The Forest Figure as Strategic Tool for Urban Transition

Research-by-Design on the Hollow Roads of the Western Witness Hill of Leuven

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Abstract

If the ambition of the Flemish territory is to become more forested, then an approximation is needed between forest and urbanization processes. Forest expansion can only be realized by developing a new understanding between forest and urbanization. This article discusses urban design explorations that stimulate a spatial transformation grafted on the forest as a structuring element of the Western Witness Hills of Leuven, through the 'forest figure'. The forest figure is explored as a concept able to incorporate and mould urban and forest ambitions into a workable spatial frame.

Keywords

Forest Urbanism, Landscape Architecture, Landscape Urbanism.

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Introduction

Forest in Flanders

Flanders is poorly forested, as are many dispersed territories in Europe. Hovering between 10% and 13%, depending on the measuring technique, its forest stock is well below the European threshold and ambition of 30% (Agentschap Natuur en Bos, 2018; Aggestam & Pülzl, 2018; Bos+, 2018). The forests that exist are highly fragmented. There are now over 100,000 private forest owners, on average possessing a forest with a size of just 1 ha, adding up to about two-thirds of the total forest area. This has led to the infamous quote by an unknown author: 'In Flanders, if we find a forest, we run a road straight through it so we have two forests instead of one' (Mens en Ruimte, 1996, p. 15).

The urban fragmentation of the territory went hand in hand with forest fragmentation, suggesting that both are the result of similar spatial dynamics. Both urbanization and forest also appear in a similar spatial configuration: many small patches of forest interlock with dispersed settlements and urbanization, sporadically interrupted by larger urban cores and forests. The 'logos' – the interface between the forest and the urban as described in the influential work of Harrison, *Forests: The Shadow of Civilization* (Harrison, 1992) – could potentially be strong in such spatially interlocking matrices, if both urban and forest systems are conceived to be mutually enriching and not the accidental result of urbanization processes. Other authors have been advocating for such more productive approaches (Konijnendijk & Van den Bossch, 2008; Konijnendijk et al., 2005; Rekittke, 2023; Shannon et al., 2023). In this article, we aim to explore a practical approach to the construction of a strong interface between the forest and the urban.

Forest Figures: Agents of Forest Urbanism

In land-use planning in Flanders, relations between forest and the urban are typically described by the distance between them, by the size and potential uses that can be hosted in the forest, and by the forest's spatial distribution in relation to urban densities (Randrup et al., 2005). The research on *Forest Urbanism in the Dispersed Flemish Territory* demonstrates, on the other hand, the necessity of (intermediate) 'forest figures' in a forest-inclusive urbanism (Wambecq, 2019, pp. 46–48, Manifesto) that breaks through classic land-use boundaries. Forest figures are defined as the result of historic interplay between forest and urbanization, where both find the essence of their functioning in a stable and productive coexistence due to the negotiated joint spatial frame.

In the vernacular urbanization of Flanders, before spatial planning and urbanism became dominant, the relation between forest and the urban existed in the form of ever-evolving lineages of such forest figures (Wambecq, 2019). In the fluidity of (collective) self-organization and self-sufficiency, the forest was continuously reinvented as part of the urban environment (Wambecq et al., 2023). When land-use planning was adopted in the 1970s, these fluidities became irregularities and were purged out of the territory systematically over the last 50 years. All the benefits of the fluidities, many shared with the concept of urban forestscapes, were lost [fig. 1].

FIGURE 1 The construction of a collective housing project illustrating the purging of forest and trees as part of the private and public landscape, in Rotselaar.

This article discusses the potential of the forest figure as a strategic tool for urban transition towards such an urban forestscape that stems from a vernacular depth of relations, seeking historic continuity and structural embeddedness in the territory's spatial complexity, while countering the more recent functional divide between the forest and urban development. Considering that the relation between forest and the urban is not linear but cyclic and thus 'reversible' or 're-mouldable', deeply rooted relations of spatial curatorship between forest and the urban can be re-activated, and new solutions for the ecological and social crises found by re-contextualising them within the frame of the forest figure, while fundamentally building a greener, more forested, and healthier territory. The forest figure might therefore be a strategic tool towards the realization of an urban forestscape.

Research-by-Design on the Western Witness Hill of Leuven

The Western Witness Hill of Leuven, further addressed as 'the Witness Hill', was the topic of a research-by-design at the postgraduate Masters of Human Settlements (MaHS) and Master of Urbanism, Landscape and Planning (MaULP) of KU Leuven. It fell prey to generic suburbanization between Leuven and Brussels and is emblematic of the post-war development of the dispersed Flemish territory. The research hypothesized that social and ecological ambitions could be addressed simultaneously within the forest figure of the hollow road.

The Forest Figure of Hollow Roads

The historic system of hollow roads, created by centuries of cattle moving up and down the steepest, northern edge of the Western Witness Hill, was defined as a potential forest figure [fig. 2]. The hollow roads connect the foot of the Witness Hill with the ridge, offering a dramatic transition from the enclosed valley to the open field on the hill's ridge. To maintain structural stability, their steep edges are most often generously planted and forested. The systemic appearance of forested hollow roads created a continuous forest along the northern edge of the Witness Hill with unique picturesque and ecological qualities.

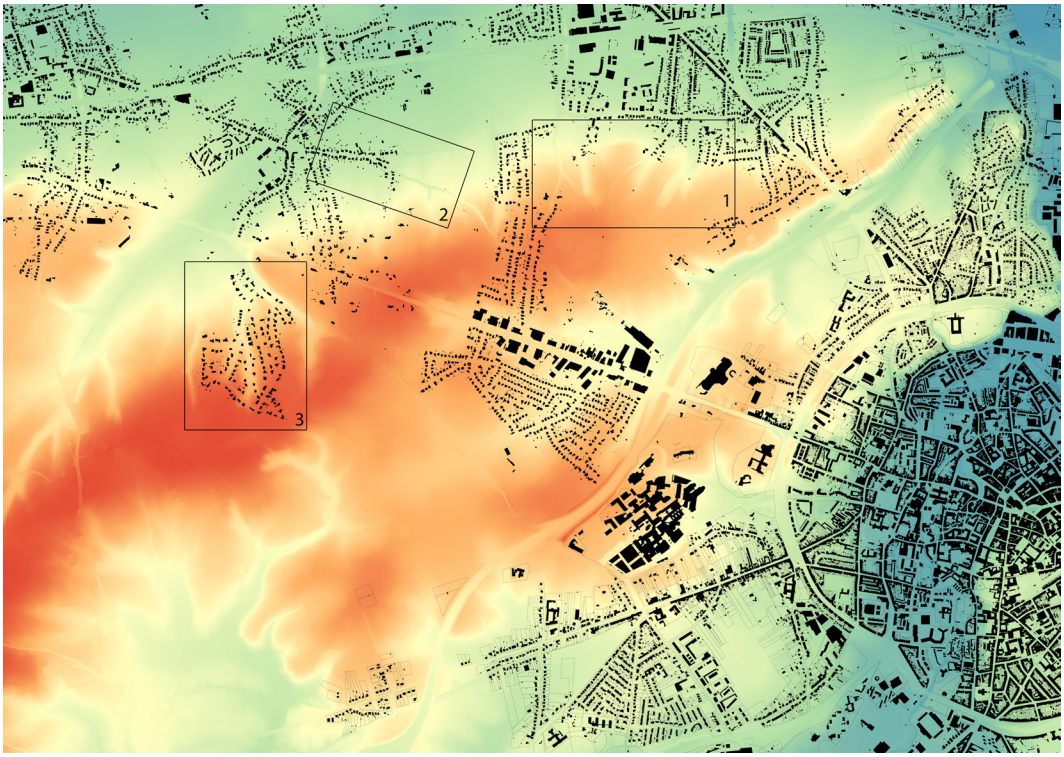

FIGURE 2 The hollow roads of the Witness Hill is clearly readable as deep cuts in the topography. The discussed cases are indicated by rectangles, along the northern edge of the Witness Hill. (1. Herent, 2. Winksele, 3. Schoonzicht, Bertem).

In the 1930s and late 1940s, the Witness Hill was mainly agricultural land with the large Bertem forest. When post-war urbanization in the form of allotments arrived in the 1970s, the system of scenic hollow roads between the valley and the plateau was partially cannibalized by the construction of houses and allotments [fig. 3]. In their attempt to follow common construction norms along the road and to allow car entry onto driveways, the hollow road topography was strongly modified, the forest along the edges removed, and the typical, noisy, cobblestones replaced by easy-going asphalt. Where the urban tissue colonized the hollow road, its identity was suppressed. Emblematic forest appearances disappeared for generic individual inhabitation. Publicly accessible forest was substituted by extensive private gardens.

The historic and future importance of the hollow road in defining the identity of the Witness Hill is undeniable. The design research investigated the concept of 'forest figures' through hollow roads as a geographic particularity of the Witness Hill, formed by the interplay of natural and cultural forces that can be recalibrated to serve the social-ecological ambitions of the territory and contribute to the construction of an 'urban forestscape'.

FIGURE 3 Historic evolution between Bertem forest on the ridge and Winksele village in the valley, and the evolution between urban and forest. From left to right: the 1930s topographic map (NGI), aerial images from the 1940s, 1970s, 1990s, and 2020.

Base Ambition: The Forest Figure (of the Hollow) Road Builds Forest

The image quality of the hollow road where houses are constructed has been reduced to a norm-abiding, generic street profile without any articulation, identity, or ecological value. To acknowledge the importance of the hollow road means reinstating its base ecology and associated image quality of lush green, ecological continuity, seemingly undisturbed by urbanization, supporting mainly the scale of the pedestrian and bikers. The ecological disruptions of the driveways are subverted while reinstating the scenic, low-speed, cobblestoned path in a lushly planted environment [fig. 4]. In fact, such a project represents the minimal ambition of ecological restoration, tackling environmental urgencies like flooding (through the adjacent flat driveways) and biodiversity loss, yet leaves the urban structures largely untouched.

FIGURE 4 Simulation of the new ecological system of the hollow road, with the restoration of its picturesque experience.

A forest figure seeks to find contemporary continuity and innovation based on its historic qualities. If this base condition is met, then the forest figure can play other, more ambitious roles in the transformation of the territory. The forest figure is therefore, first and foremost, before anything else, the start of a forest.

FIGURE 5 System of ancient connections, interlocking with the hollow roads and the forest ecology.

Increased Ambition: The Forest Figure (of the Hollow Road) Reorganizes the Way We Move through and Experience the Territory

The hollow road is also a space of mobility. First, it was traversed on foot, then with cattle, horse with carriage, and finally, today, by bike and most often by car. Only slow-paced mobility allows for complete immersion in the experiences offered by the hollow road. If we consider the ecological restoration of the hollow road as a *conditio sine qua non* for the future and success of the forest figure in the natural ecosystem of the Witness Hill, then its ability to incorporate sustainable modes of mobility as part of an extended network for movement is indispensable.

In Winksele, at the north-western edge of the Witness Hill, a road leading away from the village centre towards the plateau splits into two hollow roads that cut sideways into the Witness Hill. The hollow roads can barely be recognized. Their sloped edges are subtle or transformed into hard edges of the front garden or pushed to the back of the back garden of the urban development through intense terrain remodelling. As with many hollow roads, the street profile is normalized with an asphalt road deck and small, underused sidewalks. They are part of the system of ancient connections across the territory that hold enormous potential as a robust and efficient soft mobility network [fig. 6]. The transformation of the hollow roads would strongly contribute to this ambition.

FIGURE 6 Plan of the existing and proposed hollow roads.

The forest figure recalibrates the balance of space between hard and soft mobility. The forest figure is not dogmatic. It does not seek to chase away the car yet complements a more modest role of the car with a strongly improved and performant soft mobility network (electric bike, bike, pedestrian...). In addition, the generic streetscape is refitted as a hollow road with topographic articulations, consolidated by lush vegetation. A wide collective streetscape emerges [fig. 7].

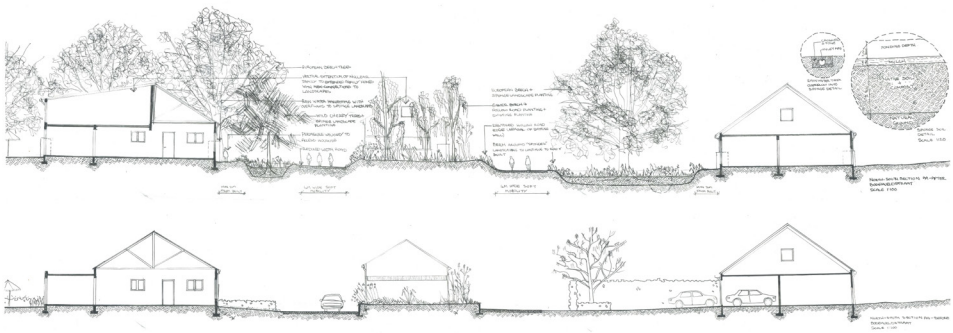

FIGURE 7 Section of existing and proposed hollow roads, evidencing the set of interventions to increase the readability of the hollow road and its experiential quality as a space of soft mobility.

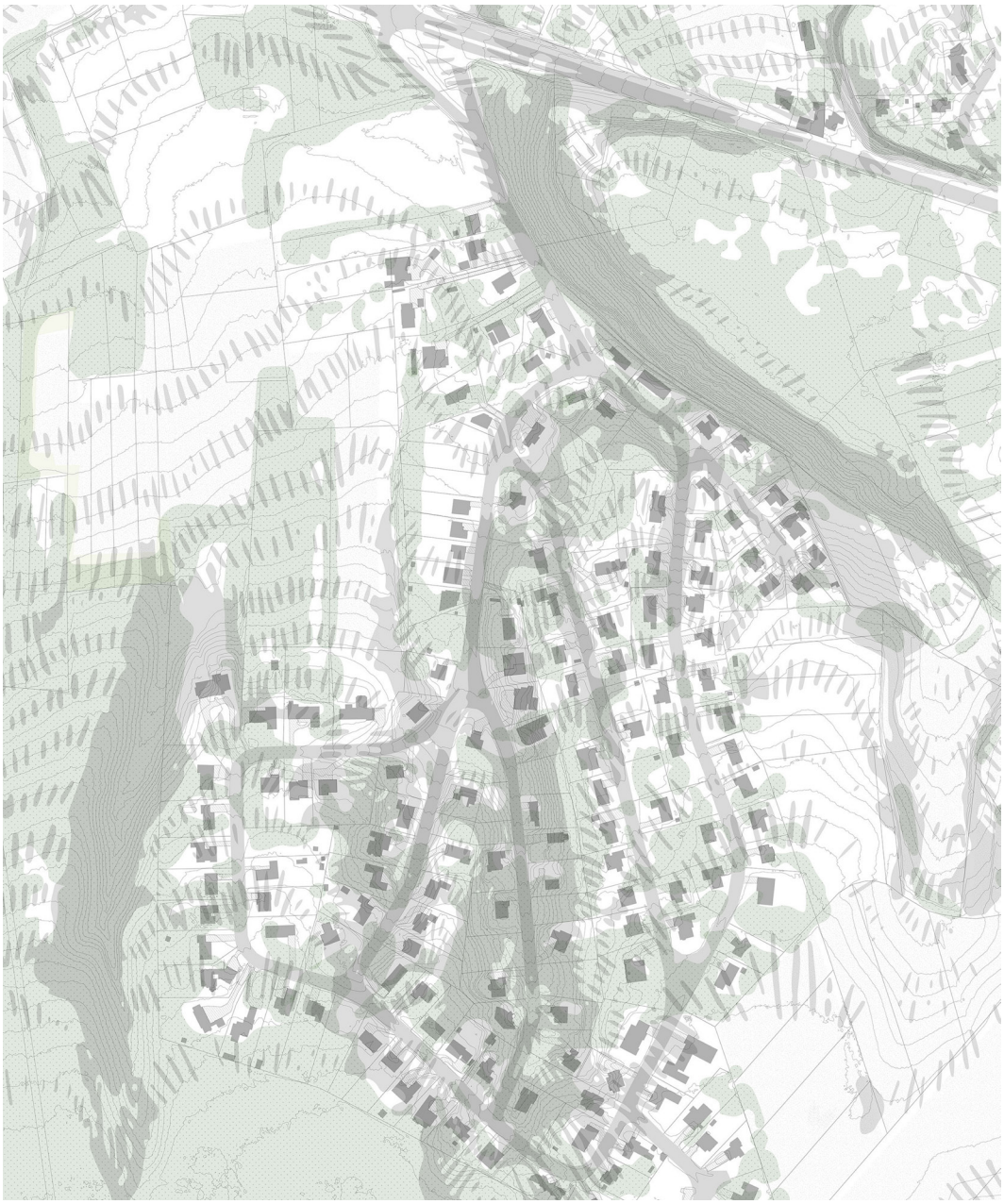

FIGURE 8 Existing plan of the allotment Schoonzicht, with its typical suburban layout of street loops and single-family villas.

Enhanced Ambition: The Forest Figure (of the Hollow Road) Stimulates and Organizes Urban Renewal

The housing allotment Schoonzicht occupied a deforested piece of the Bertem forest. The seemingly typical allotment road structure was, in fact, a system of hollow roads now formalized as norm-abiding streets [fig. 8]. The large parcels with equally large houses represent an immense built capital but a small social capital. Many people here have their own swimming pool in the garden, while the same number of people inhabit one collective residential apartment block from the 1970s close by, sharing one common swimming pool. Both are built in the same period but clearly represent different cultures of inhabitation.

FIGURE 9 Vision plan for the neighbourhood with the articulation of an inhabited forest-scape, grafted on the hollow roads as functional and experiential space.

Now is the time to imagine the transformation of the allotment. Most houses will soon need reinvestment. Large gardens and over-dimensioned houses provide ample flexibility to reshuffle the relation between nature and built and introduce a typological diversity that better represents the current societal constitution with many diverse forms of inhabitation like single-person houses, living and working combined, assisted living, or co-housing. The recalibration grafts itself on the common identity of the forested slopes of the Witness Hill and the hollow roads that function as the lifelines of the neighbourhood [fig. 9].

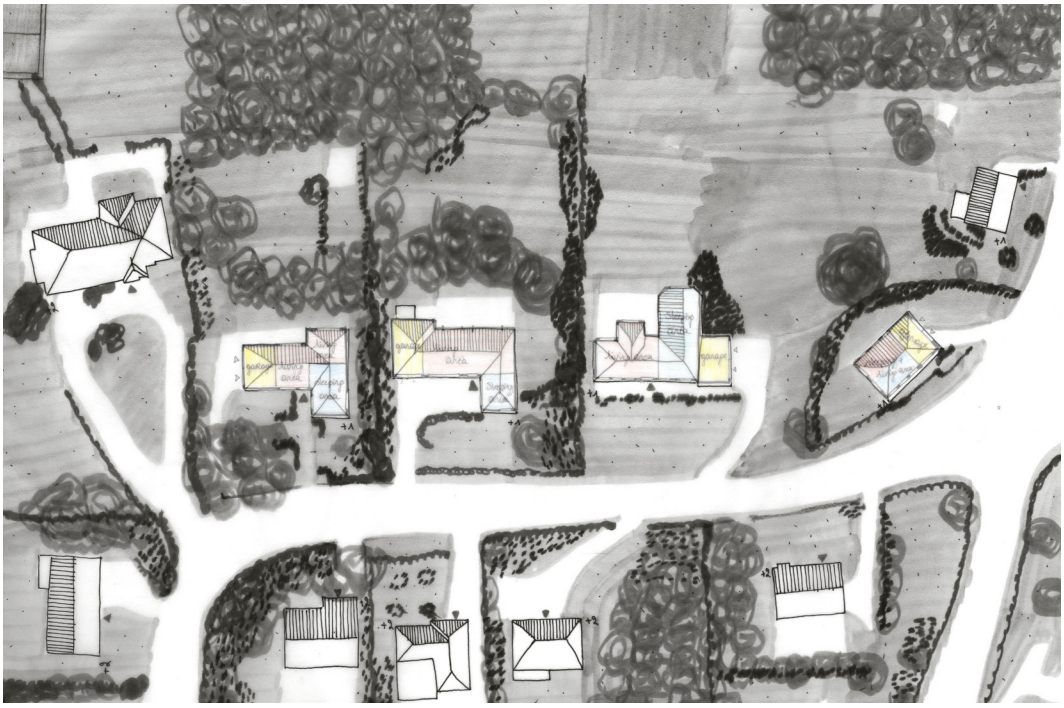

FIGURE 10 Existing piece of the Schoonzicht allotment, showing several villas and their individual organization of space.

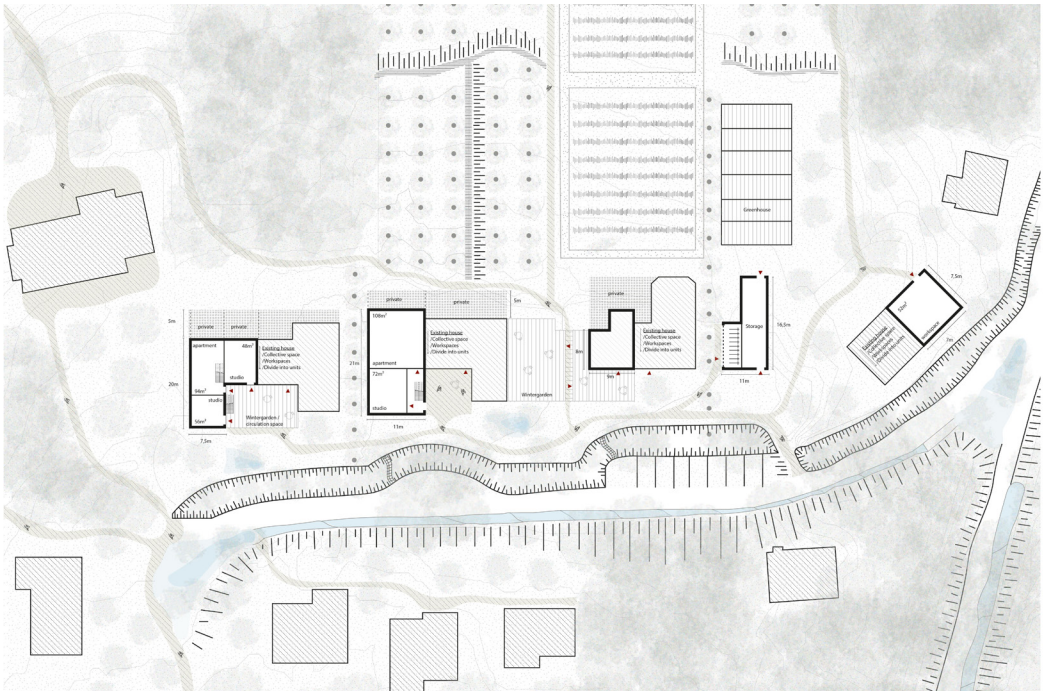

FIGURE 11 The aggregation of four villas with collective water management, productive spaces, gardens, grafted on the reenforced hollow road as the lifeline of the neighbourhood.

A piecemeal transformation starts by retaining only the hollow roads for car mobility, excluding all other redundant loops and curves, often serving only one or two houses, that are consequently decommissioned and demolished. The newly established accessibility imposes an intelligent aggregation of the houses. Front lawns and driveways are combined in collectively organized gardens – with a protective *talud* that recreates the slope of the hollow road – that serve a common entry for three to even twelve houses, depending

on the location [fig. 10]. The aggregation of the built infrastructure fits different housing typologies. Four small families in their oversized villas will gradually give space to more than ten families that benefit from collective workspace, car-sharing, leisure and community gardens, or even kitchen and living spaces. Large garages with punctual extensions accommodate a contemporary working culture of living with an atelier, office, or commercial space [fig. 11].

The re-articulation of the hollow roads creates a sense of place and belonging in an allotment that is otherwise collectively unarticulated. Today, nothing exists between the anonymity of the car going in and out of the neighbourhood and the privacy of the single-family villa. The system of the hollow roads as public space induces an intermediate level of aggregation where people live together within a small collective when wanted, or in privacy when needed. The character of house aggregations depends on the local context. Contrary to the allotment, which is, if anything, not contextual but generic, the project of aggregation introduces a new collective identity. The public structure of ecological hollow roads then consequently accommodates a variety of identities.

On the ridge, for example, just arriving on top of the Witness Hill, a small community of twelve houses is formed that adopts the agricultural identity of the ridge. The streets are decommissioned and transformed into a common, collective landscape of community gardens, framed by the bordering forest. Again, this new contextual reality with a clear ecological premise supports the densification and diversification of urban typologies that stem from the previous villas and that allow for forms of inhabitation [fig. 12].

FIGURE 12 The aggregation of twelve villas leads to a small agricultural community, embedded in the forest frame, inscribing itself in the ecological-productive ecosystem of the Witness Hill.

The aggregation of houses and transformation of the public space can evolve autonomously. Both public and private realms, each at their own pace, build towards a common identity for the former allotment. Urban transition is realized by revealing its system of forested hollow roads that carry a new logic of mobility, that supports the ecology in the form of forested edges and water buffer space, and that induces a new scale of aggregation between the houses. The new, densely organized urban form, in its turn, supports the consolidation of the forest as a collective, natural capital. An urban forestscape appears.

Ambitioning Urban Transition Through Forest Figures

We might argue that the current-day situation of the above-mentioned allotment is, in any case, already an urban forest-scape, made by the large private villas and their mildly forested gardens. We might equally argue, though, that they do not fundamentally contribute to the urban ecosystem of the Witness Hill. The current organization of the allotment cannot safeguard the ecological functions of the forest due to its privatized and selective nature. It does not represent a common natural capital in service of a broader community. In addition, the urban system functions at low efficiency. Extended streetscapes with management-intensive sewers, drainage systems, sidewalks, and parking spaces merely serve the private monofunctional residential space. Such allotments are therefore neither forest nor urban.

In practice, the simplicity of juxtaposition of forest and the urban is often conveniently abused as 'ecological', 'sustainable', or similar, yet it is insufficient to realize a long-lasting, productive relation between both. An urban forest-scape, as we would expect, should carry the values as explored in the forest figures of the hollow road, seeking relational complexity between the forest and the urban. A sustainable urban forest-scape can be successful if constructed, organized, and managed through forest figures.

The forest figure exemplifies the possibility of a deep bond that serves as a carrier of the urban forest-scape. The forest figure is therefore, at first, a space agent, or agent space, as Paola Viganò states, acting in its own ambitions and legitimacy towards ecological and social integration (Viganò, 2024, p. 115). Through its agency, transformation is imaginable and tangible, inviting the necessary disciplinary fields and actors to participate and uphold the constructive ambitions, and define negotiating principles in close collaboration. The forest figure is a collaborative framework. Renouncing the simplicity of simple juxtaposition of forest and urbanization as an urban forest-scape, the forest figure represents systemic complexity where both forest and urbanization interact through natural and cultural processes. For example, the forested gardens are extensions of the forest where ecology depends on the individual expressions of the inhabitants (fences, species, management…); the inhabitation is dependent on the conditions created by the surrounding forest (architectural style, light, humidity, heating concepts…). The forest figure is the conceptual carrier that reorganizes the necessary transformations towards consolidated, coordinated systems. A key concept is the transition towards collectivity that allows components of the system to be pieced together. The new collective dimension is fuelled by the social transition towards more diverse inhabitation, including smaller housing units, collective living solutions, work-live rebalancing, and even urban ambitions with the inclusion of services that serve the collectives. The forest figure collects these transformations and matches them with its own historic spatial repository, reinvigorating its structuring role in the (now also urban) territory.

The increasing levels of ambition for the forest figure (of the hollow road) suggest gradual transformation through the piecemeal integration of ambitions. Even if urban transition happens slowly, we can start it tomorrow by strengthening the hollow road's ecological structure, inserting it, whenever possible, into the soft mobility network of the region. At some point, the urbanization will aggregate to accommodate new urbanities, allowing structural support for the consolidation of the forest figure. If we truly believe that the quality of a forest figure lies in the deep bond between forest and urban development, based on an undeniable geographic figure such as the hollow road, and much beyond their simple spatial, static juxtaposition, then we must allow this bond the necessary time to grow deeply again, at the pace of a growing forest. The current state of the forest figure of the hollow road is, in that sense, just a temporary state of uncoordinated natural and cultural processes that we must gently, and if possible, more forcefully, reorient to converge again.

We must be realistic, though, about forging such a new deep bond between the forest and urbanization. It requires a drastic change in the way urbanism is practized. Different professionals need to converge towards a common project around ecology, mobility, urban development, agricultural and productive spaces, crossing different municipalities. A key factor in the potential success of forest figures is the operational scale, as the space agent, as mentioned before. The hollow road as a geographic feature, and the appearance of the system of hollow roads along the northern slope of the Witness Hill, have defined scales and spheres of intervention around which stakeholder coalitions can be built that work on a project-by-project basis, and not through generic, normative legislation. House owners can be incentivized in the process of change, although a slow transformation process can be expected. More than 50 years of spatial fragmentation cannot be undone easily. The re-aggregation of privatized land will require creative solutions that overcome difficulties of individual interests, uncoordinated timings, and legislative constraints.

What Makes an Urban Forestscape?

The essence of the urban forestscape lies in the forces that make such a concept possible, namely if an entity exists – a collective of inhabitants, a motivated public administration – that organizes and manages the continuous equilibrium between forest and its inhabitation. The forest figure is a strategic tool that can create and manage this equilibrium. Urban and forest fragmentation can be overcome by new collective alliances of territorial curatorship. Forest and urban spaces are managed as joint projects, by their direct inhabitants and other actors that assume responsibility for the collective space. We must not underestimate the potential of inhabitants to take care of their environment when they aggregate towards a common goal. This is the essence of what the forest figure as a tool aims to achieve. Secondly, the forest figure represents the identity that defines the direction of the urban and forest processes towards the deep bond. There is no final image about how the forest and the urban coexist in the forest figure, but only a continuity of practices, based on the forest figure's identity, that always steer towards an equilibrium between the forest and the urbanity that sits within it. Thirdly, and finally, the forest figure can only maintain its transformational relevance if it evolves into a broad, sustainable ecosystem as both an ecological and social project. It must therefore contain both interventionist capacity and territorial impact, meaning not every forest-urban coexistence is easily operationalized as a forest figure. Identifying promising and substantial forest figures is therefore an indispensable first step towards true potential urban forestscape. The construction of an urban forestscape through forest figure(s) will provide a solid base for its success in the long term.

Conclusion

The above-mentioned design explorations all build on the forested landscape of the Witness Hill to induce transition to an ecologically embedded and socially corrected urbanity. They aim to overthrow the established mode of urbanization that is detrimental to its environment, monofunctional, monotonous, and generic. We believe that the concepts of the forest figure of the hollow road, as presented in this case, form a base for many other possible forest figures, well beyond the context of Flanders.

Forest figures are defined as the result of historic interplay between forest and urbanization; identifiable within a specific spatial frame and scale, making them apt as tools for urban transformation since a clear working frame exists and even a curatorship by inhabitants can emerge; able to re-invigorate a deep and practical bond in which both forest and urban form can coexist and enforce one another through mutual respect; strategic as they can address not only ecological issues but integrate social reconfigurations within their operational scale.

If an urban forestscape is constructed as the aggregation of many forest figures, then the forest-urban balance is locked in these operational units, creating a long-lasting base of success for the urban forestscape.

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