

WEAVING CULTURE INTO THE CITY: DEVELOPING SUSTAINABLE PUBLIC SPACES IN MOSCOW

INTEGRANDO A CULTURA À CIDADE: DESENVOLVENDO ESPAÇOS PÚBLICOS SUSTENTÁVEIS EM MOSCOU

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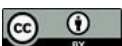
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Abstract

The rapid expansion of cities often leads to generic, identity-poor public spaces in peripheral and mid-ring districts, undermining social sustainability and community cohesion. This study explores the integration of intangible cultural heritage as a tool for creating more meaningful and sustainable urban environments. This research aims to develop and test a methodology for transposing the rich symbolic language of traditional Azerbaijani carpet ornaments into the architectural and landscape design of public spaces near metro stations in Moscow. The research employed a mixed-methods approach: ethnographic fieldwork at the National Carpet Museum in Baku to decode the semantics of recurring motifs (e.g., 'Buta,' 'Tree of Life'); urban analysis to identify suitable underutilized sites near metro stations based on functional balance and pedestrian accessibility metrics; experimental design by architecture students to apply these motifs to facades and public squares. The study resulted in a portfolio of design proposals that demonstrate a viable model for 'cultural transposition.' The motifs provided a framework for organizing space, creating rhythm, and embedding narratives, moving beyond mere decoration to inform layout and function. Sites near stations like Belayevo and Babushkinskaya were identified as high-potential candidates for such interventions. The research concludes that traditional ornaments can serve as a powerful database for sustainable urban design, fostering place identity and cultural connectivity. This approach offers a transferable model for leveraging specific

Resumo

A rápida expansão das cidades muitas vezes leva à criação de espaços públicos genéricos e sem identidade nos bairros periféricos e intermediários, prejudicando a sustentabilidade social e a coesão da comunidade. Este estudo explora a integração do patrimônio cultural imaterial como uma ferramenta para criar ambientes urbanos mais significativos e sustentáveis. Esta pesquisa tem como objetivo desenvolver e testar uma metodologia para transpor a rica linguagem simbólica dos ornamentos tradicionais dos tapetes do Azerbaijão para o projeto arquitetônico e paisagístico de espaços públicos próximos às estações de metrô em Moscou. A pesquisa empregou uma abordagem de métodos mistos: trabalho de campo etnográfico no Museu Nacional do Tapete em Baku para decodificar a semântica de motivos recorrentes (por exemplo, "Buta", "Árvore da Vida"); análise urbana para identificar locais adequados e subutilizados próximos às estações de metrô com base em métricas de equilíbrio funcional e acessibilidade para pedestres; projeto experimental por estudantes de arquitetura para aplicar esses motivos em fachadas e praças públicas. O estudo resultou em um portfólio de propostas de design que demonstram um modelo viável para a "transposição cultural". Os motivos forneceram uma estrutura para organizar o espaço, criar ritmo e incorporar narrativas, indo além da mera decoração para informar o layout e a função. Locais próximos a estações como Belayevo e Babushkinskaya foram identificados como candidatos de alto



cultural heritage to address the global challenge of sustainable and culturally sensitive urban development, contributing to the sustainable cities and communities' goals.

Keywords: Cultural Sustainability. Urban Regeneration. Place-Making. Transit-Oriented Development (TOD).

potencial para tais intervenções. A pesquisa conclui que os ornamentos tradicionais podem servir como um poderoso banco de dados para o design urbano sustentável, promovendo a identidade do lugar e a conectividade cultural. Essa abordagem oferece um modelo transferível para alavancar o patrimônio cultural específico para enfrentar o desafio global do desenvolvimento urbano sustentável e culturalmente sensível, contribuindo para as metas de cidades e comunidades sustentáveis.

Palavras-chave: Sustentabilidade cultural. Regeneração urbana. Criação de lugares. Desenvolvimento orientado para o transporte público (TOD).

1 INTRODUCTION

The rapid and often standardized expansion of metropolitan areas worldwide has frequently resulted in a phenomenon described by urban theorists as “placelessness” (Relph, 1976) or the creation of “generic cities” (Koolhaas, 1995). This is particularly evident in the peripheral and mid-ring districts of megacities like Moscow, where transit-oriented development, while crucial for connectivity, can sometimes prioritize efficiency and economic density over cultural identity and social cohesion. These new urban landscapes, characterized by repetitive architectural forms and underdeveloped public realms, often lack the unique historical narratives and symbolic depth that foster a sense of belonging and place attachment among residents (Montgomery, 1998). This loss of place identity represents a significant challenge to social sustainability, which is a core pillar of the United Nations’ Sustainable Development Goals, specifically SDG 11 aiming to “make cities and cities and human settlements inclusive, safe, resilient, and sustainable.”

Within the field of sustainable urbanism, there is a growing recognition that sustainability transcends environmental and technical metrics. True urban sustainability is tripartite, encompassing environmental, economic, and socio-cultural dimensions (Throsby, 1997). The socio-cultural aspect emphasizes the importance of cultural heritage, local identity, and the creation of meaningful spaces that contribute to human well-being. This aligns with the principles of place-making, a collaborative process that

strengthens the connection between people and the spaces they share by capitalizing on a community's assets, inspiration, and potential (Project for Public Spaces, 2023). Effective place-making moves beyond mere physical renovation to weave cultural narratives into the very fabric of the urban environment, transforming anonymous spaces into vibrant places (Jacobs, 1961).

However, a critical gap exists in the practical methodologies for integrating deep, non-local cultural elements in a way that is respectful, meaningful, and contributes to the existing urban context. How can we import cultural symbols without creating pastiche or dissonance? This study proposes a novel solution: the deliberate and analytical application of profound cultural symbols—specifically, the ancient and semantically rich ornamentation of Azerbaijani carpets—as a generative toolkit for urban design.

Azerbaijani carpet weaving, recognized by UNESCO as an Intangible Cultural Heritage of Humanity, is not merely decorative art; it is a symbolic language encoding a century of wisdom, cosmological beliefs, and a deep connection to nature (R. Efendi and T. Efendi, 2006). Motifs such as the “Tree of Life” (symbolizing perpetual growth and the universe), “Buta” (representing flame and eternity), and stylized animal figures carry narratives that transcend their origin. This research posits that transposing this structured, meaningful symbolic system can offer a powerful antidote to placelessness. It provides a framework for creating public spaces that are not only functional and aesthetically pleasing but also layered with narrative depth, fostering intercultural dialogue and enhancing the psychological comfort of a diverse urban populace.

Therefore, this study aims to develop and test a methodology for integrating the historical traditions of Azerbaijani ornamental art into the development of public territories near metro stations in Moscow. It seeks to answer the following research question: How can the symbolic content of traditional cultural ornaments be operationalized in urban design to enhance the socio-cultural sustainability and place identity of peripheral urban spaces? By doing so, this project contributes to the fields of sustainable urban design, cultural landscape studies, and place-making by offering a transferable model for leveraging intangible heritage as a core resource for creating more resilient and meaningful cities.

2 METHODS

This study employed a multi-stage, sequential mixed-methods research design to translate the symbolic language of traditional Azerbaijani ornaments into actionable urban design proposals. The methodology consisted of three core phases: (1) Ethnographic Fieldwork and Semantic Decoding, (2) Urban Analysis and Site Selection, and (3) Experimental Design and Proposal Development.

2.1 Phase 1: ethnographic fieldwork and semantic decoding

The primary objective of this phase was to build a robust database of ornamental motifs and their associated meanings to serve as the foundational "material" for the design process.

Materials: The primary source material was the collection of carpets, textiles, and related artifacts housed at the Azerbaijan National Carpet Museum in Baku. This institution holds the most comprehensive and authoritative collection of Azerbaijani textile art.

Data Collection: Researchers conducted systematic fieldwork at the museum. This involved high-resolution photographic documentation of specific ornaments and the study of accompanying curatorial descriptions and catalogues [1].

Data Analysis: The collected visual and textual data was analyzed using a hermeneutic approach, interpreting the symbolic meaning (semantics) of recurring motifs. This involved:

- Identification & Categorization: Key motifs (e.g., "Tree of Life," "Buta," "Dragon," "Goshaguş," various geometric crosses) were identified and categorized.
- Semantic Decoding: The perceived meaning and cultural significance of each motif were documented based on museum sources and established literature (e.g., [1]). For example, the "Tree of Life" was decoded as a symbol of "continuous development and a changing universe," while "S-shaped dragon" motifs were associated with "celestial or earthly elements."

- Database Creation: The findings were synthesized into a structured digital database cataloging motifs, their meanings, and their regional origins (e.g., Guba, Shirvan, Karabakh schools).

2.2 Phase 2: urban analysis and rational site selection

This phase aimed to identify suitable intervention sites within Moscow that would benefit most from identity-strengthening place-making, aligning with the goal of combating placelessness.

Materials: The analysis relied on official Moscow urban planning documentation, including the Master Plan and data on land use and functional zoning. Geographic Information System (GIS) software was used for spatial analysis.

Site Selection Criteria: Sites were evaluated based on a multi-factor framework designed to identify areas with high potential for socio-cultural sustainable development:

- Location: Focus on stations within the mid-ring and peripheral zones of Moscow, where the issue of generic urban form is most acute.
- Functional Balance: Analysis of the land use balance within a 500-meter pedestrian catchment area of each station. Sites were prioritized where the balance between residential and public-business functions was either underdeveloped or highly unbalanced, indicating a lack of quality public space (following methodologies outlined in [2, 3]).
- Existing State: Preference was given to sites exhibiting visible neglect, underutilization, or a degraded public realm (e.g., the tunnel in 4th Syromyatnichesky Lane with dilapidated graffiti).
- Cultural Context: As a secondary factor, sites with a potential contextual link to Azerbaijani culture were considered (e.g., areas near RUDN University, which hosts Azerbaijani students). However, as the primary sites of this nature were already well-maintained, this criterion served to inform design narratives rather than selection.

Selection Process: A non-random, purposive sampling technique was used. A longlist of stations was generated based on location. GIS analysis of land use data was

then applied to shortlist stations meeting the functional balance criteria. Finally, this list was validated through site visits to confirm the on-the-ground conditions.

2.3 Phase 3: experimental design and proposal development

This phase involved the practical application of the decoded symbolic database to the selected urban sites through an experimental design process.

Participants: The design work was conducted by a cohort of first-year architecture students from the Moscow State University of Civil Engineering (Russia). This provided a diverse set of creative interpretations while ensuring all proposals were developed with foundational architectural knowledge.

Design Process: The process followed a structured studio-based methodology:

- Pre-Design Analysis: For each selected site (e.g., near Belyaev, Babushkinskaya, Izmaylovskaya stations), students conducted a micro-urban analysis, mapping pedestrian flows, functional zones, compositional axes, and sight lines.
- Conceptual Transposition (Clausura): Students selected specific motifs from the Phase 1 database and explored intuitive, abstract ways to transpose their meanings and structures into urban design schemes. This moved beyond literal application to inform spatial organization, circulation paths, and landscape forms.
- Proposal Development: Conceptual ideas were developed into detailed design proposals. Façade designs where ornaments informed cladding patterns, fenestration, or lighting schemes. Master plans for squares and plazas where motifs dictated the layout of paving, greenery, water features, and street furniture.
- Output Production: Final proposals were presented as a combination of technical drawings (plans, sections), 3D visualizations, and physical scale models to fully communicate the spatial and experiential qualities of the designs.

This three-phase methodology ensured that the final design proposals were not merely aesthetic exercises but were fundamentally informed by deep cultural semantics and rigorous urban analysis, thereby addressing the core research aim of enhancing socio-cultural sustainability.

3 RESULTS

Semantic Database of Azerbaijani Carpet Motifs The ethnographic fieldwork resulted in the systematic identification and decoding of a core set of recurring ornamental motifs from the Azerbaijani carpet tradition. The analysis extended beyond visual cataloging to uncover the deep semantic meaning embedded within these patterns, transforming them from decorative elements into a lexicon for urban design. The primary motifs, their meanings, and their regional prevalence are summarized in Table 1.

Table 1

Key Azerbaijani Carpet Motifs and Their Semantic Meanings.

Motif Name	Visual Description	Semantic Meaning	Primary Regional Schools
Tree of Life	A stylized tree, often central.	Symbol of continuous development, the universe; connects underworld, earth, and heaven.	Karabakh, Guba
Buta	A teardrop or almond-shaped figure.	Represents flame, eternity, and the divine.	Shirvan, Tabriz
Dragon (S-form)	A stylized, serpentine dragon.	Associated with celestial power, clouds, and lightning; protection.	Karabakh
Goshagus	Geometric, often four-lobed.	Symbolic eye, protection from evil.	various
Bird	Stylized depictions of birds.	Represents wisdom, happiness, and love.	Gazakh, Ganja

This database provided the foundational "material" for the subsequent design phase, moving the project beyond aesthetic appropriation into the realm of meaningful application.

The application of a multi-factor selection framework to Moscow's metro network identified target sites suffering from placelessness and underdevelopment. The analysis prioritized stations in the mid-ring and peripheral zones, ultimately shortlisting sites based on two main typologies:

- 1) Degraded Infrastructure: Sites characterized by neglect and a poor public realm.

The most salient example is the area around 4th Syromyatnichesky Lane, featuring

a dilapidated building facade and a tunnel adorned with low-quality graffiti, presenting a stark contrast to the adjacent Centre for Contemporary Art "Winzavod".

- 2) Underutilized Public Space: Sites near metro stations (e.g., Babushkinskaya, Izmaylovskaya, Verkhniye Likhobory) where existing public squares and plazas are functionally barren, lack landscaping, and fail to act as community anchors despite high pedestrian traffic from the metro.

A third, contextual criterion (proximity to cultural ties, e.g., Belayevo near RUDN University) was considered but secondary, as the primary culturally linked sites were already well-maintained.

The experimental design phase resulted in a portfolio of proposals that demonstrated three distinct strategies for transposing cultural ornaments into urban design, moving from literal application to spatial organization.

Strategy 1: Literal Application to Architectural Facades. This involved directly scaling motifs for use on building surfaces. For instance, student projects for the building at 4th Syromyatnichesky Lane proposed using geometric patterns from Gazakh or Shirvan schools as perforated screens or bas-reliefs on building ends, transforming blank walls into culturally significant canvases (Figure 1).

Figure 1

Student project: Facade design with Azerbaijani carpet patterns. Author: M.A. Manukyan.

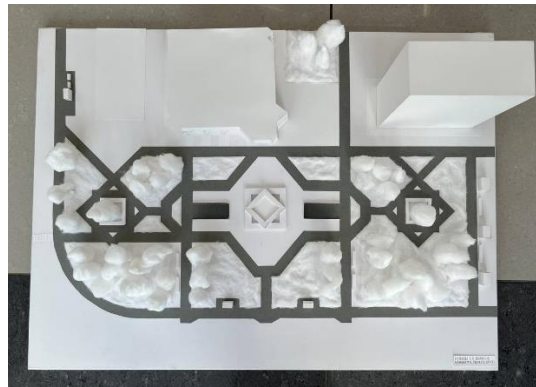


Strategy 2: Spatial Organization of Public Squares. This was the most impactful strategy, where the layout and composition of entire carpets informed master plans. For

the square at Babushkinskaya Metro (Figure 2), the central medallion of a carpet became a central plaza, the field patterns dictated the layout of pathways and garden beds, and the border motifs defined the edges of the space. This strategy uses the ornament's innate structure to create coherent, human-scale urban rooms.

Figure 2

The square near the Babushkinskaya metro station (Vylchu S.I., Khizhun E.S., Kazakova M.A., Artyukhova A.A.).



Strategy 3: Semantic Zoning. Several projects used the meaning of motifs to assign function to different areas of a space. A proposal could feature a tranquil "Tree of Life" garden for relaxation, a vibrant "Buta"-themed area for markets and festivals, and a dynamic "Dragon"-inspired playground for children, ensuring the design was not only formal but also narrative and experiential.

4 DISCUSSION

The findings of this study demonstrate a viable methodology for leveraging intangible cultural heritage as a practical toolkit for sustainable urban design. The results move beyond theoretical discourse, offering tangible strategies to address the critical challenge of placelessness.

The primary theoretical contribution of this research is the demonstration that traditional ornaments offer more than aesthetic value; they provide a pre-validated structural and semantic system for organizing space. The successful application of Strategy 2 (Spatial Organization) shows that the composition of carpets—developed over

centuries to be balanced, harmonious, and engaging—is directly transferable to the urban scale. This injects a "structured narrative" into the development process, ensuring new public spaces are intrinsically meaningful rather than generically applied. This directly answers the call from theorists like Relph (1976) and Montgomery (1998) for designs that foster genuine place identity, a core tenet of social sustainability.

This approach actively contributes to multiple dimensions of sustainability: **Social Sustainability:** Embedding cultural narratives into public space can strengthen community identity and foster a sense of belonging. Furthermore, in a multicultural city like Moscow, respectfully showcasing the heritage of a specific community (e.g., Azerbaijani) acts as a gesture of inclusivity and intercultural dialogue, making the urban environment more welcoming for all. **Cultural Sustainability:** The project operationalizes UNESCO's mandate for safeguarding Intangible Cultural Heritage. It moves the art of carpet weaving from static museum exhibition into dynamic, everyday life, ensuring its meanings and values remain relevant for new generations in a new context. **Environmental Psychology:** While not empirically tested here, the hypothesis raised by our methodology is significant: could public spaces organized by principles derived from nature (e.g., the Tree of Life) and cosmic order (e.g., dragon motifs) have a more positive psycho-physiological impact on citizens than those born from purely utilitarian or abstract modernist principles? This presents a compelling avenue for future research linking cultural design with well-being.

5.3. Limitations and Ethical Considerations The study acknowledges several limitations. The use of a student design studio, while rich in creativity, varies in technical depth and engineering feasibility. The site selection methodology, though rigorous, focused on Moscow-specific conditions. Most critically, the transposition of cultural symbols demands careful ethical consideration to avoid appropriation or superficial pastiche. The key to mitigating this, as demonstrated here, is a methodology rooted in deep semantic understanding and respect, not just visual mimicry. The proposed designs should be viewed as a starting point for co-design processes with local and cultural communities in any real-world application.

5.4. Implications for Practice and Future Research This research provides a transferable framework—decode, analyze, transpose—that can be applied to any traditional art form in any urban context. For practice, it offers urban planners and architects a concrete method to create unique, identity-rich places that support SDG 11. Future research should

focus on: Empirical Validation: Using VR simulations to quantitatively test the psychological and behavioral impacts of these culturally-informed designs versus control spaces. Community Engagement: Involving cultural bearers and local residents in the transposition process to ensure authenticity and acceptance. Technical Development: Transforming the most promising design strategies into detailed architectural and landscaping guidelines for implementation. By providing both a methodology and a catalog of strategies, this study argues that the path to sustainable and resilient cities is paved not only with green technology but also with deep cultural meaning.

5 CONCLUSIONS

This study set out to address the challenge of placelessness in contemporary urban development by exploring the potential of intangible cultural heritage as a design resource. The research successfully developed and demonstrated a novel, transferable methodology for integrating the deep semantic language of Azerbaijani carpet ornaments into the urban fabric of Moscow's peripheral and mid-ring districts. The findings confirm the central hypothesis that traditional ornaments offer far more than decorative value; they constitute a sophisticated system for organizing space and embedding narrative. The three core transposition strategies—literal application, spatial organization, and semantic zoning—provide urban planners and architects with a practical toolkit for moving beyond generic design solutions. By translating motifs like the "Tree of Life" and "Buta" into the layout of public squares and the facades of buildings, this approach directly fosters place identity, a cornerstone of social sustainability. Furthermore, it activates cultural heritage as a living, evolving practice, contributing to cultural sustainability and promoting intercultural dialogue in a multicultural metropolis. However, this study is a first step. Its limitations, particularly the conceptual nature of the design proposals and the need for deeper community engagement in the process, highlight directions for future work. The true test of this methodology will be its application in real-world pilot projects, followed by rigorous post-occupancy evaluation to measure its impact on social cohesion, perceived well-being, and economic activity. In conclusion, this research argues that the path to truly sustainable and resilient cities is paved not only with green technology and efficient infrastructure but also with deep cultural meaning. The method of semantic

decoding and structured transposition presented here offers a viable model for cities worldwide to leverage their own diverse cultural heritages, transforming anonymous urban spaces into meaningful places that promote ecological balance, social well-being, and a profound sense of belonging.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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