

Original Article

# Mapping the Urban Experience: Understanding Residents' Perceptions of the Streets of Delhi

Asmi Agarwal

*The British School, Dr Jose P Rizal Marg, Chanakyapuri, New Delhi, India.*

Corresponding Author : [asmi.agarwal@british-school.org](mailto:asmi.agarwal@british-school.org)

Received: 11 June 2024

Revised: 26 July 2024

Accepted: 14 August 2024

Published: 30 August 2024

**Abstract** - Streets form a vital component of an urban space, serving social, political, economic, cultural, and overall circulatory functions. Being the arteries of public spaces, streets are also laden with the precondition of being accessible, providing equal functionality and ingress regardless of individual or collective socioeconomic locations. A suppositious paradigm of urban streets would fulfil these and all other requisites attached to the well-being of residents occupying them; whether these aspects have been incorporated or sufficiently observed in a built environment often remains ambiguous. The divergence between the ideal model of a streetscape and the reality observed by urban dwellers can often be discerned through a phenomenological approach. This paper examines the perceptions of Delhi residents regarding the streetscape of the region. This study uses a concept mapping methodology to examine user experience by analysing several criteria, such as the perceptions and semantic associations of inhabitants. A snowball sampling strategy was employed to identify a diverse group of respondents from 4 different districts with variations across gender, age, educational background, and occupation. They were then presented with a qualitative survey to collect empirical data. Through the analysis of residents' knowledge structures, it becomes evident that residents of different districts have varying levels of accessibility. Although demographics can influence particular contentions, such as a gendered understanding of public space, we nonetheless observed concerns and perceptions which transcend such divisions. Examining these perspectives can foster a greater sensitivity to the requirements of urban planning, street design, and the habitability of Delhi's built environment.

**Keywords** - Delhi, Urban design, Streetscape, Concept mapping, Phenomenology.

## 1. Introduction

Streets form the heart of urban spaces and perform not only the circulatory function of mobility but historically have also acted as avenues for economic, social and cultural activity [1]. While often dismissed as serving only a perambulatory function, the quality of street space forms an integral part of the calibre of an urban environment. It can have a profound impact on residents' mental and physical health [2].

Streets have been epicentres of human activity—patchworks of green spaces, benches, hawker stalls, and markets. However, with the rapid increases in population and private automobile use, they have slowly transitioned into conduits for vehicular movement [3]. As streets form a vital component of public spaces, this shift in their purpose likewise affects the vitality and liveability of these areas and highlights the inherent correlation between street architecture and the mental wellbeing of its occupants [4]. As such, residents' perceptions of the streets should be considered in their design and construction to further a greater sensitivity to the requirements of human occupation in the planning of urban networks—a consideration which becomes increasingly relevant today [5].

Human-centred design pertaining to streets serves the purpose of promoting wellbeing in the form of healthy travel and other aspects of user experience, strongly influencing the quality of life in an urban setting [6]. Previous research has shown the potential of street quality to influence activity levels [7] as well as aesthetic perceptions of a region and the stress levels of its inhabitants [8]. These considerations are vital in further urban planning and construction, yet the variegated demographic and geographical divides in Delhi present divaricated perspectives on present circumstances and potential solutions.

Spanning 1483 square kilometres and 11 districts, Delhi is an agglomeration of areas with distinct characters and atmospheres [9], all of which, therefore, constitute different environments. A truly representative sample should, therefore, include residents who are geographically dispersed throughout the territory, possessing myriad perceptions of Delhi's streets and architecture.

Investigating these perceptions can provide empirical data revealing features and paucity that may solely be evident to inhabitants, filling knowledge gaps which may otherwise have deterred effective street design.



The functions of streets, social, cultural, economic, and otherwise, have been subject to extensive study over the years [10, 11, 12, 13]. In addition, streets in developing nations such as India are often subject to a great degree of economic and technical discourse in comparison to their counterparts in developed nations, being in the process of construction mobilisation [14]. As such, the centrality of the study of street design in a rapidly changing country such as India has become evident, and the advancement of humanist design plays a vital role in this progression. Yet, limited attempts have been made to understand residents' discernments of public streets, hindering progress in the development of a human-centric understanding of urban spaces [15].

There have been some efforts to study the social fabric of the Indian streets—Deore and Lathia (2018) investigated the role of street vendors in public spaces in Ahmedabad through spatial analysis [16], Tandon and Sehgal (2017) evaluated Mathura's streets architecturally in terms of religious influences [17], and Jain (1991) assessed the Indian streetscape from a metaphorical standpoint [18]. These scholarly endeavours have provided insight into the streets of India as built environments in terms of several different parameters, forming a more comprehensive view of our urban networks.

However, there persists a lack of consideration of the convictions of the inhabitants of space in the process of its construction. The consideration of community perception is equivalent to participation, as understanding the dynamics between users and the environment is essential to sustainable management [19]. Previous studies have utilised quantitative procedures such as street view analysis software, correlational research, and parametric analysis to evaluate urban streets from an objective lens. However, a human-centric approach is essential to discover and address resident experience a method that has not yet been sufficiently employed [20].

This study aims to address this research gap through a primary survey conducted in the national capital territory of Delhi, using concept mapping, semantic analysis, and a phenomenological perspective to understand cognitive structures that bear the potential of fostering greater human involvement in street design. This method underscores a humanist, community-based approach, aiming to shed light on the underrepresented relationship between Delhi residents and their environment. Furthermore, the study seeks to recognise shortcomings as well as areas of conservation to be considered in further urban planning.

## **2. The Historical Evolution of the Streetscape of Delhi**

The temporal reformation of the Indian streetscape can be evidenced by the changing fabric of the National Capital Territory of Delhi. In the 17th century, Delhi (then known as Shahjahanabad) became the permanent seat of the Mughal

Empire and a focal point for habitation and development [21]. According to the writings of Bernier at the time, the walled city was “built at different periods by individuals who paid no regard to symmetry.” Nonetheless, it was a capital of strategic importance because of its location between the North Indian Gangetic Plains and the paths to West and Central Asia [22]. Delhi also formed a centre of civilisation and culture in the sub-continent, presenting a model of pre-colonial urbanism [23].

Water, at the time, factored significantly in residents' perceptions of the city: the water bodies coursing through the main streets of Delhi became an integral facet of the city's urbanity. They reinforced Mughal conventions of civilised spaces [24]. Water was also perceived as a religious medium, a symbol of divine nourishment and providence [25]. As such, reservoirs became prominent centres of religious and secular activity, often supplemented by gardens and features of landscaping to form interactive spaces of built and natural environments [26]. Thus, the streets of Delhi in the 17th and 18th centuries reflected an integration of social life, urbanity, and natural spaces, cultivated to further perceptions of edification and prosperity under the Mughal rule.

In 1803, the British formally assumed control of the city, resulting in radical shifts in Delhi's built environment. The focus of street development in Delhi and other major Indian cities remained largely on the installation of new technologies, such as the creation of networks for the provision of utilities and sewerage works [27]. The advent of hydraulic and technological projects stemmed from a predominantly economic interest, with the supply of water acquiring a mercenary role [28]. Mills, canals, and agricultural apparatuses were set up throughout Delhi in order to maximise the potential for revenue production in the city. Consequently, the consideration of residents' welfare and the effectiveness of urban planning was limited, effectuating a myriad of environmental disasters and impoverishment of rural areas surrounding the city [26].

The colonial cityscape became exogenous to residents' lives, inciting a shift in the population's perceptions of their city. Rather than a living entity, Delhi became a mechanical structure separate from the people and the natural environment [26]. This eventually formed the base for the development of the modern union territory of Delhi.

In the 21st century, Delhi grapples with years of haphazard planning and diminished interactions between the social, environmental, and architectural elements of the region [31]. The practices associated with traditional public spaces have been displaced by urbanisation and rampant overpopulation [32]. Emulating the streetscape of many other rapidly modernised environments, the focus of transportation engineering has largely been towards vehicles rather than pedestrians or social activity, hindering human-centred design

[33]. The reinstatement of humanised urban spaces necessitates a renewed understanding of residents' perceptions of Delhi streets and a composite cognizance of the face of Delhi's streets in the contemporary era.

### 3. Concept Mapping and Semantic Analysis

Perception can be defined as the selective and subjective processing of information [34]. With the aim of attaining a deeper understanding of Delhi residents' perceptions of streets in accordance with the principle of human-centred design, this study is designed to elicit and evaluate these perceptions in terms of specific parameters and to further categorise them as positive or negative homeostasis. These distinctions can be assessed through semantic networks, which reflect an individual's reflexive reasoning and knowledge [35].

Semantic networks are composed of modules of information, or nodes, and the links between them, with the links determining the types of associations between ideas [36]. Through the analysis of these structures, an individual's perceptions about a given concept can be discerned, with different semantic associations constituting a disparate strength and nature of perception.

In this study, the associative elicitation technique was used to prompt responses based on a provided stimulus, evoking spontaneous but specific reactions which could be examined through semantic analysis [37]. While there are several approaches to associative elicitation, for the purpose of this study, concept mapping as an approach was perceived to be most suitable.

“Concept mapping is a structured process, focused on a topic or construct of interest, involving input from multiple participants, that produces an interpretable pictorial view of their ideas and concepts and how these are interrelated.” [38].

According to Trochim, the concept mapping procedure consists of six stages– (1) preparation, in which participants and a focused construct of interest are selected; (2) the generation of statements from respondents; (3) structuring of statements; (4) representation in terms of a concept map, using multidimensional scaling and cluster analysis; (5) interpreting the maps; and (6) utilisation of the maps [39].

As an approach, concept mapping prompts the recall of knowledge from long-term memory when in association with a given stimulus, which catalyses the spread of activation in memory [40]. Participants are able to respond freely, allowing for greater qualitative detail and variety in recall [41]. When respondents form conceptual connections with a stimulus, information processing and cognitive activation result in the formation of associative structures. The stored knowledge is retrieved by spreading activation from associations [42]. Concepts with greater correlative associations are activated

quicker and with higher potency [43]. These nodal linkages are then visually represented in a two-dimensional concept map centering around a certain theme.

## 4. Materials and Methods

### 4.1. Phenomenology and the Associative Elicitation Procedure to Understand Residents' Perceptions

This study adapts the sequential procedure described by Trochim (1989) to the perceptions of residents regarding the streets of Delhi, viewed through a phenomenological lens. Phenomenology describes the study of cognizance from an individual perspective [44] and posits that the understanding of a phenomenon can be derived from its manifestation in cognitive structures, with the person being central to the environment [45]. The phenomenological approach is distinguished by its interlinkages with human-centric design, described by Lyotard in 1991 to be an “effort to recover humanity itself” [46]. It acknowledges the inextricable enmeshment between consciousness and lived experience, with perception forming a veristic source of guidance [47]. As such, the phenomenological model suggests that the lived experience of the Delhi streetscape can be deduced from residents' associations in relation to concomitant stimuli.

With the availability of analytical technology, the use of qualitative elicitation procedures has diminished [48]. However, in the assessment of experience, technological evaluations often fail to consider the modulations of human perception and may introduce inconsistencies when compared with community perception [49]. This study aims to discover the engagement of residents with Delhi streets, and the qualitative handling of data fosters a holistic approach, as necessitated by the eventual objective of humanist design.

Additionally, computational methods such as analysis through street-view imagery cannot sufficiently encompass demographic considerations [50]. Conversely, this study seeks to divaricate perceptions on the basis of demography and geography, as these factors are essential in the evaluation of accessibility. Therefore, a qualitative concept mapping procedure was deemed appropriate in this exploratory research.

To elicit semantic associations from respondents, a survey with questions targeting preconceived categories was assigned. The urban experience was separated into distinct groupings, presenting a focal point for individuals to form associative linkages.

This would establish a more comprehensive concept map addressing essential considerations. The associative stimuli were to encompass the thematic foci of environment, design and aesthetic, culture, comfort and mobility, and safety. As such, respondents were asked to associate the streets of Delhi with each of these themes.

Respondents were instructed to answer in the form of a list of words and phrases rather than full sentences, using the plus (+) and minus (-) signs to indicate positive and negative associations, respectively. To identify the number and nature of associations, the elements were tallied and sorted in accordance with their semantic fields using content analysis [51, 52, 53, 54]. This allowed the sorting of perceptions in terms of certain parameters and common characteristics.

This study was conducted with the purpose of understanding Delhi residents' perceptions of their streets to provide greater clarity on the requisites of human-centric design across the region. Classifications of positive and negative associations provide a view of residents' associative leanings en masse. The categorisation serves to yield a comprehensive delineation of the minutiae of the current urban experience, presenting aspects that should be preserved while simultaneously highlighting the areas of deficiency. For each thematic focus, different sub-categories were formed to group responses while keeping in mind that sub-categories are sufficiently inclusive in scope and mutually exclusive so that each word would fall into a single sub-category. Some stimuli were subject to greater sub-categorisation due to response variety.

#### 4.2. Research Design and Sampling Framework

A digital form was used to investigate Delhi residents' perceptions of the region's streetscape. The previously stated questions were provided as stimuli to elicit open-ended responses. In addition to this data, socio-demographic information was collected from each of the participants to discern variances across factors of gender, age, educational background, and occupation. These considerations were introduced as demography can influence the quality and minutiae of experiences, so the understanding of divergences in terms of factors affecting accessibility can provide greater nuance in the evaluation of phenomenological observations [55, 56, 57, 58]. In order to map a cross-section of the region, a sample of seventeen residents was chosen from 4 different districts of Delhi (North, South, East, and West), where participants were identified using a snowball sampling method.

Table 1 outlines the subdivisions of different selected demographic parameters and their corresponding frequency in the sample. Associative leanings, en masse. The categorisation serves to yield a comprehensive delineation of the minutiae of the current urban experience, presenting aspects that should be preserved while simultaneously highlighting the areas of deficiency. For each thematic focus, different sub-categories were formed to group responses while keeping in mind that sub-categories are sufficiently inclusive in scope and mutually exclusive so that each word would fall into a single sub-category. Some stimuli were subject to greater sub-categorisation due to response variety.

**Table 1. Demography of sample**

Demographic Factor	Status Bracket	Frequency	% of Total
Age	16-18	14	20.6
	19-24	8	11.8
	25-34	15	22.1
	35-50	18	26.5
	50-59	7	10.3
	60-65	2	2.9
	65+	4	5.9
Gender	Male	34	50
	Female	34	50
	Other	0	0
Level of Education	Primary	10	14.7
	Secondary	13	19.1
	Collegiate/ Undergraduate	22	32.4
	Postgraduate/ Professional	23	33.8

A total of 68 residents were selected to participate in the survey. Since the aim of this research paper is to provide critical insights towards the design and perception of the built environment among citizens, the sample chosen for this study was consciously restricted to a relatively small size.

A smaller sample size in the study of perception can enhance accuracy and analytical depth in the evaluation of qualitative data [59]– similar sample sizes have been used in studies utilising correspondingly qualitative procedures, such as those by Hater and Bass in 1988 [60], Starbuck and Mezias in 1996 [61], Schambach and Dirks in 2002 [62], Mc Sharry et al. in 2011 [63], and Mitter et al. in 2019 [64].

The sample size was also conducive to the data analysis method of concept mapping, which is not well-suited for copious quantities of semantic data.

Respondents' semantic associations were incipiently divided and recorded in a tabular format on the basis of the content categories identified in Table 1 and in terms of positive (+), negative (-), and neutral associative nature (as indicated by participants), shown in Table 3. These quantified classifications were then represented visually using concept maps to reveal respondents' cognitive structures and nodal framework.

## 5. Results and Discussion

### 5.1. Statistical Distributions of Residents' Responses

This paper aims to explore residents' perceptions of the streets of Delhi, discerning areas of improvement and maintenance in order to foster greater human-centricity in further street design. The collated data has been analyzed in terms of demographic as well as geographical variances to identify the contentions of specific subsets of the population, in conjunction with potential differences in requisites expressed by members of different districts.

**Table 2. Distribution of responses across districts**

District	Number of Associations	Mean	Standard Deviation	Max	Min
North	296	17.4	12.2	63	5
East	230	13.5	11.5	50	7
South	237	13.9	10.5	48	7
West	300	17.6	15.6	69	8
Total	1063	15.6	12.8	69	5

**Table 3. Evaluation of Delhi streets across districts**

District	Positive	Negative	Positive or Negative	Total Associations
North	73	178	45	296
East	56	123	51	230
South	96	104	37	237
West	75	175	50	300
Total	300	580	183	1063

Table 2 depicts the distribution of associations from respondents of each of the 4 districts. A total of 1063 associations were made by participants, with a mean of 15.6 and a standard deviation of 12.8 (across all 5 stimuli). The lowest number of associations was 5 (from a respondent residing in North Delhi), and the highest was 69 (from a

respondent residing in West Delhi). Responses from North Delhi and West Delhi recorded higher mean values (17.4 and 17.6, respectively) than East Delhi (13.5) and South Delhi (13.9). However, they also had higher standard deviations (12.2 and 15.6, respectively) than did the East and South districts (11.5 and 10.5, respectively).

The distinctions of response variety across districts have been recorded in Table 3. The number of positive associations was highest for South Delhi residents (96), and the district also recorded the lowest number of negative (104) and neutral associations (37). The greatest number of negative associations was made by respondents from North Delhi (178), closely followed by those of West Delhi (175); the lowest number of positive associations, however, was made by residents of East Delhi (56), and this district also had the highest number of neutral associations (51). The greatest number of responses, overall, was elicited from West Delhi residents (300) and the lowest from East Delhi residents (230).

The general composition of associations was largely negative, indicating the necessity for advances in urban planning and improvement across the 5 parameters (Environment, Design and Aesthetic, Culture, Comfort and Mobility, and Safety) evaluated in this study. In comparison with responses rated (+) or (-), neutral associations were surprisingly low, with the majority of residents possessing clearly defined positive or negative associations with Delhi streets. This highlights a degree of polarity in response variety.

The associations consisted of individual words, such as "cars," "murals," "flyovers," et cetera, as well as short phrases (e.g., "difficult to cross roads"). The associations elicited from each stimulus were categorized in accordance with the sub-categories identified from thematic linkages between respondents. For instance, responses such as "trees," "flowers," and "vegetation" to the stimulus of Environment were sub-categorised under Flora.

**Table 4. Sub-categorization of responses to the stimulus 'Environment'**

Sub-category	Environment							
	North Delhi		East Delhi		South Delhi		West Delhi	
	Count	% of total	Count	% of total	Count	% of total	Count	% of total
Pollution	25	37.3	16	28.6	10	20.8	25	40.3
Hazards	2	3.0	7	12.5	2	4.2	10	16.1
Uncleanliness	17	25.4	9	16.1	6	12.5	8	12.9
Disorder	2	3.0	4	7.1	3	6.3	5	8.1
Flora	6	9.0	7	12.5	5	10.4	6	9.7
Fauna	9	13.4	4	7.1	3	6.3	3	4.8
Crowds	2	3.0	5	8.9	5	10.4	1	1.6
Congestion	3	4.5	4	7.1	2	4.2	4	6.5
Welfare	1	1.5	0	0	3	6.3	0	0
Culture	0	0	0	0	9	18.8	1	1.6
<b>Total</b>	<b>67</b>		<b>56</b>		<b>48</b>		<b>62</b>	

The highest number of associations was made in response to the stimulus pertaining to the Environment (21.9% of the total). This was followed by Design and Aesthetic (20.9%), Comfort and Mobility (20.8%), Culture (20.4%), and Safety (16.0%). Evidently, there was a relatively low degree of variation across categories, except for Safety, which elicited a relatively lower number of associations than the others. This may indicate a lack of importance attributed to the category or limited public awareness. The further sub-categorization of responses is depicted in Tables 4, 5, 6, 7, and 8.

Table 4 depicts the sub-categorisation of responses to the stimulus pertaining to Delhi streets and the Environment, which was the strongest category in terms of the number of associations.

For all four districts, 'Pollution' was the most populated category, encompassing 32.6% of all responses. However, the highest proportions were from North and West Delhi residents, with percentage occupations of 37.3% and 40.3%, respectively. This perception follows the quantitative pollution data certified by the Central Pollution Control Board, which indicates that the North and West districts envelop some of the region's most polluted areas [65]. Overwhelmingly, North Delhi residents also had higher associative linkages with 'Uncleanliness' than did any other district, occupying 25.4% of total associations.

East and West Delhi recorded significantly higher mentions of 'Hazards'— 12.5% and 16.1% of total responses, respectively— in comparison to North Delhi (3.0%) and South Delhi (4.2%). The responses within this sub-category ranged from hazards resulting from degradation ("potholed roads") to natural hazards ("falling trees in monsoon").

South Delhi residents had the greatest number and proportion of associations with welfare. This aligns with extant knowledge, as recent studies like those of Sharma and Abhay (conducted in 2022) [30], indicate that it is the district containing, in terms of area, a relatively high proportion of the most developed parts of Delhi. South Delhi is also the only district with a significant number of associations pertaining to 'Culture' and Environment (18.8% of the total), with responses including cultural activities, groups, and traditions, reflecting the perception of South Delhi's residents being more culturally inclined. This also represents an intersection between two parametric stimuli considered in this study: Environment and Culture in relation to Delhi streets.

Interestingly, human occupation or responses in relation to individuals were very limited within this category, apart from collective references within the sub-category of 'Crowds.' Thus, while manmade and infrastructural elements, as well as natural features, factor markedly in residents' perceptions of the environment of Delhi streets, there is limited involvement of interpersonal or social aspects, thereby casting significant implications on the inclusion of humanist elements in Delhi's urban streetscape.

Table 5 shows the sub-categories under Design and Aesthetic. Inclusive of all districts, the most populated sub-category for associative linkages between Delhi streets and Design and Aesthetics was 'Monotony,' occupying 21.6% of all associations.

The most populated sub-category for North and East Delhi was 'Monotony' as well, with a percentage occupation of 28.1% and 29.2%, respectively. For South Delhi, it was 'Art' at 15.8%, and for West Delhi, it was 'Degradation' at 21.7%.

**Table 5. Sub-categorization of responses to the stimulus 'Design and Aesthetic'**

Sub-category	Design and Aesthetic							
	North Delhi		East Delhi		South Delhi		West Delhi	
	Count	% of total	Count	% of total	Count	% of total	Count	% of total
Variety	7	12.3	5	10.4	3	5.3	5	8.3
Monotony	16	28.1	14	29.2	5	8.8	11	18.3
Degradation	14	24.6	8	16.7	6	10.5	13	21.7
Chaos	2	3.5	3	6.3	3	5.3	10	16.7
Unattractiveness	3	5.3	3	6.3	2	3.5	5	8.3
Art	1	1.8	1	2.1	9	15.8	5	8.3
Development	0	0	2	4.2	5	8.8	5	8.3
Historical/ traditional significance	10	17.5	2	4.2	4	7.0	2	3.3
Architecture	2	3.5	1	2.1	4	7.0	0	0
Infrastructural facilities	0	0	6	12.5	2	3.5	2	3.3
Nature	1	1.8	3	6.3	6	10.5	2	3.3
Dynamism	1	1.8	0	0	8	14.0	0	0
<b>Total</b>	57		48		57		60	

Interestingly, the greatest number of associations pertaining to both ‘Variety’ and ‘Monotony,’ nearly antonymic sub-categories, were made by the same district, North Delhi (the greatest proportion for ‘Monotony,’ however, was from East Delhi residents), underscoring a polarity in residents’ perceptions of the design of the district.

North Delhi also recorded the highest proportional mentions of ‘Degradation,’ followed by West Delhi. West Delhi also mentioned ‘Chaos’ and ‘Unattractiveness’ significantly more than did any other district. Overall, North and West Delhi responses within this category recorded the highest number of negative associations, with an emphasis on architectural and infrastructural flaws, such as “crowded buildings,” “ugly, grey, dull flats,” and “no space.” This was the response type of the highest concentration within this category, outlining a prominent idea to be addressed with regard to the design and aesthetic of Delhi streets.

South Delhi recorded the most associations related to ‘Nature,’ occupying 10.5% of the total, with North Delhi recording the least, at 1.8%. Overall, the percentage occupation of ‘Nature’ as a sub-category was relatively low, at 5.4% of all responses in the category, considering that as of 2021, Delhi had the largest forest cover (194.24 sq. km) among the seven major cities of the country [56]. As compared to mentions of manmade elements, the associations between ‘Nature’ and Design and Aesthetic were limited.

‘Dynamism’ only received a considerable proportion of associations from South Delhi residents (14.0%), and ‘Development’ was also most highly populated by responses from South Delhi (8.8%). Responses in these sub-categories

referred to cycles of growth and regeneration in the city, eliciting short phrases such as “constant rebuilding and development,” “new projects all the time,” and “changing urban aesthetic.” This indicates perceptions of continual advancement and evidence of public spending— a community perception missing from other districts. As such, phenomenological markers suggest the necessity of addressing this aspect of Design and Aesthetics in other districts, particularly districts such as North and West Delhi, wherein ‘Degradation’ has been identified as a shortcoming by residents.

Table 6 depicts the sub-categorization of responses to the stimulus linking Delhi streets and culture. The most populated sub-category for North and West Delhi was ‘Socioeconomic avenues,’ with a percentage occupation of 29.3% and 25.4%, respectively. For South Delhi, it was ‘Dynamism,’ at 21.2%, and for East Delhi, it was ‘Degradation,’ at 25.9%.

Most associations in relation to ‘Art’ were made by South Delhi residents, with a percentage occupation of 15.4%. South Delhi also recorded a marginally higher proportion of responses under the sparsely populated sub-category ‘Architecture’ than the other districts.

North Delhi residents made the highest proportion of associative linkages between ‘Socioeconomic avenues’ and Culture (29.3%), owing in part to the well-known street market, Chandni Chowk, which is located in this district and records one of the highest footfalls in the country. Several North Delhi residents included Chandni Chowk as a critical point of association with culture, depicting the association with street markets and the local economy.

**Table 6. Sub-categorization of responses to the stimulus ‘Culture’**

Sub-category	Culture							
	North Delhi		East Delhi		South Delhi		West Delhi	
	Count	% of total	Count	% of total	Count	% of total	Count	% of total
Art	3	5.2	3	6.8	8	15.4	2	3.2
Architecture	1	1.7	1	2.3	2	3.9	1	1.6
Socioeconomic avenues	17	29.3	11	25.0	5	9.6	16	25.4
Fauna	2	3.5	1	2.3	1	1.9	4	6.4
Food	15	25.9	12	27.3	5	9.6	14	22.2
Social	10	17.2	2	4.6	5	9.6	13	20.6
Religion	2	3.5	6	13.6	1	1.9	2	3.2
Diversity	2	3.5	2	4.6	6	11.5	2	3.2
Vehicles	2	3.5	5	11.4	2	3.9	6	9.5
Poverty	4	6.9	0	0	2	3.9	1	1.6
Dynamism	0	0	1	2.3	11	21.2	0	0
Aggression	0	0	0	0	4	7.7	2	3.2
<b>Total</b>	58		44		52		63	

South Delhi recorded the lowest percentage of responses in both ‘Socioeconomic avenues’ and ‘Food,’ at 9.6% each; these sub-categories were heavily populated for all other districts, displaying a fundamental divergence in the understanding of Delhi streets and Culture in residents from this district as compared to others. Evidently, in South Delhi, the arts factor more significantly in community perception of Culture than do consumer commodities.

The highest percentage of associations related to ‘Social’ was from West Delhi, occupying a relatively high proportion of the total (20.6%). This echoes the high concentration of ‘Congestion’ in the Environment. However, the sub-category of ‘Social’ was populated by more positive responses such as “friendly people” and “gathering areas.” Therefore, this concept holds more positive connotations of togetherness of community spirit in the category of Culture whilst representing adverse circumstances and shortcomings in Environment.

‘Dynamism’ was once more mentioned significantly only by South Delhi residents, occupying an overwhelming 21.2% of the total. Responses within this sub-category vary from descriptions of continual change to tradition to “hustle,” as referred to by several participants. This highlights the

spectrum ranging from antiquity to economic opportunity recognised as culture on the streets of South Delhi.

In each category, South Delhi residents’ perceptions have been shown to underscore change and growth far more than perceptions of residents from other districts (several of which identify stagnation), indicating an underlying theme in the management of public spaces throughout Delhi.

Table 7 depicts the sub-categorization of responses to the stimulus of Comfort and Mobility. Overall, the sub-category with the highest proportion of responses was ‘Disorder,’ occupying 26.2% of total associations. Within this sub-category, North Delhi recorded the highest number of mentions, at 31.9% of their total.

All districts also recorded relatively high associations under ‘Crowds’ and ‘Autocentrism.’ Within these sub-categories, qualifiers such as “too many” and prefixes such as “over” (i.e. “overpopulation,” “overcrowding”, etc.) were notably used, marking these concepts as requiring mitigation. Notably, the number of responses from South Delhi identifying ‘Discrimination’ as a sub-category of Comfort and Mobility was zero, perhaps correlating with the district recording the highest associations pertaining to ‘Diversity’ in the Culture category.

**Table 7. Sub-categorization of responses to the stimulus ‘Comfort and Mobility’**

Comfort and Mobility								
Sub-category	North Delhi		East Delhi		South Delhi		West Delhi	
	Count	% of total	Count	% of total	Count	% of total	Count	% of total
Disorder	23	31.9	7	16.3	13	26.0	15	26.8
Crowds	17	23.6	10	23.3	13	26.0	11	19.6
Hazards	7	9.7	7	16.3	7	14.0	6	10.7
Discrimination	3	4.2	4	9.3	0	0	1	1.8
Autocentrism	14	19.4	8	18.6	7	14.0	10	17.9
Public transport	4	5.6	7	16.3	6	12.0	8	14.3
Accessibility	4	5.6	0	0	4	8.0	5	8.9
<b>Total</b>	72		43		50		56	

**Table 8. Sub-categorization of responses to the stimulus ‘Safety’**

Safety								
Sub-category	North Delhi		East Delhi		South Delhi		West Delhi	
	Count	% of total	Count	% of total	Count	% of total	Count	% of total
Law enforcement	1	2.4	9	23.1	2	6.7	2	3.4
Misogyny	3	7.1	2	5.1	8	26.7	5	8.5
Accidents	8	19.1	12	30.8	3	10.0	12	20.3
Lacking infrastructure	13	31.0	7	18.1	10	33.3	18	30.5
Lawlessness	7	16.7	3	7.7	2	6.7	14	23.7
Negligence	2	4.8	6	15.4	2	6.7	1	1.7
Darkness	8	19.1	0	0	3	10.0	0	0
Hazards	0	0	0	0	0	0	7	11.9
<b>Total</b>	42		39		30		59	



East Delhi had the highest proportion of responses related to 'Public transport' (16.3%). Yet, there were no mentions of accessibility in East Delhi, while the other districts registered a low but comparatively consistent number. In addition, associations related to 'Public transport' were largely neutral identifications of means of public transport such as "metro," "auto rickshaws", and "DTC buses." As such, the high response concentration indicates the availability of public transport but may not necessarily have translated to accessibility.

Table 8 depicts the sub-categorization of responses to the stimulus linking Delhi streets and Safety, the weakest category in terms of number of associations.

Overall, the most populated sub-category was 'Lacking infrastructure,' occupying 28.2% of all associations ('Lacking' was a necessary inclusion, given the ubiquity of responses mentioning faults, e.g., "broken roads"). This was also the most populated sub-category for North, South, and West Delhi, with a percentage occupation of 31.0%, 33.3% and 30.5%, respectively. For East Delhi, it was 'Accidents,' at 30.8%.

'Misogyny' was mentioned much more proportionally by respondents of South Delhi than those of other districts, occupying 26.7% of total associations in the category. This diverges from responses within other categories, which significantly identify 'Diversity' in the category of Culture and record no mentions of 'Discrimination' in Comfort and Mobility, indicating that residents perceive misogynistic occurrences to affect only Safety and not the other parameters measured in this study.

Interestingly, the highest proportion of responses in 'Lacking infrastructure' was also from South Delhi, despite having the highest associations regarding 'Development' in the Design and Aesthetic category and several references to 'Dynamism' in other categories.

Notably, 'Darkness' was not at all mentioned by East and West Delhi residents but quite significantly registered by North Delhi residents, occupying 19.1% of their total, marking a regional shortcoming, as discerned by residents.

'Lawlessness' was recorded most by residents of West Delhi, occupying 23.7% of all associations made by West Delhi residents in this category. The sole district that appreciably made associations with 'Law enforcement' was East Delhi, which also had the second-lowest associative strength between Safety and 'Lawlessness,' indicating a correlation between the two ideas.

'Hazards' were only mentioned by West Delhi respondents, but with a sizable proportional occupation of

11.9%. An identical sub-category was also included in Comfort, Mobility and Environment. While West Delhi residents also recorded the highest mentions of 'Hazards' in Environment, this sub-category registered relatively low significance among West Delhi residents, proportionally and in comparison with other districts, in Comfort and Mobility.

## 5.2. Composite Evaluation

From the analysis of residents' responses, certain patterns may be observed in the associative strengths of the concepts explored in this study.

Overwhelmingly, the sub-category with the greatest percentage of occupation of each category was negative: for Environment, this was 'Pollution;' for Design and Aesthetics, it was 'Monotony;' for Comfort and Mobility, it was 'Disorder;' and for Safety, it was 'Lacking Infrastructure.' The sole exception was Culture, with the most populated category being 'Socioeconomic avenues.' Apart from this deviation, it is evident that across categories, residents' perceptions are predominantly negative, indicating a broad scope for holistic improvement and the importance of effectuating extensive change.

In addition, sub-categories containing positive responses, such as 'Art,' 'Food,' and 'Nature', outline areas of conservation and growth; these concepts represent points of satisfaction for residents and, therefore, ought to be maintained along with the management of negative perceptions.

Moreover, the data indicates that a localised approach may be necessary to efficiently distribute resources, as South Delhi records a relatively lower number and variety of shortcomings and policies directed toward the betterment of community experience across other districts, with an emphasis on North and West Delhi (as residents of these districts underscore pressing concerns such as 'Degradation' and 'Disorder') may be of greater consequence.

Thus, residents' perceptions can be considered and evaluated in detail to discern markers for human-centred design, and categorical considerations may outline the direction of further urban planning.

## 5.3. Demographic Considerations

Apart from geographical variances, it could also be propounded that perceptions may vary across demographic groups. It has been well-established that demography is a significant factor in cognitive structures and seeds subjectivity in experience [29, 39, 55, 68]. As such, differences across demographic groups were also considered in this study. However, surprisingly, relative uniformity exists in the perceptions of respondents of different ages, genders, occupations, and educational backgrounds.

For each of the sub-categories within Environment, the number of associations elicited across different demographic categories was relatively uniform. Similarly, the percentage imbalance values among demographic groups for Design and Aesthetic, Culture, and Comfort and Mobility were 6.5%, 7.0%, and 6.3%, respectively. There was, however, a notable exception— Safety. While, overall, the weakest category received the lowest number of associations (170), the stimulus of Safety prompted significantly more associations from respondents identifying as female as compared to those identifying as male. 63.5% (108) of associations in this category originate from female respondents and 36.5% (62) from male respondents.

This imbalance, to a large extent, stems from asymmetry in the sub-categories of ‘Misogyny’ and ‘Darkness.’ Proportionally, 83.3% of all responses pertaining to ‘Misogyny’ and 63.6% of those related to ‘Darkness’ were from female respondents. This constitutes a gendered understanding of Safety in Delhi streets. Evidently, Safety is not only a factor of greater concern to female residents but also involves separate considerations from those expressed by male residents.

There were also some differences in associations within sub-categories in the comparison of different age groups. These were more pronounced in the categories of Design and Aesthetic and Culture. Within the concept of ‘Architecture’ in Design and Aesthetics, distinctions were observed between the age brackets of 16-24 and 50+.

Respondents belonging to the former group were more prone to associations with architectural styles, such as ‘brutalist’ and ‘modern,’ while those of the latter were oblique references, such as ‘big buildings’ and ‘towers.’ Divergences were also observed in the sub-category of ‘Socioeconomic avenues’ in the category of Culture.

Respondents within the 16-18 age group focused on associations such as ‘rows of kiosks’ and ‘stalls,’ while those aged 35+ responded with more specific and historically rooted street establishments, such as ‘Chandni Chowk’ and ‘Janpath.’ This reflects the impact of urbanization on perception, and the potential decline in significance of traditional avenues of the Delhi streetscape.

With the exception of these instances, however, empirical data suggests few variations across demographic groups, and far greater deviation can be observed between different districts. As such, this study focuses primarily on geographical factors and the analysis of district-wise distribution of perceptions.

#### **5.4. Concept Mapping: Results from Data Analysis**

Figure 1 depicts a concept map of categories and sub-categories with corresponding associative linkages. Direct

associations made by residents (within responses) have been shown using continuous lines, and semantic similarities or links between concepts detected through semantic analysis have been represented using dashed lines. As seen in the concept map, exactly 50% of sub-categories are independent, i.e. mutually exclusive to their respective categories, while the remaining half share links with other concepts or categories.

The independence of a certain concept is not a reflection of its importance but rather its universality. ‘Pollution,’ for instance, while an unlinked category, encompassing 32.6% of all associations in the category of environment, underscoring a high, albeit categorically restricted, associative strength. The exclusivity of a concept is a significant factor in the implications cast on its further management; isolated concepts need not necessarily be regulated in an interdisciplinary or integrative manner and can remain concentrated to handlers of the singular category to which they belong.

The concepts highlighted in pink and connected using dashed lines represent sub-categories semantically linked to others, such as ‘Discrimination,’ ‘Diversity,’ and ‘Social.’ These concepts are not common to their originating categories of Culture, Comfort and Mobility but share associative similarities.

Concepts delineated in yellow, conversely, are concretely common to 2 categories (‘Fauna,’ for example, belonging to both Environment and Culture). There is only 1 sub-category belonging to 3 categories: ‘Hazards,’ present in associations stemming from Environment, Safety, and Comfort and Mobility.

The higher the number of linkages between a concept and those of other categories, the greater the ubiquity of the concept in perceptions across different parameters defining Delhi streets. As such, a greater number of associative links effectuates greater nuance in the multifarious facets of a concept, necessitating more complex management.

‘Misogyny’ is a concept associated solely with Safety, so it can be inferred that it is not perceived as a factor appreciably impacting any other category so that it can be mitigated with reference to the maintenance of safety alone. ‘Hazards,’ however, has been concretely linked with 3 categories, so it has been identified as a much more pervasive concept by respondents from the 4 districts.

Thus, the varied types and degrees of penetration amongst various categories must be considered for a sustainable resolution. It is paramount to restate, however, that cross-category connections do not account for the number of mentions of individual concepts and, therefore, reflect perceptions of breadth across varied factors rather than depth or chronicity.

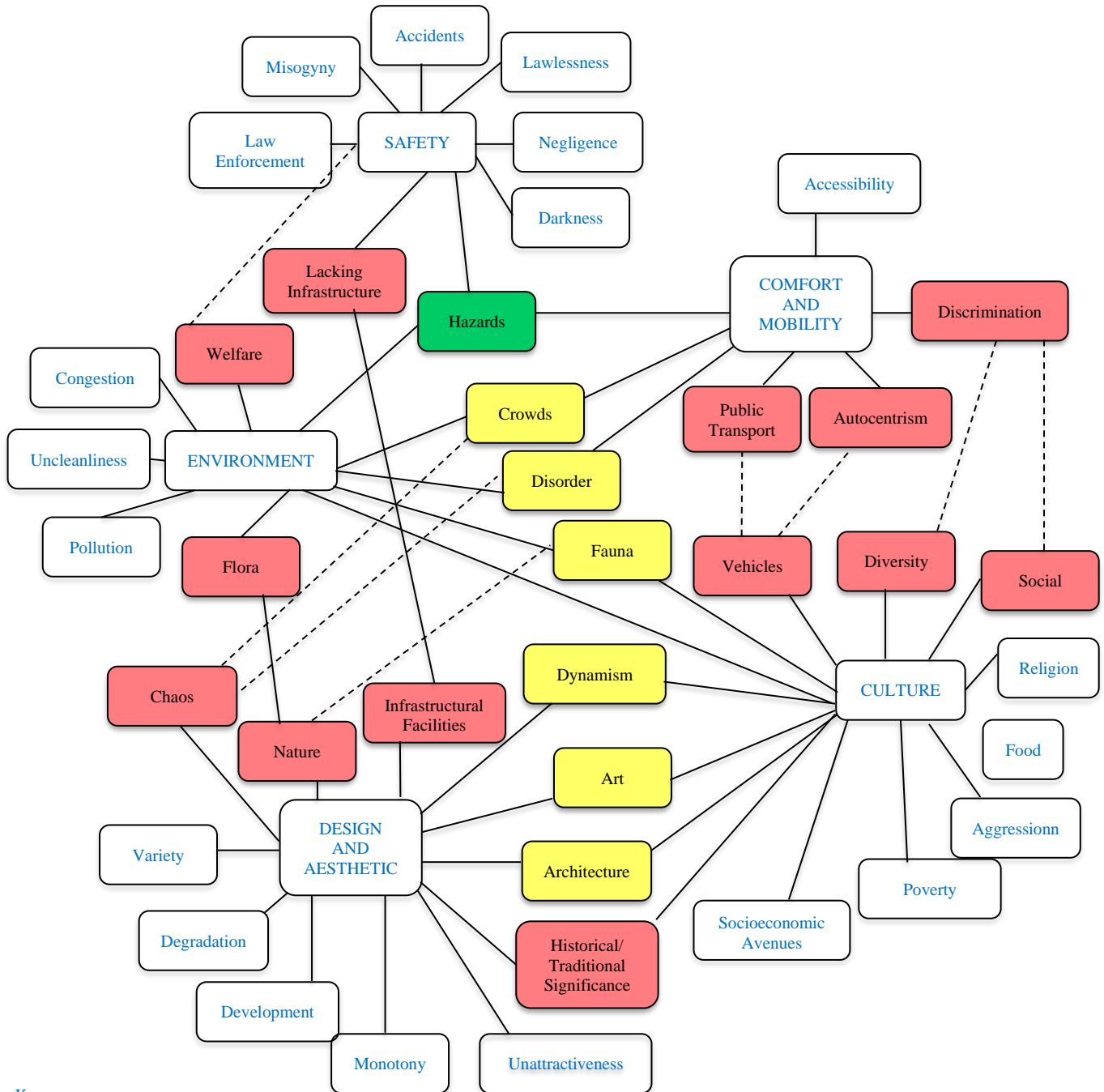


Fig. 1 Composite concept map of content categories and sub-categories

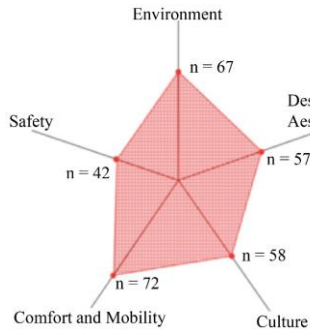


Fig. 2.1 North Delhi

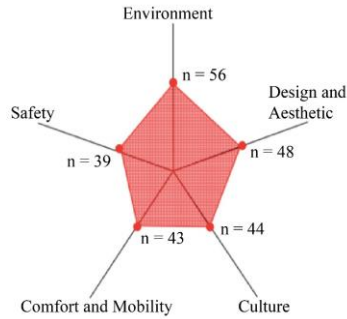


Fig. 2.2 East Delhi

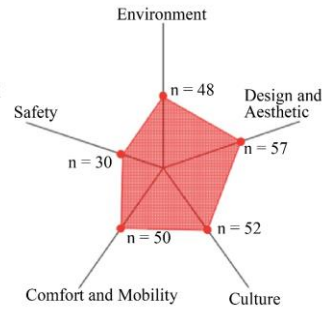


Fig. 2.3 South Delhi

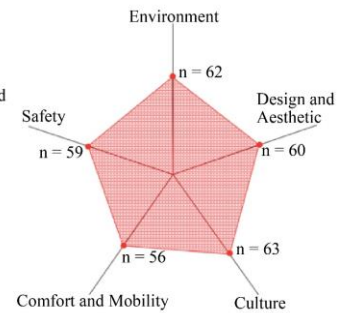


Fig. 2.4 West Delhi

Fig. 2 Cluster maps of category occupation distributions across districts

The composite map of each stimulus can also reveal causal links or correlations between different concepts. In Safety, 'Misogyny,' 'Lawlessness,' and 'Darkness' appear as separate themes in responses, but cognitive structures in the chronology of responses may divulge an interconnectedness between these three perceived aspects of safety. For instance, one respondent mentioned the following associations with the category of Safety— 'unsafe for women at night,' 'dark streets,' and 'need to be careful.' This illustrates concerns with the shared root perception of danger for females at night, casting, by extension, implications on the role of law enforcement. As such, each sub-category, while separate in meaning, can derive from or share an association with another. In Design and Aesthetics, 'Unattractiveness' and 'Monotony' can, in certain contexts, exist causally of one another, with associations pertaining to one concept developing into similar ideas in relation to another. Detailed evaluation of these linkages can enhance problem-solving and further management of these ideas, promoting integrated solutions rather than entirely isolated consideration of individual perceptions.

Associative strengths of content categories with Delhi streets vary across districts as well. This has been depicted through cluster mapping in Figure 2. The 5 categories (Environment, Design and Aesthetic, Culture, Comfort and Mobility, and Safety) have been attributed differing levels of significance by respondents of each district, thus reflecting the variances in the cognitive structures of residents. Each category is represented by a spoke, and all spokes of the cluster framework are of equal length (100 units) and equiangular, creating a pentagonal structure. Each unit corresponds to one association. The higher the adherence to a pentagonal structure in a cluster map, the greater the balance in the perception of respondents across the categories. The size of a cluster is indicative of the number of responses received; a larger area reflects a higher number of associations, and for a smaller area, the opposite is true.

West Delhi records the highest number of associations, as seen in Figure 2.4, yet these associations are relatively balanced across the 5 categories. Conversely, the cluster

delineating responses from East Delhi (Figure 2.2) occupies the smallest area and is asymmetrical, owing partly to a lower number of associations between Delhi streets and Safety ( $n = 39$ ). Greater asymmetry is seen in both the North and South districts' responses (Figures 2.1 and 2.3, respectively) despite the divergence in their cluster sizes. The former is imbalanced by high associative strength in the Environment ( $n = 67$ ) and Comfort and Mobility ( $n = 72$ ) categories and a paucity in responses pertaining to Safety ( $n = 42$ ). For the latter, the disproportion is caused by the high number of responses in relation to Design and Aesthetic ( $n = 57$ ) and a very low number for Safety ( $n = 30$ ). Evidently, all districts except West Delhi record low associative strength between Safety (presence or lack of) and Delhi Streets. Comfort and Mobility as a category remain relatively constant across districts, apart from North Delhi, wherein the number of associations is abnormally high. The number of associations pertaining to Environment does not vary greatly across districts, nor do they in relation to Culture. Design and Aesthetics, while generally proportionally uniform, receive a high number of associations from South Delhi respondents.

These variances in distribution highlight the composition of residents' perceptions and how the district of residence impacts them. Asymmetries in the cluster maps can be derived from the low importance of a given category, limited knowledge, or a lack of interest. The sources of these regional discrepancies form phenomenological markers for further investigation into areas of concern and preservation for each district, as it is empirically apparent that these considerations vary geographically. Within categories, the relative ubiquity of certain concepts provides a structural map of perceptions, evincing particularities of the experience of urban streetscapes in Delhi.

## 6. Conclusion

Urban streetscapes occupy a vastly important and extensive role as the arteries of public spaces. In this capacity, street design is laden with preconditions pertaining to social, environmental, aesthetic, cultural, ambulatory, and other functions. However, the fulfilment of these requisites is not an invariable certainty and may not be perceived by residents as

such. Therefore, accounting for the perceptions of the users of these streets provides a phenomenological indicator of the face of a region's public spaces. Accordingly, this study provides a qualitative, exploratory evaluation of Delhi residents' perceptions regarding the streetscape of the region in order to foster greater human-centricity in the design of public spaces.

A sample of 68 respondents evenly distributed amongst 4 Delhi districts– North, East, South, and West– was identified, spanning a diverse demographic composition in terms of gender, age, educational background, and occupation. A qualitative survey comprising 5 categorical stimuli– Environment, Design and Aesthetic, Culture, Comfort and Mobility, and Safety– was used to elicit associations from respondents. Content analysis was used to sort responses into several sub-categories within these groups to synthesize experiences, and many perceptions were thus discovered.

Comprehensively, a pattern of negative associations emerged from this study, such as 'pollution,' 'lacking infrastructure,' and 'unwalkable.' While positive associations were made, such as 'green,' 'diversity,' and 'good food stalls,' residents were markedly inclined towards a compositely unfavorable view of Delhi streets, with negative perceptions outnumbering the positive for each district. The negative perceptions merit additional research and consideration by planning authorities in further street design and extant maintenance projects. The positive perceptions, too, ought to be accounted for as areas of preservation. As for demographic considerations, the observation and analysis of empirical data suggest no significant differences in perceptions of Delhi streets across the demographic groups evaluated in this study. Certain exceptions– such as a gendered understanding of Safety and slightly conflicting responses under some sub-categories from particular age groups– do, however, exist. Analysis in this respect was likely limited by a relatively small sample size, and greater nuance may be achieved by including more participants. It is important to note that this is an

exploratory study and, as such, remains focused on a macroscopic and cross-district view with a more limited consideration of demographic elements.

The use of concept mapping is well-suited to this broader qualitative perspective. It provides a composite structure of linkages between varied and ostensibly disparate factors defining the streetscape of Delhi. Asymmetries and variances can be rapidly discerned, indicating fundamental areas of significance. The associative elicitation technique, inducing distinctions between positive and negative associations and disparate concepts, allows for the deduction of individual cognitive structures. Using a thorough and varied sampling can reveal general patterns of perceptions– but too large a sample can strain qualitative analysis.

This is an exploratory study, but there are inherent limitations to this approach. With a population of over 32 million, Delhi is a region encompassing a large area with a myriad of individuals varying across demography and geography. A larger sample size would be required for a definitive understanding of residents' perceptions, necessitating a quantitative approach to concretely identify the minutiae of the experience of Delhi's streetscape. In addition, the impact of demography merits greater centrality in further research. This study design could also be applied to the other 7 districts of Delhi for a wider lens that expands to every part of the region. Understanding these limitations and accounting for them in future studies is essential to foster a more comprehensive understanding of human experience.

Fundamentally, street design is an interdisciplinary task that must be approached from social, scientific, economic, and environmental contexts. An interconnected and multilayered perspective is necessary to achieve the incorporation of human-centric elements in design while considering in tandem the numerous integrations required to support a successful urban streetscape.

## References

- [1] ITDP, *Better Streets, Better Cities: A Guide to Street Design in Urban India*, Ahmedabad: ITDP, 2011. [[Publisher Link](#)]
- [2] Kim Carlotta von Schönfeld, and Luca Bertolini, "Urban Streets: Epitomes of Planning Challenges and Opportunities at the Interface of Public Space and Mobility," *Cities*, vol. 68, pp. 48-55, 2017. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [3] Mino Harirchian, Maral Esmaceli, and Shahab Kermanshahi, "A New Perspective on Urban Street Design," *The Transp Res Boa (TRB) 97th Annual Meeting*, pp. 1-14, 2018. [[Google Scholar](#)]
- [4] Marketta Kyttä, Maarit Kahila, and Anna Broberg, "Perceived Environmental Quality as an Input to Urban Infill Policy-Making," *Urban Design International*, vol. 16, pp. 19-35, 2011. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [5] Hooman Hematian, and Ehsan Ranjbar, "Evaluating Urban Public Spaces from Mental Health Point of View: Comparing Pedestrian and Car-Dominated Streets," *Journal of Transport & Health*, vol. 27, pp. 1-18, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [6] Jaisung Choi et al., "Human-Centered Designs, Characteristics of Urban Streets, and Pedestrian Perceptions," *Journal of Advanced Transportation*, vol. 50, no. 1, pp. 120-137, 2016. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [7] Clare Hickman, "'To Brighten the Aspect of Our Streets and Increase the Health and Enjoyment of Our City': The National Health Society and Urban Green Space in Late-Nineteenth Century London," *Landscape and Urban Planning*, vol. 118, pp. 112-119, 2013. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]

- [8] Matthew Carmona et al., “Street Appeal: The Value of Street Improvements,” *Progress in Planning*, vol. 126, pp. 1-51, 2018. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [9] Vaddiparti Lova Surya Prakasa Rao, Vernon Ram, and K.V. Sundaram, Delhi, Britannica, 2024. [Online]. Available: <https://www.britannica.com/place/Delhi>
- [10] Margaret A. Kubilins, “Designing Functional Streets that Contribute to Our Quality of Life,” *Transportation Research Circular E-C019: Urban Street Symposium: Conference Proceedings*, 2000. [[Google Scholar](#)] [[Publisher Link](#)]
- [11] Jan Gehl, *Cities for People*, Island Press, pp. 1-288, 2013. [[Google Scholar](#)] [[Publisher Link](#)]
- [12] Nancy Hui et al., “Measuring the Completeness of Complete Streets,” *Transport Reviews*, vol. 38, no. 1, pp. 73-95, 2018. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [13] Zhaoya Gong et al., “Classifying Street Spaces with Street View Images for a Spatial Indicator of Urban Functions,” *Sustainability*, vol. 11, no. 22, pp. 1-17, 2019. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [14] W.C. LaBaugh, “*Roads in Developing Countries*,” Transportation Research Board Special Report, pp. 25-32, 1975. [[Google Scholar](#)] [[Publisher Link](#)]
- [15] Faisal Bin Sulaiman, and Mohammed Almahmood, “Following the Process: Unfolding How Form-Based Code—As a Travelling Concept—Has Been Adapted Within the Social, Cultural, and Architectural Context of Riyadh,” *Urban Design International*, pp. 177-197, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [16] Prithvi Deore, and Saumya Lathia, “Streets as Public Spaces: Lessons from Street Vending in Ahmedabad, India,” *Urban Planning*, vol. 4, no. 2, pp. 138-153, 2019. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [17] Meeta Tandon, and Vandana Sehgal, “Traditional Indian Religious Streets: A Spatial Study of the Streets of Mathura,” *Frontiers of Architectural Research*, vol. 6, no. 4, pp. 469-479, 2017. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [18] Jyotindra Jain, “Metaphor of an Indian Street,” *Architecture Plus Design*, vol. 8, no. 5, 1991. [[Google Scholar](#)] [[Publisher Link](#)]
- [19] S. Mostafa Rasoolimanesh et al., “Urban vs. Rural Destinations: Residents’ Perceptions, Community Participation and Support for Tourism Development,” *Tourism Management*, vol. 60, pp. 147-158, 2017. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [20] Klaus Krippendorff, “Intrinsic Motivation and Human-Centred Design,” *Theoretical Issues in Ergonomics Science*, vol. 5, no. 1, pp. 43-72, 2004. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [21] Ataullah, “Mapping 18<sup>th</sup> Century Delhi: Cityscape of a Pre-Modern Sovereign City,” *Proceedings of the Indian History Congress*, vol. 67, pp. 1042-1057, 2006. [[Google Scholar](#)] [[Publisher Link](#)]
- [22] SRDC, “*Revitalisation of Shahjahanabad: Walled City of Delhi*,” File No. F. 6(11), SRDC Project CD No. 000296268, 2014. [[Publisher Link](#)]
- [23] Stephen P. Blake, *Shahjahanabad: The Sovereign City in Mughal India, 1639-1739*, Cambridge University Press, pp. 1-226, 1991. [[Google Scholar](#)] [[Publisher Link](#)]
- [24] Ivan Illich, *H2O and the Waters of Forgetfulness*, Boyars, pp. 1-92, 1986. [[Publisher Link](#)]
- [25] Sunil Kumar, *The Present in Delhi's Pasts*, 1<sup>st</sup> Edition, Three Essays Press, pp. 1-131, 2002. [[Google Scholar](#)] [[Publisher Link](#)]
- [26] Abhishek Kaicker, “*The Colonial Entombment of the Mughal Habitus: Delhi in the Eighteenth and Nineteenth Centuries*,” Master of Arts Thesis, The University of British Columbia, pp. 1-61, 2006. [[Google Scholar](#)] [[Publisher Link](#)]
- [27] Howard Spodek, “City Planning in India Under British Rule,” *Economic and Political Weekly*, vol. 48, no. 4, pp. 53-61, 2013. [[Google Scholar](#)] [[Publisher Link](#)]
- [28] Henry Harpur Spry, *Modern India: With Illustrations of the Resources and Capabilities of Hindústan*, Whittaker & Company, pp. 1-666, 1837. [[Google Scholar](#)] [[Publisher Link](#)]
- [29] Huda Khan, and Richard Lee, “Does Packaging Influence Taste and Quality Perceptions Across Varying Consumer Demographics?,” *Food Quality and Preference*, vol. 84, 2020. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [30] Forest Survey of India, “*India State of Forest Report (ISFR)*,” Ministry of Environment Forest and Climate Change, 2021 [[Publisher Link](#)]
- [31] Sarwat Viqar, “Unsettling Streetscapes,” *Interdisciplinary Unsettling of Place and Space*, pp. 153-164, 2019. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [32] Vanessa Casado Perez, “Reclaiming the Streets,” *Iowa Law Review: Texas A&M University School of Law Legal Studies Research Paper Series*, vol. 106, no. 5, pp. 2185-2213, 2020. [[Google Scholar](#)] [[Publisher Link](#)]
- [33] Werner Kroeber-Riel, Peter Weinberg, and Andrea Gröppel-Klein, *Consumer Behavior*, 9<sup>th</sup> ed., Vahlen, pp. 1-812, 2009. [[Google Scholar](#)] [[Publisher Link](#)]
- [34] Lokendra Shastri, *Why Semantic Networks*, Principles of Semantic Networks: Explorations in the Representation of Knowledge, Morgan Kaufmann Publishers, pp. 109-136, 1991. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [35] Elizabeth Cowley, and Andrew A. Mitchell, “The Moderating Effect of Product Knowledge on the Learning and Organization of Product Information,” *Journal of Consumer Research*, vol. 30, no. 3, pp. 443-454, 2003. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]

- [36] Annamaria Silvana De Rosa, “The “Associative Network”: A Technique for Detecting Structure, Contents, Polarity and Stereotyping Indexes of the Semantic Fields,” *European Review of Applied Psychology*, vol. 52, no. 3-4, pp. 181-200, 2002. [[Google Scholar](#)] [[Publisher Link](#)]
- [37] William M.K. Trochim, “An Introduction to Concept Mapping for Planning and Evaluation,” *Evaluation and Program Planning*, vol. 12, no. 1, pp. 1-16, 1989. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [38] Cria O. Gregory et al., “Health Perceptions and Demographic Characteristics Associated with Underassessment of Body Weight,” *Obesity*, vol. 16, no. 5, pp. 979-986, 2008. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [39] James A. Rye, and Peter A. Rubba, “An Exploration of the Concept Map as an Interview Tool to Facilitate the Externalization Of Students’ Understandings About Global Atmospheric Change,” *Journal of Research in Science Teaching*, vol. 35, no. 5, pp. 521-546, 1998. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [40] Christopher Joiner, “Concept Mapping in Marketing: A Research Tool for Uncovering Consumers’ Knowledge Structure Associations,” *Advances in Consumer Research*, vol. 25, no. 1, 1998. [[Google Scholar](#)] [[Publisher Link](#)]
- [41] John R. Anderson, “A Spreading Activation Theory of Memory,” *Journal of Verbal Learning and Verbal Behavior*, vol. 22, no. 3, pp. 261-295, 1983. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [42] Geraldine R. Henderson, Dawn Iacobucci, and Bobby J. Calder, “Brand Diagnostics: Mapping Branding Effects Using Consumer Associative Networks,” *European Journal of Operational Research*, vol. 111, no. 2, pp. 306-327, 1998. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [43] David Woodruff Smith, *Phenomenology*, Stanford Encyclopedia of Philosophy Archive, 2018. [[Google Scholar](#)] [[Publisher Link](#)]
- [44] Anne Flood, “Understanding Phenomenology,” *Nurse Researcher*, vol. 17, no. 2, pp. 7-15, 2010. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [45] Jean-François Lyotard, *Phenomenology*, State University of New York Press, pp. 1-147, 1991. [[Google Scholar](#)] [[Publisher Link](#)]
- [46] Amedeo Giorgi, and Barbro Giorgi, *Phenomenology, Qualitative Psychology: A Practical Guide to Research Methods*, Sage Publications Inc, 2003. [[Google Scholar](#)] [[Publisher Link](#)]
- [47] Frances Rapport et al., “Qualitative Research within Trials: Developing a Standard Operating Procedure for a Clinical Trials Unit,” *Trials*, vol. 14, pp. 1-8, 2013. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [48] Julie C. Libarkin, and Josepha P. Kurdziel, “Research Methodologies in Science Education: The Qualitative-Quantitative Debate,” *Journal of Geoscience Education*, vol. 50, no. 1, pp. 78-86, 2002. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [49] Daniel Black, *Digital Interfacing: Action and Perception Through Technology*, Routledge, 1<sup>st</sup> ed., pp. 1-210, 2018. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [50] Jack Martin, “Measuring Clients’ Cognitive Competence in Research on Counseling,” *Journal of Counseling & Development*, vol. 63, no. 9, pp. 556-560, 1985. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [51] Carola Grebitus, *Food Quality from the Consumer’s Perspective: An Empirical Analysis of Perceived Pork Quality*, Cuvillier, pp. 1-263, 2008. [[Google Scholar](#)] [[Publisher Link](#)]
- [52] Philipp Mayring, *Introduction to Qualitative Social Research*, Beltz, 2016. [[Google Scholar](#)] [[Publisher Link](#)]
- [53] Satu Elo, and Helvi Kyngäs, “The Qualitative Content Analysis Process,” *Journal of Advanced Nursing*, vol. 62, no. 1, pp. 107-115, 2008. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [54] George B. Cunningham, “Perceptions as Reality: The Influence of Actual and Perceived Demographic Dissimilarity,” *Journal of Business and Psychology*, vol. 22, pp. 79-89, 2007. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [55] Eunkyung Park, “Overestimation and Underestimation: Adolescents’ Weight Perception in Comparison to BMI-Based Weight Status and How it Varies Across Socio-Demographic Factors,” *Journal of School Health*, vol. 81, no. 2, pp. 57-64, 2011. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [56] Jun Li, Faizan Ali, and Woo Gon Kim, “Age Matters: How Demographics Influence Visitor Perception and Attitude at the Destination Level,” *International Journal of Innovation and Learning*, vol. 21, no. 2, pp. 149-164, 2017. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [57] Huda Khan, and Richard Lee, “Does Packaging Influence Taste and Quality Perceptions Across Varying Consumer Demographics?,” *Food Quality and Preference*, vol. 84, 2020. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [58] Yaakov Kareev, Iris Lieberman, and Miri Lev, “Through a Narrow Window: Sample Size and the Perception of Correlation,” *Journal of Experimental Psychology: General*, vol. 126, no. 3, pp. 278-287, 1997. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [59] John J. Hater, and Bernard M. Bass, “Superiors’ Evaluations and Subordinates’ Perceptions of Transformational and Transactional Leadership,” *Journal of Applied Psychology*, vol. 73, no. 4, pp. 695-702, 1988. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [60] William H. Starbuck, and John M. Mezas, “Opening Pandora’s Box: Studying the Accuracy of Managers’ Perceptions,” *Journal of Organizational Behavior*, vol. 17, no. 2, pp. 99-117, 1996. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [61] Thomas P. Schambach, and Jim Dirks, “Student Perceptions of Internship Experiences,” *Proceedings of the 17<sup>th</sup> Annual Conference of the International Academy for Information Management (IAIM)*, Barcelona, Spain, pp. 1-8, 2002. [[Google Scholar](#)] [[Publisher Link](#)]

- [62] Jennifer Mc Sharry, R. Moss-Morris, and T. Kendrick, "Illness Perceptions and Glycaemic Control in Diabetes: A Systematic Review with Meta-Analysis," *Diabetic Medicine*, vol. 28, no. 11, pp. 1300-1310, 2011. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [63] Hermine Mitter et al., "Exploring Farmers' Climate Change Perceptions and Adaptation Intentions: Empirical Evidence from Austria," *Environmental Management*, vol. 63, pp. 804-821, 2019. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [64] Delhi Air Quality Map: Live Air Pollution Map of Delhi, IQ Air, 2024. [Online]. Available: <https://www.iqair.com/in-en/air-quality-map/india/delhi>
- [65] Madhuri Sharma, and Rajesh Kumar Abhay, "Urban Growth and Quality of Life: Inter-District and Intra-District Analysis of Housing in NCT-Delhi, 2001–2011–2020," *GeoJournal*, vol. 87, pp. 797-819, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]