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Rethinking public space for sustainability: Ranchi, Jharkhand

Vivek Kumar Chandravanshi[1], Dr. Ashish Kumar Rai[2], Dr. Shashi Ranjan[3]

[1]*Research Scholar, Ramchandra Chandravansi University, Jharkhand, INDIA.*
[2]*Associate Professor & Dean, Ramchandra Chandravansi University, Jharkhand, INDIA.*
[3] *Professor, Mathura Devi Group of Institution, Indore, M.P., INDIA.*
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ABSTRACT
A city is a collection of activities that must cater to the requirements of its citizens and exist because of them. A city's ability to support public life and make user interactions with public spaces valuable is what makes it what it is. Residents frequently use local areas such as streets, marketplaces, etc. More attention should be paid to the details of public areas than to the architecture of famous buildings if the city is to become a better place to live. Over time, urban areas'-built environments have seen continuous expansion and development, but their inability to adjust and maintain themselves in the face of these changes is causing degradation of the cities. An ideal public area should be sustainable and flexible enough to accommodate shifting social, cultural, economic, and environmental trends. The built environment is made up of a number of characteristics that serve as performance indicators when examining a particular region. In order to investigate and assess a typical Indian market place in Ranchi, the state capital of Jharkhand, this research identifies these indicators using the literature studies that have been completed. The study's main goal is to investigate how urban public spaces might be made more environmentally, economically, and socio culturally sustainable.
Keywords: *Urban spaces, public spaces, environment, economic, culture.*

I. INTRODUCTION

Despite being the most basic public areas, streets are also the most disputed and disregarded. The street must be paramount in a city. It is the city's original institution. By agreement, the street is a shared space, a chamber whose walls belong to the contributors and which is given to the city for its collective use. Among the fundamental tenets of public space are the significance of recovering it as walkable, livable, and community-based. Anyone can enter a public area without even a notice indicating their right of entry. It has the power to bring people back together and create positive connections that promote harmony and development in the neighbourhood. The planning and engineering principles we use to build and control our streets as places—both an organising concept and strategy—can help make room for these changes, despite the fact that our values and demographics have changed significantly over the past 70 years.

"Public spaces play vital role in social and economic life of communities. They act as self-organizing public spaces, a shared resource in which experience and value are created."

Joseph Rowntree Foundation

Public areas serve as a gallery for showcasing the customs and culture of the city. Depending on the time of day, day of the week, or month of the year, different activities take place in public spaces. With the aid of local identity and ties, every public area contributes to the growth of a feeling of community inside the city.

Introduction to Ranchi & its Public spaces

The capital of the recently established state of Jharkhand is Ranchi, a city on the Chotanagpur plateau in the country's east. Originally established as an administrative hub during British rule in 1834, Ranchi was formerly known as Kishanpur. In order to sustain its administrative foundation, it has been expanding in all directions ever since. Its development in industry, education, and healthcare has also been aided by the great mineral resources of the neighbouring districts. However, the region's natural wealth, art, and culture have all been significantly impacted by this relentless growth.

The city is expanding quickly, and there is a strong demand for travel, as well as increased traffic, delays, accidents, pollution of the environment, and related energy expenses. To guarantee that the city becomes competitive and productive, it is essential to have the right infrastructure for its expansion and sustainable

development.

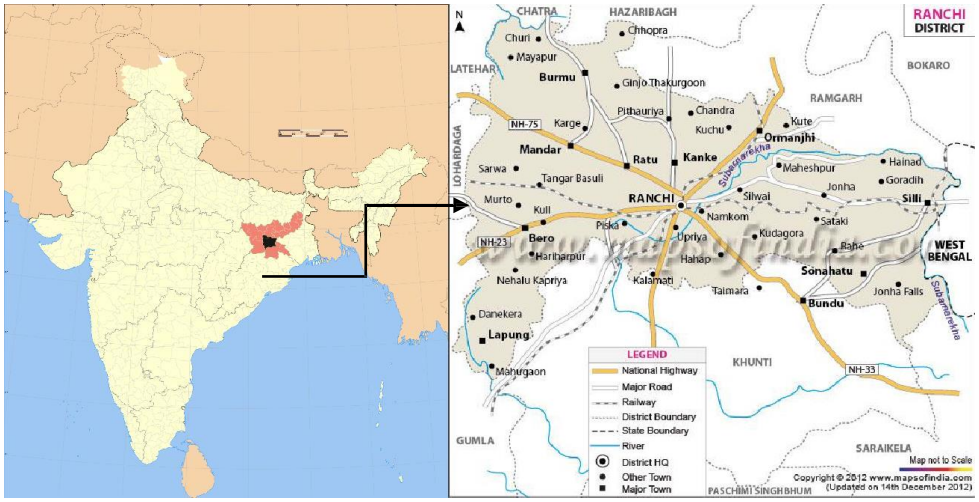


Fig. 1: Location map of Ranchi Source: mapsofindia.com

Ranchi's main public areas are the streets. The majority of the main public events are held at these locations. They are places where people congregate and engage with one another, as well as shops and stores that serve their needs and places for relaxation and amusement after a long day. These include places of worship, parks, public gardens, restaurants, food outlets, and market locations, among others. Although the streets support all social events and encourage interpersonal communication, they are poorly planned, poorly equipped, poorly organised, and poorly managed.

The majority of the streets are occupied by commercial recreational activities and retail establishments, but they lack calm, green areas where people of all ages, including young children and the elderly, can relax. They don't have a safe environment where people may wander the streets without fear. Later in this research, a full analysis of this public area is provided to bolster the aforementioned findings.

Fig. 2: Streets of Ranchi being used as public spaces Source: author

Aim

- To comprehend the City of Ranchi's public spaces' current built environment and offer ideas for improving its usability.

Objectives

- To research Ranchi's public spaces' constructed environment. to comprehend the sociocultural interactions that are now in place.
- To give recommendations on ways to improve the built environment of public areas so that current sociocultural activities can continue.

Limitations

The evaluation of the external built environment, which comprises the streets, open spaces, exterior facades, trees, green areas, and other elements of one of Ranchi's oldest public spaces, is the exclusive focus of this study. The urban conditions of the selected study area are the main focus of the investigation. People's

perceptions have been the primary basis for evaluating the built environment.

II. LITERATURE REVIEWS

A few design theorists and practitioners, including Lynch, Jacobs, Appleyard, and others, have sought to identify desirable aspects of successful urban design as part of the place-making tradition. Because people cannot travel far to view all of the structures in an urban setting, they are more likely to notice the spaces between buildings and architectural elements like facades, windows, thresholds, and entrances. This means that well-maintained details that are visually and aesthetically appropriate are important. inviting public open areas, such as covered arcades, pedestrian walkways, open walkways, and courtyards for gatherings, in order to encourage social interaction and give users a feeling of place. Interactive edges to help close the gap between the social fabric and the physical place. The distinction between public and private areas is blurred by the use of architectural features such as vibrant thresholds. increased use of non-motorized vehicles for local transportation. Mobile workspaces are ones that a range of people can utilise to carry out different tasks. Numerous amenities and services that are well-connected. Flexibility in the layout of building blocks, short building blocks that allow for frequent turning, overlapping functions that ensure the necessary services are within reachable limits, a balanced envelope enclosing the street, a wide variety of environmentally friendly transport options, adequate personal connections between users and the city through signage, lighting, and installations, a wide range of experiences to keep users interested, physical and visual connectivity/accessibility. A city can have a unique character by establishing a well-defined urban perimeter and preserving similarities in building heights, building lines, roof slopes, widow types, etc. The massing of blocks, roof shapes, building heights, and other factors determine the structures' prominence and create the skyline, hence determining the skyline's character.

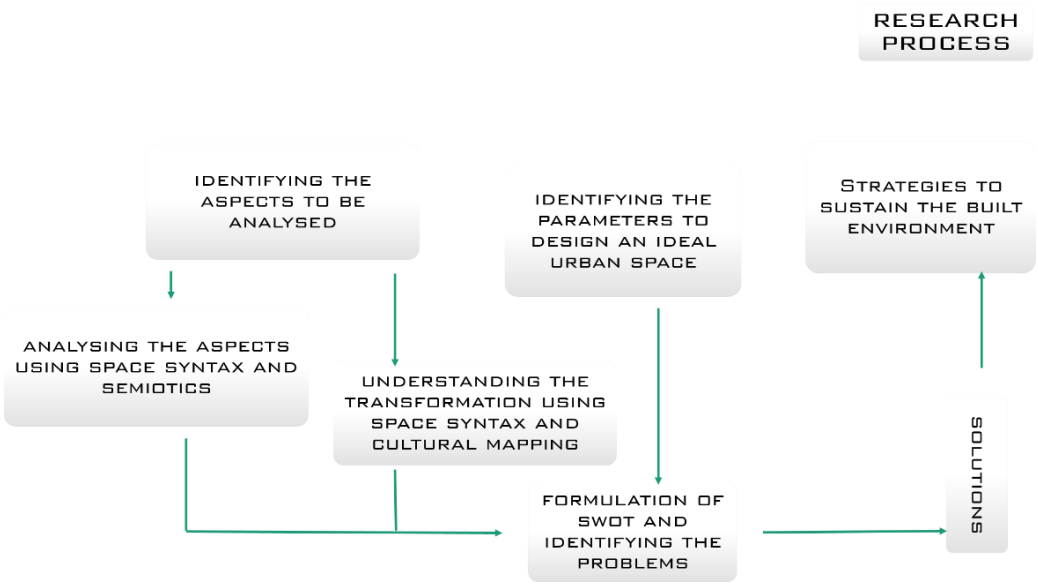
Buildings should enclose streets, squares, parks, and other open areas in proportion to their width and significance. The parking, landscaping, lighting, direction, shelter, signage, street furniture, how it is overlooked, and the routes that go through it all affect how good the public realm—which includes streets, parks, squares, and arcades—is. Well-planned public areas should be accessible to all users, including the elderly, young people, and those with disabilities, and should be useful components of the pedestrian network. Streets and intersections become more convenient if they serve as public areas rather than merely channels for traffic. Street lighting's significance can be determined by its kind and quantity. Plants, biodiversity zones, and other features can serve as a public space's focal point. Features like as windows, colonnades, and other exterior elements can pique the interest of onlookers. Incorporating artistic creations and thoughtfully designed street furniture into public areas contributes to a sense of place and identity. Access to subterranean facilities, resistance to vandalism, and maintenance requirements should all be considered while designing a streetscape.

A system of connected roads and areas for both cars and people. Minor roads, shortcuts, and well-established pathways can serve as the foundation for long-lasting connections. Short, connected streets can improve accessibility and promote bicycling and walking. An essential component of design should be the appropriate placement of buildings and spaces, as well as physical traffic-calming techniques. Public transit accessibility may be improved by the design and density of buildings. Systems of public transit ought to be planned as an essential component of the public space. Additionally, it contributes to the creation of secure pedestrian areas. Planting can be used to highlight pedestrian pathways.

In order to make the space easier to grasp, the main entrances should be clearly marked. Putting corner buildings higher than nearby structures will highlight their significance because they offer identification and points of orientation. Public use stores that are positioned on the corners of busy streets promote local identity and activity. Road's ought to be constructed in accordance with flexible standards in order to accommodate a wider range of future applications. The four characteristics that characterise a user-friendly city are readability, legibility, imageability, and memorability. Legibility can be characterised as the way the city is perceived by its residents and how easily they can navigate and identify it. The ease with which residents can move about the municipal borders is known as readability. how simple it is for users to navigate and comprehend the city. A physical thing is said to be imageable if it has a high likelihood of conjuring up a powerful image in the mind of any viewer. A well-designed, unique, and highly imageable city encourages increased participation and attention from the human senses. A sustainable public space has several qualities, such as being accessible to all users, which promotes equity; accommodating multiple uses; providing interesting vistas and pleasing visual experiences; being safe and welcoming; reflecting local culture and history; protecting and enhancing the environment and natural features; creating a sense of place among users by being readable and memorable; being visually appealing and interesting; and being economically valuable to the rest of the Built Environment. The quality of the global environment is significantly impacted by the development of the urban environment. It is well known that the process of urbanisation causes significant alterations to the local environment. Microclimates with varying degrees of comfort are produced by varied layouts.

III. RESEARCH METHODOLOGY

The literature mentioned above has been used to comprehend the significance of environmental, social, and cultural sustainability in urban space design and to determine a set of design metrics that are essential for evaluating a public space's sustainability quotient. The several elements of the urban built environment that together make up its essential component and aid in determining its state are known as these urban parameters. The location is studied by visual observation, surveys, photography, videography, and interview techniques. Maps, tables, and graphs are used to illustrate the observations. Every performance indicator has a performance criterion that is used to analyse a certain element. The performance criteria for assessing the state of the current public space are contrasted with the observed observations. Following an evaluation of the current situation, improvisational methods are suggested.
The following flow chart elaborates the process followed in the research:



Chosen Performance Indicators:

- Microclimate
- Resource management
- Ecology Greenery and Landscape
- Range of Uses
- Organization of spaces
- Transport systems
- Urban Interactions
- Mental Image and Ease of Recognition
- Intensity of Development
- Built Forms and Visual Relationships
- Culturally induced movements

Illustrated --The oldest public space of Ranchi
The four major junctions in the CBD known as Firayalal chowk, Sarjana Chowk, Shaheed Chowk and Gandhi Chowk connect the street which is the oldest public space of Ranchi. This forms the center of the municipal area of Ranchi.

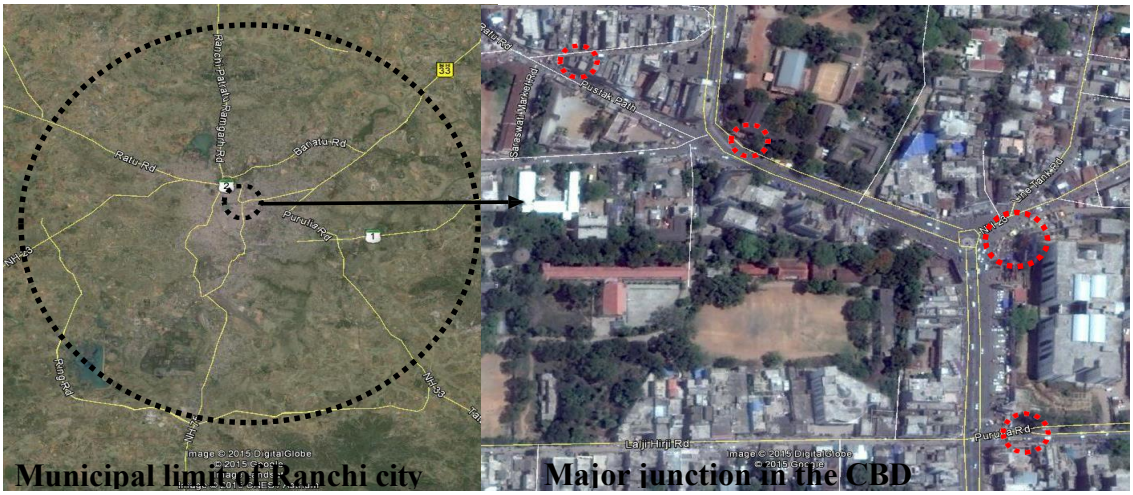


Fig. 3: location of the public space of Ranchi chosen for the study Source: author

Together, these make up one of Ranchi's oldest and most important commercial areas. The intersection of the Mahatma Gandhi Road and the Hazaribagh Highway, along with three more connecting roads, occurs here. On the outskirts of the blocks are mixed-use buildings with apartments on the upper floors, as well as retail and wholesale establishments. These blocks' interiors are made up of public semi-public structures including banks and phone offices as well as institutional buildings like Sadar Hospital, Zillah School, St. Xavier's College, and Ranchi University. The road is the site of all other activities, such as driving, walking, moving non-motorized vehicles, hawking, waiting, interacting with people, and parking.

Fig. 4: land-use and typology map Source: author

Fig. 5: An Aerial view of Firayalal junction Source: author

Fig. 6: Descriptive map to illustrate the visual observations Source: author

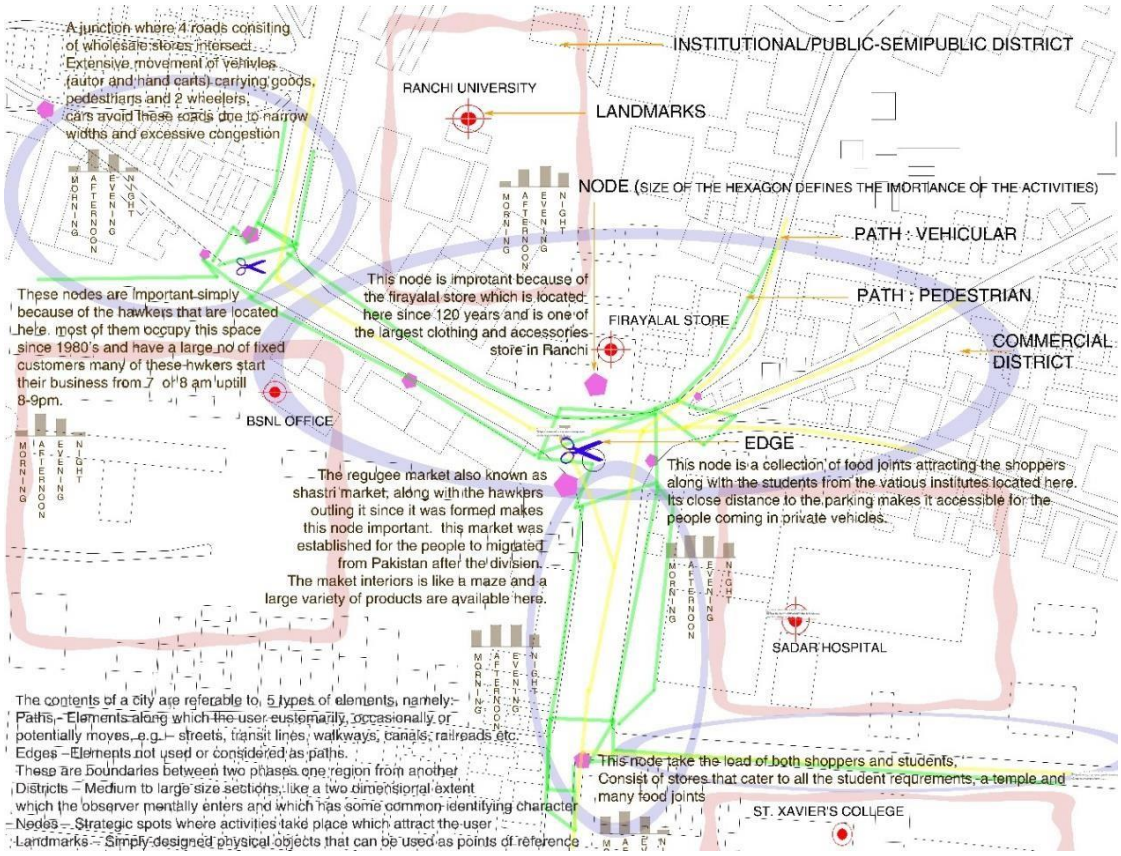


Fig. 7: legibility Map and Activity Node Diagram Source: author

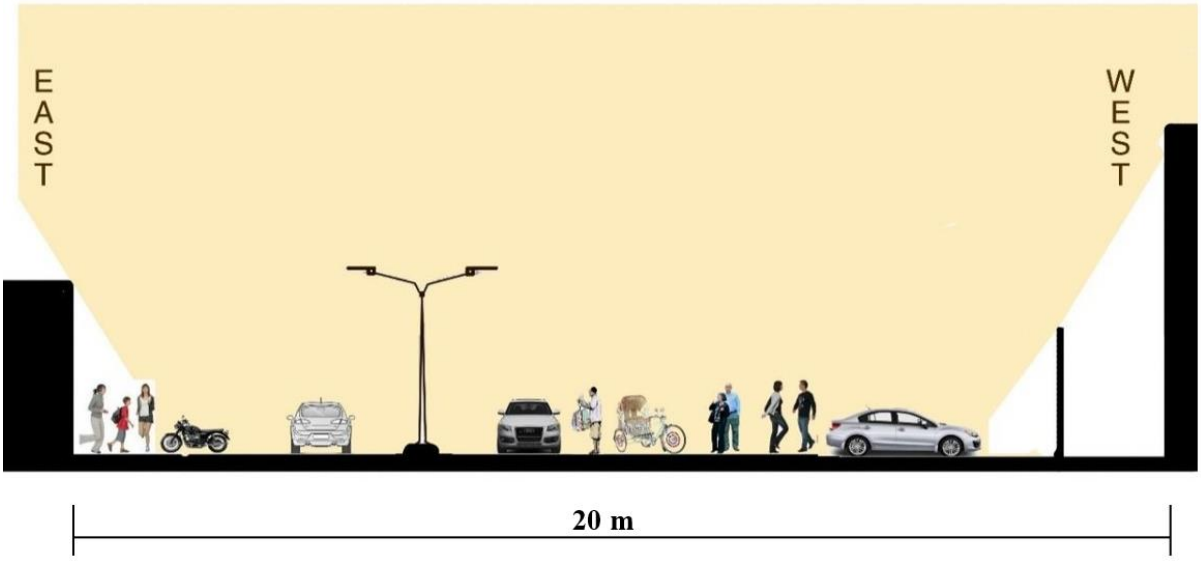


Fig. 8: Existing section[s-s] of MG Road Source: author

Table 1: Assessing and measuring the quality of public spaces

PERFORMANCE INDICATORS	**PERFORMANCE CRITERIA**	**INFERENCES**
CLIMATOLOGICAL ANALYSIS 1. TEMPERATURE 2. SOLAR RADIATION 3. WIND SPEED 4. HUMIDITY 5. RAINFALL 6. WIND DIRECTION 7. SUN PATH	• Design of passive architectural systems to reduce dependency on energy and get the most of the positive aspects of the existing climatic conditions.	Initial layouts and structures were designed such that they utilize the natural resources for energy. Initially roads were wide with plenty of open spaces but gradually as more and more structures were built, congestion increased, motorized transport systems incerased, open spaces vanished imposing negative effects on microclimate. Most of the new structures are centrally air conditioned. Many of the old structures have also been made centrally airconditioned by packing the fenestrations with fixed glass or Aluminium cladded panels. Buildings are placed very close to each other and many of them are surrounded by huge trees that prevent natural lighting of the buildings.
RESOURCE MANAGEMENT 1. METHODS FOR GARBAGE COLLECTION 2. METHODS FOR GARBAGE DISPOSAL 3. WATER MANAGEMENT TECHNIQUES (GROUND WATER RECHARGE, RAINWATER HARVESTING ETC) 4. HARVESTING RENEWABLE SOURCES OF ENERGY 5. MANAGEMENT OF NON	• Use of renewable energy resources • Generate energy on site • Reducing power losses • Increasing efficiency of usage • Water preserves • Available water resources and their maintenance • Ground water recharge and rain water harvesting measures • Reduce water losses • Regularize informal market • Door step waste collection • Proper waste segregation • Regular sweeping and cleaning • Maximizing recycling of waste • Treatment of biodegradable waste	Rainwater harvesting has now been included as a compulsory practice in the byelaws. But the old buildings have not been updated with rain water harvesting, harvesting of solar energy or any such energy efficient technology. Shops throw their garbage in the open dumping zones assigned at the corner of the streets and customers and other users also use the same space. Lack of dustbins and irregular garbage collection leads to unhygienic and dirty streets. No provision for seggregation of waste at source. After collection, ragpickers segregate plastic bottles and other recyclable materials from the garbage. Open drainage at some places lead to insects breeding in them and over

6. RENEWABLE ENERGY SOURCES	• Provisions of dustbins in public spaces • Abolition of open waste storage • Closed well maintained drains and sewers • Selection of ecologically sustainable materials, locally available materials and/or recycled materials	flowing stormwater during the rains. Such conditions are prevalent in internal lanes that are narrow and crowded. Most buildings are old and have been built using locally made bricks or concrete blocks. The materials used for façade improvizations are usually modern materials like aluminum cladded panels, exterior glass panels etc that are imported from other cities.
ECOLOGY AND GREENERY	• Incorporation of urban or vertical farms • Green buffers • Trees for shading purpose • Green facades and terrace gardens	No trees or green spaces are present on the street. All green spaces/trees located within institutional campuses. There is no space on the street that can be used as buffer zone between the buildings and the carriage way, where trees can be planted to cut out the vehicular noise from the pedestrian and private realam. Trees are found haphazardly placed in the area. Most of the time blocking the natural light fron entering the buildings. None of the public areas have been shaded using trees or any other form of plant material.  **Fig. 9:** Existing trees/green areas Source: author

LANDSCAPE 1. OPENSPACES 2. GREEN SPACES 3. PUBLIC SQUARES 4. GREEN BUFFERS 5. BARREN LANDS AND FARMLANDS 6. STREET FURNITURE, SIDEWALKS, FACILITIES	• Small installations of urban agriculture encouraging hybrid lifestyles • Biodiversity areas acting as central focus for public spaces • Pedestrian routes, streets etc emphasized using green boundries • Trees used as buffers between vehicular and non-vehicular spaces • Direct access to street from ground floor to reduce lengths of blank facades (access to buildings by means of internal courtyards reduces street activity) • Use of hedges or shrubs to demonstrate boundries for different spaces • Use of street furniture to make streets more interactive and accessible • Shaded areas acting like a safe pedestrian island among the crowded surroundings	Lack of open green spaces like plazas or courtyards. There are many nurseries in the interiors but these are not used as social spaces and are known to very few people. There are two lakes located within a radius of a kilometer from this commercial area. None of these lakes have been developed in a way that they can act as social public spaces. All the shops open directly on the street. Blank institutional boundries are also outlined by hawkers. Scarce street furniture. People usually sit on their bikes, in their cars or on road sides while waiting for others, eating from the roadside food stalls or even shopping from hawkers. At many places hawkers place a plank across the drains to lay their carts. No provision of dustbins on the street. (when questioned people said they throw garbage in the corners and in the drain because that's where they are supposed to throw and it will be picked up from there) Only few tall buildings provide some shade on the road in some parts of the street. Very few trees haphazardly located between the buildings.  **Fig. 10:** People using umbrellas for shade Source: author

MENTAL IMAGE AND EASE OF RECOGNITION 1. MEMORABILITY 2. LEGIBILITY 3. READABILITY 4. SAFETY 5. ACCESSIBILITY 6. EQUITY 7. CHARACTER	• Well-designed signage and hoardings to avoid clutter and adequate personal connections of the users with the place • Adequate lighting to make the spaces accessible and safe • Space design to make it memorable and keep the users engaged like works of art and well-defined street furniture integrated into the public spaces gives identity and enhances the sense of place • At junctions and corners buildings act as a point of entry, defines routes and gives identity to the place. • Public-use shops located at the corners enhance activity and induce character in the space • Distinguished landmarks for redabiity and memorability, help in wayfinding • Well delineated pathways and edges for legibility, safety, equity and accessibility • Distinguished aesthetic and architectural character • Easily identifiable entrances for legibility and accessibility • Most active uses concentrated on major routes for ease of accessibility and legibility	Innumerable bright hoardings and missing wayfinding signages make the legibility of the space poor. Major areas are well lit but pleanty of dark unused spaces also exist. Lighting on streets has not been creatively used to seggregate activities and highlight some areas. Memorable because of the presence of very old institutions and one of the first few fashion stores. These buildings have become the identity of the space. Most of the corner buildings are in the background. Foreground is occupied by hawkers and street vendors. These generate a lot of activity on the street but their unorganized placement leads to chaos. All institution buildings and the old stores act as landmarks. Most of them also act as major activity nodes. A number of pathways exist but lack of edges decreases legibility and equity. Unorganized streets lead to unsafe environment. No distinguished architectural character. The architectural character of the old buildings are either hidden behind the huge hoarding or are too dilapidated to appreciate.  **Fig. 11:** Old structure with shops on the ground floor and residence on top Source: author

RANGE OF USES 1. TYPES OF USES 2. TYPES OF ACTIVITIES	• Extensive mixed-use buildings & multiple usage spaces • Overlapping functions to make required uses within reachable limit, these uses must me compatible • Efficient interaction between uses and activities • Equity of space, accessibility between types of activities Residential spaces - private houses, apartments, Institutional spaces – schools, colleges, universities etc., Work places – Private and Public, Healthcare centers – hospitals, clinics, nursing home, medical stores , Recreational spaces- parks and green spaces, community gardens, hotels, restaurants, bars and pubs, commercial spaces - food cart vendors and other street vendors, food and general stores, farmers markets, shopping centers, transportation hubs: auto stands, rickshaw stands, bus stands, bus stops, parking lots etc. streets – walk ways, non-motorized transport ways and motorized transport ways.	Mixed use buildings consisting of residential and commercial uses. Some stores on Pustak Path have residence on higher floors. Residences overlooking the congested noisy street. A combination of institutuionl, commercial and offfice buildings. General use stores, food stalls, banks, hawkers etc. are at a walkable distance from instiutrional buildings and offices. This leades to a large amout of interaction between the activities and uses.  Source: author Large variety of activities on the road with no specific place assigned for them  Source: author Stores on MG road are mostly of clothes, footwear and accessories; while on Pustak path all kinds of stores like hardware, electrical, utensils, furnishings etc. can be found.

ORGANIZATION OF SPACES 1. SEGREGATION OF DIFFERENT TYPES OF MOVEMENTS ON STREETS 2. SIZES AND ARRANGEMENT OF STREETS 3. SIZES AND ARRANGEMENT OF BLOCKS 4. FREQUENCY AND LOCATION OF TURNS 5. HIERARCHY OF STREETS 6. ACCESS TO FACILITIES 7. DESIGN AND DETAILING OF SPACES	• Established hierarchy of spaces • Seggregated movements • Defined directions • Organization of public utilities for ease of accessibility • Well designed and adequate street furniture • Integrating humanscale into the urban scale with the help of well-defined details • Well-developed street life • Streets squares, parks and other open spaces should be enclosed with buildings such that they relate to width and importance of space. • Public spaces and streets provided with human scaled enclosures. • Public spaces stretched beyond ground level • Adequate parking spaces and vehicular movement spaces seggregate form pedestrian movement • Public spaces well integrated with pedestrian network and easily accessible for all users • Streets and junctions acting as public spaces rather than just traffic routes provide equity for vehicular and non-vehicular users • Maximizing open spaces in form of pedestrian pathways, walkways etc. to make people get involved in social activities	Many types of activities happen together at one place, since there is no space designated for them, the space gets very congested and messy.  **Fig. 14:** activities clashing Source: author Sidewalks are encroached with retail spillovers, parked vehicles and hawkers, leading to haphazard movement of pedestrians and forcing them to walk among vehicular traffic. This leads to congestion and unsafe environment. Some old markets spaces have developed like a maze internally, with no natural ventilation and poor accessibility. No defined spaces for social activities. Street bears the load of all public activities without proper organization or segregation. Equity in terms of safety is missing since vehicular and non-vehicular movements have not been segregated. Adequate open spaces available but due to poor organization they become congested and are misused. These spaces are sometimes encroached by parking and sometimes used as a dump yard. The main street caters to various kinds of traffic. The shoppers, students, workers, professionals, servicemen and also the passersby. Some of them are the users of the activities located there while some just use the road as a connector.

TRANSPORT SYSTEMS 1. MODES OF TRANSPORT 2. CONNECTIVITY 3. PHYSICAL LINKAGES	• Well integrated modes of transport and Maintaining hierarchy of modes of transport • Roads built in adaptable standards to cater to a greater variety of uses that develop over time • Smaller block sizes and increased number of turns make urban space more flexible and adaptable and improve the accessibility of the area • Public transport must be designed as an integral part of street layout • Minimizing walking distance between major land uses and public transport nodes • Personal vehicle restraint measures and balanced parking facilities and reduced travel time • Restricted motorized movements and adequate non-motorized modes • Network of well-connected routes for pedestrians as well as vehicles and physical traffic calming measures • Short linked streets that make spaces more accessible and encourage walking and cycling	Large variety of transport modes can be found, but there are no specified lanes for their movement.  **Fig. 15:** Transport modes predominant Source: author Block sizes are small with adequate internal roads, but the internal roads are narrow with 2-3 storey buildings on either side. These roads do non-receive adequate natural ventilation. Wide main roads are adaptable to future changes but poor organization leads to unsafe and congested environment. Many non-motorized public transport options are available. These improve the accessibility of the space. No personal vehicle measures or parking restrictions applied. Unsegregated roads create an unsafe environment and decrease the walkability quotient of the space. No traffic lights or zebra crossings, people are unaware of the traffic light rules, a policeman stands at the junctions to control the traffic. Non-motorized and motorized vehicles moving in the same lane causing traffic jams. Roundabout at Firayalal and Shaheed chowk increase traffic congestion.

INTENSITY OF DEVELOPMENT 1. DENSITY OF BUILDUP SPACE 2. POPULATION DENSITY	• Narrow plot frontages allow small scale shopping and commercial activities to adapt changing needs • Building should have proper setbacks to breakdown the density of the area • Setbacks contribute in enhancing the social activity of the space. Depending on the dimensions of the setbacks their uses must be specified	Buildings have shorter facades facing the road and longer façade stuck to the adjacent building and absence of internal courtyards decreases the available surface area for fenestrations. Storefronts have very poor maintenance. Continuous Street fronts with little or no setbacks. Hence the total area available for open and green spaces is less. The density of built form is high in commercial zones while low in the institutional zones. This is because the institutions existing there were built way back in 1940's and were one of the first buildings to be built in Ranchi. They have been provided with adequate setbacks and open spaces within their campuses.
BUILT FORMS 1. BUILDING TYPOLOGY 2. BUILDING SHAPE AND SIZE 3. IMPORTANCE TO QUALITY AND DETAILS	• Transparency in urban framework maintained for better understanding of the space. Huge buildings should not hide the structures behind it. • Massing of blocks enhancing the skyline (shape of roof and height of building) • Dominance of landmarked building must be defined • Robust built forms not designed for any particular use allow great variety of future uses to creep in • Structurally stable buildings make infrastructure/buildings recyclable	The commercial and institutional buildings are directly seen from the street and the residential buildings are located towards the interiors. Most of the landmark buildings have huge footprint and height but most of them are used as a land mark because of their age and not their built form. The roof shape and other architectural details that dominate the visual appearance of the skyline are mostly hidden behind hoardings. Most of the structures are huge in size. The old ones were previously used as residences with shops on the ground floor. Most of the old structures that were residences have been converted into shops or warehouses. Most of these old structures are unrestored and in dilapidated conditions.

VISUAL RELATIONSHIPS 1. RATIO BETWEEN BUILDING HEIGHTS AND OPEN SPACES AROUND 2. VOLUME AND SHAPE OF ENCLOSURES ON THE STREETS USING STREET WIDTHS AND BUILDING HEIGHTS 3. ELEVATIONAL PROFILE OF THE STREET 4. RELATIONSHIP BETWEEN FOOTPRINT AND FAÇADE 5. USER PERCEPTION AND IMAGIBILITY	• Integration between old and new development • Continuity in building typology • Creating well defined urban edges • Maintain relationship between building heights • Maintain regular building lines, roof typologies, window, door details, façade details etc. • Projections and setbacks from the building line such as bays and entrances add valuable emphasis and can create usable attractive spaces for pedestrians • Layout and massing should encourage pockets in between to permit day light and natural breeze. • Balanced envelop enclosing the street scale of the buildings must relate to street widths. • Well designed and well-maintained details that are visually and aesthetically appropriate (because in an urban setting people cannot go far to see the entirety of the structures instead, they tend to notice spaces between the buildings and segments of architecture like entrances, thresholds, windows facades etc.) • Balanced envelops enclosing the street • Skylines must incorporate visually appealing variations in form of buildings.	Many old structures have half built structures on top of them with only the front façade complete. The users consider it unnecessary to finish the rear sides as they are not visible from the front. The only form of continuity maintained is in form of huge and bright hoardings placed on the façade of every building. Buildings' heights are similar for all kinds of structures irrespective of their use. Roof, window or other façade details covered with hoardings and signage. Building entrances blocked by parking and hawkers. Closely packed structures with only front façades are exposed to natural ventilation. Main street is wide with 2-3 storey structure on either side. This provides for a fairly open enclosure on the street, enhancing its imageability and comfort quotient. Internal lanes are narrow and lined with 2-3 storied structures making the envelop highly enclosed and congested.  **Fig. 16:** Internal lanes Source: author

DISTRIBUTION AND TYPES OF ACTIVITIES 1. TYPES OF ACTIVITIES THEIR REASON AND LOCATION 2. TRANSFORMATION /EVOLUTION OF ACTIVITIES OVER TIME	Outdoor activities are of 3 types, each with different demands on physical environment: Necessary activities, optional activities and social activities. Necessary: Activities in which those involved are to a greater or lesser extent needed to be involved, going to school, work, shopping, waiting for bus, another person etc. because these activities are necessary, they are influenced only slightly by the environment. Optional activities are those where people get involved only if they wish to do so. Example taking a walk, standing or sitting around enjoying the surroundings etc. As the levels of optional activities rise, the levels of social activities increase substantially. • **Enhanced cultural and traditional character for sense of place** • **There must be healthy interaction between all the activities** • **The urban spaces must be adaptable for the changing activities with time**	Hang out spaces, restaurants, parks and gardens etc. are the spaces that promote social activity. Absence of these spaces in the area brings down the percentage of social activities to negligible. Optional activities such as waiting, walking etc. also take place only occasionally. These spaces majorly cates to necessary activities like travelling to work, shopping, parking etc. Some food stalls located at Firayalal chowk are only used because they are needed by students and workers. These stalls are not used as hangout food joints that promote socializing.
URBAN INTERACTIONS 1. INTERACTING BETWEEN SPACES 2. INTERACTIONS BETWEEN USERS 3. INTERACTION BETWEEN USERS AND SPACES	• Entrances where people move between private and public create activity on streets. • Architectural elements like threshholds, well designed building edges, steps, plazas, entrances etc. can blur the line between inside and outside making the space safe • Healthy collision of activities creates positive economic and social interactions	There is activity on every commercial entrance but the activity does not connect the inside and the outside. These activities take place because of the presence of hawkers and the parking spaces. Edges, threshholds entrances are not noticeable. Sometimes hidden behind the hoarding and sometimes blockled by hawkers and parking. There is safety on the streets from social miscreants because of the concept of 'eyes on the street' but the unorganized systems itself make it unsafe for pedestrians, children and elderly.

LIGHTING, SOUND, SMELL 1. TYPE AND QUALITY OF LIGHTING 2. TYPE AND NATURE OF SMELLS AND ODORS 3. SOURCE AND TYPE OF SOUND	• Layout of buildings must encourage between buildings to permit day lighting and wind movement • Well-lit areas are safe and accessible, dark streets create unsafe areas • Amount of lighting and type of odor of a street can define its character and importance • Nosie levels on the street should be within the bearable limt and must add to the character of the street.	During the day time the internal streets are not well lit and ventilated because they are narrow with 2-3 storey buildings on either side. Street lighting in the night time is adequate for the people to walk around or access the shops but existence of dark corners threatens safety and lead to decrease in crowd and shutting down of stores by 8 p.m. Most of the streets have a combination of a wide range of activities and hence a particular kind of odor of noise that can distinguish them does not exist. High decibels of traffic noise prevail during the day time. This sometimes makes normal speech also unaudible to the people around. Honking noses and motor noises make the space stressful. They contribute towards headache and increased stress levels in the users.
CONSTRUCTION 1. CONSERVATION OF ARCHITECTURE STYLES 2. USE OF LOCAL AND TRADITIONAL MATERIALS 3. CONSERVATION OF STRUCTURES	• Sustaining old structures and adapting them for new uses • Sustaining architectural stylesans historic styles help the users to connect with the past and contextualize their existance • Use of local meterials helps to maintain similatry in construction and develop a culture and tradition.	New uses have been applied to many old buildings but without any restoration of the existing. Higher floors have also been built on top of these dilapidated structures. The materials used and the historic architecture styles in some cases are hidden behind hoardings. The local construction materials are bricks, cement, sand, mud etc. but some materials like stone, granite, marble and other cladding materials are being imported for new buildings.
MOVEMENT PATTERNS OF PEDESTRIANS AND VEHICLES	• Culturally induced movements add a sense of tradition to the place and make the people feel more comfortable • Well seggregated movements make the space comfortable, accessible and safe • Spaces where movements collide must be well designed for safety and ease	Most of the movements in these areas are culturally induced. There have developed over time due to the activities located there. Neither are the activities nor the movements are well seggregated. This threatens the safety and accessibility of the space.

Major strategies that need to be implemented to boost the sustainability of the space:

Having nice views is essential for a whole walking experience. When partially constructed buildings are combined with completed facades, they appear unsightly. To make the space aesthetically pleasing, consistency must be maintained. The area can be made to look more lovely by adding painted ornaments, gall fenestrations, and other decorations to exposed brick and concrete structures. The building heights and roof shapes must blend well with the surrounding landscape. Regulations limiting roof kinds and heights can aid in preserving the area's homogeneity. Infrastructure improvements will raise the area's level of safety, accessibility, and beauty. This will contribute to showcasing the region's economic expansion. Spreading knowledge among users about the significance of improving the infrastructure and how they may contribute to it is crucial since a lack of awareness among users can undermine all policies and planning initiatives. According to Ranchi's bylaws, rainwater collection must be a requirement for any new development. The bylaws should also have a policy to integrate it into the current structures. Additionally, solar harvesting needs to be required for all commercial and institutional buildings. Solar heat harvesting should be aided by the usage of solar street lighting systems. Lighting needs to be thoughtfully designed to draw attention to key nodes, divide various tasks, and avoid excluding shadowy or obscure areas. Due to the majority of new buildings' blank façade and non-operable windows, artificial lighting and air conditioning have become more common. By installing windows and balconies, artificial ventilation will be used as little as possible. This will be a cost-effective and energy-efficient choice. Regular garbage collection is necessary. It is necessary to make provisions for waste segregation at the source. Raising awareness of the value and practices of waste segregation is crucial for the effective enforcement of such regulations. Drains need to be covered and carefully designed to prevent overflow. Street and pavement slopes need to be carefully planned to allow water to flow easily to the drain. It is important to improve the structural integrity and aesthetics of the historic buildings that are currently used for new purposes. These structures enable individuals relate to and connect with their history by showcasing the customary architectural elements of their time. Emphasising thresholds and entrances is necessary to make the area readable. Planters can be utilised to draw attention to the thresholds, and hoardings and embellishments can be used appropriately to draw attention to the entrance.

Design Strategies

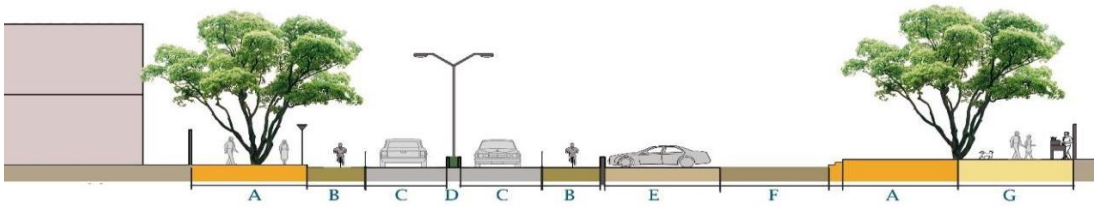


Fig. 17: Proposed section for the MG road Source: author

Areas must be specified for all uses and activities for better space organization and better segregation of movements

A – Pedestrians, B- Non motorized transport, C- Carriage way, D-Median, E-Parking, F-Service Road, G-public plazas and hawking zones

Fig. 18: Perspective view, as proposed for MG road Source: author

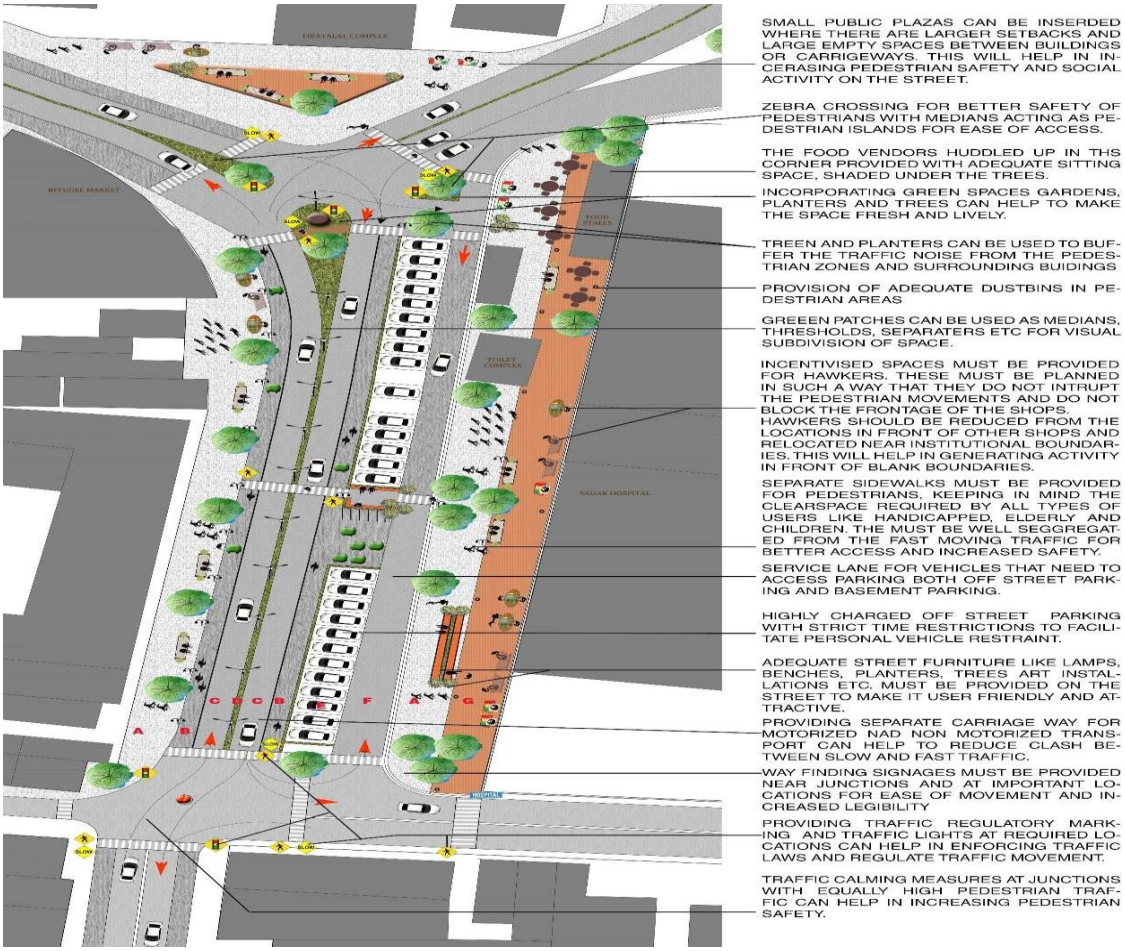


Fig. 19: Proposed Plan for MG road Source: author

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