BOOK OF PROCEEDINGS

1st International Conference on Built Environment

ICBE 2026

MAY 08th-09th, 2026
POLIS University, Tiranë

ISBN: 9789928347282

DOI: 10.37199/c4100031

CIP Katalogimi në botim BK Tiranë

Universiteti Polis

1st international conference on built environment (icbe) :

may 08th-09th, 2026 : book of proceedings / POLIS University,

Tirane. - Tiranë : Universiteti Polis, 2026. 1 burim në linjë (... f.)

ISBN 9789928347282

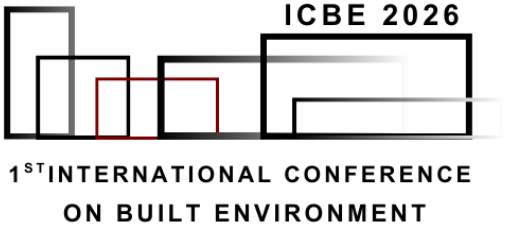
1.Arkitektura 2.Konferenca

72 (062)

BOOK OF PROCEEDINGS

1st International Conference on Built Environment

ICBE 2026



MAY 08th-09th, 2026
POLIS University, Tiranë

ISBN: 9789928347282

DOI: 10.37199/c4100031

1st International Conference on Built Environment

ICBE 2026

Conference Theme and Rationale

The 1st International Conference on Built Environment (ICBE 2026) was conceived as an international and interdisciplinary forum for advancing knowledge, critical discussion, and innovation across architecture, urban planning, engineering, construction, materials, design, and the wider built environment. Organized by POLIS University in collaboration with the National Agency for Scientific Research and Innovation in Albania (AKKSHI), the Academy of Sciences of Albania and the University of Ferrara in Italy, the conference brought together academics, researchers, practitioners, students, and industry representatives to exchange research findings, professional experience, and emerging perspectives on the transformation of contemporary cities and territories.

The conference theme reflected the increasingly complex challenges shaping the built environment, with particular attention to sustainability, resilience, technological innovation, heritage preservation, and socially responsive design. Contributions addressed sustainable architecture and green building, innovative construction technologies and materials, climate-responsive and energy-efficient design, disaster risk reduction, circular approaches to construction, and the integration of renewable energy. Equal emphasis was placed on digital transformation through Building Information Modeling, Geographic Information Systems, artificial intelligence, data analytics, automated solutions, digital fabrication, and advanced manufacturing.

ICBE 2026 also recognized that the future of the built environment cannot be approached through technological innovation alone. Urban transformation, cultural heritage, adaptive reuse, inclusive design, ecological thinking, art, and interdisciplinary research were therefore integral to the conference rationale. The scientific sessions examined topics ranging from seismic resilience, geotechnical engineering, and structural safety to urban fragmentation, public space, heritage conservation, adaptive environments, and new relationships between human and non-human systems.

Through keynote lectures, scientific presentations, case studies, and interdisciplinary debate, the conference encouraged connections between research and practice while promoting approaches capable of responding to environmental, social, cultural, and technological change. The breadth of contributions demonstrated the value of bringing engineering, architecture, urbanism, design, heritage, and emerging technologies into a shared academic framework for more resilient, sustainable, adaptive, and human-centered environments.

Held on 8-9 May 2026 at POLIS University in Tirana, with in-person and online participation, ICBE 2026 welcomed guest speakers and participants from Albanian and international universities, research institutions, professional organizations, and industry. Its sessions established a platform for presenting current research, exchanging expertise, strengthening meaningful collaboration, and identifying future directions for the built environment.

The event

The **1st International Conference on Built Environment (ICBE 2026)** is an interdisciplinary academic and professional forum dedicated to exploring contemporary challenges, emerging research, and innovative approaches shaping the future of the built environment. Bringing together researchers, academics, architects, engineers, urban planners, designers, practitioners, and industry professionals, the conference promotes the exchange of knowledge and encourages collaboration across traditionally interconnected disciplines. Its thematic scope encompasses sustainable and resilient construction, technological innovation, advanced building materials, urban transformation, cultural heritage, and interdisciplinary design approaches. Particular attention is given to the growing role of digital technologies, data-driven methodologies, intelligent design processes, and advanced analytical tools in supporting more informed and responsive approaches to architecture, engineering, and urban development. At the same time, ICBE 2026 recognizes the importance of environmental responsibility, cultural identity, social needs, and human-centered design in shaping contemporary cities and territories. Through keynote lectures, scientific sessions, case studies, and interdisciplinary exchange, the conference provides a platform for presenting current research, discussing professional experiences, and developing new perspectives capable of contributing to **safer, more sustainable, adaptive, inclusive, and resilient built environments**.

Objectives

- Promote interdisciplinary collaboration among researchers, academics, practitioners, and professionals in architecture, engineering, urban planning, construction, design, heritage, and related fields of the built environment.
- Advance the use of digital technologies and innovative methodologies, including BIM, GIS, artificial intelligence, data analytics, digital fabrication, and parametric approaches, in research and professional practice.
- Encourage sustainable, resilient, and climate-responsive approaches to architecture, construction, and urban development through innovative materials, energy-efficient strategies, and environmentally responsible design.
- Address contemporary challenges affecting cities, buildings, and infrastructure through scientific research, applied case studies, evidence-based approaches, and innovative design solutions.
- Promote the conservation, transformation, and adaptive reuse of cultural heritage, balancing cultural identity, contemporary needs, structural safety, and responsible urban development.
- Support human-centered and socially responsive urban transformation, considering public space, mobility, ecological systems, community needs, and the wider social and economic impacts of the built environment.
- Provide a platform for knowledge exchange and emerging research, enabling scholars, young researchers, professionals, and students to present innovative ideas, strengthen international collaboration, and contribute to future directions in the built environment.

Main Conference Themes

- Sustainable architecture and green building practices.
- Innovations in construction technologies and materials.
- Heritage preservation and adaptive reuse in the built environment.
- Digital tools and smart technologies in architecture and construction (e.g., BIM, GIS).
- Climate-responsive and energy-efficient design.
- Disaster risk reduction and resilience in the built environment.
- Circular economy approaches in construction and material usage.
- Integration of AI and data analytics in building design.
- Acoustic and thermal performance in building design.
- Renewable energy integration in building systems.
- Advanced manufacturing techniques in construction, such as 3D printing.
- Innovations in construction technologies and materials.
- Heritage preservation and adaptive reuse in the built environment.
- Disaster risk reduction and resilience in the built environment.
- Digital tools and smart technologies in architecture and construction.
- Advanced manufacturing techniques in construction.
- Geotechnical Engineering for Sustainable Development.
- Cartography and Geographic Information System.
- Computer Automated Solutions for Built Environment.
- Reliability in Civil Engineering.
- Urban planning strategies for resilient cities.
- Climate-responsive and energy-efficient design.
- Regulatory frameworks and policies impacting construction and urban development.
- Design in the Era of Anthropocene (Rethinking the Relation between Human and Non-Human Species)
- Speculative Design (with Attention to “Discursive” and “Critical” Design)
- Design and Cross-Disciplinarity (with Emphasis on Processes rather than Design Outputs)
- Inclusive Design
- Art and Urban Regeneration (Focus on Participatory, Collaborative, and Research-Based Practice)
- Relational Art and Architecture
- Monuments and ‘Anti-Monuments’ (Particular Attention to the Process of Designing and Building the City)

Committees

Scientific Committee

Prof. Dr. José Turmo / Universitat Politècnica de Catalunya · BarcelonaTech (UPC), Spain
Prof. Dr. José Antonio Lozano-Galant / University of Castilla-La Mancha (UCLM), Spain
Assoc. Prof. Dr. Francisco Javier Castilla Pascual / University of Castilla-La Mancha (UCLM), Spain
Prof. Emeritus Dr. Pantoleon Skayannis / University of Thessaly, Greece - POLIS University
Acad. Prof. Dr. Gëzim Hoxha / Academy of Sciences of Albania
Acad. Prof. Dr. Stefan Çapaliku / Center for Arts Studies, Academy of Sciences of Albania
Prof. Dr. Roberto Di Giulio / Department of Architecture, University of Ferrara, Italy
Assoc. Prof. Dr. Theo Zaffagnini / Department of Architecture, University of Ferrara, Italy
Prof. Emeritus Dr. Sherif Lushaj / POLIS University
Prof. Thoma Thomai / POLIS University
Prof. Dr. Besnik Aliaj / POLIS University
Assoc. Prof. Dr. Mario Ferrari / POLIS University
Dr. Elona Karafili / POLIS University
Assoc. Prof. Dr. Merita Toska / POLIS University
Dr. Manjola Hoxha / POLIS University
Assoc. Prof. Dr. Skënder Luarasi / POLIS University
Assoc. Prof. Dr. Llazar Kumaraku / POLIS University
Adjunct Prof. Dr. Svetlana Brzev / University of British Columbia, Canada
Andrew Charleson, Adjunct Research Fellow / Victoria University of Wellington, New Zealand
Dr. Seyyed Behrad Emadi / Imperial College London
Dr. habil. Eng. Jarosław Górecki / Bydgoszcz University of Science and Technology, Poland
Prof. Giuseppe Mincolleli / Department of Architecture, University of Ferrara, Italy
Prof. Dr. Panagiotis Kyriatsis / University of Western Macedonia, Greece
Dr. Ledian Bregasi / POLIS University
Assoc. Prof. Dr. Merita Guri / POLIS University
Dr. Sonia Jojiç / POLIS University
Dr. Ilda Rusi / POLIS University
Dr. Klodjan Xhexhi / POLIS University
Dr. Keti Hoxha / POLIS University
Dr. Kristiana Meço / POLIS University
Dr. Endri Duro / POLIS University
Dr. Malvina Istrefaj / POLIS University
Dr. Ornela Sen / POLIS University
Dr. Nikolla Vesho / POLIS University
Dr. Blerim Nika / POLIS University
Dr. Genti Avdija / POLIS University
Dr. Marsela Plyku Demaj / POLIS University

Organizer Committee

Chairs:

Dr. Ilda Rusi / POLIS University

Dr. Klodjan Xhexhi / POLIS University

Dr. Sonia Jojiç / POLIS University

Co-Chairs:

Dr. Endri Duro / POLIS University

Dr. Kristiana Meço / POLIS University

Members:

Acad. Assoc. Prof. Dr. Rrapo Ormeni / Academy of Sciences of Albania

Acad. Prof. Dr. Gëzim Hoxha / Academy of Sciences of Albania

Acad. Prof. Dr. Stefan Çapaliku / Center for Arts Studies, Academy of Sciences of Albania

Mirela Muça, MA / General Director, National Agency of Scientific Research and Innovation (AKKSHI), Albania

Assoc. Prof. Dr. Sotir Dhamo / POLIS University

Assoc. Prof. Dr. Merita Guri / POLIS University

Dr. Ledian Bregasi / POLIS University

Keynote Speakers

Adjunct Prof. Dr. Svetlana Brzev / University of British Columbia, Canada

Assoc. Prof. Dr. Markel Baballëku / Polytechnic University of Tirana, Albania

Eng. Daniel Naterop / DNGeo Consulting - SISGEO, Switzerland

Eng. Skënder Allkja / ALTEA & GEOSTUDIO 2000, Albania

Dr. Stefano Romano / Center for Arts Studies, Academy of Sciences of Albania

Assoc. Prof. Dr. Alessandro Massarente / Department of Architecture, University of Ferrara, Italy

Industry & Construction Partners

Lindner Albania / Interior Fit-Out, Building Envelope & Construction Solutions

Saint-Gobain Albania / Sustainable Construction Materials & Building Solutions

ALUMIL Albania SHPK / Architectural Aluminum Systems & Building Envelope Solutions

Scientific Secretariat

Dr. Kristiana Meço / POLIS University

Msc. Eng. Erjon Çobani / POLIS University

Msc. Tekla Tasho / POLIS University

Msc. Vjola Ziu / POLIS University

Web Designer

Msc. Altin Sula / POLIS University

MSc. Nikol Doda / POLIS University

The conference is structured around six thematic sessions, each addressing a specific area of research and practice within the built environment.
Each session is coordinated by experts in the relevant disciplinary field and is open to professors, researchers, PhD candidates, and other scholars and professionals contributing to the conference themes.

SESSION I
Urban Planning and Societal Impact

Chair: Dr. Gent Avdija

This session examines the relationship between urban transformation, spatial development, and their social implications within contemporary cities. Contributions address rapid urbanization, urban fragmentation, the transformation and loss of public space, informal and spontaneous development, and the challenges associated with balancing growth and modernization with human-scale urban environments. Particular attention is given to the evolving conditions of Albanian cities and to planning approaches capable of supporting more inclusive, sustainable, socially responsive, and livable urban environments.

SESSION II
Sustainable Materials, Resilient Construction & Smart Design

Chair: Dr. Endri Duro

This session explores innovative approaches to sustainable construction, resilient structural systems, and environmentally responsive design. Particular attention is given to sustainable materials, energy-efficient and climate-responsive strategies, prefabricated and lightweight construction technologies, and human-centered approaches to structural and architectural design. The session investigates how material innovation, technological development, and responsible design practices can contribute to safer, more efficient, adaptable, and environmentally sustainable built environments.

SESSION III
Technological Advancements and Seismic Design for Resilient Places

Chairs: Dr. Seyyed Behrad Emadi & Dr. Ornela Şen

This session examines the role of technological innovation and advanced engineering methodologies in developing safer, more resilient, and adaptable built environments. Contributions address seismic hazard and risk assessment, digital fabrication, parametric and computational approaches, transformations of building envelopes and prefabricated housing systems, and emerging concepts for future urban mobility. The session highlights how the integration of engineering knowledge, digital technologies, and resilience-oriented design can strengthen the capacity of buildings, infrastructure, and urban environments to respond to contemporary and future challenges.

SESSION IV

Cultural Heritage

Chairs: Dr. Nikolla Vesho & Dr. Marsela Demaj

This session addresses the preservation, interpretation, and transformation of cultural heritage within contemporary architectural and urban contexts. Contributions explore conservation strategies for historic buildings and sacred architecture, seismic assessment and strengthening of heritage structures, adaptive reuse, and the social implications of urban regeneration and heritage loss. Particular emphasis is placed on achieving a responsible balance between conservation ethics, cultural identity, structural safety, and the evolving functional requirements of historic buildings and urban environments.

SESSION V

Spaces of Connection: Art and Design for an Interspecies and Interdisciplinary Environment

Chair: Dr. Francesco Scasciamacchia

This session explores the intersections of art, architecture, design, technology, and the built environment through interdisciplinary and experimental perspectives. It investigates changing relationships between human and non-human systems, spatial perception, adaptive reuse, post-industrial landscapes, urban representation, digital heritage, and environmentally and socially engaged design practices. Through critical, speculative, participatory, and research-based approaches, the session examines how art and design can generate new forms of connection, reinterpret existing environments, and contribute to emerging cultural and spatial narratives within contemporary cities.

SESSION VI

Next-Generation Pioneers of the Built Environment

Chair: Dr. Flogerta Krosi

This session provides a dedicated platform for emerging researchers and students to present innovative, experimental, and forward-looking approaches to the built environment. Contributions span architecture, engineering, urban planning, environmental resilience, design, and related creative disciplines, reflecting the interdisciplinary character of a new generation of researchers and practitioners. Through projects addressing topics such as bioclimatic design, flood-risk management, structural technologies, architecture-inspired design, and critical interpretations of objects and social space, the session encourages critical inquiry, experimentation, and new perspectives on the future of the built environment.

Layout & Design:

Dr. Kristiana Meço

Msc. Erjon Çobani

POLIS University Contact:

Rr. Bylis 12, Autostrada Tiranë-Durrës, Km 5, Kashar

Kodi Postar 1051, Kutia Postare 2995

Tiranë, Albania

Tel: +355.(0)4.2407420 / +355.(0)4.2407421

Fax: +355. (0)4.2407422

Mob: +355 (0) 69 40 88 111

Email: contact@universitetipolis.edu.al

Website: www.universitetipolis.edu.al

Table of Contents

SESSION I 14

Urban Planning and Societal Impact 14

The Fading Public Realm: 5

From Expansive Open Spaces to Morphological Compression in Durres' Rapid Urban Growth

Arjola SAVA 5

Spontaneous Architecture as Adaptive Metabolism in Post-Socialist Cities Renis Batalli 18

The ground floor as an urban interface: the human-building relationship and the Loss of Urban Contact Avrili MESHI 35

Urban Blueprint and Compatible Growth: 45

A Multi-Scalar Morphological Method for Sustainable Transformation in 45

Erseke, Albania **Mario DINE** 45

Examining the Internal Anatomy of Socialist-Era Hotels in Albania: 58

Spatial organisation, Geometry, Structure, Circulation, and Function**Malvina Istrefaj(KOLIÇI)** 58

Urban Construction Through Destruction Sotir DHAMO 73

SESSION II 87

Sustainable Materials, Resilient Construction & Smart Design 87

Human Centered Design in Civil Engineering Ilda RUSI, Albi ALLIAJ 88

The courtyard as a climate-responsive and resilient spatial strategy: the case of Novi Pazar Elma MAHMUTOVIĆ, Dragana KONSTANTINOVIĆ 103

Numerical assessment of the thermal performance of a heated and cooled floor containing upgraded phase change materials Oumayma BABAHARRA, Khadija CHOUKAIRY 121

Eco-Friendly Building Envelopes: 132

Thermal, Energy, Cost, and Time Performance of Prefabricated Lightweight MRC Panels in Residential Construction **Erjon ÇOBANI, Flogerta KROSI, Ornela ŞEN** 132

SESSION III 156

Technological Advancements and Seismic Design for Resilient Places 156

Identification and assessment of resident-driven façade interventions in prefabricated large panel buildings: 157

the case of Tirana Flogerta KROSI, Alma GJONAJ, Merita GURI, Ornela ŞEN, Endri DURO 157

Tirana_ toward a (non) resilient city of the future 173

Re-shaping mobility and bring back "La raison d'être of the city" **Ina MUSAI** 173

A Seismic Hazard Model of Albania 187

Case study: Kukes, Berat and Himarë **Anila XHAHYSA, Neki KUKA** 187

Phenomeno-Parametrism: 203

Translating Place Experience into Parametric **Markeljan LLESHI** 203

SESSION IV 217

Cultural Heritage 217

Preserving and Adapting Sacred Architecture: 218

A Case Study of the Jazak Monastery **Una RADIVOJEVIĆ**.....218

Monumentality Reconsidered: Heritage Preservation and Adaptive Reuse through the Theories of Robert Venturi and Aldo Rossi **Harika SHEHABI** 233

Seismic Performance Assessment of Historic Stone Masonry Buildings: 245

The Case of the Angonate Residence, Gjirokastër **Alma GJONAJ, Merita GURI, Endri DURO**... 245

Future Heritage by Design: 258

New Design Approaches to Heritage Reuse **Gregor ANDONI, Kristiana MEÇO** 258

SESSION V.....267

Spaces of Connection: Art and Design for an Interspecies and Interdisciplinary Environment 267

Heritage as Narrative:.....268

Building City Image Through Adaptive Reuse in Durrës **Vjola ZIU, Remijon PRONJA** 268

The Extraordinary Everyday Children's Spatial Agency as Anti Monumental Practice **Xhoi MUSLIAKA** 281

'Liminal Architectural Bodies' in Post-Industrial Kuçova:.....298

From an Ecological Perspective to an Aesthetic realm **Dorina XHERIMEJA, Aishe BITRI**.....298

IN Illyria, Episode I: Apollonia 311

A Pixel-Art Game Framework for Archaeological Interpretation and Cultural Heritage Learning **David KRYEMADHI, Nikolla VESHO, Skervi BAUSHI, Remijon PRONJA, Kujtim HALILI**.....311

In the Age of Material Transformation: Textile Design and Upcycling **Armela LAMAJ**.....326

AI as a Designer:.....336

The Future of Taste and Creativity in Automotive Design **Gregor ANDONI** 336

The Secondary Archive: 342

Collective Memory, Mental Images and AI-Assisted Representations in a Transforming Tirana **Dejvi DAUTI** 342

SESSION VI.....352

Next-Generation Pioneers of the Built Environment 352

Performance-Based Bioclimatic Design of a Kindergarten in Tirana: Integration of Passive Systems and Dynamic Simulation **Erald MEÇE, Afërdita MUHAMEDI, Verona HYSI, Klodjan XHEXHI**.....353

Integrated Flood Risk Management in Albania: 363

Human drivers, Basin dynamics and Policy gaps **Zejd BUSHATI, Esad MALAJ, Erjon ÇOBANI, Merita GURI** 363

Steel frame technology for residential buildings:.....383

A comparative thesis-antithesis study versus reinforced concrete systems **Elton AHMETAJ, Erjon ÇOBANI, Merita GURI** 383

DOUBLE SKIN:.....394

How does the "Double Skin" concept interact with our body in the field of fashion design? **Desara LLESHI**.....394

Chairs as instruments in the construction of social roles and human bodies Aurora BALLA 401

Autonomy as a Value:.....409

Design and Branding in the Post-Fordist Era **Irena ALIAJ, Erson RAMAJ**.....409

SESSION I

Urban Planning and Societal Impact

Urban transformation and growth: Rapid urbanization / Urban expansion / Contemporary city transformation / Growth and modernization.

Urban form and spatial quality: Urban fragmentation / Human-scale development / Public-space transformation / Spatial continuity and connectivity.

Society and the city: Social impact of urban development / Community needs / Inclusive urban environments / Quality of urban life.

Planning challenges in changing cities: Spontaneous architecture / Informal development / Sustainable urban planning / Transformation of Albanian cities.

Spontaneous Architecture as Adaptive Metabolism in Post-Socialist Cities

DOI: 10.37199/c4100033

Renis Batalli
ORCID 0009-0008-3817-8054
Polis University, Albania
renis_batalli@universitetipolis.edu.al

Abstract

Post-socialist cities have gone through fast socio-economic changes which have resulted in urban growth, weak regulation and informal architecture. Often this is seen as failed planning or illegal activity, but at the same time it can be understood as adaptive responses to spatial needs, economic uncertainty and changes of everyday life. The study of this phenomenon argues how informal architectural production reshapes the built environment and public space, and how these processes can be part of contemporary urban planning and strategies.

The aim is to examine spontaneous architecture as expression of urban metabolism and self-organizing processes through which cities grow and shape over time. This study explores the possibility that these transformations can be understood as a form of adaptive reuse and intelligence rather than disruptions to formal planning systems. It is hypothesized that informal architecture is a manifestation of private necessity and collective urban life by producing resilient and inclusive transformations to existing structures.

The methodological approach combines field documentation, spatial mapping and architectural analysis of informal interventions across multiple urban scales, with a focus on post-socialist contexts. Visual surveys, diagrammatic interpretations and typological classification are used to identify recurring patterns of transformation, supported by conceptual frameworks related to complexity theory and ecological relationships.

The analysis indicates that the informal reuse and adaptation of existing structures extend building life and activates underutilized public space through intuitive and responsive transformations. By using these alternative research methods, we can observe and analyse the city based on new paradigms to fill the gap between collected data and reality. Recognizing urban metabolism as an analytical framework and design tool can produce usable knowledge for architects and planners on how to better understand the built environment and propose strategies for more adaptive, inclusive, and resilient urban planning.

Key words: *Urban metabolism, Informal architecture, Adaptive reuse, Living Heritage, Post-socialist cities*

1. INTRODUCTION

1.1 Background and Rationale

The transformation of post-socialist cities, such as Tirana from the early 1990s, is one of the most complex urban transitions in recent history. The collapse of centralized planning systems and the sudden shift to market economies created a gap in governance, regulation and spatial control. In this context, urban environments did not just grow, they began to reorganize themselves through informal processes that reshaped the physical form and social life.

This phenomenon has often been described as disorder, illegality or chaotic growth. Informal settlements, building extensions, rooftop additions and the enclosure of public or semi-public spaces are usually seen as problems or deviations from proper planning. However, these interpretations ignore the adaptive logic of these interventions. Rather than being anomalies, they often respond directly to people's needs, showing how cities can adapt and self-regulate under uncertain conditions.

In the case of Tirana, the built environment has become a result of formal and informal processes. Buildings are no longer static objects but evolving organisms going through modifications to accommodate new functions, economic growth, and social needs. This condition challenges traditional architectural and urban theories that understands the city as static, stable and coherent.

1.2 Research Problem and Question

The main issue lies in the limited way informal architecture is currently understood and interpreted. Recent planning paradigms tend to categorize such interventions as illegal or chaotic, thereby excluding them from meaningful integration into urban development strategies. This has led to the public opinion to perceive this reality as negative and harming to the city.

The lack of understanding of this process has pushed current urban planning strategies and interventions to adopt a radical approach on dealing with these structures. Either they are left untreated, in a degraded state, often disrupting everyday life of citizens, or going to the extreme by taking initiatives to demolish informal settlements without a proper analysis of the impact that these actions have on the context, whether it is harming or not the environment, and with no concern on the impact and consequences that these demolitions have on the spatial, economic and social level.

This raises the question of whether informal architectural transformations might be understood as expressions of an adaptive urban metabolism, reflecting how cities reorganize themselves under internal and external pressures, and what we can learn from them.

1.3 Aim and Objectives

The aim is to critically examine informal architecture as a manifestation of self-organizing urban processes. The objectives include:

- Visit and observe areas in post-socialist cities that have gone through socio-economic transition and fast urban growth.
- Documenting changes and transformations that happened to the city's urban texture.
- Identifying recurring patterns of informal interventions across different spatial scales.
- Evaluating their role in extending building lifecycles and activating urban space.
- Reframing informal architecture as a form usable knowledge to better understand and plan cities that have gone through spontaneous architecture activities.

2. LITERATURE REVIEW

2.1 Informality and Urban Theory

The concept of informality has been discussed in urban studies, often in relation to economic conditions and governance structures. It has often been seen as a deviation from formal planning systems, something temporary, irregular, or even problematic. More recent perspectives shift this understanding by positioning informality as a mode of urbanization rather than an exception. In this view, informality shows the ability of cities to function beyond rigid regulatory frameworks, shaped by necessity, adaptability, and everyday innovation.

This shift in perspective allows for a clearer understanding of informal architecture. Bernard Rudofsky's book "Architecture Without Architects" highlights the intelligence embedded in vernacular and spontaneous forms of construction, suggesting that design knowledge is not exclusive to professionals. In a similar way, research on self-built environments emphasizes the active role of inhabitants in producing and transforming space. Rather than passive users, individuals become important actors who shape spatial, social, and economic conditions through their interventions.

In his book "How the Other Half Builds", Vikram Bhatt focuses his study on about how informal settlements and low-income housing actually develop in cities, especially in developing countries. Rather than treating slums as problems, the book looks at them as organic systems of building and living shaped by the people who live there.

The book analyses how people with limited resources choose, shape, and build their own homes and neighborhoods, often in ways that are efficient, functional, and adapted to their daily needs, even if they don't follow formal architectural rules. It argues these settlements work in ways that conventional planning often ignores. To better illustrate these spontaneous solutions to lived space, the publication contains a series of diagrams and drawings of these built environments. These illustrations map different scales, from neighborhood to detailed unit or room representations of ingenious solutions that come from users with no knowledge

on building techniques or policies.These approaches challenge the usual divide between formal and informal, showing that cities are shaped in more dynamic and participatory ways over time.

2.2 Complexity and Self-Organization

Complexity theory provides a useful lens for understanding informal urban processes. Cities can be seen as complex adaptive systems composed of multiple interacting agents. Rather than being centrally controlled, they evolve through decentralized interactions that produce emergent patterns.

Christopher Alexander's distinction between "tree" and "semi-lattice" structures highlights the importance of overlapping relationships in urban systems. Informal architecture often operates within such semi-lattice conditions, where spaces serve multiple functions and boundaries are fluid.

In the work of Michael Batty, cities are described as dynamic systems characterized by non-linearity, self-organization, and emergent behavior. Small actions can lead to large-scale spatial transformations, often in unpredictable ways. This perspective is useful in understanding informal architecture, where interventions, extensions, enclosures, additions etc. accumulate to produce recognizable patterns across the city.

"*As the technological revolution continued, cities were becoming ever more complex. The understanding that had been gleaned from their earlier study became rapidly dated and less relevant. Planners found it hard to keep up with this increasing complexity and in terms of techniques and tools, had a hard time running to keep standing still. The focus changed radically to one where cities could no longer be regarded in analogy with machines - they were more like organisms, evolving from the bottom up in ways that were surprising and often counter-intuitive.*" – Batty, M. (2022). *The emergence of a science of cities. Urban Solutions*, (20), 39–45.

Sotir Dhamo in his book "Understanding Emergent Urbanism" further explores the parallel of the city as an organism:

"*This self-organization tends to self-regulate in a cyclical casual fashion, based on a combination of bottom-up and top-down individual and group behaviors generated within the hierarchical structure of the system, out of which the system reproduces itself.*

If we want the model to be adaptable to change and to self-generate, it must be able to "understand" and develop using a similar cognitive process to that of living organisms." – Dhamo, S. (2021). *Understanding Emergent Urbanism*. *The case of Tirana*.

Within this framework, informal architecture can be seen as a process of urban self-organization. Spatial configurations are not fixed but continuously adjusted, allowing buildings and urban spaces to respond to changing needs. Boundaries become flexible, functions overlap, and the built environment evolves through a series of adaptive modifications rather than urban plans.

2.3 City as an organism and ecological relationships

Following the analogy of "city as an organism", we can draw comparisons from natural ecosystems and ecological interactions to further explore this hypothesis. Based on the article "Relationships in nature" by Dr. Biology (2025), there are five main types of ecological relationships: predation, competition, commensalism, parasitism, and mutualism.

Spontaneous architecture can be understood through ecological relationships that describe how elements coexist and interact. In **symbiosis**, informal additions and host buildings have a long-lasting relationship for a considerable amount of time, enough to draw conclusions whether this interaction is harming or not to the host. **Mutualism** appears when both the original structure and the intervention benefit, such as increased space and activity. **Commensalism** occurs when additions use existing structures without significantly affecting them. **Parasitism** describes cases where interventions rely on the host while potentially overloading or degrading it. Other relationships, such as **competition, predation** or **adaptation**, also emerge, revealing how urban elements negotiate space, resources, and survival within a constantly evolving environment.

2.4 Metabolism in architecture

Adaptive metabolism refers to the way a city changes and adjusts over time to meet new needs. Like a living organism are part of an ongoing cycle affected by internal and external factors, built environment grows, adapts, and reuses what already exists. Buildings and spaces are modified through changes which come organically from the actions of common individuals with little to no knowledge of formal planning and building practices. Over time these small changes add up and shape the city in a continuous way.

The idea of metabolism in architecture, first developed in Japan during the 1960s, emerged from the need to rethink cities after war, destruction, and rapid urban growth. Instead of seeing buildings as fixed objects, Metabolist architects understood architecture as a living system, able to grow, adapt, replace parts, and regenerate over time. In this sense, architecture was not complete once built, but remained open to transformation.

This way of thinking is useful for reading informal architecture as a living organism. In many cities, especially in contexts of uncontrolled or spontaneous growth, buildings do not remain static. They receive balconies, extra rooms, rooftop additions, extensions, enclosures, and improvised structures. These additions can be interpreted as smaller organisms that attach to a host building and interact with it. Sometimes they support the host by giving it new functions; sometimes they overload it; and sometimes they create a form of coexistence between the original structure and the new intervention. Kisho Kurokawa's idea of replaceable and adaptable parts can help explain this condition. Rather than demolishing entire structures when they no longer respond to social or spatial needs, informal additions show how architecture can be modified, reused, and reactivated through partial transformations. This gives buildings a continuous social and spatial life.

3. METHODOLOGY

3.1 Research Design

The study focuses on the analysis of informal architectural interventions within post-socialist urban contexts. The methodology integrates field observation, spatial analysis, and conceptual interpretation.

3.2 Data Collection

Data is collected through:

- **Field documentation:** photographic surveys and on-site observations have been performed on a selected lot in the city of Tirana. A total of 700 images has been divided into categories by typology of intervention.
- **Spatial mapping and study:** identification of informal interventions at building and neighbourhood scales by re-drawing the patterns of transformations.
- **Case selection diagrams:** Creation of drawings and diagrams that map informal transformations, including extensions, enclosures, and rooftop additions.

3.3 Analytical Framework

The analysis is structured around three key dimensions:

1. **Spatial configuration:** how interventions modify existing structures.
2. **Functional adaptation:** how new uses emerge through informal processes.
3. **Relational dynamics:** how interventions interact with public space and surrounding context.

Diagrammatic representations are used to identify patterns and relationships, while typological classification helps organize recurring forms of intervention.

3.4 Conceptual Tools

The interpretation is guided by:

- Complexity theory (self-organization, emergence).
- Ecological analogies (symbiosis, parasitism).
- Urban metabolism (adaptive reuse, modularity and transformation).

4. RESULTS AND DISCUSSIONS

As a result of the data collection, field documentation and spatial mapping, a series of diagrams have been produced and put in a transformation typology classification framework.

4.1 Selected area

The focus of the field documentation is an area of 1.16 km^2 in the city of Tirana (marked in red in the map). This territory is located inside the central ring of the city and is composed mainly by collective buildings built in the years 1960-1970 which have been subject to transformations that started in the year 1990.

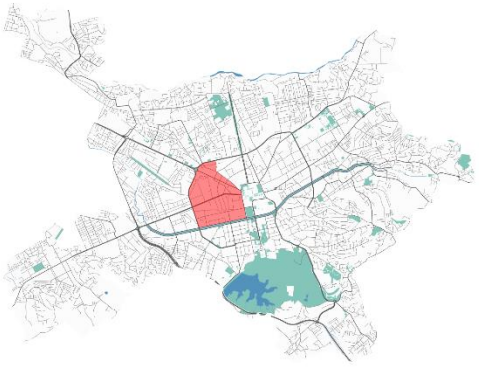


Figure 1. Map of Tirana. Source: Renis Batalli

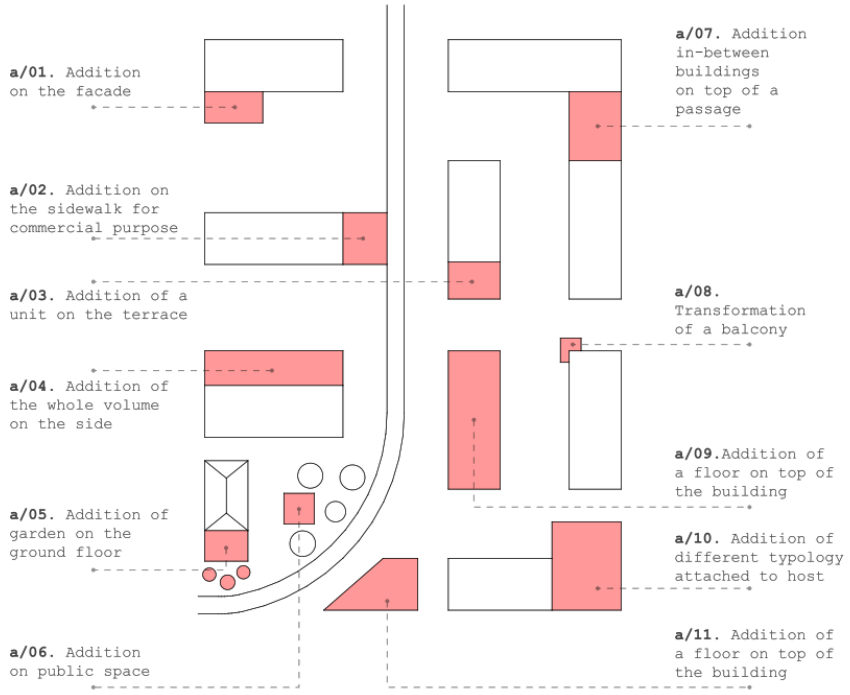
4.2 Photographic documentation

Through the visiting of the area, photographs of the transformations have been taken and grouped to show the differences of interventions as well as recurring patterns and similarities.



Figure 2. Collage of images from Tirana's buildings. Source: Renis Batalli

4.3 Urban scale transformations (top view)



Urban scale interventions show how spontaneous architecture has been spread across public space and circulation paths.

Several examples focus on additions **attached directly to existing structures**, such as façade extensions, rooftop units, or side expansions.

Figure 3. Top view diagram. Source: Renis Batalli

These interventions increase built volume while maintaining a connection to the original building. In some cases, entire new floors are added on top, resulting to a more unpredictable and dynamic top view of the area.

Other interventions are positioned more on the **public areas**. Additions on sidewalks for commercial use, small gardens at ground level or extensions into open space show how private needs lead to occupation of shared urban space. These changes often activate empty or underused spaces and provide a new function or service to the neighbourhood.

There are also more complex scenarios, such as **in-between additions** built over passages or connections between buildings. These interventions tend to maximise the use of space by creating new units on top of pathways by not disrupting circulation.

In some cases, new typologies are introduced attached to existing structures which creates an eclectic and vibrant built landscape.

4.4 Urban scale transformations (front view)

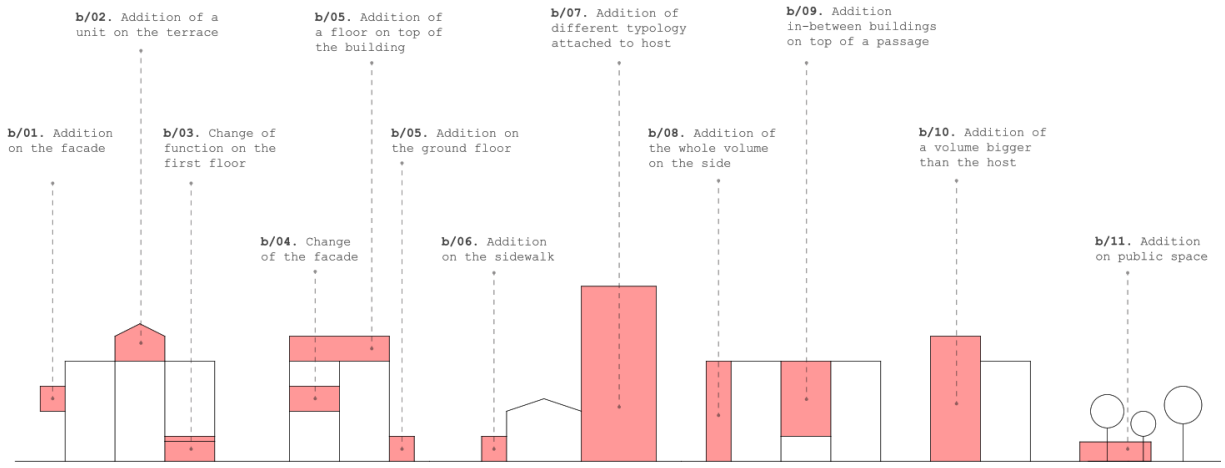


Figure 4. Front view diagram. Source: Renis Batalli

From a vertical perspective, the diagram shows how the original building (the host) and the intervention (added organism) interact by transforming the cityscape.

Many of these interventions occur on the **façade**, where changes include both the transformation of openings, such as windows and balconies, and the addition of new volumes at different levels. In some cases, multiple small interventions are merge together, creating entirely new compositions and changing the original view of the elevation.

Rooftop additions are a recurring pattern that often result in the addition of one or more floors. This process increases the number of units and produces a new and taller building typology.

At the ground level, interventions mostly happen due to **functional change**, such as a shift from private to public use. A common modification involves the openings, windows become doors, while elements such as shelters, platforms, vegetation, and urban furniture are added to allow new commercial functions to operate and give services to the area. In some cases, entirely new units are added, extending into sidewalks or public space.

4.5 Building scale transformations (vertical section)

The diagram presents a series of recurring informal interventions that modify existing buildings through adaptive changes. These interventions can be understood as **additions, transformations, and extensions**, each operating at different scales and positions within the structure.

The first group includes **additive interventions**, where new volumes are attached to the building. They are located on the ground floor, façade, or rooftop, showing how unused or accessible surfaces become opportunities for expansion. These additions often respond to spatial needs, increasing usable area without replacing the original structure.

The second category involves **transformations**, where existing spaces are altered rather than expanded.

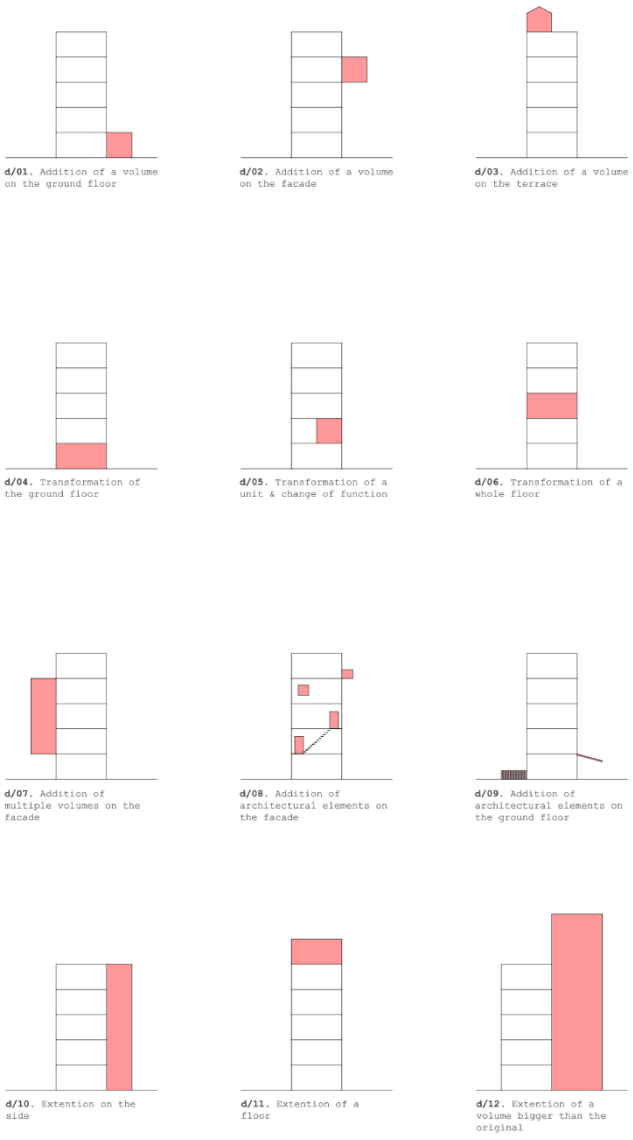


Figure 5. Building diagram. Source: Renis Batalli

This includes the conversion of ground floors, the modification of individual units or the reconfiguration of an entire floor. These changes often happen due to changes of function, such as residential spaces turning into commercial use.

The third group consists of **extensions**, which enlarge the building's footprint or volume. These can appear as side expansions, vertical floor additions, or large-scale extensions that exceed the original structure in size. Unlike smaller additions, these interventions have a more drastic visual effect by reshaping the identity of the building.

These types of interventions show a continuous process of adaptation, where buildings evolve over time through modifications driven by socio-economic changes.

4.6 Unit transformations (isometric view)

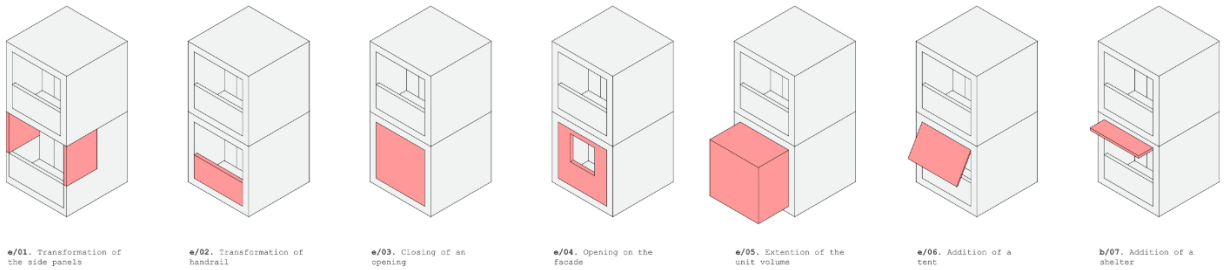


Figure 6. Unit diagram. Source: Renis Batalli

This analysis focuses on smaller scale modifications made directly to individual housing units. Unlike larger building transformations, these changes happen on a more intimate level, reflecting immediate needs and personal preferences of the user.

The first set of interventions involves **surface transformations**, such as modifying side panels or altering railings. They are often made to improve privacy, safety or environmental comfort. Similarly, the **closing or opening of façade elements** shows how residents adjust light, ventilation, and visibility according to their needs. A closed opening can create more usable interior space, while a new opening can provide a better connection to the outside.

Another group includes **volumetric additions**, where small extensions are added on the outside of the existing unit. These interventions increase usable space without altering the building structure, often used for storage, living functions or commercial activities.

Temporary elements such as **tents and shelters** are flexible adaptations that provide shading and privacy with lighter structures that can be easily modified or removed.

4.7 Surface level transformations (perspective view)

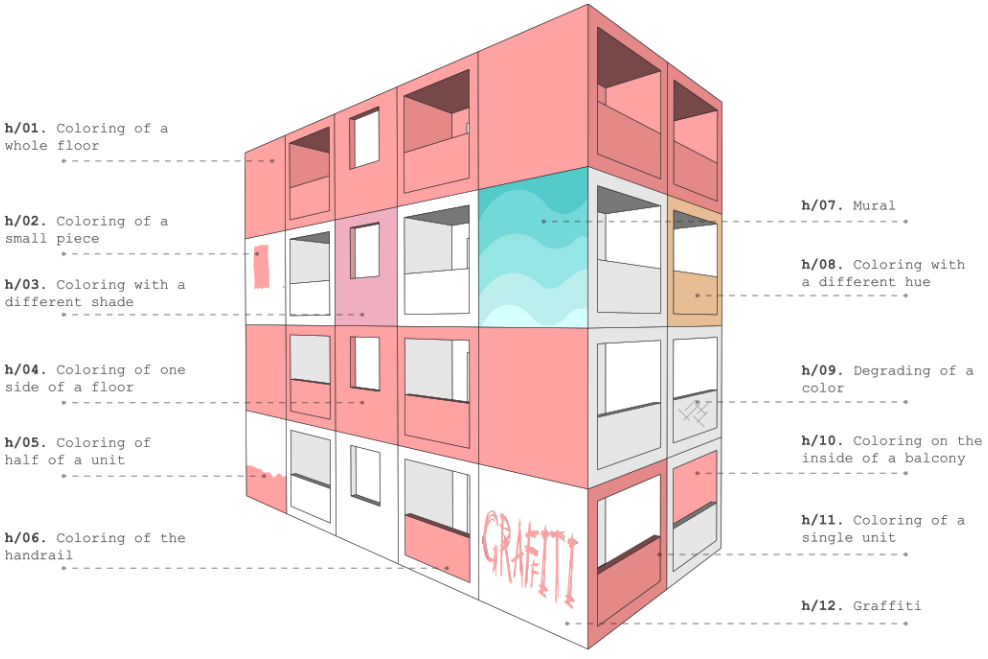


Figure 7. Surface transformation diagram. Source: Renis Batalli

Surface-level interventions focus on how color and visual elements are used to transform the appearance and identity of a building. Unlike volumetric additions, these changes do not change the physical structure but they happen on the façade surface.

Color alteration is one of the main ways that facades are modified. On a bigger scale, entire floors or sides of the building are **recolored**, creating strong visual contrasts that redefine the overall composition. In some cases, only parts of a façade are painted, such as a small area, half of a unit, or a single element. This results in a fragmented and not unified composition which contributes to the chaotic feeling that is perceived while visiting these areas. By recoloring the degraded façades one unit at a time, on different periods and with colors that are matched only by intuition and visual observations there are variations in tone, shade, and hue that make the visual appearance even more diverse.

Other interventions are more expressive and symbolic, such as **murals and graffiti**, which introduce narrative, identity, or personal expression into the urban environment. These elements often reflect social, cultural, or individual messages, turning the façade into a communicative surface, even though in the case of Tirana these types of artistic expressions are less common, and the messages that are drawn more often involve information or “do not park here” warnings.

Smaller interventions, such as coloring the inside of balconies handrails show how even small change can contribute to the overall visual transformation.

4.8 Façade material transformations (front view)

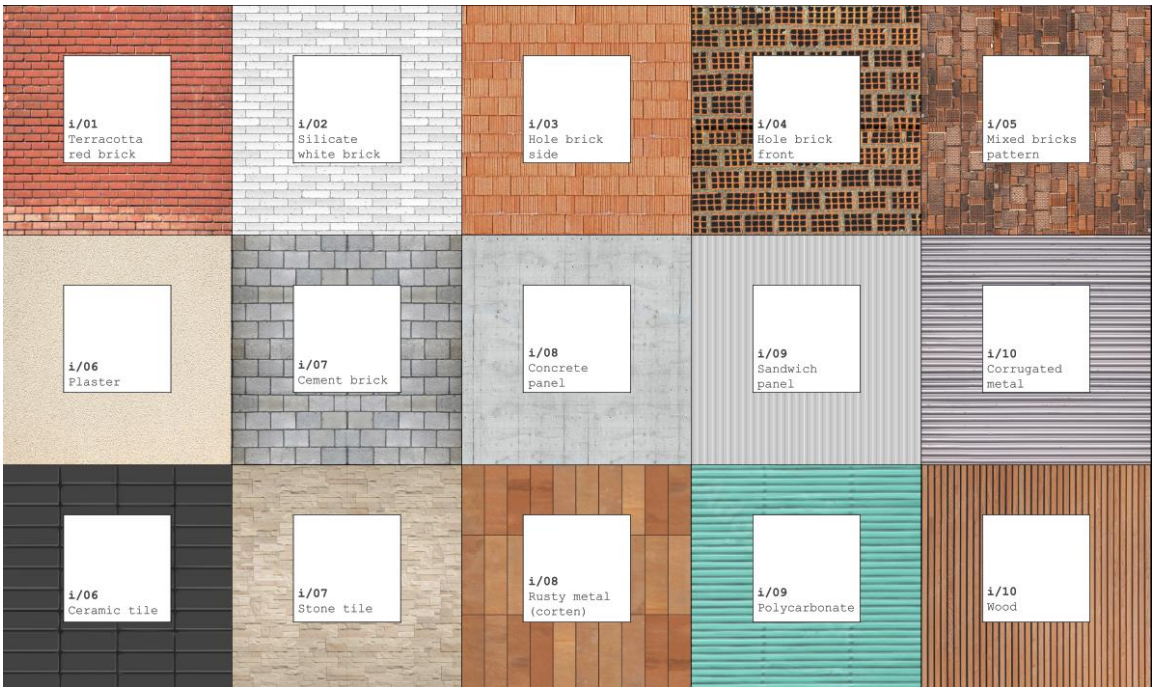


Figure 8. Material transformation diagram. Source: Renis Batalli

The diagram presents samples of façade material transformations, showing how different materials are applied to existing buildings as result of spontaneous interventions. These

transformations operate at the level of surface redefining the visual identity as a result of reconstruction and improvement of insulation to provide comfort to the indoor unit.

A large group of materials is based on **brick variations**, including terracotta, silicate, and perforated bricks, used both structurally and as covering. These often reflect locally available resources and construction practices, while also allowing for patterns, textures and sometimes transparency. Mixed brick compositions show how citizens often do their interventions in patches over a period of time, where materials are combined rather than applied uniformly.

Other interventions involve **industrial or prefabricated materials**, such as concrete panels, sandwich panels, corrugated metal, and polycarbonate. These are typically lightweight, affordable and easy to install, making them suitable for quick adaptations or extensions giving priority to speed and efficiency over permanence.

Finishing materials like **plaster, ceramic tiles, stone, and wood** introduce another layer of transformation, often related to aesthetics, protection, or insulation. In some cases, materials such as rusted steel or metal sheets are signs of improvised solutions.

4.9 Ground floor urban furniture and infrastructure (perspective view)

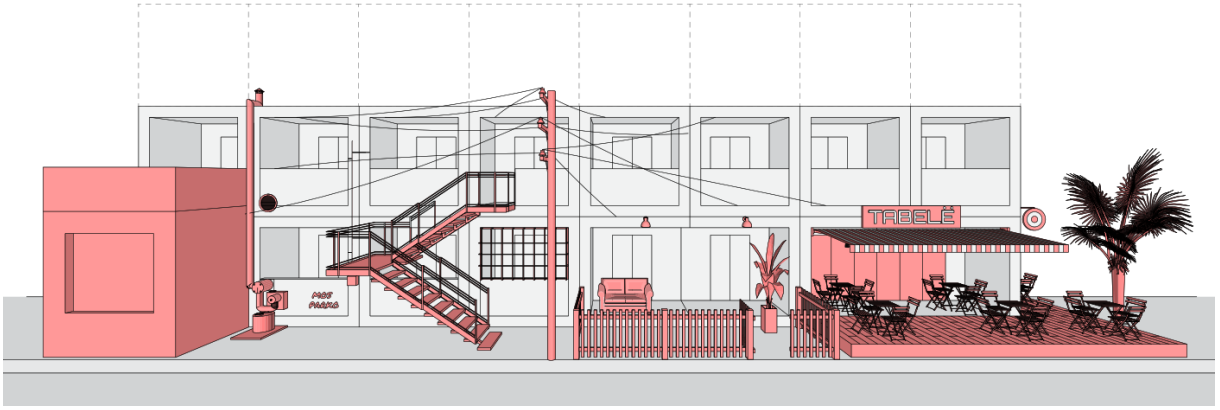


Figure 9. Ground floor diagram. Source: Renis Batalli

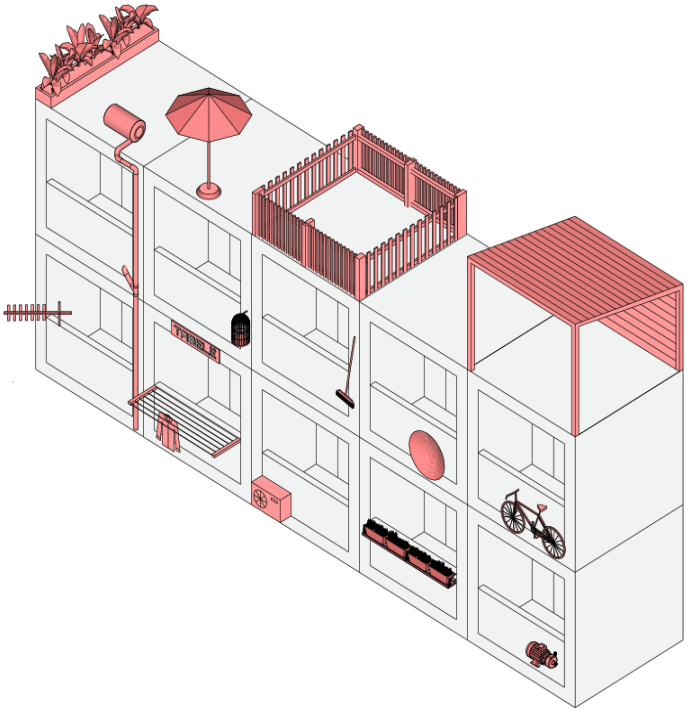
The diagram shows a series of **ground floor interventions** that combine urban furniture, infrastructure, and small architectural additions to transform the relationship between the building and the street. These interventions are positioned directly on the line between private and public, making them very visible and present in social life.

Several elements focus on **access and circulation**, such as the addition of external staircases and platforms. These introduce new vertical connections and redefine how the building is used, allowing for new alternative entrances, often on upper floors. **Infrastructural components** like poles, cables, lighting, and mechanical units allow for new commodities such as electricity and ventilation to improve the living conditions and become part of the visual landscape.

Other interventions activate the ground floor through **semi-private extensions**, including fences, small gardens, seating and enclosures. These create an in-between state between

inside and outside, balancing private life and public space.

Commercial activity is also present, with the addition of **shopfronts, signage, and outdoor seating**, turning the ground floor into a social and economic space. Elements such as terraces, shading elements and vegetation contribute to a more comfortable environment.



4.10 Upper floors urban furniture and infrastructure (perspective view)

In the upper floors, façade and rooftop, elements of urban furniture and infrastructure are less present than the ground level interventions, but visually they occupy a considerable amount of the building's surface. These additions show how everyday needs and technical systems emerge on the outside of the building which is treated like storage space, while upper floors become active and functional areas at service for the inhabitants.

Figure 10. Upper floors diagram. Source: Renis Batalli

Some interventions relate to **domestic use**, such as plants, laundry racks, shading devices, and small storage elements. These introduce showcase everyday life into the façade, making private activities visible from the outside. Objects like bicycles, satellite antennas or hanging equipment show how residents adapt available space to meet practical needs.

Other elements are linked to **infrastructure**, including pipes, cables, lighting fixtures, and drainage systems. These components are not placed by design but convenience, creating a network of visible connections on the building's surface.

At the **rooftop level**, interventions become more spatial, with the addition of terraces, pergolas, fencing, and vegetation. These spaces are often appropriated as extensions of the dwelling or private use, where one unit uses the space on top to extend their living area or areas for leisure. At times they can be common areas for social interaction or cultivation.

4.11 Typologies of transformation

The analysis reveals several recurring typologies:

- **Vertical additions:** Expansion of existing buildings through rooftop extensions, resulting in additional floors and increased height.
- **Horizontal additions:** Extension of existing units along the façade, increasing usable space outward.
- **Ground floor additions:** Expansion at street level through the introduction of structures, extensions or urban furniture.
- **Enclosures:** Conversion of balconies or semi-public areas into enclosed private spaces.
- **Openings:** Modification of existing openings, often enlarged to improve access, light, and ventilation.
- **Change of function:** Transformation of residential units into commercial spaces.
- **Modification of internal layout:** Reorganization of interior spaces by adding or removing walls to create new layouts.
- **Occupation of public space:** Installation of kiosks, structures or extensions within shared or public areas.
- **Infrastructure improvements:** Addition or upgrading of systems such as utilities, drainage, wiring, or mechanical equipment.
- **Changes in color and materials:** Surface interventions with the purpose of improving insulation, repairing façades or altering the building's visual identity.

These typologies demonstrate a consistent logic of maximizing the use of space and improvement of infrastructure within similar conditions.

4.12 Ecological relationships of spontaneous architecture

Just as ecosystems consist of interdependent organisms, informal architecture exists in a system of **spatial interdependence**. This interpretation adopts ecological classifications to interpret architectural relationships, among others:

● A rooftop house blocking a neighbor's light may be **parasitic**.

● Two families sharing a newly built staircase is **mutualism**.

● A kiosk benefiting from foot traffic without disrupting others is **commensalism**.

● An informal shop extension that provides income to the resident while serving the daily needs of the neighborhood could be interpreted as **symbiosis.**

Ecological analogies shift the language from legality/illegality to **coexistence**, **adaptation** and **impact**, allowing a new lens of analyzing these interventions and affect planning decision making whether to reconstruct or demolish the structure.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

Informal architecture in post-socialist cities represents more than a lack of formal planning norms. It can be understood as a form of urban metabolism through which cities adapt to changing conditions.

Informal interventions often repurpose existing structures rather than replacing them. This process extends building lifecycles and reduces the need for new construction. In this way, informal architecture operates as a form of adaptive reuse which comes as a direct response to the citizen's needs.

Many interventions merge together private and public space. Street-level additions, kiosks and extensions bring facilities and increase urban activity. Besides the cases when these structures disrupt circulation, when they are not harming their surroundings, the community can benefit from such additions.

5.2 Informal architecture challenges

Informal architecture can often create serious problems because additions are made without proper planning, structural control, or respect for the original building. These interventions may overload the existing structure, reduce natural light and ventilation, block public space, damage the urban image, and create unsafe living conditions for residents. While they may respond to real social and economic needs, their uncontrolled growth can produce fragmented, chaotic, and vulnerable urban environments.

The purpose of this study is not to define informal architecture as a positive or negative phenomenon, but see it objectively and understand what can be learned for future planning.

5.3 Implications for Urban Planning

Despite their adaptive qualities, informal interventions are rarely included in regulatory frameworks. This highlights the need for more flexible planning approaches that can accommodate evolving urban conditions.

The emergent and adaptive nature of informal architecture can be translated as a form of intelligence. Decisions are made by individuals while they collectively produce coherent patterns. This challenges the notion that effective urban design must be centrally planned.

Recognizing informal architecture as a source of spatial knowledge can inform more adaptive planning strategies. Rather than attempting to eliminate informality, planners can engage with it as a resource for innovation and resilience.

5.4 Future Research

Further research could explore:

- Analysis of informal growth patterns.

- Comparative studies across different post-socialist contexts.
- Producing a conceptual framework of filtering interventions through ecological relationships.
- Integration of digital simulations and modelling tools.

6. REFERENCES

Dr. Biology. (2025). Relationships in nature. ASU - Ask A Biologist. Retrieved from https://askabiologist.asu.edu/ecological-relationships

Alexander, C. (1965). A city is not a tree. Architectural Forum, 122(1), 58–62.

Batty, M. (2022). The emergence of a science of cities. Urban Solutions, (20), 39–45.

Batty, M. (2005). Cities and complexity: Understanding cities with cellular automata, agent-based models, and fractals. MIT Press.

Rudofsky, B. (1964). Architecture without architects. Museum of Modern Art.

Bhatt, V. (1984). How the other half builds. Center for Minimum Cost Housing, McGill University, Montreal

Dhamo, S. (2021). Understanding Emergent Urbanism. The case of Tirana. Springer Cham

Kurokawa, K. (1977). Metabolism in Architecture. Studio Vista.

The ground floor as an urban interface: the human-building relationship and the Loss of Urban Contact

DOI: 10.37199/c4100034

Avrili MESHI

ORCID 0009-0000-6166-8416
Polis University, Albania

avrili_meshi@universitetipolis.edu.al

Abstract

Urban design and planning often treat the city as an abstract composition seen from above, giving priority to form, order, and large-scale spatial organization. This is the reason why the experience of the city at street level remains in the background. Within this condition, the ground floor becomes particularly important, since it forms the point of direct contact between the street, the pedestrian, and building. The ground floor in this study is treated as an urban interface by examining how spatial and morphological factors affect the urban environment, the legibility of public spaces and the perception of the pedestrian.

This study focuses on some selected segments in the city of Shkodra, Albania. Shkodra is shaped by the coexistence of several historical layers, transitional conditions, and contemporary interventions. This allows the selected segments to be read comparatively across different urban periods. Based on this, we understand how the building influenced by different periods builds or weakens the relationship with the street and the urban environment. The methodology focuses on direct observation, morphological analysis, photographic documentation. Attention is focused on some specific elements that create an active urban front. These elements have to do with rhythms, relationships between the interior and exterior, the articulation of thresholds, relationships between the building and the public space. These enable some conditions that enable interaction, daily use, stopping, communication.

The analysis suggests that urban fronts characterized by frequent subdivisions, multiple entrances, articulated thresholds, and stronger building street relations tend to support more intense forms of urban contact and public continuity. The urban fronts that belong to contemporary and post-socialist interventions are characterized by monotonous, continuous facades, with edges dominated by services and parking. These conditions weaken the mediating role of the ground floor and reduce the street to a corridor of passage However, the value of the ground floor lies not in its historical from itself, but in its capacity to support presence, legibility at the human scale, exchange, and interaction. In this sense, a more legible, more experiential, more inclusive urban environment comes from the revaluation of the ground floor.

Keywords: *pedestrian experience, urban interface, human scale, street-level urbanism, active front*