

# Understanding the Street Attributes in Influencing Livability on the Mixed Land use Neighbourhood Streets. A case study of a street in Bangalore

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## ABSTRACT

Urbanisation is happening rapidly all over the world. As population increases in the urban settlements, it's required to provide quality of life to all the inhabitants who live in. Livability is the concept where inhabitants have quality of life in terms of social, economic, cultural and physical aspects. Streets are public spaces which have mixed land use, operate as meeting places, market places and create accessibility to various destinations and space for pedestrian and vehicular movement. People socialize, shop and move on streets. Streets in the urban scenario have all the above said to be fulfilled to achieve quality of life that is livability. Functions on streets are vital and create a sense of belongingness. In the present situation, traffic and diversified uses on streets created an imbalance on the users and their functional dimension. This paper attempts to understand the street attributes which makes the street safe, livable and place of interest. The methodology of the research attempts to understand the social qualities of streets which influence the livability and enhance the perceptual qualities of user.

**Keywords:** Livable streets, mixed land use neighbourhood streets, Quality of life, Sense of safety and comfort, Social behaviour

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## INTRODUCTION

Livability is a concept to state the living environment of the inhabitants and speaks on the quality of life of inhabitants in the locality. Livability is defined as the 'quality of life' or 'well-being' as experienced by the people in the particular region. Livability is applied to the quality of life of a region, a settlement, a neighbourhood or can be a street or any public realm. The public realm in any settlement is an accessible precinct and constitutes a social, economic, cultural and political part of the settlements. Livability is influenced by social, economic, cultural and physical aspects of the context. This paper explains the social and physical aspects on streets which have an impact on safety and comfort of different users on the street which means the physical and social attributes which contribute to achieve livability. The livable concept is essential in the commercial streets of the neighbourhood which creates social inclusion and provides safety and comfort for pedestrians. People have always lived on the streets. They have been the places where children first learned about the world, where neighbours met, the social centres of towns and cities. As there is a mixed land use in the neighbourhood commercial streets, multimodal transport system, growing population and diversified functions on the street, the users are chaotic and confused in their movement and also have an impact on behavioural setting. The physical and social attributes contribute the sense of belongingness to the users. Streets have many functions that give the sense of belongingness and thus increase the 'well-being' in the precinct. The physical characteristics of streets which are on street elements and off street elements contribute to make streets legible and accessible, and also provides a safe, comfortable and visibility to the users. The buildings, its envelope, their function and sidewalk and its physical dimensions and elements present on sidewalk matters a lot to the pedestrians and also for traffic movement on the street. It is important to understand the street character and the role of physical characteristics of the neighbourhood commercial street to achieve livability.

## STREETS AS PUBLIC SPACES

Think of a city and what comes to mind? It's streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull. Public space is defined as 'publicly accessible places where people go for group or individual activities'. Public space in urban fabric is such space which has physical and visual access. Research statistics in urban studies states that public space is important to generate, enhance and sustain a sense of community. Streets form public space in urban context. Streets are moving corridors for pedestrians and vehicular traffic. Streets are bazaars, theatres, exhibitions, eat out spaces and many more. Commercial streets include a range of activities from

eating, worship, business, shopping, vending and also for protests, funeral or marriage processions. Multifunctional streets are not only traffic infrastructures, but also lively and inclusive public places and places of economic development. The neighbourhood commercial streets are the hub of mixed land uses and support social interaction. The livability is created by the existence of social and physical attributes. Due to urbanisation, streets are widened to meet the flow of increased traffic. The importance of the street edge is concentrated on the movement of vehicles rather than the pedestrian movement. But, people preferred the setting of space to meet friends, enjoy window shopping and entrances, and watch other people and activities. A pedestrian friendly street with proper sidewalk space with street furniture, shade and shelter and articulated building facades increases the ambience and comfort on commercial streets. "Streets and their sidewalks, the main public spaces of the city, are its most vital organs. Sidewalks, their bordering uses, and their users, are active participants in the drama of civilization..." In urban areas, streets represent a majority of the area of public space and efforts to rejuvenate the streets are made to make streets lively and generate activities. In mixed-use neighbourhoods, much of this public and social life now occurs at such venues on neighbourhood commercial streets.

### **NEIGHBOURHOOD STREETS:**

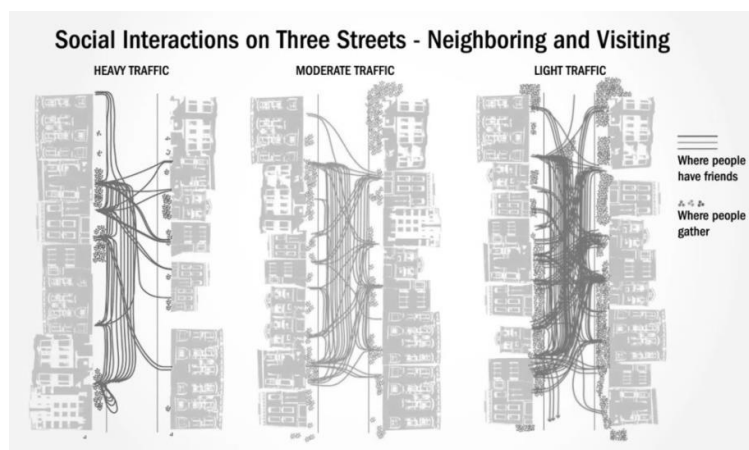
The neighbourhood streets are mixed land use streets that link retail and residential districts, connect physical characteristics, and accommodate social activities and cultural resources. Human interaction is the primary criteria in any neighbourhood street.

Neighbourhood streets are for a pedestrian that means walking and public life of pedestrians creates an inherent relationship. Pedestrians bring close contact to other people and outdoor activities that are social in nature. Qualities of sociability are dramatically enhanced in sociable transactions that transpire in public spaces and most especially in pedestrian spaces.

### **LIVABLE STREET:**

"The street has always been the scene of this conflict, between living and access, between resident and traveller, between street life and the threat of death" as well as "Liveable streets are comfortable, welcoming and safe places where people can live, play, socialise, travel and shop. These streets bring people together and foster a strong sense of community".

The concept of Livable streets was first coined by Donald Appleyard in 1981 after studying the traffic and territoriality of human activities on high, medium and low traffic roads. Many attempts have been made to define the characteristics of livable streets. Appleyard states that an ideal street is one which provides safe, healthy, green and enjoyable surroundings.



Source: Livable streets by Donald Appleyard

Appleyard found that the amount of car traffic on the street controls the interaction amongst the neighbours. He conducted a study on livable streets, comparing three residential streets in San Francisco where traffic volume differed on every street. The 16,000 vehicles per day were observed on heavy traffic streets and around 8,000 on medium traffic and 2000 on light traffic streets. His study researched that residents of Light Street had more friend's acquaintances than the people on Heavy Street.

Livable streets are sociable streets which are part of a neighbourhood used by local residents, visitors, workers and many more for myriad purposes of socializing, shopping every day, dining, lingering, celebration and other defined uses. A relationship between livable street and residents is through social inclusion, street traffic, infrastructure interactions and stakeholders. Streets within neighbourhood are to be a safe and comfortable environment for pedestrians, children, and all aged people to access the facilities. Livable streets also allow motorized vehicles with

restricted speed and less domination. Livable Street encourages public space on the street and give the users a freedom to use the functions and enjoy the multiple activities on the street.

Livable Street is a movement space with paved corridors for pedestrians and lined with buildings on either side. It's a public realm in the urban scenario which creates social spaces with proper landscaping and street furniture. Allan Jacobs describes an urban street played the role of uniting the circulation route, the public places and the built frontages thus establishing urban identities.

Neighbourhood Streets are the place where people gather easily, inexpensively, regularly and pleasurably. Outdoor public realm is created on street with daily activities like shopping, travel, interaction with friends and relatives. Streets are a social and physical dimension in the urban public realm. Lawrence Halprin in his book 'cities' in 1963 says that the neighbourhood streets gives a better living environment, knitting together the urban fabric of people and places that make up a community.

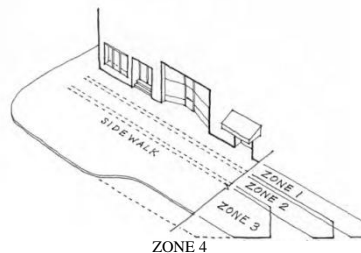
Livable streets are sociable streets which are open-minded spaces, designed for a variety of uses, inclusive of many functions and used by different people to their convenience. Such streets are a desired component of a good mixed use neighbourhood.

Neighbourhood streets should represent the following qualities;

1. The street is safe to access : Streets should be safe from traffic and speed. Pedestrians and children should be able to walk safely through the neighborhood streets.
2. The street as a Livable : Street should encourage activities and social life between neighbors, and be provided with suitable sidewalks, street furniture, and play places for children.
3. The street as a clean public space : Residents have to feel that street belongs to them, a sense of cleanliness and well maintained.
4. The street as a green and pleasant land: Trees, plants and landscape are most desired in big cities; they provide a relief from pollution, shade, and a pleasant visual natural environment.
7. The streetan historic identity: Street shows an unique quality through ages and certain characters gives a sense of place more than a traffic corridor.

Aim of the study is to identify and retain the identity of streets in the neighbourhood by integrating social spaces onto the activities of streets to make streets livable. It's so crucial to understand the characteristics of the street, physical features, type of activities and functional and social spaces.

### NEED AND AIM OF THE STUDY



The zone of interest is divided into three zones based on the activities to happen.

Zone 1: The first zone was along the edges of buildings and was essentially used for entering and exiting, window-shopping.

Zone 2: The second zone was primarily for pedestrian movement.

Zone 3: The third zone was used to perform the majority of the stationary and social activities observed on the street, such as street furniture, trees for shading etc.

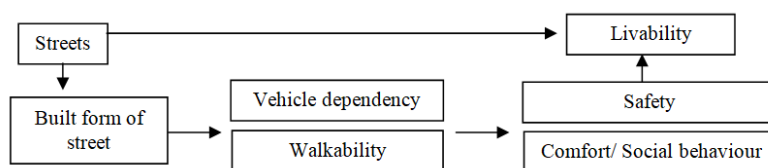
Zone 4: Vehicular movement.

ZONE	USE	USERS
Z 1	Foot path	Pedestrians
Z 2	Parking	Pedestrians, parking
Z 3	Non motorised way	Pedestrians, bicycles,
Z 4	Motor way	Pedestrians, vehicles

In Indian context, in present days the role of a street is to act for vehicular movement, transferring traffic, goods and services through urban areas. More vehicular activities have an impact on pedestrian movement and public life on the

street. Zone 3 is occupied by vendors, on street parking and many obstructions which have spoiled the quality of social spaces that need to be experienced by pedestrians. The chaotic activities on pedestrian zone like extension of building frontage, vendors occupying the space, on street parking and many more obstructions have squeezed the pedestrian space thus encouraging a researcher to understand the spaces that creates livability on the street.

Streets have an influence on livability impacts impacts



Livable streets offer a place, comfort, definition of scale, visual sense, transparency, compatibility in terms of land use and well maintained. Livable street is that mode of street in the neighbourhood that allows spontaneous social interchange for its users. This achieves the sense of completeness and users experience the sense of belongingness. Aim of the study is to identify and retain the identity of streets in the neighbourhood by integrating social spaces onto the activities of streets to make streets livable. It's so crucial to understand the characteristics of the street, physical features, type of activities and functional and social spaces. Donald Appleyard raised a question, "What could a residential street -a street on which our children are brought up, adults live, and elders spend their last days- be like?".

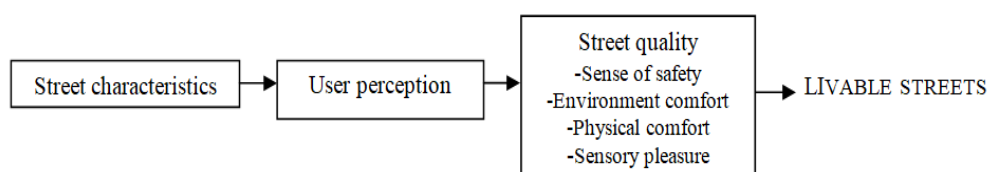
#### STREET ATTRIBUTES TO LIVABILITY:

INDICATOR	SUB INDICATORS
COMFORT	Physical comfort
	Accessibility– Access points
	Street vendors
	Building setback- Pedestrian movement
	Climatic comfort
SAFETY /SECURITY	Pedestrian safety
	Traffic safety
SOCIALNESS	Building activity
	Building frontage
	Transitional spaces

Source: Authors

#### METHODS TO STUDY NEIGHBOURHOOD STREETS:

The research addresses the methods to study the on street elements and peoples activities along the streets. Since the aim of the research is to understand the social spaces on the street, it is required to study the people's activities and their social behaviour to derive livability. This article discusses the study of streets in Bangalore city. A conceptual framework is derived to study the street attributes which will contribute to livability. The research is done on selected streets to study the existing physical attributes and user's social behaviour and their perception on streets. The first stage is the field work as a basic method, the mapping of physical dimensions of the street with sidewalk and its elements are done through field observations and the people's behaviour is recorded by interviewing the street users. The questionnaire survey method is employed to gather information about people's preferences on streets that could allow them to linger and socialise along public streets.



STREET CHARACTERISTICS	USER PERCEPTION	STREET QUALITY
Street length and width	Purpose of visit	Building transparency
Street edge	Duration of stay on street	Street permeability
Building frontage	Favourite places	Street furniture
Building use	Cleanliness and maintenance	Density of people
Pavement characteristics	Pedestrian comfort	Landscaping
Parking	Building versus sidewalk	Open spaces and plazas
Formal and informal business	Frequency of visit	Night time safety

Multiple attributes are considered which affect the livability on streets. The qualitative and qualitative methods reinforce the research techniques in getting the authentic data to derive the results. Mixed methods research provides an opportunity to explain the findings of one method through another, thereby improving the accuracy of findings.

### CASE STUDY OF BANGALORE STREETS:

Bangalore is one of the metropolitan cities in the country and has exhibited a great enhancement in the field of information technology and biotechnology sector. The rise in the urbanisation degree was observed since 1990 and there is a major shift in the urban form. The number of people in the tertiary sector of occupation and their demands and requirements has changed the physical setting of the city. Larger investments are made in the logistics sector and housing improvements and different kinds of urban form evolved. People's preferences, cultural diversity, economic balance, and physical characteristics changed the older parts of the city and gave a new dimension to the newer developments.

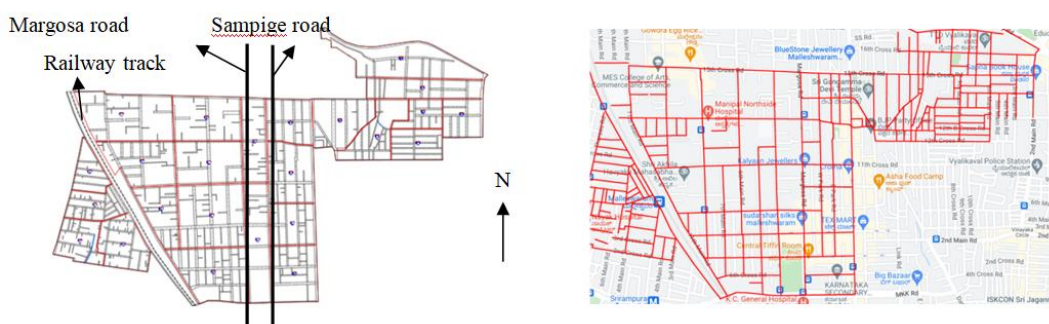
Bangalore is the capital of Karnataka state and has a population of 9,621,551 as per 2011 census data. The history of the settlement dates back to the first half of the 16<sup>th</sup> century and has experienced the significant growth till today. Bangalore is the only city in Karnataka state that could accommodate any economic insert and experienced pull factor from other parts to the state. Population has increased significantly and has an impact on the urban infrastructure and urban amenities. Due to increased population, the resultant space in the city like streets and other public spaces became neglected.

In this context, it is essential to understand the complexity of urban streets and factors that shape them. This research attempts to analyse the spatial factors of streets and understand the existing paradigms on streets which would quantify with the requirement of livable streets.

### SURVEY METHODS:

**Observation method:** Observation method employed to select the streets in the mixed land use neighbourhood streets. Hierarchy of streets is studied in the neighbourhood and secondary or minor roads are selected to study. According to Donald Appleyard, less traffic streets will have more social inclusiveness and more territoriality amongst residents of the neighbourhood.

Malleswaram is an old residential neighbourhood in Bangalore. Malleswaram is a well-planned locality like a chess board situated in the North West part of Bangalore city. There is a boundary defined to this neighbourhood where the railway line marks the boundary. Main roads run North to South are main roads and perpendicular are the cross roads. This neighbourhood has mixed demographics, comprising all different income families. This area is very near to the CBD of Bangalore city and has a greater impact on commercial and residential sector. New developments are seen in terms of residential typology that means individual old plots to newer high rise apartments. Malleswaram is the hub of the retail commercial sector. This area is known for its daily shopping, clothes and apparels and street shopping. This area is well accessed by different modes of public transportation like Metro, BMTC buses and auto rickshaws. The interconnecting roads which link this area to other parts of the city are Sampige road and Margosa Road.

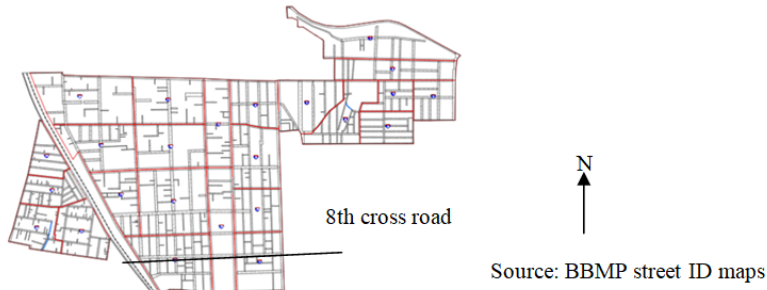


Source: Open city maps. <https://opencity.in>



This area has mixed land use of residences, commercial setup, educational institutions, religious precincts, hospitals. This area has a true mix of various land uses. Existence of big malls and Malleswaram 8<sup>th</sup> cross road enhances the commercial sector in the neighbourhood. Malleswaram in its essence is full of shops, trees, temples and south Indian food. 8<sup>th</sup> Cross Malleswaram is termed as a middle class version of Brigade road in Bangalore. This street has temples, vegetable markets, well known textile shops and street vendors add a vibrant function to the street. Each cross road has its own defined function and activities. 11<sup>th</sup> cross Malleswaram is for flowers and garlands.

Malleswaram is a neighbourhood which has something to offer to all age groups and diversified cultural groups of the city. After the observation study of the whole neighbourhood, 8<sup>th</sup> cross road suited to be ideal to study because of its vibrant activities and foot fall of people in comparison to other cross roads.



Malleswaram 8<sup>th</sup> cross is a mixed land use neighbourhood street.



a. Side walk



b. Vendors on sidewalk



c. On street parking



d. Building frontage  
Source: Authors



e. Pedestrians walk on street

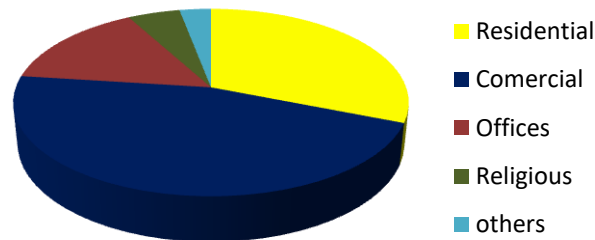


f. Temple Setting of street at different nodes

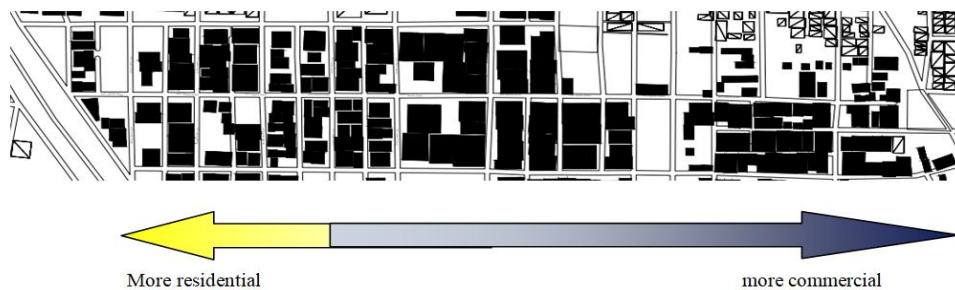
This street is little crowded with lots of commercial activities and vendors occupied the street. Largest temples of the city located on this street add a variety of activities on to the street. The ground floor of buildings has local commercial shops, residential and offices are shifted to the above floors. Corners of the intersections have lots of vending activities. The whole street is lined with trees on either side indicating that this area is much older part of Bangalore.

#### LAND USE PATTERN:

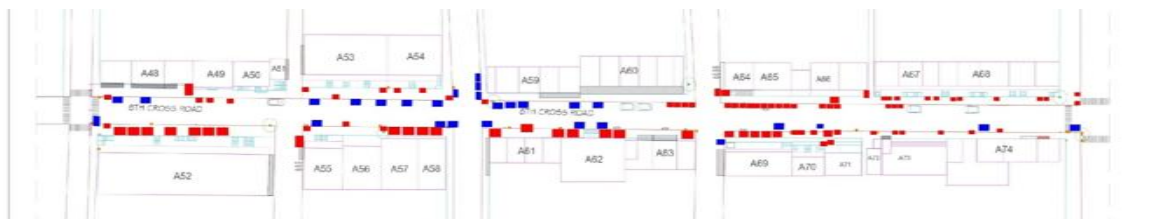
This street composed of commercial, offices, religious, educational and residential land uses.



Commercial land use is prominent either on shop or on street vending. The whole stretch of street have commercial set up on o the street frontage. Different types of commercial shopping like, women clothing and suits, jewelry, men's branded showrooms, interior decorative items, restaurants and cafés and etc., Residential land use is at the third floor and higher level giving space to commercial at lower spaces due to high land value. Either apartments or individual housing is found all along the stretch of street. Various banks, head offices, charity offices are part of offices land use.



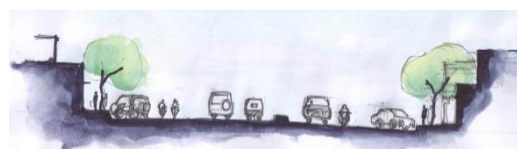
Different categories of vendors like, Clothes, vegetables, food, flowers, decorative items and women's novelties. Street vendors were stationary or on mobile carts occupying sidewalk and spread o to street.



Part of the street between Margosa Road and Sampige Road showing the vendors on the sidewalk and on the street in the afternoon.

Source: Authors

#### STREET EDGE:

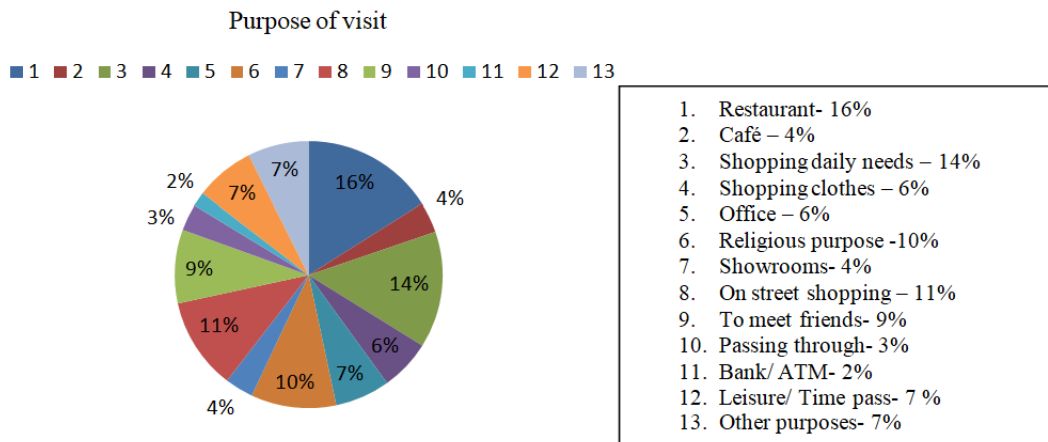


Typical section along the street with so many activities.

Malleswaram 8<sup>th</sup> cross is well known for shopping and eating. Its street shopping creates a different environment in the public realm. Sidewalk measures 3 m along the stretch of the street and is used differently at varied points. A pedestrian experiences a wild walking on the sidewalk. Street edge is lined with trees on either side creating a chaos to the pedestrian since all trees are planted on the sidewalk. Sidewalk curb is not maintained well creating ups and downs to pedestrian path way.

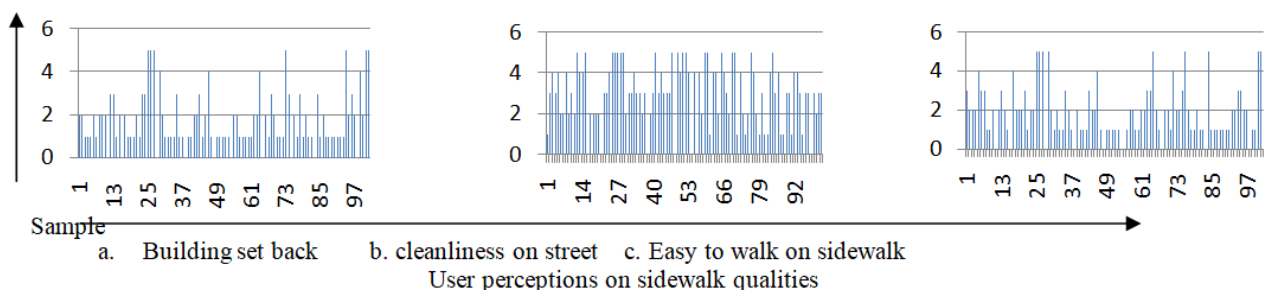
Parking on the street is another issue that is in need of concern. Street edge is not accessed well due to parking on either side in the peak hours creating a disturbed walk to a pedestrian.

### USER PERCEPTION:



The study area has been observed and quantified qualitatively. On the qualitative survey method, the questionnaire survey was conducted to get the data of purpose of visit to the street. About 101 persons were questioned and data collected which would be analysed further.

1 is strongly dis- agree and 5 is strongly agree



### User perceptions on sidewalk qualities

Questionnaire data states that 80% of the people feel that the building and its activities open onto the sidewalk without set back. Users have an opinion that cleanliness and maintenance has to be improved. Lots of fruit and flower vendors create garbage on the street. Walking on the sidewalk is difficult due to the extended activities of shops on the sidewalk and also the vendors on the street. Vehicular movement and on street parking creates chaos while walking.

### CONCLUSION

Public streets are the most complex urban environment where designers and planners have to consider different levels of attributes and users perception. The study was conducted on Malleswaram 8<sup>th</sup> cross road, a neighbourhood street of Bangalore city. Different attributes of livability like comfort, safety and socialness were studied and measured with different study attributes. Quantitative and qualitative surveys conducted to understand the physical characteristics of on street elements and users perception on the quality of street. The comfort level needs to be enhanced with design elements where pedestrians should have easy a walk on the sidewalk. If proper sidewalks are created with standard dimensions and typical sections, it will create an environment of socialness and public realm. The quality of streets would be increased only when a designer considers the pedestrian comfort and safety which promotes socialness. If all the attributes are satisfied there is the factor of livable streets on the mixed land use neighbourhood streets.

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