

Streets of Traditions: exploring the character of ancient streets with the vision of contemporary streets in Vadnagar

Drashti Gajjar

Student, P P Savani University, Gujarat

Abstract—This research is based on a qualitative exploratory study. Streets play a major role in human lifestyle and well-being, and where they are directly connected to houses, they become a second home and a communal space. Vadnagar, as a city with a history of 2500 years of continuous habitation, the residents of this town are attached to their town, and now it has India's largest Archaeological Experiential Museum. The streets of Vadnagar tell a story about the history and human settlement. Therefore, this history and heritage should be preserved. From the street, this can be achieved by keeping the essence of the cultural and traditional architectural and street elements in the newer urban construction of Vadnagar in the outer part of the town. By doing this, residents can also feel a sense of belongingness and gain the advantage of the traditional architecture with modern technologies.

Index Terms—Built Environment, Cultural Bonding, Heritage, Opla, Streets, Urban Growth.

I. INTRODUCTION

All the built environment around the world plays crucial roles in our lives, from occupation to household to culture, community, travel, and the growth of civilisation. We spend most of our time near any kind of built mass or maybe on the roads while travelling. Therefore, these built environments play an important role in our well-being and human behaviour. These structures do affect the human mind. As Richard Rogers stated, "My passion and great enjoyment for architecture, and the reason the older I get, the more I enjoy it, is because we live in it, we eat in it, we sleep in it, we work in it, we play in it. And it has a huge effect on our lives."

This study focuses more on the streets and how streets can affect human nature. Streets are more than just a means of connecting areas and cities; they hold

the history of people, culture, and historical occasions.

Streets are public spaces where people can explore different lifestyles and cultures. However, "streets" is a broad term that encompasses everything from a house to the city, from rural to urban. Therefore, the focus is solely on the streets of the old town. Ancient towns in India have a heritage and a history to tell. This study emphasises the narrow streets of the town, and for that, the selected site is Vadnagar. Vadnagar is a thriving composite township of historical times, with a history of 2500 years of continuous habitation. By highlighting the interconnections between the physical environment of the streets and facades and the psychological well-being of the residents, this multi-faceted approach will articulate how and why they continue to perceive their compact houses and Vadnagar as integral parts of their identity and social relations. Now Vadnagar has India's largest "Archaeological Experiential Museum," which makes Vadnagar stand out from other cities. Because of this museum, the town now has many growth opportunities. The town is rich in culture, heritage, architecture, agriculture, town planning systems, and tourism growth. The study of the streets of this town will provide insights and a glimpse into how any future spaces can be designed to offer comfort and cultural identity through architecture.

II. STREETS AND HUMAN ENGAGEMENT

Streets are not just connected areas but also connect communities, human settlements, and culture. As Herbert Reinhold Jacobson stated, "No one thing has reflected the true simage of man through his various stages of advancement as has the road. Oldest, humblest, and most subtle of all his

accomplishments, it has carried all the joy and sorrow, love and hatred, knowledge and superstition that man has experienced. The whole history of man has been written large upon the roads of the world, but Time, the destroyer, has left us no key to the secret.” Streets are open spaces on which people can travel through vehicles from one place to another, connecting neighbourhoods, towns, and cities. Streets consist of many activities and structures. Street patterns and their usage change over time. Some streets are just for vehicular mobility, but after some development of the streetscape, that street is now livelier and holds many different activities of people, and that is how some street changes make it more vibrant.

Streets hold a lasting cultural significance. Activities like, in Asian street festivals are more likely to be celebrated on the streets. The narrow streets and alleys make it the place for talking with neighbours, sitting and watching people and movement. In urban areas, people do this at streetscapes and pedestrian roads.

Streets and roads have many different day-to-day activities like parking vehicles and taking the exit from the road, movement of vehicles on different lane streets, from crossroads, wide roads, and from low to high traffic streets.

Public transportation, such as buses, the movement of goods, and animal carts in heavy traffic and industrial or institutional areas, facilitate the transit of passengers on public transport and students from school buses along pedestrian pathways.

Public engagement on streets makes the streets livelier. People have food stalls on the streets, small stores or shaded spaces where vendor sits making the street market, encouraging commercial activities on the streets, often near public squares or parks. Many also do publicity of their business out there. On the streets like that rallies and marches also happened.

III. BEHAVIOURAL IMPACTS OF STREETS ON HUMAN WELL-BEING

Most of the time of the day is spent in public places, offices, and houses, surrounded by the built mass. The WHO report entitled Healthy Housing accepted the vital association of housing and its built environment that has a profound effect on human health in many dimensions (WHO, 2018). Streets are

considered the most important public spaces where people-environment interactions occur (Appleyard, 1981; Carmona et al., 2003; Chekki, 1994; Jacobs, 1961; Jacobs, 1995; Lofland, 1998; Mehta, 2007; Southworth and Ben Joseph, 1996; Vernez-Moudon, 1991). Mind reads all the structures and environment, and according to that, it behaves. Various factors in public spaces, such as noise pollution, visual pollution, air pollution, crowdedness, social conflicts, decreased sense of belonging, scarcity of green space, and lack of security, tend to create psychological tensions and negatively affect people’s physical and mental health (Allahyari et al., 2017; Cutrona et al., 2006; Groenewegen et al., 2018; Gruebner et al., 2017; Halpern, 1995; Hematian & Ranjbar, 2022; Layeb et al., 2016; Schweitzer et al., 2004). Street planning significantly influences mobility—walkable, well-connected streets promote a healthier lifestyle, whereas those lacking adequate sidewalks or crossings hinder walking and lead to greater vehicle dependence. Moreover, streets embody cultural identity; historic and traditional ones safeguard heritage and create a sense of belonging, while excessively commercialised or poorly designed areas may seem impersonal.

Apart from the type of land use, high-rise buildings have a repressive effect on pedestrians and may increase anxiety. This effect can be mitigated by using shades in the street that could partially block these buildings from people’s view (Gruebner et al., 2017). Pedestrian-oriented spaces encourage people to walk and perform physical activity and provide an opportunity for social interaction and encountering nature (McCay et al., 2017). Sometimes, a good social relationship can compensate for poor physical conditions, and residents are likely to remain (Galster, 1987). Studies in neuroarchitecture and environmental psychology indicate that interaction with greenery, street art, and thoughtfully designed public areas improves mental well-being and cognitive abilities. The colors, materials, and design of streets influence emotions, where natural elements induce calmness and bright colors inject energy.

IV. VADNAGAR

The neighborhoods of Vadnagar are marked by a dense array of narrow streets that promote strong community connections. The town hosts a variety of

socio-religious groups, including Hindus, Muslims, Jains, and Buddhists. Despite having few green spaces, the incorporation of locally sourced materials in building construction enhances thermal comfort and creates an environmentally sustainable habitat. Vadnagar is notable for its ancient water management systems, some of which remain in use today, showcasing the town's commitment to sustainable urban planning. A Mohalla delineates a specific cluster of homes that typically forms around shared kinship, community ties, or religious connections.

Currently, a heritage preservation project initiated by the Indian government focuses on restoring the historic houses near Prerna School, preserving the town's architectural character using traditional materials and techniques, as well as the "Archaeological Experiential Museum," to showcase the history of 2500 years of Vadnagar's history. Vadnagar's urban design features a system of narrow streets originally built with stone blocks for durability and resilience. About 15-20 years ago, these streets were reconstructed with concrete, improving accessibility while maintaining the historical essence of the streetscape. In the market areas, the streets are generally around 3 meters wide, facilitating both pedestrian and vehicular traffic. Many streets still utilise open drainage systems, a traditional approach to stormwater management. The natural topography of Vadnagar ensures effective water runoff, thus avoiding waterlogging and supporting sanitary conditions within the urban environment.



Fig. 1 Vadnagar map (by the author)

V. MAPPED STREETS ACROSS DEFINED STUDY AREAS

The study focuses on the streets of Vadnagar, specifically five distinct streets chosen to analyse their activities, differences, similarities, usage, and significance. Each street in Vadnagar carries its own historical and cultural importance. In the selected areas, heritage monuments and various types of buildings are nearby. Additionally, much of the city consists of residential structures, so each street also includes residential buildings.

A. Street 1

This 250-meter-long street serves as a vital connection from the first intersection near Amtol Gate to the Mator Mata temple, constituting the principal market thoroughfare of the town. Residents and visitors alike converge here to engage in commerce. Several individuals operate their shops on the ground floor of their residences, while others maintain separate commercial spaces. The street experiences significant activity during the morning and evening hours. Due to its narrow design, traffic congestion is a commonplace issue. This street features a variety of residential, commercial, religious, and mixed-use buildings.

Individuals residing in close proximity to the market street have generally not encountered disturbances or frustrations. While they may occasionally experience a sense of diminished privacy owing to the constant flow of people and vehicles, this very activity contributes to their feelings of safety and security. This thoroughfare not only connects to the entire town but also functions as a crucial route for local residents.

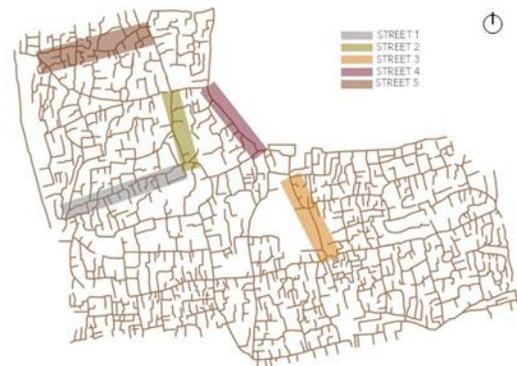


Fig. 2 Vadnagar street map (by the author)

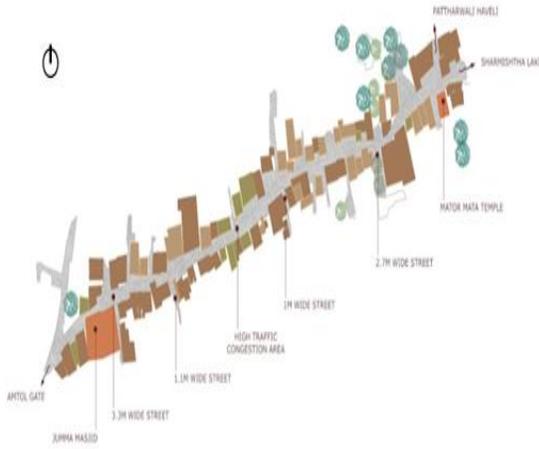


Fig. 3 Plan of street I (by the author)

B. Street II

This street stretches from the Mator Mata temple intersection to the Ram temple, and it is less crowded than the market street. It primarily features residential buildings, alongside a bank and two ancient havelis from Vadnagar. One of these, Pattharwali haveli, has been converted into a library. Spanning 148 meters, this street is rich in heritage, showcasing a number of havelis. A few shops operate here, many of which are linked to their residences or extensions thereof. The presence of Pattharwali haveli and Vadnagar Nagarik Sahakari Bank significantly contributes to pedestrian traffic.



Fig.4 Plan of street II (by the author)

C. Street III

This street sits at the highest point of Darbargadh. Stretching 194 meters, it connects the Bala Hanuman Temple to the first intersection leading to Sharmishtha Lake. Among its notable structures is Prerna School, one of the most modern buildings in town. The government has also renovated the houses

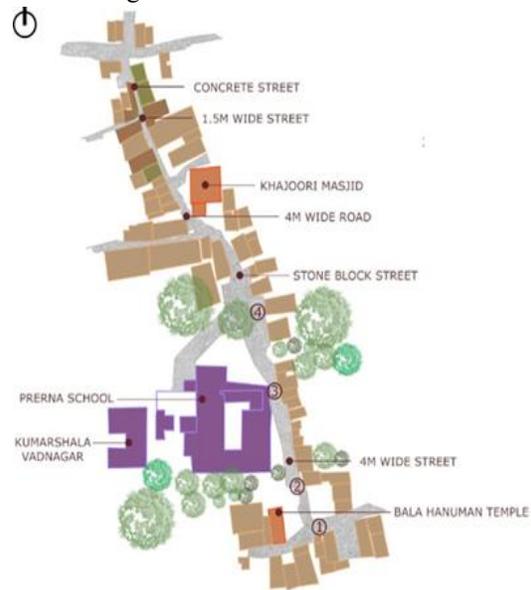


Fig. 5 Plan of street III (by the author)

opposite the school and the Khajoori mosque. The renovations reflect the traditional architecture of Vadnagar, utilising age-old techniques and materials. This street enchants visitors with its architectural charm. It features a mix of commercial, religious, and residential buildings, creating a moderately busy atmosphere.

D. Street IV

A street with the most beautiful view of the Sharmishtha lake. People have settled on the periphery of the Sharmishtha Lake with some streetscape. This street has a pedestrian path of 0.9m, a viewpoint for the lake, and seating. There are many mohallas, few shops, and temples. The site chosen from the street is from Vadnagar Seth library to 150m from the residential building. While walking, this street shifts from the busy market street to the residential lane.



Fig. 6 Plan of street IV (by the author)

E. Street V

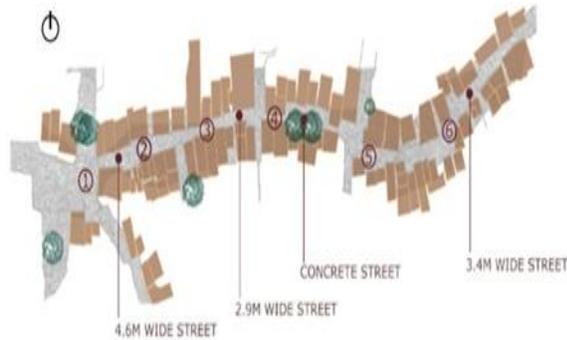


Fig. 7 Plan of street V (by the author)

A street originates from the pride of the town, Nadiol Gate. This area features dense residential housing, including many traditional homes, some in poor condition, alongside renovated and modern houses. The study area extends from the first junction off Nadiol Gate to a straight stretch of 170 meters. Every festival is celebrated here, and marches and parades also traverse this street. Although it feels empty in the afternoon, its vibrancy returns in the evening.

F. Methodology

This is a qualitative and exploratory research. It will involve case studies, interviews with residents, documentation of the streets, literature reviews, narrative analysis, questionnaires on living preferences, and a Likert scale method to measure responses.

VI. RESPONSES

Elements shape the activities on the streets, while the duration of street pattern usage influences various

aspects of change. Changes in the street are influenced by factors such as usage, ongoing activities, the physical characteristics of the street and its environment, and vehicle flow.

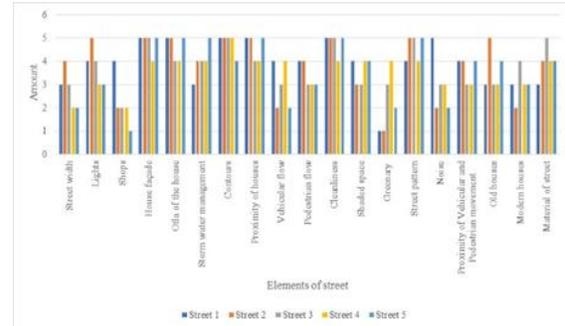


Fig. 8 Residents' responses to the elements of the street and their quantity.

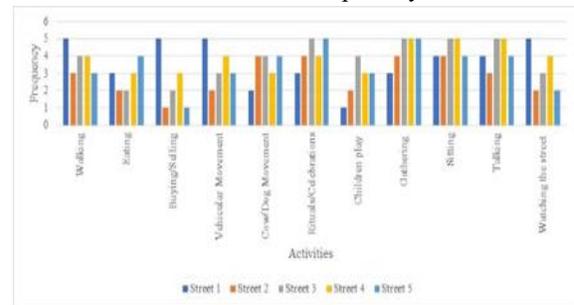


Fig. 9 Residents' responses to the frequency of activities taking place on the street.

The street has a high proximity of houses to the street, but it is also not a large-scale building, which allows both the street and the homes to receive ample sunlight. The close proximity of the houses fosters a sense of closeness among neighbours. The outermost part of the house, known as the 'Otila,' is directly connected to the street, providing residents the chance to celebrate, engage in conversations, and carry out household tasks while interacting with neighbours.

Most of their activity aligns with the elements of the street; they do not engage in any late-night activities outside the house. Therefore, the number of street lights is sufficient for them. Even with the vehicular traffic congestion caused by the street's width, they wait for vehicles to pass rather than increases the traffic situation and noise pollution. Sometimes empty streets without any pedestrian or vehicular movement, can evoke feelings of insecurity, anxiety, and danger. One of the residents said that "Watching the street, the vehicular and pedestrian movement

lifts the mood.” Another one said that “Watching the street activity and movement helps not to overthink.” Walking is the most prominent activity on the street and serves as the most comfortable mode of transportation. In the morning and evening, people walk for health benefits and to visit places of worship. During peak market hours, they walk shop.

Fig. 10 Residents' responses to the visual perception and the amount placed on the street.

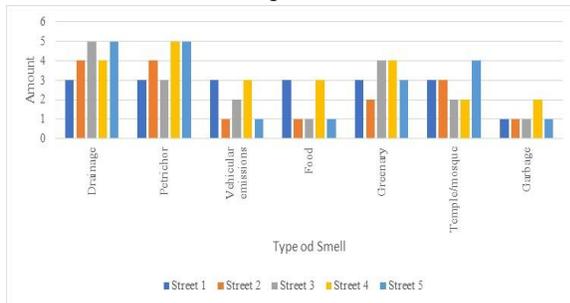


Fig. 11 Residents' responses to the sense of smell and the amount placed on the street.

Numerous informal gatherings occur on the street; while heading home or going out, people often pause to greet one another. This kind of activity strengthens the sense of belonging and has positive effects on the mind.

The sunlight streaming through narrow lanes and open plazas influences mood and energy. Bright, sunlit streets often feel more inviting and safer, promoting activity and movement. The building facades, often adorned with intricate carvings, pastel hues, or signs of wear, evoke a sense of heritage and continuity, fostering emotional attachment and visual richness that sparks curiosity and pride.

The height of the street, determined by the taller surrounding buildings, influences the feeling of openness or enclosure. Narrow streets with towering façades feel intimate and secure, while wider streets provide a sense of freedom and spaciousness. The closeness of neighbouring buildings and their relation to the street significantly affects whether a street feels sociable or private; tightly grouped facades encourage interaction and vibrancy. The architectural styles, ranging from linear arrangements to staggered or stepped terraces, guide movement and perception, shaping patterns of circulation through space.

The scents of temple incense, camphor, and fresh flowers establish a profoundly spiritual and –

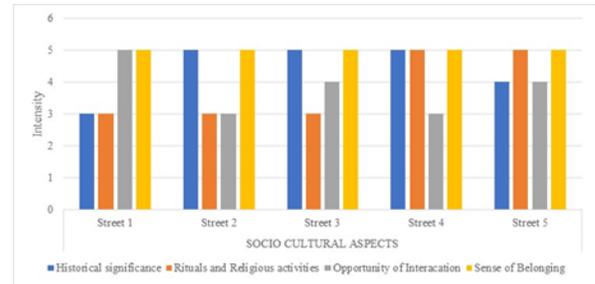


Fig. 12 Residents' responses to the socio-cultural aspects of the street.

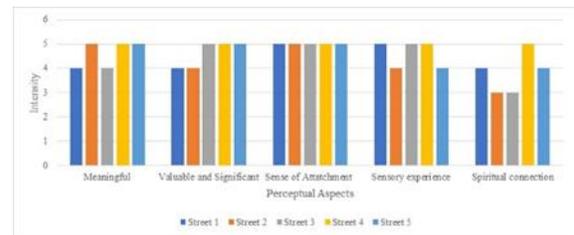


Fig. 13 Residents' responses to the perceptual aspects of the street.

grounding ambience, nurturing a feeling of inner peace, devotion, and a connection to tradition. The aroma of masala chai, especially in the early morning, serves as an olfactory alarm clock, marking the beginning of the day and encouraging casual interactions. Conversely, unpleasant odours like open drains, garbage, or stagnant water can trigger discomfort, irritation, or avoidance, subtly impacting mood and movement in specific areas.

These complex scents serve as memory triggers and emotional signals, shaping daily routines, influencing how individuals feel in particular environments, and reinforcing cultural identity through a dynamically evolving sensory landscape.

One of the individuals said, “We share a bond, attending both the wedding and the funeral.”

The relationship with neighbours is so strong that there's no need to ask them to care for a child left alone at home; in any emergency, neighbours are always willing to help. Such gestures foster a sense of belonging in the neighbourhood, making residents feel more integrated into the city.

When people return home, they gather on the Opla and inquire about each other's day and activities, creating a welcoming atmosphere that eases work-related stress and replenishes energy for the next day. This sense of community is one reason many choose to stay in the town.

The residents share a deep connection with their town; despite facing various challenges, they have no desire to leave. As one individual commented, “Eating chilli and bread at home is better than living somewhere else.”

Remaining in a place with a cultural bond, a history tied to the city where one grew up, and an appreciation for its resources makes attachment to that place even stronger. The mind perceives the lively street activities, which influence human behavior. Elements such as lights, buildings, architectural details, colors, street materials, and the level of congestion all affect the human psyche, whether positively or negatively. However, the residents feel that these aspects embody the town's essence, and it's these activities, along with their cultural ties and emotional connections, that keep the town vibrant and thriving.

VII. ANALYSIS AND FINDINGS

Table. 1 Table of Analysis and Findings

PROBLEMS	EXPECTED OUTCOME	SOLUTION	IMPACT
During peak hours, the pedestrian and vehicular traffic increased	Vehicles can be able to move freely with the pedestrian traffic	Implement shared street principles with flush surfaces (no curbs), permeable paving, and pedestrian-priority zones.	Reduced congestion (20-40% crash reduction), enhanced accessibility for elderly/disabled, and continued informal vendor culture.
The contemporary urban regulations only focus on vehicular traffic over pedestrian-oriented streets	Prioritises the pedestrian flow on the street so that social interaction can also take part, while preserving the historic street character.	Use the street as a stage for local festivals, rituals, and daily practices, integrating these into the design rather than restricting them, slow movement design can be done,	Increased sales for local businesses on main street, Safer, more inclusive movement for all residents.
Concrete replaces traditional stone block paving decreasing heritage integrity. The younger generation will see the narrow street as no longer suited for contemporary use.	New development that defines Vadnagar's 2500-year spatial characteristic (3-6m wide), courtyards and corridors-oriented layouts.	Climate-responsive street design: Narrow east-west streets for summer shading (as in Madrid) with winter sun traps via strategic building setbacks. Use local sandstone/basalt pavers with traditional jointing patterns.	Strengthened place attachment (87% of residents associate narrow streets with cultural identity), improved thermal comfort (2-4°C temperature reduction), and intergenerational knowledge transfer.
Drainages are also open at some point, because the resident has faced water backup issues in the new drainage system.	Contours and slope should be maintained for the rain water flow, cleanliness should be there as current scenario, proximity of houses needs to be low.	Cleanliness and counters can be maintained with proper maintenance, ancient drainage systems should be incorporated, and the proximity of houses should be considered.	The proximity of houses would create a neighbourhood, the cleanliness makes the space to stay and visit.

Concrete roads lack the absorbent quality, flooding rainwater flow worsens despite of the use of contour-based drainage.	Integrated service that preserves the historic character: concealed conduits beneath paving and bioswales that echo ancient water channels.	"Archaeology-aware" utility corridors beneath streets, using ground-penetrating radar to avoid historic layers. Introduce permeable resin-bound gravel surfaces for stormwater management.	Preserved archaeological integrity, 30-50% runoff reduction, and continued operation of 12th-century stepwells as functional infrastructure.
Socio-spatial fragmentation as new developments adopt wide roads, disrupting the Mohalla system's kinship-based neighbourhood structure.	Urban expansion that maintains the Sheri (lane) as social unit - max 150m length, serving 15-20 households.	Incremental densification: Allow 3-4 story buildings with street-facing verandas, using form-based codes to ensure ground-floor active uses. Replicate Mohalla gates as community landmarks.	40% higher neighborly interaction (per Hanzel's shared space study), crime reduction via natural surveillance, and economic vitality from home-based enterprises.
Psychological disconnection due to loss of multisensory streetscape - textured surfaces, vendor calls, seasonal fragrances	Streets that engage neuroarchitecture principles: varied roof heights (2.5-4m), irregular building lines, and embedded cultural markers.	Memory paving' with local artifacts/mosaic work at decision points (wells, shrines). Mandate 75% façade transparency for visual engagement. Install low-height streetlights (2.5m) to accentuate nighttime shadows.	62% improvement in residents' mental well-being scores, stronger spatial navigation skills in children, and heightened tourist immersion in heritage.

VIII. ANALYSIS AND FINDINGS

- The narrow streets of Vadnagar, directly connected to house entrances, blur the boundary between public and private spaces, fostering a unique sense of belonging. Unlike conventional urban settings where congestion is undesirable, residents embrace the street's vibrancy, often gathering on the Opla to observe daily life.
- Rather than feeling disrupted by activity, they find comfort in movement, associating street life with security and community.
- Silence, conversely, induces unease, highlighting the psychological connection between residents and their environment.
- Walking is an integral part of daily routines, as vehicles are parked outside the Mohalla, promoting

social interactions and health benefits. The absence of physical enclosure strengthens ties within the neighborhood, turning streets into extensions of homes.

- The street, as a public space connected directly to their houses, serves as a venue for festivals, celebrations, and events. Because it is directly linked, it gives everyone equal importance in participating in the celebration, which strengthens the community bond.

- The honking of vehicles, bicycle bells, and pedestrian chatter create a sonic environment that keeps people mentally engaged and reactive, shaping how they navigate shared spaces. For many, this consistent sensory input forms an unconscious map of safety, activity, and routine.

IX. CONCLUSION

- We can do cluster and block arrangements in residential areas with religious places in every cluster. We need to make them feel more at home in their residential place and the culture of the neighbourhood.

- The same construction techniques and material may not be copied in modern times because of various reasons like economy, less availability of material, less availability of craftsman but the spatial arrangement of the House, the arrangement of neighbourhood, the design elements, the art of the façade can be achieved as well as water management systems.

- We can maintain the town's significance by continuing the behaviour of the streets, their spatial features, the type of land use, the proximity of houses to the streets, and the connection of the houses to the street.

- Street can influence the neighbourhood, the community bond, economy situations, cultural aspects as well as the routine of the resident's street is a multi-functional space which is even public by the arrangement and private by the users (users don't feel lack of privacy of direct connexion of the house to the street.), which can influence the positive cultural behaviour.

- The design of the street should be considered by the uniqueness of the street. These design considerations and policies should be developed by the behaviour of the street and context.

- To design the urban or rural street, a detailed study should be done on the users of the street, as it will make the space more comfortable for the users.

- The physical infrastructure of the street must be considered in design as the street will be in daily use by the user therefore it will unconsciously give impact on user mind and that will affect to their behaviour and day to day tasks.

- The street is not necessarily equipped with modern technologies; if ancient technologies work there, they should take priority.

- The modern streets are more focused on the transportation connections between places and modern facilities; they are all necessary, but it should not be so significant that it erases the cultural aspects of the street.

- In residential clusters, walking should be promoted by parking the vehicle a little further from the house by using narrow streets and a dedicated space for parking, which will not only give the benefits to the user's health but also make the area less air-polluted.

- Streets also have their own ecosystems, so the ecosystems of the street should be considered, as it will promote the quality of urban/rural ecosystems.

- The behaviour and usage of the street may change over time for various reasons, but it will always have an impact on the users.

REFERENCES

- [1] Lucchini, M. (n.d.). A common ground between neurosciences and architectural design: Empathy, embodiment, emotion.
- [2] Shojazadeh, H. R., Kazemi, M., & Shafizadeh, A. A. (n.d.). Environmental psychology in architecture and urban design.
- [3] Human, S., & Puren, K. (n.d.). An exploration of streets as social spaces as informative for urban planning and design.
- [4] Census of India. (1981). Series 5: Gujarat.
- [5] Roy, A., & Pramanik, S. S. (n.d.). Anandapura (Vadnagar) in Gujarat: A site catchment analysis.
- [6] Ambekar, A. S., Chakraborty, A., Varkey, G. A., Ranjith, R., Gotad, S. S., Seth, D., & Rajpurohit, J. (n.d.). Vadnagar: A thriving composite township of historical times.
- [7] Ambekar, A. S., Thakor, M., & Varhat, B. (n.d.). Vadnagar: A story of human innovation and resilience for more than two millennia.

- [8] Gupta, V. K. (n.d.). A glimpse into the archaeological antiquity of Vrindavan.
- [9] Gupta, M. (n.d.). The Ancient Monuments and Archaeological Sites and Remains Act, 1958 with Amendment of 2010 and centrally protected monuments and sites in Mathura and Hathras districts of the Agra Circle of the Archaeological Survey of India: An analysis.
- [10] Tandon, M., & Sehgal, V. (n.d.). Place-making attributes in the streets of Indian religious cities. Faculty of Architecture and Planning, Integral University, Lucknow & Dr. A.P.J. Abdul Kalam Technical University, Lucknow, India.
- [11] Pati, A., & Husain, M. (n.d.). People's perspectives on heritage conservation and tourism development: A case study of Varanasi.
- [12] Tandon, M., & Sehgal, V. (n.d.). Traditional Indian religious streets: A spatial study of the streets of Mathura.
- [13] Sadeghpoor, F., Ranjbar, E., Esmacilinasab, M., Seyed Valiloo, M. H., & Nieuwenhuijsen, M. J. (n.d.). Streets and stress: A pilot study on how quality and design of streets impacts on urban stress.
- [14] Spence, C. (n.d.). Senses of place: Architectural design for the multisensory mind.
- [15] CEIC Data. (n.d.). India Census: Population: Gujarat: Vadnagar.
- [16] UNESCO World Heritage Centre. (n.d.). Vadnagar – A multi-layered historic town.
- [17] The Overcast. (n.d.). Urban Form: Why Narrow Streets Make Better Places.
- [18] Strong Towns. (2016, June 6). Narrow Streets Do More with Less.
- [19] New World Economics. (n.d.). Narrow Streets for People.
- [20] Strong Towns. (2023, November 8). Public Health Experts: Narrow Lanes Should Be the Default on City Streets.
- [21] Sandi, C., & Haller, J. (2015). Stress and the social brain: Behavioural effects and neurobiological mechanisms. *Nature Reviews Neuroscience*, 16(5), 290–304.
- [22] World Health Organization. (2018). Healthy housing and the health of the urban poor
- [23] Appleyard, D. (1981). *Livable streets*. University of California Press.
- [24] Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2003). *Public places, urban spaces: The dimensions of urban design*. Routledge.
- [25] Chekki, D. A. (1994). *Community structure and social change in an Indian village*. BRILL.
- [26] Jacobs, J. (1961). *The death and life of great American cities*. Random House.
- [27] Jacobs, A. (1995). *Great streets*. MIT Press.
- [28] Lofland, L. H. (1998). *The public realm: Exploring the city's quintessential social territory*. Aldine de Gruyter.
- [29] Mehta, V. (2007). Lively streets: Determining environmental characteristics to support social behavior. *Journal of Planning Education and Research*, 27(2), 165–187.
- [30] Southworth, M., & Ben-Joseph, E. (1996). *Streets and the shaping of towns and cities*. McGraw-Hill.
- [31] Vernez Moudon, A. (1991). *Public streets for public use*. Columbia University Press.
- [32] Galster, G. (1987). Identifying the correlates of dwelling satisfaction. *Environment and Behavior*, 19(5), 539–568.
- [33] Jackson, L. E. (2003). The relationship of urban design to human health. *Landscape and Urban Planning*, 64(4), 191–200.
- [34] McCay, L., Lang, J., & de Nazelle, A. (2017). Urban design and mental health. *Journal of Urban Design & Mental Health*, 2, 1–19.
- [35] Brosschot, J. F., Verkuil, B., & Thayer, J. F. (2018). The default response to uncertainty and stress. *Current Directions in Psychological Science*, 27(3), 186–193.
- [36] Ward Thompson, C., Aspinall, P., & Roe, J. (2016). Access to green space in urban areas and well-being. *Landscape and Urban Planning*, 148, 234–252.
- [37] Gifford, R., & Scannell, L. (2014). The psychology of place attachment. In R. Gifford (Ed.), *Environmental psychology: Principles and practice* (4th ed., pp. 137–148). Optimal Books.
- [38] Adli, M. (2011). Urban stress and mental health. *Urban Design International*, 16(2), 105–112.
- [39] Burton, L. C. (1990). Health and environment in older populations. *The Gerontologist*, 30(2), 154–162.
- [40] Kondo, M. C., Jacoby, S. F., & South, E. C. (2018). Does spending time outdoors reduce

- stress? *International Journal of Environmental Research and Public Health*, 15(8), 1636.
- [41] Gascon, M., Triguero-Mas, M., Martínez, D., Dadvand, P., Rojas-Rueda, D., Plasència, A., & Nieuwenhuijsen, M. J. (2016). Residential green spaces and mortality. *Environment International*, 91, 120–128.
- [42] Allahyari, T., Namdari-Pejman, M., & Poorhashemi, S. A. (2017). Investigating psychological tension in urban spaces. *Journal of Environmental Psychology*, 53, 19–28.
- [43] Cutrona, C. E., Wallace, G., & Wesner, K. A. (2006). Neighborhood characteristics and depression. *Current Directions in Psychological Science*, 15(4), 188–192.
- [44] Groenewegen, P. P., van den Berg, A. E., de Vries, S., & Verheij, R. A. (2018). Vitamin G: Effects of green space on health, well-being, and social safety. *BMC Public Health*, 6, 149.
- [45] Gruebner, O., Rapp, M. A., Adli, M., Kluge, U., Galea, S., & Heinz, A. (2017). Cities and mental health. *Deutsches Ärzteblatt International*, 114(8), 121–127.
- [46] Halpern, D. (1995). *Mental health and the built environment*. Taylor & Francis.
- [47] Hematian, A., & Ranjbar, E. (2022). Urban stressors and mental well-being. *Health & Place*, 76, 102845.
- [48] Layeb, S., Taleb, O., & Hamaidi, M. (2016). Urban public space and mental health. *Procedia - Social and Behavioral Sciences*, 234, 517–524.
- [49] Schweitzer, J., Gilpin, L., & Frampton, S. (2004). Healing spaces. *American Journal of Public Health*, 94(9), 1436–1438.
- [50] Gifford, R., & Scannell, L. (2014). The psychology of place attachment. In R. Gifford (Ed.), *Environmental psychology: Principles and practice* (4th ed., pp. 137–148). Optimal Books.
- [51] Edvinsson, T. E. (n.d.). *Reimagine streets as places: A public space and public life analysis*.