

The Block as a Missing Room

Post-Earthquake Rehabilitation, Courtyard Transformation, and the Case for Integrated Urban Regeneration in Zagreb

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Figure 1. Zagreb's Lower Town, aerial view. The nineteenth-century perimeter ring is largely intact; the courtyard interiors tell a different story. Zagreb, Croatia. Imagery © Google Maps, accessed July 4, 2026

EXECUTIVE SUMMARY

What the Earthquake Made Visible

On March 22, 2020, a magnitude 5.3 earthquake struck Zagreb, causing significant structural damage across the historic Lower Town — the Donji grad. Facades cracked.

Cornices fell. Roofs failed. Within months, a visible repair process was underway: renders replaced, cornices restored, windows reframed.

But the earthquake did not produce the underlying problem. It revealed it.

Zagreb's Lower Town was designed in the second half of the nineteenth century as a coherent orthogonal city, guided by urban planner Milan Lenuci. Block perimeters were robust, streets tree-lined, and courtyards intended as semi-private breathing space within the dense urban fabric. From the 1930s through 1968, rapid industrialisation filled those courtyards progressively with warehouses, auxiliary structures, and ad hoc additions — invisible from the street, ungoverned, and now structurally obsolete. The earthquake damaged the facades. The decades before it had already degraded the blocks.

This case study examines what a genuinely integrated response to that condition would require. The analysis focuses on three representative urban blocks — A, B, and C — using block morphology data from 1887 to 2021 to trace the pattern of courtyard densification. Block B, the most severely over-built and functionally obsolete, serves as the primary site of intervention. Block A is developed as a parallel adaptive reuse proposal, demonstrating the scalability of the strategy across the historic core.

Two strategic approaches are proposed for courtyard rehabilitation: the "Green Heart" (maximal clearance, unified public green space) and the "Permeable Hub" (selective retention with a network of passages and pocket gardens). These are integrated with a Superblock mobility strategy drawn from Barcelona's Superilles programme, which returns interior streets to pedestrians and cyclists. Together, they constitute a proposal not for repair, but for transformation.

The central argument is precise: the courtyard is not a residual space. It is the city's missing public room. What happens to it will determine whether Zagreb's rehabilitation is genuine or merely cosmetic.

CASE OVERVIEW

Zagreb's Lower Town

Location: Zagreb, Croatia. The Lower Town (Donji grad), situated between the medieval Upper Town (Gornji grad) and the main railway station.

Site / Urban System: The orthogonal historic block network of the Lower Town, developed primarily between 1860 and 1923 under successive urban plans (1864/65, 1887/89, 1894). The case focuses on three specific urban blocks representative of the district's varied conditions.

Why this case matters: The Lower Town is one of Central Europe's most coherent examples of late nineteenth-century urban planning. It is not a UNESCO World Heritage Site, but it constitutes a significant historic urban landscape whose spatial, cultural, and social values are directly at risk from both seismic damage and decades of unregulated internal densification.

Main urban issue: Post-earthquake rehabilitation has focused on the repair of visible facades while the systemic degradation of block interiors — courtyard infill, functional obsolescence, absence of green space, and car-dominated streets — remains unaddressed.

Relevance to: Heritage conservation, urban regeneration, adaptive reuse, pedestrian mobility, climate resilience, and the governance of historic urban change.

AUTHOR'S FIELD OBSERVATION

What the Street Does Not Show

There is a building in Zagreb's Lower Town whose facade was repaired within months of the March 2020 earthquake. From the street, it looks fixed.

Step through the main entrance, however, and a different condition appears: a courtyard interior shaped by decades of accumulated neglect.

The original perimeter ring of nineteenth-century residential rooms wraps around it in a state of progressive deterioration. The courtyard is not publicly accessible. It is not green. It functions, to the extent that it functions at all, as informal storage and ad hoc parking.

This is what the earthquake did not create, but made impossible to ignore. The damage to the street facade was legible and politically addressable. The damage to the block interior was neither — it had accumulated over decades, invisible from public view, outside the frame of standard damage assessment.

The same condition repeats across the Lower Town with only minor variation. The pattern is not exceptional. It is systemic. And it raises a question that a repair programme alone cannot answer: what, exactly, are we trying to restore?



Figure 2. A repaired street-facing facade in Zagreb's Lower Town stands beside an open passage into the block interior, where the deeper courtyard condition remains largely hidden from public view. Zagreb, Croatia. Imagery © Google Maps, accessed July 4, 2026

CORE PROBLEM

Repair Is Not Rehabilitation

Post-earthquake responses typically operate at the scale of the individual building: assess the damage, classify the structure, assign a repair budget, and restore the envelope. This approach is legible, politically manageable, and visually effective. In the case of Zagreb's Lower Town, it is also insufficient.

The block is a more complex unit than the building. Its urban performance depends not only on the condition of individual facades but on the spatial arrangement of the entire block: the relationship between perimeter buildings and interior structures, the condition and accessibility of the courtyard, the pattern of ground-floor use, and the integration of the block with its surrounding street network.

Three structural conditions have accumulated in Zagreb's Lower Town independently of the earthquake, and none are addressed by facade repair alone.

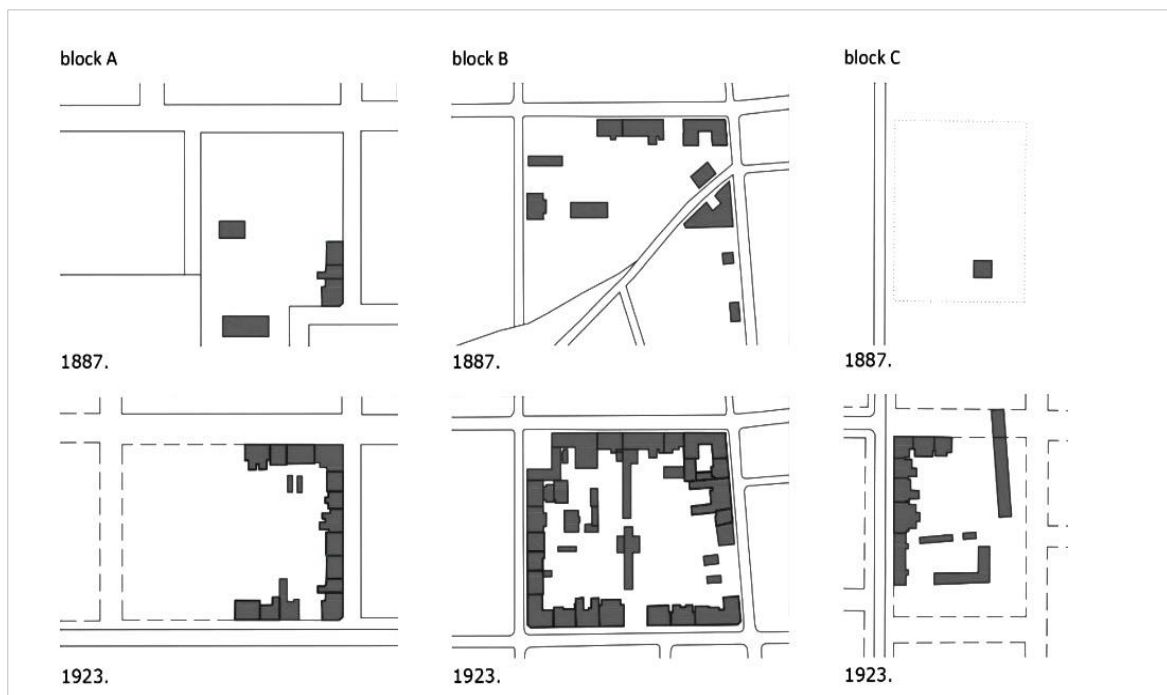
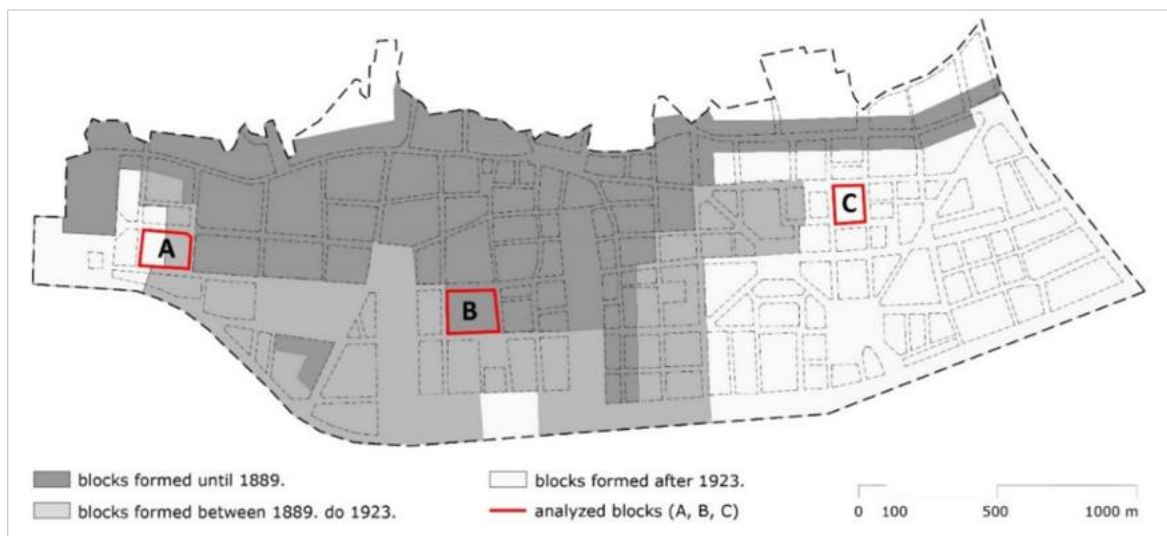
First: courtyard densification. Between the 1930s and 1968, the block interiors were built up steadily with auxiliary structures — workshops, warehouses, storage buildings — that have since become functionally obsolete and structurally deteriorating, without serving any productive urban function.

Second: the absence of public green space. The original courtyard has been almost entirely consumed by built structures. The Lower Town has minimal permeable green surface

within its block interiors, with direct consequences for stormwater management, urban heat, and everyday quality of life.

Third: car dominance. The secondary street network has been progressively surrendered to parked and moving vehicles. Footpaths are narrow. Cycling infrastructure is minimal. The street environment is hostile to the pedestrian movement that a dense, mixed-use historic neighbourhood requires.

These three conditions did not begin in March 2020. The earthquake provided the political moment to address them.



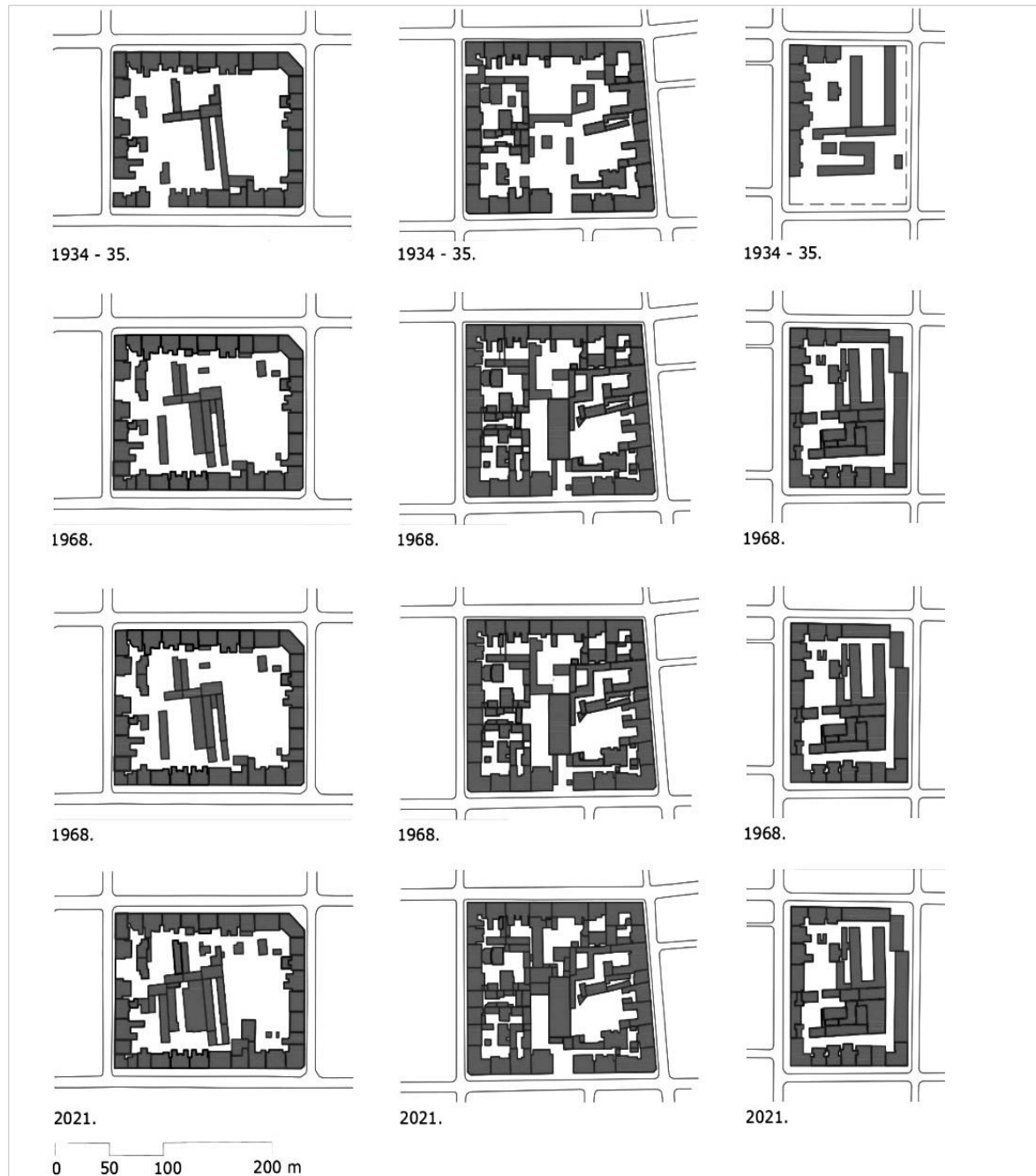


Figure 3. *Morphological transformation of Blocks A, B, C, 1887–2021. Source: Gašparović et al., 2021.*

SPATIAL ANALYSIS

Three Blocks, Three Conditions

Block A — The Oldest Layer

Located in the oldest part of the Lower Town, Block A was formed before 1889 and is primarily residential. Its courtyard has limited public green space and a pattern of neglected open areas reflecting gradual, uncontrolled subdivision of the interior over time. The perimeter buildings are structurally robust but functionally underperforming: ground floors are largely inactive, and the courtyard offers no public access or environmental value. Block A represents quiet neglect rather than dramatic infill — but the consequence is the same: an enclosed, privatised, non-productive interior.

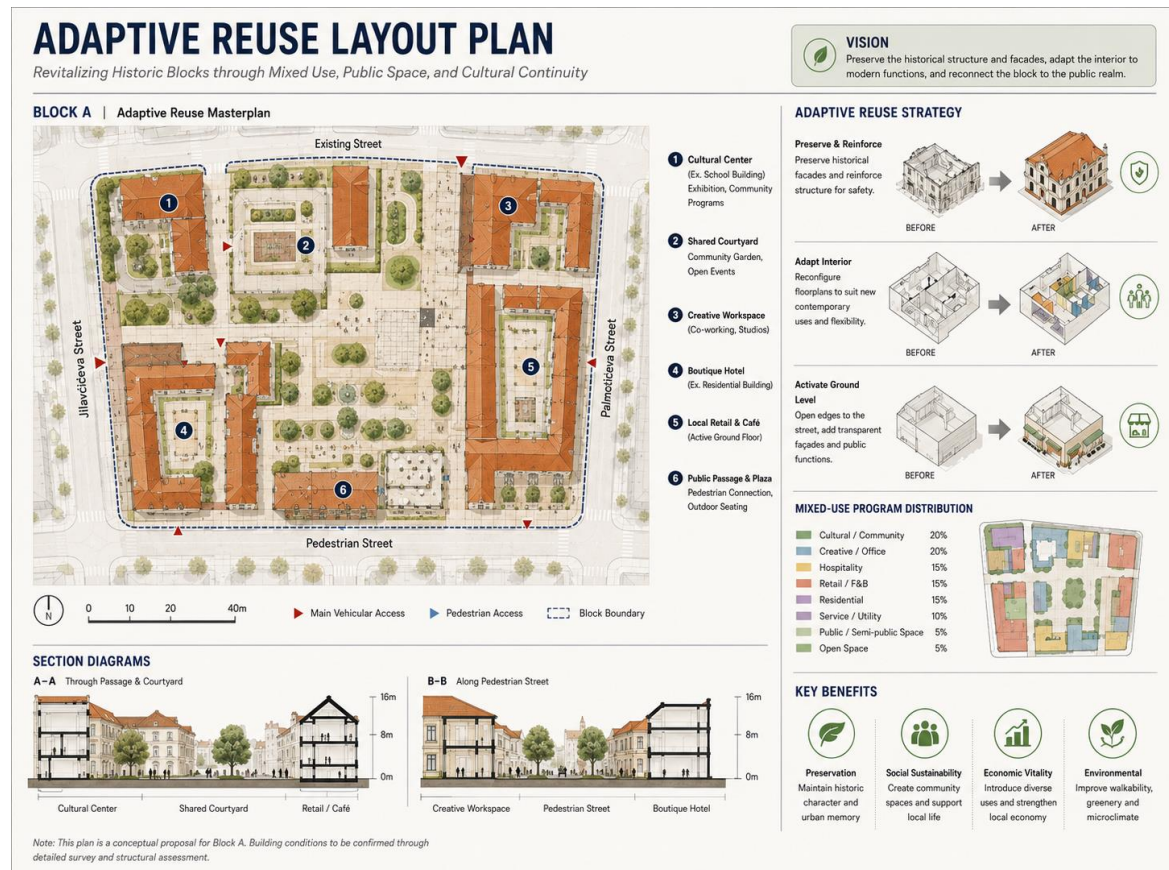


Figure 4. Adaptive Reuse Masterplan, Block A, Zagreb Lower Town. Conceptual proposal; subject to structural assessment.

Block B — The Primary Intervention Site

Block B, located at the heart of the district, shows the most severe courtyard densification of the three analysed blocks. A significant proportion of its interior is occupied by large structures that formerly served production functions — warehouses, workshops, and light industrial facilities — that have since lost their original use. These structures are not historically significant; they are post-war additions built without urban design consideration, and they now occupy a high-value urban block in an advanced state of disrepair.

For this reason, Block B is developed as the primary courtyard recovery proposal. The strategy preserves the nineteenth-century historic perimeter ring, removes obsolete non-historic infill, and transforms the interior into a permeable green public courtyard. New open gates reconnect the courtyard to surrounding streets, while active ground-floor edges introduce cafés, local retail, and community-oriented uses. Unlike Block A, where the emphasis is mixed-use adaptive reuse, Block B demonstrates maximal courtyard recovery: from an overbuilt service interior to a shared urban room.

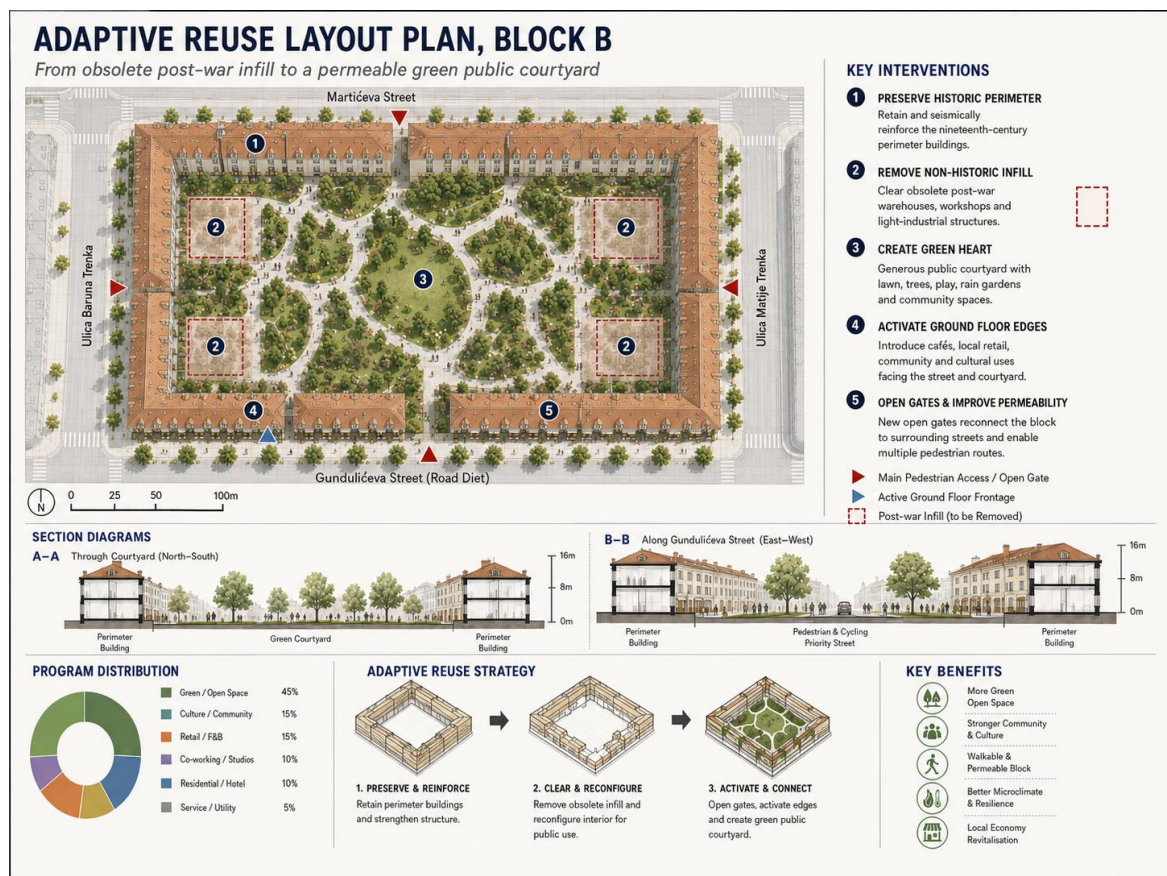


Figure 5. *Adaptive Reuse Masterplan, Block B, Zagreb Lower Town. From obsolete post-war infill to a permeable green public courtyard; conceptual proposal subject to structural assessment.*

Block C — The Newest Fabric

Block C, in the eastern section of the district, corresponds to a later period of urban development. Courtyard infill is less severe than Block B, but the block suffers from a lack of social and cultural infrastructure. It functions primarily as a housing location rather than a neighbourhood. This condition requires a different response — not clearance of obsolete structures, but addition of missing programme — confirming that adaptive reuse strategies must be calibrated to each block's specific condition rather than applied uniformly.

Street Typology

The Lower Town's street network divides into four types. Type A: wide tree-lined avenues, with generous pavements but multi-lane vehicular traffic. Type B: historic access roads, characterised by irregular widths and mixed traffic. Type C: narrow residential lanes perpendicular to the avenues, with minimal footpaths and dense on-street parking. Type D: short connector streets, often entirely occupied by parked vehicles with no meaningful pedestrian space. This typological range confirms that a blanket approach to pedestrianisation is insufficient; each street type requires a differentiated intervention calibrated to its spatial character and network role.



Figure 6. Street typology, Zagreb Lower Town: Type A / B / C / D with differentiated pedestrianisation responses.

MANAGEMENT / POLICY / GOVERNANCE LAYER

What Systems Produced This Condition

The courtyard infill of Zagreb's Lower Town was not the product of a single decision. It accumulated across several decades as the result of overlapping governance failures.

The 1953 urban classification of the Lower Town as a commercial and residential zone created pressure for intensification without establishing effective controls over courtyard development. The 1968 Zagreb Urban Development Plan prioritised the southward expansion of the city, directing planning attention away from the block interiors of the existing historic core. During the same period, rapid industrialisation created demand for production space within the city, and the hidden interiors of historic blocks — uncontrolled, unmonitored, and largely invisible to public oversight — became convenient locations for ad hoc industrial additions.

The result by 2021 is a block fabric in which the historic perimeter is legally protected as architecture but the interior is largely unregulated as urban space. Governance has historically been far stronger at the street-facing fabric than at the scale of the block interior.

Post-2020 earthquake governance has reinforced this pattern. Emergency repair programmes have operated at the scale of the individual building, assigning structural categories and repair budgets based on facade condition. The block interior — its courtyard, interior structures, ground-floor programme, and relationship to the street network — has not been addressed within the emergency framework.

Genuine rehabilitation will require a governance approach that operates at the block scale: assessing the entire block as a unit, identifying which interior structures are worth retaining and which are not, and coordinating the clearance, redesign, and re-programming of courtyard space as a public or semi-public resource.

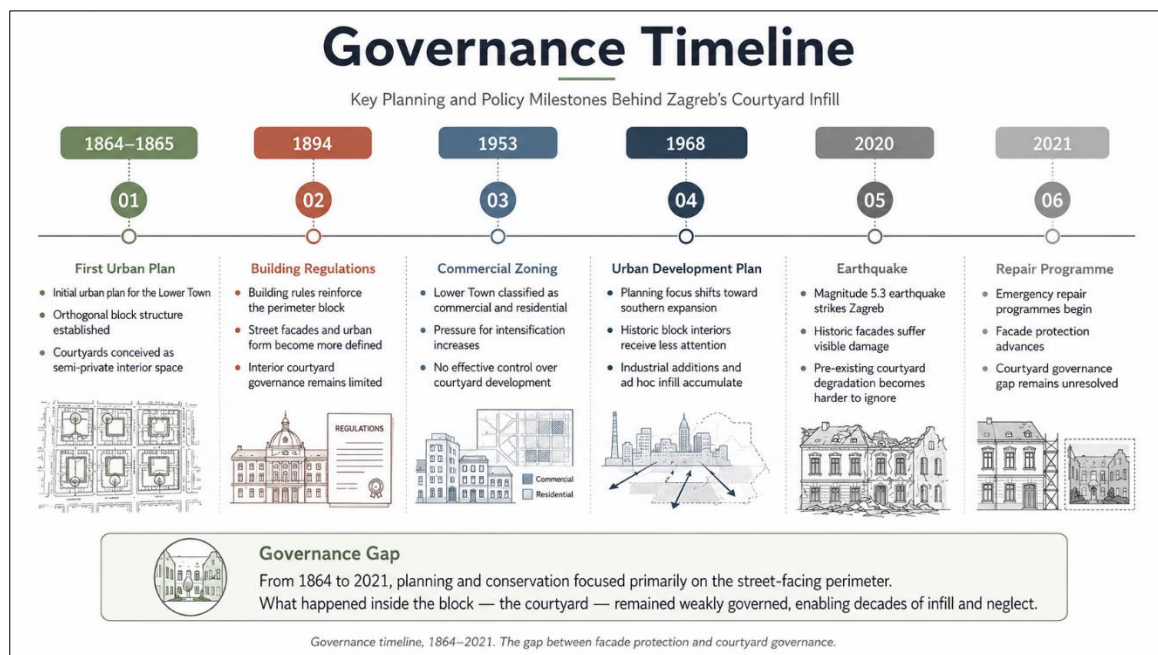


Figure 7. Governance timeline, 1864–2021. The gap between facade protection and courtyard governance.

HUMAN EXPERIENCE LAYER

Who Lives with This Problem

The degraded condition of Zagreb's Lower Town is not an abstract spatial problem. It has direct consequences for residents, workers, pedestrians, local businesses, and visitors.

Residents of the perimeter buildings live adjacent to deteriorating, inaccessible courtyards that provide neither visual amenity nor practical value. In summer, the hard surfaces of the built-up courtyard intensify urban heat. The courtyard functions as a source of darkness, noise from delivery vehicles, and chronic maintenance disputes between building owners who share a boundary but no common governance framework.

Pedestrians on the secondary streets navigate a hostile environment: minimal footpaths, constant conflict with parked vehicles, no cycling infrastructure, and ground-floor frontages that are predominantly closed or inward-facing. The street offers movement, but not experience. It is a corridor, not a place.

Local businesses on perimeter ground floors operate in an environment that discourages foot traffic. Without the activation that pedestrianised streets and accessible courtyard space would bring, many ground floors have shifted to uses — offices, storage, service functions — that contribute nothing to the public life of the street.

Visitors to Zagreb's historic centre encounter the Lenuci Horseshoe parks and the main commercial avenues, but the interior of the block network remains invisible and inaccessible. The tourist experience of the Lower Town is, spatially, a perimeter experience — it follows the avenue frontages and park edges, and never penetrates the block interiors where a different and potentially more interesting city is buried under decades of accumulation.



Figure 8. Existing Type C and D street conditions, Zagreb Lower Town. Source: Google Maps Street View screenshots, Berislavićeva ulica and Trg Nikole Zrinskog, Zagreb, Croatia. Imagery © Google Maps, accessed July 4, 2026

COMPARATIVE CASE

The Barcelona Superilles — A Tested Model

The Superblock model, developed in Barcelona as the Superilles programme by the Urban Ecology Agency of Barcelona (BCNecologia), is the closest tested precedent for what Zagreb's Lower Town requires.

The model groups several standard city blocks into a single larger mobility unit, restricting motor vehicle access to perimeter streets while reallocating interior streets to pedestrians, cyclists, local access, and public life. Measured outcomes vary by site. In Sant Antoni, post-intervention monitoring recorded a 25 per cent reduction in NO_2 and a 17 per cent reduction in PM_{10} at the intervention site. At city scale, a separate health-impact assessment estimated that implementation of 503 Superblocks could prevent 667 premature deaths annually (Mueller et al., 2020). More broadly, Cairns et al. (2002), reviewing more than 70 international cases of road-space reallocation, found that traffic often fell overall rather than simply shifting to adjacent streets. This broader evidence supports the principle of traffic evaporation, but it is not a source for Barcelona-specific outcomes.

The spatial logic of Zagreb's Lower Town — an orthogonal grid with clearly defined block perimeters and a hierarchy of street widths — is directly compatible with this approach. The proposed Zagreb Superblock unit groups four to six Lower Town blocks, restricting through-traffic to the perimeter avenues and converting Type C and D interior streets to pedestrian and cycling priority. This creates the mobility framework within which courtyard rehabilitation becomes viable: if the streets surrounding a block are accessible and

pleasant, the courtyard opening onto those streets becomes a public asset rather than a private liability.

The Barcelona precedent does not transfer without adjustment. Zagreb's block interiors are more densely built. The governance context differs. The seismic repair programme adds a layer of urgency that Barcelona's model did not have to navigate. Barcelona should therefore be read as an adaptable precedent, not a template for direct replication: its spatial logic, mobility strategy, and evidence base are transferable to Zagreb's Lower Town, but only once adjusted for local courtyard density, governance capacity, and seismic-rehabilitation conditions.

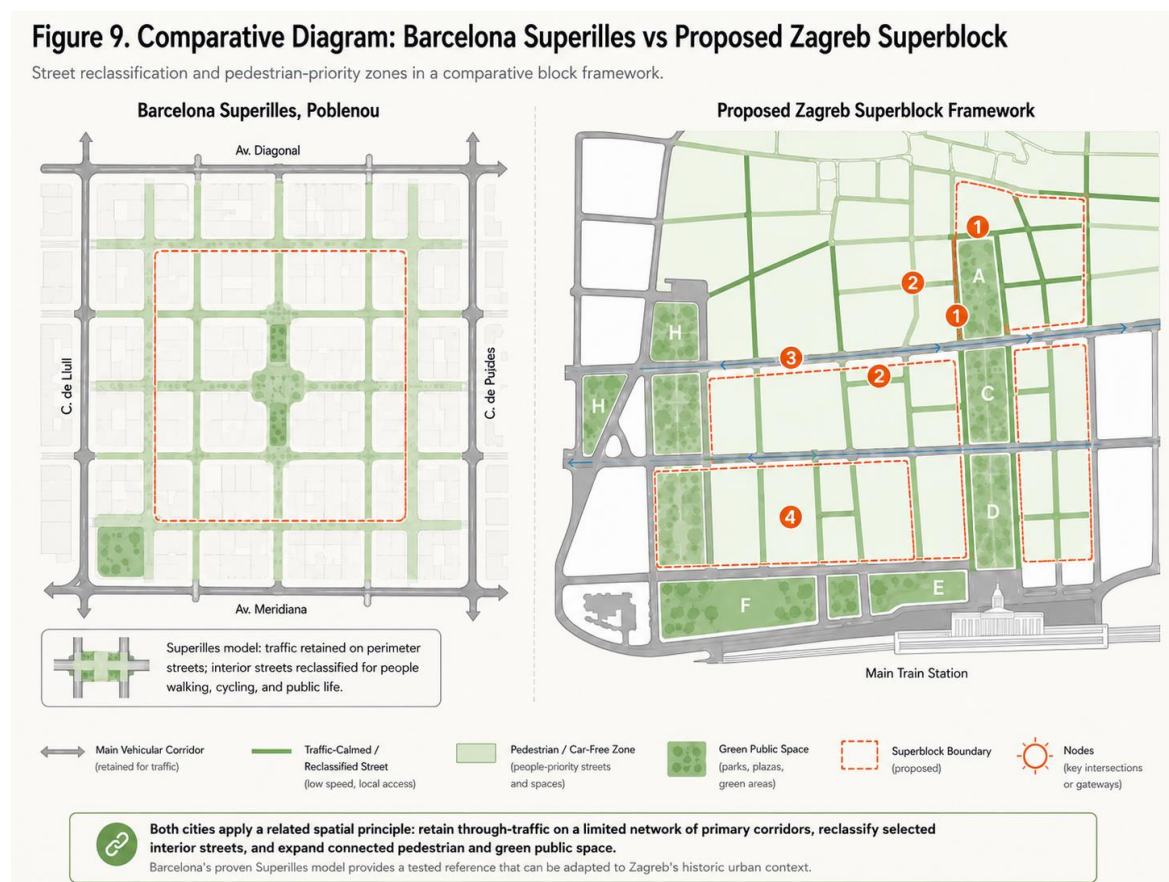


Figure 9. Left: Barcelona Superilles, Poblenou. Right: proposed Zagreb Superblock framework. The comparison shows how perimeter traffic, reclassified interior streets, pedestrian-priority space, and connected green public areas can be adapted to Zagreb's historic urban context.

DESIGN PROPOSALS

Two Models for the Courtyard

Two complementary approaches to courtyard rehabilitation are proposed, each suited to different block conditions and governance contexts.

Concept 1 — The Green Heart (Maximal Clearance)

This approach is suited to blocks like Block B, where the courtyard is densely built with non-historic post-war additions that are structurally deteriorating and functionally obsolete. The proposal involves the complete clearance of these structures, retaining only the nineteenth-century historic perimeter ring. The cleared courtyard becomes a unified public green space: dense tree canopy for shade, unsealed soil for rainwater drainage, generous open area accessible from multiple points on the surrounding streets. Ground floors of the perimeter buildings are activated toward this new interior — cafes, community spaces, local retail. The block gains a room it never had: a quiet, green, publicly accessible interior that reconnects the perimeter buildings to each other and to the city.



Figure 10. A maximal-clearance strategy that removes non-historic post-war infill, preserves the nineteenth-century perimeter, and creates a unified public green courtyard.

Concept 2 — The Permeable Hub (Selective Retention and Pathways)

This approach is suited to blocks where some interior structures retain architectural character worth preserving — a brick warehouse of genuine spatial quality, for example, or a small industrial building whose scale and material texture contribute something to the interior. Rather than full clearance, a limited number of such structures are retained and

converted to glass-fronted pavilions housing cultural or community functions. The courtyard becomes a network of intimate passages, pocket gardens, and activated nodes. Access is permeable from multiple points, creating shortcuts and unexpected routes through the city fabric. The block functions as a porous, multi-layered hub: workshops, boutique galleries, cafes, and community spaces distributed through a network of small spaces.

Concept 2 — The Permeable Hub

Selective retention, small pavilions, passages, and pocket gardens within the block interior.

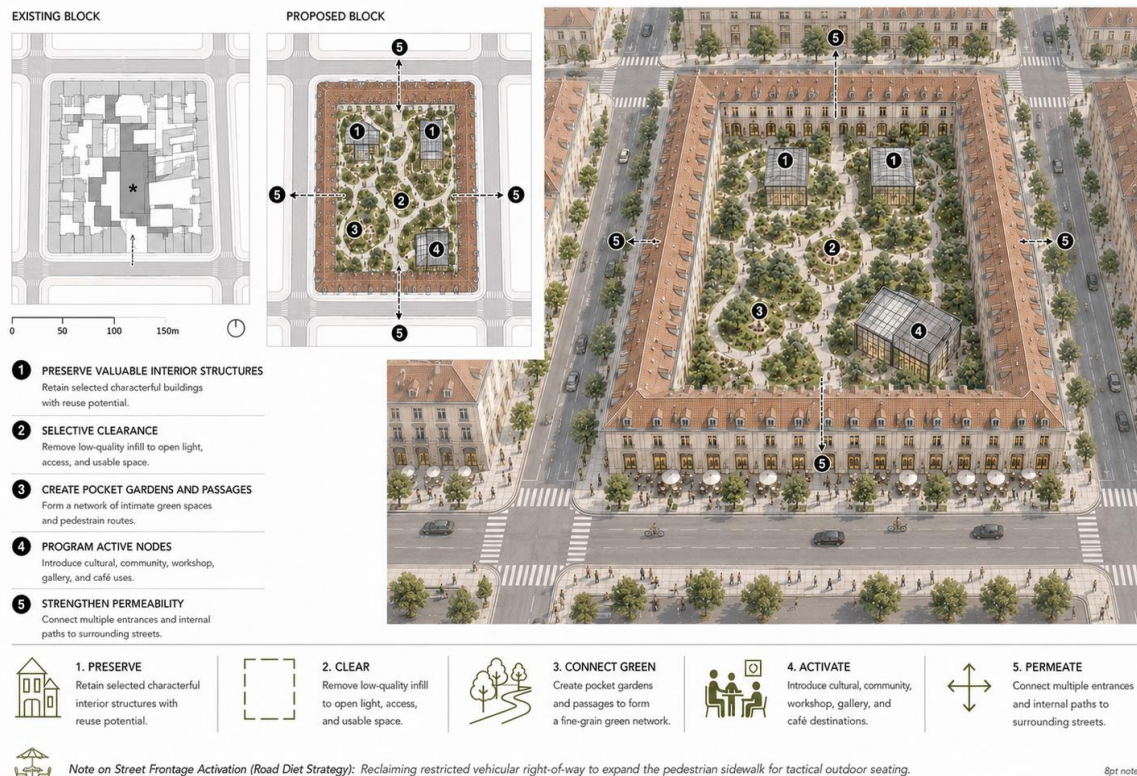


Figure 11. A selective-retention strategy that preserves characterful interior structures and transforms the courtyard into a permeable network of passages, pocket gardens, and active community uses

Block A — Adaptive Reuse Masterplan

The Green Heart and the Permeable Hub are courtyard-clearance strategies suited to blocks like Block B, where the interior is densely built with obsolete structures. Block A presents a different condition — quiet neglect rather than dramatic infill — and is developed instead as a parallel mixed-use adaptive reuse model, demonstrating that the same block-scale logic can activate an underused interior as readily as it can clear an overbuilt one. For Block A, the masterplan proposes six programmatic interventions within the preserved historic perimeter: a Cultural Centre (converted school building) for exhibitions and community programmes; a Shared Courtyard for community events and gardens; a Creative Workspace for co-working and studios; a Boutique Hotel in the former residential

building; Local Retail and Café at the active ground-floor level; and a Public Passage providing pedestrian connection with outdoor seating. The strategy follows three stages: preserve and seismically reinforce the historic facades and rooflines; reconfigure interiors for contemporary uses and spatial flexibility; open ground-floor edges to the street and the new courtyard interior, adding transparent frontages and public functions. Section diagrams A–A (through the passage and courtyard) and B–B (along the pedestrian street) illustrate the spatial relationship between historic perimeter and new interior.

Implementation Roadmap

The Green Heart, the Permeable Hub, and the Block A masterplan describe what should change at block scale. They do not on their own explain how a Superblock mobility framework spanning several blocks gets built. That sequencing question is addressed separately, through the three-phase roadmap set out in Recommendation R3: short-term tactical pedestrianisation to test the model and build community support, medium-term permanent redesign of Type C and D streets, and long-term integration with HUL management and green infrastructure planning across the Lower Town.

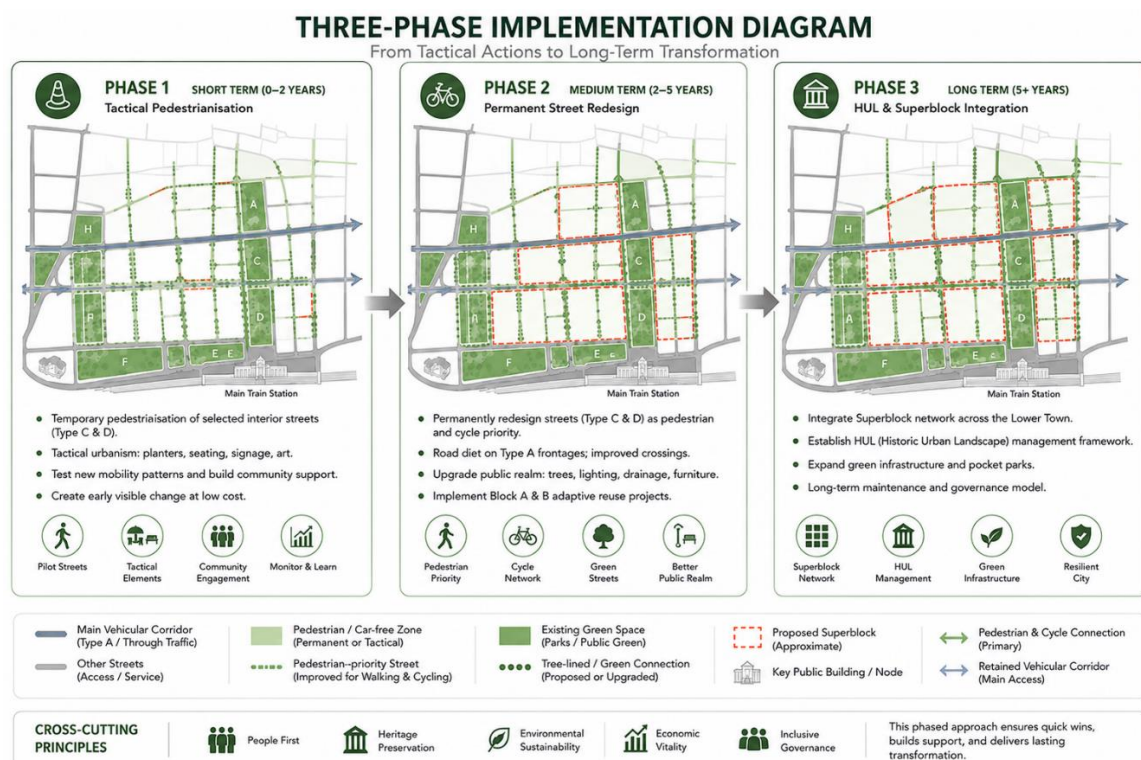


Figure 12. Three-phase implementation strategy for Zagreb Lower Town: short-term tactical pedestrianisation, medium-term permanent street redesign and pilot Superblock implementation, and long-term integration of the Superblock network with HUL management and green infrastructure.

KEY FINDINGS

What This Case Demonstrates

- 1. The earthquake exposed a pre-existing systemic condition.** The 2020 seismic event damaged facades already sitting on top of decades of unregulated courtyard infill. The repair programme addresses the legible damage; the systemic condition has not been addressed.
- 2. The block interior is the critical site of intervention.** The courtyard — not the facade — is where the Lower Town's urban performance is most degraded and where the greatest transformation potential exists. Post-war additions within block interiors are structurally obsolete, environmentally harmful, and publicly inaccessible.
- 3. Adaptive reuse requires block-scale governance.** Conservation law and repair programmes operate at the scale of the individual building. Courtyard rehabilitation requires a governance framework capable of assessing and acting at the scale of the entire block.
- 4. Street typology determines intervention strategy.** The four types of streets in the Lower Town require differentiated responses. Blanket pedestrianisation is not appropriate; each street type requires an intervention calibrated to its spatial character and network role.
- 5. The Barcelona Superilles model provides an adaptable, transferable precedent.** The spatial logic, evidence base, and mobility strategy of the Superilles programme are transferable to Zagreb's Lower Town, but adapted transferability — not direct replication — is required, given differences in courtyard density, governance capacity, and seismic-rehabilitation conditions.
- 6. This strategy is scalable across the historic core.** The adaptive reuse models developed for Blocks A and B are not site-specific inventions. They represent a replicable approach applicable across the Lower Town — and more broadly across European historic city centres facing comparable conditions of courtyard infill, seismic vulnerability, and car dominance.

From Repair to Transformation

R1 Establish block-scale assessment as the basis for rehabilitation. Seismic repair programmes should be reframed to include the block interior as a unit of assessment, not only the perimeter buildings. This requires a regulatory framework that can identify, classify, and act on interior structures as well as facades.

R2 Prioritise Block B for immediate courtyard intervention. The post-war industrial structures within Block B are structurally deteriorating with no viable ongoing use. Their clearance should be treated as part of the post-earthquake rehabilitation programme, not deferred to a future planning process.

R3 Implement the Superblock mobility framework in three phases. Short term: tactical urbanism — temporary pedestrianisation of selected interior streets to test the model and build community support. Medium term: permanent street reclassification and redesign of Type C and D streets. Long term: integration of the Superblock framework with HUL management and green infrastructure planning across the Lower Town.

R4 Apply the Adaptive Reuse Framework to Blocks A and B as pilot projects. Block B (Green Heart model) and Block A (mixed-programme model) should be developed as pilot implementations with full design development, structural assessment, and governance coordination, to provide a replicable template for the wider district.

R5 Develop a ground-floor activation programme alongside courtyard rehabilitation. Courtyard rehabilitation creates the spatial condition for ground-floor activation, but activation requires additional support: rental subsidy, use-mix regulation, and programme coordination for cultural and community uses.

R6 Integrate courtyard greening with climate resilience planning. The substantial new permeable surface created through courtyard recovery could contribute to stormwater management and urban heat mitigation. This should be embedded within Zagreb's broader climate resilience strategy.