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A STORYTELLING PERSPECTIVE OF STREET DIVERSITIES IN INDIAN SMALL TOWNS: THE CASE OF
ROORKEE, INDIA

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Abstract

The Indian city improvement programs are aligned with the generalized ideas of infrastructure requirements in cities. The ineptness of city planning resulted in a series of top-down initiatives. As a result, public spaces, particularly streets, lose their value and opportunity to contribute to a city positively. Streets in Indian cities are appallingly insufficient, and whatever streets are available in the cities are extremely overcrowded. Activity and diversity are important criteria to determine a successful street, but overcrowding and intense activity may jeopardize the street experience. This paper examines a semantic structure for urban narratives that applies elements of tales to construct stories of the activities and relationships of people with the commercial streets in Indian small towns. Much initial theorizing on planning has focused on the planner's role as a storyteller. The paper studies the diversity of street activities and the contextual settings in Indian small towns and their use for mobility and community interactions. We aim to establish meaningful insights on Indian street diversity necessary for developing public spaces in Indian small towns.

Keywords: Street activity, local area plan, master plan, informal activity, land use, density

1. INTRODUCTION

Urban planning has witnessed an increasing interest in the potential of stories, narratives, and discourses as building blocks for urban (re) development. Some have even seen a distinct narrative or story turn to deal with real-life complexities (Cohen, 2008; Sandercock, 2010; Ameen, 2018; Flyvbjerg, 2001). The

narrative, in this case, is understood as a sequence of connected events evolving in space and time. The progression of a narrative is selective because the events are chosen and structured by the individual author specifically to suggest a coherent plot. It is therefore intersubjective and communicative because the plot renders meaning to specific experiences or logical deductions. It is also a powerful means of communicating an argument (Guhathakurta, 2002). One must “think of planners as authors who write texts, that shape the reader’s attention, turning it this way instead of that” (Throgmorton, 2003). This paper argues that a narrative typology of urban streetscape could bring new insights and visualization into the discursive urban practices that appeared in the place of empirical investigation (Majone, 1992). Listening to stories of place can inform urban planners and designers about the narrative fabric that is as much a critical part of the other relevant physical contexts (Childs, 2008). Persuasive storytelling can promote the conception of a conceived space and representations of space as mental abstractions of social networks of the local people (Wallin, et al., 2018). Perhaps urban planners should create anthologies of neighborhood stories to help inform projects and otherwise serve as curators (Childs, 2008). They shape the course of discourse by defining the issues and reshaping the initial positions of the actors' concerned (Guhathakurta, 2002). An awareness of the local stories in a community is explicitly seen as beneficial for a more inclusive, democratic, and sustainable city (Throgmorton, 2003; Depriest-Hricko & Prytherch, 2013; Hajer & Wagenaar, 2003; Biswas, 2016). Planning descriptions shared by the affected community may be crucial for success since influential information in policymaking is locally shared (Innes & Booher, 2010).

However, diverging notions remain on what is meant by narratives and their functions and use. This paper utilizes two distinct types of urban planning narratives - “in” and “due to” planning (Ameel, 2018; Biswas, 2021). The objectives of the paper are to apply narratives “in” planning to demonstrate the pattern of activities, conflicts, and the behavior of people in a commercial district of a small Indian town and to apply narratives “due to” planning to identify the logical reasoning for the relation between users, local community, and streetscape. The study is particularly benevolent for developing economies recognizing the dynamic streetscape due to the emerging market economy. The scope of the research is based on our field study of Roorkee city. Although we analyzed a specific case of the streetscape, the case successfully postulates the paradigm of urban transformation with empirical rigor and references to other small towns across the country (Kundu, 2003; Chattopadhyay, 2017). Recently small and medium towns have received a renewed interest from the government to redirect investment and create counter magnets to larger cities and metropolises (Shaban, Kourtit, & Nijkamp, 2020).

The research will benefit the global and Indian readers to comprehend urban streetscape from a densely populated small town through “place potential”, narratives “in” and “due to” planning and hierarchical analysis order. The empirical study also reveals the consequential attributes of the Indian streetscape with the social, cultural, economic, and behavioral values of Indian society. We juxtapose spatial attributes like city form, land use, density, and street location with social attributes like local economy, business transactions, and inequality. The underlying hypothesis is that the physical and social attributes are symbiotic and strongly influence each other. The narration is based on direct observation and mapping. Mapping the urban environment, visual exploration, and crowdsourcing are the critical methodological tools for this study.

The paper contains five sections. Following section 1, section 2 articulates literature reviews. The existing cases and relevant literature provide important attributes for learning and comparison. The literature also focused on the historical evolution of streets and many of their forgotten dimensions.

Section 3 introduces the study area and research methodology. We investigate Roorkee city, a small town in the Indian state of Uttarakhand. This section elucidates a relevant description of the city. This section also details the narrative methodology. It discusses data visualization, the relation between activity and outdoor spaces, and important determinants for studying the case area. This section concludes with a research analysis table that introduces a hierarchical analysis process and its deliverables to establish the Indian street diversity and contextual settings.

Section 4 presents analysis and findings from the narratives “in” and “due to” planning in the study area. We have collected data through primary surveys, research papers, reports, and documents. The data is both in the form of statistics and illustrations, analyzed and presented in this section. The study proposes a hierarchical approach to studying streets through narration and storytelling. It studies streets and their contextual settings from a city to a local perspective. The city contexts help to grasp the transit problems, effectively influencing the local street activities. We have achieved these objectives by carrying out a series of analyses that are interconnected with each other. Each analysis leads to the subsequent analysis and is grouped in three orders.

The final section summarizes this paper with concluding arguments and relevant discussions from the paper.

2. LITERATURE REVIEW

The city street is the stage where physical and cultural exchanges take place. It is access to homes, workplaces, and the passage to other places within and outside of the city (Werf, Zweerink , & Teeffelen, 2016). Streets are linear physical spaces that permit people and goods to get from here and there. It is more than public utilities, traffic conduits, and the equivalent of waterlines, sewers, and electric cables (Jacobs, 1993). A vital quality of an urban street is that it is central to the local life of an area, but it also links with other places and people. An urban street situates and connects, focusing on and extending the possibilities for contact between different people (Hall, 2010).

Traditionally, streets did not exist in cities before the 19th century. Habitation, work, and trade took place in the same building, and streets were meant to display merchandise in front of their homes. Zoning and land use planning brought separation of functions that streamlined new city areas and neighborhoods, which led to increased traffic (Werf, Zweerink , & Teeffelen, 2016). Gradually, the sidewalk was created to give pedestrians their place in the crowded streets. Further improvement in traffic safety was carried out by establishing various strategies like separating traffic flows, zebra crossings, traffic lights, and roundabouts. The division of streets gave away the cohesiveness of streets. One aspect of good and varied streets is to have compact concentrations of different functions(Karssenber & Laven, 2016).

Activity is crucial for a vibrant street, community, and city. Streets with accessible, transparent plinths enhance the possibilities of an active street. A transparent street is an open façade that attracts more people than streets (Muller, 2016). Streets facilitate an array of society's social, physical, and economic environments. One of the major criteria for determining a successful street is its activity level. However, a heightened activity level does not necessarily transform into better urban quality. It is also important to look at quality content, i.e., the wealth of experiences, and the delight of being in cities than only focusing on how many people walk, stop, sit and stand (Gehl, Kaefer , & Reigstad, 2016).

While urban planners may create potential environments, people create an effective environment. Determining human actions or behavior through design may give away human behavior. Gehl (1969) argues that urban design can manipulate the probabilities of certain human behavior by adapting necessary, optional, and social activities (Carmona, Heath, Oc, & Tiesdell, 2003). The basis of the argument is to create public places that are more socially active and reiterate difficulties in designing public places. One can hope that people will interact with and value a place's potential. Maslow (1968) identifies a five-stage hierarchy of basic human needs (Maslow, 1968). While the basic needs are physical, the complex needs are more psychological. Gehl (1987) distinguishes public activities into

A STORYTELLING PERSPECTIVE OF STREET DIVERSITIES IN INDIAN SMALL TOWNS: THE CASE OF ROORKEE, INDIA

necessary, optional, and social activities and argues that poor-quality urban spaces can only facilitate necessary activity (Gehl, 1987). The place potential of a public place is an important parameter for deciding on the hierarchy of needs and its associated activities. The following table combines the hierarchy of needs, its distinction, and relative activity to identify the present realization of needs by Roorkee city and its relative activity (Table 1).

TABLE 1 - HIERARCHY OF NEEDS AND ITS CORRESPONDING URBAN ACTIVITIES IN ROORKEE

Needs	Distinction of needs	Activity in Roorkee
Self-actualization	Aesthetic needs (sensory and intellectual), symbolism,	Optional activity
Esteem needs	Cognitive needs, learning, experience, enjoy,	Optional activity
Affiliation needs	Kinship, communal organization, formal organization, comfort, and barrier free environment	Optional activity
Safety and security needs	Physiological protection, protection from nature - machine and people,	Necessary activity
Physiological needs	Survival, health, networking	Necessary activity

Adapted from (Gehl, 1987; Lang, 1987)

After attaining an elementary level of psychological wisdom, realizing a higher order of “complex needs” like esteem needs and self-actualization among people arrive. These complex needs differ with the level of economic prosperity, knowledge, education, awareness, values, and morality. Basic physiological needs must be satisfied before moving to the higher-order needs (Lang, 1987). However, the choice to move higher up in the order is a collective choice of society. It can be attained at a mature level of development. The whole society or a significant part of the society collectively needs to change its perspective to move up in order. It is debatable whether good quality public space can move society to realize higher-order needs. A successful street requires both these quantitative and qualitative considerations.

Urban planners need to understand and comprehend the extent of a society’s preferences and create place potential. There is also a need to visualize streets that adapt to the future development of social norms, values, and behavior. Creating streets’ place potential also depends on the duration of human activities and financial capacity. The streets of developing cities, including Indian cities, are known for their density and conflicts between pedestrian and vehicular traffic. Cities in the industrialized West have experienced similar phenomena in the past. The magnitude and intensity might be different. Nevertheless, many cities successfully resolve conflicts between motorized traffic and pedestrian through multipronged strategies. European cities like Amsterdam, Barcelona, and Copenhagen are the most pertinent examples

of cities that retrieved their urban life from the chaos of traffic and car invasion. The case of Barcelona provides many lessons in successful street design and planning.

Ildefons Cerdà planned Barcelona's city extension project. The plan followed the hygienist concepts of the 19th century, which was based on an orthogonal grid of streets that served as mixed-use blocks. He also envisaged large public spaces with free domestic spaces, unlike today's blocks (Commission for Ecology, Urban Planning and Mobility, 2016). The grid dimension for the city extension plan was 113.3 mt by 113.3 mt, with three varied streets width ranging from 20 mt, 30 mt, and 60 mt. The smaller grid provided ample flexibility for future modifications. The city plan went through many modifications in due course of time. In the process, many streets of Barcelona became automobile-dependent during the latter half of the 20th century. Parking and passages for vehicular movement replaced the space allocated for pedestrian use. Gradually, the situation worsened with increasing pollution and congestion. Barcelona residents could not use the streets originally designed for community activities (Valerio, 2016). The Barcelona government envisaged reclaiming most of the streets for the community without reducing traffic flow. The idea was to enhance the quality of life of its people by reorganizing pedestrian and vehicular movement and improving the public open spaces. The superblock model was considered to restructure the city by reversing the distribution of space allocated for vehicles and people (Figure 1).

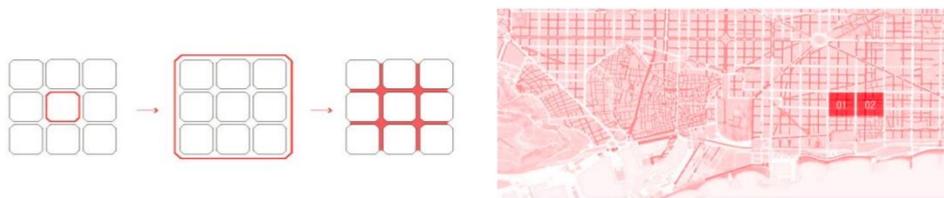


FIGURE 1 - BLOCKS TO NEW SUPERBLOCK AND PEDESTRIANIZED INTERIOR STREETS (SOURCE: SPERANZA, KEISLER AND MAI 2015)

3. METHODOLOGY

3.1. Study area

Cities are hubs for exchanging goods, culture, knowledge, and ideas, yet small cities outside the large metropolitan regions' influence zones experience unique situations of differentiated consumerism and individual libertarianism' that ignore small towns' needs, challenges, and opportunities (Scrase, Rutten, Ganguly, & Brown, 2015). Small towns, largely homogenous, focus on agro-processing, mercantile activities, government-supported co-operatives, and small industries and services to support their population. Most Indian small towns proliferating today are built around "nodes" established during the colonial period (Heitzman, 2008). We have shortlisted Roorkee, located on the erstwhile colonial route

A STORYTELLING PERSPECTIVE OF STREET DIVERSITIES IN INDIAN SMALL TOWNS: THE CASE OF ROORKEE, INDIA

between Delhi and the Himalayan towns in Uttarakhand. The population of Roorkee, categorized as a Class I town, is 118,200 (Census 2011, 2011). The area and density are 8.11 km² and 14, 575 persons per km² respectively. The city's literacy rate is 89.48%, higher than the national literacy rate.

Nevertheless, 34.77% of the city's total population lives in slums and squatter settlements. Some people have the substantial financial capacity and spending power, while most find it difficult to survive. This socioeconomic inequality is also reflected in the quality of the built environment and the spatial distribution of communities (Seta, Sen, Biswas, & Khare, 2017). The study area, popularly known as the old city of Roorkee, is one such example. The area is adjacent to the Ganga canal and connected by over bridges with the other side of the canal (Figures 2 & 3).

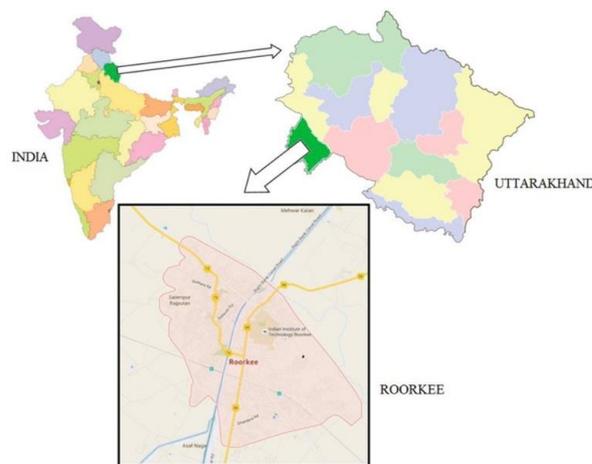


FIGURE 2 - LOCATION OF ROORKEE CITY (SOURCE: ALAM AND KULKARNI 2016)

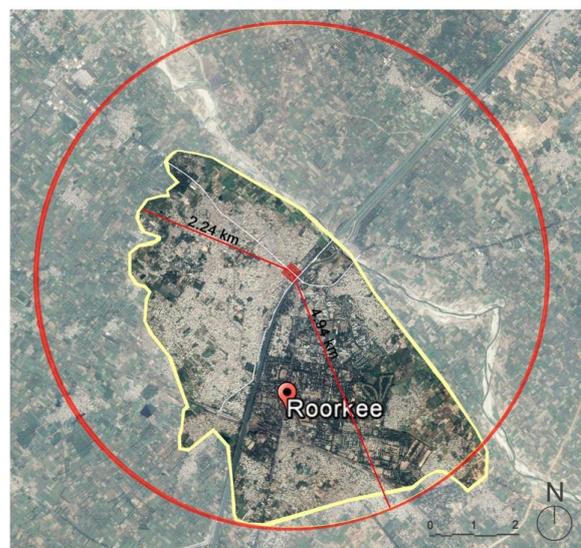


FIGURE 3 - LOCATION OF THE STUDY AREA (OLD CITY AREA) WITH REFERENCE TO THE ROORKEE CITY REGION

Roorkee city has an unusually high automobile dependency. In the absence of an organized transportation network, informal transit like auto-rickshaws and battery-operated rickshaws are widespread. Walking and bicycling, prevalent in many Asian cities, are not the preferred mode of transit. The reasons might be poor and unsafe road conditions, harsh climate, uneven terrain, and uncomfortable modal shifts. Urban structure and urban economics also affect such a development pattern. Affluence may not be the only reason for automobile dependency. The study suggests that the most auto-dependent cities are less wealthy than other more transit-oriented cities. They have the worst operating cost recovery in the transit (Kenworthy & Laube, 1999). In Roorkee, 68,063 vehicles were registered between 2007 and 2017. Almost 80% of these registered vehicles are two-wheelers. In addition to automobile dependency, intermixing of heterogeneous traffic, lack of lane discipline, parking chaos, and uncomfortable street experiences create many traffic problems (Mittal & Biswas, 2019). The automobile is also considered the primary reason for traffic congestion, air pollution, social segregation, and decreasing quality of life (Shariff, 2012). Rampant development, segregated land use, and urban sprawl also increase the number and length of trips, which results in more automobile trips (Biswas, Mittal, & Padmakar, 2019).

3.2. Study methods

Cities are complex and interrelated systems that generate complicated and heterogeneous data (Berta Cormenzana, et al., 2014). We have often used intuitive strategies like counting, mapping, tracing, tracking, and photographing to collect these heterogeneous data on-site. Shortlisting data among the numerous data generated by the users and their interaction with streets are crucial for this research. Gehl and Svarre (2013) have listed counting, mapping, tracking, and other tools for studying cities (Gehl & Svarre, 2013). Finding an appropriate way to document the interaction between physical and virtual characters requires off-site observation and repeated on-site visualization of these characteristics (Speranza, Keisler, & Mai, 2015). Narration through data visualizations is time-consuming, particularly when we try to find new ways to visualize things around us. The narrative presents its story by investigating the usage of streets and their relationship with the urban commons in Indian cities. In order to achieve our main goal, we have identified determinants and relationships among these determinants. These determinants are adopted from the dimensional studies on an urban design by Carmona, et al (Carmona, Heath, Oc, & Tiesdell, 2003). The determinants are grouped into three divisions: “physical space”, “social space”, and “streets” (Figure 4).

A STORYTELLING PERSPECTIVE OF STREET DIVERSITIES IN INDIAN SMALL TOWNS: THE CASE OF ROORKEE, INDIA

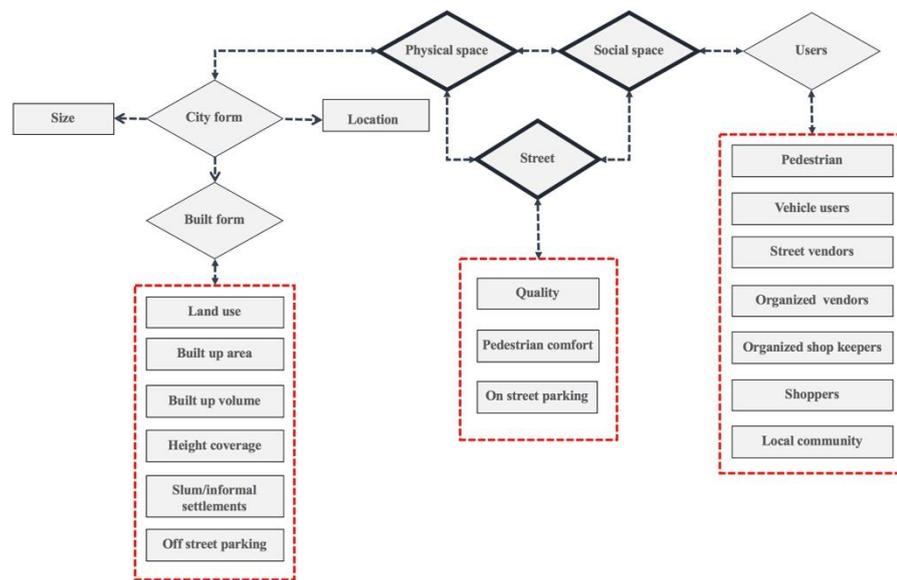


FIGURE 4 - DETERMINANTS USED FOR THIS STUDY

We assume “physical space” as a city form in an urban structure. It has three components – built-form, city size, and location. While city size and location relate to the macro-level dynamics of a city region, built form relates to a street’s micro-level dynamics. The study of built form is crucial because it focuses on studying streets at the micro-level. We have identified six variables under the built-form component – land use, built-up area, built-up volume, height coverage, slum and informal settlements, and off-street parking.

Studying street consists of three variables – quality, pedestrian comfort, and on-street parking facility. We have studied the “social space” of streets from the perspective of its users. We have identified seven users of local streets – pedestrians, vehicle users, street vendors, organized vendors, organized shopkeepers, shoppers, and the local community. We have observed many users who use the streets as a thoroughfare during their travel rather than use it explicitly for some specific purposes. After determining the relationship between the determinants and variables, the research team surveyed the old city. A “research analysis map” is prepared to inform the analysis tools and techniques and the interconnection between the determinants and their verifiable indicators (Table 2).

The study undertakes three analysis orders that follow their spatial hierarchy from the city region to the street. Each analysis order is placed with its verifiable indicators and data sources. Verifiable indicators refer to the analysis tools that are used for the analysis purpose. Each analysis order has a specific objective and leads to the following analysis order. “Analysis order I” provides a contextual understanding of the old city’s transit network and transportation behavior. It provides valuable insights into the existing transport system, including transit mode, transit route, modal split, and traffic behavior of the old city.

“Analysis order II” focuses on micro issues such as the interaction between land use patterns, urban morphology, and 3D built form with the streets. Lastly, we have studied the main shopping street and evaluated the interaction between the street and formal and informal activities. “Analysis order III” studies street diversity and its relationship with street users in detail.

TABLE 2 - RESEARCH ANALYSIS MAP OF THE STUDY

Analysis order	Spatial scale of analysis	Verifiable indicators	Means of verification/Data source
I	Spatial context of the old city within the Roorkee city region	Spatial mapping; Spatial networking;	Location map in city; Road network and land cover map of Roorkee city region;
II	Analysis of street and it's adjacent neighborhood's physical context, and neighborhood's relational proximity	Land use and morphology analysis; Built-up area and (built-up) volume analysis; Photographic analysis; Off-street and on-street parking analysis;	Mapping from on field survey; Morphology and 3D built-form; Photography;
III	Street diversity and its relation with street users	Congestion, mobility and accessibility analysis; Network analysis between on street people;	People tracking, footfall and behavior mapping; On site survey of congestion and footfall;

4. ANALYSIS & FINDINGS

The streets of the old city of Roorkee attract most of the city's vehicular and pedestrian trips. As a result, the old city's streets are always bustling with various vehicles and pedestrians. It serves as the commercial and wholesale trade hub of the city. The business timing spans from morning to evening and remains open throughout the day. During the peak hours (9 AM to 11 AM and 5 PM to 8 PM), the streets are filled with pedestrians, bicyclists, two-wheelers, and auto-rickshaws (Figure 5).



FIGURE 5 - A STREET IN THE OLD CITY OF ROORKEE SHOWING THE EXTENT OF VEHICULAR TRAFFIC

Traffic regulation and orderly traffic movement have led to intense competition among individuals to move ahead early. Traffic maneuvering in these narrow lanes is managed through mutual coordination, hand gesture, and eye contact. One must be in the crowd and maneuver it by hand gestures, eye contact, and predicting others' movement direction and speed. Interestingly, Joseph (2017) claims that this disorder comforts people in experiencing the street's social hierarchy (Joseph, 2017). Given an option, people may prefer to move to a calm street instead risking their life. At present, people cannot imagine the possibilities of a calm street in the old city that may facilitate easy and safe movement. The analysis below further reveals the issues of streets in small towns.

4.1. Analysis order I

It explores the regional setting of the old city. It functions as the center of the wholesale and retail market of Roorkee city. Recently, many isolated shopping arcades and retail outlets have developed along the main arterial roads and highways, bypassing the city. Still, the old city market attracts the city people with its variety of products and cheaper cost. We have considered approximately 24.9 acres of the old city market area for this study. The study area is delineated in the figure below (Figure 6). The delineated part of the old city market is very congested by shoppers, pedestrians, and vehicular traffic.

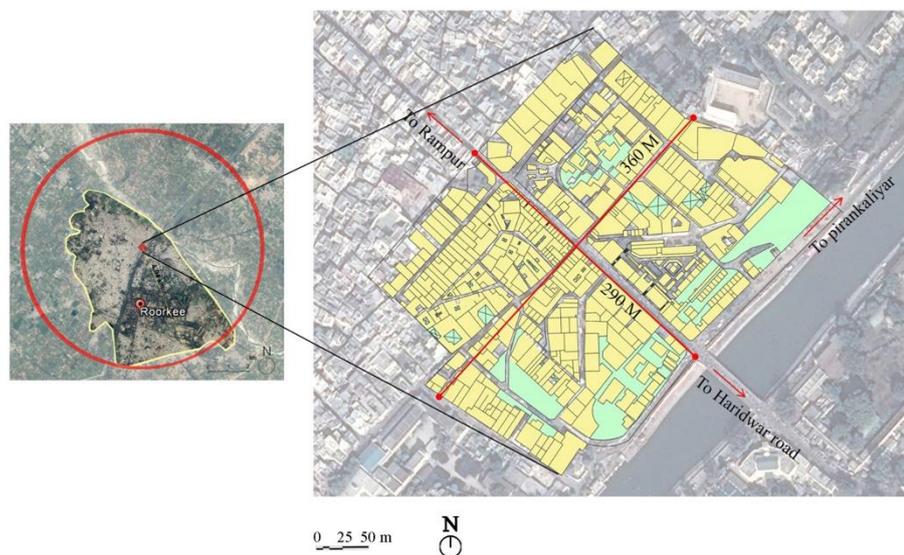


FIGURE 6 - LOCATION OF THE STUDY AREA

Most travelers use two-wheelers for traveling to the old city market. The traffic congestion worsens during the morning and evening peak hours. The traffic authority vehemently restricts vehicular movement during peak hours and yet achieves limited success in facilitating mobility along the main street corridors (Figure 7).

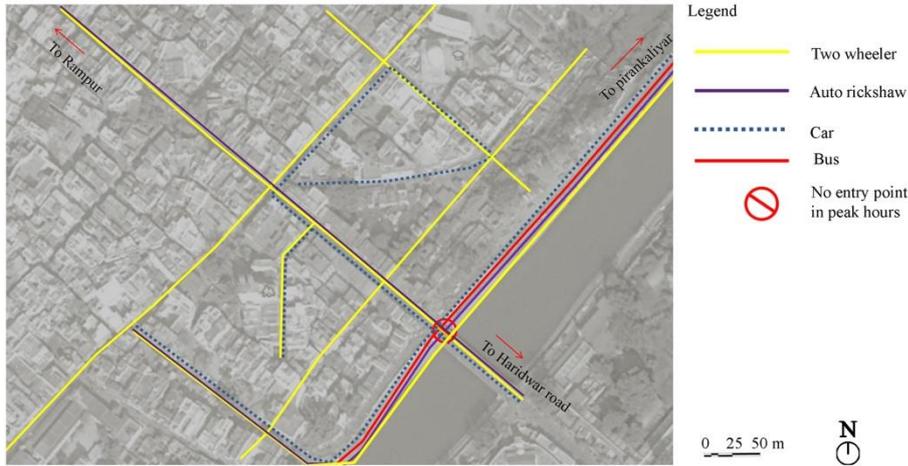


FIGURE 7 - LOCATION OF THE OLD CITY MARKET AND ITS TRAFFIC ROUTES

The market's central location within the city region also influences many people to use the old city streets as a thoroughfare. We have carried out a traffic count survey at three locations on the primary road to know the traffic volume and its combination. The survey is carried out during the evening peak hour on a weekday, and the results are presented in Figure 8. We denoted three locations: points A, B, and C. Point A is along the canal and connects the street to Haridwar road, whereas point C is the last surveyed point towards Rampur Road. Point B is taken as an intermediate between the two extreme points (Figure 8).

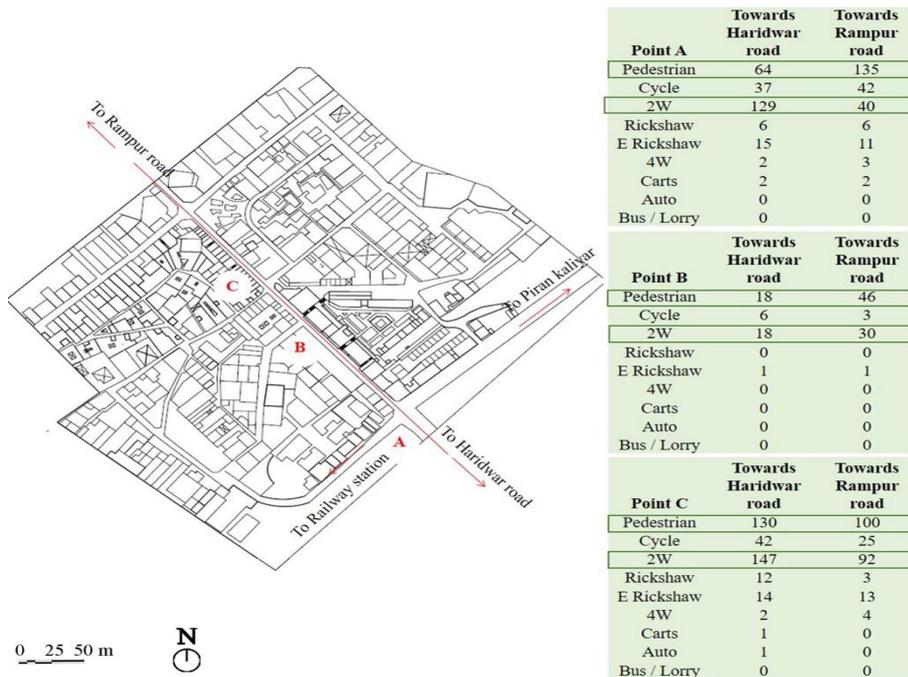


FIGURE 8 - TRAFFIC COUNT CALCULATION

A STORYTELLING PERSPECTIVE OF STREET DIVERSITIES IN INDIAN SMALL TOWNS: THE CASE OF
ROORKEE, INDIA

The study shows that most rickshaw and e-rickshaw trips conclude at the old market street between points A and B, restart between points B and C, and travel in both directions. So, all these rickshaw and e-rickshaw must be using parking space between point A and C. Two-wheelers traveling towards Rampur road is mostly thorough traffic. The old city market attracts much of the traffic generated in the much wider city region. Appropriate alternative traffic routes and judicious traffic planning may reduce much of this unnecessary congestion. It creates added pressure on commercial or retail trade locations and original residents of the old city market. It also negatively influences the street character and hinders the productive use of such streets.

Rickshaws and e-rickshaws park on the streets due to the non-availability of organized parking. Their idle time does not stretch for long due to plentiful returning passengers. The organized, on-street, and unauthorized parking locations are surveyed and delineated in Figure 9. On-street parking on the shopping street primarily consists of rickshaws, e-rickshaws, autos, and two-wheelers. The residents, shopkeepers, and business personnel mostly occupy off-street organized parking.

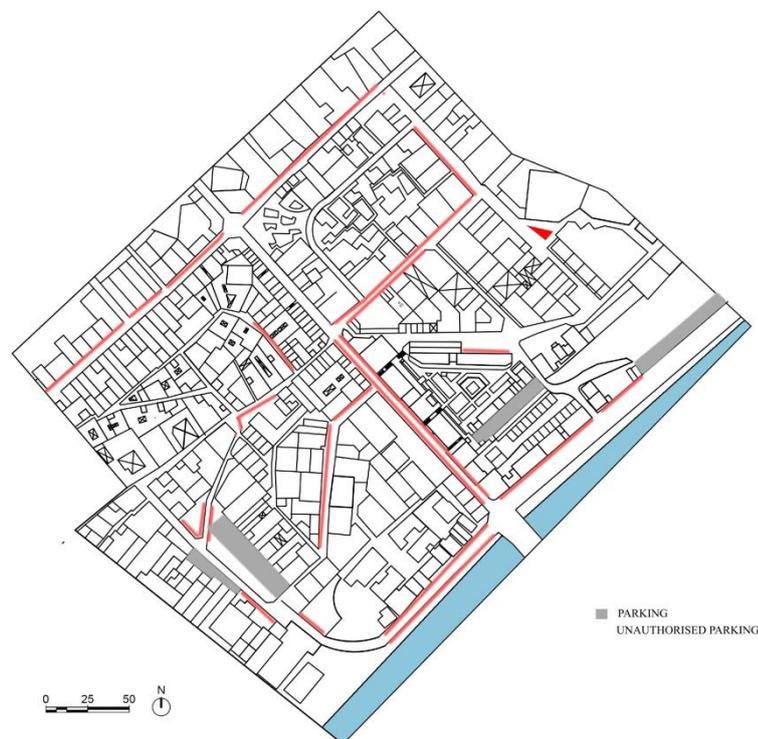


FIGURE 9 - OFF-STREET ORGANIZED AND ON-STREET UNAUTHORIZED PARKING LOCATION

A study of the land use, built-form, density, and morphology will further exemplify the relation between traffic congestion and built-form.

4.2. Analysis order II

We have surveyed the study area and documented its present land use distribution (Table 3). Land use is an important attribute, but it is equally important to understand the contextualities between land use, density, and street.

TABLE 3 - LAND USE TYPES AND ITS PERCENTAGES

Land use typology	Land use (absolute) (in sq.-mt.)	Land use (%)
Residential	32,638	32.4
Commercial	22,992	22.8
Mixed land use	10,594	10.5
Open space	11,044	11.0
Religious	2,110	2.1
Streets	21,356	21.2
Total	100,734	100.0

We have found that commercial land use is more prevalent on the main streets, whereas residential and mixed land uses are more widespread along the minor streets and inner core (Figure 10).

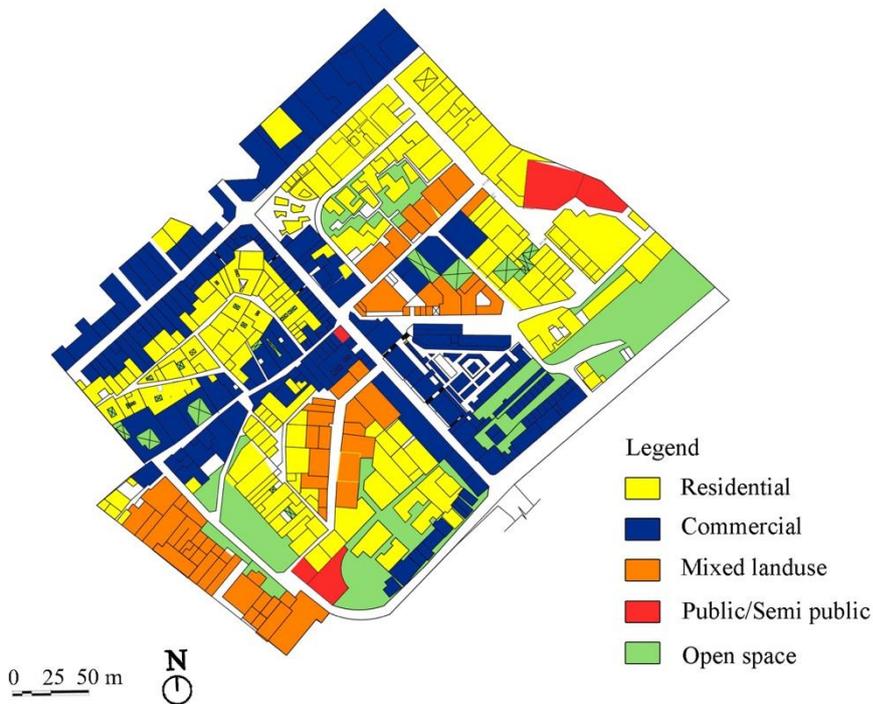


FIGURE X: LAND USE MAP OF THE STUDY AREA

In the volumetric and morphology mappings, we have found that the average building height is not more than two floors, whereas the percentage of open spaces excluding the streets is only 11 percent. There must be some spatial and economic explanation for this occurrence (Figures 11 & 12).

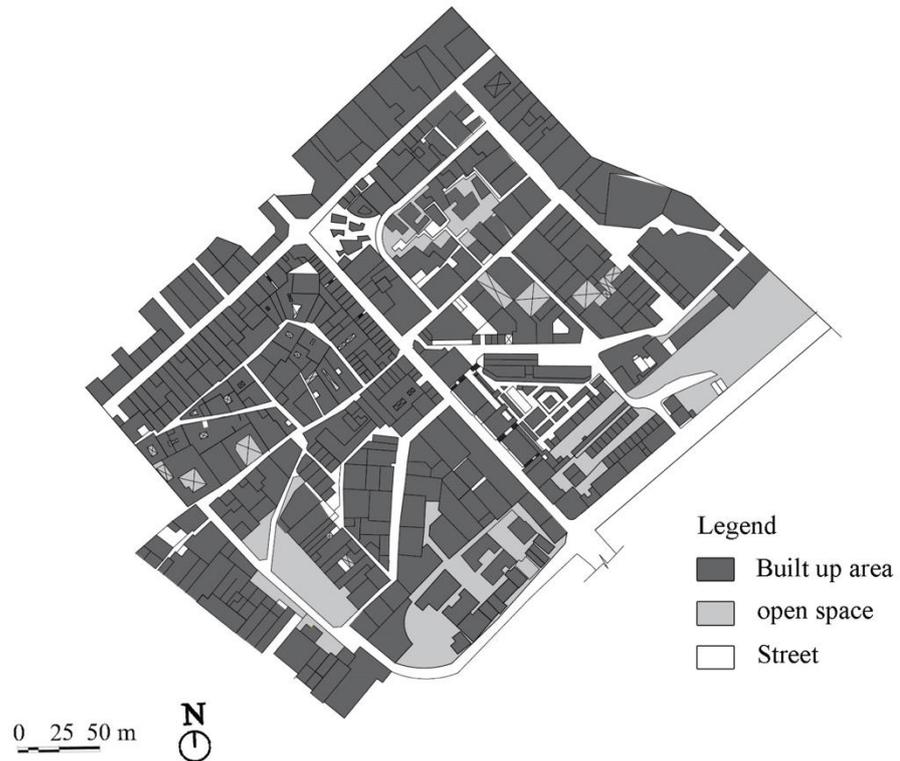


FIGURE 11 - FIGURE-GROUND MAP OF THE STUDY AREA

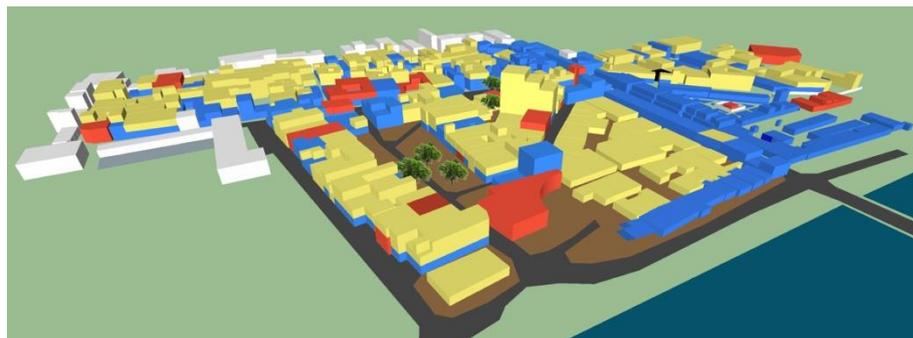


FIGURE 12 - VOLUMETRIC MAPPING OF THE STUDY AREA

After going through the surveyed areas and listening to the narration of the local communities, we noted that the owners of the retail and commercial outlets on the shopping streets aim to maximize visibility and contact with travelers and potential buyers (Figure 13). All shops and commercial establishments are open, transparent, and welcoming. These shops use the front porch as an extension of the formal outlet. These extensions are unauthorized and hinder pedestrian movements. However, shop owners escape from any action due to lapses by the local administration. Street vendors also locate themselves along the shop entrance to enhance their visibility. Informal activities are crucial in commercial districts of small towns. The upper floors of the shopping street are used for warehousing and storage of front shops. We

realize that the reasons for such instances are visual and physical inaccessibility to the upper floors by travelers and buyers. We have also found some unsuccessful efforts of modern shopping malls gentrified inside the commercial district.



FIGURE 13 -PHYSICAL AND VISUAL CONNECTION BETWEEN SHOP FACADES

Rent also varies between the ground floors and upper floors, but a comparatively lower rent on the upper floors does not create much demand for such spaces. As a result, the usage pattern of the upper floors did not alter much over the years. Alonso (1964) is one of the first to theorize the modern approach to urban land use by considering city transport, land use, and population issues in a mono-centric city model (Alonso, 1964). Outbidding existing users can also happen if negative externalities like congestion, noise pollution, safety, and security reduce, or a higher yield of business and economic activities materializes. Such a condition requires a tertiary-sector dependent working class or an industrial base that may use these spaces for work or living. However, the agglomeration of such services or creative classes like artists, designers, and entrepreneurs within a small town like Roorkee is insignificant.

Therefore, the commercial district does not find any incentive to change its usage or increase density. As we proceeded inside the communities from the main shopping streets, we observed a horizontal and layered expansion of land and building usages. The front layer, which directly faces the main street, has commercial and retail activities. It gradually changes into mixed use with warehouse and residence, which further changes into residential usage only. The location of land and building use further explain the economic tradeoff between price and accessibility. Further, we have investigated the primary street of the commercial district based on its contextual settings and ability to foster a socio-economic relationship with the commercial district.

4.3. Analysis order III

The physical condition of the road is poor, with many potholes and uneven road surfaces. It does not have any demarcated space for pedestrians or bicycles. Street amenities like toilets, drinking water, street furniture, litterbin etc. are not available within the proximity of the main street. We started this analysis by counting footfall and transit modes (Figure 14). We surveyed between 3:30 to 4:00 PM on a weekday using photography and videography.

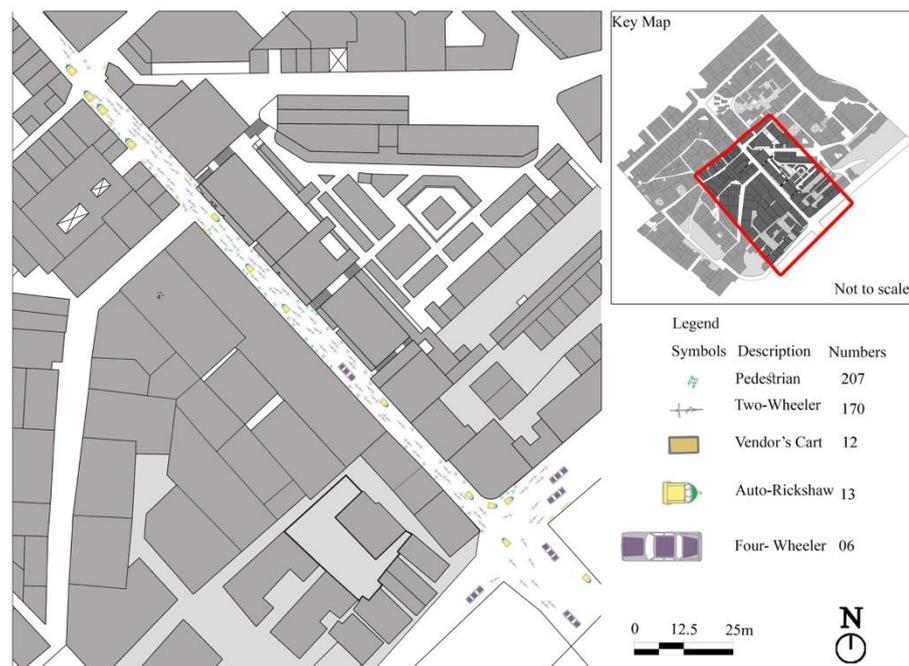


FIGURE 14 FOOTFALL AND TRANSIT COUNT OF THE IDENTIFIED SHOPPING STREET

We observed that the ratio between pedestrians and vehicles, particularly two-wheelers, is approximately 1:1, and almost 85 percent of these vehicles are two-wheelers. The street experiences extreme conflict between pedestrians and vehicular traffic. Walking on this street is very unpleasant and uncomfortable, particularly during peak hours. Pedestrians must always be vigilant against any possible collision with fast-moving vehicles. Excessive honking is common among the vehicles maneuvering through this street. Even though the street is of inferior quality, it produces a niche of human activities in the organized and unorganized categories. The organized street activity and its relationship with people are elaborated in analysis order II, but unorganized activities are highly significant for Indian streets. The predominance of the unorganized sector depends on many attributes – the presence of unskilled labor within a society that has minimal law and order is one of them. In some instances, people's interface with unorganized activities surpasses organized activities. People spend more time carrying out business transactions with

street vendors than with established shops. The study records this diversity of Roorkee's streets with further analysis (Figures 15 & 16).



FIGURE 15 - NORTH-EAST ELEVATION OF THE SHOPPING STREET



FIGURE 16 - SOUTH-WEST ELEVATION OF THE SHOPPING STREET

North-East and South-West elevation of the shopping street portrays the organized commercial establishments, unorganized activity, passenger travel, and business transactions. We found unauthorized on-street parking, mainly two-wheelers, in front of the business establishments. Most people park their vehicles on-street and indulge in shopping activities. We also learned from the shop owners that the number of on-street parking remains constant throughout the day. The street vendors strategically position their moving stalls between parking or in front of busy shops. The strategic location of parking and movement of traffic thoroughfare within the shopping street are the major hindrances for people to interact and experience the vibrancy of this shopping street. Despite these limitations, people all over the city visit the old city market and indulge in shopping activities.

The narrative approach helps to grasp the unique diversity of Indian streets of small and medium towns and visualize the issues in a systematic order. The visualization outcome also helps to comprehend the problems from diverse perspectives. Integrating the unique features and patterns of economic transactions of small and medium towns are important considerations before any realistic strategic intervention to achieve a safe, inclusive, and pleasant street environment.

5. CONCLUSIONS

The paper narrates the diversity of Indian streets in a small town and its integral relationship with the urban fabric. The research presents empirical evidence from Roorkee city and highlights the vibrancy and diversity of small Indian city streets as poignant elements. The paper refers to relevant literature and case studies for establishing the argument and forming a research methodology. The analysis comprises three

orders, analyzing the street and its relationship with the urban fabric from the city to the local setting. The first analysis order reveals the locational weaknesses of the old city market that functions as the hub of wholesale and retail businesses of the city. The centralized location of the market within the city compels it to be used as a thoroughfare, largely enhancing its traffic volume within it. The study also reveals that most rickshaw and e-rickshaw trips end and restart within the market, specifically between points A and B. The absence of public transportation, extreme congestion, haphazard parking, and excessive use of two-wheelers are some of the stumbling issues hindering the old city market's street environment. Biswas (2019) argues that many cities in India showcase similar issues due to the absence of systematic urban planning efforts (Biswas, 2019). Small and medium towns in India do not possess the institutional capacity and financial abilities to prepare and implement urban planning projects or local strategies to respond to these haphazard growths. A combination of local strategies e.g., comfortable pedestrian corridors, multiple parking locations, segregation of passenger and goods vehicles, with city-wide strategies e.g., alternative mobility options between origins and destination, and implementation of transport regulations should facilitate an improved street environment.

The second analysis order analyzes the relationship between the street and the built form. The study finds a predominance of commercial land use along the main streets, and residential and mixed land uses along the minor streets. The area is densely built with an average building height of two floors. The percentage of open spaces excluding streets is only 11 percent. To attract customers, shops are open, transparent, and welcoming on the ground floor and primarily packed with storage and warehousing on the upper floor. Street vendors are an integral part of the old city market's urban fabric. They are extremely mobile, shifting their vending cars from place to place, allowing greater visibility and accessibility. The growth of the shopping district is incremental with the slow and gradual extension of the shops, sometimes illegally encroaching streets. Renewal of the shopping district with modern shopping arcades has been found to be an unsuccessful effort till now. Without a vibrant tertiary sector, it might be difficult for a small town like Roorkee to promote such urban rejuvenation attempts.

The third analysis order analyzes the market street and reveals pedestrian behavior, hawkers' positions, the conflict between pedestrian and vehicular movements, on-street parking, and the shopping pattern. The research finds excessive use of two-wheelers in the old city market. The conflict between pedestrians and vehicles, coupled with the bad road conditions, make the streets very unpleasant to walk. Small and medium towns need novel approaches considering the city's character and its economic functioning to safeguard street diversity and yet achieve order in street mobility. The urban economy of small and medium towns is largely dependent on informal and partially formal sectors. Street vending and on-street

commercial activities are such vibrant street characters that need to be integrated to achieve inclusive, efficient, and diversified streets.

The study reveals the vibrant use of the old city market streets even though the streets are of inferior quality and produce an extremely uncomfortable experience. People use the streets to perform necessary activities like travel and shopping. However, optional activities like enjoying street life, social networking, and kinship are missing from Indian street life. The necessary activities remain timid due to improper visualization of physical strategy, excessive congestion, and conflict between pedestrians and vehicles. We may further infer that this ailment may be reversed with appropriate design, regulation, and policy interventions. Habitat III has identified urban planning and design as one of the major challenges for sustainable urbanization. A systematic weakening of urban planning has resulted in such a situation. It is incorrect to expect that the market will efficiently allocate the resources and that we will have enough public space (Rajagopal, 2017). The study also exhibits unique diversity and mutual compatibility of formal and informal activities on Indian streets. Appropriate intervention may nurture it further. The consequential attributes of the Indian streetscape with social, cultural, economic, and behavioral values of Indian society were very prominent during the study.

The research contributes to the emerging arguments of achieving place potential and adaptive streets facilitating social-cultural-economic-behavioral values of Indian society. Before preparing city development plans, urban planners and designers are often unaware of such networking operating in Indian cities. The research will benefit the global and Indian readers to comprehend the urban streetscape of a densely populated small town through “in” and “due to” narration and hierarchical analysis order. The research is limited to the streets of a small town in a developing country and the findings can be referred to in similar empirical studies from developing countries. Big cities and cities of developed countries exhibit different patterns of street activities and should not be compared together. Further, the interpretation and narratives put forward in this paper are limited to the field survey data and inferences from them. Future research may focus on studying the street diversity of different classes and sizes of cities in India and other relevant developing countries. A collation of empirical studies on street activities from different city typologies will provide the relevant knowledge and bottom-up understanding of streets, allowing greater interventions with planning strategies in developing countries.

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