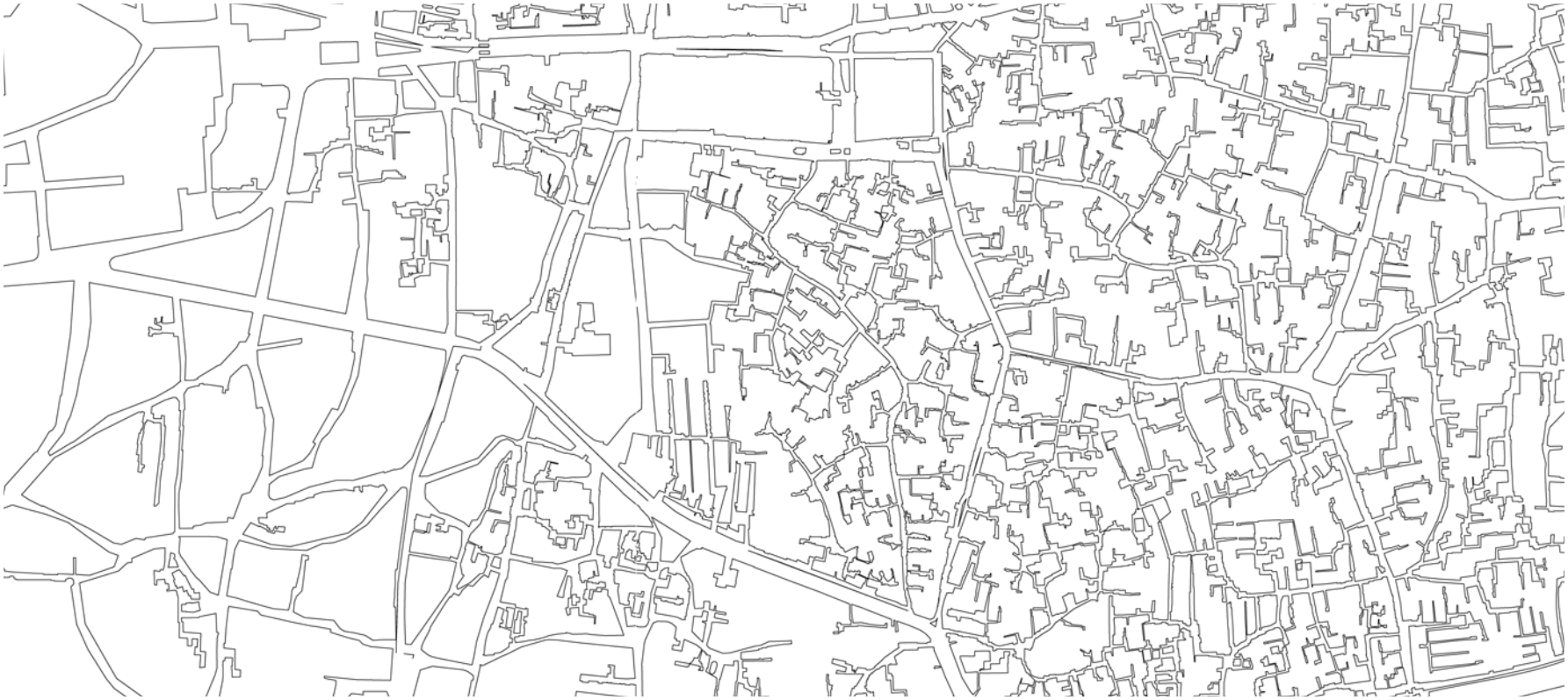
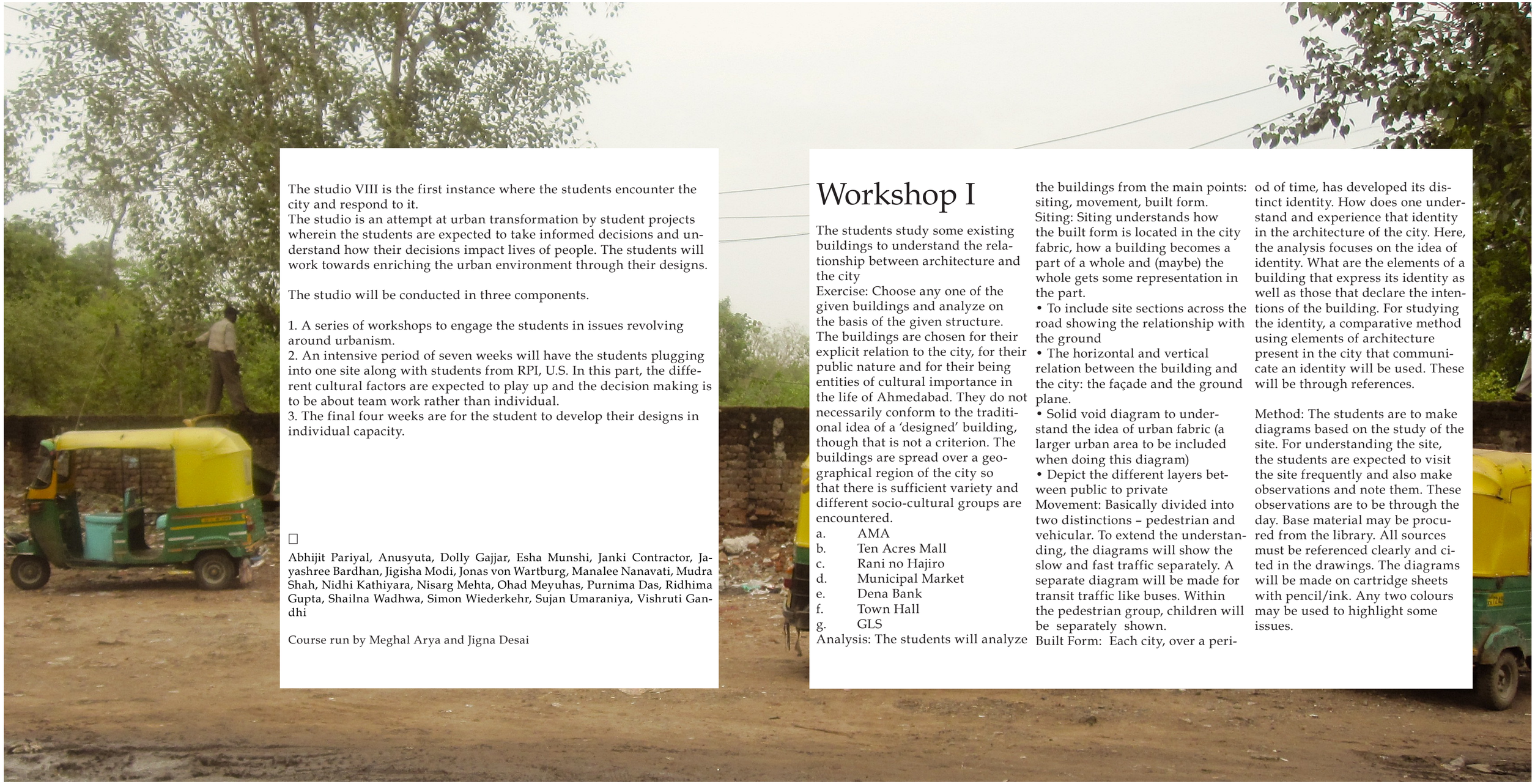
Studio VIII

CEPT University



Monsoon 2009 Ahmedabad



The studio VIII is the first instance where the students encounter the city and respond to it.
The studio is an attempt at urban transformation by student projects wherein the students are expected to take informed decisions and understand how their decisions impact lives of people. The students will work towards enriching the urban environment through their designs.

The studio will be conducted in three components.

1. A series of workshops to engage the students in issues revolving around urbanism.
2. An intensive period of seven weeks will have the students plugging into one site along with students from RPI, U.S. In this part, the different cultural factors are expected to play up and the decision making is to be about team work rather than individual.
3. The final four weeks are for the student to develop their designs in individual capacity.

□

Abhijit Pariyal, Anusyuta, Dolly Gajjar, Esha Munshi, Janki Contractor, Jayashree Bardhan, Jigisha Modi, Jonas von Wartburg, Manalee Nanavati, Mudra Shah, Nidhi Kathiyara, Nisarg Mehta, Ohad Meyuhas, Purnima Das, Ridhima Gupta, Shailna Wadhwa, Simon Wiederkehr, Sujan Umaraniya, Vishruti Gandhi

Course run by Meghal Arya and Jigna Desai

Workshop I

The students study some existing buildings to understand the relationship between architecture and the city
Exercise: Choose any one of the given buildings and analyze on the basis of the given structure. The buildings are chosen for their explicit relation to the city, for their public nature and for their being entities of cultural importance in the life of Ahmedabad. They do not necessarily conform to the traditional idea of a 'designed' building, though that is not a criterion. The buildings are spread over a geographical region of the city so that there is sufficient variety and different socio-cultural groups are encountered.

a. AMA
b. Ten Acres Mall
c. Rani no Hajiro
d. Municipal Market
e. Dena Bank
f. Town Hall
g. GLS

Analysis: The students will analyze the buildings from the main points: siting, movement, built form.
Siting: Siting understands how the built form is located in the city fabric, how a building becomes a part of a whole and (maybe) the whole gets some representation in the part.
• To include site sections across the road showing the relationship with the ground
• The horizontal and vertical relation between the building and the city: the façade and the ground plane.
• Solid void diagram to understand the idea of urban fabric (a larger urban area to be included when doing this diagram)
• Depict the different layers between public to private
Movement: Basically divided into two distinctions – pedestrian and vehicular. To extend the understanding, the diagrams will show the slow and fast traffic separately. A separate diagram will be made for transit traffic like buses. Within the pedestrian group, children will be separately shown.
Built Form: Each city, over a period of time, has developed its distinct identity. How does one understand and experience that identity in the architecture of the city. Here, the analysis focuses on the idea of identity. What are the elements of a building that express its identity as well as those that declare the intentions of the building. For studying the identity, a comparative method using elements of architecture present in the city that communicate an identity will be used. These will be through references.

Method: The students are to make diagrams based on the study of the site. For understanding the site, the students are expected to visit the site frequently and also make observations and note them. These observations are to be through the day. Base material may be procured from the library. All sources must be referenced clearly and cited in the drawings. The diagrams will be made on cartridge sheets with pencil/ink. Any two colours may be used to highlight some issues.

Municipal Market
AMA
GLS
Central Bank
Rani No Hajiro
Town Hall

AMA

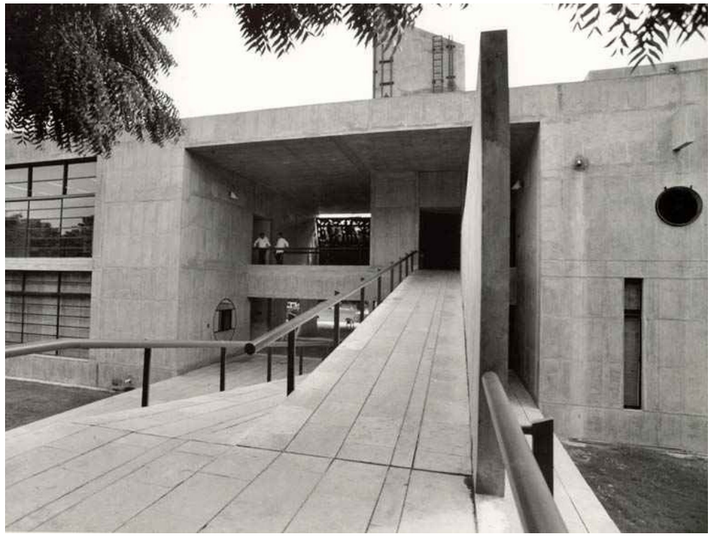
by Bimal Patel

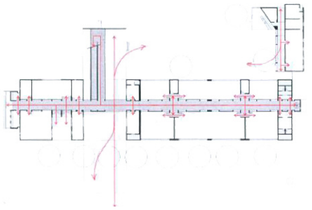
INTRODUCTION

Ahmedabad Management Association is a non-profitable organization with the objective of creating significant awareness of management's concepts at society level and to prepare industries to use these concepts.

The institution was set up keeping in mind the need to cater to mostly students, businessmen and professionals.

AMA was established in 1956 by Dr. Vikram Sarabhai.

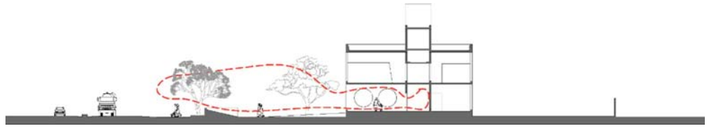


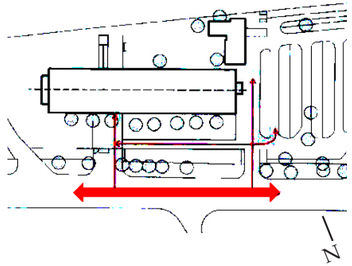


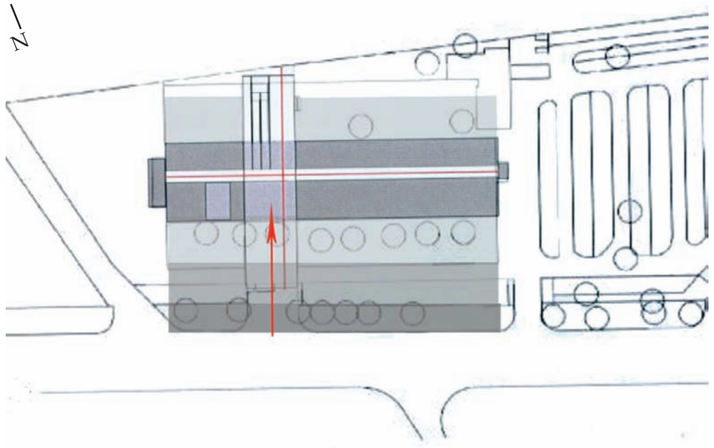
SITING

The building itself is located in the ATIRA campus in western Ahmedabad.

There are several premier institutions in the vicinity of AMA like LD College of engineering, Indian Institute of Management, CEPT University, AES PG for Business Management, Physical Research Laboratory.





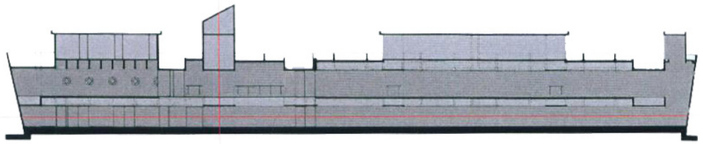


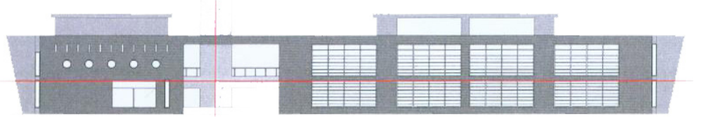
HIERARCHY OF PRIVACY

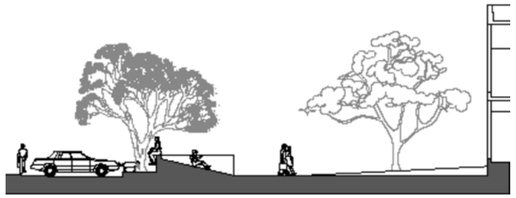
1st layer: main road, pavement, boundary wall and the sloped lawn.

2nd layer: pedestrian walkway.

3rd layer: eight existing trees on site and the approaching ramp.







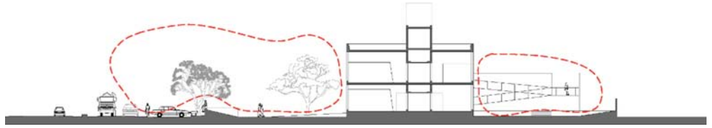
MASSING

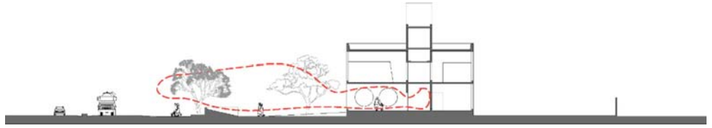
The two storey built mass is placed on a 3 feet high plinth following the axis of the main road. The simple geometry with terminated edges appear as an object standing in space. The ship like form also gives the building a distinct formal identity.

The structure determines the overall form, and the form in turn reflects the structural discipline on external fronts.

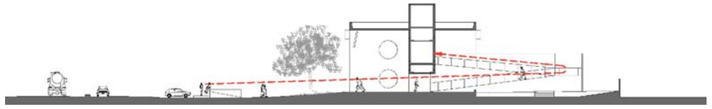
The built mass is spread horizontally to get maximum open edge for showcasing the institution's activities. This reinforces the idea of making the building "an object of public spectacle".

The building also responds to the physical conditions of the site by running parallel to the row of trees to take full advantage of the shade against the southwest sun.

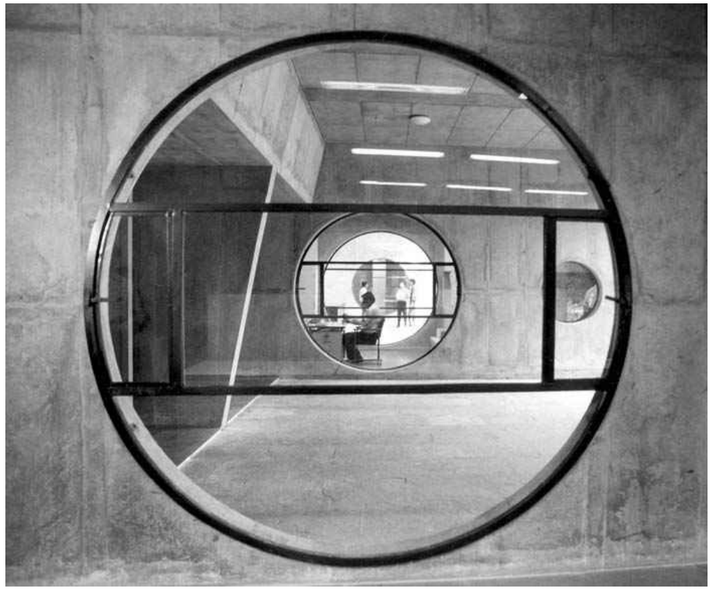


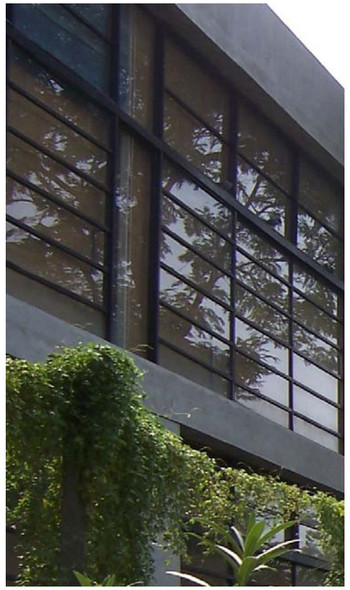


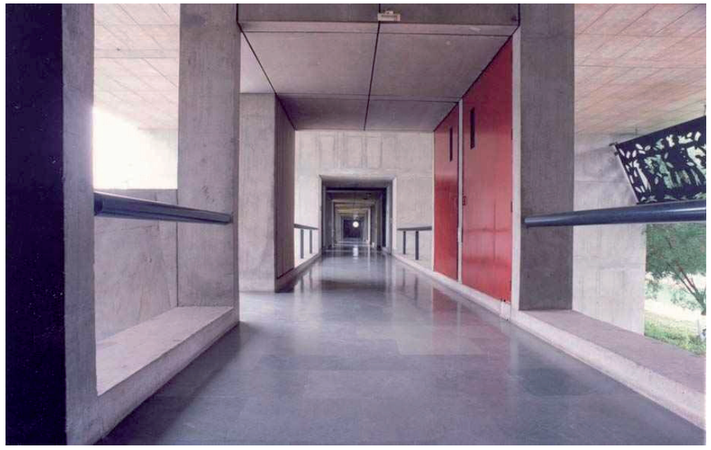
The placement divides the site in two parts- the northeast along with the canteen it forms the private outdoor space. While in the southwest it forms an open edge for public interaction.

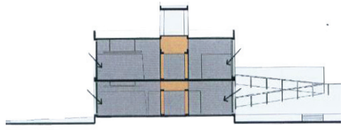


TRANSPARENCY OF STRUCTURE

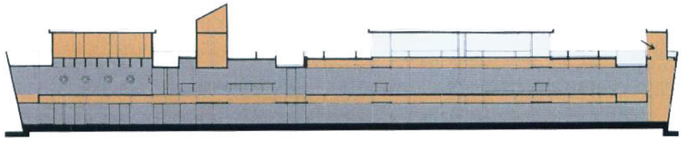


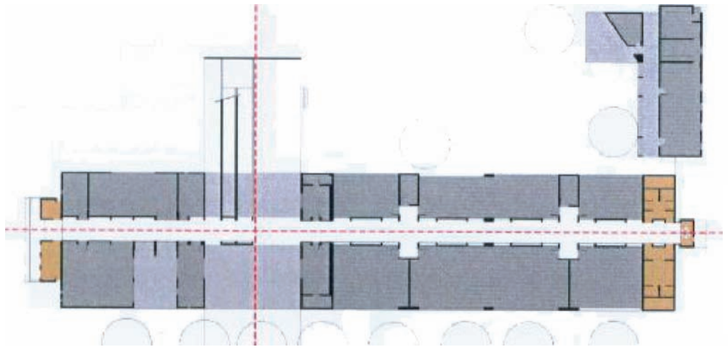






The centrally located corridor as servant space for the adjacent functions. The outer edges receive maximum daylight and provide maximum opportunity for display.





functional space

circulation

services

Visual and spatial connection between the building and the main road (people).
Building responds to the outside by creating a transparent façade to showcase activities.
Structural clarity defines the uses and character of the building.

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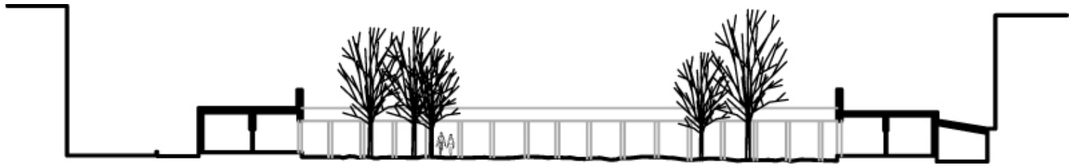
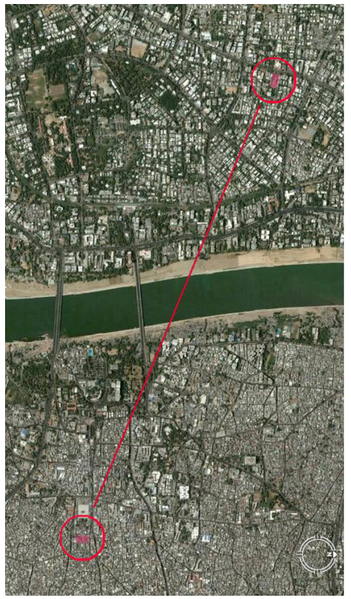
MUNICIPAL MARKET

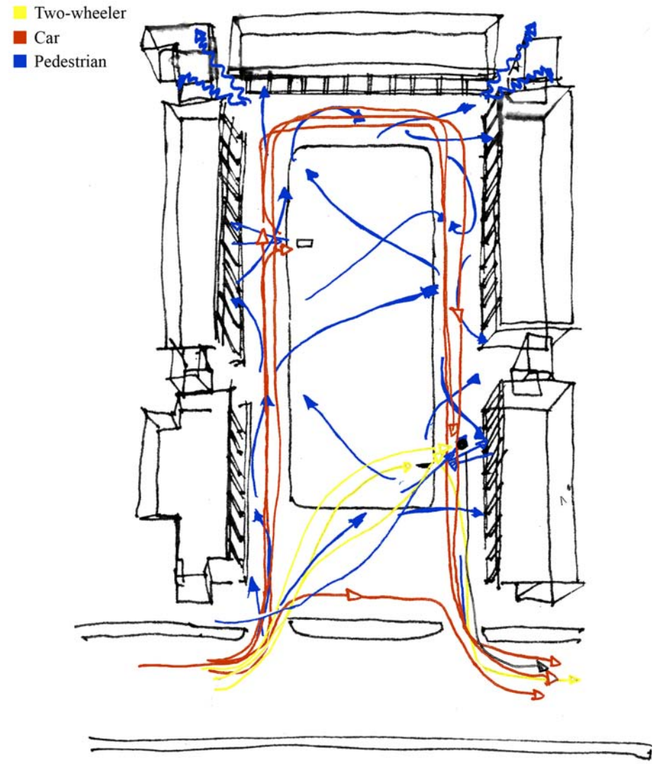
It was designed in the 1960's and built in two phases between 1968 and 1975. The prime function of this market was to take the load of shopping off Manek Chawk which was till then the main shopping area. Also because of the development of the new city on the western bank of the river, a new commercial zone was already being developed on Ashram Road and C G Road.

The Municipal Market being located on the C. G. Road to fulfill the prime function of commerce. But instead it is today the most active place for gathering and eating out.
Its location makes it the most accessible for people who have come to C G Road for shopping or for any other purpose and the eating out becomes a support activity for them.
The market becomes the part of the whole on different levels of scale.
On the scale of the city around its the only green open space in the densely packed surrounding,insignificant of the individual.





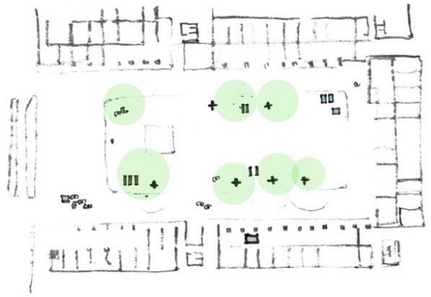
Municipal Market as an alternative to Manek Chowk.



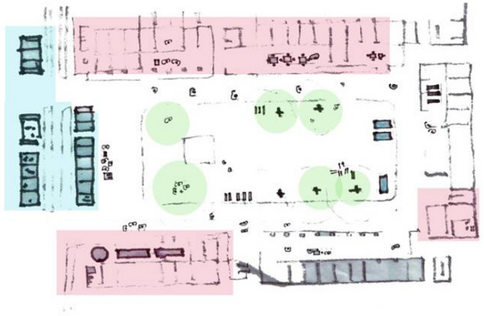
Movement Diagram of Municipal Market. Which is, as a whole, unorganized movement.

On an inbetween scale it provides a breathing space for the immediate buildings.
On a small individual scale it acts as a gathering and interaction space for people, leaving an imorint on an individual.

Two distinct scales can be seen within the plan of Municipal Market.
The scale of the open space and the scale of the semi-covered walkway.
The scale between the two which would actually create a relation between the building and the open space is missing.
Apart from these, the road around the open space creates and entirely new scale.
The place changes its nature from a purely commercial area during the day to a hang-out place and a food joint at night.
The actvity also affects the nature of the place. The position of trees,eating places act as crowd pullers.



08:40 am



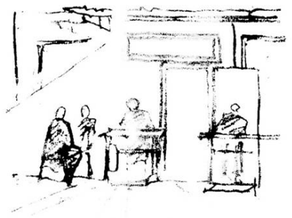
02:15 pm

09:00 pm

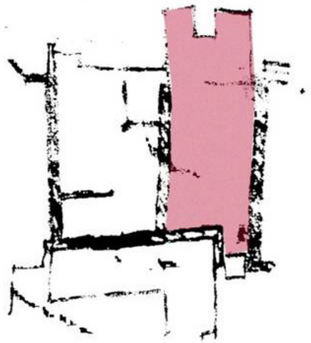
ELEMENTS
The Municipal Market is constituted of the most basic elements of architectural form.
They are :
• Plinth
• Columns
• Roof
• Infill walls
These come together to make the long arcade which becomes the area of maximum activity in the market.

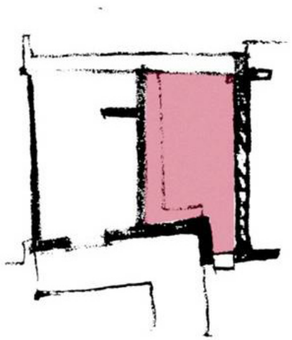
The plinth itself is a low plinth, barely functional to keep the rainwater and dirt etc. out of the shops.
The columns although heavy in proportion, seem a little slender due to their height.

And they are decorated in different ways according to the individual shops.
The roof remains a flat concrete plate which sits on thick beams. One face of the beam is articulated to take the signages and is in itself a substantially heavy element.
This makes up the building of Municipal Market.



The use of very basic elements of architecture allows the space to be used freely. The facade edge remains blank when the shops are closed, while open the edge gets fuzzy and allows adaptive nature of the place.





The Municipal Market being located on the CG Road to fulfill the prime function of commerce. But instead it is today the most active place for gathering and eating out. Its location makes it the most accesible for people who have come to CG Road for shopping or for any other purpose and the eating out becomes a support activity for them.

The use of very basic elements of architecture allows the space to be used freely . The facade edge remains blank when the shops are closed, while open the edge gets fuzzy and allows adaptive nature of the place.

Bibliography

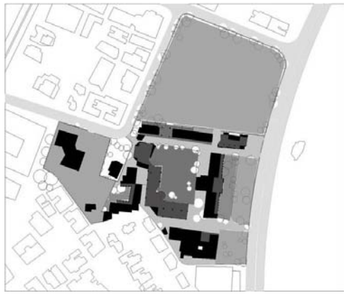
Qualitative aspects of place : A study of Manek Chawk and Municipal Market
Nishka Mistry RA TH 0156 MIS
www.google.com
Google Earth

G.L.S. CAMPUS

More than seven decades, back, a few like minded visionaries who recognized the value of advanced education came together and established Gujarat Law Society (G.L.S) the first institution of its kind in the region which later became the state of Gujarat. The G.L.S campus has 38 institutions including nusury,primany and secondary schools and some major colleges. The campus is located opposite to the law garden which is one of the major public gardens in Ahmedabad. It has the busy netaji road at one end and is quite near to the c.g road.There are also some other institutions nearby like the ahmedabad gymkhana, the british library and the gujarat association of engineers and architects. The netaji road is quite busy during the day due to the gls campus and in the evenings due to the law garden.

N

Roads | Commercial | G.L.S. Campus | Other



Different schools on G.L.S Campus and use of spaces.

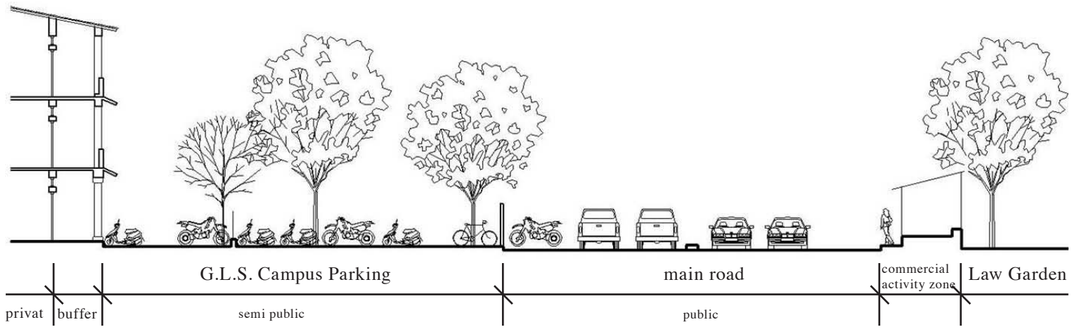
Spatial and functional location of the buildings that constitute the Gujarat Law Society Campus. 1. Central administration | 2. Staff parking | 3. School parking | 4. C.U. shah primary and M.K. high schools | 5. Canteen | 6. Garden | 7. L.M. Nanavati law | 8. College parking | 9. G.L.S. institute of commerce | 10. H.A. commerce college and S.M.S.C. arts college | 11. Institute for teachers and research | 12. Pre-primary school 13. Parking for students and pre-primary staff | 14. S.M. patel institute of commerce

There are some stalls located outside the law garden opposite to the gls campus which functions majorly in the evenings and during the day is used by the school children as well as the general public for resting in the shade.

HIERARCHY OF SPACES

Different areas of GLS campus are used by the students coming at different times of the day. As we move from the road to the classrooms, we see a hierarchy of spaces moving from a very public to semi – private spaces.

The movement of vehicles stops at the parking spaces allotted. These parking spaces also act as a buffer between the building and the road, thus shielding the school from the noise of the busy road in front of it. The pedestrian movement is definite for the primary school children, but is random for the older students.



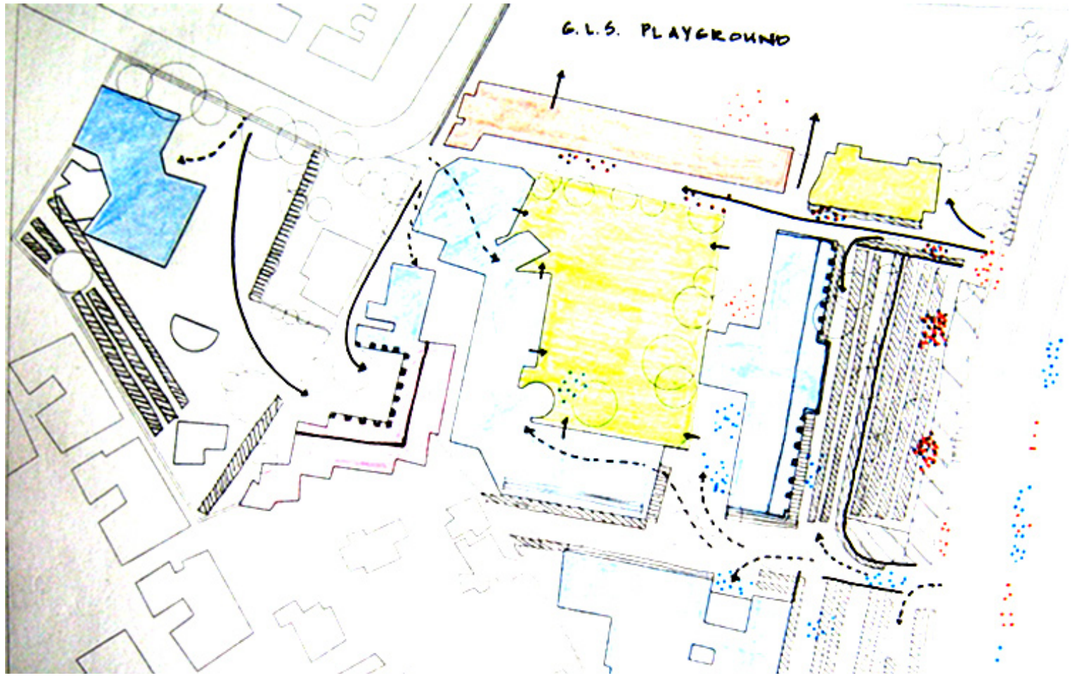
A Movement of students on the G.L.S. campus at 7.00 AM
Defined linear movement for school children and irregular random movement for college students.

B Movement of students on the G.L.S. campus at 12.30 PM
Use of spaces and movement definition at time of transition between high school students, primary school students and college students of morning and afternoon session.

C Movement of students on the G.L.S. campus at 5.00 PM
Movement of school students and college students throught the campus at the end of the session.

A

B C



A general idea of how movement of students and vehicles takes place on the campus.

- Primary School
- Movement of primary school
- Administration
- College students
- Movements of college students
- Pre-primary school
- Movement of pre-primary school

At 10.00 AM
When students of the morning shift are in the class

At 12.30 PM
Transition between senior students of M.K. and junior students of C.U. Shah school.

At 2.00 PM
When C.U. Shah primary school students are in the class.

The G.L.S campus is an introvert institute, which has expanded over the time.
The movement of the children is restricted because of the functions imposed. The open spaces provided in front of the buildings which were originally designed as play areas are used as the parking spaces.
The playground is used only by the students of the primary school only during the school hours, rest of the time it is used by people outside the campus as a skating ring.

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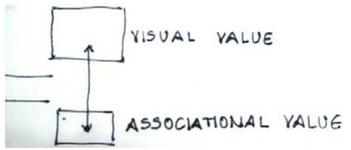
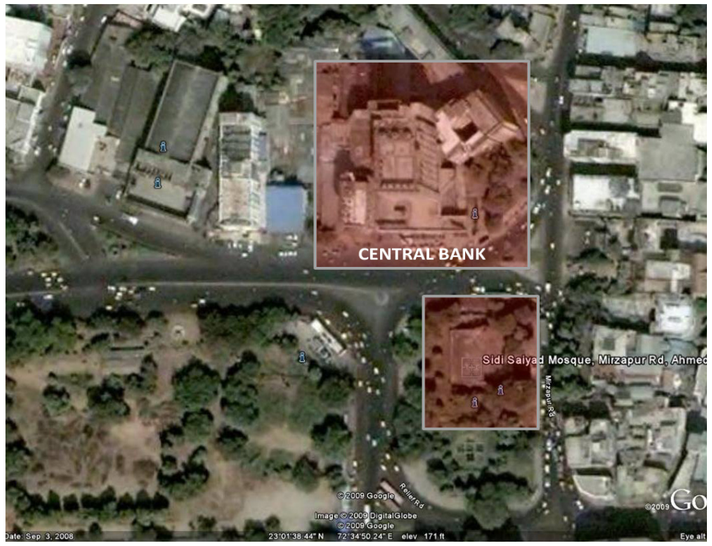
CENTRAL BANK

by B. V. Doshi

SITING

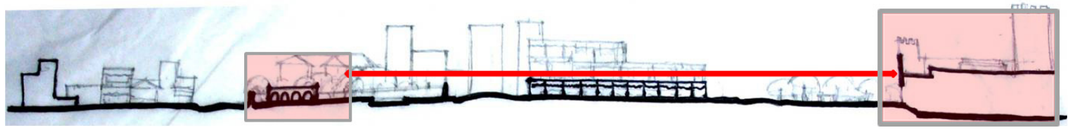
'SIDI SAIYAAD NI JALI' Has an monumental value as a symbol of Ahmedabad city.
Siting the tall and strongly defined structure of the Central Bank just across the Sidi Saiyyad Mosque gives a visual landmark to the area.





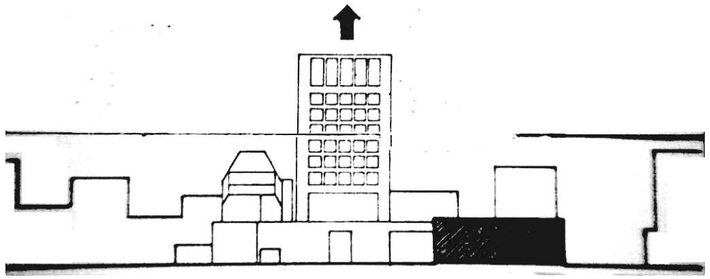
Sidi saiyyad and bhadra fort retaining their monumentality.

Centralbank overpowering the monumentality of sidi saiyyad mosque and the bhadra fort.



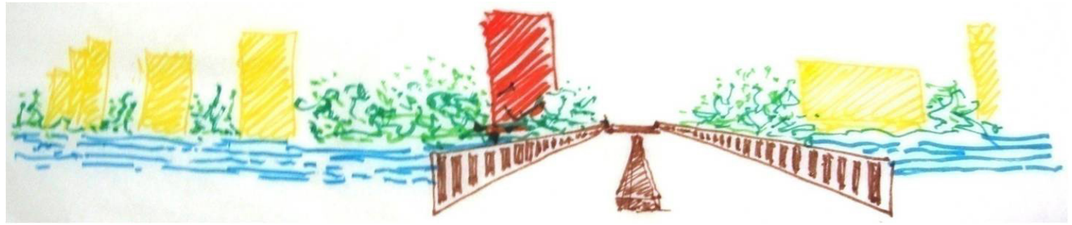
VISUAL LANDMARK

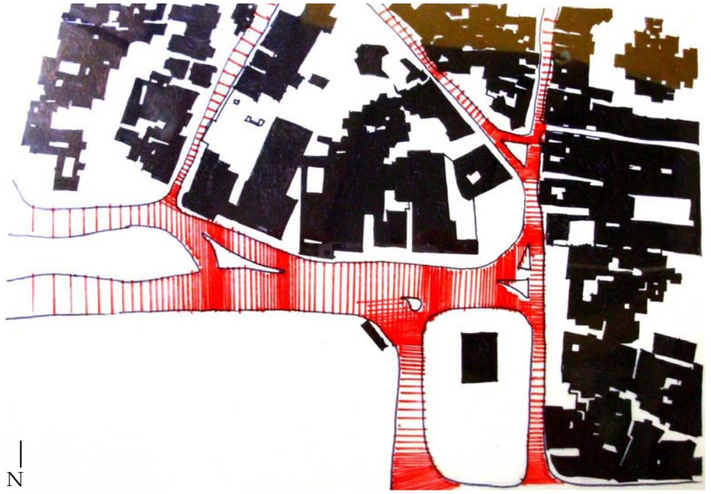
Building stands out separately contradicting the surrounding buildings and expresses a powerful identity.



PROPOSED SITING

The proposal was of making a pedestrian walk at 20ft height. Public places can be location above and so the traffic can be re-organized.

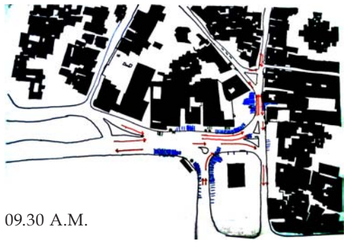




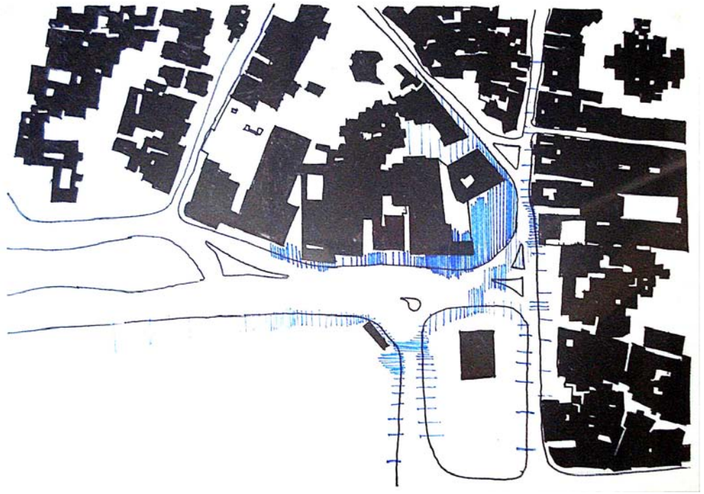
MOVEMENT

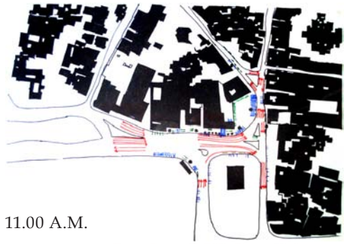
Intensity of vehicular movement. (red)

Intensity of pedestrian movement. (blue)



09.30 A.M.





11.00 A.M.

06.00 P.M.

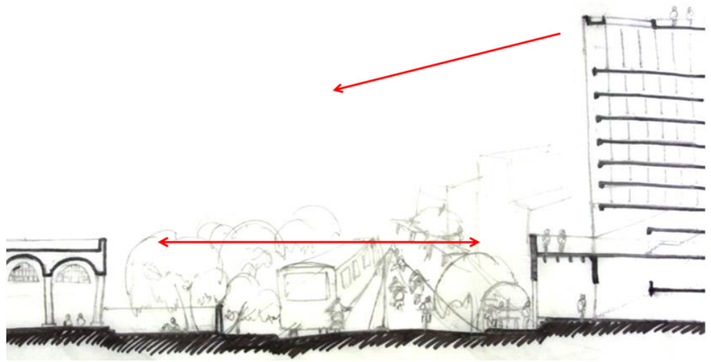
BUILT FORM

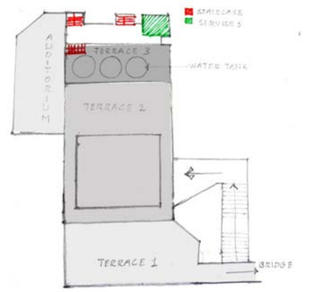
Podium at the same level of the terrace of Sidi Saiyyad Mosque provides visual connectivity to Bhadra.
The second podium provides visual connectivity to the city and provides an observatory point.

Plan of the building itself contains a void on the staircase part which balances the massive nature of the site.

The public and private functions both are intervined in each other but still are separately defined. Movement of the public functions is arranged in such a way that it does not disturb the movement in the bank but continues parallely.

The facades are treated according the climatic condition. The facade also respond to the settlement around. The influence of modernism can be seen in the use of concrete.

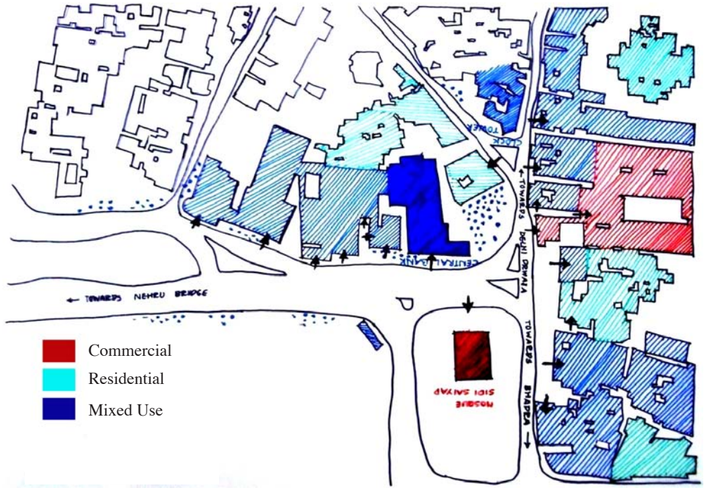


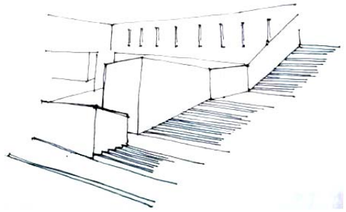


SEMI PUBLIC AREA

SEMI PRIVATE AREA

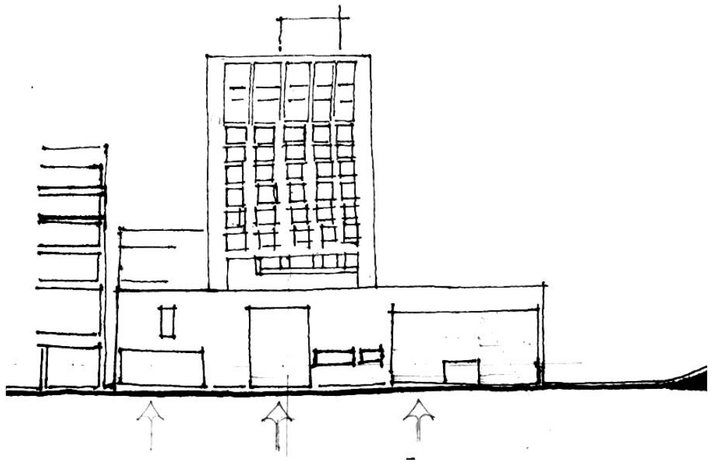
PRIVATE AREA





The perforated wall on the front façade gives a sense of enclosure and gives a strong barrier to the building to separate it from the heavy traffic of the road.
Also the wall is provided with perforations in such a manner that it balances the heavyness and provides separate entries to every function such as parking,bank and public places.

Wide staircase opens on the main road inviting people to the first podium which then connects to the auditorium.



This building is standing in contrast to historic building (siddi saiyad mosque) in front of it. Massing and volume of the building seems to overpower the importance of the mosque. The architect wants to imply the beginning of the modernist era of architecture by using exposed concrete in the old city of Ahmadabad. As the neighborhood of this building is very busy and compact, the form of the building high plinth and grand entrance provides space for other functions and also decrease effect of activities happening in the building.

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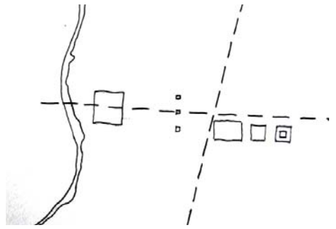
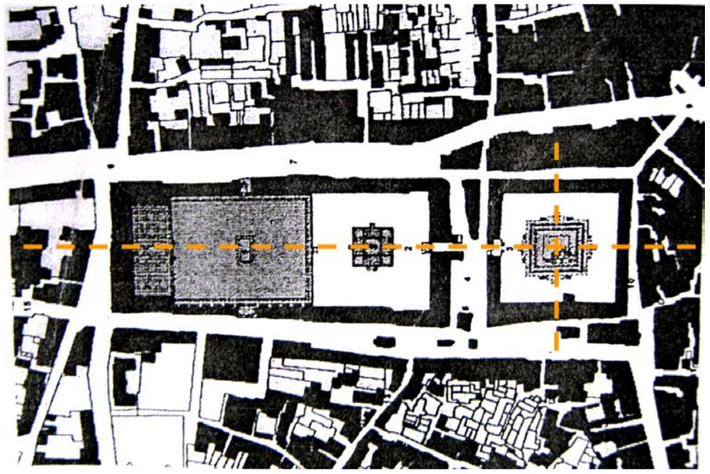
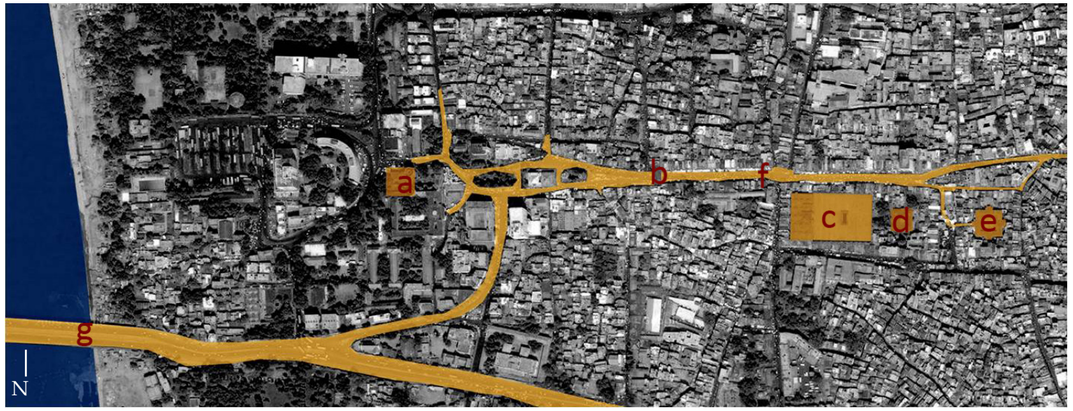
RANI NO HAJIRO

A centre for commercial activities

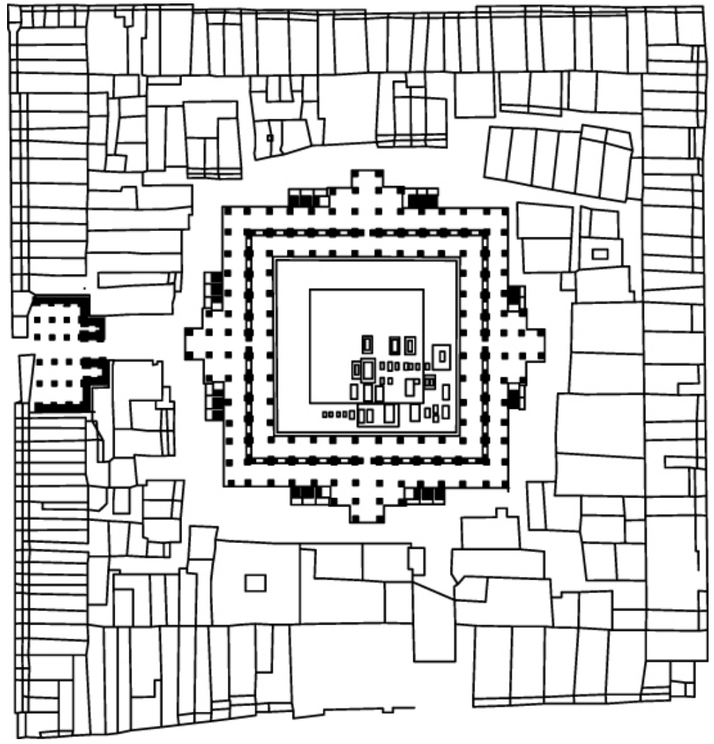


The river moves along the N/S Direction.
The Major Public buildings lie on the E/W Axis. Which also corresponds to the Quibla Axis.

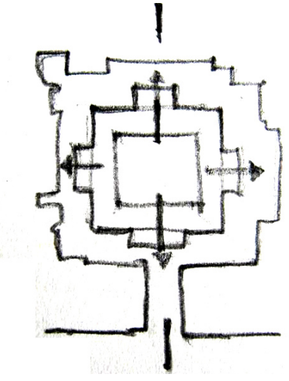


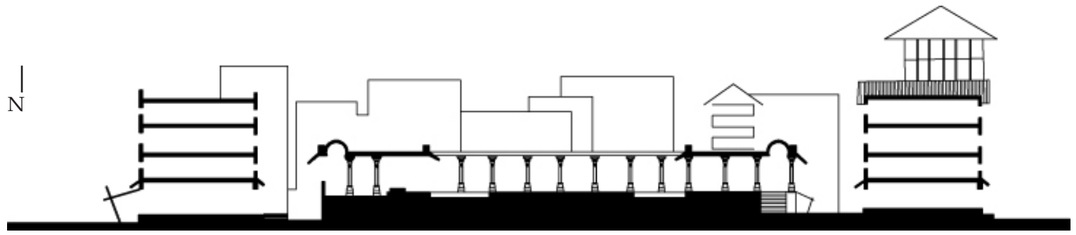


a. Bhadra Fort b. Teen Darwaza
c. Jami Mosque d. King's tomb
e. Queen's tomb f. Gandhi Road
g. Ellis Bridge

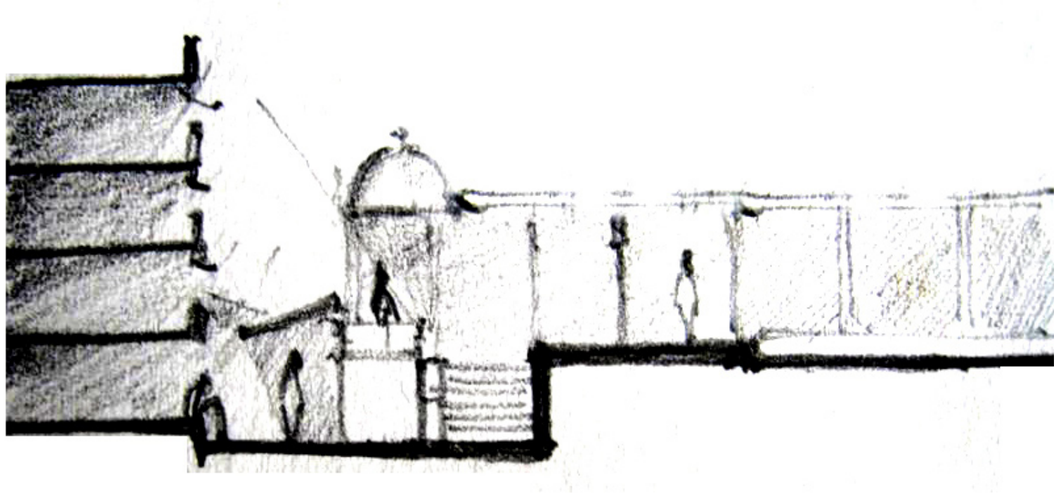


The queen's tomb is defined by the enclosure of system of walls and columns but possess an extroverted space.
It consists of a colonnade relating to the outside and a wall enclosing the inside. The porosity and transparency of the bounding surface relates the inside to the outside and makes them into an integrated whole.



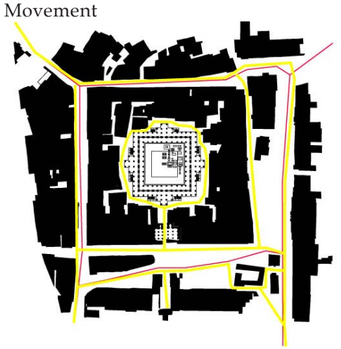


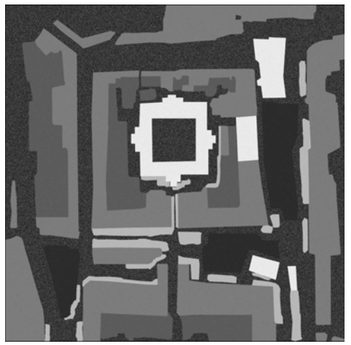
The space of the tomb is differentiated by the peripheral walls and the shops that have attached to the wall.
The wall, shops and the porches together define a transition from one level to another.



- Monuments
- Temporary Shops
- Shops
- Residences
- Temporary
- Roads
- Pedestrians
- Vehicular traffic

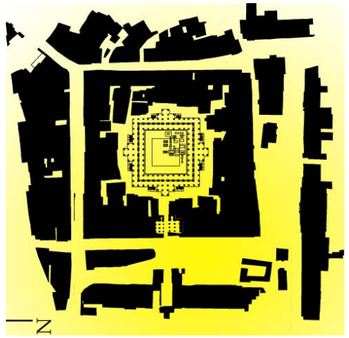
Movement



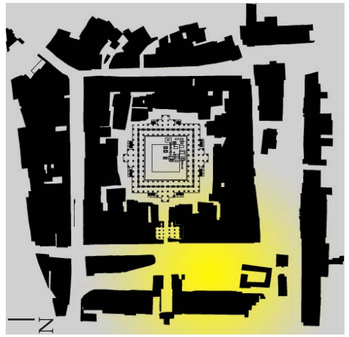


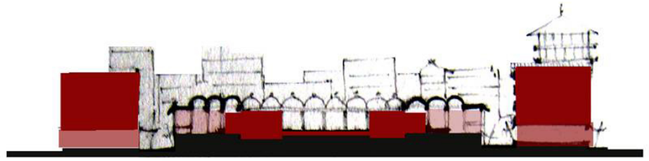
Manek chowk remains the centre of major activities throughout the day.

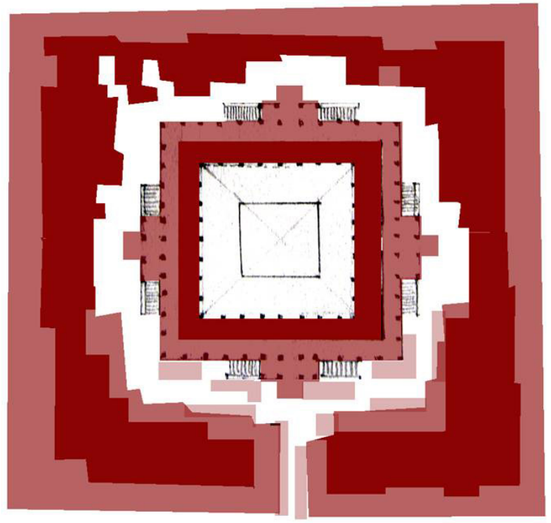
Day time activity



Night time activity



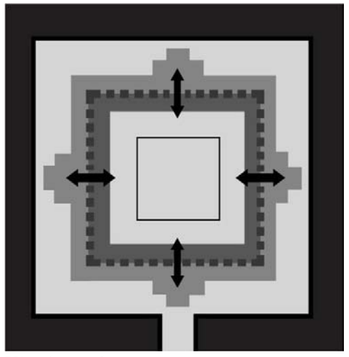




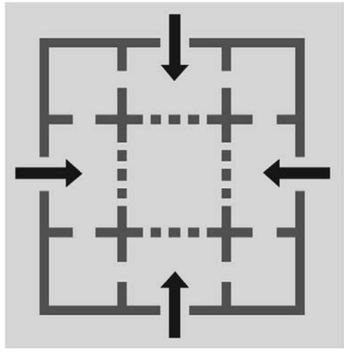
Change in the levels of privacy as one goes from outside to inside.

If we compare the footprints of the king's tomb and the queen's tomb, then it can be seen that the Queen's tomb is introvert as well as extrovert but on the other hand the king's tomb is an introvert structure.
Their structures also play an important role in the manner the urban fabric developed around them.

Looking in from the colonnade



King's tomb



Queen's tomb

Rani no hajiro is an introvert as well as an extrovert structure.The presence of a colonnade helps it to relate to the outside whereas presence of the jali wall gives it an introvert character.
The queen`s tomb makes an impact on the urban fabric whereas king`s tomb is a monument by itself.

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Town Hall

by Claude Batley

Till 1860 A.D there was almost no development on the western bank of the river.
Construction of Ellis Bridge in 1892 A.D led to development on the west side of the river.
No building was built on west bank as late as 1902 AD.
In 1938 AD Town Hall was built as a cultural centre, in front of the Ellis Bridge connecting the old city to the new city.

Schematic section taken through Town Hall along the Ellis Bridge and the Church on the eastern bank of Ahmedabad.

Elevation along Ashram

Elevation along Ellis Bridge

Town Hall sitting on Western bank along the axis of Ellis Bridge right opposite to the church and Ahmedshah Mosque on Eastern bank.

New kind of Archicture in the new city of Ahmedabad.

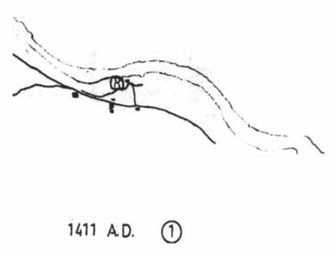
Town Hall

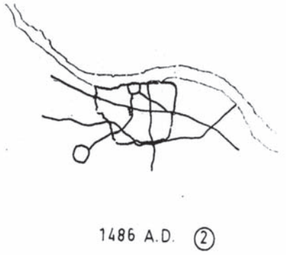
M.J Library

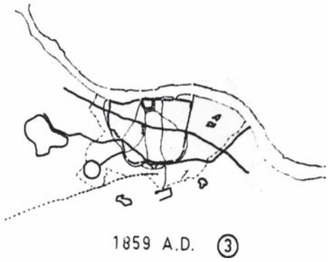
Gujarat University

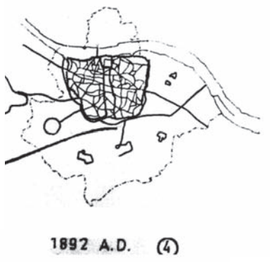
Existing buildings of old Ahmedabad

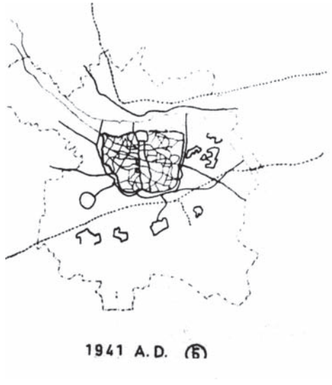
History of Development of the Ahmedabad City
The Study of Indian Urban History

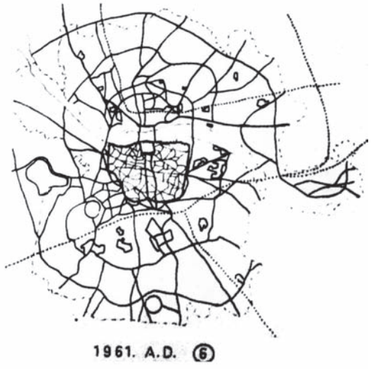












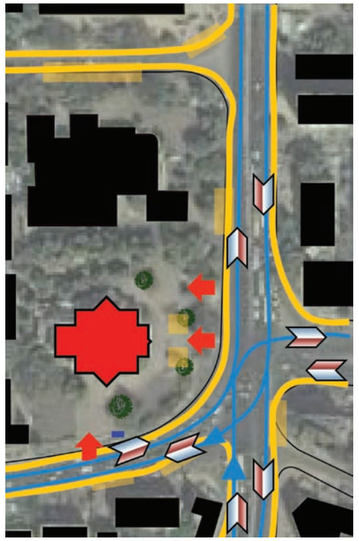
Pedestrians

Hawkers/ Mobile shops

Entrance to Town Hall

Bus route

Slow Traffic
Heavy Traffic



existing section

Elements
Cone of Vision

Entrance to Town Hall

Entrance to Town Hall

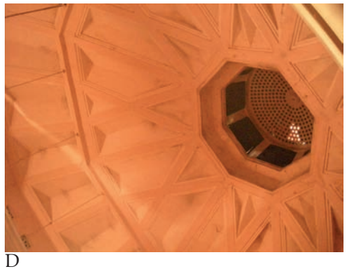
A

B

C

The monumentality of Town Hall is highlighted by:
The strong axis along the Ellisbridge connecting the old city to the new city.
Symmetry of the building
High plinth
Setback from the road which allows a sense of awe for the viewer (all the details of the building suggest that it has to be viewed/looked upon by the viewer).

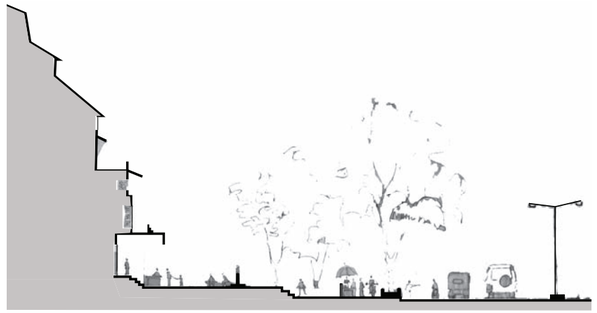
Eclectic character of building
Classical/ Neo classical
Modern – Exposed brickwork
Indian – Chajjas, Jaali openings



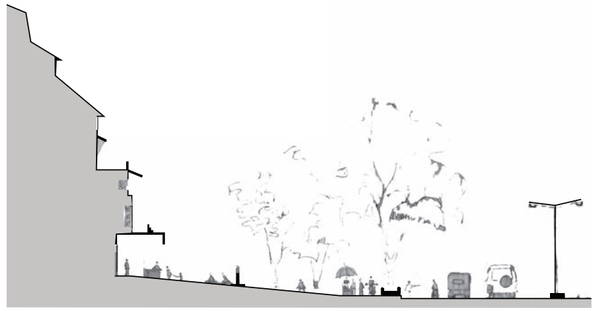
D

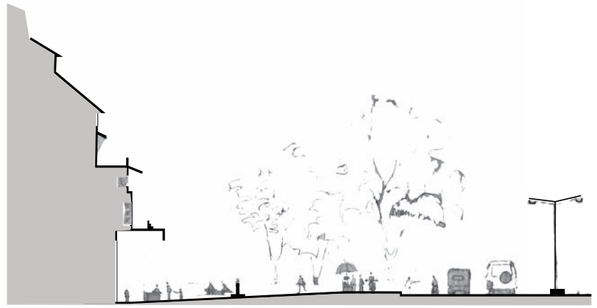
E

F



existing section





Modification in relationship of building with the ground -
(1) Introducing ramp connecting the ashram road
(2) making appropriate changes to the land around the building to make people part of the building and not only the viewer.

Every building is made by minute details. Even the small change can change the building.

The monumentality of Town Hall building was achieved keeping in mind the time and space in which it was built.
Whether the building retains its monumentality always depends on the change in the surrounding because monumentality is relative to the surrounding.

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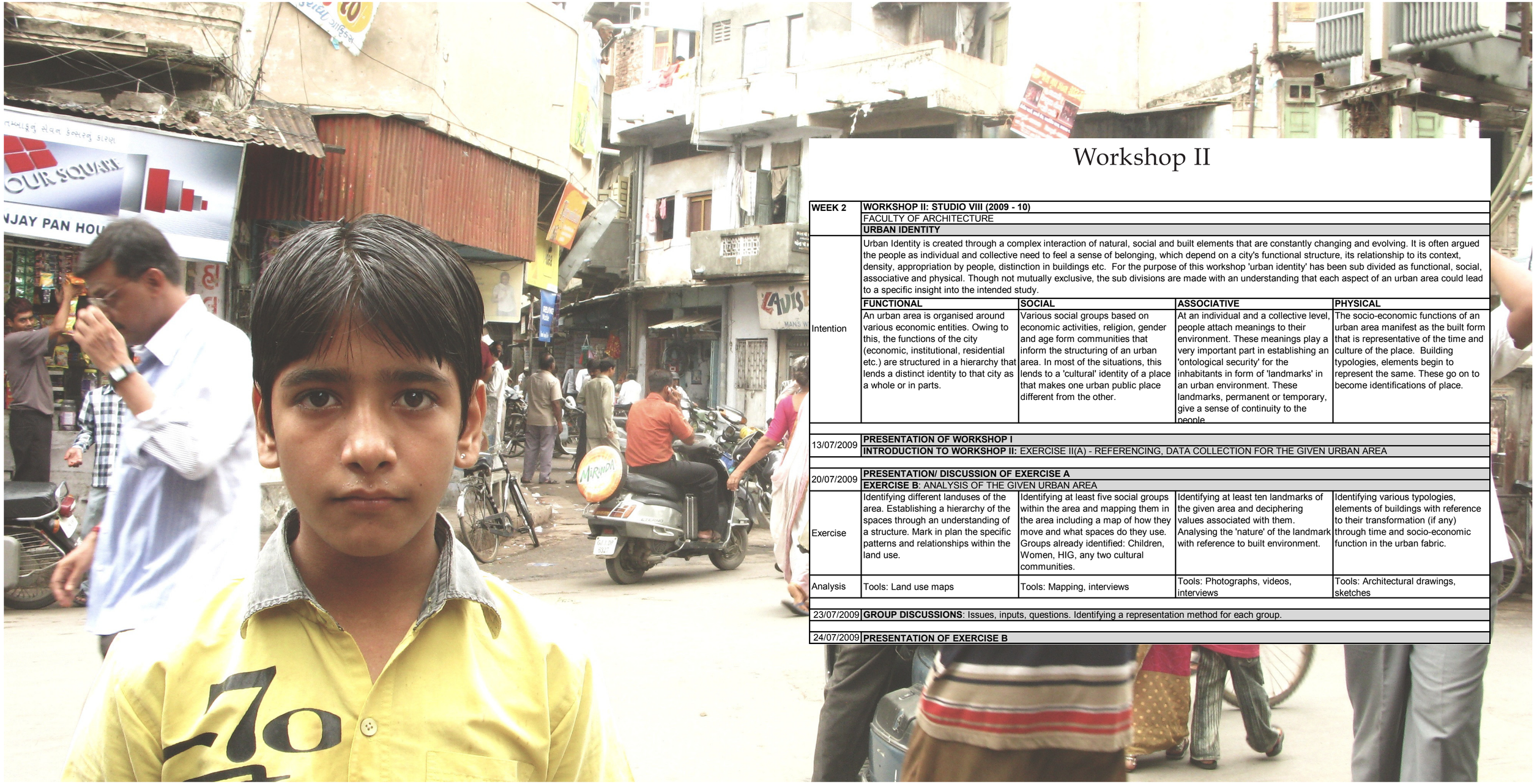
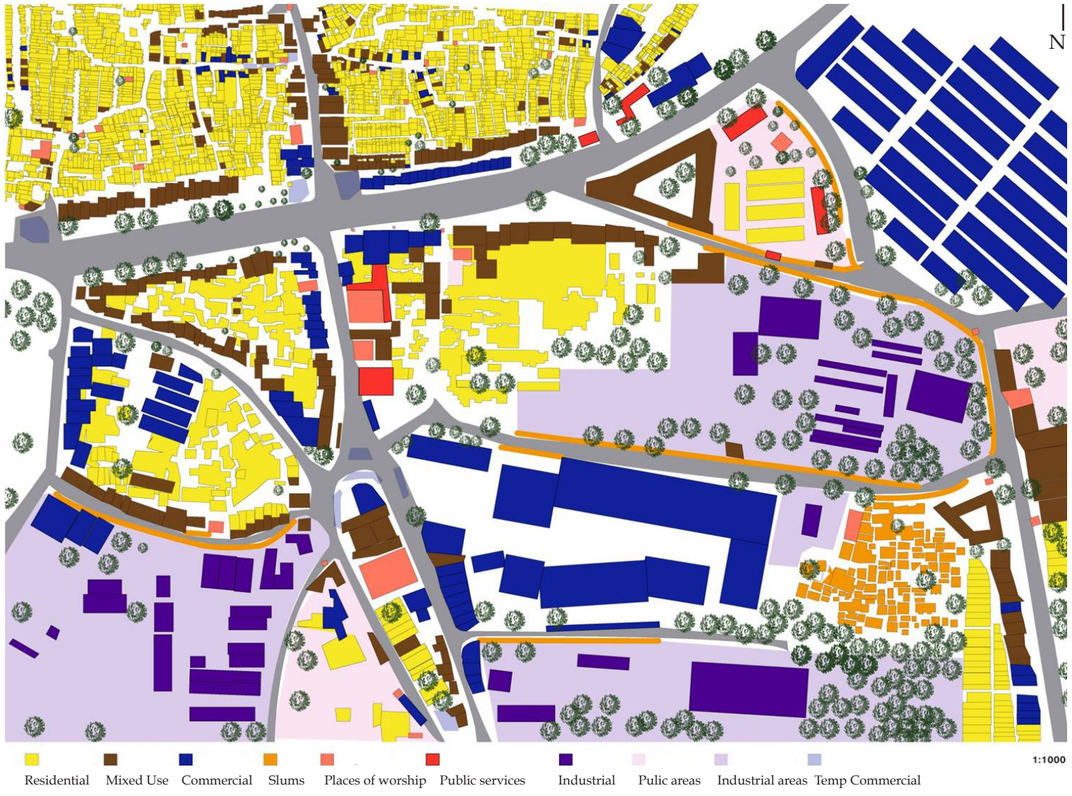


Workshop II

WEEK 2	**WORKSHOP II: STUDIO VIII (2009 - 10)**			
	FACULTY OF ARCHITECTURE			
	URBAN IDENTITY			
Intention	Urban Identity is created through a complex interaction of natural, social and built elements that are constantly changing and evolving. It is often argued the people as individual and collective need to feel a sense of belonging, which depend on a city's functional structure, its relationship to its context, density, appropriation by people, distinction in buildings etc. For the purpose of this workshop 'urban identity' has been sub divided as functional, social, associative and physical. Though not mutually exclusive, the sub divisions are made with an understanding that each aspect of an urban area could lead to a specific insight into the intended study.			
	FUNCTIONAL	**SOCIAL**	**ASSOCIATIVE**	**PHYSICAL**
	An urban area is organised around various economic entities. Owing to this, the functions of the city (economic, institutional, residential etc.) are structured in a hierarchy that lends a distinct identity to that city as a whole or in parts.	Various social groups based on economic activities, religion, gender and age form communities that inform the structuring of an urban area. In most of the situations, this lends to a 'cultural' identity of a place that makes one urban public place different from the other.	At an individual and a collective level, people attach meanings to their environment. These meanings play a very important part in establishing an 'ontological security' for the inhabitants in form of 'landmarks' in an urban environment. These landmarks, permanent or temporary, give a sense of continuity to the people	The socio-economic functions of an urban area manifest as the built form that is representative of the time and culture of the place. Building typologies, elements begin to represent the same. These go on to become identifications of place.
13/07/2009	**PRESENTATION OF WORKSHOP I**			
	INTRODUCTION TO WORKSHOP II: EXERCISE II(A) - REFERENCING, DATA COLLECTION FOR THE GIVEN URBAN AREA			
20/07/2009	**PRESENTATION/ DISCUSSION OF EXERCISE A**			
	EXERCISE B: ANALYSIS OF THE GIVEN URBAN AREA			
Exercise	Identifying different landuses of the area. Establishing a hierarchy of the spaces through an understanding of a structure. Mark in plan the specific patterns and relationships within the land use.	Identifying at least five social groups within the area and mapping them in the area including a map of how they move and what spaces do they use. Groups already identified: Children, Women, HIG, any two cultural communities.	Identifying at least ten landmarks of the given area and deciphering values associated with them. Analysing the 'nature' of the landmark with reference to built environment.	Identifying various typologies, elements of buildings with reference to their transformation (if any) through time and socio-economic function in the urban fabric.
Analysis	Tools: Land use maps	Tools: Mapping, interviews	Tools: Photographs, videos, interviews	Tools: Architectural drawings, sketches
23/07/2009	**GROUP DISCUSSIONS**: Issues, inputs, questions. Identifying a representation method for each group.			
24/07/2009	**PRESENTATION OF EXERCISE B**			

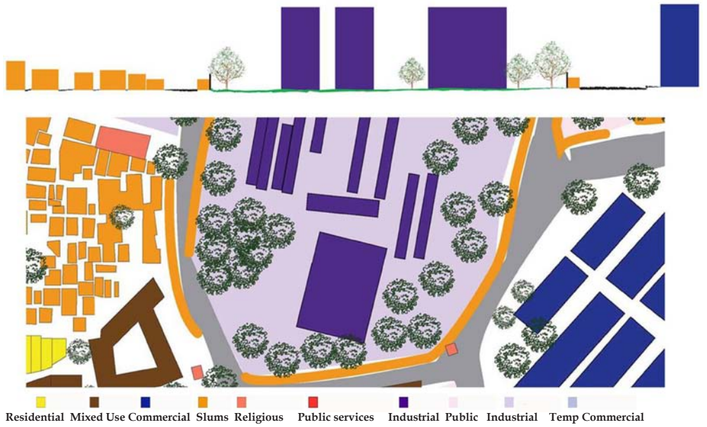
FUNCTIONAL MAPPING OF RAIPUR DARWAJA AREA



The diagram above shows analysis of Raipur darwaja area according to its function.

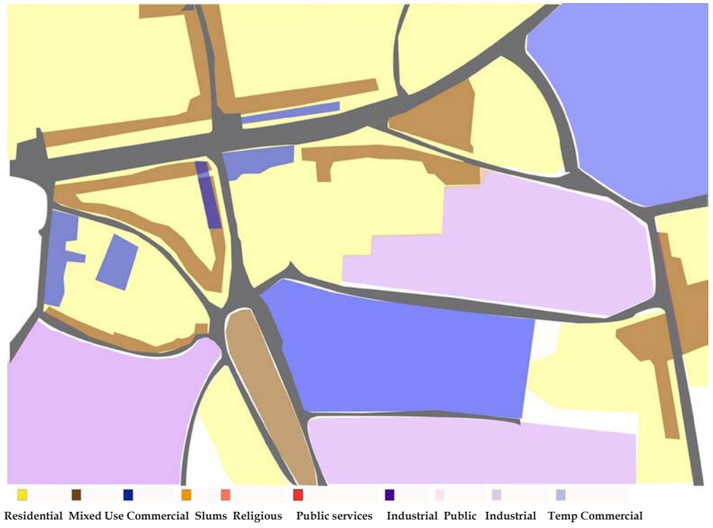
The main road is of utmost importance as it very evidently divides the area into residential, commercial and industrial. Also it marks the area into old and new based on the development.

The buildings on the road edge are either public buildings or of commercial and mixed use. As we move farther away from the road into the interior of the area, it is relatively quieter, the road width decreases and accessibility by vehicles decreases.

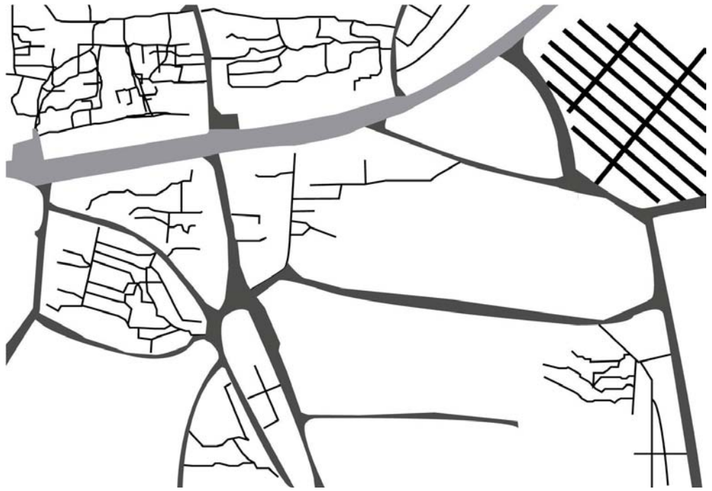


The rundown mills occupy a large part of the site with mostly open space around it and the periphery marked by a high compound wall. Temporary housing or slums take the edge and continue along it in a linear manner.

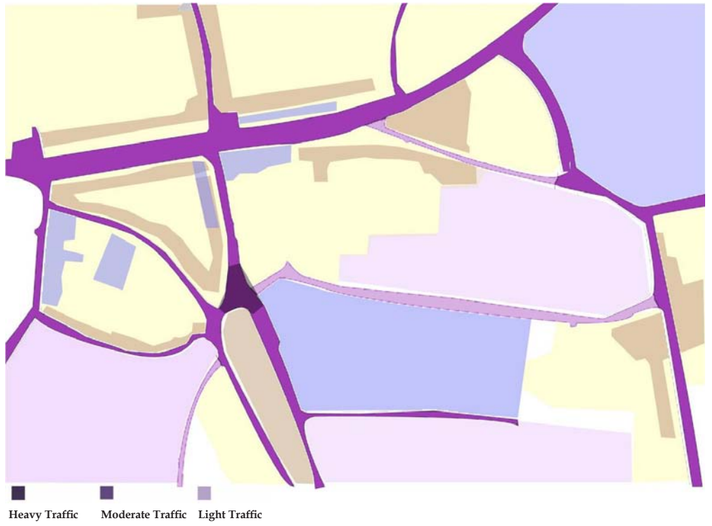
The street edges are taken up by the commercial and the mixed use buildings. As one proceeds farther from the main roads, the residential type dominates the built fabric.



This diagram represents the defined division of the Raipur area according to the spaces occupied by various functions.



This diagram represents the road network, where the main road forms the main axis of the area. As we move towards the interiors of the area, the primary road divides into secondary roads that run perpendicular and further divide into tertiary roads, which are parallel to the main road.



This diagram shows the traffic and movement analysis at 9am.
The variation in colour intensity indicates the traffic intensity. At this time, moderate traffic can be seen on all the roads except at one junction, where the traffic intensity is high due to merging one-way traffic.

This diagram shows the traffic and movement analysis at 5pm.
The variation in colour intensity indicates the traffic intensity. At this time, heavy traffic can be seen on the primary and all the secondary roads. Light traffic can be seen on a few tertiary roads

The area around Raipur darwaza has distinguished zones of landuse, but at some places two or more types come together.

The region that falls under the territory of the old city is largely dominated by the pol houses, with most of the houses towards the road edge having a commercial function on the lower floor and residence on top.

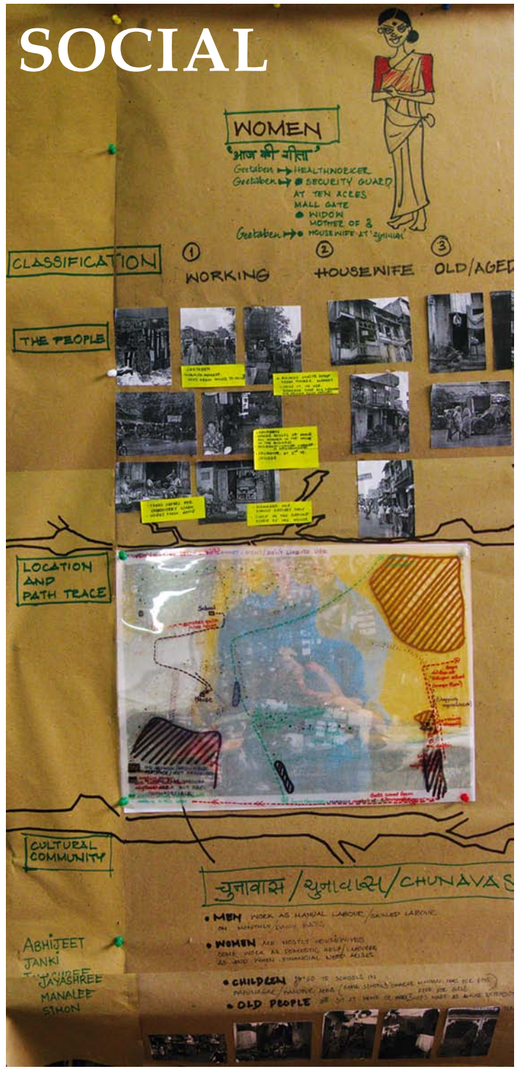
the edges of the main roads have mainly commercial, public buildings or buildings of mixed use.

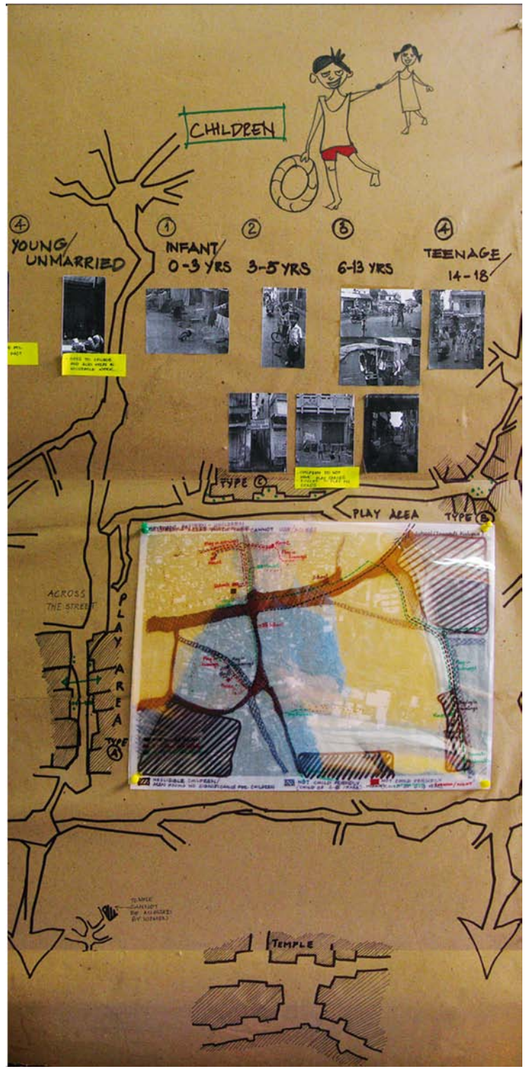
The industrial buildings are mostly oriented in the direction of the roads.

The region around the run down mills have been taken up by the slums, arranged in a linear pattern.

The open spaces within the region are not very large and are mostly located farther from the main roads.

SOCIAL


WOMEN
CLASSIFICATION
① WORKING
② HOUSEWIFE
③ OLD/AGED
THE PEOPLE
LOCATION AND PATH TRACE
CULTURAL COMMUNITY
चुनावास / चुनावास / CHUNAVAS
ABHIJEET
JANKI
JAYASHREE
MANALEE
SIMON


CHILDREN
④ YOUNG/UNMARRIED
① INFANT/0-3 YRS
② 3-5 YRS
③ 6-13 YRS
④ TEENAGE/14-18
TYPE C
PLAY AREA
TYPE B
ACROSS THE STREET
PLAY AREA
TYPE A
TEMPLE

OLD/AGED
① 60-80 YRS
② 80 & ABOVE

WORK COMMUNITY
HIGHER INCOME
LOW INCOME
① DESK JOBS
② SELLING
① MANUAL LABOUR
② SKILLED LABOUR
③ CRAFTS JOBS
WORK PLACES
SLUM DWELLERS
COMMUNITY SPACE
TRAFFIC ISLAND ACTS AS PUBLIC SPACE

WOMEN

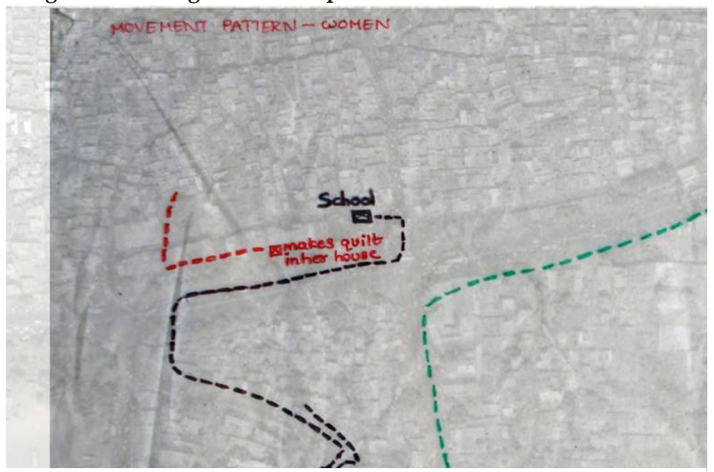
Working

Housewife

Old/ Aged

Young/ Unmarried

Diagram showing movement pattern of women



The following diagram shows the movement pattern of different women, in different areas, at different times of the day.

From this diagram, we infer that the intesection of all kinds of women occurs at the public open spaces which happen to be the vegetable markets,grocery stores,etc.

Movement of a housewife

Movement of women having work at far off places

Movement of women having work in their neighbourhood.

Diagram showing gathering densities of women

The following diagram shows the gathering densitites of women at different times of the day.
From the diagram we come to know that in the morning movement is more near the roads and school.

In the afternoon is near the residential areas or near work places.

Morning

Afternoon

Evening/Night

The diagram shows blackholes or areas which women feel uncomfortable to access/ pass through.

Some of these areas include

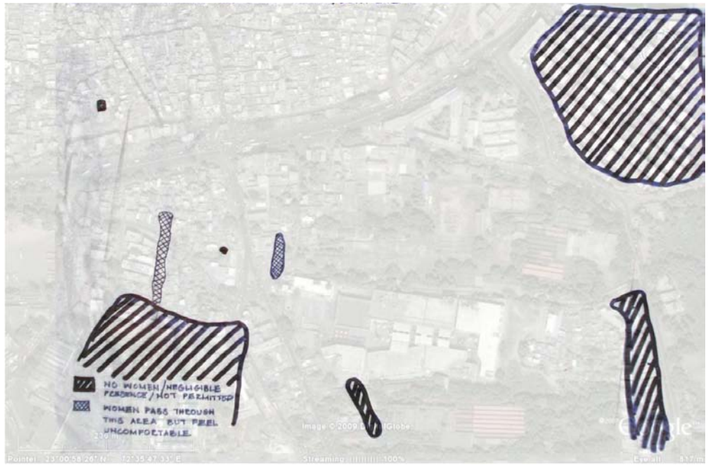
New Cloth market

Streets near auto rickshaw garages

A Street where there is a gathering of daily wage earners

Areas surrounding stalls crowded by men/ boys

Religious places which prohibit entry of women



Women walk through this area but feel uncomfortable

No women/ negligible women present

CHILDREN

Infants

3-5 years

6-13 years

Teenage/ 14-18 years

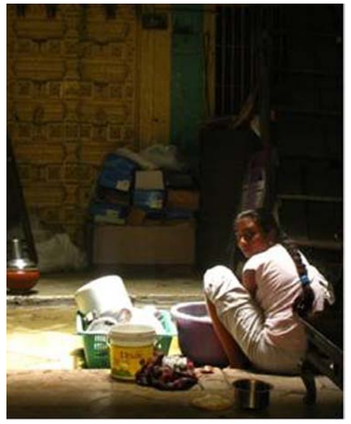
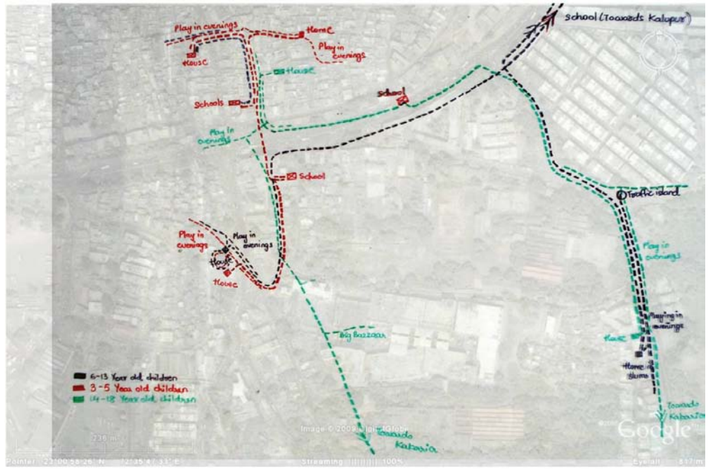


Diagram showing movement pattern of Children



The diagram shows that small children play near their homes, while older children play on the steets, etc away from their place of stay. This shows that mobility range of children increases with age.

6-13 yr old children

14-18 yr old children

3-5 yr old children

Diagram showing gathering densities of Children

The process of going and coming back from school becomes an event children's lives.

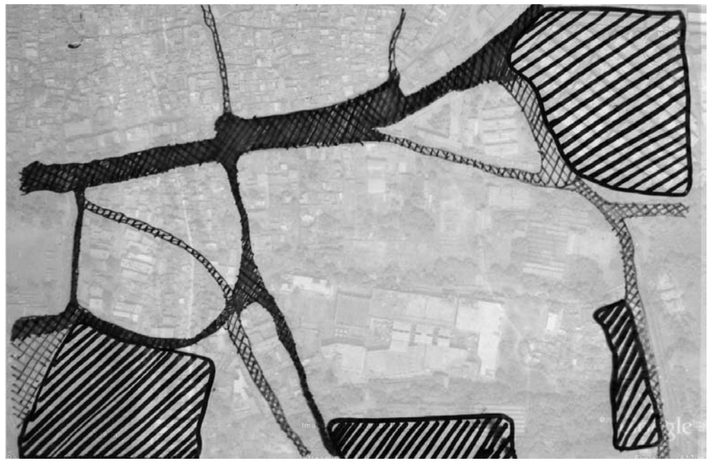
The diagram shows that young children use the inner residential streets and chowks to play while older children wander and play on the main streets.

Morning

Afternoon

Evening/Night

Diagram showing area children don't/feel uncomfortable/not safe



The diagram shows the blackholes or areas that children don't use or is not safe for them to use.

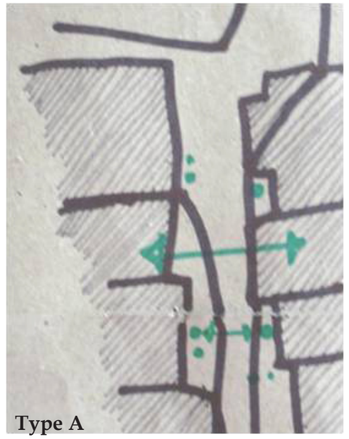
New Cloth Market, the autorickshaw garages, the high traffic streets, etc are some of them. A large part of the city is inaccessible to children.

Not child friendly child of 3-5 years.

Negligible children/areas having no acess for children

Not child friendly 6-18 years

Diagram showing different types of play spaces for children



Type B

These diagrams show different types of places which children use for playing

As shown in

type A children play in areas in front of their houses across the streets

type B chilldren play in the chowks

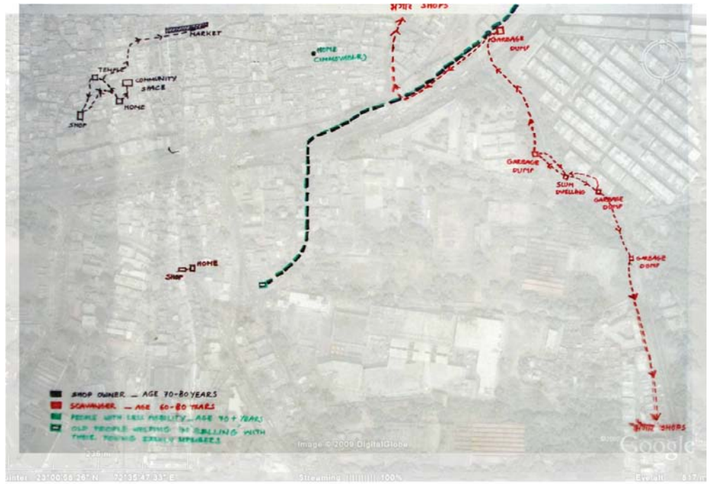
type C children play in front of their homes

OLD/ AGED PEOPLE

60-80 years

80 years and above

Diagram showing movement pattern of old people



The diagram shows that old people generally use community spaces near their residences as leisure areas .

Also, once in a day most old women capable of physical movement move around their neighbourhood to meet people, visit the temple,etc.

If the family owns a shop near their house or in the house the elderly people run them.

Shopowner of age 70-80

People having less mobility 70+ yrs

Scavenger of age 60-80 yrs

Diagram showing gathering densities of old people

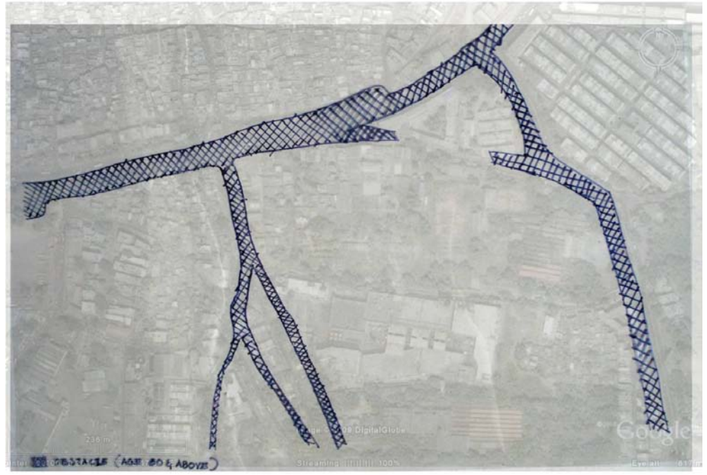
The diagram shows that old men generally gather near the corner shops and other open spaces.

Old women generally gather in front of their houses, temples, sometimes in shaded chowks etc

Morning

Afternoon

Evening



The diagram shows the area which old people feel uncomfortable to use.

Obstacle 80 and above

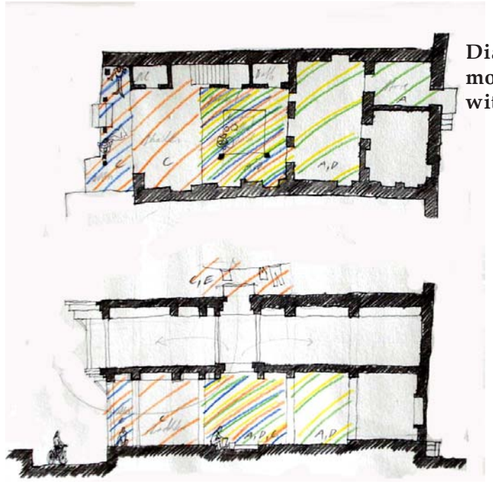


Diagram showing movement of old people within the house

6am -9 am

9am to noon

noon to 5pm

5pm-10pm

Night

Most of the time old people stay in their house and go out once or twice in a day.

The diagram shows the movement pattern of old people within the house at different times of the day
.
Old people generally sit near the courtyard of the house or at the entrance plinth(otla) during the evening.

Some old women also spend time cooking or sending their grandson/ granddaughter to school in case her daughter-in-law is working somewhere.

WORK COMMUNITY

Desk jobs

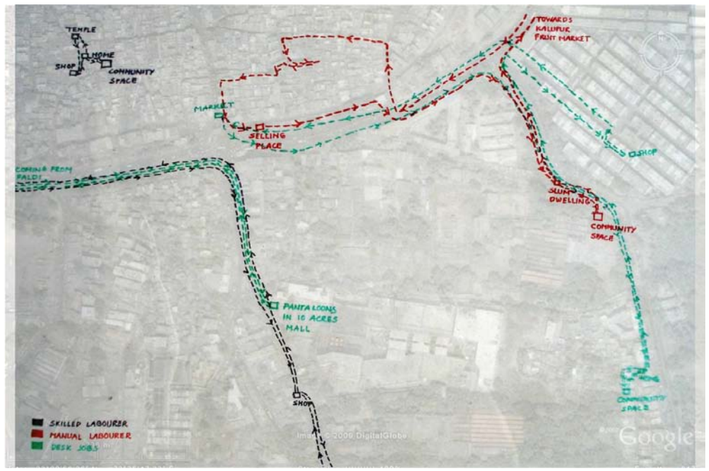
Crafts jobs

Selling

Manual labour

Skilled labour

Diagram showing the movement pattern of the work community



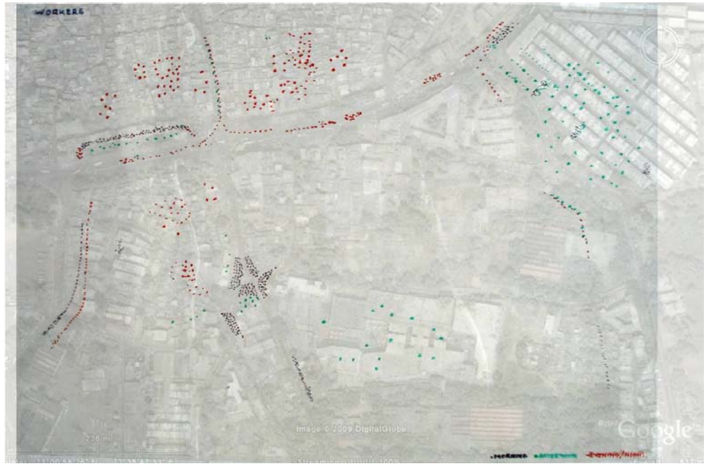
The diagram shows that the skilled labour community has jobs within the neighbourhood, whereas the manual labour and people with desk jobs need to go to far off spaces for work.

Skilled labour

Desk jobs

Manual

Diagram showing the gathering densities of the work community



The diagram shows that the work community spend the maximum part of their day in their respective work spaces

They use the streets for commuting, streetside stalls for leisure.

Evenings are spent with family

Workers whose main business happens at evenings or nights, the evening and night slot of the day are also spent at work places

Morning

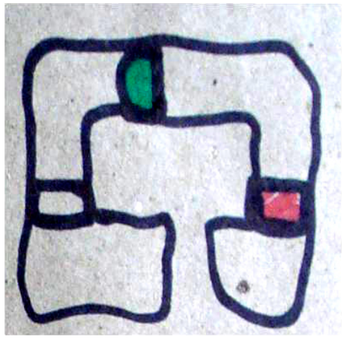
Afternoon

Evening/Night

Types of markets offering work to work community

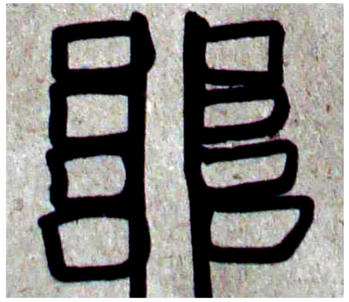
Type A

Shops selling different products/ services to the neighbourhood, thus forming a neighbourhood boundry.
EG. POL



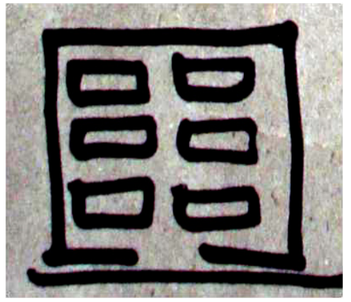
Type B

Shops selling different products/ services within a cluster residence on first floor and shops on ground floor.
EG. POL



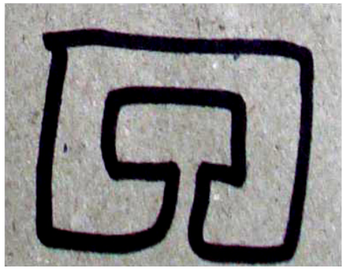
Type C

Area with shops of similar type.
EG. AUTOMOBILE, CAR REPAIRERS AREA



Type D

Enclosed area with shops of similar type.
EG. NEW CLOTH MARKET



Type E

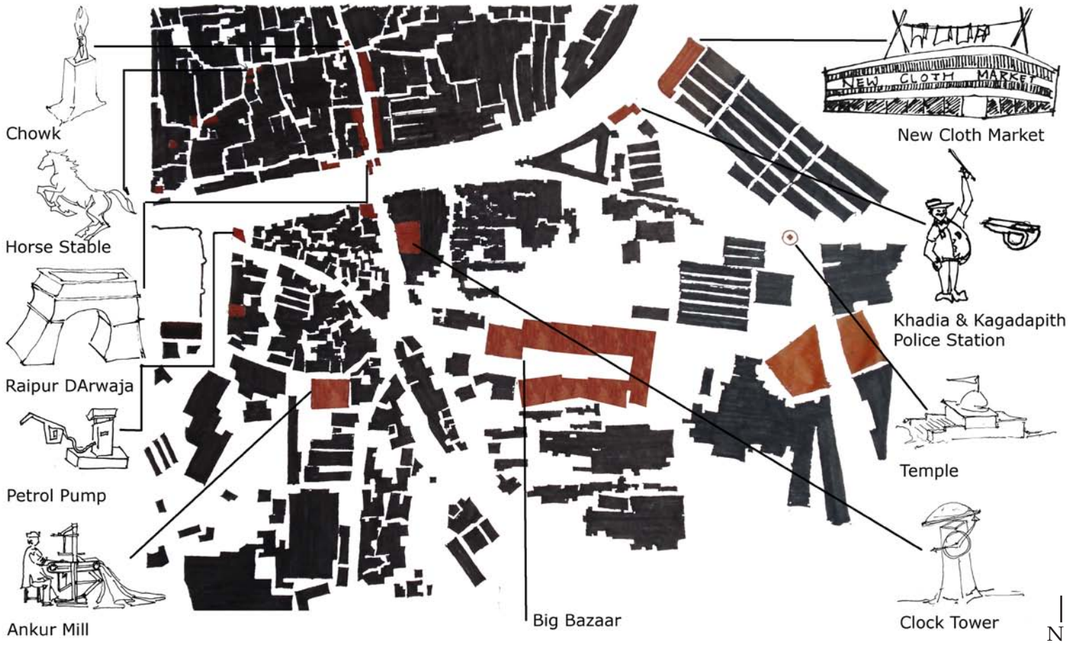
Enclosed area with shops of all type under one roof.
EG. TEN ACRES MALL

Every cultural community has a large percentage of the following social groups-
Women, children, old people and the work community.
Each of these social groups has different needs and different behavioural patterns.
A city which offers equal usage options to all these social groups would be ideal.

Bibliography

Google Earth
A Pattern Language
Alexander, Christopher

ASSOCIATIVE



Associative Value Of "Landmark"

• Raipur Darwaja: Part of the fort wall, old city, Ahmedabad. It was enclosed within a fort (bhadra fort). This fort had 12 gates. Raipur Darwaja is one of them. The darwaja has beautiful carvings. It has become a landmark of that region since it is a part of the historic fort wall, its scale and its architecture.

• Raipur bhajiya house: Its just outside the Raipur darwaja, it is one of the oldest food joints of this area. It has become a landmark because of its good quality bhajiyas.(which has now become a brand name)

• New cloth market: Its a cloth market on a huge scale to sell fabrics in whole sale. Since it is located on the corner of the junction and lots of people have functional association to it, it has emerged as a landmark.

• Horse stable: There is a community settled in this area. They are band master by their profession. So there are some horse stables in this area, which represents the cultural and functional identity of this place.

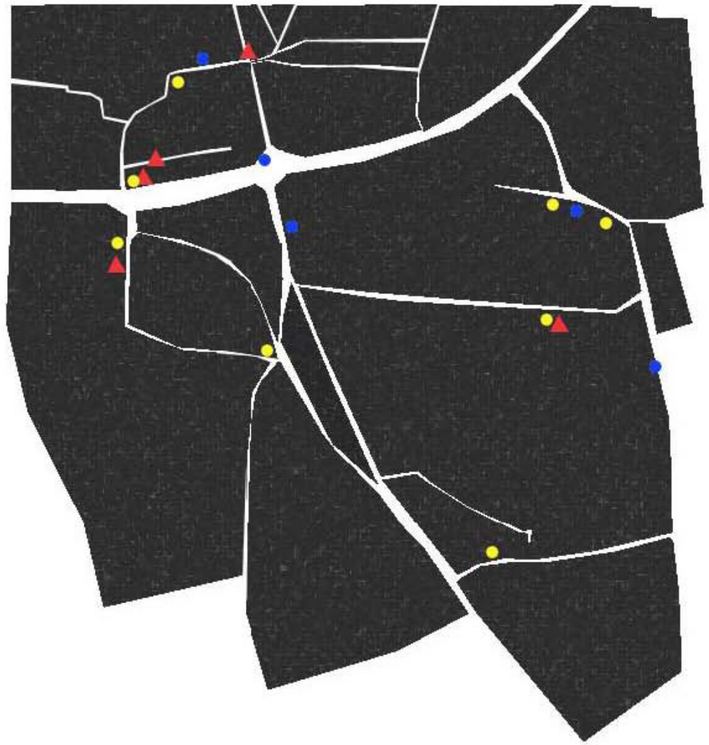
• Hirabhai market: Its again a whole sale market but not containing only fabric shops. It's a mixed used market where there are shops for car dealers, road transporters and fabrics. Again it is on a junction so the location and its associative value makes it a landmark in that area.

• Ankur mills: It is a division of Arvind mills, established in early 20th century. It is producing voiles-cotton fabrics (thin fabrics) and also producing denims.

• Kothari market: It is a combination of two buildings having very similar activities happening in it like hirabhai market. The cladding of both the buildings distinguish them from the surroundings and that makes it a landmark of that area.

• Big Bazaar: The Ten Acres Mall is popularly known as 'Big Bazaar'. Big Bazaar is of the many stores in the mall. The central space of the mall is thronged by people asan 'outing' place

Absence of Associative values



▲ Cows

● Good smells

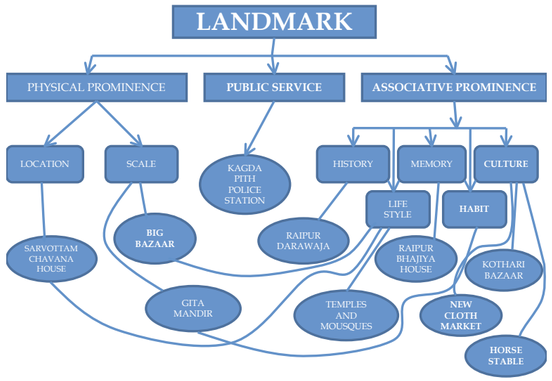
● Bad smells

N

• Absence of any associative values for a place or the lack of information such as the local language, makes one create ones own landmarks for everyday use.

• These landmarks could be cows or maybe even some olfactory reminders. Itrcould even be a place where one might have taken a photograph with strong connotations.

	Landmark at City Level		Landmark at Raipur Area Level						Landmark at Neighbourhood Level				
Classes	**Raipur Darwaja**	**New Cloth Market**	**Raipur Bhajiya House**	**Big Bazaar**	**Kagadapith Police station**	**Khadia Police station**	**Seasonal Market**	**Kothaari Market**	**Horse Stable**	**Temple/ Mosque**	**Sarvottam Chavana**	**Ankur Cloth Mill**	**Chowks**
Lower class	√	√	√		√	√	√				√		
Rickshaw Drivers	√	√	√	√	√	√	√	√					
Middle and	√	√		√			√	√					
Upper class													
Residents (Local)	√	√	√	√	√	√	√	√	√	√	√	v	√
Why Landmark?	Historic	Economy	Habit	Visual	Visual	Location	Economy	Economy	Contrast	Cultural	Habit	Economy	Location
Associative value		Functional		Functional		Visual	Functional			Ritual	Location		Cultural
Historic	√												
Form (in urban fabric)	√			√					√	√		√	√
Economical		√	√	√			√	√			√	√	
Functional													
Visual	√			√	√	√				√			
Location		√	√		√						√		√
Culture										√			√
Habit			√								√		√

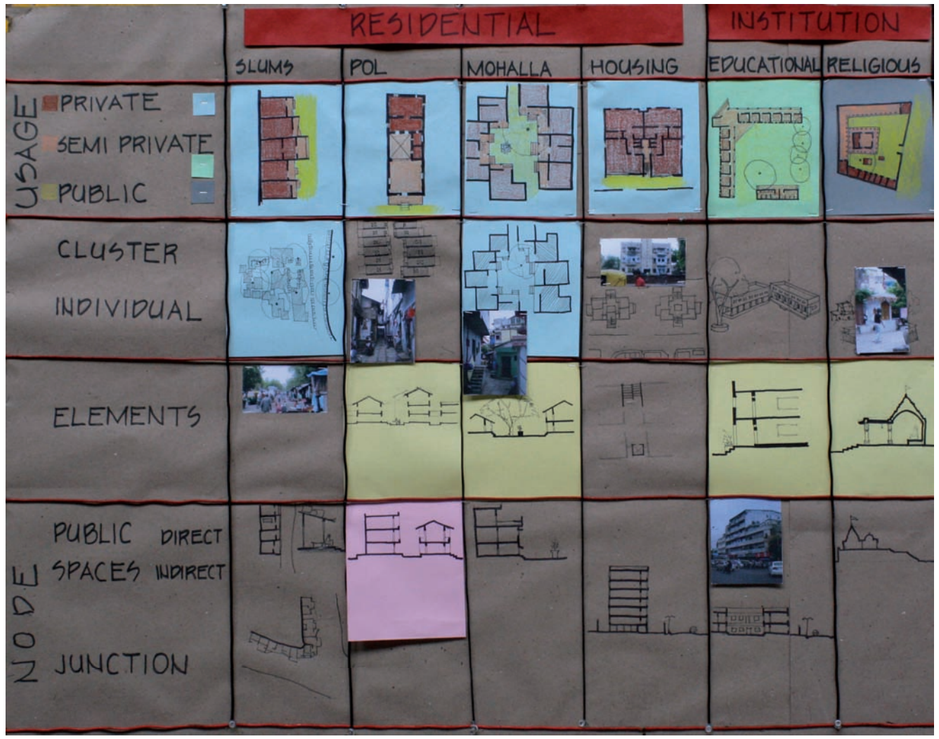


Anything which is in contrast to its surroundings, happens to become a landmark gradually Landmarks are different for different people and there are landmarks at different levels: global landmarks, landmarks at the city level and landmarks at community level.

PHYSICAL
DISTRICT RAIPUR

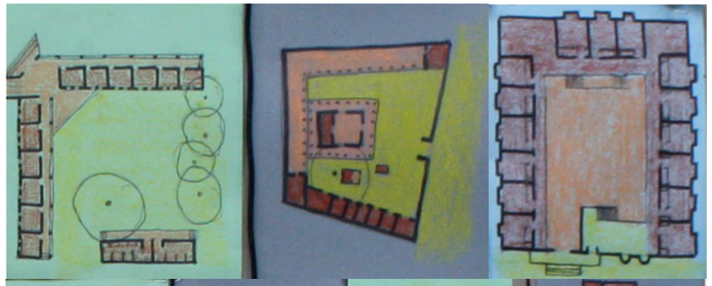
CIRCULATION

BASED ON THE BUILDING TYPE

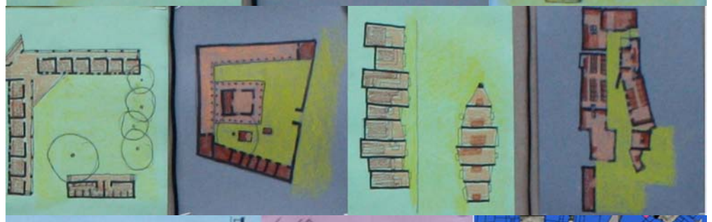


INSTITUTIONS

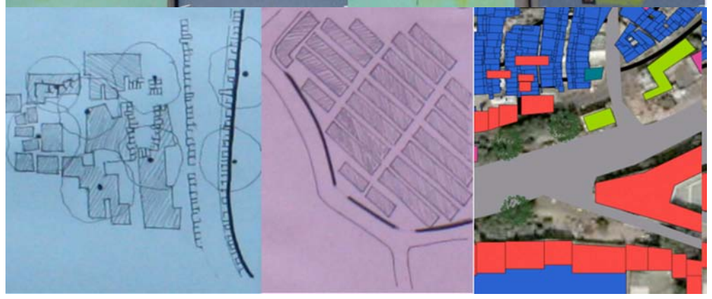
Most of the circulation paths are semi-private.



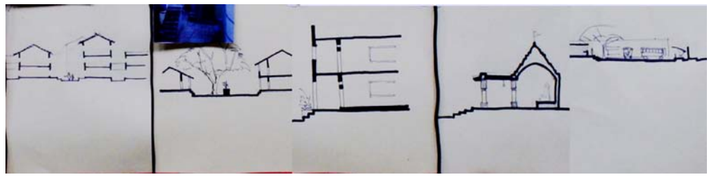
All the public spaces are open to sky.



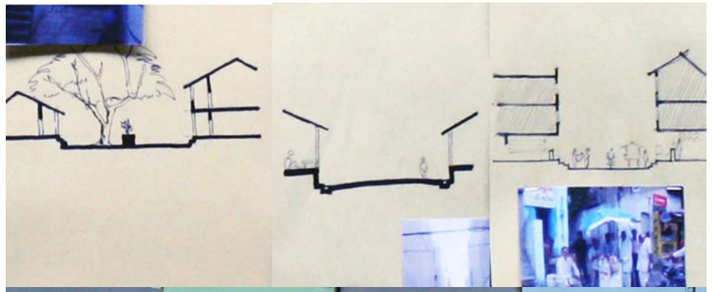
Residential buildings comes on edge whereas commercial buildings are on the junctions.



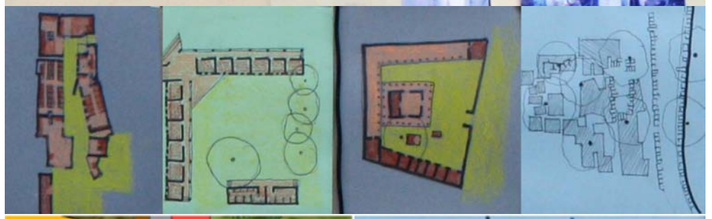
Plinth acts as main element in most of the cases.



90% of the activities respond directly to the public spaces.



Institutions, commercial, services and infrastructures acts as a whole entity whereas residentias formed of parts.



Trees act as an important nodal point in city fabric.

Independent buildings act as physical landmark.

Slums are dependent on existing structure and irregular in its arrangement.
Pols are built in refrence to the topography and water drainage of the land. It uses common walls and narrow streets.
Mohallas are clustered housing creating introvert community space.
Appartments follow a systematic grid and not allowing defined community space.
Educational institutions are located in the old part of the city. They open out on the street.
Religious institutions are more distinct and separate themselves by a forecourt.
Public service building open directly on the street.They are independent and visibly noticeable. They act as associative landmarks.
Commercial buildings work at larger scale. They are visually inviting and directly accesable.
Theyare made of respective units and built on nodes of the city.

Workshop III

Urban Resources

Intention:
Cities could be seen as mechanisms designed with the resources available to it. Though both the mechanisms and the resources have a large role in shaping the way lives are carried out in a city, in most of the cases today, the mechanisms make the root of the resources invisible. Workshop III was designed to bring into the foreground the role of the above.

Exercise:
Pre-industrial cities, due to its dependence on non-mechanised natural resources, evolved in tandem with its environment and unlike the post industrial cities had a more direct relationship with its resources. In most of the situations the management of it was intertwined with the social and economic systems of the inhabitants. Using this as a benchmark the students were to do a comparative study with the post industrial city area.

This study was to be carried out in five groups: Energy, Materials, Water and Sanitation, Mobility and Transport, Land and Green. The exercise was focused on identifying the relationship between the pattern of settlement with the resources it uses and the mechanisms that manage it.

ENERGY

	CHINA	INDIA	USA	EURO
Population (millions)	1,288	1,064	291	306
GNP ($=billions)	1,417	571	11,013	6,978
Water Use (cubic kilometers)	526	500	467	185
Energy Use (quadrillion BTUs)	52	23	97	50
GNP/Pop (per capita income)	1,100	536	37,844	22,803
Water/GNP (cubic meters water per $1.00 of GNP)	0.37	0.88	0.04	0.03
Energy/GNP (BTUs per $1.00 of GNP)	36,717	39,926	8,808	7,210
Water/Pop (per capita water use in cubic meters)	408	470	1,606	605
Energy/Pop (per capita energy use in millions of BTUs)	40	21	333	164

The knowledge about architecture in dessert areas such as Ahmedabad is found in the old city's polhouses. The housing entities have mostly one facade facing a narrow gap. The others are shared walls with other entities. In addition the grain of the settlement is highly dense. This manner of architecture is keeping the inside room temperatures low. Further on this typologie of housing consists a courtyard that conditions the building with air. The narrow and elevated shape stacking three buffering storeys keeps the ground level chill.

Back to microgeneration
The result of our study is that the behaviour of energy consumption has increased in a scale of no control. Artificial lighting allows us to enlarge our day – blending day and night – uses energy. Economic growth needs energy – Nations are competing and in the same time not allowing to reduce energy consumption. This is why we have to focus on other resources – renewable resources as solar, water, wind, geothermal energy. Further on there's a matter of transmitting energy in large scale settlements resulting huge amounts of energy losses. Even transporting fuel is using a lot of energy. We need to use resources existing in the local area. For Ahmedabad we found out that most of the LPG used for cooking is a fossil fuel. Closer resources are solarenergy, windenergy (gross resource of 9675 MW)
This is leading us back to microgenerations.

Energy used for cooking

Pre-industrial time
Pre industrialisation period firewoods were used as a source of energy because of the easy and cheap availiability of woods in the area surrounding the fort wall.
Because of excessive usage of woods as fire woods deforestration started and the envoirnment was also affected
Later as the deforestration began and there was a reduction of the availiabilty of firewood , coal was used as an alternate source of energy which was brought in from present day nagpur region, and jharkhand. After a certain period it became a very important source of energy because of its cheap availiability and it burned for a longer time.

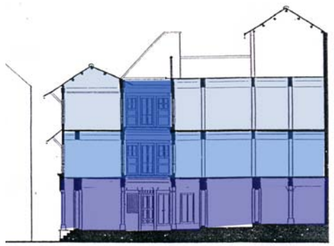
Natural ventiltion in the old city before industrialisation

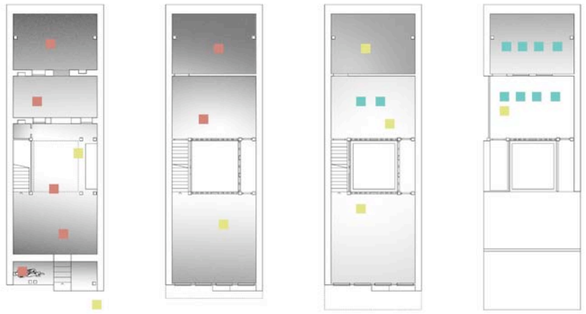
Natural cross ventilation took place in the old city since the house was a linear unit having its extreme ends open and a cental courtyard.

Also due to the central courtyard the hot air from the house rose up and cool air came in from the openings.

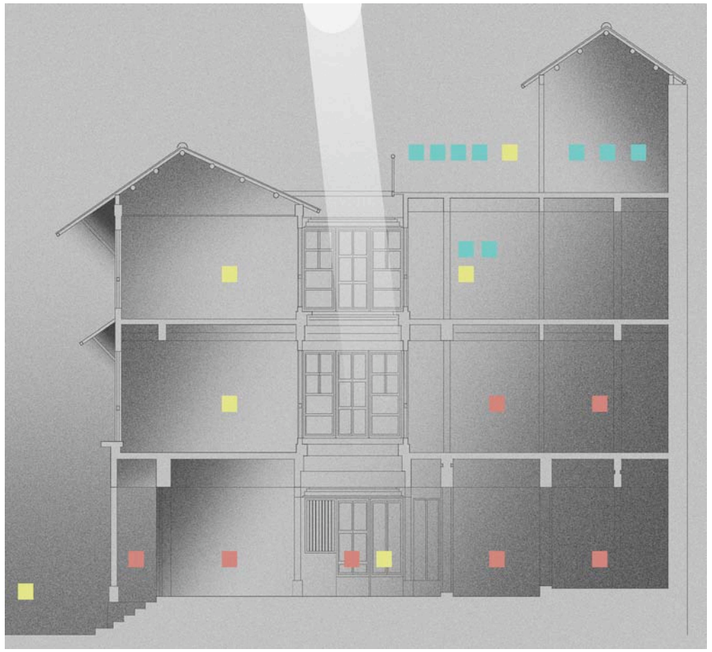
Also as we move inward in the house it gets cooler. The plinth and the imeditate room is warmer compared to the inner room. But again that is one of the breeziest rooms because of the courtyard.

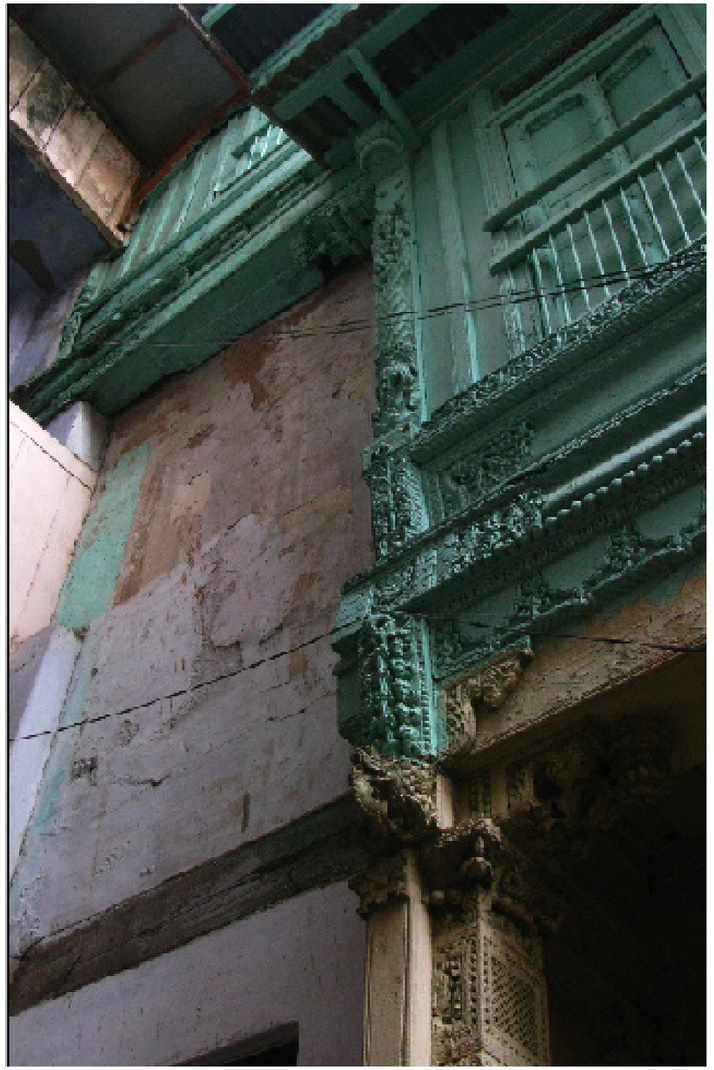
Also major activities take place in the court yard, it being the heart of the house.





Morning - Midday Midday - Evening Evening - Morning





Post industrial time

Liquified petroleum gas (LPG) are used, it is produced by the oil producing companies.

The gases which are produced are then taken to the bottling plant where under extreme conditions they are filled in cylinders.

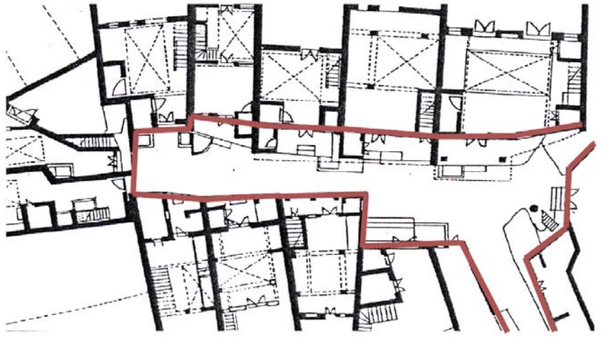
These cylinders are then taken to the dealers, who then make it available it to the common people which is then used as an important source of energy for cooking.

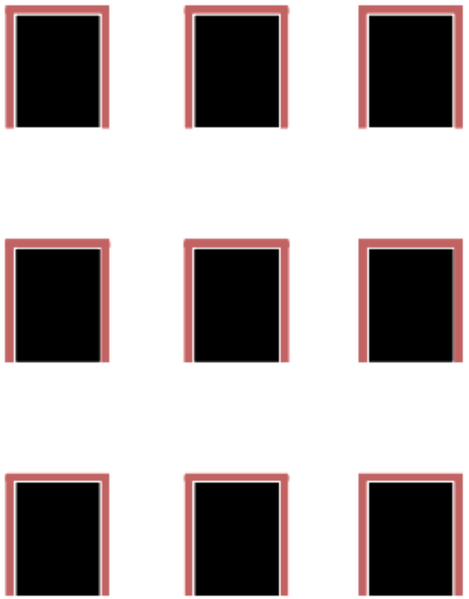
The LPG produced by the companies generally then distribute it to private companies who have the license to sell it and they as well own the bottling plant.

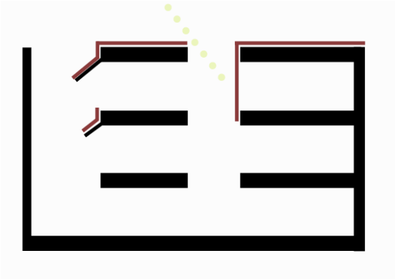
Due to cross ventilation the pol houses of ahmedabad remain naturally cool.

The usage of energy is minimised due to the sharing of the longer wall by the adjoining houses. Due to this the shorter facade faces the street and hence the coolness/warmth is maintained.

If the houses are placed separate from each other the facades would be heated from the sun from all sides hence increasing the losses, thus using more energy.







	OLD CITY (PRE-INDUSTRIALISATION)	OLD CITY (POST-INDUSTRIALISATION)	NEW CITY (POST-INDUSTRIALISATION)	NEW CITY (POST-INDISTRIALISATION)
LOCATION AND AREA	MEHTA NI POL RAIPUR	MEHTA NI POL RAIPUR	JUDGES BUNGLOW ROAD SG HIGHWAY	SATELLITE APPARTMENTS SATELLITE
NO OF PEOPLE	10-12PEOPLE	3-4 PEOPLE	4-5 PEOPLE	4-5 PEOPLE
AREA OF HOUSE	35-45 sq mt 2 FLOORS	35-45 sq mt 2 FLOORS	110 sq mt (70 sq. mt. BUILT .. 2 FLOORS)	60 -70 sq. mt.
ENERGY CONSUMING EQUIPMENTS	USED 20-25 KG OF FIREWOOD PER MONTH FOR COOKING,LIGHTING,ETC	4-5 TUBELIGHTS 3-4 FANS SOMEPLACES 1 TELEVISION	13-14 TUBELIGHTS 8-9 FANS 2 TELEVISIONS 2 AIR CONDITIONERS	7-8 TUBELIGHTS 4-5 FANS 1 TELEVISION 1 AIR CONDITIONER
AVERAGE ELECTRICITY BILL AND COMPANY(BIMONTHLY)	----------	RS. 1000-1100 TORRENT POWER	RS 8000-RS 11000 TORRENT POWER	RS 4000-5000 TORRENT POWER

POST INDUSTRIAL --- ELECTRICITY

Electricity generating station
generating step up transformers
transmission lines(138 kw or 230 kw)
Sub station step down transformers
26kw or 69 kw
Transferred to the electric sub station at the city level
13kw or 40 kw
Transferred to the electric sub station at the area level
120w or 240w
Then electricity distributed to houses which is then used to operate fans, tubelights, televisions
and many more appliances

But the distribution of electricity from station to sub station causes the loss of electric energy.

ELECTRICITY

A 65 watt fan which is on for 10 hours uses:
65 (watt) X 10 (hour)
= 650 watt hour
=.6 kilowatt hour (kWh)
= .6 (kW) X 3600 (s)
= 21.6 X 102 J- energy
AN AIR CONDITIONING SYSTEM IS 3000 WATT, IF IT IS ON FOR 10 HOURS USES:
3000 (watt) x 10 (hours)
= 30,000 watt hour
=30 kilowatt hour (kwh)
= 30 x 103 x 3600 (s)
= 108 x 106 J - energy

India has a huge scope for harnestinge solar energy since it has a clear sky alomost all year round.

Solar energy can be harnessed in the form of solar panels, solar heater etc.

A photovoltaic module or photovoltaic panel is a packaged interconnected assembly of solar cells, this photovoltaic module is known as a solar panel which again is used as a component in a larger photovoltaic system to offer electicity for commercial and residential purposes.

Solar panel generally has a efficiency of 40% to 60%. This panel also gives 50% of the energy it collects.

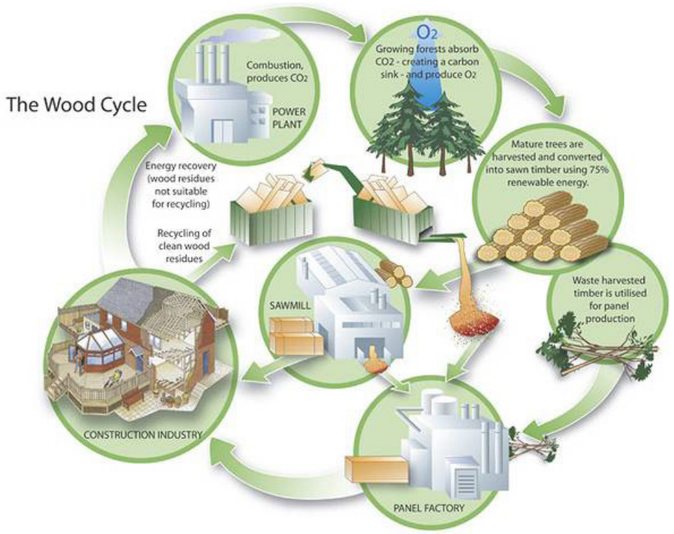
Solar panels are generally available in the size 5ft. x 3ft. Its total collection area is 15 sq ft. (1.4 sq m.)

If the solarradiation of India is 1000kwh / sq. m./ year then,

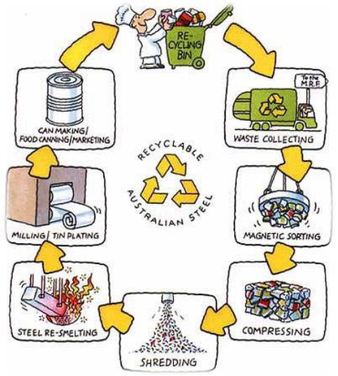
The panels will collect
1000 x 1.4 = 1400kwh per year
dividing this by 50%(efficiency)
1400/2 = 700 kwh per year.
If more energy is required per year then 4-5 more panel are to be connected.

Gujarat has a good scope for developing energy from wind since it has a huge coast.
Wind energy can be in the form of wind mills, wind turbines, wind pumps etc.
But in cities where such practice is not possible it is more advisable to create wind towers (wind catchers)
Average wind speeds of Ahmedabad is 55 km/h from the south west direction Yazd, located in central Iran is a city of wind towers. These architectural innovation helped the inhabitants survive the hot summer days in the desert.
The wind towers trap the wind and channel it into the underground soil which has some moisture then spread the cool humid air into corridors.

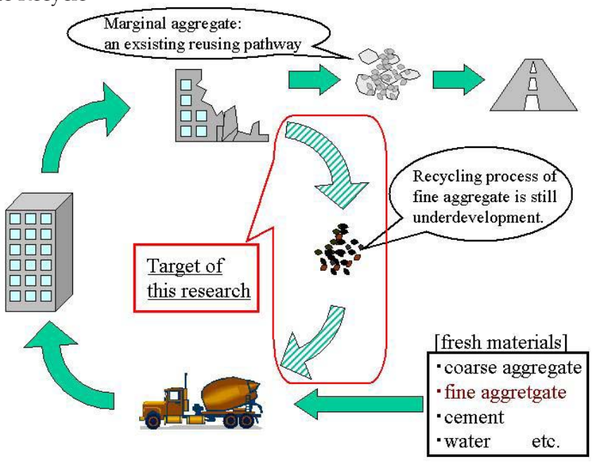
MATERIAL



Aluminium Recycle

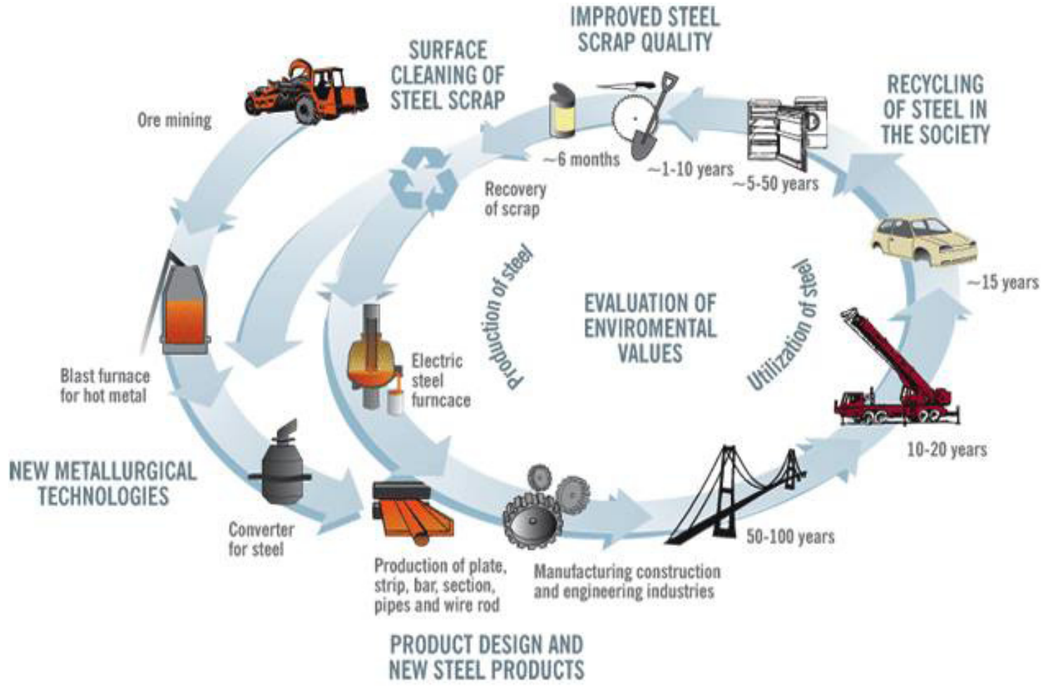


Concrete Recycle

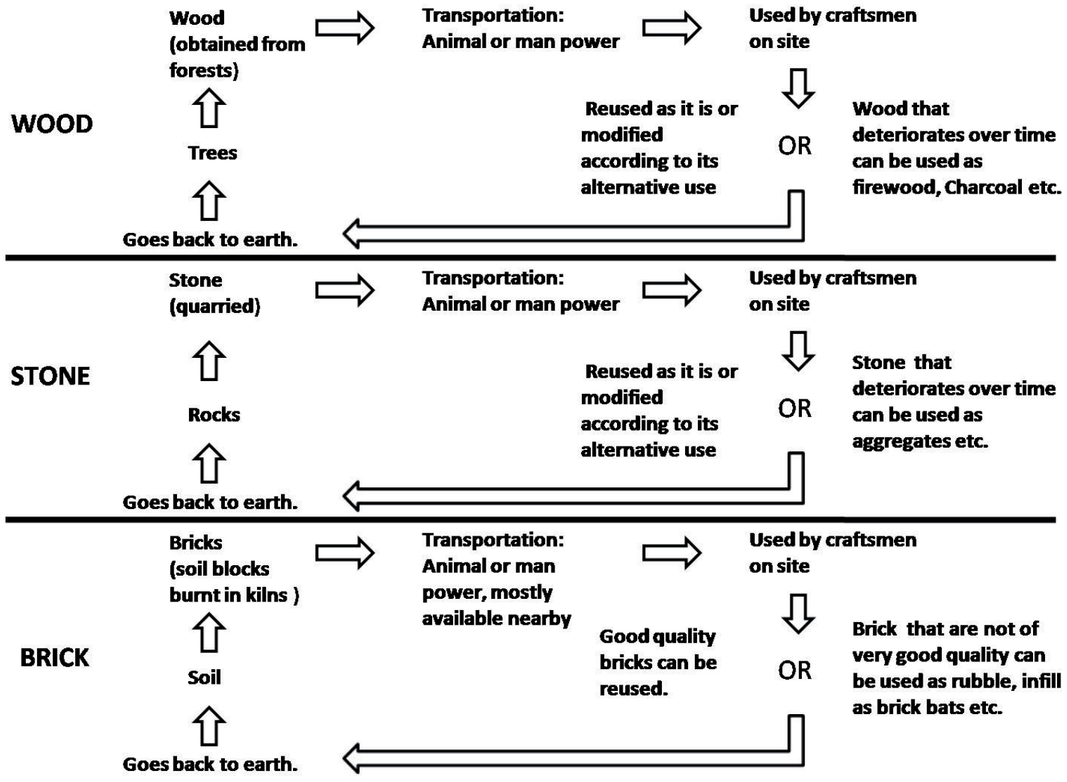


SOME INTERESTING FACTS ABOUT STEEL RECYCLING

Steel's magnetic attraction makes it one of the easiest materials to recycle.
It takes about 45 seconds to shred the average automobile into fist-sized pieces of steel for recycling.
The steel found in just six cars, when recycled, is enough to build a brand new house, using steel framing.
Steel is one of the few materials you can purchase that is guaranteed to be recycled, and it can be recycled repeatedly without loss of quality or strength.



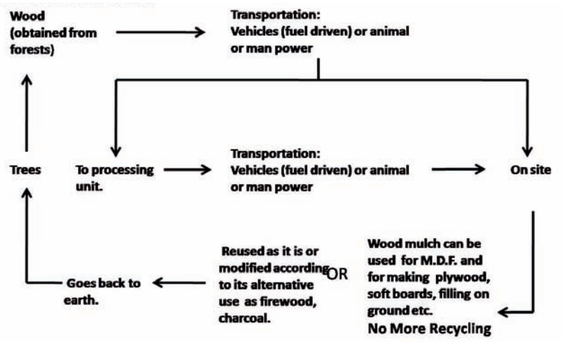
PRE INDUSTRIAL MATERIALS



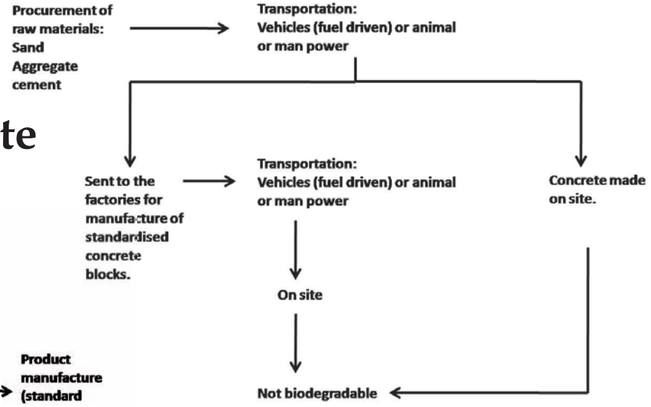
Post Industrial Materials

Brick is used in the post-industrial age also and its cycle of production is similar to the pre-industrial times. **Glass** is another post-industrial material.

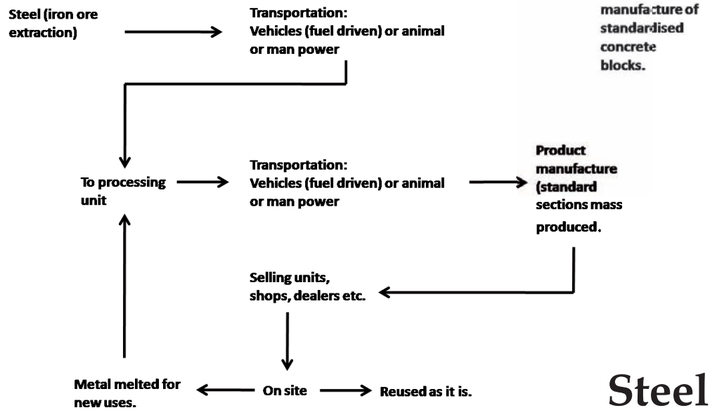
Wood



Concrete



Steel



DATA BASED ON CENSUS 2001

Distribution of census houses by predominant material of roof

	Total no. of census houses	Grass,thatch, Bamboo, wood, Mud,etc.	Plastic, polythene	Tiles	slate	G.I., metal Asbestos sheets	Brick	Stone	Concrete	Any other material
Total	1,536,435	37,500	9,171	235,266	0	451,379	9,230	15,645	758,377	19,867
Rural	355,233	22,893	457	202,605	0	63,283	1,277	3,207	45,316	16,195
Urban	1,181,202	14,607	8,714	32,661	0	388,096	7,953	12,438	713,061	3,672

Distribution of census houses by predominant material of wall

`	Total no. of census houses	Grass,thatch, Bamboo, etc.	Plastic, polythene	Mud, Unbu-Rnt brick	wood	G.I., metal Asbestos sheets	burnt Brick	Stone	Concrete	Any other mat.
Total	1,536,435	9,810	4,694	254,554	6,953	14,734	1,218,189	9,151	16,928	1,422
Rural	355,233	5,950	170	186,469	1,125	2,010	152,655	5,355	1,135	364
Urban	1,181,202	3,860	4,524	68,085	5,828	12,724	1,065,534	3,796	15.793	1,058

Distribution of census houses by predominant material of floor

	Total no. of census houses	Mud	Wood, bamboo	Brick	Stone	Cement	Mosaic, Floor tiles	Any other material
Total	1,536,435	278,782	3,805	7,735	235,425	358,516	642,208	9,964
Rural	355,233	223,256	1,046	2,600	16,534	76,500	34,587	710
Urban	1,181,202	55,526	2,759	5,135	218,891	282,016	606,621	9,254

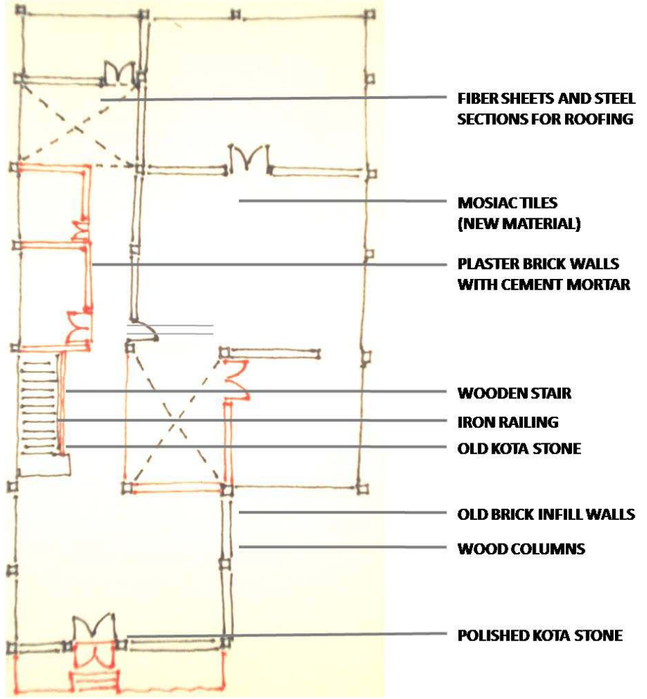
INFERENCES

Use of concrete as predominant material of roof is maximum in urban areas.
Inspite of use of locally availiable materials, use of concrete in rural areas is not nil.

In urban areas ecological footprint is higher because of use of materials which consume more energy in procurement, processing, transportation etc.

Use of locally avaliable materials maximum in the rural areas range of procurement of materials is smaller in rural areas as compared to urban area.

CASE STUDY: DHAL NI POL



PLAN: RENOVATED HOUSE IN DHAL NI POL

OTHER NEW MATERIALS USED ARE....

Glass-window

Aluminium chrome plated-Window grill.
G.I sheet-roofing

Aluminium-window

Kota-flooring.

Steel sections-floorings.

`

Facades of houses reflect the time in which the building was built or the time when the elements of the facade were added

IN SEQUENCE OF EVOLUTION/ CHANGE(from left to right)

OTHER EXAMPLES OF BUILDING FROM WASTE

ALUMINIUM CAN HOUSE:

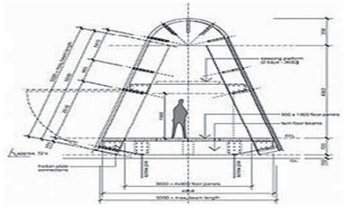
Aluminum can is a reusable material.

CARDBOARD HOUSE:

It is 100% recycled material. It was first worked with in Australia.

Building a house from cardboard will save 12 cubic meters of landfill, 39 trees and over 30,000 liters of water.

The lightweight, movable structures can be used for emergency shelter or for other short-term accommodation needs.

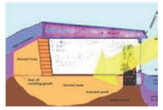


TYRE HOUSE:

WALL FRAMING USING AUTOMOBILE

SOIL IS THEN SHOVELED INTO TYRES AND COMPACTED BY REPEATED BLOWS BY SLEDGE HAMMER.

THE WALLS OF THE RAMMED EARTH TYRES ARE MADE BY STACKING THEM ON TOP OF EACH OTHER.



ALTERNATIVE BUILDING METHODS

AUROVILLE, INDIA- ' VIKAS' HOUSING BY ARCHITECT SATPREM:

Vikas is a community housing scheme designed by the Auroville Earth Institute.

It is an ecologically friendly and a sustainable housing community.

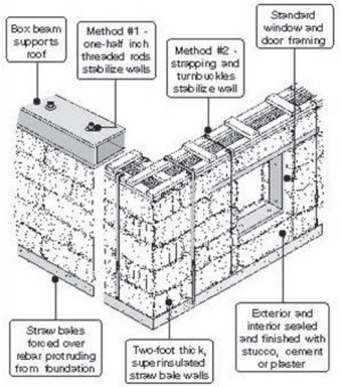
Factors which make this housing ecologically sustaibale are:
Use of earth as a building material eg- CSEB

Alternative technologies like biological waste water treatment, solar lighting, wind, and solar pumping, composting etc.

ENVIRONMENTAL COST	MONETARY COST	STRENGTH
CSEB and RE are more eco-friendly than fired bricks	CSEB and RE always cheaper than fired bricks	CSEB and RE are:
Pollution emission: 2.4 times less than wire cut bricks 7.9 times less than country fired bricks	**A finished m³ of CSEB wall is:** 19.5 % cheaper than country fired bricks 45.5 % cheaper than wire cut bricks	1.4 times stronger tha country fired bricks
Energy consumption: 4.9 times less than wire cut bricks 15.1 times less than country fired bricks	**A finished m³ of RE wall is:** 21.9 % cheaper than CSEB wall 37.1 % cheaper than country fired bricks 57.4 % cheaper than wire cut bricks **Note:** RE = Rammed earth	0.5 times weaker than wire cut bricks

STRAWBALE CONSTRUCTION:

The cans are filled with
It is used in New Mexico. The straw inside the wall acts as insulation. 80% of materials which are used in

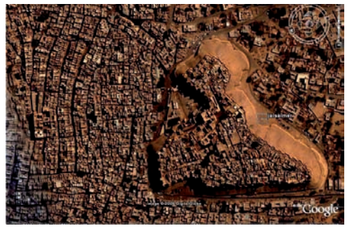


BEFORE INDUSTRIALIZATION

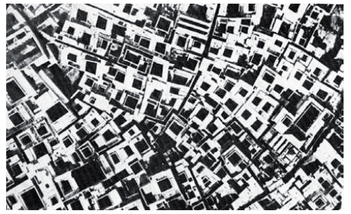
AHMEDABAD

JAISALMER

SIMILAR URBAN FABRIC, SIMILAR CLIMATIC CONDITIONS

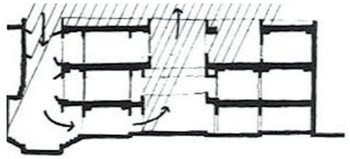


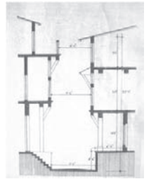
OLD CITY



URBAN FABRIC

HOUSE PLAN





STREET SECTION, SHADOWS, COURTYARD EFFECT

BEFORE INDUSTRIALIZATION

AHMEDABAD

JAISALMER

DIFFERENCES OWING TO CONSTRUCTION MATERIALS

FACADE

FACADE

FACADE ELEMENT DETAILS

TIMBER FRAME, BRICK INFILL

STONE FRAME STRUCTURE OR STONE LOAD BEARING STRUCTURE

CONSTRUCTION TECHNIQUES

BEFORE INDUSTRIALIZATION

DIFFERENT URBAN FABRIC, DIFFERENT CLIMATIC CONDITION, DIFFERENT SOIL CONDITION

SAME MATERIAL - DIFFERENT WAYS OF USING THE SAME MATERIAL

AHMEDABAD, GUJARAT

BISHNUPUR, WEST BENGAL

CITIES TODAY

NEW DELHI

MUMBAI

AHMEDABAD

..... GENERALISED IMAGE

Materials are resources obtained from nature either directly or after processing. It becomes very important for these resources to form a cycle for a harmonious environment.

Present construction practices break this harmony. Alternative techniques of construction which gain influence from old practices have to be adopted again to restore/ maintain the harmony with nature.

Cities today replicate themselves without considering local conditions which destroys the uniqueness of the city.

Every material has its unique characteristics. The language of a building generates from the inherent characteristics of the material used in construction.

The language of the building extends to the language of the street, cluster and so on and finally to the language of the city. Each city gets its unique character only when materials are used in their true capacity.

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Materials, Construction Techniques and Dwelling forms

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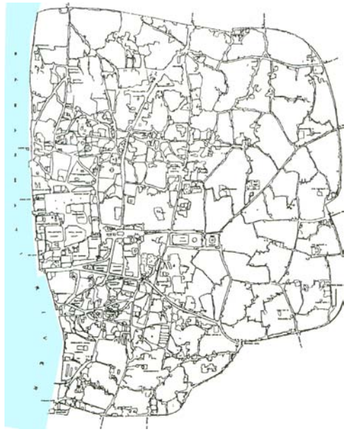
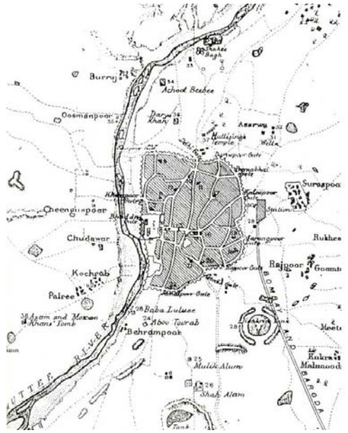
LAND AND THE GREEN

Walled city of Ahmedabad



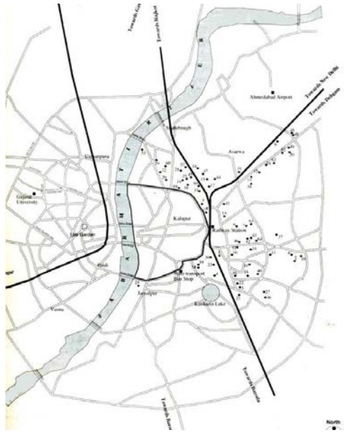
Dense fabric

Ahmedabad – Colonial phase in 1856

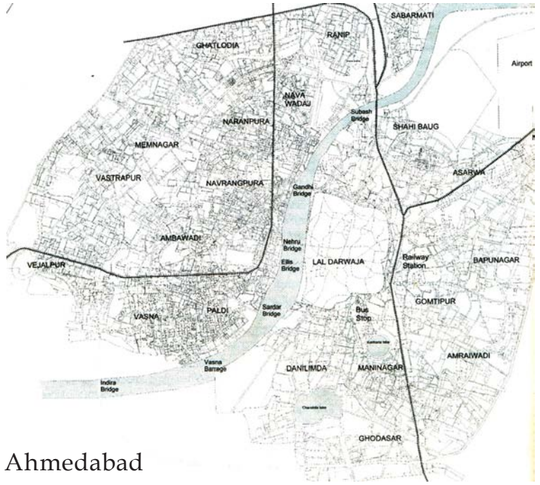


Development of western part through Ellis bridge

Textile industries from 19th century onwards

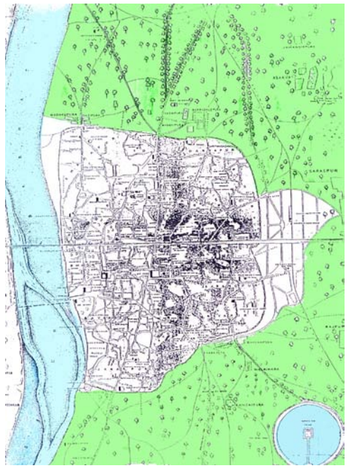


Industrial development along the wall city and railway line East side more



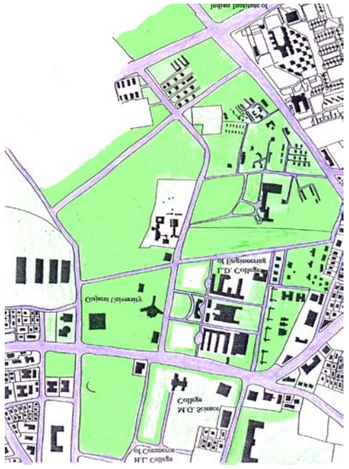
Present city of Ahmedabad

Old city and Green spaces



Walled city

New city and Green space



University area

Gujarat college, Ellis bridge

In Old city

- Green space was planned Outside the walled city.
- Green & public spaces are not same

In New city

- Green & open spaces is within the city.

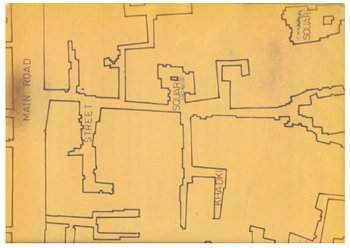
Proposed Green Belt

Typical fabric of the walled city

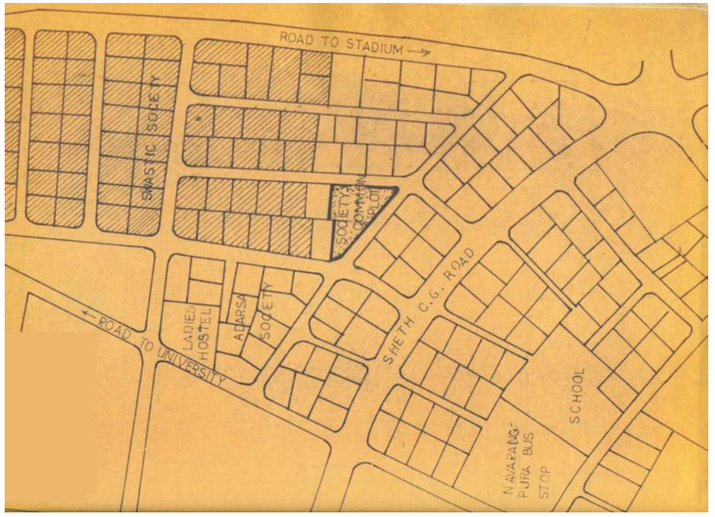
Comparative area - study of old and new city

Old city

- Dense
- Part of an entity
- Hierarchy of public space
- Built - 80% Unbuilt - 20%



Hierarchy of public spaces



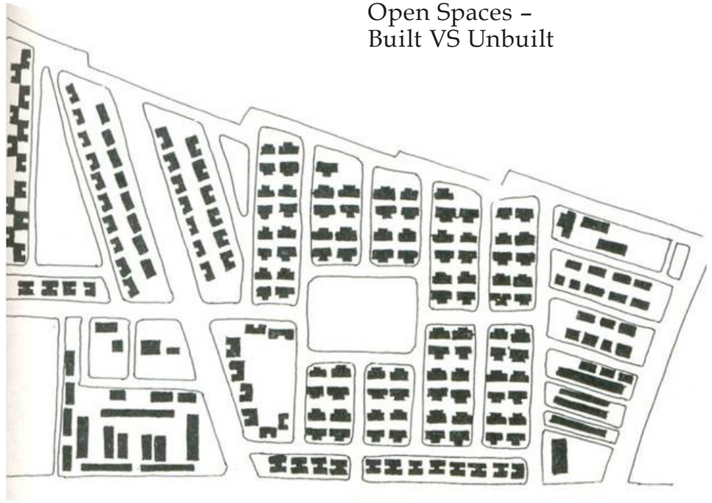
A area in new city – swastik society

Individual plots

New city

- Scattered
- Individual entity
- Wasteful open spaces around the building
- Built - 37% Unbuilt - 63%

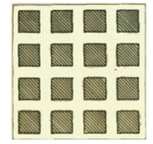
Open Spaces – Built VS Unbuilt

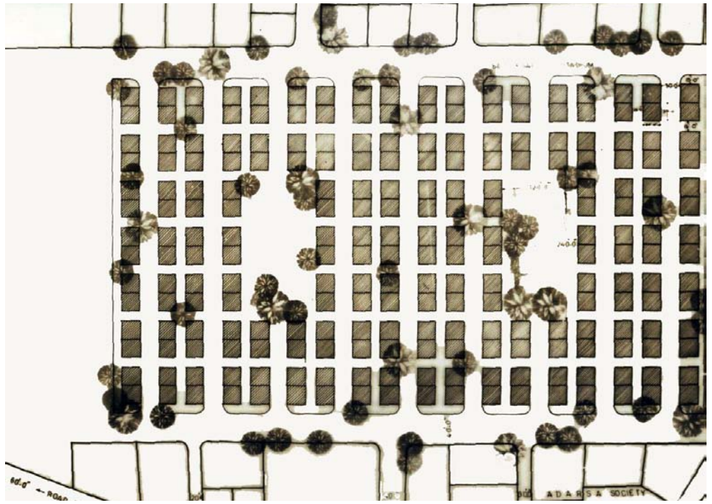


Layout of a society

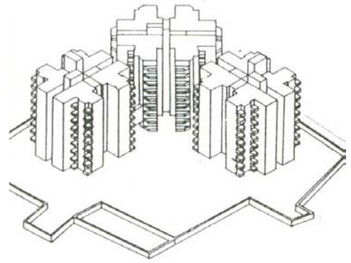
Old city

New city





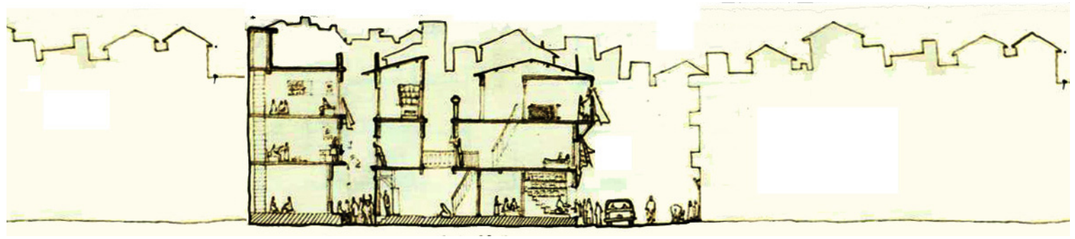
Layout of a mass housing



High rise apartment

Common open plot in society building is the social unit but used very rarely for social purposes because of its scale and activities around it.

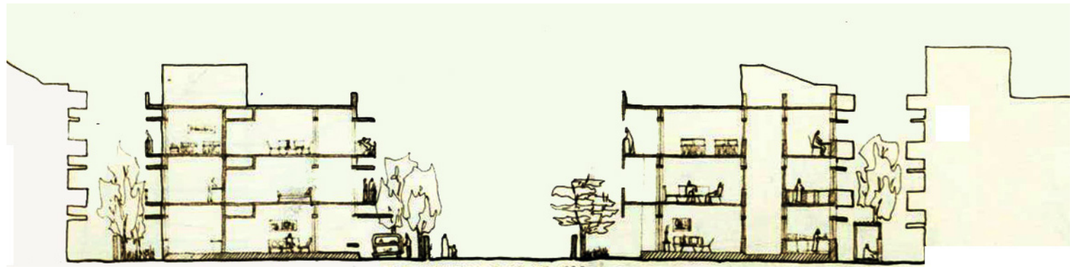
Changing notion of street



- Street as an interactive public space
- Plinths make the street edges

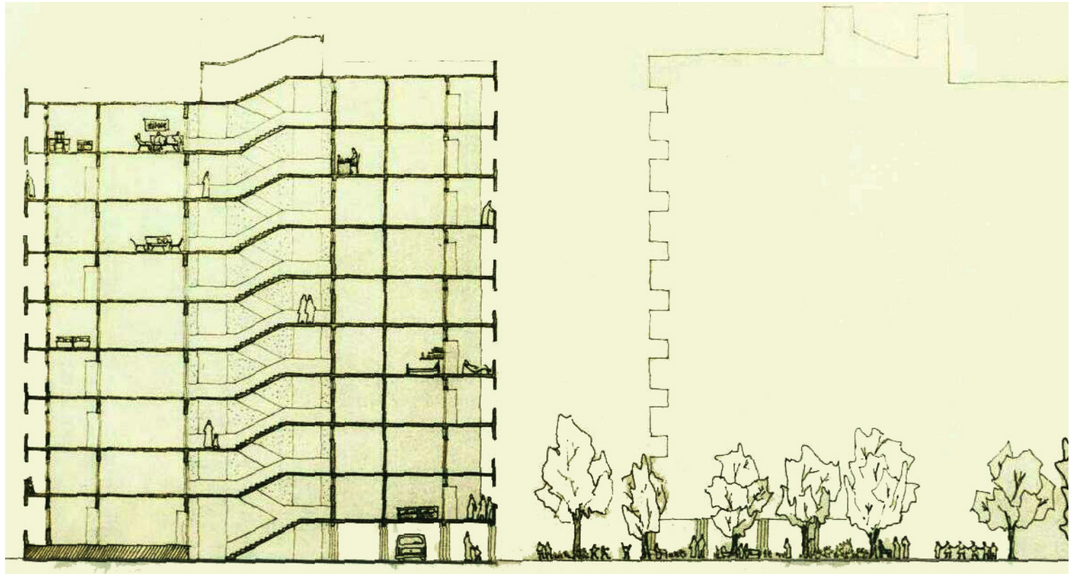
Section through a pol

Section through a society



- Street as a vehicular path
- Green became individual
- Less social interaction
- Compound wall make the street edges

Section through a low rise apartment



- Ground became free due to stilts

Section through a high rise apartment at modern time

Earlier
Teen Darwaja

- Less vehicular movement
- Less commercialization

Old City
Delhi Darwaja

- Streets was for pedestrian

Street
Teen Darwaja

Today

- High vehicular movement
- Road sides are used as parking and market

New City
University Road

- Streets for mostly vehicles
- Edges used by people

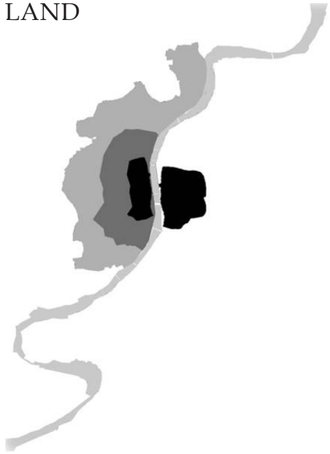
Node
Bhadra square

80% Density turned 37% density in the New city... So What.. ???

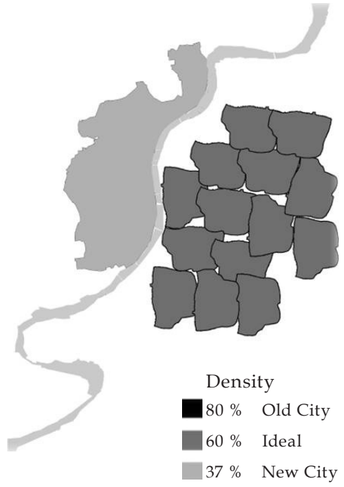
Less Amdavadis per sq km than ever

Ahmedabad city was 21,977 persons per sq km in 1872. It stands at just 9,707 in 2009.
A major reason is that Ahmedabad Municipal Corporation area has expanded phenomenally from 5.72 sq km in 1872 to 464.16 sq km in 2009. AMC increased its limit just a year ago to include all the areas inside the Sardar Patel Ring Road.
This massive expansion of nearly 275 sq km has more than doubled its existing area, resulting in a sharp fall of population density from 18,445 to 9,707 persons per sq km over the figure in 2009.

LAND



37% density turned 80%



80% density turned 37%

TRANSPORT

Availability of newer means of transport.
- *So scattered city developed*

More people added in.
- *Need of transport elements increased*

Roads designed for vehicles rather than pedestrians
- *So houses got set back from road*

ENERGY

More fuel consumption

MATERIAL

Complex division in lifestyle
- *Use of more construction material*

Use of advanced construction technology with non bio-Degradable material.
- *Problem of dumping them*

Scattered built up
- *All facades open to sun*
- *Increase in heat inside the house*

WATER & SANITATION

Scattered city development
- *Increase in running length of services*

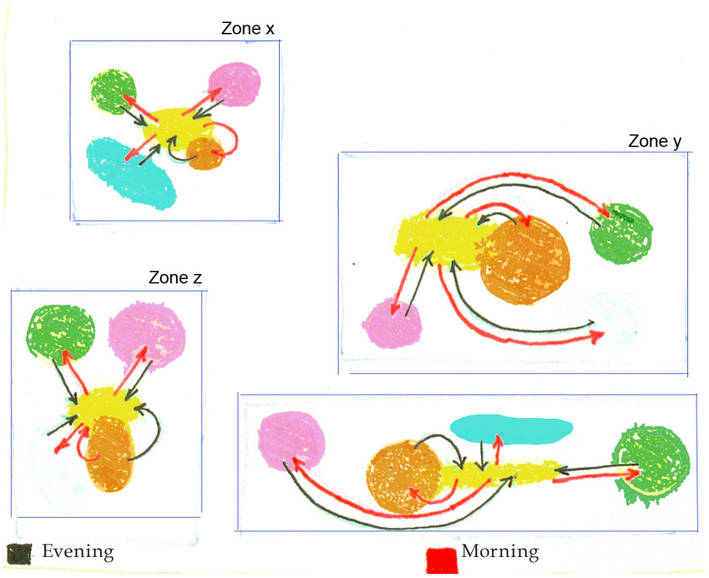
Development away from natural water source
- *Complex water storage system developed*

Extracting more ground water
- *Water level went down*

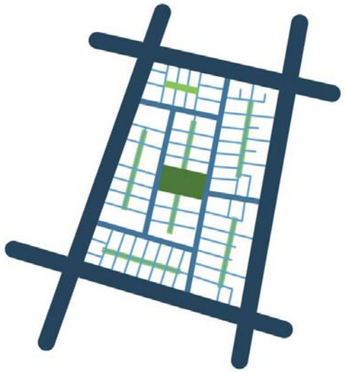
Patrick Geddes's idea of town planning

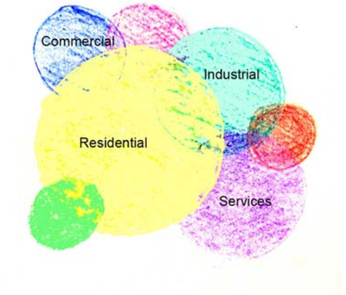
City is divided into zones.
Each zone has a mixed use area with open space & public parks.

A Garden Block in Tel Aviv

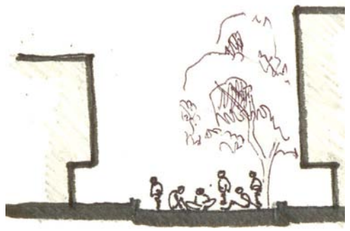


Movement in the city





Functions of each zones are interconnected.

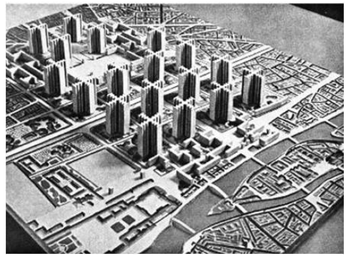


Community spaces are the social interactive spaces because of the scale and enclosure around.

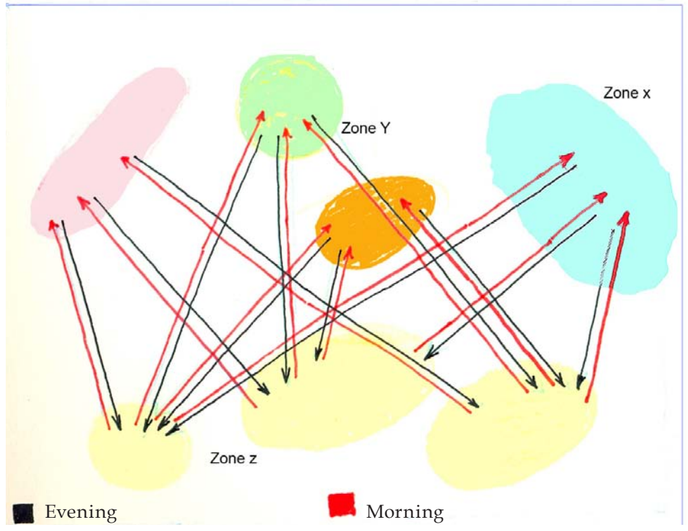
Green space
Commercial
Services
Industrial
Residential

Corbusier's idea of a town planning

City has different zones of industrial, commercial , residential, open and public space



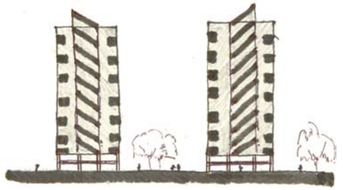
Corbusier's town planning



Movement in the city

Green space
Commercial
Services
Industrial
Residential

Zones of work and stay are segregated.



Ground is free. Entire network of footways can be deploy unhindered over the terrain.

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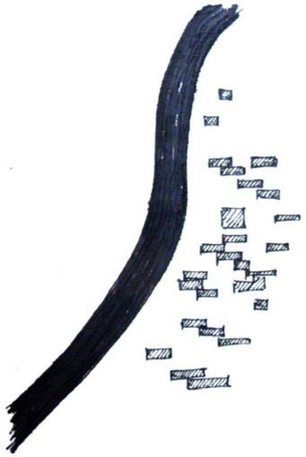
A comparative study- case study
ahmedabad
Chronicles of Ahmedabad
Amdavad Nu Sthapya: eno itihas
ane samanya rooprekha
Censes
Thanks to Parin (Landscape
Architecture batch- 2008)
Website – google earth
www.google.com

WATER AND SANITATION



SETTALMENT ON THE RIVER

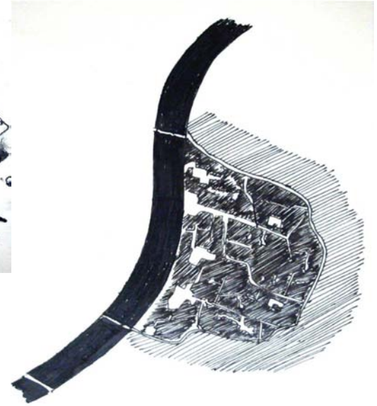
The river provided favourable conditions to the nomad to settle down.

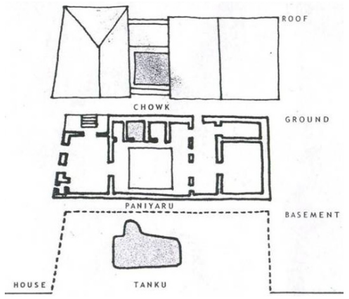
WALLED CITY – AHMEDABAD

The strata besides the river provided a big source of underground water.

The method of digging the ground and taking out water in every locality by tube wells was popular.

Big water supply plants were set up to provide the water to a larger area by connecting the tubewells.

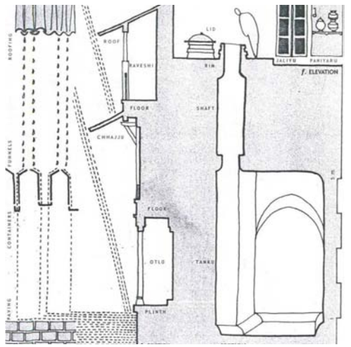


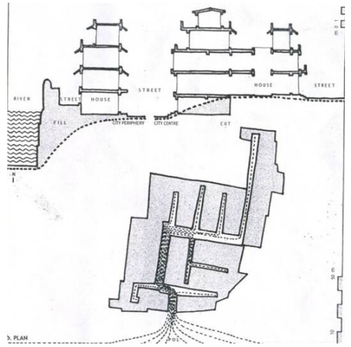


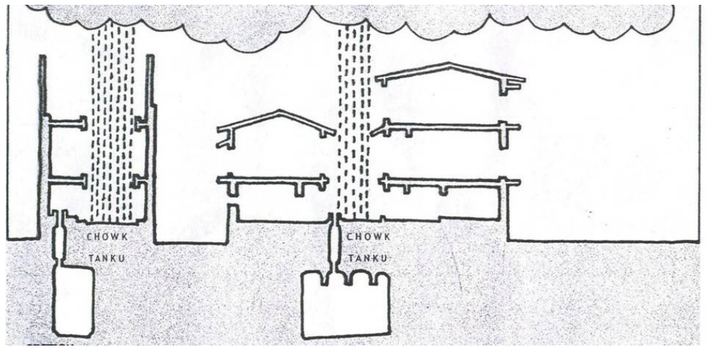
UNDERGROUND WATER STORAGE SYSTEM

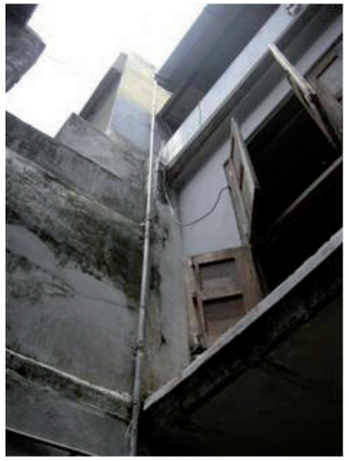
'TANKU'- The strategic positioning of tanku creat a micro climate that keep the stored water potable for long duration of time.

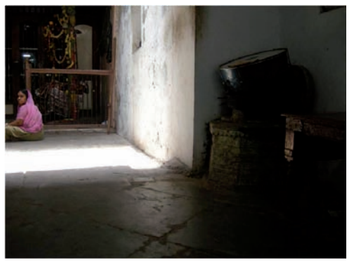
- The core of the house is occupied by a chowk to receive the rain, a tanku to harvest it and a paniyaru to store it.
- The efforts put in structuring the house to celebrate the arrival and avaibility of water.
- The individual control of water ensures hygienic storage conditions.
- Like the streets, the roofs in the sky too respond to the force of rain with slops.
- The pitch roofs along with weather shades, projected upper floors and itla creat a sort of funnel to guide the water down to its destination in the house to store or onto the streets to dispose it off.
- The depth of the tanka &the height of the house could be the same.
- The mouth of the tanka is marked with a high stone rim & covered with a copper lid,which protects the water from any litter or spilled liquid around.
- This also prevents sunlight from touching the water so the formation of algae or other organic form is discouraged.the water remains clean to be consumed year-round.





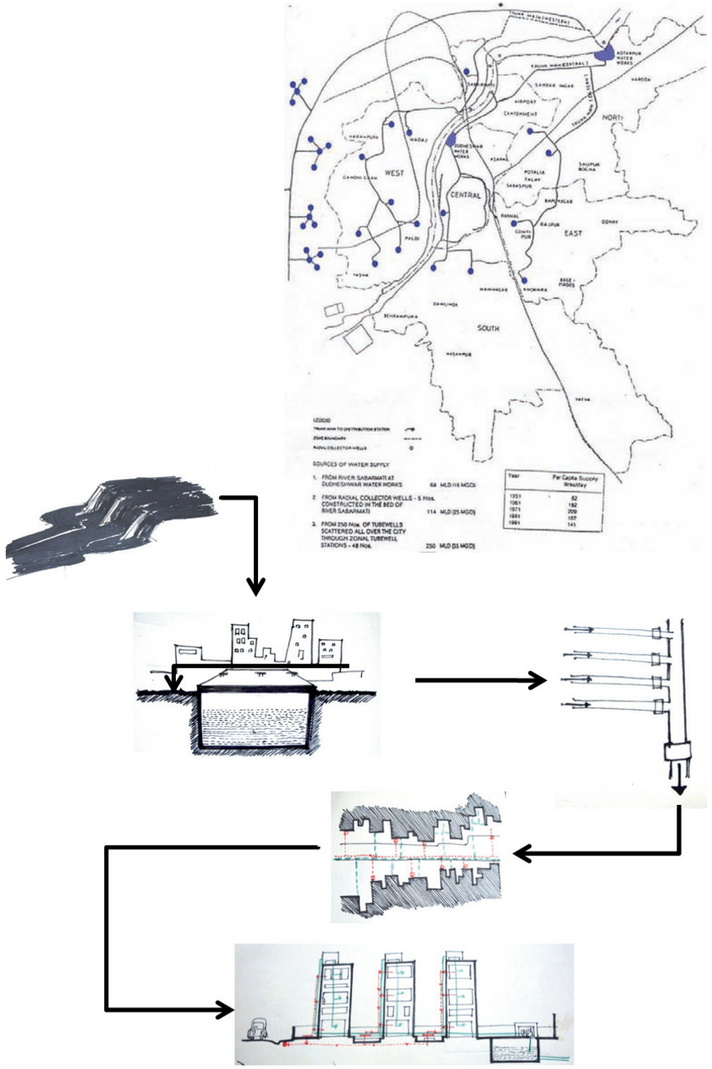






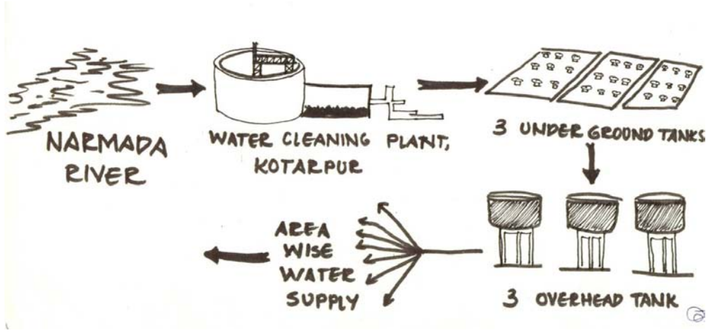
CASESTUDY POLw HOUSE, KHADIYA

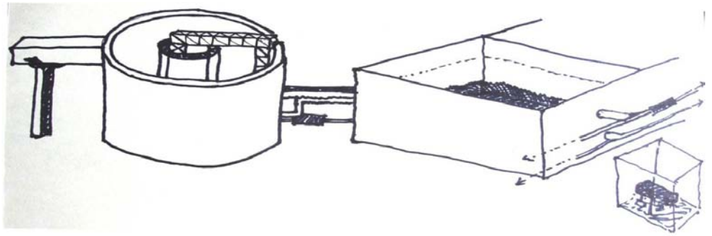
• The traditional system of storing rain water in each unit serves the water need for the whole year.
• The tanks for a family of 4-5 persons is generally 30-40 feet deep and having an area of 225sq feet.
• The under ground tank has a small-narrow access, which is kept closed in a shaded area, so the water inside the tank doesn't get the sunlight and ramains potable even after many years.
• The rain water is catched majorly by the roof but sometimes it is also taken by a hole provided in the ground which is kept small so that the sun light can`t enter inside.
• The tank is cleaned generally once in two years.
• Courtyard is the most efficient structure at the unit level to catch the rain and collect the water.
• The first 1or 2 rains are not used for collecting the water.so that the roof and floor surfaces are washed by the rain water itself. Then from the third rain,the hole of the tank is kept open. Sometimes temporary pipelines are provided to receive the rain water flow from the roof.
• There are rituals connected with this system.the water is collected only in a particular 'nakshatra' like 'pushya','megha' and 'ashlesh'.
• In some houses,the tank is divided in seven layers and the water is stored seperately according to the functional requirement.

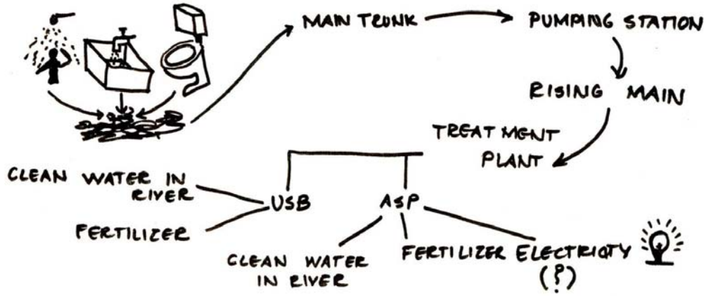


WATER SUPPLY STATIONS_AHMEDABAD
CASE STUDY_AZAD SOCIETY

• The municipal water is supplied in the morning from 6a.m. to 8 a.m.
• In the summer and in the onth of 'shravan'they supply it in the evening also.the daily supply is 7.40 lack gallons for the whole area.
• Every residential appartment has its own unit for storage which is supplied water by the main water supply plant of the area.
• The water pipes runs under the main roads along with the sewage pipelines.
• The undergroundtank after getting filled supplies the water to the over head tanks on individual units.
• The water is supplied then to every individual unit by the gravitational force.
• Each unit also has its own storage systems to keep the provision for the shortage in supply.







DUDHESHWAR WATER WORKS

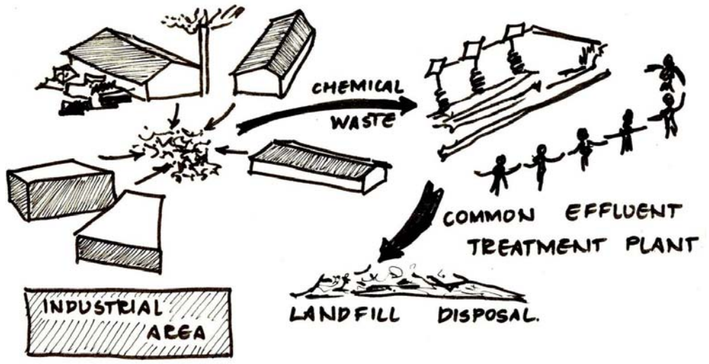
• The entire old city of ahmedabad gets clean drinking water (24 hours) from here.
• They get purified water from water purification plant of kotarpur which surves the entire ahmedabad with narmada water.
• Where on the other side in new city…rather then having one source like dudheshwar, they have different tube wells in different areas.
• In old city the water usage per day is : 256 lacks gallons
• [each undergroung tank : 119 lack gullion
(1 gullion = 1000 liters)]
• [each overhead tank : 12 lack gullion]

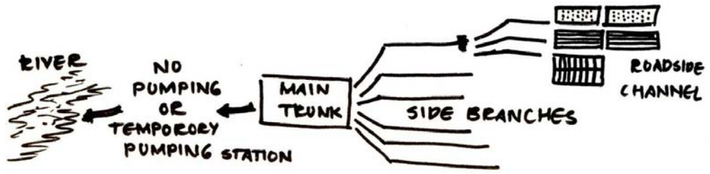
WATER PURIFICATION SYSTEM

• Kotarpur water supply plant: on a cluster level
[in dudheshwar they have the same system as backup…]
• Pirana water recycling plant : on a city level

PIRANA PLANT : WASTE WATER TREATMENT

How the grey water from our houses reaches the sabermati….?
• Daily sewage generation – 700 MLD (million liters per day)
• Right now we have 2 recycling plants at pinara. Which works on the basis of usp method and we get fertilizer as byproduct…

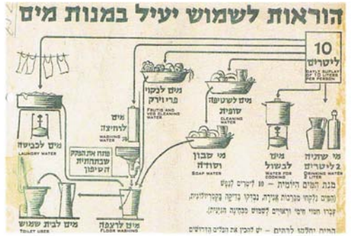


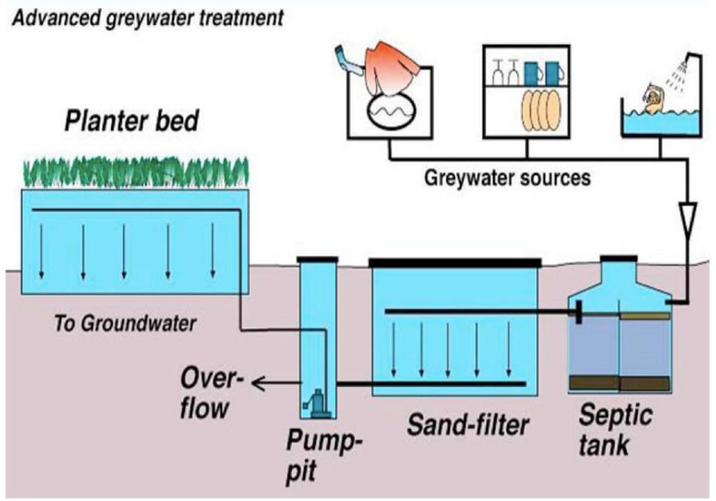


• They have proposed 3 more plants working on the basis of asp method with which we may be able to produce electricity.
• Here at Pirana site we have Ahmedabad's water treatment plan from where the liquid waste is getting recyclet and the recycled water goes to Sabermati where the bi-product i.e. the sludges get converted into big cakes wich we can use as fetilizer. And near by that only there is a solid waste disposal site.
• In industrial area…all industry owners by laws take the responsibility to manage their chemical liquid waste by being part of the Common Effluent Treatment Plant (CETP)
• And after that they leave the left material on solid waste disposal site

STORM WATER DRAINAGE

• There are roadside grills along with the road for storm water…
• Those grills collect the water, takes it to the main trunk…
• Corporation set up some temporory pumping stations in the required areas so after pumping the water, it goes to the river…





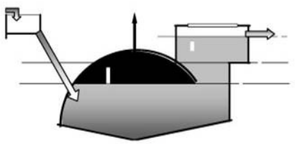
SEWAGE SYSTEM TODAY

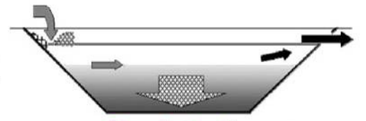
• During the blockade time on jerusalem and hebrew places on 1948 the israeli security office publish a document that explain how to save water and how to reuse gray-water [greywater] in cheap ways.
This document should have been stamped on every fridge in every house.
Reuse of gray water can save 30-60% of house water use.

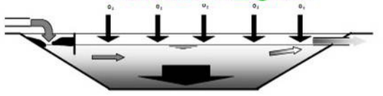
• Their are more ways to treat greywater, those are more costly and needs some preparation before doing it, the most important one is to separat grey and black water to 2 different pump system.
After doing so you can choose the way to clean the gray water the best is with bio purgation which is not uses chemicals so clean the water.

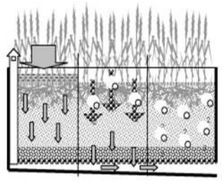
DEWATS IS BASED ON FOUR TREATMENT SYSTEMS

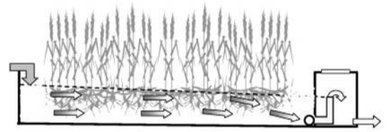
• Sadimentation and primary treatment in settlers,septic tanks or imhoff tanks.
• Secondary anaerobic treatment in fixed bed filters or baffled reactors.
• Secondary and tertiary aerobic/ anaerobic treatment in planted gravel filters.
• Secondary and tertiary anaerobic/aerobic treatment in ponds.

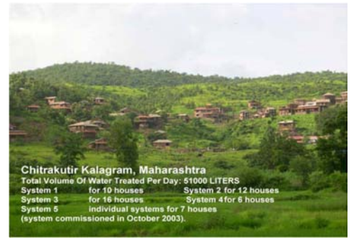


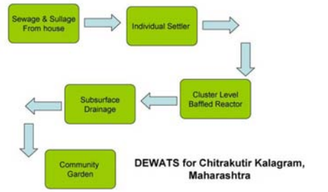


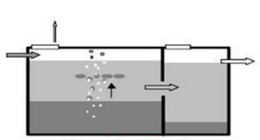


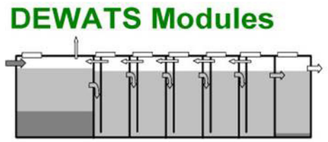


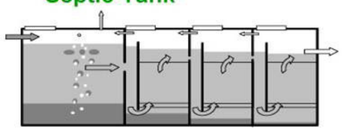


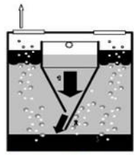


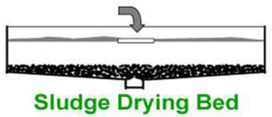






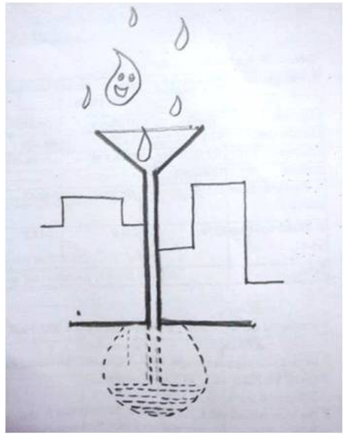


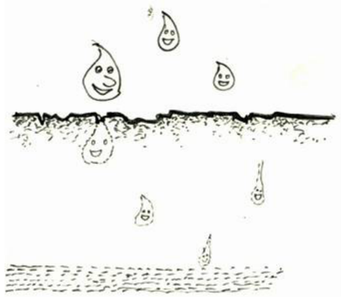




INDIVIDUAL WATER RECYCLING IN HOUSING COLONIES /TOWNSHIPS

• It can be decentralized thereby reducing plumbing and pumping costs.
• Possibility of safe reuse of water for gardening open spaces.
• Can be integrated as part of the landscape.
• Low energy and operation costs.
• Civic responsibility.





ALTERNATIVE TECHNIQUES

• Groundwater makes up about 20% of the world's fresh water supply, which is about 0.61% of the entire world's water.
• In the last years the groundwater resources are reduce do to expansion of urban area, in those places less and less rain water can get absorbed in the ground, and more water get waste.
• We can easily help the water go underground all we need to do (in case that we are not using the rain water) is to collect the rain water by a pipe and divert it t o the ground and let the rain go into it.

WE CAN USE THE DREY WATER

WETLAND CREATION
Wetlands can be created using grey water.
IRRIGATION
As we saw that the maximum water is used for agriculture,then this treated water can be used for the same purpose and so the usage of potable water can be reduces.

INDISTRIAL USE
It can be used in industries where poatble water is not required. in places like in cooling towers,in landscaping around,as process water,as boiler-feed water etc.

RECREATIONAL USE
It can be used for landscape maintainance, aesthetic impoundments, recreatonal lakes, ornamental fountains, snow making and fish farming etc.
GROUND WATER RECHARGE
We can store reclaimed water for future use.
It includes surface spreading in basins and by direct injection into aquifers.surface spreading utilizes flooding,ridge and furrow,constructed wetlands and infilterations.
POTABLE REUSE
In extreme situations we can use this water after extensive process.

WE CAN SAVE THE WATER!

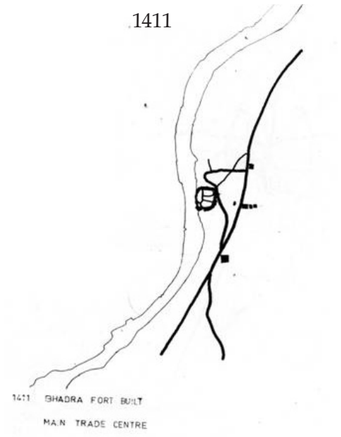
Water wastage can be stopped and water can be saved by simply awareness:
• Close the taps when not in use
• Repaire the leaking pipes
• Develop good habits of flushing and cleaning
• Use grey water for cleaning and plantation.
• Also there are some techiniques we can use to save the water like. Showers with air pressure so it uses less water.
Irrigation techniques such as drip irrigation,green houses and sprinklers.

Water and Sanitation

The water supply and storage system was dealt at individual unit level in the past. So it was intertwined with culture.
The system today has become more efficient as it is now centralized but has lost the connection with culture.
For a better future combination of these two systems – encouraging reusing recycled water and awareness to save water in it – is necessary.

TRANSPORTATION
DEVELOPMENT OF AHMEDABAD

1411



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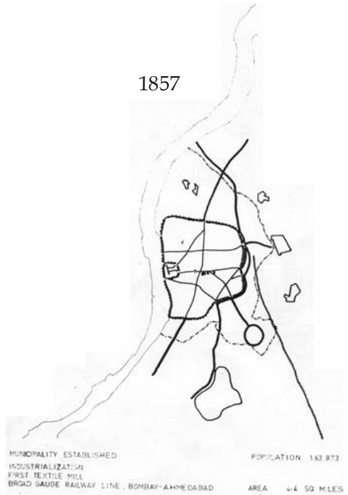

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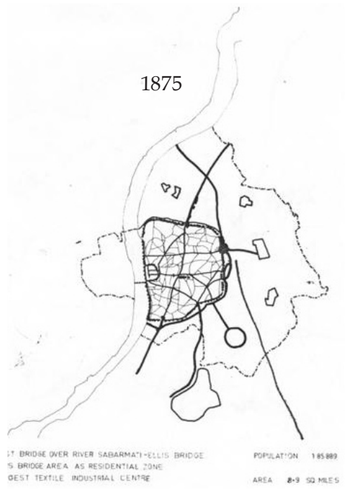

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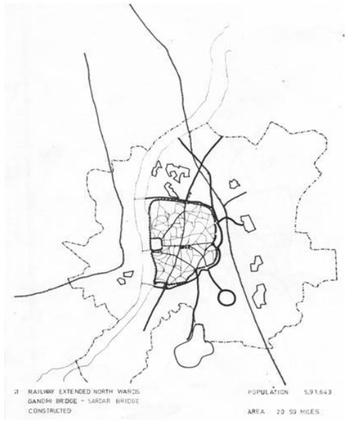

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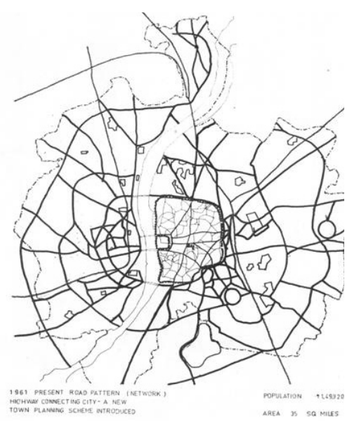
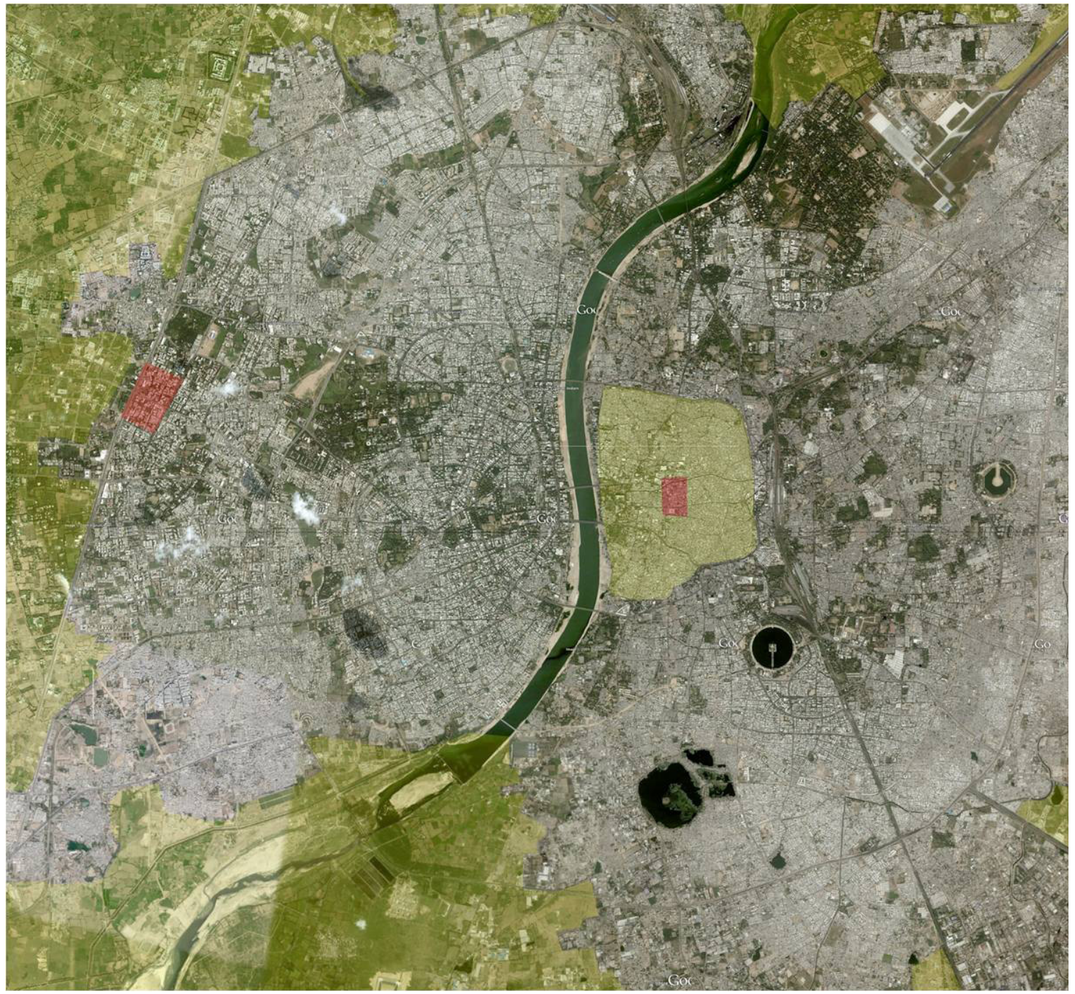


1992

Existing situation & comparison of Ratan Pol and Judges Bungalow area.

N



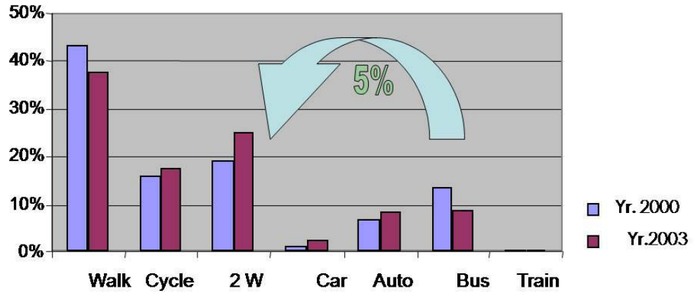
Fr - upto 5
Fr - 5 to 10
Fr - 10 to 20
Fr -20 to 30
Fr - 30 to 40
Fr - 40 to 50
Fr - above 50

AMTS ROUTE COVERAGE AND FREQUENCY

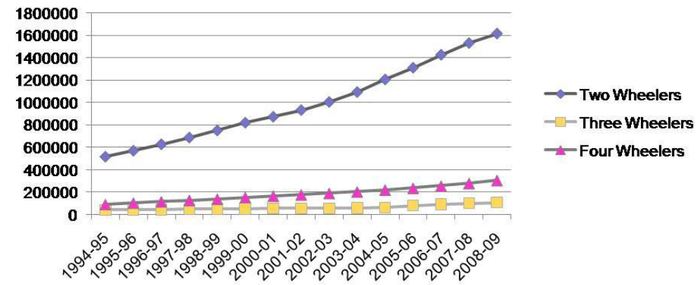
With the growth of the city AMTS Trip Length increased. For people travelling small distances it's efficient but for people travelling long distances it becomes inefficient.

For exmple:
It would take 45 mins to 1 hourfor a person travelling from Maninagar to University area with AMTS, while in car or an auto it would take around 20-25 mins.
So people prefer travelling by personalized vehicles than public transport, in Ahmedabad more than in other cities as seen below.

City	Population (Million)	PT Share	
		% of Total	Modes
Delhi	12	60+	Bus/Metro
G. Mumbai	13	80+	Sub-urban Rail/Bus
Kolkatta	13	50*	Sub-urban Rail/Metro/Bus
Chennai	6.4	48	Sub-urban Rail/Bus
Ahmedabad	4.5	14	Bus



No.	Type of Vehicles	2005-06	2006-07	2007-08	2008-09
1	Motor Cycle/Scooters	98690	110880	99881	82208
2	Moped	5589	4679	4686	1825
3	Auto rikshaws	19196	13022	7468	7046
4	Jeep	666	632	1321	1346
6	Four wheelers M/Car	15168	19226	21731	25062
7	Taxi	411	277	303	514
14	Truck/Lorries	689	875	761	536
16	Tempo	3072	4088	3288	2868
17	Other light Vehicle	481	991	1429	1396
18	Transport-Trailors	703	815	1044	913
22	Others	571	514	845	852

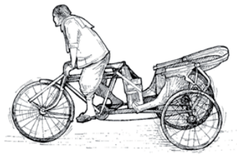


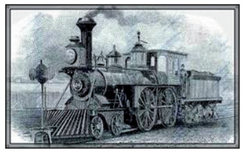
SITUATION OF MODES OF TRANSPORTS AND INCREASING VEHICLES

Because of the sparse development of the city, public transport becomes inefficient after a point. So in 3 years 5% people of the total population have switched to private vehicles. Because ot this, the graph of vehicles added on the road is going up in a straight line. This creates many more issues in itself.

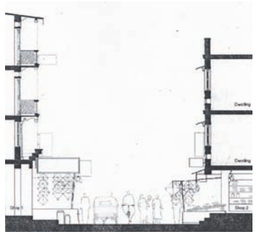
PRE-INDUSTRIAL

POST-INDUSTRIAL

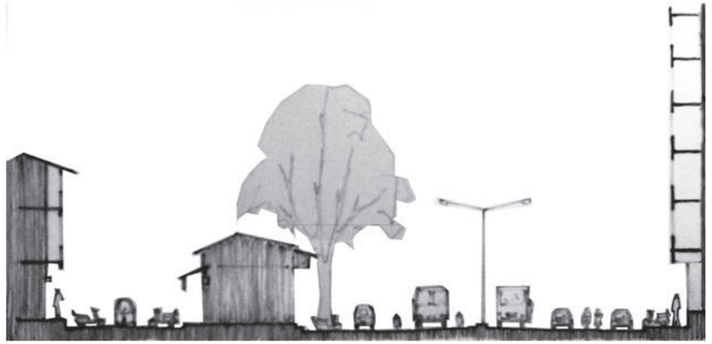




TODAY



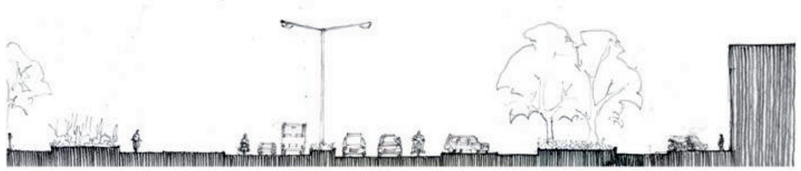
Road section, Pipardi Ni Pol



Road section, Raipur

COMPARITIVE STUDY OF EQUITTABLE ROAD DISTRIBUTION

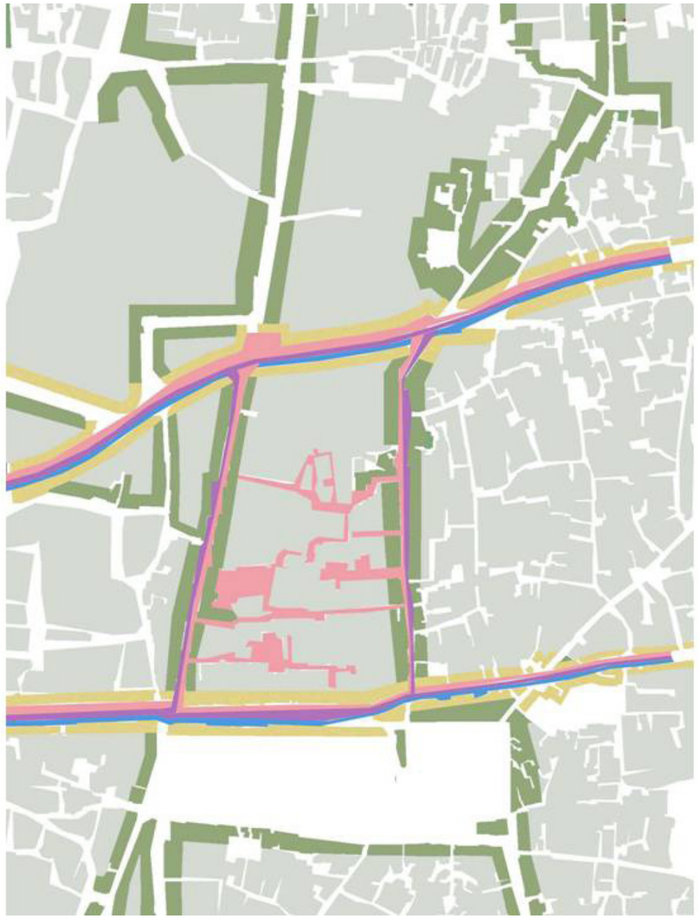
The modes of transport changed with the time, so did the roads as seen in these sections (pre-industrial), Raipur(post-industrial) and S.G. Highway(today).
But in this developement the equittability of different modes of transportation is lost.
Till post-industrial time that equittability was there as on the same road all modes of transports were taking place, but on S.G. Highway there`s no place for pedestrians and cyclists as one can see in the section.



Road section, SG Highway

MOBILITY,
RATAN POL AREA

In the old city commercial buildings are on the edge of the main road, mixed use on the edge of secondary roads and residential areas(pols) are in the interior.
But the fabric in old city is really dense, which makes the old city roads walkable.



Pedestrians
3 Wheelers Movement
2 Wheelers Movement

N

MOBILITY,
JUDGES BUNGLOW AREA

In the new city commercial, mixed use buildings are on the edge of the main road, mixed and residential on the edge of secondary roads and mostly residential areas(houses, apartments, etc.) in the interior.
But the fabric in the new city is really sparse, which doesn't keep the roads of the new city walkable anymore.

Bus movement
Pedestrians
4 Wheelers Movement
3 Wheelers Movement
2 Wheelers Movement

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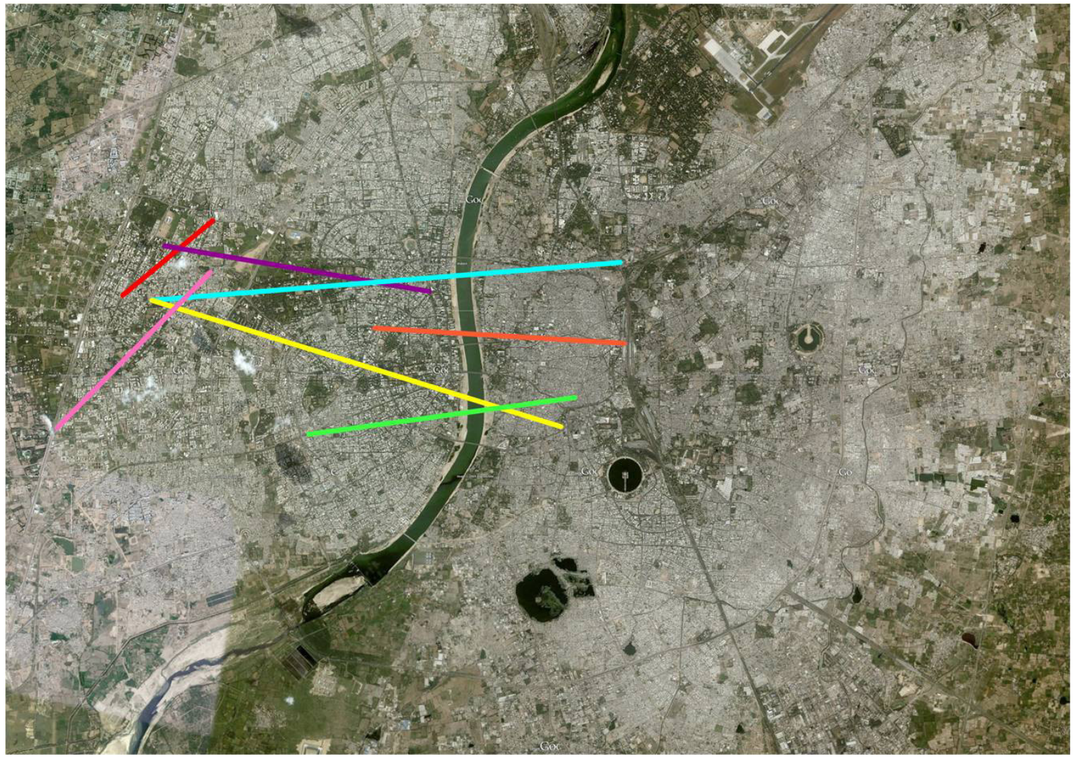
Case-study for average trip length



		From	To	Purpose	Child's School
	Person 1	Mansi, Satellite	Astodia	Business	GLS
	Person 2	Regency, Satellite	Chokha Bazaar	Shop	DPS
	Person 3	Aashiana, Satellite	Gurukul	Job	Maharaja Agrasen
	Person 4	Takshashila	Aashram Road	Business	GLS
	Person 5	Shabari	S.G. Highway	Showroom	
	Person 6	Kalupur	C.G. Road	Job	
	Person 7	C.G. Road	Raipur	Factory	

RESTRICTIONS FOR LUXURY BUSES

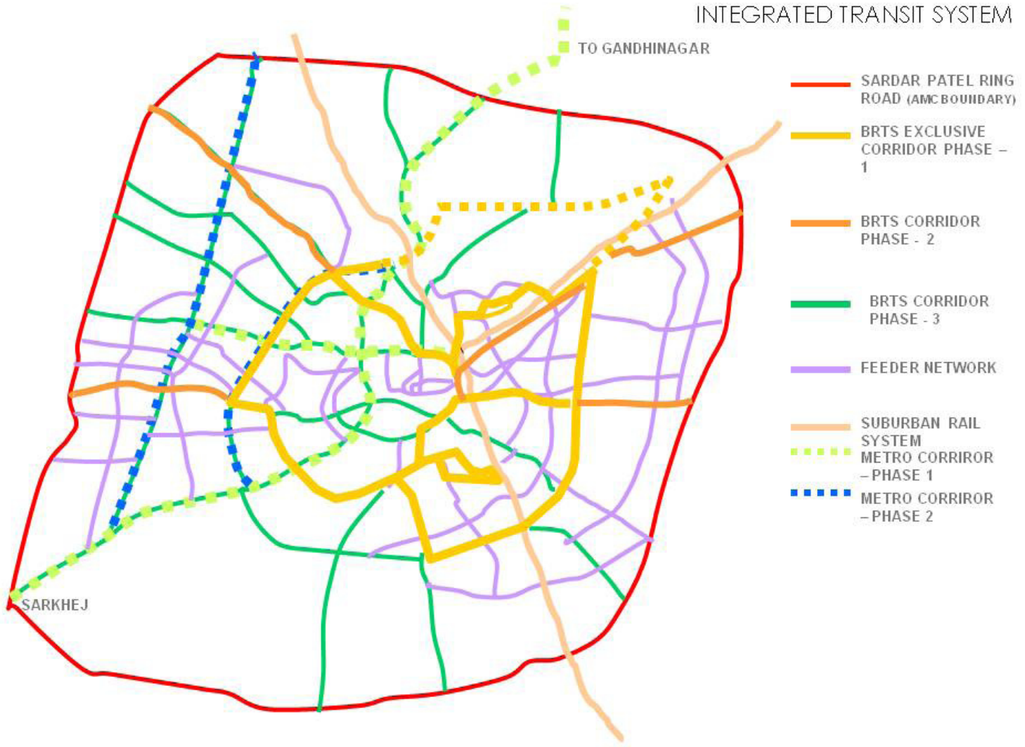
• Movement within the city limit is restricted between 9am - 12noon during the day and 5pm – 9pm `and school rush.
• Three nodes are specified as entry and exit points with a defined route within the city.
• Around 50-60 buses move in and out of the city every day.

RESTRICTIONS FOR SCHOOL BUSES

• Pick up points defined every 3-4km and some closer depending on the number of students at every stop.
• Parking of the school buses is outside the city traffic limits. For most of the schools, it is towards the highway with low traffic intensity so that the bus movements don't add to it.

RESTRICTIONS FOR TRUCKS

• Movement of trucks inside the city limits is permitted between 11pm – 6am.
• Daily delivery of newspapers and dairy is the main reason for truck movement.
• Unloading of goods, supplies, fruits and vegetables for supermarkets takes place outside the city limit and then dispatched using smaller vehicles such as tempos.



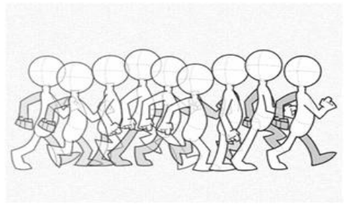
Rail

Light Rail

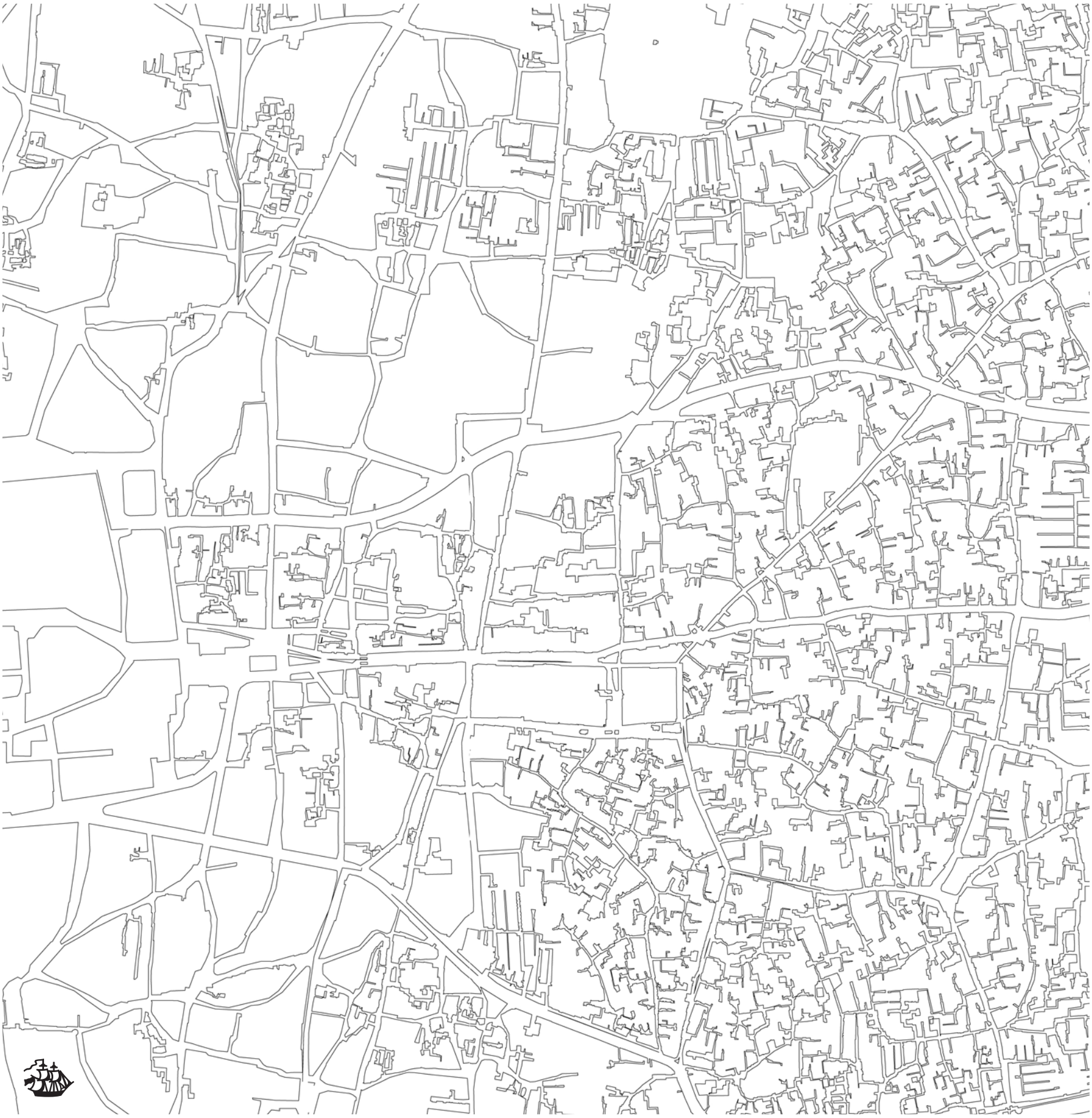
Bus Rapid Transit System

Metro

DIAGRAM SHOWING
SHARED AUTO TRIPS IN
AHMEDABAD



ALTERNATIVES – PRIVATE
TRANSPORT

The inefficiency of the public transport system is the main reason for a high traffic rate at the city level, however there are many reasons that add to the increase in the number of private vehicles at the individual level. By interviewing people, the conclusion was drawn that the main reasons were sense of security, independence and social standing in the society. Decrease in road width and the ever increasing number of vehicles on the road also adds to the traffic congestion and is the main reason as to why some roads are denser than others.

Also, alternatives such as fuel efficient vehicles, car pooling and an effective public transport may be the keys to increasing ease of mobility in the city.