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Red Bricks Brushed with War: Transformation of Bow Barracks through the Lens of Behavioral Urbanism

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Abstract-This paper examines the socio-spatial transformation of Bow Barracks, Kolkata—a 1918 Anglo-Indian housing precinct—through the lens of behavioural urbanism, with particular attention to the dynamic interplay between built form and everyday human action. It argues that the precinct's spatial character is not fully intelligible through formal planning logics alone, but must instead be understood as an environment-action feedback loop in which residents respond to spatial affordances, mental maps, social norms, and prospect-refuge conditions.

Drawing on Jan Gehl's public life metrics, the study analyses the relationship between stationary and moving activities, human-scale spatial dimensions, and the qualitative intensity of public life. In parallel, it employs Affordance Theory to interpret how architectural elements such as balconies, thresholds, stair landings, and doorsteps invite or constrain particular forms of use, while Temporal Urbanism provides a framework for understanding how the precinct is periodically reactivated through festivals, weddings, and other collective events. Together, these perspectives enable an examination of Bow Barracks as a lived urban environment shaped by both enduring spatial conditions and time-bound social performances.

Methodologically, the paper integrates archival mapping, space-syntax analysis of the grid-alley structure, Gehl-style behavioural mapping, and affordance-based observation of transitional spaces. These methods are used to trace three temporal layers of transformation: diachronic adaptation, in which long-term accretions such as balconies and street thresholds support natural surveillance and everyday sociability; seasonal ritual intensification, during which Christmas, Easter, and other events temporarily reconfigure the street into a socially dense and animated public realm; and everyday micro-behaviours, in which ordinary acts of sitting, watching, conversing, and childcare sustain the precinct's cognitive and social legibility.

The analysis critiques conventional heritage approaches that privilege conceived space over lived space, arguing that Bow Barracks demonstrates how neglect, repetition, and incremental adaptation can preserve behavioural richness. It further proposes a framework of behavioural conservation urbanism, in which interventions are designed to enhance edge affordances, reinforce public-life patterns, and support low-impact, people-centred regeneration. In doing so, the paper positions Bow Barracks as a significant case for understanding how marginal heritage precincts sustain urban identity through resilient everyday practices and temporally layered social life.

Keywords: Behavioural urbanism, Heritage, Public Life, Behavioural Conservation, Affordance.

I. INTRODUCTION

Bow Barracks occupies a distinctive place in Kolkata's urban history. Located in the central part of the city, the precinct is widely associated with Anglo-Indian residential life and with a strong Christmas tradition that continues to shape its public identity. Although it is often described as a heritage locality, its significance extends beyond architecture or nostalgia. The settlement offers a living example of how urban form, social practice, and collective memory interact over time to produce a resilient place identity.

This paper reads Bow Barracks through behavioral urbanism, a perspective that treats the city as something continuously produced through everyday action. Rather than seeing streets and buildings as static forms, this approach emphasizes how people use, modify, and interpret space through routine behaviour, ritual activity, and social expectation. In Bow Barracks, this means paying attention not only to the red-brick built fabric, but also to the thresholds, courtyards, lanes, and shared edges through which social life is performed.

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II. WHY THIS RESEARCH? (RATIONALE)

Bow Barracks has frequently been discussed as an architectural and cultural heritage precinct of Kolkata. Existing studies primarily focus on its colonial origins, Anglo-Indian identity, architectural character, and festive traditions. However, limited attention has been given to the behavioural processes through which residents continuously reproduce the spatial and social identity of the precinct.

Contemporary heritage conservation frameworks often privilege physical preservation while overlooking everyday practices, informal adaptations, and temporal patterns of occupation that contribute significantly to place identity. As a result, the relationship between built form, human behaviour, and collective memory remains insufficiently understood.

This research addresses that gap by examining Bow Barracks through the lens of behavioural urbanism. By integrating behavioural mapping, affordance theory, temporal urbanism, and spatial analysis, the study seeks to understand how everyday actions, seasonal rituals, and long-term adaptations contribute to the resilience and continuity of a marginal heritage precinct.

The research is important because it shifts the focus of heritage discourse from static architectural objects to dynamic human-environment interactions, thereby offering a more holistic framework for conservation and regeneration in historic urban neighbourhoods.



Fig 1. Site Plan

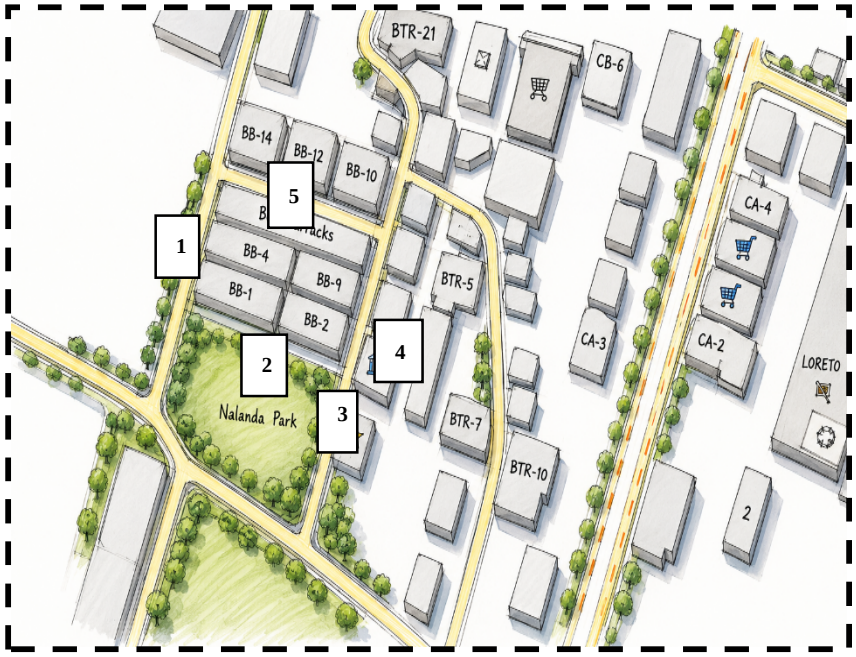












Fig 2. Site Delineation

A. GAP ANALYSIS

Existing Research Focus	Identified Gap	Contribution of Present Study
Historical evolution of Bow Barracks	Limited study of everyday behavioural patterns	Examines lived experiences and behavioural dynamics
Architectural and heritage documentation	Neglect of social-spatial interactions	Links built form with everyday use
Cultural identity and Anglo-Indian heritage	Limited understanding of behavioural resilience	Investigates how daily practices sustain identity
Festival-based studies	Lack of temporal urbanism perspective	Analyses seasonal transformations and ritual intensification
Physical conservation approaches	Minimal focus on behavioural conservation	Proposes a framework for behavioural conservation urbanism
Urban morphology studies	Insufficient integration of affordance theory and space syntax	Combines spatial configuration with behavioural observation

B. SWOT ANALYSIS

1) Strengths

- Strong and distinctive heritage identity.
- Compact urban morphology encouraging social interaction.
- High degree of community cohesion.
- Active public life supported by thresholds and transitional spaces.
- Rich seasonal cultural traditions.

2) Weaknesses

- Physical deterioration of building fabric.
- Limited infrastructure upgrades.
- Aging population and outmigration of younger residents.
- Lack of formal conservation management.
- Spatial constraints for future expansion.

3) Opportunities

- Behaviour-sensitive conservation planning.
- Heritage tourism linked to community participation.
- Public realm enhancement without disrupting social life.
- Documentation of intangible cultural heritage.
- Development of people-centred urban regeneration models.

4) Threats

- Real estate pressure and redevelopment.
- Commercialisation of cultural events.
- Loss of Anglo-Indian demographic presence.
- Over-regulation through conventional conservation policies.
- Erosion of everyday social practices due to modernization.

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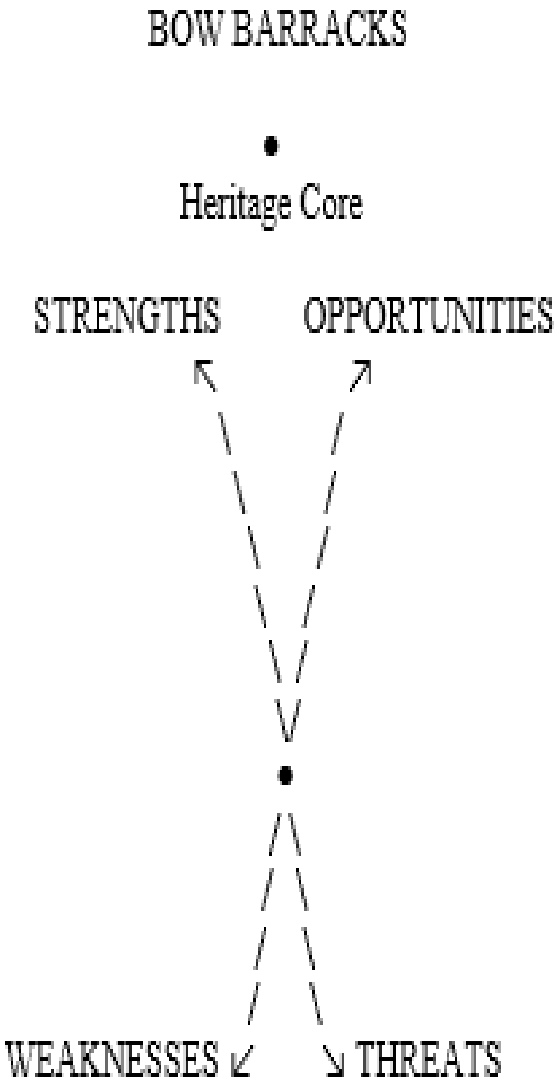


Fig 3. SWOT ANALYSIS

III. AIM AND OBJECTIVES

A. *Aim*

To examine the socio-spatial transformation of Bow Barracks through the lens of behavioural urbanism and to understand how everyday practices, spatial affordances, and temporal activities contribute to the resilience of a historic ethnic neighbourhood.

B. *Objectives*

- To identify spatial affordances that support everyday social interaction and community life.
- To examine the role of seasonal events and rituals in shaping public-space use.
- To evaluate spatial configuration through space-syntax analysis and behavioural mapping.
- To develop a behavioural conservation framework for heritage-sensitive urban regeneration.

IV. SCOPE AND LIMITATIONS

A. *Scope*

- Examination of Bow Barracks as a behavioural and socio-spatial system.
- Analysis of physical form, public life, and everyday activities.
- Assessment of spatial affordances within streets, thresholds, balconies, and transitional spaces.
- Investigation of seasonal and event-based spatial transformations.
- Application of behavioural urbanism to heritage conservation discourse.
- Development of recommendations for low-impact urban regeneration.

B. *Limitations*

- Study is restricted to Bow Barracks and may not be directly generalizable to all heritage precincts.
- Behavioural observations represent specific periods and may not capture all temporal variations.
- Space-syntax outputs indicate spatial potential rather than actual behaviour.
- Historical records may contain gaps regarding informal transformations.
- Seasonal observations depend on access during major community events.
- Findings focus primarily on socio-spatial dimensions rather than structural or engineering conditions.

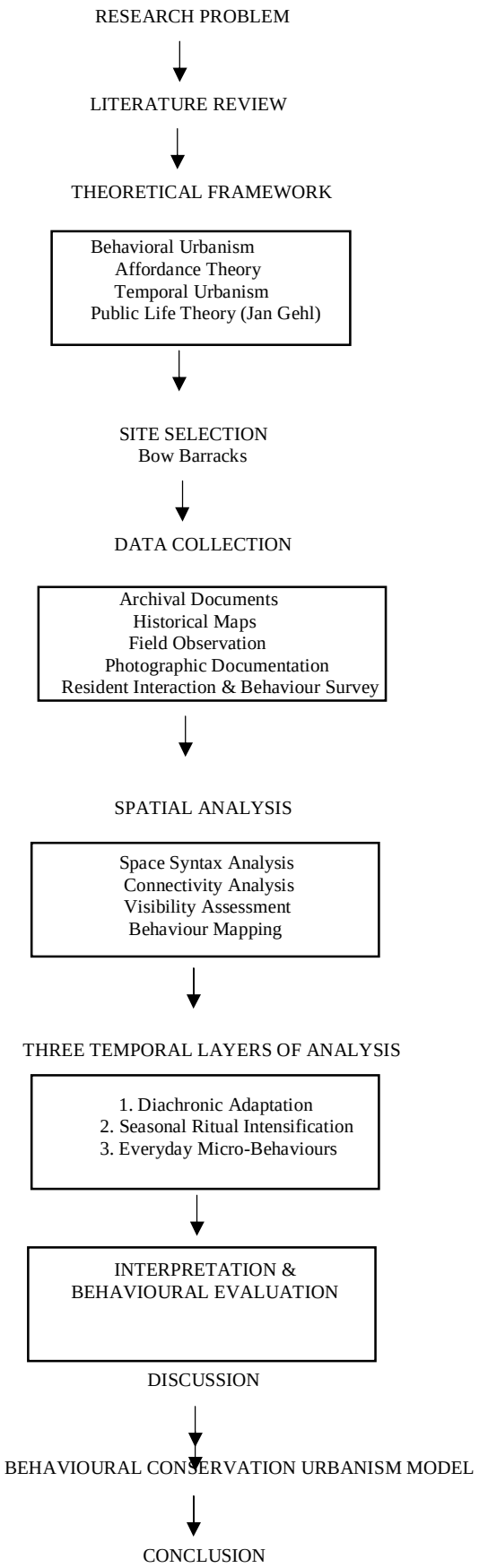
V. METHODOLOGY

The paper adopts a qualitative, observational, and spatially interpretive methodology. Archival mapping is used to reconstruct the historical development of the precinct and its built form. Space-syntax reading is applied to the grid-alley structure in order to understand connectivity, visibility, and movement potential. Behavioural mapping is used to record stationary and moving activities across different times and conditions. Finally, an affordance-based audit of thresholds, edges, and transitional elements is used to identify the spatial supports of social life.

These methods are interpreted through three temporal layers. First, diachronic adaptation examines how long-term occupation and incremental modification have stabilized everyday use. Second, seasonal ritual intensification studies the temporary spatial transformation that occurs during festivals and collective events. Third, everyday micro-behaviours focus on small but repeated actions such as sitting, watching, and informal conversation, which collectively sustain the precinct's social fabric.



Fig 4. Grid Alley Structure


RESEARCH PROBLEM
LITERATURE REVIEW
THEORETICAL FRAMEWORK
Behavioral Urbanism
Affordance Theory
Temporal Urbanism
Public Life Theory (Jan Gehl)
SITE SELECTION
Bow Barracks
DATA COLLECTION
Archival Documents
Historical Maps
Field Observation
Photographic Documentation
Resident Interaction & Behaviour Survey
SPATIAL ANALYSIS
Space Syntax Analysis
Connectivity Analysis
Visibility Assessment
Behaviour Mapping
THREE TEMPORAL LAYERS OF ANALYSIS
1. Diachronic Adaptation
2. Seasonal Ritual Intensification
3. Everyday Micro-Behaviours
INTERPRETATION &
BEHAVIOURAL EVALUATION
DISCUSSION
BEHAVIOURAL CONSERVATION URBANISM MODEL
CONCLUSION

VI. LITERATURE STUDY

Bow Barracks-The identity of Anglo Indians in Kolkata-Fight for Survival

By Dr. Shivashish Bose and KanupriyaGoel

Abstract- Kolkata is marked with many architectural marvels and historic settlements that are in dire need of recognition and conservation. One such settlement is existing in between the congested streets of central zone of main city of Kolkata. It is simple but spacious housing colony in 3 bighas area, called 'Bow Barracks' now under proposal for demolition by the local government . This settlement is inhabited by a very special community , popularly known as 'Anglo Indians' that are offspring of European and Indian parents . This buildings have a history ,elegant architecture, unique culture and a mark of a symbolic identity of this community for over a century . The aim of this paper is to highlight this living cultural settlement with its different aspects and issues of today and its past and to demonstrate conservation as a better alternative than bulldozing these buildings for construction of high-rise buildings to realize economic value.

THEORITICAL FRAMEWORK

Behavioral Urbanism

Behavioral urbanism focuses on the reciprocal relationship between built environment and human conduct. It suggests that urban spaces shape behavior, while behavior in turn reshapes urban space through repeated use, informal modification, and collective habit. In this framework, the city is understood not as a fixed object but as an evolving behavioral field in which perception, movement, pause, interaction, and territoriality all matter.

A. Affordance Theory

Affordance Theory helps explain why certain physical elements attract specific actions. A doorstep may invite sitting, a stair landing may invite pause, and a balcony may support watching or conversation. These are not merely geometric features; they are action possibilities embedded in space. In Bow Barracks, the many transitional edges of the precinct can be read as affordance-rich zones that support informal social life and everyday occupation.

B. Temporal Urbanism

Temporal Urbanism focuses on how urban space changes through time, especially through temporary, recurring, and seasonal forms of activation. It is useful for understanding Bow Barracks because the precinct is not socially uniform throughout the year. Christmas, Easter, weddings, and family gatherings temporarily intensify street life, alter spatial use, and transform the atmosphere of the lane into something closer to an event space than an ordinary residential street.

C. Public Life and Surveillance

Jan Gehl's work on public life provides a practical lens for reading Bow Barracks. His emphasis on stationary and moving activities, human scale, and the quality of public space is especially relevant in a dense precinct where social life depends on close physical proximity and visual contact. The idea of natural surveillance also remains important, since active edges and occupied thresholds increase mutual visibility and support safer everyday environments

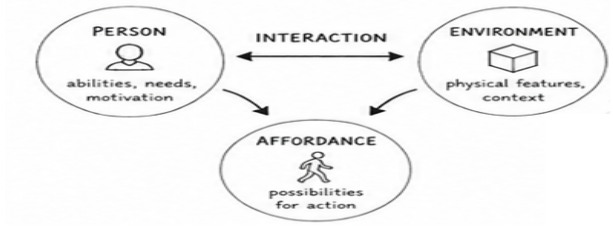


Fig 5. Affordance Theory



Fig 6. Public Life and Surveillance



Fig 7. Temporal Urbanism

VII. ACTIVITY ANALYSIS- 3 LAYERS

A. *DIACHRONIC ADAPTATION*

The long-term evolution of Bow Barracks can be understood as a process of gradual adaptation rather than formal redesign. What began as a military or wartime housing structure later became an inhabited ethnic enclave, and its architectural edges were progressively appropriated for domestic and social use. This transformation is significant because it reveals how settlement identity can change without the physical erasure of earlier spatial forms.

Balconies, thresholds, stair landings, and doorfronts in Bow Barracks have acquired socially meaningful roles through repeated occupation. These elements now operate as protected edges where residents can sit, observe, and interact while remaining spatially connected to the street. Such use intensifies natural surveillance and encourages what Gehl would describe as stationary activity, especially in places where the boundary between private and public remains porous.research.

From an urban design perspective, diachronic adaptation suggests that durable social life depends on spatial flexibility. The precinct's inherited form did not determine a single use, but created conditions for continuous reinterpretation. This is why Bow Barracks remains legible and inhabited even though its physical fabric has aged and some of its original functions have changed.

B. *SEASONAL RITUAL INTENSIFICATION*

The second temporal layer concerns recurring festive activation, particularly Christmas and Easter. During these periods, Bow Barracks becomes a socially amplified environment in which the narrow lane is filled with decoration, music, food, and collective gathering. The usual rhythm of residential life is temporarily transformed into a denser public performance, and the street takes on the character of a shared cultural stage.

This seasonal intensity is not simply decorative. It reprograms the street as a temporary public realm and intensifies movement, pause, and encounter. In behavioural terms, the balance between moving and stationary activity shifts as people stop to talk, watch performances, or participate in collective celebrations. Such changes demonstrate how temporal events can reshape urban experience even when the underlying form remains unchanged.

Temporal Urbanism is especially useful here because it treats the event as an urban condition rather than an exception. Bow Barracks shows that rituals can be spatially productive, creating short-term publicness that reinforces long-term neighbourhood identity. The annual repetition of such events helps sustain memory, social continuity, and the symbolic visibility of the precinct within Kolkata's broader urban culture.

C. *EVERYDAY MICRO-BEHAVIOURS*

The third layer consists of ordinary daily practices that often remain unnoticed but are central to place-making. In Bow Barracks, everyday behaviours include sitting on steps, speaking across doorways, watching children, and using small edges as informal meeting points. These actions are important because they continuously reproduce the social atmosphere of the precinct. Affordance Theory is particularly helpful in explaining this scale of use. The built environment offers a range of small invitations to action: a low step suggests sitting, a landing suggests pause, and a balcony suggests observation. Such spatial cues shape what people do without requiring formal instruction or planning. Over time, these small interactions accumulate into a recognizable behavioural pattern that supports community cohesion.

These micro-behaviours also have cognitive significance. Repeated use of thresholds and edges helps residents form mental maps of the precinct, making the local environment easy to navigate and socially legible. The result is a settlement that remains active not only during festivals, but also in the subtle rhythms of everyday life.



Fig 8.Diachronic Adaption



Fig 9. Seasonal Ritual

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Fig 10. Micro EverdayBehaviour

Temporal Layer	Spatial Analysis	Public Life Behaviour	Affordance Threshold	Temporal Ritual Change	Integrated Outcomes
Diachronic Adaptation	The grid-alley structure, compact blocks, courtyards, and edge conditions create a highly readable spatial system that supports repeated movement and surveillance.	Daily use builds steady presence in lanes and courtyards, increasing lingering, watching, and informal interaction over time.	Balconies, doorsteps, stair landings, and thresholds become "protected seats" and social edges through repeated occupation.	Long-term occupation by Anglo-Indian residents transforms a wartime barrack into a lived ethnic enclave with stable social identity.	Bow Barracks evolves over time through adaptive use of streets, thresholds, and shared spaces while retaining strong community identity and spatial continuity
Seasonal Ritual Intensification	The same narrow street becomes temporarily reprogrammed into a festive corridor through lights, stalls, and crowd concentration.	Public life intensifies during Christmas and Easter, with more people moving, pausing, talking, and gathering in shared space.	Temporary seating, food stalls, decorations, and props turn edges into active social nodes and invite spontaneous interaction.	Rituals seasonally reshape the precinct, making it function like a temporary public plaza during festival periods.	Festivals transform everyday streets and courtyards into dense social and ritual spaces through decoration, gathering, and collective occupation.
Everyday Micro Layers	Small spatial elements such as front steps, stair edges, and narrow gallis structure the intimate scale of movement and visibility.	Routine activities such as sitting, chatting, childcare, and street watching maintain everyday social rhythm.	Everyday edges act as soft thresholds where people naturally pause, converse, and observe without formal planning.	Ordinary daily habits repeat so often that they quietly preserve the precinct's social memory and identity.	Daily interactions at doorsteps, balconies, edges, and alleys create continuous social surveillance, informal gathering, and neighbourhood cohesion.
Integrated Outcomes	The interconnected morphology of Bow Barracks produces a highly permeable yet socially controlled environment where movement, visibility, and enclosure collectively shape behavioural interaction and community cohesion.	Everyday and festival activities transform streets and courtyards into dynamic social infrastructures that support interaction, observation, play, commerce, and collective belonging.	Architectural edges and transitional elements function as active behavioural affordances that mediate between private and public realms while encouraging surveillance, pause, communication, and participation.	Temporal variations between ordinary life and festive occupation reveal how rituals, seasonal events, and recurring social practices continuously reconfigure spatial meaning, atmosphere, and collective identity.	Daily interactions at doorsteps, balconies, edges, and alleys create continuous social surveillance, informal gathering, and neighbourhood cohesion.

Table 1. Temporal layer vs Theoritcal Framework

VIII. SYNTHESIS

Bow Barracks challenges conventional heritage thinking in several ways. First, it shows that preservation is not only about maintaining facades or materials; it is also about protecting social practices and spatial behaviours. Second, it suggests that neglect does not always mean loss. In some cases, limited formal intervention allows social life to continue adapting organically, preserving forms of use that might otherwise be displaced by excessive renewal.

The precinct also exposes the limits of planning approaches that privilege abstract order over lived reality. Formal redesign may improve appearance, but it can weaken the informal affordances that support neighbourhood life. Bow Barracks demonstrates that narrow lanes, edge occupation, and repeated rituals are not defects to be erased; they are part of the behavioural structure that sustains the place. For urban design, this implies that conservation strategies should be behavioural as well as physical. The goal should not be to freeze the precinct in time, but to support the spatial conditions that allow social life to continue. This includes preserving transitional thresholds, retaining visual permeability, and respecting the temporal cycles through which the precinct activates itself.

IX. CONCLUSION

Bow Barracks is best understood as a time-layered urban environment in which built form and behaviour continuously shape one another. Its long-term transformation from wartime housing to ethnic enclave, its seasonal reactivation through festivals, and its everyday micro-behaviours all reveal a settlement sustained by lived practice rather than formal planning alone.

By combining behavioural urbanism, Affordance Theory, and Temporal Urbanism, this paper shows that marginal heritage precincts can remain socially resilient when their spatial edges continue to support everyday occupation and collective ritual.

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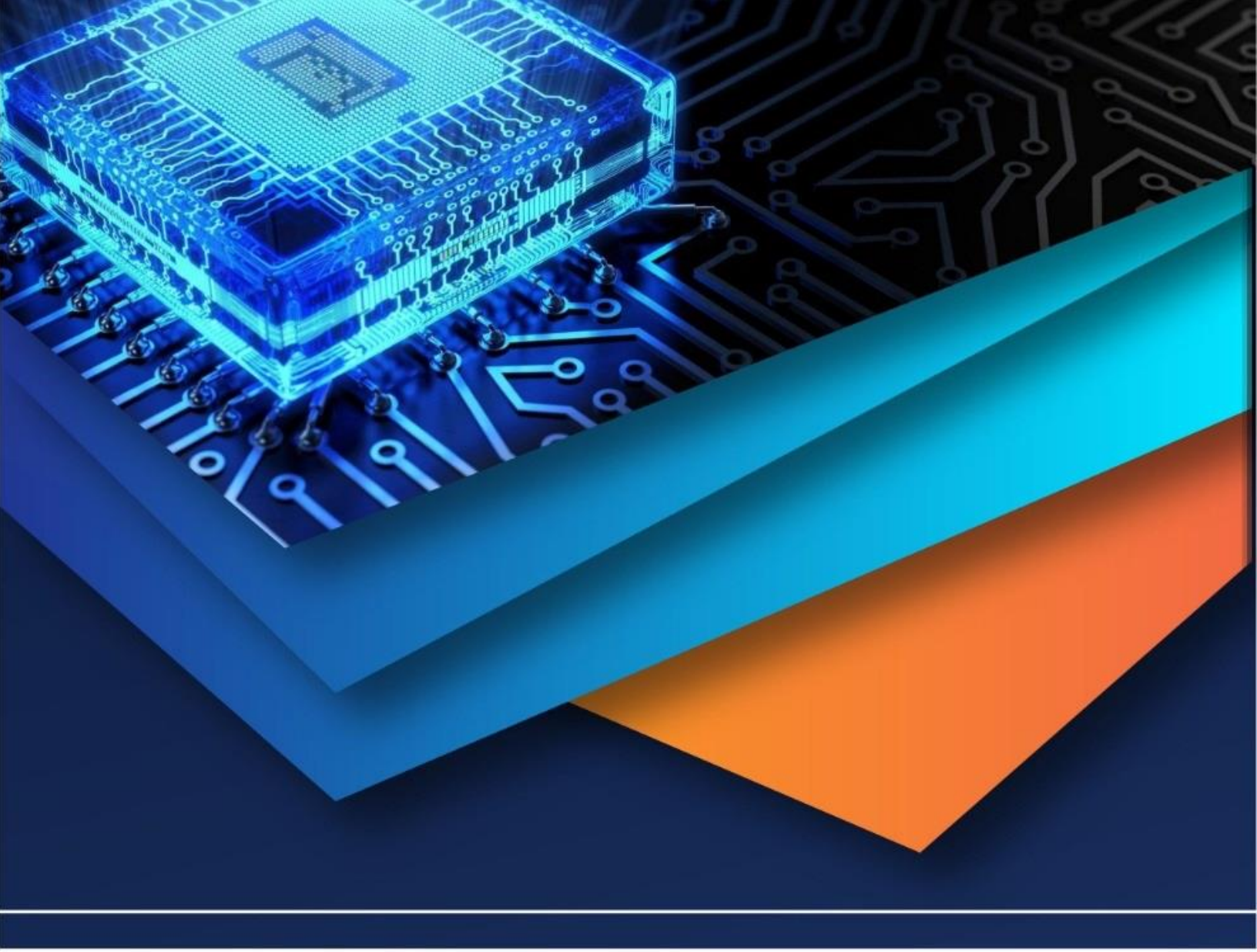
Bow Barracks therefore offers a valuable model for behavioural conservation urbanism in Indian cities: one that values people, thresholds, repetition, and temporality as central components of urban heritage.

X. ACKNOWLEDGEMENT

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