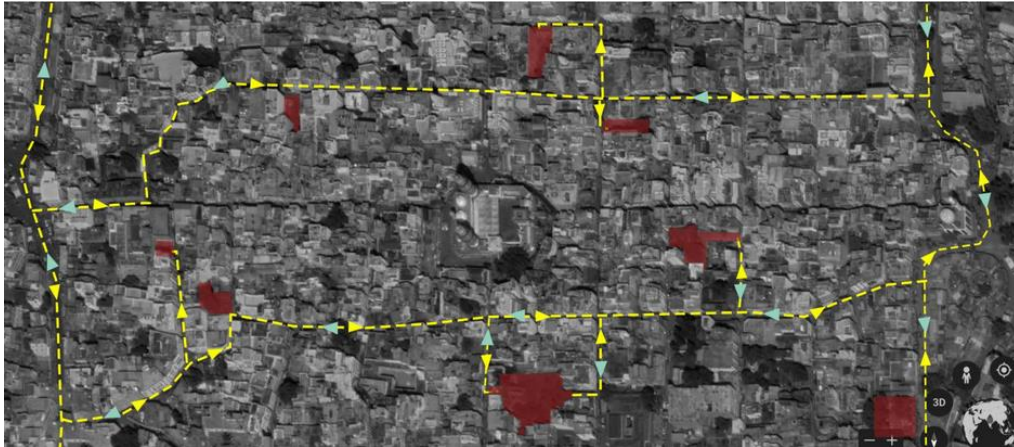


Figure 23.Re-routing of vehicular movement

5. Road widening by an offset of at least 0.5 M while redeveloping the structures

6. Widening of the square around Jama Masjid

To decongest the excessive parking happening around Jama Masjid and the haphazard parking along the main spine

7. Re-routing and MLCP

A MLCP is proposed for decongesting the parking around Jama Masjid thus, making the square clear, visible and accessible to all. It is located on an existing parking ground and abandoned nearby structures.

The ground floor shall host various informal activities and an urban green garden with some cafes is proposed on its roof. This MLCP is connected to one of the major grid- iron roads of the Chowk Bazaar precinct that would still be in use once pedestrianization of the main spine is done.

8. Ratio of tread and Riser are inappropriate, and stairs needs to be designed according to the Norms with the addition of ramps/lifts

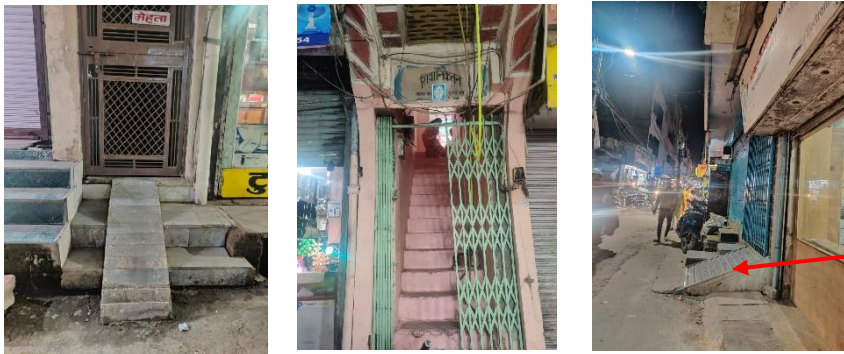


Figure 24. Ramp and steps

The buildings along the streetscape have very high risers and a disproportionate ratio of riser to tread that makes using staircases extremely difficult. The few ramps present also do not follow the norms which are comfortable to use.

It is proposed to add ramps with usable slope and elevators wherever possible along with the ratio of riser to tread maintained.

9. Inclusive toilets

Presently, there are only 3 washrooms found on the entire stretch and are poorly maintained. Also, these washrooms are not accessible by all due to uneven thresholds, lack of ramps, handrails and signages.

The design proposes to add toilets at each recreational zone that caters it to all the genders.

10. Access to Jama Masjid

Jama Masjid, a cultural anchor attracts diverse user groups but with only large staircases as entry to it. This is a problem for elderly, people with mobility issues and many others. As a Grade 2 heritage structure, it is proposed to relocate an adjacent shop to make way for an elevator that would be usable by all.



Figure 25. Proposal of elevator location to access the Jama Masjid

Conclusion

An Indian Street is a maximization of all sense. From touch, smell, sight to even taste, Chowk Bazaar is no exception in being an elevated and heightened sense of reality. In addition to these factors, the street also fulfils a functional purpose making it susceptible to various users. Thus steps have to be taken to enhance the functionality and ease of use for the street as well as making it inclusive for a diverse user groups. The steps and design interventions listed are only a step in the direction to making a street like Chowk Bazaar of such mammoth scale and history inclusive.

Acknowledgements

We would firstly like to thank the head of department of architecture Dr. Sandeep Sankat for his constant encouragement. A sincere thanks also goes to Prof. (Dr.) Rachna Khare for her expertise and knowledge which has been invaluable throughout the process. We also send our gratitude to our Urban Design faculty, Dr. Piyush Hajela, Ar. Vikram Kohli, Ar. Pooja Ninawe and Ar. Surekha KC for their guidance throughout the semester. Last but certainly not the least we also thank our teammates, Madhukar Gupta, Harshit Mor, Charan Anand, Sudipta Konhar for their continuous commitment and hard work is making sure we have a thorough research and contextual study.