



DEVELOPMENT OF SUSTAINABLE URBAN STREETS IN NEIGHBORHOOD: A CASE OF BASAVANAGUDI

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Abstract— As we progress towards urbanization the streets are becoming more complex and significant system in Urban area. The concept of sustainable streets plays a vital role in creating vital urban spaces. Urban streets are places in a city where people come together to interact and spend some leisure time in the given urban lifestyle, apart from commuting. Automobiles dominate the urban streets and people's life, hence makes walking less attractive and necessary. The city hence is losing its energy consequently and leading to an automobile driven society.

The paper outlines a global perspective of creating people centric streets for the sprawling metropolitan cities where urbanization is rampant and rapid. The first part of the paper discusses how a place can be defined and how the current technology has changed our lives and lifestyles. The latter part of the paper throws light on, how to create sustainable streets as thriving components of a city, with the case study of urban morphology of a neighborhood "Basavanagudi" in Bengaluru. Basavanagudi, a commercial and residential locality houses numerous old and beautiful temples, elite institutions, busy marketplaces, parks, and lakes. This residential neighborhood has become a hectic hub for business communities today.

Through this paper, we intend to understand the urban morphology of the locality by studying the public areas in the thick of the residential neighborhood. The most sort after public area of this locality being Gandhi Bazaar that hosts many shops, also houses the most vibrant informal street market in the city. Public Spaces serve more vibrant and livable streets that offer social and economic benefits, including walkability, connectivity, and better living experience. The paper is concluded with the analysis of the results of the study of neighborhoods and community in the spatial sense. We have attempted creating the parameters for a walkable city and implemented the same on the chosen area as a possible prototype.

Keywords— Urban Morphology, Urban Street, Sustainability, Walkability and Neighborhood

I. INTRODUCTION

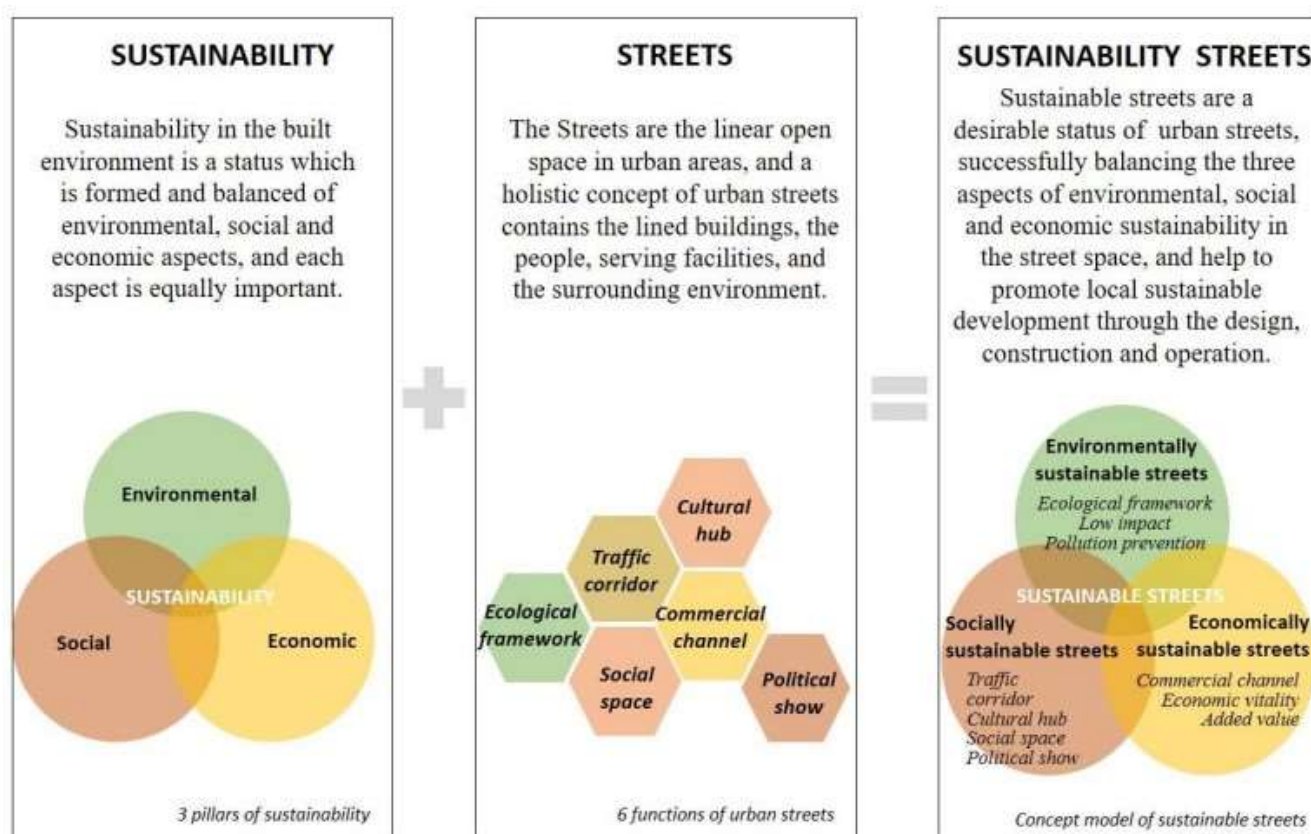
The cities in India are growing at very fast rate, with an urbanization rate of 34.9%. With the current urbanization trend, the city is growing hap-hazardously. There are tremendous issues faced by urbanization. Losing the spaces

dedicated for the public is just one of them. Cities are characterised by the public spaces and neighbourhoods within them, which serve as the focal points for the socio-economic and cultural activities that define the distinctive characteristics of the community and frequently offer opportunities for personal growth. The associations of public areas are always the same, reflecting the differences in context, society, and time. The majority of the public places develop naturally over the course of some period of time, but some of them may be created to reflect the society. Because they are the centre of a community and define its "sense of place," public spaces also encourage social interaction, which is essential for a high-quality urban life. This transition may also be seen in the urban streets, which are one of the most significant components of the urban system. Particular land systems and urban morphologies, in the context of huge population and rapid urbanisation, have created many "large, boring and car-oriented streets". (Brier and lia dwi jayanti 2020)

A significant contribution to the development of progressive urban culture is made by the urban streets that make up the primary element of the public space. The oxford dictionary (2016) defines the "street" as "a public road in a city or town that has houses and buildings on one side or both sides". The physical and social dynamics of streets empower the communities they inhabit by nurturing positive social interactions. Strengthening the connection between people and the places they share will shape our public realm to maximize shared value. With community-based participation at its center, an effective 'streets as places' process capitalizes on a local community's assets, inspiration, and potential, and results in streets that contribute to people's health, happiness, and wellbeing.

II. SUSTAINABLE URBAN STREETS

Many scholars have studied and given various interpretations of urban streets. Palladio (1508-1580) raised a geometric perspective to explore and depict the pleasant streetscape in "The Four Books of Architecture" (Palladio, 1965). Jacobs (1961) believed that the streets are the most important organs of one city. Lynch (1981) introduced psychology into urban research and expounds the



significance of urban streets for people to understand a city. Gehl (1987) used the human dimension as the starting point to study and measure the success of urban streets. In summary, many researchers highlight the unique values of streets to a city: they are the most significant public space. urban streets are the linear open space in urban areas. Except for the linear space similar to the road, a holistic concept of urban streets also contains the lined buildings, the people, serving facilities, and the surrounding environment. (Brier and lia dwi jayanti 2020)

very rapid pace. It had developed into a residential and commercial locality in Bangalore. The name "Basavanagudi" refers to the Bull Temple which is a major religious landmark on the cultural map of Bangalore. The name "Basavanagudi" comes from the Bull Temple, which is one of the important religious precincts of Bangalore.

Gandhi Bazaar Main Road and D. V. Gundappa road sits on land that has been an important part of Bangalore's history and it has its own identity and unique features. It is

Figure 1: Procedure of Concept Development of Sustainable Streets

Source: (Brier and lia dwi jayanti 2020)

III. BACKGROUND OF BASAVANAGUDI

Basavanagudi is one of the earliest and most historically significant neighbourhoods in Bangalore's south, one of the city's expanding metropolitan areas. It is the replica of the Bangalore of yore, with wide tree lined avenues dotted with houses on defined grid iron pattern. After the major epidemic that occurred in 1898, the city administrators were compelled to enforce the rules of town planning that placed an emphasis on public health. As a result, a plague camp was established in the area. It is constructed strictly according to the grid iron pattern, which makes it possible for the built forms to be formed facing the cardinal points in accordance with the old planning principles. This is accomplished by following the rectangular design, with roads going north to south and east to west. The remarkable endurance of the network of roads, open spaces and interlinked communities of these original layouts of Bangalore has now prompted urbanization at a

that stretch of the road where people go for shopping, eating or just 'hanging'. It is becoming a highly packed, congested, polluted, and chaotic environment which is imposing a huge strain on the neighborhood fabric as it is currently under the

burden of tremendous expansion and unchecked transformation.

IV. CULTURE AND FESTIVALS

This area is the cultural capital of Bengaluru with predominant kannadiga population and lot of festivities. Every year three day fair of peanuts is held near dodda ganapathi temple of Basavanagudi called Kadalekaye Parishe which translates to Groundnut Fair. Lot of different kinds of groundnuts are exhibited and sold during this time. Kadalekaye Parishe is one of the most famous events

celebrated in the city of Bangalore. In this occasion the farmers offer pujas and thank the almighty for the better cultivation of Crops in the coming year. Many groundnut

shop owners, owners and tenants of the residential houses.



A. Morphology

The figure ground diagram illustrates the distinct delineation of urban spaces and the elements that connect these spaces. The desirable location of the land has ultimately resulted in a mixed-use development with commercial/ retail on the lower level. The building is increasingly getting denser due to its strategic location and increasing land price. The figure ground indicates built spaces and unbuilt spaces which includes streets as linear grids, open spaces, parks and playgrounds.

traders visit the fair of Kadalekaye Parishe every year to sell variety of groundnuts. It is also one of the prime attractions of the city. The fair and the festival attract many visitors in Bangalore city during this occasion.

It is mostly residential area covering 80% of the total as residential land use. Remaining 20% includes commercial (mainly shops, retail stores and restaurants), green space, public utilities and mixed use.

V. STUDY AREA

A total of 1.8 square kilometres of the study area have been selected taking MN Krishna Rao park in the centre. The main commercial street of Basavanagudi is Gandhi Bazaar Main road and DVG Road, which is home to numerous retail businesses including some famous eateries/ restaurants.

VI. SURVEYS

A set of surveys was conducted in the study area. The surveys included residential and the commercial surveys including opinion surveys and roadside interviews. The



Figure 4: Land Use Map

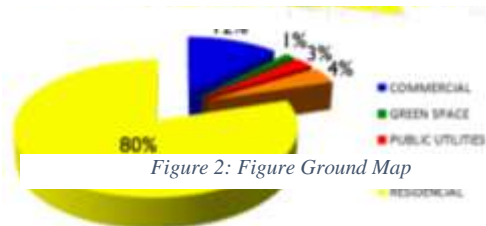


Figure 2: Figure Ground Map

Figure 5: Land Use Ratio

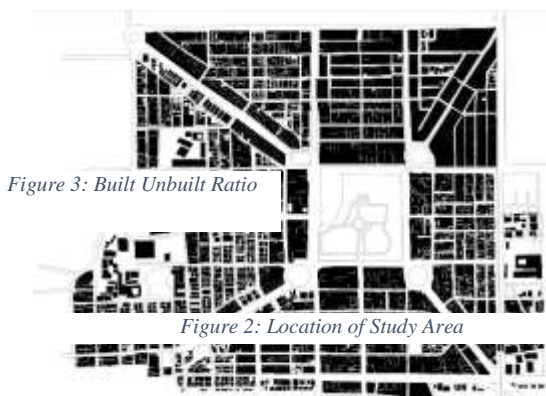
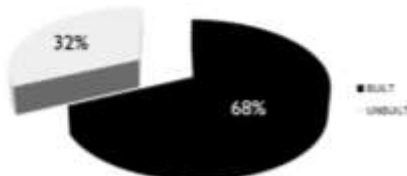


Figure 3: Built Unbuilt Ratio

Figure 2: Location of Study Area

targeted people for conducting the surveys are pedestrian, shoppers, visitors,



Most of the building heights vary between G to G+3 comprising of 86% with only 14% above G+4. Most of the buildings in the study area are in average condition as the construction is more than 10 years old comprising of 46% of the total. 34% are in good condition and only 20% in poor condition.

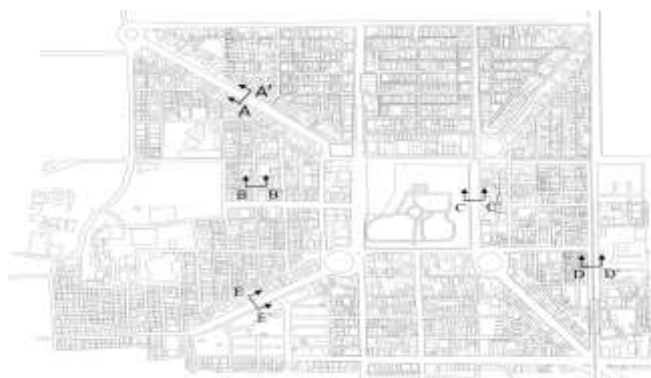
The area consists of a wide range of eateries, most of them are concentrated on the peripheral zone. Most of the public

utilities like hospitals, banks and ATMs, hotels and restaurants, temples, institution and public buildings and bus stops are located upfront on the main streets. Multiple spots of cultural and religious importance also exist alongside other developments.

Open and green urban spaces will consist of open areas, recreational fields, parks, botanical gardens, patches of vegetation, and so on. Along with a linear greenway (series of trees), the study location contains a well-known neighbourhood park- MN Krishna Rao Park. Multiples trees of various varieties are seen- Mahogany, rain tree and Gulmohar are prominent ones along with other native species. Huge, canopied tress exist along arterial roads and sub arterial roads which provide shade to the entire streets.

B. Circulation and Public Realm

The street pattern is the most influential factor in determining the physical layout of an area or neighborhood and has a significant bearing on the accessibility criteria. The study area is well-connected in terms of various street hierarchies and within walking distance of public transport facilities. Through its street hierarchy, the Basavanagudi plan emphasizes the importance given to pedestrians (refer to fig. 6) to promote walkability in the neighborhood. Within 500 meters, the study location is well-connected by multiple street hierarchies and public transportation options.



As a result of hawkers occupying the footpaths and sides of the carriage way, most of the major streets have been encroached upon, which makes it impossible for people to walk on the footpaths. The footpaths are quite congested and

Figure 6: Location of Sections

are rarely maintained. The majority of the area on the walkways is taken up not just by the hawkers but also by electric poles and trees. The presence of pedestrians, hawkers on the footpaths, and unauthorized parking on the carriage way all contribute to the formation of traffic bottlenecks, which in turn makes it difficult for vehicles to move through the area. During festive times, the neighborhood is overrun with hawkers, particularly on Gandhi Bazaar Main Road and DVG Road; as a result, it is extremely challenging for pedestrians to navigate the area, and it is even more difficult for vehicles to move through



Figure 7: Street section across Gandhi Bazaar Road (AA')

the area. To improve the quality of the walking experience across the neighborhood, particularly along the primary commercial thoroughfares of Gandhi Bazaar Main Road and DVG Road, improved pedestrian infrastructure and streetscape facilities are required.

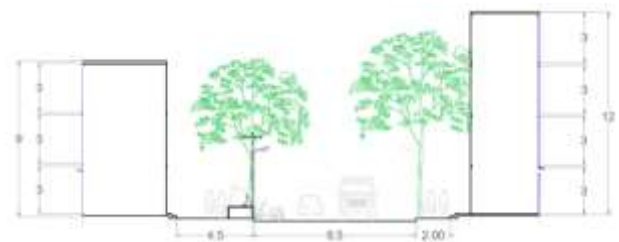


Figure 8: Street section across DVG road (BB')

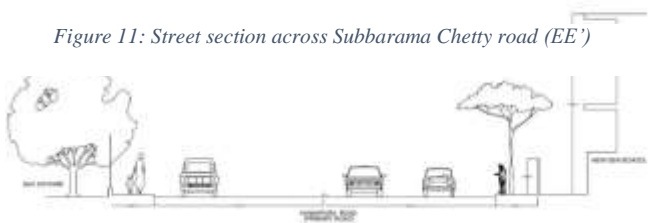


Figure 9: Street section across Kanakpura road (CC')

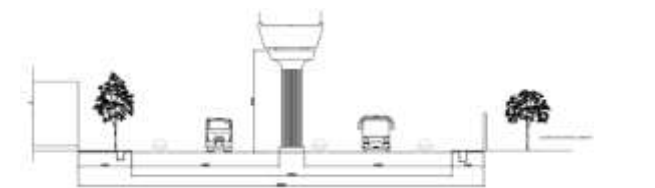


Figure 10: Street section across Rashtreeya Vidyalaya road (DD')

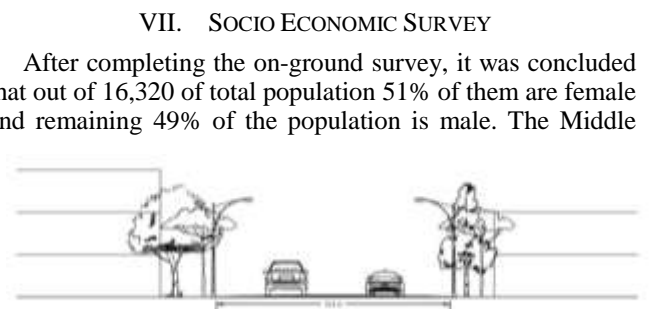


Figure 11: Street section across Subbarama Chetty road (EE')

VII. SOCIO ECONOMIC SURVEY

After completing the on-ground survey, it was concluded that out of 16,320 of total population 51% of them are female and remaining 49% of the population is male. The Middle

age group between 30 to 50 years dominates over the other

Festival Time	Complete Pedestrianization	Prohibition of motorized traffic vehicles on all day except the night by means of formal traffic orders.
Weekends	Part-time Pedestrianization	Prohibition of motorized vehicles for only few fixed hours of the day.
Full Time	Part-time Pedestrianization	Proper infrastructure for pedestrians/ cyclists/ NMT and public transport should be provided.

contributing to 35% of the total population in that area and hence denotes the habitation of working class. The least population of 6% is observed in children age group below 10 years of age. Relating to the age group study shows most people aged between 25 to 40 years are married. Hence, the married ratio dominates by 70%. The population in Basvanagudi are mostly educated with 43% of them being undergraduates. Only 2% are illiterate, with 22% being metric pass. 21% of residents in this area are students due to the area having close proximity to the institutions. Since Gandhi Bazaar is a commercial area, 21% of residents have their own private business.

39% of population in this area use public transport over their private modes of transportation as the area has good bus routes and has close proximity to metro station. 37% of population stays within 2 to 5 kilometers of their workplace in this area with only 8% of population travelling more than 20kms for work in this area. Majority of the population- 46% has occupied the place for more than 10 years, indicating it is a preferred place to settle down. 44% have 3 to 5 members indicating the rise of nuclear families in the area.

46% of the household have single earning member while 40% of the household have two earning members in a household. 71% of the residents own the property while 22% are tenants in this area. 46% of the population here owns two vehicle which generally consists of a car and a bike for convenience. 38% of the population have monthly household income of more than a lakh.

VIII. COMMERCIAL SURVEY

Eatery being the major industry in this area followed by general stores and textile. 92% of the shops here are of small scale with less than 10 employees. More than half of the employees in the stores are just 10th passed. 41% of the employees here commute daily by public transport, followed by 34% of them commuting by their private vehicle. Majority of the shops are on rent i.e., 86% and only 9% are owned leaving only 5% that are on lease which is also a type of rent. The rent amount varies depending upon the area of the stores and their location on site and on the level placement of it like ground, first floor, etc. Majority being less than a lakh per month.

IX. CONCLUSION

Not only are pedestrian zones that are successful designated routes for public use, but they also involve the creation and administration of an urban environment that is safe and conducive to pedestrian activity. According to the study that was conducted for the Bangalore Comprehensive Traffic and Transportation Plan (CTTP), Gandhi Bazaar Main Road and DVG road have been indicated as one of the roads that are eligible for becoming pedestrian only roads (refer table:1).

Table 1: Pedestrianization Strategy

There should be proper provisions provided for hawkers with dedicated spaces for them along the main commercial streets. In this way they would get allotted spaces for running their small-scale business and the traffic and pedestrians will not get disturbed/ disconnected due to issue of encroachment. The study area is all well connected from residential to commercial zones. Mixed land use is also seen as the ground floor is dedicated to commercial shops and the upper stories are used for residential purposes. MN Krishna Rao Park is situated at the center of the study area and at a walkable distance of 500m approx. from all the four sides. The metro line is running across the right end of the study area with the metro stations of Lalbagh and South End Circle. Hence, it can be concluded that the area is well connected to the metro as well as there are adequate bus stops at a walkable distance for the use of public transport.

X. WAY FORWARD

When urban residents of all ages and with a variety of abilities are able to play a crucial role in the creation, preservation, and identity of the street, and when they are able to be an integral part of the street, the shared value of the street is maximized. The public parts of the street should be developed and maintained by catering to the ever-changing requirements of the people who live in the area. It is recommended that a thorough analysis be conducted, and that solutions be presented, for inclusive interactions that promote the increased usage of Gandhi Bazar Main Road, DVG road, and Kanakpura road near the park as public spaces within the neighborhood. Streets like Gandhi bazaar, if properly built as inclusive streets, could contribute to increased sociability and community interactions, which is particularly important as urban public spaces continue to contract on a daily basis. Not only does effectively remaking public spaces in holistic neighborhoods connect communities, but it also engages people in such neighborhoods. Concepts and tactics for such public places can be gradually adopted through improved planning and design, careful consideration for important components of the streets, and active participation from the community.

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