Core houses and offshoots - State of the art and first questions.

That people appreciate influencing their own surroundings is nothing new. What may be new, however, is the shift in how everyday environments—the built environment—are conceived. In the past, architects primarily designed palaces and castles for those in power, whereas today, they are responsible for shaping the spaces in which ordinary people live and work. A central issue this text addresses is that architects still, in a sense, "design the castle." We continue to use the same tools and operate within similar social (power) structures as before. The result is buildings that, rather than reflecting the vanity of an undemocratic ruler, instead express a builder's good intentions and refined taste. Too often, architects have either accepted or taken advantage of these conditions to leave their own mark. However, in some cases, the residents of these buildings have managed to assert their own influence. One notable example of this is Le Corbusier's housing project in Pessac, near Bordeaux - see below.

In response to Le Corbusier's ideas about rational, mass-produced construction - particularly inspired by the car industry - the Situationists, including Asger Jorn (who was influenced by his early work for Le Corbusier), criticized the characterless and anonymous suburbs that emerged after the Second World War. As an alternative to industrial construction and standardized

neighborhoods, they proposed large structures that would allow for more free and spontaneous appropriation. A key example of this is Constant's *New Babylon* (Wigley, M., 1998).

Other notable figures from the same period—who were part of a network of like-minded thinkers—include Yona Friedman (Friedman, Y., 2006) and Frei Otto (see more below).


Among Danish references, the best-known experiment at the Louisiana *Museum of Modern Art* is *Boligkulissen* (1977), carried out by Carsten Hoff and Susanne Ussing. Link here. This experiment at Louisiana was the culmination of a series of projects dating back to Thylejren in 1970. It is included in the collection of examples of co-construction in the book *Hier Entsteht* (Fezer, J., & Heyden, M. (Eds.), 2004) and is also mentioned in *Vitale Architektur* (Hegger, M., Pohl, W., & Reiss-Schmidt, S., 1988). Like the international references mentioned earlier, *Boligkulissen* was a three-story structure designed to allow for user-driven construction and modification. An example of how this experiment continues to inspire contemporary projects is the *Other Houses* competition, published in 2022 by the Norwegian Association of Architects. [Link here. Hoff and Ussing's experiment at *Louisiana Museum of Modern Art* remains the most prominent reference in this context, followed by other more conventional examples of affordable housing construction, such as the architecture office *Vandkunsten* with *Tinggården* in Herfølge south of Copenhagen (1978).

A similar experiment was carried out by the architect Frei Otto, mentioned earlier in connection with the IBA building exhibition in Berlin (1987), which was primarily known for a series of postmodern buildings by Rossi and Krier. Otto's construction took place between 1983 and 1992 and involved a number of engaged residents who worked with models to incorporate their ecologically driven building ideas—a principle that closely resembles Hoff and Ussing's *Boligkulissen* at the Louisiana *Museum of Modern Art*.

The 2011 documentary *Dreaming of a Treehouse* highlights the concept of raising house structures above the ground to allow plants and animals to thrive beneath them, contributing to greater biodiversity - an important principle for Frei Otto. Link here. The film features, among others, the French architects Lacaton and Vassal, demonstrating Frei Otto's lasting influence on contemporary construction. A similar acknowledgment of his impact was seen in a major exhibition at ZKM, Karlsruhe, in 2017. Additionally, the documentary reveals that while the project strongly emphasized ecological principles, it lacked sufficient attention to social dynamics. This shortcoming became evident in the challenging collaborative process among the (future) residents involved.
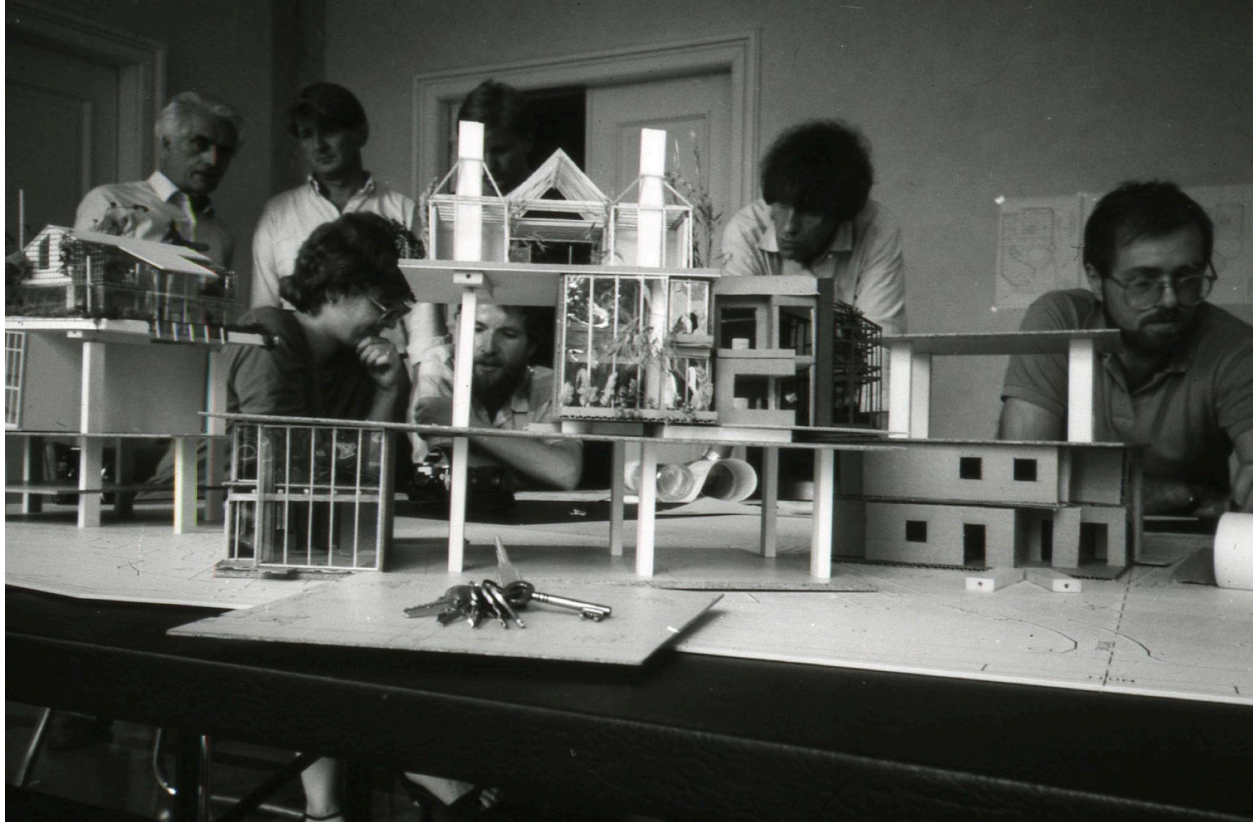
Christiania's Green Plan and the Concept of Core Houses

Christiania's Green Plan from 1991 was an offshoot of the Building Stop from 1987, which was introduced in response to concerns that construction in Christiania had become too disruptive - particularly on the historic ramparts. The Green Plan also emerged as a reaction to a national planning directive and a local plan for Christiania drafted by the Danish government, which Christiania residents viewed as having "too great a gap between theory and reality."

With the Green Plan, Christiania sought to create its own planning framework to ensure the area's development as an "open and recreational space." The plan included various ecological initiatives—many of which have since been realized—as well as guidelines for building typologies and the placement of new construction. One of its key goals was to establish a stronger connection between nature and the built environment. From Christiania's perspective, the state's proposal was problematic in its rigid division between a "densely populated city and an empty park."

One of the proposals in the 1991 Green Plan for a flexible building typology was Kærnehuse—Danish for "core houses," but also a play on words alluding to the core of an apple.
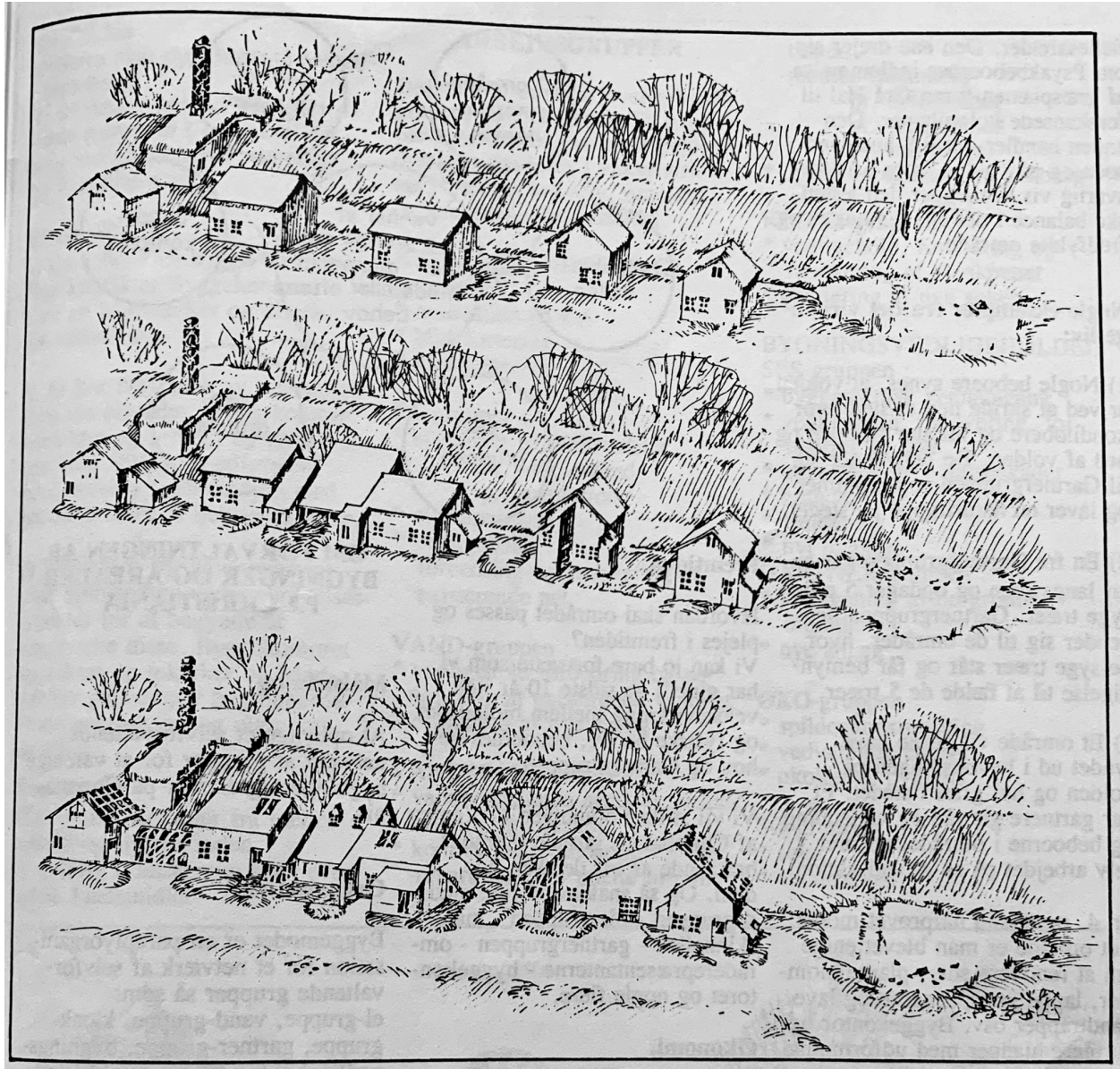
Core houses: The concept envisions a craftsman's workshop building a series of minimal homes, each approximately 25 m² in size. The houses are equipped with a 12-volt electrical system, including a solar panel, a solar powered collector for drinking water, and a south-facing glass facade for passive solar heating. Additional shared resources include a wood-fired heating central, heat storage within the rampart, a rainwater tank, and a communal wastewater sump featuring carp, reeds, and a fountain, along with multiple toilets. These homes are designed to be expanded as residents' needs and financial means evolve. (Christiania's Green Plan, 1991)

In Christiania's development plan from 1994 and the catalog of ideas *Building and Urban Renewal* from 2004, *Kærnehusene* is not mentioned. However, the concept of minimum housing is central to the flexible buildings discussed in *Imagine What If*, a 2006 publication on *New Construction rooted in Christiania*. This publication may have been a response to KAB and Realdania's 2004 study/report, *A Possible Way for Christiania*, which dismissed more flexible typologies - citing Hoff and Ussing's experiment at Louisiana as "too expensive." Similarly, the 2005 volume study from the design studio Vandkunsten took a more traditional and static approach to construction, using terms such as "Silvanization" and the "Hundertwasser Syndrome" to describe the built culture in Christiania:

> If Christiania is to retain its "right to express itself alternatively," both the Christianites and the plan must earn it. In this context, Vandkunsten has found it legitimate to respond to the "Silvanization" of Christiania and the lack of appreciation for character-defining building conservation. They criticize the inappropriate and complacent import of kitschy detached houses and fences, the inhospitable enclosures shutting Christiania off from the outside world, and the misguided belief that something is acceptable just because it is different - the "Hundertwasser Syndrome".

The 2005 publication *Christiania: En hvidbog i farver (Christiania: A White Paper in Colors)* includes an entry by Ditlev Nissen, who proposes that the sanctuary be granted the status of a "Sustainable Experimental Zone":

> Such a zone can be defined as an area where priorities differ from those in mainstream society. Here, experimentation is possible without being restricted by conventional prohibitions, regulations, or administrative hurdles. In an experimental zone, all solutions are permitted as long as they address a given problem as effectively—or more effectively—than known methods.

The same publication also provides an example of Christiania's built culture and its flexible approach to typology:

> "The pagoda is an example of a house that has evolved alongside the lives of its residents. It has expanded and been rebuilt over four life periods." (see below)

In the 2006 publication *Imagine What If,* mentioned above, written by authors who were both creators and residents of the aforementioned Pagoda at the time—there is an argument from the outset for "flexible housing," where:

> *The idea is that a home begins as a minimum dwelling of approximately 50 m² with a low initial rent. This home can accommodate, for example, two adults or one adult with one to two children. The minimum dwelling can later be expanded by 30–40 m². The self-built extensions are located between the minimum homes, allowing for free expression in construction—only requiring precautions such as firewalls for safety. As life and family needs evolve, so does the home—just as it always has in Christiania. With the production of 10–20 similar homes, costs—and therefore rent—can be kept low. The design is so flexible that these homes can be placed in multiple locations across Christiania.*
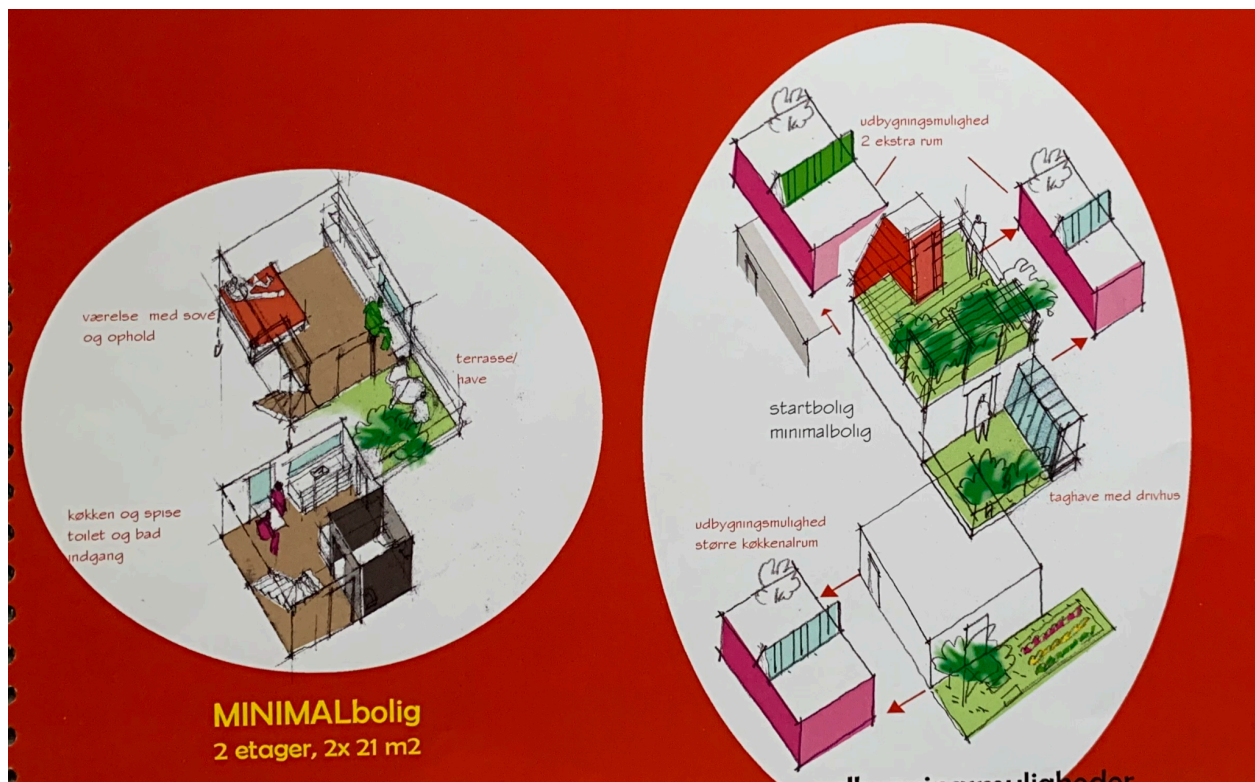
The publication *Imagine What If* presents several examples of how flexible housing can be integrated into Christiania—whether by building at height, adding extensions to existing structures, or creating floating homes on the water. Central to all these examples is the idea that:

> *"Christiania has never had an overarching plan. Houses, the city, and its people have developed like an organism—sometimes for the better, sometimes for the worse—but always with life, strength, and joy. Can these qualities be carried into a new era? Can Christiania's way of life continue to thrive while also meeting local planning regulations and other requirements from official Denmark?"*

Mass production and offshoots

Before the idea of core houses emerged in Christiania, Finnebyen was built on the outskirts of Aarhus shortly after the Second World War - an example that, in retrospect, turned out to be a concrete realization of core houses. Denmark's housing shortage and Finland's food scarcity formed the basis for a barter agreement that resulted, among other things, in the construction of 122 houses, originally 56 m² in size. The house elements were produced by the Finnish company Puutalo OY (meaning *Wooden House*), which exported 120,000 prefabricated houses and a total of 8,800,000 m² of buildings worldwide. These prefabricated elements allowed three people to assemble a house in just a few days. The story of these Finnish-made wooden houses was presented at the 2021 Venice Architecture Biennale in the Finnish Pavilion under the exhibition title *New Standards*. Link here. However, while the exhibition featured many examples of standardized construction, the concept of core houses and offshoots - using standardized structures as a foundation for organic growth and adaptation - was almost entirely absent.
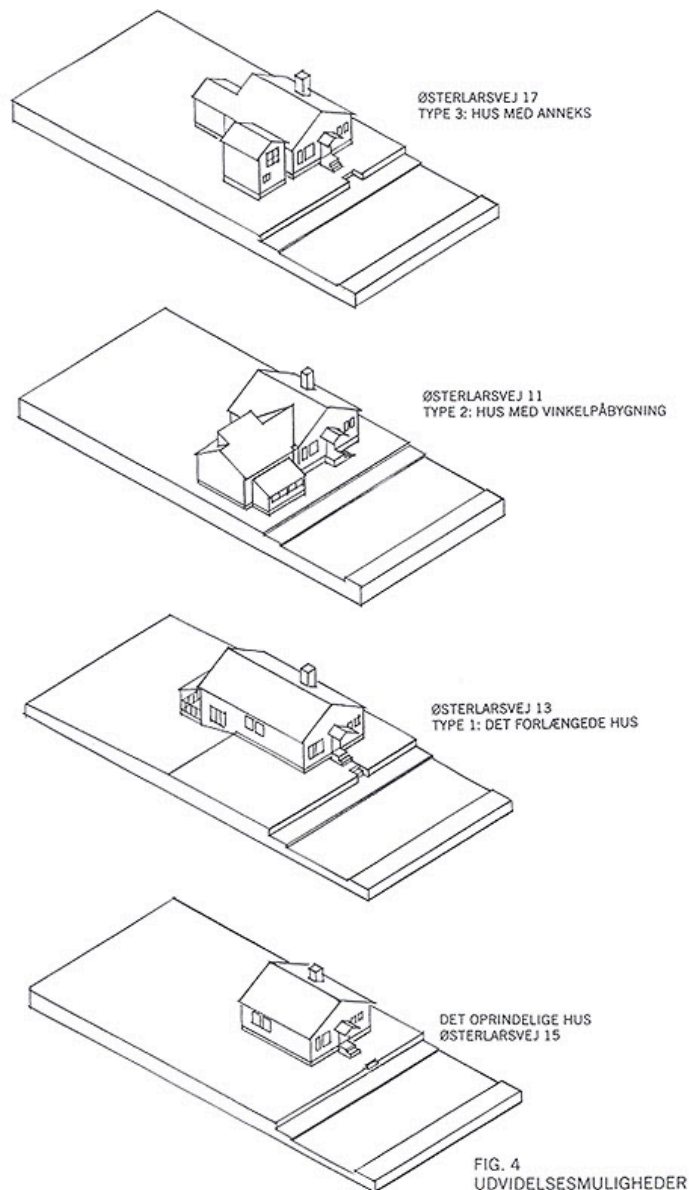

What is particularly interesting in this context is how these mass-produced houses became the core of numerous conversions and extensions. The article from *træ.dk* - link here - and even more so, the 1998 book *"Finnish Timber Boards and Community"* - provides a detailed review of the construction techniques. Below is a quote explaining why these houses became so remodel/offshoot -friendly:

One key factor contributing to the many conversions and extensions is undoubtedly the technically simple foundation, which allows many self-builders to construct additions with relative ease. The original, unexpanded Finnebyen house is highly adaptable because both the floor and ceiling boards are continuous and installed before the internal partitions are put up. This makes it extremely simple to move interior walls without requiring complex or costly modifications to the floor and ceiling.

The variety of extensions can be categorized into three main types:

- **Type 1:** Extension of the house along its longitudinal axis
- **Type 2:** Angular attachment
- **Type 3:** Addition of an annex, for example, connected by a glass corridor


ØSTERLARSVEJ 17
TYPE 3: HUS MED ANNEKS

ØSTERLARSVEJ 11
TYPE 2: HUS MED VINKELPÅBYGNING

ØSTERLARSVEJ 13
TYPE 1: DET FORLÆNGEDE HUS

DET OPRINDELIGE HUS
ØSTERLARSVEJ 15

FIG. 4
UDVIDELSESMULIGHEDER

Wikihouses - Flexibility through the use of new technology

WikiHouse was developed around 2010 by the London-based architecture firm 00, quickly gaining attention for its innovative approach to modular, open-source building design. The system combines digital fabrication with CNC-milled plywood sheets, enabling efficient and adaptable construction. Their work was first exhibited at the Gwangju Design Biennale in 2011. A more recent example from 2022 includes the construction of small houses for refugees in Ukraine.
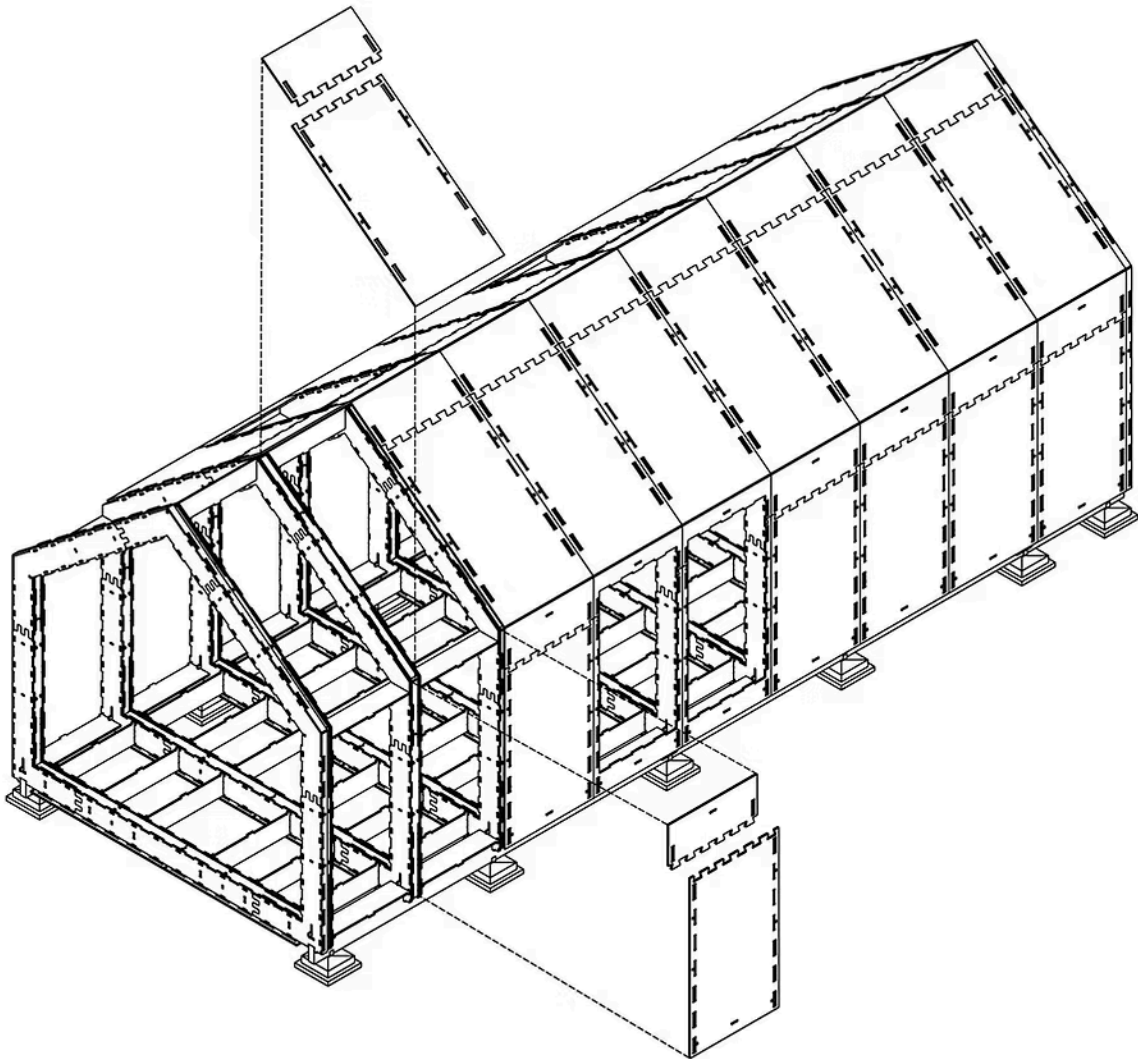
Digital fabrication enables the production of wooden building components that can be assembled within a few hours with millimeter precision. The company has developed and tested standardized components, allowing for flexible designs that can adapt to different locations and needs. Unlike traditional manufacturing, WikiHouse components are not produced in a single centralized factory but rather through a distributed network of small, local CNC manufacturers.
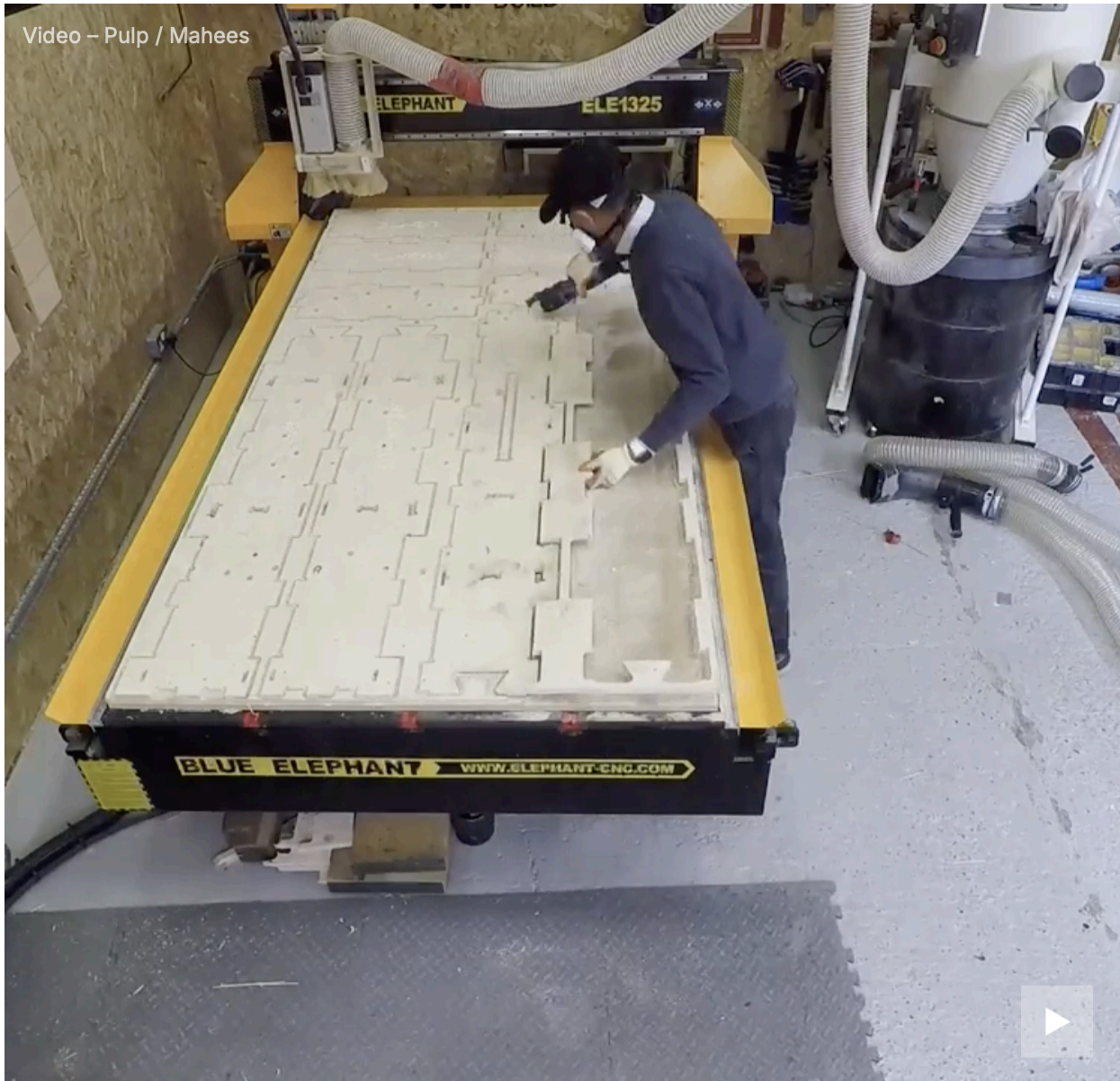
This decentralized production model is more flexible, resilient, and supportive of local businesses. WikiHouse components can be quickly assembled on-site by almost anyone, even those without traditional building skills. As an open-source technology, WikiHouse benefits from a global community of designers, engineers, and builders who continuously test, use, and improve the system.

**Incremental housing and self-organized construction**

In India, the concept of incremental housing was explored early on, with a notable example from 1989 being Aranya Low-Cost Housing in the state of Gujarat, designed by architect Balkrishna Doshi and his Vastu Shilpa Foundation. The goal of the project was to create affordable, healthy, and dynamic housing that encouraged self-organization. The concept involved constructing a plinth or foundation along with a core unit—consisting of a bathroom and toilet, with a kitchen on the exterior—which could then be expanded over time as needed. Link to an article with a revisit the area here

Informal and Self-Organized Construction in a European Context

Informal and self-organized construction need not be seen as distant or exotic in a European context. One example from the book *Self-made Cities* (United Nations, 2009) is the so-called "Koreas" on the outskirts of Milan—so named because the settlement resembled images of war-torn Korea. Here, migrants from Southern Italy built their own homes in the period following World War II. Initially, these houses were constructed on land owned by the self-builders but lacked basic infrastructure such as electricity, sewerage, and water. Over time, these services were installed, and the original sheds and houses were demolished in favor of more permanent structures—a process made possible through legalization, on the condition that hygienic standards and "straight streets" were implemented. The case of Bollate, now a suburb of Milan, is particularly relevant. Nearby, a social housing complex designed by a well-known Italian architect fell into a vicious cycle of social problems. In contrast, the self-organized neighborhood has developed into a well-functioning community. The book uses this example to highlight the strengths and potential benefits of self-made cities.
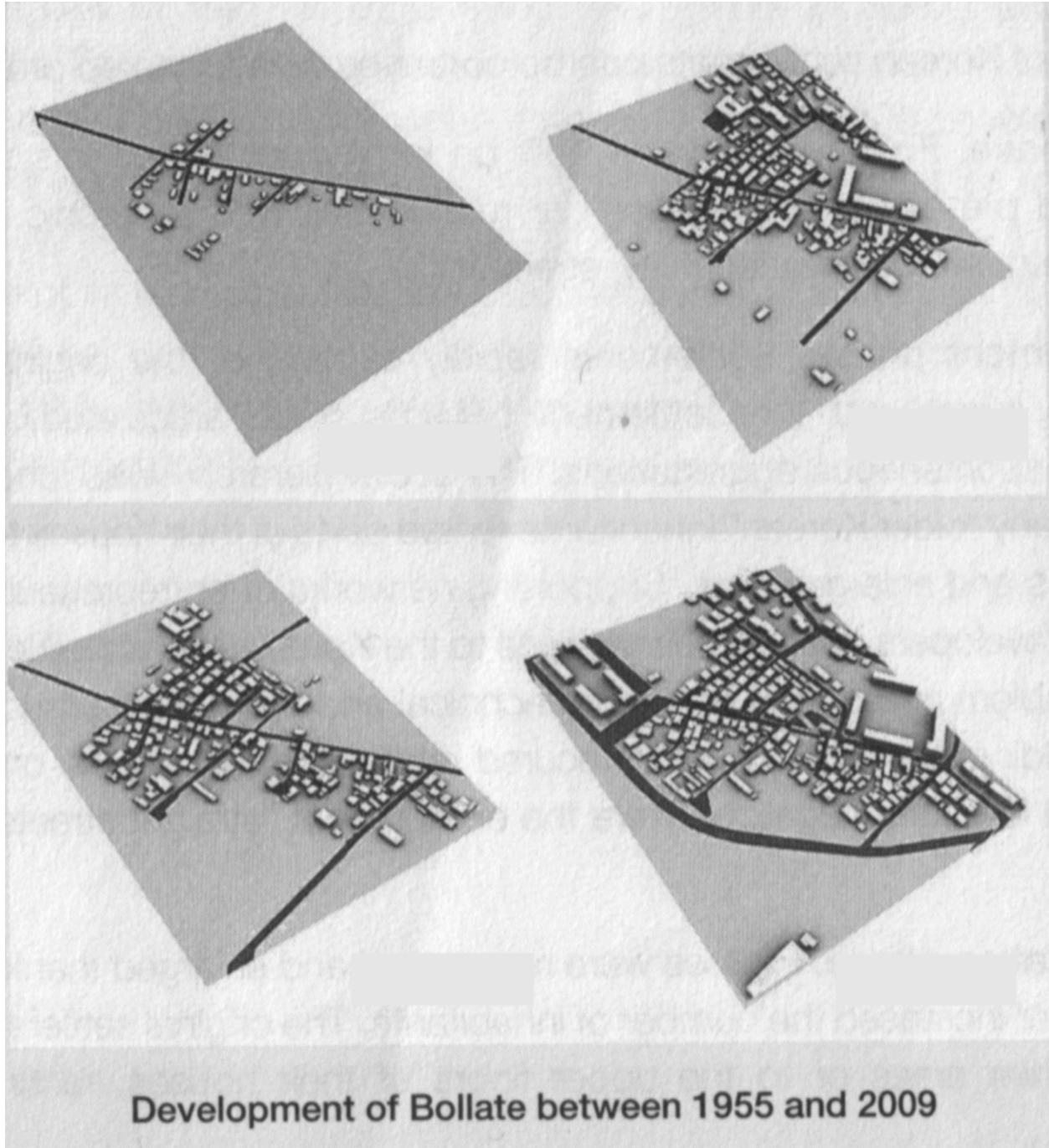
Development of Bollate between 1955 and 2009

Informal Construction and Architectural Research Since 2000

Since the early 2000s, research and practical work have explored various forms of informal construction, many of which share the same flexible qualities—though they often arise out of necessity rather than choice. A classic example is South America's favelas, which have been extensively studied by Alfredo Brillembourg through the *Urban Think Tank*, founded in Venezuela in 1993. Since 2010, Brillembourg has also been a professor at ETH Zurich. One of the key studies from this research was an investigation into Torre David, an unfinished 45-story

bank building that was repurposed for seven years as an improvised housing structure and a model of self-organization. This study was exhibited at the 2012 Venice Architecture Biennale. Link here

Another example of work on informal and temporary construction is post-industrial reuse, where buildings that had lost their original function were repurposed for new uses—similar to Christiania's adaptation of old barracks buildings, though not originally intended to be temporary. A notable initiative in this field was Urban Catalysts, based in Berlin (*Dienel, H. L., & Schophaus, M., 2002*). The growing international interest in informal construction among architects was further reflected in the 2016 Venice Architecture Biennale, curated by Alejandro Aravena, a Chilean architect who gained widespread recognition for his incremental housing project from 2003–2004, which consisted of 93 dwellings. Link here.

The project became renowned for its architectural appeal and adaptability—featuring terraced houses with a pre-built core that residents could expand over time. This innovative approach led to Aravena receiving the Pritzker Prize in 2016 (often referred to as the Nobel Prize of Architecture) and secured his role as curator of the 2016 Venice Biennale.

Despite architect Alejandro Aravena's iconic status in the architectural world - largely due to his work with incremental housing - it is difficult to find examples of other architects or developers who have pursued the same ideas. Even Aravena himself discontinued this practice after completing three more social housing projects in the years leading up to his major awards.

This raises important questions for reflection: Are modular and flexible construction methods truly sustainable solutions, or are they simply fixed ideas? And if they are indeed valuable approaches, what prevents them from being more widely adopted?

R50: Collective Housing and Cost-Effective Co-Design

At the same time - in 2013 - and not far from Frei Otto's Ökohouse in Berlin (mentioned above), the R50 collective housing project (*Ritterstrasse 50*) was completed. This multi-story building, consisting of 19 homes, was designed with a strong emphasis on co-design, allowing future residents to actively participate in shaping their living spaces—while also keeping costs low. In this sense, R50 could be seen as a response to the criticism of Hoff and Ussing from KAB, mentioned earlier. One could argue, however, that what was gained internally- a high degree of resident-driven interior design - was lost externally. The building, with its austere and restrained aesthetic, stands in stark contrast to Frei Otto's Ökohouse, appearing almost as its diametric opposite. This deliberately low-cost aesthetic in construction recalls the austere style of architect

Hannes Meyer, who championed affordable, functional housing for the masses. The six-story concrete structure features a central core on each floor, containing three flexible kitchen and bathroom units. A partition and outer wall system, made of wood, allows for modular layouts—a concept reminiscent of the Finnish prefabricated houses mentioned earlier. While these flexible configurations are only subtly visible in the building's facade, they enable a variety of different floor plans.
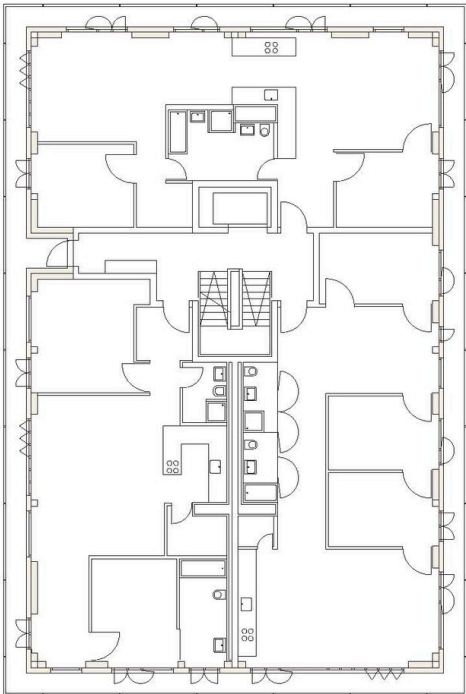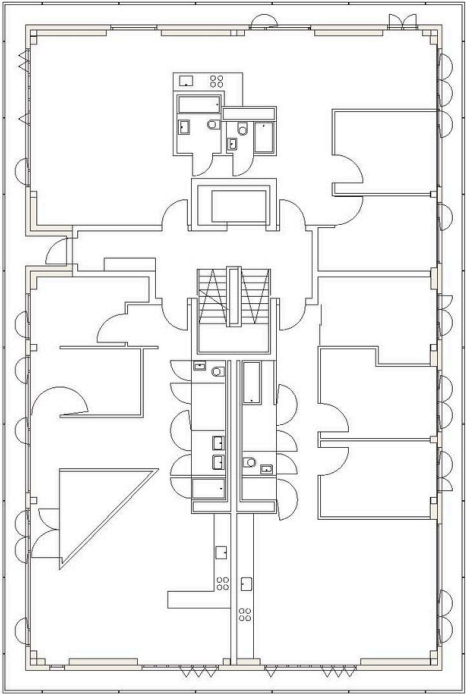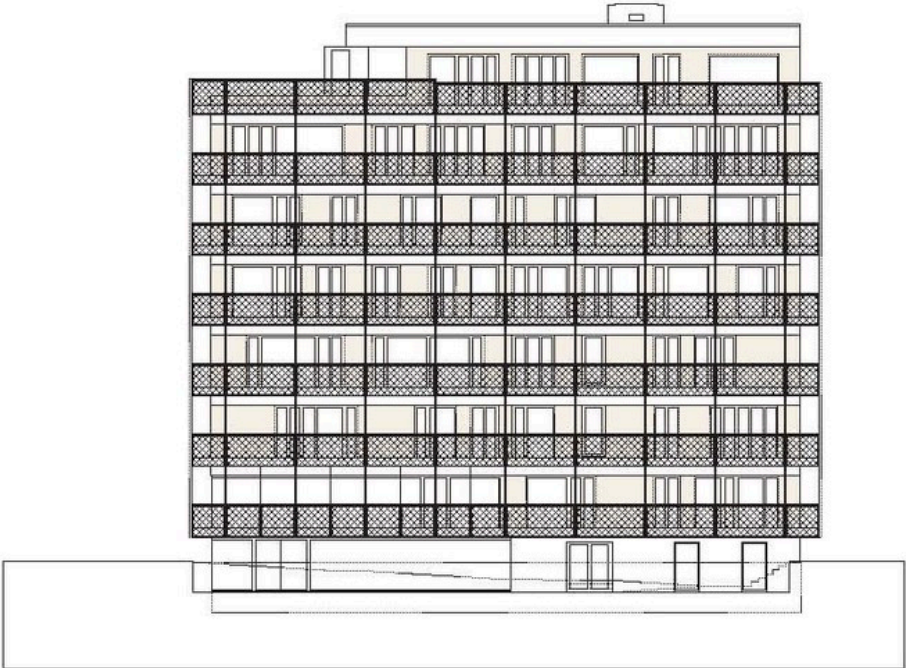
The R50 building possesses many important qualities, but as previously mentioned, these are quite introverted. As a result, the building does not contribute to the creation of a public space where individual residents and citizens have the opportunity to express themselves.

This raises the next question: How can we build affordably while also allowing residents to visibly appropriate and personalize the structure?

Some important limitations of the informal and unregulated

However, it is also crucial to recognize the limitations of informal, spontaneous, and especially unregulated construction. A now classic example is the concept of Non-Plan, which was co-developed by architect Cedric Price as a challenge to rigid and formal planning paradigms (*Barker, 1999*). The original proponents of Non-Plan sought to break free from the top-down approach of planning - where authorities dictate "what's best for the people." However, to the horror of many (though not the concept's originators!), Non-Plan later became an inspiration for the London Docklands redevelopment. The project led to the creation of an economic free zone—the "Enterprise Zone"—established in 1981 as a concrete symbol of Margaret Thatcher's neoliberal policies (*Easterling, 2014*).
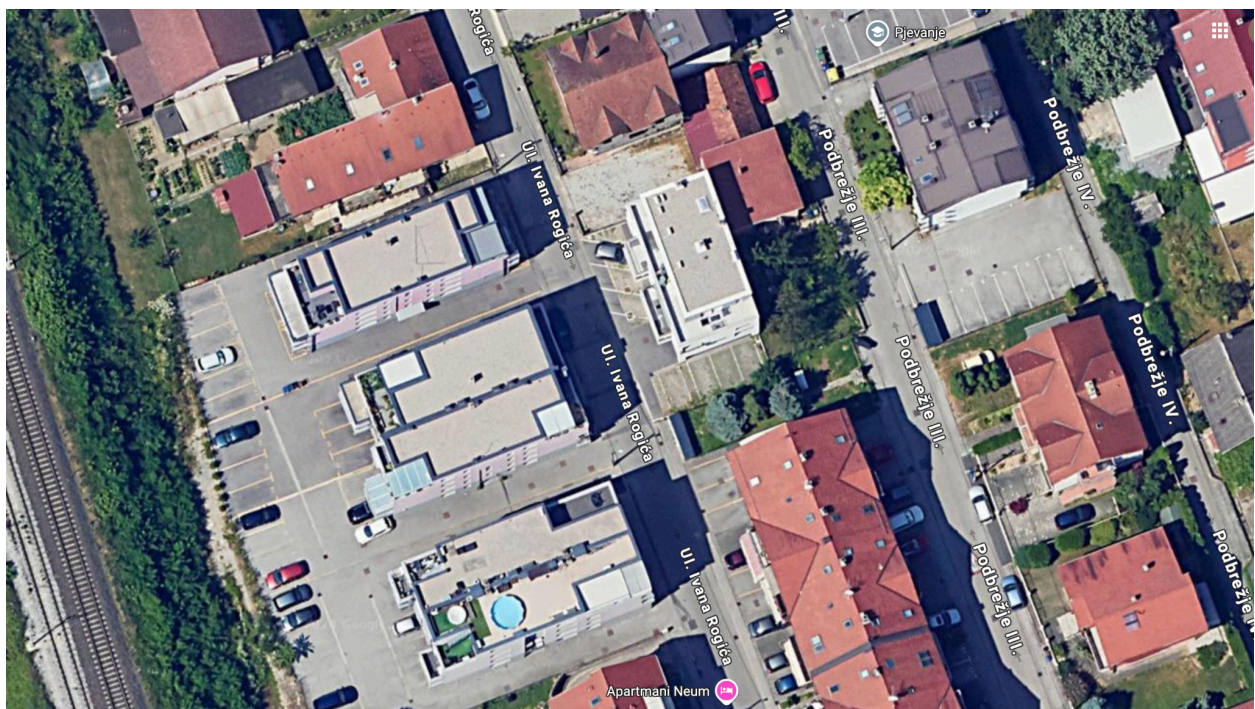
Another example is the Kajzerica neighborhood in Zagreb, where the consequences of privatization following the collapse of Yugoslavia became evident. Urban planning was unprepared for the influx of developers and an overheated housing market (*Platforma 9.81, 2004*). As a result, the built environment became defined by profit-driven development, where every square meter had to generate a financial return. The neighborhood is almost entirely devoid of public spaces—including sidewalks—and, in many cases, land has been repurposed

for construction or parking, leaving little to no room for green spaces. This highlights the need to balance the sometimes romanticized view of informal settlements - such as the fascination with the Turkish phenomenon of Gecekondu (_Wikipedia reference_) - or the absence of a formal plan for Christiania, as discussed in the _Imagine What If_ publication. These perspectives should be supplemented with a deeper understanding of the power dynamics in urban development and their spatial consequences.

A Final Question: Rather than merely mitigating the worst consequences of market-driven urban development - where urban design and planning often serves only to camouflage these issues - **How can we develop new planning paradigms that foster socially produced public spaces through openness and creativity, with the conditions and capacities for new forms of democratic participation to emerge?**

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