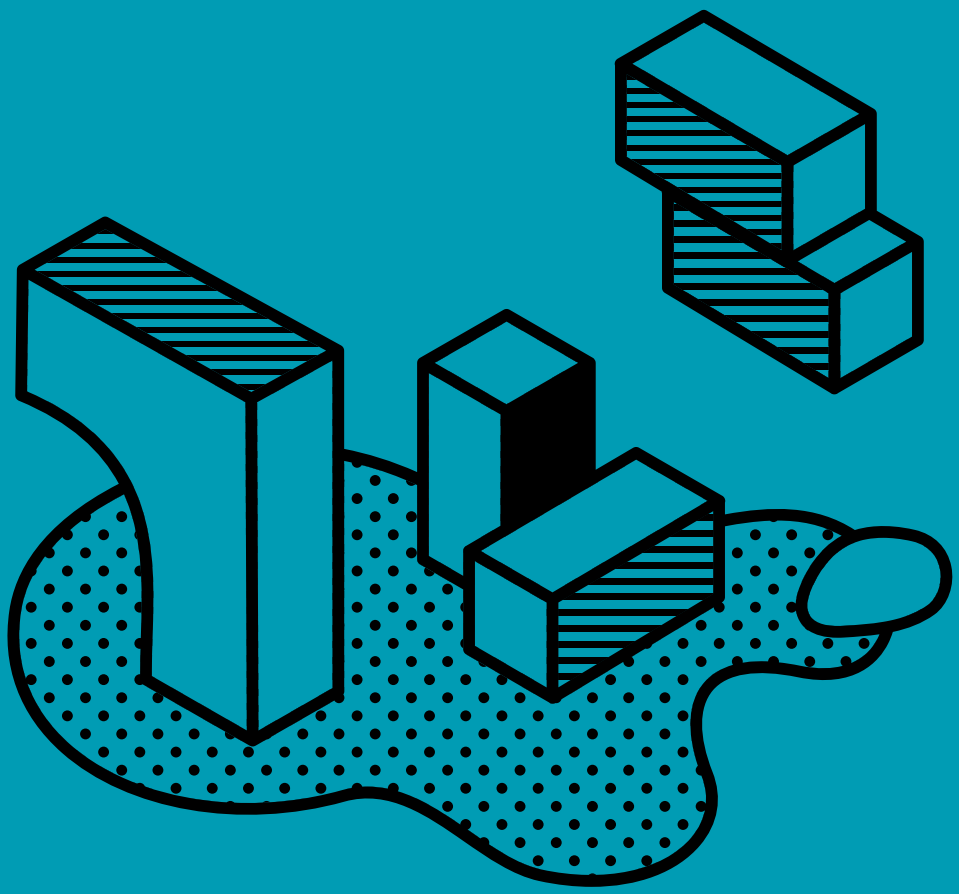
Designing Brussels Ecosystems

Metrolab Brussels MasterClass II



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Andrea Bortolotti
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(eds)

Metrolab series

Designing Brussels Ecosystems

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Foreword

Exploring urban ecology with Metrolab

Bernard Declève and Geoffrey Grulois

This book presents the results of the second international MasterClass hosted by Metrolab in January and February of 2019, on the theme of urban ecosystems in Brussels. The event was the outcome of a transdisciplinary methodological reflexion on the relations between urban ecologies and urban policies. How can urban ecosystems be approached from a transdisciplinary perspective? How can urban projects such as ERDF be mobilized to initiate a socio-ecological transition? Before delving into these methodological questions, we would first like to put this project back into the Metrolab context.

Metrolab is a transdisciplinary and inter-university laboratory for applied and critical urban research funded by the Brussels-Capital Region through its European Regional Development Fund (ERDF) programme (2014-2020). This new laboratory, created by UCLouvain (Université Catholique de Louvain) and ULB (Université libre de Bruxelles), is a collaboration between four existing research laboratories: CriDIS (social sciences), LOCI (architecture and urban planning), LoUIsE (urbanism, infrastructure and ecologies), and IGEAT (geography).

Metrolab offers a unique opportunity to experiment with new forms of transdisciplinary urban research, embedded in the practical and institutional setting of the Brussels-Capital Region. The European Regional Development Fund for the Brussels-Capital Region provided Metrolab with the means to conduct action-research studies as part of the 46 projects subsidised in the 2014-2020 programme.

The main objective of this academic support for ERDF is to test the ability of university researchers to offer reflection and coordination for urban policies such as ERDF. The objective is also scientific and epistemological as Metrolab seeks to test new scientific forms of engagement and positioning in urban research.

In terms of the themes covered, Metrolab's scientific programme is structured around three research themes: urban inclusion, urban ecology, and urban production, which follow the focuses of European urban policies and are in line with the social, environmental and economic dimensions of sustainable urban development. In terms of timing, these lines of research form three successive work cycles.

Reflections on the theme of urban inclusion began in December 2015. During the years 2015 and 2016, ethnographic surveys, mapping and co-design workshops were organized around several ERDF

projects in collaboration with local actors. These investigations on urban inclusion and hospitality in Brussels culminated in the In / Out Designing Urban Inclusion Conference and Masterclass organized in January and February 2017. The publication of the results of this Masterclass concluded by emphasizing the importance of the concept of “inclusive enclave” for urban policies.

The theme of urban ecology has been explored since 2017. For two years, it has given rise to seminars exploring the fields of political ecology, human ecology, metropolitan agriculture, urban metabolism, socio-ecological transition, etc. In October 2018, the Brussels Ecosystems international conference foresaw an integrated approach to environmental, social and political ecosystems. The Designing Brussels Ecosystems Masterclass was then planned as a testing ground for this transdisciplinary approach of urban ecosystems.

Each thematic cycle ends with a MasterClass where all members of Metrolab (researchers, coordinators, professors and administrators) apply methodological innovation to real-life situation and case studies in coproduction with stakeholders in the Brussels urban project (including actors in several Brussels ERDF projects). This means that the MasterClass is a unique moment for transdisciplinary experimentation and co-production: it calls upon the skills and knowledge of our researchers; it builds relationships with those in charge of ERDF projects and other urban projects; it experiments new methods for urban analysis, idea development, and urban project improvement. It allows international researchers in various disciplines (sociology, architecture, political science, landscape architecture, urbanism, geography, etc.) to gather in Brussels to reflect on the local ERDF programme and develop new and future-oriented suggestions aimed at improving urban policies.

This second Designing Brussels Ecosystems MasterClass explores the topic of urban ecology as part of a transdisciplinary methodological exploration of urban ecosystems and socio-ecological transition. How can urban ecosystems be approached from a transdisciplinary perspective? How can urban projects such as ERDF be mobilized to initiate a socio-ecological transition? The introduction to this publication defines the Metrolab approach to the concept of urban ecosystem and the methodology for investigating urban ecosystems. This methodology and the themes were defined by a group of researchers from Metrolab (Andrea Bortolotti, Bernard Declève, Geoffrey Grulois, Roselyne de Lestrange and Corentin Sanchez Trenado) in close collaboration with a scientific committee of local and international experts (Elena Cogato-Lanza, Brian McGrath and Serge Kempeneers) and the two Metrolab managers (Sara Cesari and Louise Prouteau). The introduction is followed by a presentation of the four Brussels Ecosystems explored during the Brussels Ecosystems Conference and Masterclass. It was prepared by a larger group of Metrolab researchers also including Marine Declève, Anna Ternon, Chloé Salembier and Stephan Kampelmann.

Following this introduction, the publication presents the design exploration co-produced by thirty researchers with diverse disciplinary and geographical backgrounds (Belgium, Italy, Spain, US, Turkey, France, China, etc.), in close collaboration with key stakeholders from Brussels. The publication closes with critical insights from the researchers at Metrolab and the international experts on the scientific committee (Elena Cogato-Lanza and Brian McGrath). We hope the Designing Brussels Ecosystems MasterClass and this publication are a first step toward building collective knowledge ecology in Brussels Ecosystems.

Introduction

Designing Brussels ecosystems

Geoffrey Grulois, Bernard Declève, Roselyne de Lestrange, Corentin Sanchez Trenado and Andrea Bortolotti

Brussels Ecosystems: conceptual framework

In Brussels the concept of urban ecosystem emerged over forty years ago, in the context of ecological studies conducted by the interdisciplinary teams of Paul Duvigneaud. The goal of Duvigneaud’s work was to provide a broad perspective of the interdependencies that exist between the human and non-human worlds. While the positivist project of offering a global ecosystem science was eventually abandoned, the ecosystemic approach is today at the heart of research and innovation in a number of areas of natural sciences, social sciences, engineering, design and the humanities.

Each of them includes the concept of ecosystem in its field of study in order to develop specific methods. Beyond the increasing weight of environmental issues, we suggest that the current ubiquity of the notion of ecosystem is contributing to an epistemological transition where more focus is placed on the interconnectedness of all things (human and non-human). Brussels Ecosystems intends to advance in this direction, experimenting with new interdisciplinary integrative tools for the critical evaluation and support of urban policies and urban projects.

Brussels Ecosystems is centred on a common goal: leveraging various aspects of ecology (natural, social, political and knowledge-building) as a basis for reflection on the interdependence between the components of a city, while taking into account the notions that the world is a finite pool of resources and that humans are an integral part of nature. In this way, Brussels Ecosystems wishes to contribute to forward-looking discussions on the transition of Brussels toward a new socio-environmental and technical regime.

In practice, Brussels Ecosystems included two different events: an international conference held the 18th and 19th of October 2018, and a MasterClass from 28th of January to 8th of February 2019. While the conference was intended to lay the groundwork the conceptual and methodological framework of Brussels Ecosystems, the MasterClass was a first experiment in its application to urban policies and urban projects in Brussels.

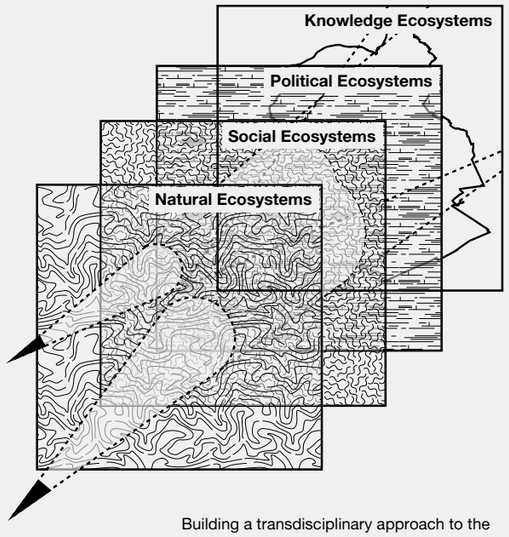
A transdisciplinary approach to urban ecosystems

The conference explored various ways in which the concept of ecosystem can be shaped in order to allow the concepts — which are often metaphorical in nature — and the methods derived from them to come together, thus creating an integrated framework for analysis and forward-looking action.

The conference sought to put the topic of Brussels’ ecosystems in a transdisciplinary perspective, by asking, ‘What is an urban ecosystem?’ The variety of scientific approaches to the interaction between society and environment were leveraged as a resource for knowledge, project and policy support. Which dimensions of urban reality do the various aspects of ecosystems reveal to us? What tools do they provide in the various fields of study involved?

To what extent can these additional ‘lenses’ help us to think about the urban reality, societies and the relationship between human and non-human? To engage in ‘transversal’ action within and upon society and the environment?

The conference was intended to contribute to an interdisciplinary approach of these questions, exploring four aspects of the concept of ecosystem: natural ecosystems, human ecosystems, political ecosystems, and knowledge ecosystems. Let’s briefly go over these four different layers of ecology and ecosystem.



Building a transdisciplinary approach to the study of Brussels ecosystems

Natural ecosystems

Natural sciences define an ecosystem as a dynamic group of living beings that interact with one another and with their environment’s biophysical components. This definition refers to the scientific project of ecology, a term coined in 1866 by Ernst Haeckel, from the Greek roots *oikos*, ‘house’, and *logos*, ‘study’). Generally speaking, the ecosystems-based approach relates to the scientific study of relationships between living organisms — including humans — and their environment. More specifically, Metrolab focused here on the patterns that these interactions and their variations produce on the landscape. At the conference, Jacques Baudry and Grégory Mahy discussed the concept of biodiversity and landscape ecology by stressing the interaction between humans and nature. They insisted on the shift from a static notion of nature in equilibrium to a dynamic and process approach of ecosystems including the anthropogenic aspect. One of the interesting outcomes of the discussions was an exploration of how to connect biodiversity and sociodiversity in the Brussels context.

Social ecosystems

A second aspect of the concept of ecosystem is based on the paradigm of human ecology developed by the Chicago School of Sociology, which proposed a theory of human environments that it developed in the context of a city seen as an ‘organism’ where a number of processes occur that exist in the natural world (competition, distribution, isolation, succession, symbiosis, etc.). The specificity of this approach is that it looks into the interaction between society and its environment, based on concepts and tools that are especially sensitive to the relationships between the groups that make it up (Joseph & Grafmeyer, 2004).

Setting itself apart from the environmentalist approach, human ecology is defined as the study of the relationships between different populations that are affected by the environment in which they coexist (Wirth, 1945; Park, 1953). While also taking into account both the biotic and symbolic dimensions of human environments (Cefaï, 2015), human ecology aims at understanding and describing interdependent relationships between the environments that make up a ‘web of life’; these relationships are determined by spatial as well as social factors.

During the conference, a thematic session on social ecosystems brought together contributions by Francis Chateauraynaud and Joëlle Zask. While Joëlle Zask reminded us of the ecology of democratic space, Francis Chateauraynaud explored methods for investigating environmental crises and technological risks.

Political ecosystems

A third aspect of the concept of ecosystem takes into account political ecology, examining the kinds of issues that might be raised by a ‘human government that takes non-humans into account’. The issue here is not knowing the environment or describing the interdependence between its components, but rather questioning human actions within the environment (Augagneur, 2015).

The Metrolab conference focused on one branch of urban political ecology. Inspired by the eco-Marxist discourse of authors such as Henri Lefebvre, André Gorz and Ivan Illich, it is based on the idea that nature is itself a social and cultural construct. In turn, it has inspired Piers Blaikie and David Harvey’s classical concept of ‘political ecology’, as well as Erik Swyngedouw’s and Matthew Gandy’s ‘urban political ecology’ (Swyngedouw, 2006; Gandy, 2004). Urban political ecology builds upon the eco-Marxist discourse by calling upon more recent notions such as hybridization, collectives and the actor network theory, proposed by authors such as Michel Callon, Bruno Latour and John Law, and popularised in the English-speaking world by Donna J. Haraway and Sarah Whatmore. This branch has also reappropriated the concept of metabolism, including the work of Erik Swyngedouw and Matthew Gandy on urban networks. Matthew Gandy and David Wachsmuth contributed to the Political Ecosystems session of the Metrolab conference by fundamentally questioning the concept of socio-nature and urban metabolism.

Knowledge ecosystems

The fourth aspect of this reflection links the concept of ecosystem to the process of knowledge-building. Here, the quest for innovation is based on the idea that humans are not only part of an environment whose reproduction they are associated with — together with non-human species — but they are also completely permeated by the environment. A major publication in this field is Gregory Bateson’s book “Steps to an Ecology of Mind”, which sets the foundations of the interactional approach based on the idea that the environment inhabits both individuals and communities, and that it determines the systems through which meaning is produced at every level of society’s structure. Authors such as Félix Guattari, François Cooren, Laurence Kaufmann and Cynthia Fleury have contributed to opening this perspective of ecology: in this context, it is no longer only about the environment, but about an epistemological system based on building healthy relationships between humans and the environment that they inhabit and that inhabits them. This fourth aspect relates more to the role of culture as a process generating ecosystems of individual, collective and social subjectivities that display varying degrees of resilience to the alienation of individuals from their environment.

A panel discussion was organized for the conference to foresee how Metrolab can contribute to the Brussels knowledge ecosystems in relation to urban projects and urban policy.

Themes connected to Brussels ecosystems

The Brussels Ecosystems conference also initiated – in collaboration with public, associative and private stakeholders – an analysis of the issues linked to the ecologies of urban policies in Brussels and in particular the ERDF programme and its urban projects. This first analysis went through the description of a few ERDF projects and their environmental, social and political ecosystems. The discussion helped to identify some paradoxes that emerge from a lack of connections between those dimensions. Alongside the exploration of the four

dimensions of ecosystems, four key themes related to urban policy in the Brussels-Capital Region were problematize with local stakeholders. During the discussions, the four themes pointed toward four different socio-spatial and socio-technical systems that may play a key role for the transition of Brussels Ecosystems. These themes and the associated socio-spatial and technical agencies are:

1. Agriculture and city
2. Density and open spaces
3. Work and territory
4. Circularity and resources

MasterClass methodology

The MasterClass's purpose was to put the transdisciplinary ecosystem approach to the test, starting with the realities of Brussels and the intercultural profiles of the participants. The MasterClass continued with the multi-layer analysis of the issues and paradoxes of urban policies previously identified with a focus on different cases including innovative projects funded by the ERDF programme for 2014-2020. These innovative projects were identified in relation to contextual situations that could act as catalysts to initiate the transition of Brussels Ecosystems. The aim of this two-week workshop was thus to contribute to drawing up an atlas of Brussels' innovative projects and their contextual situations pointing toward socio-ecological transition through:

— the understanding, description and mapping of the spatio-environmental and socio-political ecosystems in these different situations/projects;
— the identification of challenges and opportunities emerging from these situations/projects;
— the elaboration of design scenarios and proposals aimed at enhancing these situations and ecosystems and guiding the transition of Brussels ecosystems.

During the MasterClass, participants were divided into four thematic groups identified during the conference: agriculture – agro-landscape; density – transitionary occupation, work – third places, and circularity – hotspot of material flows. Each theme is related to an ecosystem of an innovative project and the contextual situations of socio-ecological transitions, which means spaces of experimentation and their related stakeholders as well as potential sites and actors that could play a key role in the ecosystems' transitions.

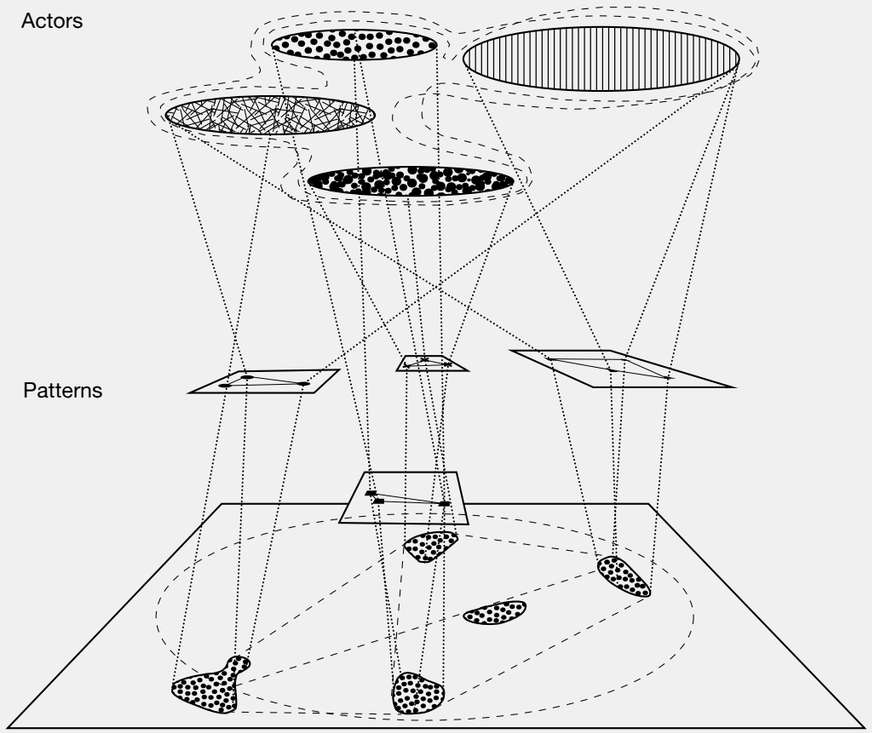
Designing Brussels Ecosystems was approached with a twofold method: first, a descriptive atlas of Brussels' innovative project and contextual situations and, second, scenarios and proposals to guide the transition of the Brussels-Capital Region. (See p.13)

Atlas of Brussels Ecosystems

The main task during the first week of the MasterClass was to carry out an investigation on the spatio-environmental and socio-political patterns that characterize the ecosystem of innovative projects and their contextual situations in Brussels. A field trip to collect data and meet the stakeholders enabled the participants to explore this socio-spatial description.

The groups organised a continuous back and forth between urban scales on the community, neighbourhood, urban, regional, metropolitan and global levels. On the one hand, they attempted to describe the ecosystems of actors and their relationships with their socio-political environment (top of the diagram). On the other, they had to describe the 'sites', their relationships with their spatial-environment and the flows (i.e. metabolism) generated by the activities (bottom of the diagram).

Each group combined different description and design tools: spatio-environmental mapping, socio-political diagram, metrics and typologies of situations, etc., in order to understand the patterns of interdependencies at stake for each theme.



Methodological diagram proposed for the study of the Brussels Ecosystems by the MasterClass

Participants used the communication system and graphic matrix crafted for this workshop in all the representations they produced during the MasterClass. In the second part of this publication (Design Exploration), dedicated to the work and reflexion produced during the MasterClass, the reader will find a summary of the graphic material prepared by the group of researchers.

While identifying the patterns of interdependencies among innovative projects and between them and the contextual situation, the teams discussed and negotiated existing spatio-environmental and socio-political links and missing connections between and across the aforementioned scales.

The results of the first week of the MasterClass is an innovative contribution to an atlas of Brussels Ecosystems. The participants had the opportunity to present their progress during a mid-term presentation and discussion with the stakeholders they met with during the week. This was an opportunity to compare the patterns identified and to discuss the hypotheses of the forward-looking scenarios to be developed during the second week. The teams were then ready to move toward developing their scenarios and design for guiding the transition of Brussels ecosystems.

Designing the transition of Brussels ecosystems

During the second week of the MasterClass, participants designed scenarios and projects for the transition of Brussels ecosystems. The scenarios addressed interdependencies, missing links and new relations between ecosystems and innovative projects, asking the question: what would happen if these missing/new links were to be activated? With the scenarios, the groups were now asked to design and propose a plan of action aimed at transforming existing situations and ecosystems following the common values identified on the first week.

Design scenarios are a set of structured visions that aim to catalyse the capabilities of the various actors and agencies involved in the process of framing the ecosystem transition.

Participants were given a few days to use their initial findings from the first week to formulate alternative social, economic and political frameworks that served as bases for new design scenarios. Groups developed a series of scripts and diagrams that represent connections and interfaces, potentially generating the transition of ecosystems. Most importantly, the groups were asked to articulate and negotiate spatio-environmental and socio-political dynamics between and across the initially assigned analytical scales, boundaries and thresholds, with the idea that it is not only physical things that are being designed here, but also the protocols and policies that will ensure the ecosystem transition.

During the last two days of the MasterClass, the final step in this process was to design and develop specific projects. Assuming that a team's design scenario proposes the many artefacts ('things') and systems (interdependencies) needed for the transition to work, each team member then focused on one such artefact and system. In doing so, we assumed that the project, as a heuristic device (logic of invention), defines relations among: practices (of the actors identified in the research, 'the stakeholders'), processes (that bring them together in forms of interaction and possibly collaboration and co-production), resources (both the available resources and those needed for the proposal to work) and outcomes (the desired outcomes of the proposed project as defined by team's design scenario). The goal of the MasterClass was to strengthen interdependencies and ecosystems that allow all of these characteristics to work together in a way that promotes local resource renewal, social inclusion and ecosystem transition. This means that the projects must generate an ecosystem transition that is both socio-natural-political and geographical at the same time.

For this, the different thematic groups formalised design tools (graphs, diagrams) to reflect on the possible innovative relations between the different elements needed for the ecosystem transition.

The results were presented and discussed during the last afternoon, at the end of the two-week MasterClass. Stakeholders were invited to give a final comment on the proposals drawn up in collaboration with them. The presentations were followed by an intense debate with local stakeholders and academics. These comments were taken into consideration by the four groups in order to submit the final contribution to this publication.

Structure of this publication

In order to contextualize the work of the four groups of researchers in the MasterClass, this general introduction is followed by a more detailed presentation of the four thematic ecosystems: Agriculture, Work, Density and Circularity. These thematic introductions lay the groundwork for each theme in the context of the Brussels-Capital Region. What are the current challenges that concern these themes in terms of urban transformation and urban policies? What are the situations, projects and potentialities of change related with each of them? And lastly, what is the conceptual framework required to analyse them in a forward-looking way?

A cartographic atlas displays some of the important layers concerning the four themes in order to illustrate how they are developing in the Brussels-Capital Region. The atlas acts also as an introduction to the graphic material prepared by each group in the following section.

Following the four thematic introductions, the reader will find four design and narrative contributions produced by MasterClass participants and a set of short reflections by the urban project stakeholders. These design contributions and presentations are followed by a reflection by Metrolab about what compass is needed for navigating the socio-ecological transition.

The last part of the book brings together some reflections on both the methodological approach and the results of the MasterClass by members of the scientific committee (Elena Cogato-Lanza and Brian McGrath). The general conclusion by Mathieu Berger presents the entire process implemented over these two years in the perspective of an ecology of knowledge, for which he gives an overview of the challenges posed in terms of epistemology and the bridges between disciplines.

Graphic protocol

The elements of the existing context

Underlying elements and situations

The proposals developed during the MasterClass

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Four Brussels ecosystems in transition

Case studies

1. Zinneke – Masui4Ever
2. Hotspot EC – Quartier Nord
3. Smart
4. AuQuai
5. Atelier Groot Eiland
6. L'uZinne
7. Recyclart
8. Libelco
9. Decoratelier
10. Wood in Molenbeek
11. RecyK
12. Veolia
13. Studio CityGate
14. BoerenBruxselPaysans
15. Les moutons bruxellois
16. Casernes d'Ixelles – Usquare
17. La ferme du Chant des Cailles
18. Cycle Farm

Agriculture

Transition agricultures & emerging landscapes

Roselyne de Lestrange

Why did we choose agriculture as one of the four entry points to design Brussels' ecosystems transition? The reasons are theoretical and contextual. Agriculture, through its multifunctional contribution to urban needs, is a potential sustainability hotspot. But it is also a challenge for Brussels, a city-region with very little agricultural land and facing a growth in population.

This chapter presents some elements of an exploration of unconventional agriculture[1] that led to the emergence of a project horizon for the Brussels Ecosystems MasterClass: the need to structure it spatio-environmentally and socio-economically, i.e. to design it as an ecosystem.

Agricultural transition: research hypotheses

On 28 January 2019, as the MasterClass Brussels Ecosystems opens, the medical journal The Lancet publishes a report on 'The Global Syndemic of Obesity, Undernutrition and Climate Change'. It highlights that the globalised food system, agricultural policies, transportation modes and urbanisation are 'different links of a same chain, which strangle humanity — and the planet' (AFP 28 January 2019). The harmful combination of land degradation, depletion of natural resources, pollution emissions, undernutrition, obesity and other diseases caused by over-processed food and sedentary lifestyles is the result of two intertwined causes: urbanisation and a globalised market economy / food supply chain.

While agriculture is at the heart of this pernicious regime, its alternative practices constitute real niches that can contribute to its radical transformation — and that of our territories.

Urban or unconventional, what are these new modes of agriculture which objectives go far beyond food production?

Urban agriculture has many definitions. Let us remember as a fundamental characteristic its spatial dimension: food

1 In contrast to so-called 'conventional' or 'industrial' agriculture, non-conventional agriculture is territorialised and works in symbiosis with ecosystems; it promotes minimal input of natural resources, while focusing on building soil fertility through a set of techniques as permanent cover, associated cultures etc.

production inside and around the city, mainly intended for local consumption. This practice has many advantages: among which, a lower environmental impact and the creation of a greater sense of community and greater food security. According to a multi-level approach to transition dynamics, it is a niche that contains many of them. But it is weakened by conflicts that can emerge between them (high- or low-tech practices, economic niche or social commitment, etc.).

Unconventional agriculture refers to practices that are alternatives to the industrial model. Many technical or lexical variations exist (permaculture, agroforestry, peasant or family agriculture, cultivation on living soil, etc.). They are often grouped under the generic term 'bio-farming'; due to the ambivalence of the *bio* prefix, we prefer the term 'agroecology'. Organic or bio agriculture was originally a project of an ethical society centred on respect for life — including humans; but today, it is confused with a label allowing industrial practices that are incompatible or even contradictory with these original values. Agroecology, as a practice and an ethic of life progressively formulated from the 1980s (Rabhi, 2015), defends a holistic approach to agriculture that 'conceives food systems based on the principles of life (cycles, rhythms, relationships between organisms, etc.) by placing the human being, and, in particular, the peasant, at the centre of the project' (Servigne, 2012). It protects ecosystems, biodiversity and biomass, and even enhances their functions. To do so, it calls for a profound change in our dietary habits, which improves public health while reducing our consumption of space and natural resources. This approach, which revives the common sense of peasant knowledge, (re) builds a strong *mediance*[2].

By reconnecting society with the soils matrix it produces, it is undoubtedly a driver for the transition of our ecosystems. Agroecology is recognised as a science and practice, but also as a movement that explicitly addresses social and environmental justice. It founds numerous civic and public initiatives in metropolitan areas where, on a background of imagination of the nourishing city, land cultivation is regaining a presence and visibility that it has gradually lost over the past 150 years.

Brussels makes no exception. But despite their dynamism and the prospects of sustainability unconventional agricultures offer to this metropolitan territory, they remain at a distance from planning concerns: a weak competence of urban policies. Therefore, their development raises many questions.

How to choose between the right for housing and the protection of the non-renewable resource of living soil? As the renewed interest in the commons suggests, should we consider land cultivation in the city as a service to society? What territorial logics would this suggest to rethink?

How can we reconcile spatial practices such as living and cultivating that have been disjointed for so long? Indeed, what would be the impact of the agro-ecological transition on urban form? Its values of milieu care relate in principle to a radical project that affects the scales of living — more local — and the reconnection between land resources and land uses: what is the situation in practice? Is there an emerging structuring alternative, or does the phenomenon only make sense on the margins — both spatially and economically?

These questions form the basis of our description process. Some clarification of its methods is necessary. The first point concerns the territory under consideration — the *Bruxellian*[3] bioregion, which is, in itself, a hypothesis. This concept refers to third geographical entities, socio-natural living basins or life-places defined by a specificity of integration between human and non-human systems, at the median scale of landscape units (Thayer, 2003). Apprehending territories beyond normative or hierarchical approaches, the concept of

2 A concept developed by Augustin Berque, 'médiance' is the dynamic, ontological relationship between our animal body and our eco-social body, and between oecumene and biosphere.

3 With reference to the geological layer of Bruxellian sands specific to this geographical area. It allows to distance ourselves from the term 'Brussels', which underlies a hierarchical relationship between city centre, periphery and countryside that is incompatible with bioregionalist thinking.

bioregion is used for the reappropriation of local territories (Magnaghi, 2014).

As agro-ecologies are part of this movement of 'taking autonomy and construction of commons in the hollows or on the margins of metropolitan territories' (Duhem and Pereira de Moura, 2018), the bioregion is a relevant field of exploration. This choice, in turn, involves specific modalities in a way as it is inoperative here to consider it as an area (de Lestrange, 2017). The Bruxellian bioregion is rather a network of places, emerging from coalitions of actors and their organic logics, and from the multi-scalar territories they mobilise on a daily basis. Exploring such an ecosystem — whether interstitial, ephemeral, micro-local or hybrid — requires to cross a cartographic approach and inductive dives into the thickness of the territory. This can lead to the scale of the plot or small groups of actors. According to systemic logic, they are just as valid to describe the phenomenon as the major dynamics.

This quantitative and sensitive method, both spatial and social, is based on landscape analysis. It is therefore doubly opportune because, however tenuous or ephemeral they may be, the environmental forms and new geographies that urban farmers invent on a daily basis — combining radical choices and a 'do-it-yourself' (DIY) approach with standards — take shape in the landscape. However, the latter is not only an indicator of ecological transition: it is also an issue, not only because of its natural resources, but also because it is the milieu of our individual and collective lives. This is reflected in the argument in favour of 'landscape quality' that is omnipresent in studies on the evolution of agricultural practices, which otherwise mainly focus on quantitative criteria. Observing and describing the footprints of these transformations on the landscape becomes an ethical necessity: both with regard to the living beings that constitute it and the human society to which it is a common good.

Metropolitan agricultural context

In Belgium, agriculture is a matter of regional competence. This condition reinforces already-varied situations inherent in contrasting landscape contexts. On the other hand, the three Regions share the phenomenon of urban agriculture which plural forms and values questions the governance of territories.

The extension of agricultural land is relatively similar between Flanders (61,000 hectares ~ 235 sq. mi.) and Wallonia (71,000 hectares ~ 274 sq. mi.). The latter is the most rural of the 3 Regions. From south-east to north-west, it successively hosts forests, cattle breeding and field crops, with mixed transitional zones. The transition to bio-farming is part of the public policy strategy, and the emergence of food belts around major cities reflects the demand not only for organic but also local agriculture. This is evidenced in a continuous increase of agricultural land reconversions (from 200 to more than 1600 certified organic farms between 1997 and 2017; Statbel data, 17 July 2018).

Flemish farms are smaller, but more intensive. Given the diffuse urbanisation of the region, they are mainly located in an urban context. In addition to a few major crops, the region specialises in the horticultural, vegetable gardening and fruit sectors, and dairy farming. Its agricultural policy supports the conventional sector, but, at the same time, the Region has an ambitious environmental policy. This is reflected in the integration of the spatial planning competence into that of the environment, materialised in the adoption of the 'Stop Concrete' Regional Sustainable Development Plan. At the interface of these two logics in tension, we observe a multitude of rural dynamics that emerge from individuals undergoing reconversion but also from territories (such as the Ghent food belt). The public authorities, which declare themselves neutral in the debate between conventional and alternative farming practices, have set up the Flemish Strategic Plan for Organic Agriculture. Among its objectives is, surprisingly, the protection of conventional agriculture. In line with this plan, the Brussel Lust initiative aims to encourage farmers, who until now have been mainly devoted to conventional agriculture, to supply the capital with organic products.

Finally, Brussels-Capital Region, whose dimensions are, of course, not comparable with those of the other Regions, has very little agricultural land — 1.5% of its territory. Agriculture is confronted with many paradoxes. Its development takes place mainly outside regulatory agricultural land, although partially unexploited (Terre en Vue, 2017). The Region is also experiencing significant population growth, but it is constrained by its borders. The resulting land pressure creates competition between agriculture and housing. This city-region status makes the capital's food system particularly vulnerable, as it depends on supra-territorial conditions. Many actors are addressing this issue.

First, public action — economy and employment, environment — has developed a strategy to improve the sustainability of the food system: Good Food. This 5-year program, launched in 2015, is organised around two main areas: produce better, particularly by increasing local sustainable food production, and eat well. To achieve these objectives, Brussels is considering collaborations between sectors but also with its hinterland, which is mainly Flemish. The strategy has thus identified a theoretical foodshed with a 10 km radius beyond its borders, to supply 30% of Brussels' market gardening needs. In the field of environmental policy, the Nature Plan supports Good Food directly, through the protection of agricultural land, but also by considering cross-border landscape collaborations in terms of quality and continuity, including cultivated land.

Often on public initiative and linked to Good Food, research[4] is also very active. It observes the phenomenon of the (re) development of cultures in cities through history, sociology or economics; it explores prospective agro-ecological, logistical and economic scenarios; it makes urban and legal recommendations to support and supervise its development.

Civil society is at the forefront of new production and distribution dynamics. Between values more or less critical with regard to the market economy, technical forms, territorial conditions and economic models, the approaches are very diverse. The associative sector, which is more involved in agro-ecological approaches, claims socio-cultural, ethical and environmental objectives and support for the peasant model. The private sector more easily assumes the pursuit of economic profit, and under the aegis of 'sustainable development', carries projects that range from high to low tech.

Bruxellian agro-ecologies: a nebula of situations…

Agro-ecological farming is thus increasingly identified in the Brussels-Capital Region. But the majority of the bioregional foodshed, located in Flanders and Wallonia, is much more difficult to identify. Due to ethical or technical choices, a large proportion of unconventional farms are not included in official European Common Agriculture Policy surveys. The data it provides related to organic labels, are not all relevant because some of these farms belong to industrial networks. In addition, only the Biowallonie agency provides data on plots. Flanders provides addresses that do not always correspond to the land being farmed. However, to describe this emerging territory, to evaluate its structuring potential, or to consider the effect of its deployment on the urban form, it is essential to be able to describe its physiognomy.

To this end, this exploration has opened several observation axes.

Field trips to some unconventional farms covering different types of production (market gardening, livestock farming, orchards) allowed us to identify spatial characteristics specific to their practices. On this basis, we have attempted to generalise through the use of remote sensing (orthophotoplans 2016 resolution 25cm) to the scale of the bioregion[5]. But the process proved inadequate, as errors were all too frequent. An empirical method of analysis of the web resource has been more conclusive, which is, in itself, quite revealing of the hypertextual nature of this territory (Corboz, 2001). We have georeferenced the addresses of producers listed via Internet platforms. Gradually, the crossing between

4 In particular through the Brussels research administration Innoviris.

5 According to our preliminary research (de Lestrange, 2019), its extension corresponds practically to that of the functional metropolis as defined by the Hinterland study (ICEDD & KULeuven, 2010).

some 700 points, in situ checks and/or orthophotoplan analysis led to the emergence of a constellation of unique models (see map p. 64). Bruxellian agro-ecologies have common values, but mobilise them in different ways. (see figure p. 26)

Sobriety and food sovereignty involve logics of scale for both cultivation and distribution, as well as a food diet change from eaters. Milieu care requires cultivation techniques without artificial inputs, a deep understanding of agroecosystems, the integration of local knowledge and attention to animal and human well-being. Emancipation, which results in social and environmental justice, leads to the adoption of cooperative models, and to the delicate search for the right price. However, the implementation of these values confronts field actors with dilemmas (prioritise production or education?), to which they respond with compromises that lead them to favour some rather than others, hence the observed heterogeneity (Dumont, Stassart, Vanloqueren and Baret, 2014).

The latter is also dependent on landscape conditions (soil, water resources, plot morphology, exposure to wind, sunlight, nature of the edges, plant resources) and territorial conditions (urban fabric type, physical and social accessibility, typology and ownership of plots, legal situations). These conditions are decisive in the choice of the type of production, and also influence its technical forms. From agricultural land, parks and gardens — private or public — to the surroundings of facilities, including activity zones, land reserves, wastelands, berms, banks, interstices to buildings, the typology of the spaces invested is very varied. According to the scientific literature, the production of small fruits and vegetables is, with regard to practices and profitability, the most adaptable to the conditions of dense urban areas (small areas, irregular shapes, interstitial spaces, above-ground situations). Sheep farming and the cultivation of large fruits that require more surface area (between 5 and 20 hectares — ~12 to 49 acres — to be autonomous) are more frequent in peri-urban situations but also exist in the form of discontinuous territories in the consolidated city. Food or fodder crops and cattle breeding do not adapt well to such fragmentation (15 to 50 hectares minimum to be profitable) and are therefore, with the exception of Brussels agricultural relics, reserved for the diffuse city that extends beyond the capital's borders. The combination of these parcel constraints with eco-landscape conditions defines certain patterns of implementation in the bioregion. These probably also refer to historical conditions. The fine grain of the Flemish parcel, now an intensive horticultural and market gardening sector, is related to a past of sharecropping; the wide meshes of the Walloon Brabant, now dedicated to large-scale farming, are relics of the great seigneurial domains.

Finally, at the interplay between spatial conditions and values, it is undoubtedly in exploitation and distribution models that we find the greatest inventiveness. Unlike the conventional sector, where the chains are specialised, new agricultures hybridise and multiply the models linking production, distribution and consumption. Whether merchant, non-merchant or mixed, individual or collective, professional, amateur or combining both, labelled or not, in short circuits more or less strictly local, modest or of metropolitan scale and beyond, these networks generate new territorialities whose lowest common denominator seems to be the notion of interconnectedness.

Production or supply sites, shared depots and tools, paths: the nodes through which they intersect structure the nebula into an organic territory.

… and paradoxes

In the midst of conventional development dynamics, through their different spatial, environmental, social or economic forms, these agro-ecologies act as critical operators of the dominant regime. However, this does not prejudge their ability to transform it, because they face paradoxes that keep them in a situation of fragility.

First of all, there are some regulatory incompatibilities between nature conservation and conservation agriculture. Environmentally, the interest of these practices seems to be well established, but regulations for the

- TYPE OF LOCATION
  - agricultural land
  - public park
  - (private garden)
  - roof, slab
  - land reserve
  - residual space
  - berm, enbankment
  - wasteland
  - commercial zone
  - industrial zone
  - public equipment (schools, cemeteries,…)
- PRACTICE
  - bio hydroponics
  - bio intensive
  - agro forestry, forest gardening
  - conservation
  - aquaponics
  - permaculture
- TYPE OF EXPLOITATION
  - specific monoculture (herbes, mushrooms...)
  - farm (polycuture, breeding)
  - allotments
  - collective or shared garden
- PRODUCTION
  - fruits
  - vegetables
  - dairy products
  - herbs
  - meat
    - eggs
    - poultry
    - cattle
    - sneep
    - goats
    - pork
  - food
    - feed
    - cereals, proteinous
    - fibres
    - tubers
    - seeds
  - green manure
  - sprouts and micro greens
  - oleaginous
  - biodiesel, biogas
- TECHNICAL FORM
  - outdoor breeding
  - open ground cultivation
  - off ground cultivation
    - integrated to a building
    - no integrated to a building
  - undercover crop of livestock
    - greenhouse
    - barn
- ENVIRONMENT
  - soil, erosion
  - water
  - air polution
  - heat island effect
  - biodiversity
    - heterogenerity
    - connectivity
- ACTOR NETWORK
  - inhabitants
  - non-profits
  - professionals
  - public actors
  - university, schools
  - horeca
  - distributors
  - conditionners
- OPERATING SYSTEM
  - merchant
  - non-merchant
  - dual

Metropolitan Agroecology Dimensions

- VALUES & OBJECTIVES
- SPACE
  - structure
  - cultural landscape
  - integration
- SCIENCE, RESEARCH
- SOCIAL
  - education
  - work
  - socioprofesionnal integration
  - inclusion
  - environmental justice
  - social bond
  - intergenerational link
  - empowerment
  - health
  - spiritual
  - aesthetics, pleasure
- DISTRIBUTION SYSTEM
  - CSA
  - cooperative
  - pick your own
  - farm sale
  - market
  - basket
  - independent trade
  - supermarket
  - E-farm
- FARMER
  - dual
  - non-professional
  - professional
- MODEL
  - individual
  - collective
  - shared
- LEGAL FORM
  - non
  - asbl
  - SAgr
  - SPRL
  - SA
  - SCRL
- LABEL
  - yes
  - no
- SHORT CHAIN
  - exclusively
  - non exclusively

protection of natural habitats may prohibit certain techniques[6]. The paradox here lies in the scale of apprehension of nature.
Other weaknesses are due to planning documents not adapting to technological evolution and to the diversity of urban agriculture, which remains reduced to its productive and economic dimension. A redefinition of urban planning regulations is under way in Brussels, which should improve the situation. Incentives such as the valuation of ecosystem services production, as a service to society, could become structural sources of financing, alternatives to the current subsidiarity that keeps farms in a highly vulnerable situation.

Thirdly, agro-ecologies are inherently weakened by a tension between a growing demand for local and quality food, the need to structure the sector to guarantee its independence from the conventional market, and the value of frugality incompatible with a quest for 'growth'.

Heterogeneity, in theory a resilience factor, also has its limitations. Inquiries with stakeholders from different parts of the sector reveal the risk of isolation, dispersion and loss of vitality. In landscape terms, a specific grammar resulting from the combination of technical forms and territorial patterns is gradually becoming identifiable. The heterogeneity it prints locally could generate a very fine and characteristic mosaic on a large scale (de Lestrange, 2019). But certain interstitial situations combined with an aesthetic (voluntary or not) of the ephemeral, experimental or DIY, can, on the contrary, contribute to the illegibility of the urban form — and to a kind of rejection by some residents.

Finally, the administrative fragmentation of the foodshed represents a serious obstacle to any attempt to develop a project for it.

How to overcome all these constraints and barriers, and allow this emerging ecosystem to consolidate in order to be a driving force for the food transition?

A return to the history of urban planning, and more particularly to the story of the landscape inversion that conceives the city through its open spaces and in a regime of cooperation with the countryside, suggests a way forward. A landscape urbanism approach could transpose this tenuous territory into an infrastructure — organisational, constituent and significant — for the ecological metropolis[7].

Agroecology as an urban project: experiments

Literature acknowledges that food autonomy in urban areas has become a utopia. On the other hand, in view of the need to improve the sustainability of food systems, the urgency of reactivating urban and peri-urban agricultural sectors is undeniable. Agriculture is once again an urban planning issue. As such, it is more than an opportunity to green up urban planning, it requires a real project built on the basis of its constraints, first and foremost priority access to fertile land.
Such agrarian urbanism (Donadieu, 2014) has its roots in the origins of the discipline itself. The question of density that now dominates the debate on urban form places it in a tension between high and low tech — vertical farms in compact cities, or agro-urban meshing in the landscape city. In the first model, agriculture is reduced to a productive and sectoral function, very far from the territorial role it assumes in the second. Agro-landscape parks or RFSR (Regional Food System Reliance) are operational forms of these so-called 'territorial agricultures', based on the relationship between production and territory, producer and local society. But more commonly, however, agriurban strategies remain the domain of the alternative initiative. With few tools in their own field, they draw financial resources from related environmental policy, which benefits from a strong legal framework and political support. In particular, the European green infrastructure strategy, whose purpose is biodiversity, includes multifunctional farming

6 For example, mulching of century-old high stem organic fruit trees is not allowed in some natural areas of Pajottenland, which makes them vulnerable to diseases and pest attacks and endangers this ecological and landscape heritage.

7 'Dessiner la Transition: outils et dispositifs pour le projet de métropole écologique'. The deliberate paradox contained in this expression is the subject of a series of research seminars conducted by Metrolab-LOCI UCLouvain in collaboration with the Fondation Braillard Architectes de Genève and EPFL since 2018. See Metrolab.brussels website.

among the recommended mechanisms for meshing our territories — particularly urban ones — with areas of 'nature'.

The Continuous Productive Urban Landscapes (CPUL) Strategy is one of these approaches that mobilises the environment and landscape sectors for agricultural purposes. It has the remarkable particularity of being adaptable to any cultural, scale and economic situation (Viljoen, Bohn and Howe, 2005). It is an ecosystem-based project method, a transdisciplinary codesign strategy for the coherent and structuring integration of agriculture in the urban space.

It sets up networks of nourishing landscapes, more or less spatially continuous depending on the situation. At the micro level, CPULs are deployed through vegetable gardens in public parks, the cultivation of interiors of blocks, open spaces of public or corporate land, or through the development of productive and ecological solutions for off-soil agriculture (therefore, dependent on living and not inert energy). At the median scale, the landscape elements (rivers, woods, metropolitan parks) host more ambitious programmes — farms, agricultural parks. At the metropolitan level, these elements are linked to the green infrastructure to build an agro-ecological-landscape matrix.

From the design stage, combining aesthetics with agricultural technical requirements, and working with the private and public sectors, CPULs meet economic and social, production and leisure needs. Their development capitalises on 150 years of agrarian urbanism as well as on living practices gathered in both informal and consolidated contexts. Lateral dynamics that cross the traditional boundaries between planners and activists, farmers and designers, experts and inhabitants, these projects initiate what could radically transform our urbanisation logic: what we have called the 'yellow network' (de Lestrange, 2019). As well as its green and blue antecedents — of which it can in certain configurations constitute the ecotone — it aims to produce healthy and local food, and to protect fertile soil.

The establishment of such a network requires a profound reassessment of the sectoral or territorial approaches that underpin the governance of a region. In the field of urban planning, the revolution is not the least important: it is a question of moving from a surface-lifeless-monetarised soil to a volume-living-common-good one!

In a region as complex as Brussels, considering the implementation of a yellow network could be seen as utopian. It is this radical nature, capable of transforming the current regime, that motivates us to make it the focus of Brussels Ecosystems' works. These consisted, based on two metropolitan cross-border situations, in testing a CPUL scenario as a first step towards a bioregional yellow network. The additional hypothesis resulting from the preliminary meetings with stakeholders was to think of these continuities in the way of clusters, integrating the principles of circularity and complementarity between the different types of production and uses of the landscapes.

There were several reasons for choosing the initial situations. First, they offer a variety of urban and landscape conditions. They then host different types of urban agriculture, reflecting the great variety of this sector. They, therefore, require different types of alliances and networks. Finally, they include strategic areas of urban and environmental public policy.

The first situation we proposed to address in the framework of the MasterClass is a transect of urban-rural gradient, which runs from the dense historic city to the southwest. It presents an interesting plot pattern from the perspective of food production clusters. On the edge of the Brussels-Capital Region, there is the BoerenBruxselPaysans site, a flagship project of the Good Food strategy and ERDF 2014–2020 programme. The project, which brings together two public and two associative partners, includes the renovation of a farm of about 2.5 hectares. Its objective is to support the ecological transition of existing farms and the installation of new urban farmers into the Brussels-Capital Region. In concrete terms, the project offers a test area, technical support and assistance in the search for land. In parallel, it elaborates sustainable urban and peri-urban agricultural models and supports the development of a new local transformation sector. The densest part of this situation crosses formerly industrial working-class districts that have interesting morphological conditions and host mixed agricultural projects with a productive and social vocation.

The second situation runs along the regional border to the south. Unlike the previous one, it has a fairly homogeneous urban fabric, the 19th and 20th centuries belt. The density is lower, the neighbourhoods are residential, very green and mainly wealthy, although with some vulnerable areas. Its interest lies in its open continuities — former land reserves never built and reclassified as semi-natural areas; the Sonian Forest, Brussels' major landscape structure; and the Promenade Verte, a public facility that runs 60 km around Brussels and can be turned into the backbone of this area.

This situation calls for other scales of clusters, rather to be considered as edge projects: perhaps less diversified in terms of food production, but more locally embedded and with more urban functions.

Conclusions

We believe that the radical nature of agro-ecology is essential to support an urgent and fragile agricultural transition in a region like Brussels. It raises very concrete questions of governance (the essential interregional collaboration) and policy such as the unlocking of competences (environment, agriculture, urban planning). The challenges are also technical: legal definition of urban agriculture, adaptation of regulatory plans and labelling requirements; transition from an abstract and globalised (monetary) yield indicator to a concrete and localised indicator that could be the one of living energies (Visser, 2018). But more than anything else, the urgency seems to be a shift in the perception of the soil — and therefore of the land use logic.

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Work

Third-places of social economy and the relationship work-habitat

Marine Declève and Chloé Salembier

This article describes the context of the MasterClass workshop that launched a reflection on ecosystems, with the issue of work as a starting point. Its theoretical approach is intentionally different from the way in which economics typically tackle the issue of work. The goal is not to frame the question in economic terms, but rather to develop — based on concrete cases — a method by which work and the productive city could be placed in an ecosystemic perspective, mainly in order to describe the network of relationships between forms of work and ways of inhabiting and producing territory within a city. This investivation project is tied to three radical premises / goals: overcoming of the idea of *homo economicus*, upon which contemporary thought on work and territory is based; refusing the urban model built on the functional production of non-places dedicated to work, with no true social existence; and, lastly, the interaction premise, in which the meaning of objects is based on the relationships between people. According to us, this final premise promotes a new 'ecology of the mind' through a culture and symbols that emphasises the relationships within and between ecosystems as much as their structures.

Beyond homo economicus

Homo economicus is a theoretical model of human behaviour based on the idea that the rationality of human actions essentially aims to maximise profit. This portrayal has gradually taken over economic sciences and, to a certain extent, all human sciences starting in the 1960s. Accepting it amounts to reducing social relationships to business relationships and accepting the idea that social relationships and social cohesion are governed by market conditions.

Certain intellectual circles, defined as anti-utilitarian, oppose this idea. To them, social relationships are not regulated based on the market, but on a three-fold obligation: giving, receiving, and giving back[1]. This is the 'gift economy', which Marcel Mauss theorised based on his study of a number of archaic societies, stating that in these societies,

1 The two figureheads of this school of thought are Karl Polanyi (1886–1964) and Marcel Mauss (1872–1950).

relationships are more important than goods. This economic principle clearly results in a very different approach of ownership. It can change violence into alliance and rivalry into cooperation.

The urban situations studied as part of the workshop were chosen in this perspective: we prioritised social economy practices and forms of work based not on a requirement of capitalist profit, but rather on an attempt to create or strengthen social actors involved in the economic transition.

Identifying alternatives to non-places inherited from supermodernity

The concept of *non-place* is drawn from the anthropology of supermodernity developed in France by Marc Augé in the early 1990s. It refers to spaces inherited from an approach of urban design based on zoning and specialised functions: this place is for living, this one is for working, this other place is for learning, that one is for entertainment, and the space between all these is for circulating. Non-places are the result of the territory's functional adaptation to the economy's demands. They are spaces that reduce the relationship between human beings and the territory to one of utilitarian consumption. To those who travel through it, a non-place conveys nothing about its identity, the relationships between its users, much less about their common history. This is the opposite of an 'anthropological place'. Treating work as a form of inhabiting means going radically beyond the concept of non-place and replacing our approach of work in an anthropological perspective, showing how work creates relationships with the space, the environment, time, and human beings.

In this perspective, we are especially interested in the concept of *third place*, which manifests a will to resolve the fragmentatation of our lives and of the time frames dedicated to inhabiting. This concept is built on the hypothesis that each of us, in our quest for what is necessary for life or what helps us live, builds a network of relationships between one or several homes (*first places*), one or several work places (*second places*), and third places in which we exercise our public lives. From the Agora in ancient Athens to the pub around the corner, the history of cities is rich in references to third places (Burret, 2017). They crystallise individual and collective forms of inhabiting and reveal the meaning that individuals and collectivities give to work, by enabling professions and social skills to recreate history (Burton, 2016).

This hypothesis has led us to selecting third places for social economy, where the question of work as a process of physically transforming matter was clearly posed; this is not the case with spaces that are referred to as productive but where 'work spaces' simply consist in an individual sitting in front of a computer.

For an ecology of the relationship: the interaction hypothesis

The ecosystemic preoccupation lets us methodologically qualify this approach. It lets us design a method centred on an approach that has much in common with care theory as developed in the field of health, which looks at patients, caregivers, and the relationship between them, the idea being that the quality of this relationship affects the healing process and the overall wellbeing of those involved. Similarly, the approach of interactions as part of the work-habitat relationship will attempt to connect human, social, and economic dimensions. It will look into relationships with the territory and the environment, as well as into relationships within the production system. Here again, third places are of interest in this perspective as we see in them the development of a 'political ecology of the concrete' that is also found in care theory (Guérin, 2011). They are places where spatial, political and social structures can be tested that enable creating relationships between individual and collective needs, testing environmentally friendly development solutions and paving the way towards a fairer and more pleasant society.

Based on these hypotheses, we have suggested that MasterClass participants could analyse three situations of third places organised by renowned stakeholders

in Brussels' cultural and social economy: Recyclart, Smart and Zinneke[2]. We will examine them as socio-spatial manifestations of an attempt to transition towards a model of city that overcomes both the figure of homo economicus and the production of non-places of work.

The three situations have all existed for some twenty years (see map p. 66), which makes it possible to evaluate their participation in the urban ecosystem with the same amount of historical perspective. They are also undergoing a transition between two lifecycles, albeit for different reasons: activity expansion (Smart), forced relocation (Recyclart), opportunity for permanent implantation (Zinneke). Changes are related to the conditions of localisation and implantation in space, as well as to the configuration of the system of stakeholders. It forces projects to completely redefine their inner workings and reinvent the system of relationships with the urban context. This is, therefore, a good time to consider how these experiments contribute to the urban ecosystem. What is their spatial and environmental footprint? Do they prefigure new ways to apprehend and transform the world, or new relationships to the city, to work, to governance? How are they appropriated by those who run them, by residents, and by the city's institutions? How do they challenge the materials and methods of urban projects?

Recyclart

Recyclart is a collective dedicated to social economy, socio-professional integration, art creation and urban reflection, created in 1997 as part of a pilot urban project involving the transformation of the Chapelle train station in Brussels' Marolles neighbourhood. The collective is established as a non-profit association (asbl), and its project is supported by a partnership that includes the Brussels-Capital Region, the VGC / Vlaamse Gemeenschapscommissie (Flemish Community Commission), the European Union, the City of Brussels, and the Brussels network of centres for social welfare (CPAS). The project includes an art centre (with exhibitions, conferences and concerts), the 'Fabrik' (workshops for woodworking, metalworking and fabricating public spaces) and a slow-food bar and restaurant; the latter two are developed as part of a socio-professional integration process.

For twenty years, the association was a landmark of underground culture in Brussels. This was due first to its location, straight beneath the tracks of Brussels' north–south connection, an urban break in the city centre that the project consistently attempted to transform into an inter-neighbourhood connection. Next, it created a link between day and night, transgressing the *modus vivendi* of the Chapelle train station and tranforming it into a metropolitan third place offering, every night after the last train has departed, artistic and socio-cultural activities such as exhibitions, debates, parties, and concerts. Lastly, its team contributed to transfiguring public space through a variety of experiments in which its members systematically acted as mediators between ideas and people. This involved, for instance, creating a large skate park used by a wide variety of people where the railway goes into the city's underground; or the decoration of tunnels crossing under the railway by art collectives working with the neighbourhood children; or the installation of a 'beach' in front of the train station, used by patrons of the bar-restaurant and the art centre as well as by passersby. Like the train station's inside spaces, these outside spaces were active day and night.

From its very inception, the project had to comply with the safety requirements laid down by SNBC (Belgium's national railway company). In 2009, these requirements

2 The choice of these situations is the result of two processes: one is the progress made in two research projects dedicated to this topic within Metrolab Brussels; the other is discussions between Metrolab Brussels researchers and stakeholders. Researchers and stakeholders met twice: on 19 October 2018, during a workshop organised by Metrolab Brussels to prepare for its MasterClass, as part of the conference on 'Designing Brussels Ecosystems'; and on 22 November 2018, during a round table on the role of third places in creating urban space, organised by Metrolab Brussels in partnership with EPFL as part of the symposium on 'Scaffolds. Open Encounters with Society, Art and Architecture'. The projects that were presented during on these two events were Recyclart, Parkfarm, Smart, NovaCity, Abattoirs, Masui4Ever (Zinneke) and Libelco.

pushed the Fabrik workshops to a different area of the neighbourhood[3], and in 2018, the same rules forced the art centre out of the Chapelle train station. For six months, the association continued its activities on a nomadic basis. The bar-restaurant was moved to the Brigittines chapel, where it called upon outside collaborations to ensure the survival of the association's other activities. More recently, there was an opportunity to relocate the entire project in a former printing plant at 15 Rue de Manchester, in Molenbeek. Thus, in early May of 2019, the inauguration of a 'large soundproof box' with room for 400 people — built in the printing plant's warehouse — marked the beginning of a second life for the association, which will now endeavour to recreate a neighbourhood centre and a metropolitan hub. Its members expect that a number of mental barriers will have to be overcome before Recyclart can once again offer the symbiotic formula to which it owes its success with creators, artists, workers undergoing professional integration, students and residents of the neighbouring areas. From a spatio-environmental point of view, the situation has completely changed compared to the first twenty years: the building does stimulate the imagination in a way that promotes the development of cultural activities, but it also suffers from how the locals see it, i.e. as a space dedicated to work and, as such, closed off from public life. In addition, the venue is less accessible, and it will continue to feel isolated from the city centre for as long as construction work at Porte de Ninove will continue. However, the presence of a network of cultural actors along the canal reinforces the feeling that a metropolitan hub is being created. The Kunstenfestivaldesarts's[4] decision to set up its centre and ticket office contribute to this trend. The Festival's opening date means that the architects in charge or rehabilitating the venue must work on a short deadline, with the additional challenge that Recyclart's programming must be maintained during construction.

However, while Recyclart was very much a trailblazer in 1997 when it took over the Chapelle train station, the association can now rely on an entire network of third places in Molenbeek that share similar goals and constraints. This can be seen in the spatial project. For instance, a physical breach was made in the wall between the former printing plant where Recyclart is installed and the former Graeffe sugar refinery that is now home to Charleroi Danse (the Wallonia-Brussels choreography centre). Recyclart also shares the use of its space with the De Vaartkapoen community centre, whose main site in Rue de l'École is under renovation. An ecosystem dynamic seems to be appearing, based in cooperation and sharing rather than competition.

Zinneke

The Zinneke Parade is a cultural event created as part of Brussels 2000, European Capital of Culture. Every other year, the event mobilises a loose network of social, cultural or neighbourhood organisations that prepare a large festive parade dedicated to a specific theme. This provides an opportunity to bring the public space to everyone's attention, by presenting a rich variety of socio-artistic creations that reflect the diversity and energy of cultures that contributes to Brussels' identity. The preparation and performance of this event mobilises an entire ecosystem of craftspeople and artists associated with groups formed in neighbourhoods. In the Zinneke jargon, this temporary association of partners of various statuses around a common artistic project is called a *zinnode*; the term also applies to the network of schools, academies, neighbourhood centres, vacant warehouses or ordinary production spaces in which workshops dedicated to designing and manufacturing

3 In a former garage on rue de la Philanthropie, on the ground floor of a building belonging to Le Foyer Bruxellois.

4 The Kunstenfestivaldesarts is an annual international festival dedicated to contemporary artistic creation. Created in 1994, the Festival is a three-week event held in May in some twenty Brussels sites dedicated to artistic creation as well as public spaces. Fundamentally designed as a bilingual project, it involves Dutch-speaking and French-speaking institutions, and promotes a dialogue between the communities that live in the city. Every year, the Festival sets up its centre in a different cultural hub.

the costumes, floats, and decorations, as well as parade rehearsals are held. In the days leading up to the parade, the zinnodes go out into the public spaces of their respective neighbourhoods for dress rehearsals — called *soumonces* in the Zinneke jargon. On the day of the parade, all zinnodes converge towards the *zinnodrome*, a central area whose borders change every year but is always inside the city centre. So the Zinneke parade contributes to the social production of space, both on a local scale and a city-wide scale.

The organisation's centre is itself a third place. For fourteen years, it did not have a fixed location and was temporarily housed in iconic buildings such as the Galeries Anspach and the Byrrh buildings. In 2014, Zinneke took the opportunity it was offered to occupy the former Atelier général du timbre, an industrial building in the Masui neighbourhood in Schaerbeek) that belongs to the state, which it lets out to Zinneke on a 20-year contract requiring renovation work. Using a grant from the EU's ERDF programme, Zinneke can conduct a pilot project to recycle the building whose goal is to install spaces dedicated to meeting, creating, learning, and producing, in line with Zinneke's needs and following strict specifications related to circular economy[5].

Its transition from a nomadic to a sedentary presence has forced the association to rebuild its centre while working on to concurrent projects: the biennial parade and renovation work on the building. While ensuring the parade runs smoothly, Zinneke must enable a number of activities: workshops (metal and wood) accessible to lorries from the road, warehouses (espace Matos) to store and recycle costumes and other materials, offices, reception areas and a multipurpose area. The work is carried out by people who are taught on-site to have the versatility required for artisanal renovation. These qualifications are leveraged in both the work involved in transforming the building and the creations related to the parade[6]. The challenge that Zinneke must address, however, does not stop at the building's doors: the organisation must also take root into the Masui neighbourhood. This involves opening — physically or symbolically — series of doors, and generally reconfiguring the network of relationships between Zinneke and its partners as well as the city's institutions.

Smart

When Smart was created in 1998, its project was to build a self-funded artists' mutual organisation. Its goal is to relieve the administrative burden of freelance workers by offering them support for legal, tax-related and financial matters. Initially intended for artists, the project was later opened to freelance technical workers and other craftspeople. In 2015, a reflection was launched on the future of the organisation, leading to the establishment of a cooperative in 2016. Smart is now one of Europe's largest cooperatives with a presence in 9 countries and more than 40 cities.

One of the services it offers is the availability of shared working spaces where freelance workers can enjoy working conditions suited to their needs and rely on specific common services. The cooperative has two sites in Brussels: the Brussels Art Factory (BAF) in Saint-Gilles, an 800 m² (8,600 sq. ft.) near the Brussels-South railway station and LaVallée, a 6,000 m² (6,500 sq. ft.) space that opened in 2014 in a former laundry in Molenbeek. These coworking spaces are built on a sharing dynamic, a proximity effect between users and the cross-pollination of projects started by the cooperative's entrepreneurs. However, they remain open to residents who are not necessarily members of Smart and the cooperative[7].

At LaVallée, the workshops and working spaces dedicated to creative activities are structured around two main open areas, with secondary common areas (kitchens, living rooms, courtyards, patios). The venue's layout is designed to encourage the application of social and solidary economy principles: association, cooperation, and resource pooling. This enables freelance workers whose activities are complimentary to work together on a project, or to share some of

5 The pilot project funded by the ERDF consists in a partnership between the Zinneke association and various organisations active in Brussels' recycling industry: Rotor, Ouest architecture, and MATRIciel, an engineering firm specialising in special techniques.

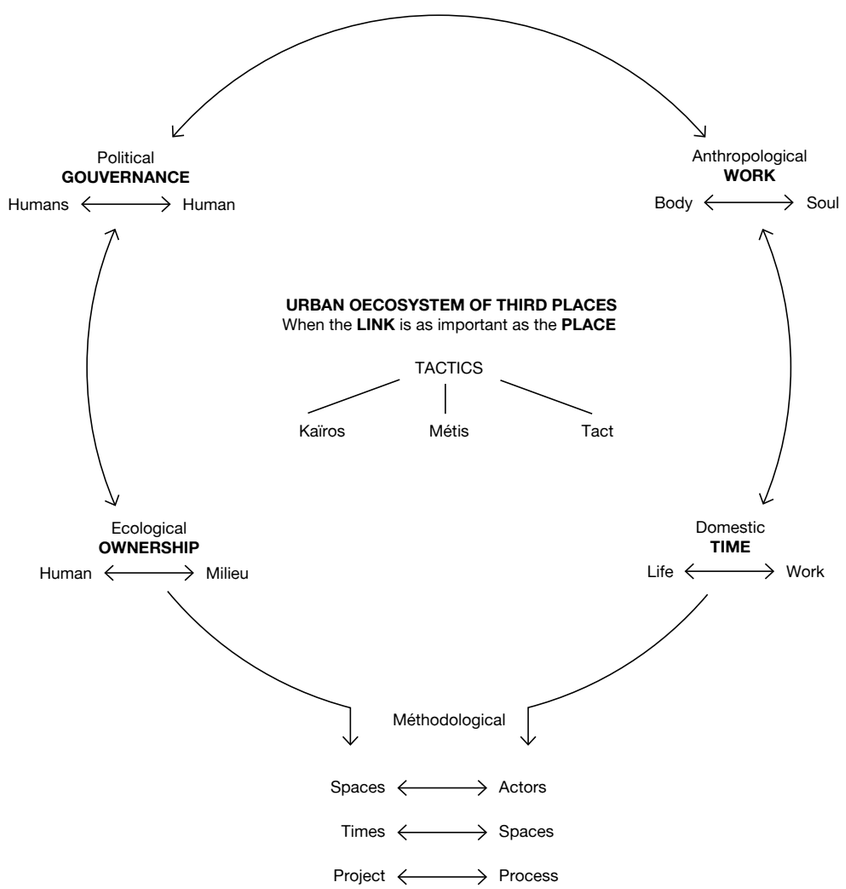
6 Innovative legal work was done to make the circularity requirements related to recycling compatible with public procurement procedures.

7 They may therefore have self-employed or employees' status in a traditional economic structure with no social purpose.

their activity's functional costs if they work in the same industry. The venue also has two large rooms that can be loaned or leased upon request for community activities dedicated to the neighbourhood or the city.

Oecosystem of third places. When the relationship is as important as the place.

To what extent does the ecosystem approach question the methodological approaches on which we rely as thinkers of the city and the roles of the architect/urbanist? When the relationship is as important as the place, must the role of the architect be reconsidered? And if so, in what way? It appears important to rethink modes of representation in order to show relationships, rather than the static and stable systems offered by maps. Participants to the MasterClass have attempted this exercise, and a number of methodological challenges have emerged from their analytical work. The projects dealt with ecosystems, and therefore examined the relationships between spaces and the players they involve. It is about proposing research mechanisms that are close to the realities on the ground, by calling upon methods including interviews, visits and reflections between project leaders and researchers. MasterClass participants proposed some tests of representation based on their own reflections on the links between temporalities and spaces. In their proposals, they reconsidered their approach to the relationships between projects and processes. They emphasized the processes used rather than the final image produced.



A Brussels oecosystem of third places for social economy?

The overview of these three situations shows how they contribute to the birth of an oecosystem[8] of third places dedicated to the social economy, which appears to be an emerging phenomenon of urban development in Brussels. The phenomenon's geography is not yet established, and the MasterClass's workshop can offer a helpful contribution in this regard. The figure below shows how we believe the survey project should describe the contribution of the three situations to this oecosystem.

From a **spatial** perspective, we can analyse the tactics that enable third places to make a place for themselves in the city. We are using the term 'tactic' here in reference to Michel de Certeau, to whom tactics are one of the determiners of *everyday inventions*, which he defines as a series of practices developed by ordinary people to invent or reinvent their everyday lives so that they are in line with their desires. Tactics are characterised by the ability to seize opportunities (*kairos* in Greek), call upon forms of practical intelligence (*mêtis* in Greek), and display *tact*, or a 'sense of touch' (from the Latin *tangere*, touch) in how one inserts oneself into a context (de Certeau, 1990).

Regarding the *kairos*, we will analyse how the three situations seize the opportunities offered by the network of interdependencies that link them to a series of public and urban institutions; how this law of opportunity has led Recyclart to its location in Rue de Manchester and Zinneke in Place Masui, in a context where neither organisation had full control over where it ended up; how they manage to benefit from their situation while also contributing to the goals of a territorial development policy that also benefits from their activity by adding value to the canal area and brownfield sites. This is how Recyclart and Zinneke were able to receive funding from neighbourhood development contracts, urban renovation contracts, or ERDF grants, enabling them to renovate buildings. Smart follows a more independent approach, as it owns the land that it occupies in Saint-Gilles while its LaVallée site is a long-term lease. However, by investing its capital in renovating these buildings, it is also displaying tactical opportunism: it implicitly contributes to the policy because it feels that these areas have high potential.

Regarding *mêtis*, or practical intelligence, we can study the ability of third places to deploy installations that can change based on the cohabitation needs of the various categories of 'residents' and switch between work, leisure and civic creativity at various times of day. This form of intelligence can be seen, for instance, in the way in which the organisers transform limitations and constraints into assets and opportunities. For instance, the 'tunnel' between Recyclart and Wallonia-Brussels Centre Chorégraphique de la Fédération Wallonie-Bruxelles, in addition to being a physical link (a 'door'), hints at an ability to transform the principles of association and pooling into resources for projects and innovation, rather than into a constraint.

Lastly, tact is the way in which the players define their own relationship with the context. We can analyse how, from their initial position as outsiders, the three organisations create a place for themselves in the neighbourhoods and in the system of metropolitan centralities. Three figures have emerged at the workshop's conclusion that could guide a typology: magnets, which attract or repel (Recyclart), doors, which open and close (Zinneke), and bubbles, which exist on their own and fly away (Smart). We can also note that with the exception of Recyclart when it occupied the Chapelle train station, none of the three situations is directly and permanently connected to a top-level urban infrastructure. At the Chapelle train station, Recyclart was not only an outsider, but also

8 We are using the term *oecosystem* as defined by Pierre Calame in his work on oeconomics. Pierre Calame has placed this concept back under the spotlight, showing that some revolutions are silent. In 1755, he explains, the encyclopedia compiled by Diderot and d'Alembert remove an 'O': what used to be called 'oeconomics' becomes 'economics'. Jean-Jacques Rousseau used both spellings of the word. In his article on 'political economy', he states: 'The word economy, or oeconomy, is derived from 'oikos', a house, and *n mos*, law, and meant originally only the wise and legitimate government of the house for the common good of the whole family. The meaning of the term was then extended to the government of that great family, the State.' (Calame, 2018)

a resister: for twenty years, the association used considerable tact to maintain its position. It has forced the railway company to cooperate and share spaces, going against its habitual practices. Eventually, the argument of fire safety overcame this resistance. Does this mean that third places for social economy are systematically pushed away from traditional structures? This is not certain, but — as we have seen — it does not keep each project from contributing, physically and socially, to the production of interfaces between various spatial scales.

From an **anthropological** point of view, we see revealed in the situations offered new forms of appropriating work as an urban value. A first approach has to do with the need for roots (enracinement), the term being a reference to a book by philosopher Simone Weil in which she lists how work must serve human beings. In it she writes: 'It is through work that reason grasps the world and takes hold of the wild imagination' (Weil, 1949). This phrase postulates two aspects of work: an objective aspect, which drives us to working in order to earn a living and improve our living conditions, and an imaginative aspect, which drives us to projecting into the real world what started as a mental prefiguration, a dream for a future society, or a model for living. The work that we can see being developed in the third places studied here appears to feature this duality. Workers in these spaces are not only paid for their work; they also have a space-time that lends itself to the quest for meaning: this is the case at Recyclart and Smart, where trainees, trainers, artists, and cultural managers can meet at the bar-restaurant or at the cafe, and get to know one another and discuss the meaning of work in society. The imaginative aspect can even overtake the objective one: for instance, at Zinneke, involvement in an artistic project is done on a voluntary basis, because the project conveys a societal message with which the participant agrees.

A second approach deals with the social division between productive work and reproductive work, or between personal and professional life. The profit imperative of production has led industrial society to separating work time from family time, and hence to creating a strong duality between public spaces and domestic spaces. Women, especially feminist thinkers, were the first to challenge the inequality in the relationship between productive work and reproductive work, as well as the contemporary social order's rejection of activities that exist at the intersection of these two structures of everyday life. Certain practices recorded in the third places we have visited, however, promote new interrelations between the two worlds in a way that deserves some attention: for instance, when they allow music — an activity typically associated with leisure time — to freely occupy a space devoted to manual work (Zinneke); or when they offer equipment (bar, restaurants, but these could also be childcare or extracurricular activities) and services (parcel reception, etc.) that are at the intersection of productive and reproductive work; or when they transform their spaces into amenities such as a health club available to neighbourhood residents (Smart). In the case of Recyclart and Zinneke, training is also a significant part of this intersection.

These experiments cannot exist independently from **political** aspects. From this point of view, modes of internal governance reveal the ways in which the three organisations think and decide what seems to contribute to their project. Smart has adopted a cooperative model in which decisions are made following the principle of 'one person, one voice'[9]. Zinneke has a consensus-based coordination model of decision-making, intended to enable the association to speak with one voice. Recyclart has a more differentiated coordination model, which aims to call upon each participant's skills to contribute to the common project, while also taking into account the diversity in the levels of socio-professional transition represented.

Lastly, from an **ecological** perspective, we believe that these three situations of third places for social economy call for reconsidering the question of property as an embodiment of the relationship between

9 Decisions taken according to this principle concern the strategic orientations on which the Board invites the General Assembly to choose. For the day-to-day management of the organization, decisions are taken by the direction, within a traditional hierarchical structure.

homo economicus and their environment. By the way in which they insert themselves into urban reality by seizing opportunities that present themselves, they prioritise a model of appropriation based on usages rather than on a legal status of property.

Conclusion

The questions raised in this document are directed at the participants of the MasterClass, but also at those involved in the next episodes of our investigation on the evolution of work-habitat relationships. The goal is to determine whether the information collected during this preliminary research truly point to an oecosystem whose geography can be described, whose spatial form can be analysed, and for which we can assess how it contributes to a transition from an urban regime governed by homo economicus to a regime that would reconsider political governance relationships (between humans), ecological relationships between humans and their environment (including through forms of appropriation of real estate) and anthropological relationships with work as a resource for building roots and as an everyday temporality that articulates — in habitable forms — economic production and domestic reproduction.

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Density

From temporary densification to transitory urbanism

Anna Ternon

The background of this article is the ecosystem of players, places and processes of Brussels' urban densification. It examines a specific aspect of this ecosystem: the temporary occupation of sites or buildings involved in 'urban projects'.

The article highlights the variety of practices that fall under this category, in terms of the spatial objects they produce as well as of the related systems of actors and social visions. It looks into how taking into account the temporal aspect can yield fresh insight into the debate in the city's qualitative densification.

Regarding the spatio-environmental aspect, we will examine the nature and conditions of the relationship between the places created by temporary occupations and the 'sustainable' densification of the city. We are basing our approach on a dual assumption: first, that the temporary occupation of sites and buildings is a concrete form of the city's densification process; secondly, that temporary spatial and social arrangements may, under certain conditions, prefigure a new life cycle of space and original forms of sustainability. This dual assumption is at odds with a dominating view according to which temporary occupation is defined as a momentary initiative taken in order to seize a niche opportunity with no durable constraints on the spatial form and its social organisation.

These two views have in common that they acknowledge temporary occupation as an opportunity to liberate unused potentials for urban intensification (useful square footage per unit of time) found in vacant spaces. However, one stops at opportunistic exploitation without challenging the 'business as usual' approach, in which real estate is an economic asset. The other approach sees opportunities for temporary occupation as resources that can attempt to respond — on a small scale and outside of the market — to societal and environmental challenges related to the ecological transition.

The question of transitory occupation is examined as part of the Metrolab MasterClass, in order to reflect on the ecosystems involved in this practice as well as on their impacts on the long-term processes of urban densification.

The question of density in Brussels — territorial background

The question of density in Brussels has a number of specificities, due to its status as both a city and a region; this means territorial development is subject to the evolution of the political and institutional situation. With its status as capital of five different entities, Brussels' leadership is not uncontested. The local authorities do not control the development of the loose metropolitan network in which the city exists, unlike in the Industrial Era when the young Belgian state had adopted policies on land use planning and railways that intentionally spread out the population across the entire territory rather than only in cities (Grosjean, Gilot and Tsiomis, 2007).

However, the importance of regional borders now forces Brussels' authorities to deny this history. Their project for the city's future is dense and compact, and increasingly limited by available land. Yet the reality of Brussels' metropolisation is very different: it results both in an intensification/concentration of motor functions inside the city itself (the territory of the Brussels-Capital Region) and in a movement of extension/diffusion of the urban fabric over a metropolitan region whose definition challenges historical territorial borders. The spatial organisation of this living area is closer to the concept of a dispersed city and that of a 'small horizontal metropolis' presented by B. Secchi and P. Vigano during the 'Brussels 2040' campaign launched in 2010 by the Region's government in order to provide a background to the reflection on the Region's new sustainable development plan (Declève and Declève, 2017).

If we are to adopt an ecosystemic perspective, this question of the geographical and institutional context for densification should remain open. Are the bio-region (see de Lestrange, p.17) and the Brussels metropolitan community not the only viable avenues for the development of the true city? And yet, most reject this ecosystemic common sense, since it is — now more than ever — a political utopia. If the Brussels-Capital Region is to take on a realistic approach, it must take into account its entire 162 km² (63 sq. mi.) area for its territorial development. The territorial view inherited from history is dismissed as a utopia, even as imagination can provide the best answers to the reality of metropolisation and the challenges of ecological transition.

This tendency is reinforced by the fact that demographic pressure in Brussels' 19 municipalities has once again become positive in the first decade of the XXith century, after thirty years of population decline and of middle and upper classes leaving the city to live in surrounding provinces. In order to respond to what the Regional Plan for Sustainable Development (PRDD)[1] calls the 'demographic challenge', public territory policies are centred on the idea that the city must be densified: the authorities must respond to the increase in the number of residents and distribute it across the entire city-region while also ensuring that enough amenities and services are available for education, mobility, social cohesion and quality of life.

In quantitative terms, according to the statistics published by the Federal Planning Bureau and Statistics Belgium, the Region's population will increase by 10,000 inhabitants each year until 2025, then by 9,000 each year between 2025 and 2040. The target defined by the PRDD in order to respond to the demographic challenge is for all players involved to create 6,000 new homes each year, up from the current rate of around 4,000 homes each year. Among these 6,000 new homes, 1,200 (20%) should be public housing, 60% of which should be destined to welfare recipients and 40% to middle income households. This is an ambitious target, considering that for the past fifteen years 400 public housing units have been built each year, with 41,000 households on the waiting list.

In order to tackle this challenge, the Brussels-Capital Region is calling upon a number of tools for action[2]:

— PRDD, roadmaps, Plan Canal and PAD
— (Sustainable) Neighbourhood Contracts and Urban Renovation contracts
— Development of housing covered by citydev.brussels
— Incentives for households
— Funding for social housing from the Brussels-Capital Region

We know that from a quantitative point of view, much of the challenge lies in the reuse of vacant or underutilised land and buildings. And these are precisely the types of spaces on which temporary appropriation practices have been increasing in recent years.

Density and temporary occupation[3]

'Temporary use has become a magical term: on the one hand, for those many creative minds who, in a world ruled by the profit maxim, are trying nevertheless to create spaces that reflect and nurture an alternative vision of the transition to the future; and, on the other, for urban planners to whom it represents a chance for urban development.' (Oswalt, 2013)

The background of this article is the relationship between the temporary occupation phenomenon and the ecosystem of players, places and processes of Brussels' urban densification. In the context we have described, this ecosystem's transition is strategically designed around 'mobilising potentials and real estate resources', in order to ensure a 'controlled densification of the territory', as well as around the development of social housing. There is nothing ecological about this view of transition: in particular, it does not take into account the risks of soil sealing and, more importantly, of rapid exhaustion of the rare resource that is unbuilt land; in addition, it remains confined to a perspective that prioritises large-scale urban projects and the production of new homes, while Brussels has many underutilised real estate resources whose activation could enable a response to the demographic challenge that could better contribute to ecological balance.

At the interface between both positions, transitory urban planning provides the leverage necessary to contribute to qualitative densification of the city. The temporary activation of these sites encourages innovation and creativity, and often promotes a diversity of uses; these are key requirements for an open and collaboratively designed city that meets the needs of its active inhabitants (residents, workers, students, etc.). Temporary urban planning often manages to create social value in little time, whereas traditional urban projects only consider social value in the longer term, with no true guarantee of success. The concept of urban planning includes the prefiguration aspects of future projects for transitory urban planning (Diguet, 2018).

Evolution of the system of players and of the conditions for temporary occupation[4]

There is insufficient data to produce a comprehensive history of temporary occupations in Brussels. Here we will simply present a few milestones that show the phenomenon's evolution and demonstrate the increasing diversity of spatial objects, player interactions, forms of appropriation and value systems that underlie this type of urban planning.

The squat movement

Starting in the 1970s, Brussels was affected by urban exodus, mainly from middle-class households who found easier access to housing in the city's outskirts. The increase in urban poverty and in the number of vacant buildings in municipalities at the centre of the city resulted in illegal occupations driven by a highly active movement in favour of housing rights and the right to the city. The ilôt Soleil, located Rue des Chevaliers, and the squat at Rue des Drapiers are high-profile examples of this type of occupation.

Temporary occupation agreements

Some of these occupations organised into associations. One of them is 321 logements, a non-profit that organised the occupation of the former Tagawa hotel on Avenue Louise, which had been vacant for many years. After many expulsions, the association occupied a former administrative building located at 123 Rue Royale. This occupation marked the

1 See the 2018 PRDD https://perspective.brussels/sites/default/files/documents/prdd_2018_fr.pdf

2 See the map of regional planning perimeters (p.68).

3 The map p. 67 shows the relationship between these two variables in Brussels

4 (RBDH, 2013)

first instance of a new form of agreement between occupants and owners: the temporary occupation agreement. Following this, the association also signed an agreement with Infrabel, for houses located Rue du Progrès near the Brussels-North railway station.

Gradually, public authorities as well as private owners came to realise the benefits of promoting these practices and giving them a proper framework. This lets them avoid vacancy taxes, ensure their buildings are maintained, prevent vandalism and make neighbourhoods more active. The temporary occupation agreement is not a leasing agreement, but rather an agreement that allows the legal occupation of a space and possibly — depending on specific terms negotiated with the owner — provides for a period of notice before the occupants are required to vacate the premises. Among other achievements, this tool enabled FeBul, a housing rights association, to sign agreements with SISPs ('sociétés immobilières de service public', which are in charge of social housing in the Brussels-Capital Region) on the occupation of buildings awaiting renovation.

Brussels also promoted temporary occupations by socio-cultural projects, by facilitating agreements between associations and owners. For instance, the PRECARE programme, launched by City Mine(d), enabling the activation of a dozen spaces between 2000 and 2010 in Brussels' central neighbourhoods. The programme's purpose was to allow emerging initiatives to occupy working spaces in temporarily vacant buildings, thus encouraging the city's function as a laboratory. These temporary occupations are mostly in vacant buildings, but other forms of occupation emerge on unused urban land such as the Josaphat site in Schaerbeek — occupied by non-profit Commons Josaphat — and the Chant des Cailles in Watermael-Boitsfort. There are also occupations of the public space, which involve events such as the Picnic the Streets event on Boulevard Anspach.

Subsidies

Temporary occupation agreements and the creation of associations have led to a form of institutionalisation of temporary occupations. Public authorities are increasingly aware of the social value of temporary occupations and their role in activating neighbourhoods. As a result, they are granting more and more subsidies to the associations that launch these types of initiatives. This is how Recyclart — the association that temporarily occupied the Chapelle station under the city's main railway connection with a project dedicated to social economy, urban reflection and artistic creation and diffusion — has received funding under the EU's ERDF programme. Another source of funding is the Neighbourhood Contract, which has a specific fund dedicated to socio-cultural projects.

Calls for projects

The support from the public sector also takes on the form of calls for projects. This is how Bruxelles Environnement supports the Parckdesign festival and has made the occupation of the 'Allée du Kaai' possible.

Other public administrations have recently launched calls for interest regarding the management of temporary occupations on sites awaiting development. This is the case with the See U project, which involves the temporary occupation of the Ixelles barracks at the initiative of the Urban Development Corporation and the Université libre de Bruxelles; another example is Studio CityGate in the Biestebroeck neighbourhood, at the initiative of citydev.brussels. The latest call for projects is related to the occupation of the former mail sorting centre building: after a grassroots petition gathered nearly 7,000 signatures, the SNCB and the municipality of Saint-Gilles launched a call for projects for temporary occupation before work begins on the new SNCB headquarters in 2023.

A challenging aspect of these calls for projects is their administrative complexity. Applicants require a structured organisation that has the human resources and experience necessary for this type of process. It should also be noted that these calls for projects are not intended as tools to meet the demand for housing; in fact, so far

they have excluded all projects that involve housing vulnerable citizens.

Still, these new tools have given considerable momentum to the movement, and resulted in the emergence of organisations specialised in managing temporary occupations. On the one hand, there are activist associations like the non-profits Communa and Toestand, whose support of temporary occupation is part of a wider project in favour of a more democratic society and for more inclusion of vulnerable groups in cities. On the other hand, there are companies in the private market sector, such as Entrakt, who have identified the market opportunity created by vacant spaces in Brussels: they charge owners a service fee to manage their buildings and rent them out on a temporary basis, for a much lower price than on the rental market.

From a market point of view, the question of temporary occupation soon collides with that of neighbourhood gentrification. We can mention the recent example of non-profit association Up4North, created in 2016 by eight real estate companies (AG Real Estate, Allianz, AXA, Banimmo, Befimmo, Belfius Insurance, Immobel and Triuva) to 'breathe new life into Brussels' Northern Quarter' (Up4North, 2017). This neighbourhood of high-rises in the city centre has three types of occupants: civil servants and office workers isolated in office buildings; residents of social housing towers; and refugees occupying the Parc Maximilien. These groups seldom encounter one another, and as a result the neighbourhood is not very lively (10 to 15% of building space is vacant).

In November of 2017, Up4North launched a call for temporary occupation projects, receiving 67 proposals. This has enabled some thirty organisations to set up in the World Trade Center 1 and North Plaza buildings (Up4North, 2017). The criteria guiding project selection are open, but they prioritise start-up companies and innovative cultural projects. An art school, for instance, has installed a satellite campus in one of these vacant spaces. The explicit goal of the temporary occupation organised by Up4North is to widen the range of habitation practices in the neighbourhood. It attracts younger users, whose habits and temporalities are different from those that exist in the area. The term 'integrative gentrification' (Lemaier, 2018) eloquently conveys the paradox of this movement.

Anti-squatting law

Acting as a counterpoint to the public initiatives mentioned above in favour of temporary occupation, the legislative framework has been made stricter in November of 2017 with the entry into force of a new anti-squatting law, which now includes a criminal section that was absent from the previous law.[5] The occupation of vacant spaces now requires the owner's prior formal consent. In practice, however, the occupation itself is what creates a power dynamic that triggers negotiations with the owner. The new provisions of the law only widen the often blatant gap between the legality of an occupation and its legitimacy, and could also result in longer proceedings.

Urban planning regulations

Another difficulty related to temporary occupations is that there exists no regulatory framework on urban planning or safety that governs them specifically. This means they must be in line with applicable standards on urban planning. Such a requirement makes temporary occupation much less attractive, as it loses its main benefits: affordability, flexibility, and expediency. This legal vacuum is also a boon to large owners or managers of real estate, who can more easily exploit loopholes in the system to their own benefit.

Saint-Vide Leegbeek

In response to the market sector's new interest in temporary occupations, and fearing that this movement could be exploited as a tool for gentrification and urban marketing, several socially oriented temporary occupation platforms have recently created the '20th Municipality of Brussels'. A symbolic territory, it includes all vacant spaces in the Brussels-Capital region. 'After long remaining unnoticed

5 Law of 18 October 2017 on the illegal entry into, occupation of or residence in another's property (Loi relative à la pénétration, à l'occupation ou au séjour illégitimes dans le bien d'autrui) (Belgian official journal, 6 November 2017).

— because they are spread out across the entire city —, 6.5 km² (2.5 sq. mi.) of vacant space are now revealed to citizens. Office complexes, town houses, residential buildings, former industrial sites: real estate vacancy in Brussels involves buildings of all types.'[6] There are an estimated 30,000 vacant housing units among privately owned buildings, while 10% of public housing is vacant (for reasons of unsuitability) as well as 1.55 km² (0.6 sq. mi.) of office space. By creating this 20th Municipality, the associations involved intend first and foremost to highlight the ecosystem's potential to promote an ecological, social, political and cultural transition through initiatives that benefit the entire urban collective. The goal of the 20th Municipality is to defend this resource by recommending measures on real estate taxation, public tenders, legislation on urban issues or structural financial support.

Temporary occupation as a form of citizen participation

Temporary occupations emerge as a new form of citizen engagement, in a context of questioning and co-producing urban phenomena.

As we have seen above, these illegal occupations — now referred to as 'temporary occupations' — are often institutionalised in order to be in a position to receive public subsidies. In this new context, temporary occupation is about more than access to housing: it is an opportunity to teach about the meaning of citizenhood and experiment with new ways of living together. The challenge of these new participatory processes lies in synchronising the pace of the association with that of the site or building transformation project around which they are built. According to the vision of urban project operators, their operational programme does not include the temporary occupation programme and the social experiment is intended to end as soon as the project's construction phase begins. The occupants, on the other hand, often see their occupation as the prefiguration of a sustainable housing programme for the site or building in question. In this perspective, the projects encourage individuals to emancipate themselves by playing an active part in urban transformation.

Urban temporalities and democracy

If the question of temporary occupation is viewed from the perspective of ecological transition, three narratives can be distinguished:

— The first considers the challenges of transition to be part of 'business as usual', prioritising the market value of space. It gives these challenges an interpretation that is essentially technological in nature, falling under the remit of architecture and landscape planning and used as a tool for urban marketing.

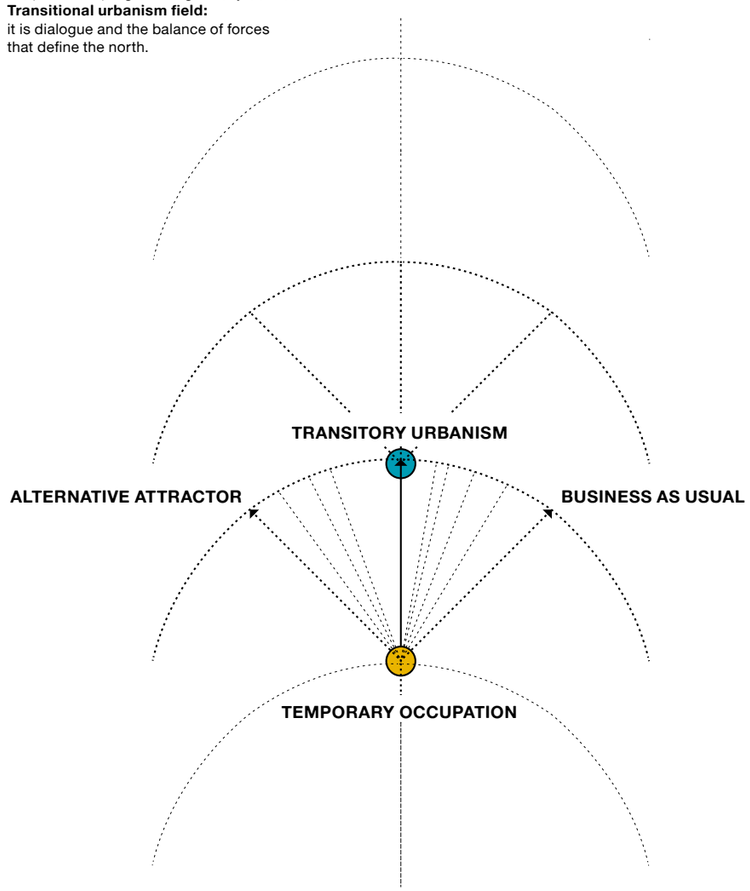
— The second narrative considers ecological constraints to be part of environmental management and, as such, under the responsibility of experts. In this context, population growth is a social constraint that must be managed through an appropriate city densification policy. The question of the relationship between built and unbuilt land is essentially resolved through regulation, by enacting rules on urban development or landscape design.

— The third narrative focuses on democracy as a mediator for society as a whole (Gorz, 2008). This perspective is based on 'dividing power against itself' and on creating many spaces dedicated to 'structured free debates', according to P. Ricoeur as quoted by Declève and Mabardi (1994). The challenges related to the ecological transition are interpreted in the context of the fight for housing rights and for the right to the city in a quality environment. Population growth, through the irreplaceable nature of individuals seeking freedom, is seen as a resource rather than a constraint of urban densification. Building on the idea that 'conquering time is the first challenge of freedom', (Fleury, 2018) this narrative approach sees temporary occupations as places that offer the time necessary for freedom.

6 See https://www.leegbeek.brussels/histoire (accessed on 1 June 2019)

The compass of temporary occupations in a perspective of ecological transition:

— **Transition to an alternative attractor (North):** from temporary occupation to alternative non-market programming
— **Business as usual:** transition from temporary occupation to the profitable programming initially defined
— **Transitional urbanism field:** it is dialogue and the balance of forces that define the north.



Methodology and case studies used in the MasterClass

The task submitted to participants of the Designing Brussels Ecosystems MasterClass was to analyse the interplay between these three narratives in the Canal area, which was drastically affected by deindustrialisation and plays a major strategic part in the territory's redevelopment policy, as the PRDD has labelled it its main regional intervention area (ZIR). The transition from an 'economic activity area' to an 'enterprise area in an urban environment' (ZEMU) has legally paved the way for building housing, which — considering the high number of plots and buildings left vacant by deindustrialisation — makes the area an ideal environment for real estate development.

Participants to the MasterClass were presented with two case studies: Studio CityGate and the Pop Up Canal projects. The first is part of the broader project for urban transformation in the Biestebroeck neighbourhood, a former single-purpose industrial site in the south of Brussels, while the second is part of the revitalisation project for the Heyvaert neighbourhood, which is one of the city's most dense and

underprivileged areas; located in the centre of Brussels, it has become an international hub for the second-hand vehicle market over the past few decades.

Studio CityGate

citydev.brussels, the Brussels-Capital Region's development corporation in charge of promoting economic expansion (by creating spaces dedicated to businesses) and urban renovation (by building subsidised housing), has acquired the former Vesdre Continental plant in order to develop a multi-purpose project: CityGate II. At the same time, the Brussels-Capital Region's social housing institution (SLRB) has bought the adjoining plot, the former site of AMP. citydev.brussels and the SLRB collaborate on this project, and have decided to launch a joint procurement as part of the redevelopment programme for the Biestebroeck neighbourhood, in Brussels' southern municipality of Anderlecht. A high-priority area in the Region's development strategy for the Canal territory, it is also part of the Biestebroeck local land use plan (PPAS). Construction work for CityGate II should start in early 2022 and is expected to end in 2025. Considering the time it takes to identify a site, acquire it and make the project operational, sites often remain vacant for several years. This is why citydev.brussels has launched a call for expressions of interest for the management and coordination of the site's temporary occupation for a period covering the four years before work begins (2018-2022). This temporary occupation is called Studio CityGate. The company selected at the conclusion of the call was Entrakt, a private company whose main activity consists in managing vacant buildings by temporarily reallocating them. These buildings can belong to either public or private owners. The company currently manages some forty projects across Belgium.

Both the former plant and the adjacent outside space are occupied. The building is 20,000 m² (215,000 sq. ft.), divided into two wings, and houses artist studios, a cultural, social and economic centre, shared facilities, a climbing gym and an indoor skate park. Outside spaces host project Wonderlecht, whose purpose is to gather residents around topics such as organic food production, biodiversity and climate protection. Entrakt has recently started organising events on the site. The building is currently occupied to 80% of its capacity. Occupants are organisations of one to ten people, and space is rented from 1 to 10 euros per square metre (~11 sq. ft). Most organisations are craftspeople or artists from various places in the Brussels-Capital Region and its outskirts.

'At the end of the day, we remain a business; our first goal is not public well-being. As the project manager, I have a stake in achieving this result, but it's not the end goal' explains Gerd de Wilde, former Studio City Gate manager for Entrakt.

The social relationship with the neighbourhood is limited, as some of the events programmed are restricted to economic activities that are not open to the public. Income-generating activities open to the public every day are the climbing gym and the indoor skate park. Still, certain activities create true interactions with the neighbourhood or with a broader audience. This is the case of project Wonderlecht and of various one-time cultural events. Entrakt also leases certain spaces to neighbourhood associations (e.g. for homework assistance). Lastly, workshops are offered to youths in the neighbourhood, introducing them to manual labour.

Pop Up Canal

Every year, the Brussels-Capital Region issues a call to the municipalities located within the urban renovation area (ZRU) for the conclusion of neighbourhood contracts, which allow them to receive subsidies by defining a perimeter and a programme for urban renovation. Neighbourhood contracts do not fund only urban transformations, but also socio-cultural projects.

As part of the Petite Senne Sustainable Neighbourhood Contract, a total subsidy of 100,000 euros (30,000 euros/year in 2016–2017 and 40,000 euros in 2018) is distributed to neighbourhood residents and associations by the Molenbeek-Saint-Jean municipality's executive body for the implementation of project Pop Up Canal from 2015 to 2018.

The project's goal is to activate vacant or untapped sites (public spaces, buildings, warehouses, etc.) and, at the same time, to activate the Petite Senne neighbourhood's

social fabric and network of relationships. Pop Up Canal is a call for projects, accepting applications from all organisations seeking space for their activities.

In practical terms, it aims to support temporary occupation projects in vacant buildings or public spaces, developing a social dynamic in the neighbourhood.

One of the municipality's ambitions is that if the chosen site is eventually selected for a future project of rehabilitation (through the Petite Senne Sustainable Neighbourhood Contract or any other public or private organisation), the momentum of the temporary occupation will contribute to shaping the site's new purposes.

Three projects currently receive funding as part of this call for projects. Subsidies are put towards making the buildings functional and ensure they meet safety standards. As a public authority, the municipality requires that all standards be complied with, which is not necessarily the case with private players. The three projects are located in the same city block as the project for the rehabilitation of Halle Libelco as a public space, as part of the Petite Senne Sustainable Neighbourhood Contract. The Halle Libelco project also receives funding from the European Union (ERDF).

— uZinne
Since the summer of 2017, non-profit DAK-Domus Art Kunst has been coordinating project uZinne, a temporary socio-cultural centre installed in an abandoned industrial warehouse. uZinne gathers six associations that collaborate and share resources and space. If a space is made available to an artist, they must do something for the space in return. uZinne works in collaboration with the Citizens' Platform for Refugee Support, offering refugees shower facilities.

— Liverpool 24
This massive building of around 2600 m² (28,000 sq. ft.) will be fully remodelled in the context of the Petite Senne Sustainable Neighbourhood Contract.
As part of the Pop Up Canal project, the site's occupation is managed by Entrakt, who has signed a temporary occupation agreement with the municipality. The main occupier is Decoratelier, a project by the artist Josef Wouters. Decoratelier is a studio open to artists, with room for scenographers and audience members as well as for interdisciplinary collaborations and social experiments. It has also developed a creation space for vulnerable people and refugees.

— Wood in Molenbeek (WIM)
WIM is an Action Co-create (Innoviris) research project that gathers multiple partners. As such, it receives additional funding from the Brussels-Capital Region. The project's objective is to develop a creative and productive living lab, in partnership with the neighbourhood's residents, dedicated to recovering and reusing wood. It offers training courses for local residents. The building that houses the project is a former used vehicle business. The municipality plans to develop a housing project (in its place), through a public-private partnership. Once construction work begins, the WIM project will be permanently relocated into another building in the same city block.

Towards other urban temporalities

Temporary occupations are a growing phenomenon, in Brussels as well as in many European cities. The practice consists in occupying vacant buildings or spaces while they are not used by their owners.

The Metrolab MasterClass examines the ecosystems linked to the practice of temporary occupations. What are the spatial and social forms of temporary occupation? How do they contribute to an ecological, political, social and cultural transition? The current debate on temporary occupation and the densification of Brussels is proof of the tension that exists between the temporalities created by market approaches and the temporalities that enable the creation and reinvention of a variety of usages. The hypothesis explored here is that this variety can occur in the spatial and temporal gaps within territories. In particular, the MasterClass looks into the concept of 'transitory urban planning' as a lever

for the qualitative densification of the city. Questioning Brussels' temporary occupation ecosystems also means examining the coexistence of various approaches, as well as the mediation tools that make this coexistence possible in the longer time frames involved in densification processes.

Through these two case studies — involving ongoing transformation processes in two different morphological contexts that generate interactions between players promoting different values —, the MasterClass attempts to lay the groundwork for reflections that could help ensure this coexistence in the long run.

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Circularity

On scales and agency – territorialising circularity

Andrea Bortolotti, Geoffrey Grulois, Stephan Kampelmann

Steering the transition towards a circular economy (CE) is one of the pillars of the EU's regional development strategy. The concept is appealing for its promises of boosting new economic cycles in times of crisis while tackling major environmental issues (such as resource depletion, pollution, etc.). Drawn from the European strategy, the concept of circular economy — together with that of sustainable urban metabolism, intended as a model of material economy with reduced negative externalities — has gained traction in Brussels among business and policy-makers, being translated into objectives in regional plans and programmes. Addressing the issue of 'circularity' within the framework of the Metrolab MasterClass and in collaboration with the ULB Chair on Circular Economy is thus a way to reflect on the urgent question about how to territorialise discourses and strategies on circular economy and sustainable urban metabolism in the context of Brussels' regional development and policy.[1]

Three challenges for a circular economy

Today, city administrations in Beijing, Amsterdam, Paris and Brussels have in common that they claim to use the principles of 'circular economy' as their compass for navigating economic and environmental challenges. The policy roadmaps they produce in this context often describe the circularisation of urban systems in terms of their 'metabolism'. The two central concepts underpinning these policies — the urban 'metabolism' and its 'circularisation' — remain, however, often very poorly characterised. Regarding the notion of 'metabolism', the metabolic overviews that have been commissioned by cities are largely confined to discussing material flows to, from and within a given urban agglomeration (see, for instance, EcoRes, ICEDD and BATir, 2015). In most cases, this is achieved through quantitative accounts in form of

1. This paper is an elaboration based on our contribution to the publication *Designing Territorial Metabolism* published in 2018 (Grulois et al.).

Material and Energy Flow Analysis (MEFA) or Sankey diagrams.[1] As shown by the seminal experience of Paul Duvigneaud in Brussels, the intensity of flows is, however, not the only dimension of a city's metabolism. The first objective of this contribution is to discuss the implications of the spatial scale and structure at which these flows and circularities are organised and the socio-technical agencies that govern them.

Current uses of the notion of 'circularisation' are often simplistic. Arnsperger and Bourg (2016) recently pointed out that many of the CE policies and promises churned out by governments, consultancies and corporations are, in fact, not 'authentically' circular. Being soaked in the language and ideology of economic growth, these circular economy initiatives might eventually fall short of expectations. A better understanding of the various dimensions of urban metabolism and their circularisation is not only of theoretical interest; the issues of **intensity, scale and socio-technical agencies** are also relevant in the practical context of developing plans and strategies aimed at improving metabolic flows in the urban environment. To be sure, previous research on planning for circular economy — and, in particular, contributions based on research by design (Grulois, Casabella, Crosas and Perea, 2015; Grulois, Tosi and Crosas, 2018) — has already touched upon all of the three dimensions of urban metabolism we highlight in this paper. However, a critical approach that frontally and explicitly addresses the multidimensional character of circularity is still missing in the literature.

Intensity

The intensity of stocks and flows of water, construction materials, nitrogen, food, fuel, final products, municipal waste, etc. is arguably the most explored aspect of urban metabolism in Industrial Ecology and neighbouring fields (Weisz and Steinberger, 2010). The analysis of metabolic intensity relies on quantitative indicators such as the primary and final consumption of a given territory. The literature has also developed tools that pull several quantitative indicators of metabolic intensity together, such as Material and Energy Flow Analysis (MEFA), Life Cycle Analysis (LFA) or Sankey diagrams. These approaches have the merit of allowing more systemic analyses of the relationships between different material flows (Haberl, Fischer-Kowalski, Krausmann, Weisz, and Winiwarter, 2004). Following quantitative indicators over time has led to the observation that the flows of many substances have intensified in most cities over the 19th and 20th centuries (Barles, 2015; McNeill, 2001).

How would circularisation affect the intensity of stock and flows of the urban metabolism? The answer to this question marks a clear divide between, on the one hand, those that see circular economy as a 'Third Industrial Revolution' harbouring the prospect of renewed economic growth and those, on the other hand, who argue that the circularisation of material flows necessarily entails a drastic reduction of their intensity. The drum of the former fraction has been banged most loudly by the Ellen MacArthur Foundation, a lobbying group that never misses an opportunity to tell the world's largest corporations that they can grow bigger and faster by embracing the principles of circular economy. Among the spearheads of the critical stance are Christian Arnsperger and Dominique Bourg, whose recent work sums up convincing arguments leading to their conclusion that an 'authentically circular economy' is incompatible with strong economic growth (Arnsperger and Bourg, 2016).

To the extent that economic growth and material throughput continue — at least at larger scales — to be highly correlated, the critical stance developed by Arnsperger, Bourg and others offers a sobering message: the circularisation of the urban metabolism not only implies purging toxic materials, but also a general reduction of throughput intensity of all other substances whose reproduction cannot keep up with the pace of economic growth. This calls for reducing the throughput of virtually all resources whose global use exceeds a growth rate of 1%, and therefore also materials with an already very high recycling rate, such as metal or paper.

Circular economy might stand at a crossroads: either it will become entirely

2 A Sankey diagram depicts flows of any kind, where the width of each flow pictured is based on its quantity.

subsumed under the promise — and illusion — that economic expansion and resource circularity are compatible; or it embarks on a more critical programme that asks for ways towards circularisation that do not depend on economic growth. We believe that the critical programme cannot succeed if it is only confined to issues of material and energy intensity. A pro-growth interpretation of circular economy is hardly concerned with issues of political economy: the champions of the business-as-usual approach are also supposed to be those who underpin circular resource flows (see the list of corporations endorsed by the Ellen MacArthur Foundation for their circular business practices: Total, Renault, H&M, Unilever, etc.). By contrast, a post-growth interpretation of circular economy is a heterodox undertaking that needs to explain how economic systems such as urban economies can operate within certain limits. These limits are biophysical in nature, but need to be negotiated socially. This negotiation could give rise to a new social(-ecological) contract defining viable throughput intensities, but also the spatial structure and socio-technical agencies of circular flows. This negotiation could be greatly helped if social scientists, planners and designers provide concepts and representations for territorial metabolism in which economic actors (including for-profit and non-profit organisations) consider the physical and social boundaries of the ecosystems that sustain them. So far, for instance, the physical, spatial and social implications of a post-growth economy have hardly been explored at all. The goal of the circularity transdisciplinary group working in the framework of the Metrolab MasterClass is therefore to shake the industrial ecology and urban metabolism paradigm in order to tackle the questions of scale, place and agency that are implicit in the notions of territorial metabolism and political ecology.

Scales

The intensification of throughput that characterises the historical evolution of most cities has been accompanied by spatial externalisation (Barles, 2007, 2015; McNeill, 2001). This means that urban regions such as Brussels source materials and energy from outside of the urban core from ever larger and more distant ecosystems and territories. Not only the provision of materials and energy has been externalised to a globalised hinterland: since the second half of the xixth century, cities also depend on external ecosystems to absorb growing quantities of waste. Geographers and ecologists have documented the spatial externalisation of urban metabolism through a series of indicators such as Ecological Footprints, (Wackernagel and Rees, 1996), Food Miles (Weber and Matthews, 2008) or Food-Prints (Billen, Barles, Garnier, Rouillard and Benoit, 2009). Applying the latter to the case of the Île-de-France region, Billen et al. show that the territory of the food metabolism includes various provisioning areas at different scales, ranging from the traditional and relatively close agricultural hinterland surrounding Paris to vast stretches of South America. This fact leads critical urban theory inspired by Henri Lefevbre to consider that beyond the city, urbanisation is a planetary phenomenon as the territory of resource extraction and waste disposal is global (Brenner, 2014).

What does the objective of circularisation imply for the territory of a city's provisioning and disposal areas? First of all, it should be clear that the circularisation of flows cannot be considered at a single scale. The multi-scalarity of resource extraction and waste disposal make it impossible to return to the dichotomy of a city versus a clearly defined agricultural hinterland. To go back to the biological origins of the metaphor, the metabolism of, say, a tree cell is not circular if we look at it at the scale of the cell. Even the entire organism, i.e. the whole tree, is not circular, as it is mostly engaged in biochemical interactions with its environment. Only if we zoom out and take into view the entire forest ecosystem can we perceive natural cycles of nitrogen or carbon that have been described by scientific ecology. Metabolic exchanges are also mostly linear if we confine the analysis to cities. In fact, with the exception of acute crises, it seems to be a historical constant of a city to behave as a 'parasite' (Odum, 1989), in the sense that it depends on hinterland for their survival (Barthel and Isendahl, 2013). This implies that restricting circular economy policies to the single scale of a city such as the Brussels-Capital Region can only provide relatively anecdotal leverage. Even urban agriculture, which is arguably one of the most emblematic efforts of organising circular flows within city boundaries, will hardly reduce the need for access to arable land outside of the

city. Indeed, early contributions on urban metabolism by Wolman (1965) and others were not confined to the limits of the city, but rather used the concept to 'characterise the city as an ecosystem embedded in a larger system' (Broto, Allen and Rapoport, 2012, p. 852) Today, this larger ecosystem is the biosphere and it involves various interdependencies on many different scales. As a consequence, rather than eradicating resource input and waste output to a city, circularity implies activating exchanges across areas with different urbanisation patterns (urban core, agricultural hinterland, extraction and waste territories, etc.). Such intricate territorial metabolism can only be circular if we recognise that the provisioning and disposal spaces overlap at different scales.

A circular territorial metabolism is, however, as much a social as an ecological problem. In addition to ecological parameters, the contours of a circular territorial metabolism will also depend on social and technical factors. It forces us to set aside the traditional division between nature (material resources) and society (human and technical agency) (Wachsmuth, 2012). For example, returning nutrients to cultivated ecosystems implies designing, financing and operating socio-technical infrastructures that are fit for this purpose. It means that actors from both urban hubs and agricultural areas will have to cooperate in order to coordinate the flows of organic resources — which, in turn, necessitates a system of governance that goes beyond the boundaries of the region and that is able to attenuate the inevitable conflicts of interests between the urban hub and the agricultural hinterland.[2] Another issue relevant for the design of circular metabolism appears if we consider the urbanised territories as a multifunctional whole. In this perspective, sustaining the urban hub not only requires a certain space or territory from which resources are sourced, but also raises questions about how the spatial diversity and the different functions of urbanisation can be grasped in order to be circular beyond the traditional division of the city vs country and society vs nature.

One way to frame the complexity of a circular territorial metabolism beyond the question of territorial scale and the nature-society division is by looking at it as a social-ecological system, an ensemble in which biophysical and anthropogenic elements interact in complex ways (Olsson et al., 2006). Since the vast number of social and ecological factors cannot be expressed in a commensurate metric, the design of a circular social-ecological system is a transdisciplinary qualitative exercise that needs to define new social, economic or political institutions that underpin these flows. An example of designing new and circular social-ecological systems is the idea of 'bioregionalism' as proposed by David Brunckhorst (2000). This approach combines the definition of ecosystems at regional scales with the problem of social institutions capable of sustaining them through durable forms of extraction and resource renewal. A 'bioregion' is therefore not only an ecological system with a regional scope, but also a political entity. While certainly attractive for the circularisation of flows that can be organised at the regional scale (like food or certain building materials), bioregionalism should not obliterate material and social interdependencies at other scales.

In summary, the implications of circularity and territorial metabolism are both extremely simple and almost infinitely complex. Simple because their physical organisation can be expressed in a concise formula: provisioning spaces need to overlap with disposal spaces so as to allow for closed loops of resource production, use, disposal and renewal. Complex, because the scale at which these loops can occur will vary greatly depending on the material flow, geomorphological context and urbanisation rate at hand and require designing not only technical infrastructures, but also institutions that are capable of organising the social, political and economic ramifications of circular flows. The following section uses the lens of socio-technical agencies to look in more detail into these non-physical aspects of circular territorial metabolism.

Socio-technical agency

The literature on circular economy, and, more specifically, on the circularisation of urban metabolism, still offers an extremely rudimentary understanding of agency.

2 In the case of Brussels, the Brussels-Capital Region versus Flanders and Wallonia.

Wachsmuth (2012) noticed the absence of 'the social and the historical' in early theories on circular and linear urban metabolism in the Industrial Ecology tradition. But issues of agency are even less topical in the more recent discourse on circular economy by the Ellen MacArthur Foundation, arguably because the great transition towards circularity that this discourse advocates leaves the distribution of economic and political power of the linear economy almost untouched: citizens continue to be passive consumers of goods and services, the only difference being that these products are redefined to allow for more efficient resource circulation; public administrations are supposed to play a role in the transition towards circular economy, but only within the neoliberal tradition of supporting and facilitating agencies that leave most of the initiative to the market; and corporations like Total and H&M can simply switch from linear to circular business models without giving up their habitus of profit maximisation, capital accumulation, shareholder satisfaction and economic expansion.

How could a critical interpretation of circular economy principles reintroduce questions of agency? We argue that a pivotal aspect of agency should revolve around the relationships between different social groups and technology. To be sure, the technological configuration plays a central, if not overriding, role in how materials and energy flow through territorial social-ecological systems. In most cities these flows are organised in centralised networks such as underground sewage systems. Historiographical accounts on the emergence of these centralised networks suggest that they have been conditioned and marked by a specific social group: engineers and technicians (Barles, 2015; Deligne, 2016; McNeill, 2001). From an Industrial Ecology perspective, we can add that this group also plays a dominant role for the possibility of reforming current technological configurations. Engineers are, to use the terminology of the *Multi-Level Perspective on social-ecological transitions* (Fischer-Kowalski and Rotmans, 2009), part and parcel of the 'hardness' — in a literal and metaphorical sense — of socio-technical landscapes, which 'include the material aspect of society, e.g. the material and spatial arrangements of cities, factories, highways, and electricity infrastructures' (Geels, 2004, p. 913). The flipside of the central position of engineers and other technical experts in territorial metabolisms is the relative powerlessness and passivity of the large group of individuals that use the technical infrastructures on a daily basis, but also a relative dependence and captivity of decision makers.

Similar to the opposition between pro-growth and post-growth stances regarding circular urban metabolism, different types of socio-technical agencies can also give rise to contrasting paths towards circularisation. On the one hand, circularisation initiatives can be as technocratic as the linear arrangements they aim to replace. Indeed, if the circularisation of metabolic flows will be driven top-down by large corporations and market-oriented public administrations, it is not unlikely that the infrastructures that will underpin the circular flows will resemble current infrastructures in their capital-intensity and centralised nature, thereby maintaining both the centrality of experts, passivity of users and dependence of political decision makers. On the other hand, there are circularisation initiatives that challenge the current technocratic set-up and propose to organise circular flows in which users become agents and have a much more proactive role. This type of initiative tends to rely on less capital-intensive and more decentralised technical infrastructures (Coutard and Rutherford, 2009). To the extent that the latter can often be understood, modified or even replaced by the users themselves, they allow for a degree of socio-technical emancipation.

Framing circularity in Brussels: the Metrolab experience

How did Metrolab reflect on these challenges of territorial metabolism and circularity? In October 2018, we invited David Wachsmuth and Matthew Gandy to question the notion of urban metabolism and the society-nature division at the Brussels Ecosystems conference. In the same conference, we discussed the issue of 'circularity' during a round table gathering stakeholders, professionals and academics concerned with two projects funded by the ERDF programme (2014-2020) for Brussels directly linked with the topic of the circular economy: IRISPHÈRE and BBSM (Bâti Bruxellois comme source de nouveaux matériaux de construction — Brussels buildings as a source for new

construction materials). IRISPHÈRE is a project coordinated by citydev.brussels — a public body and major property developer in the Brussels-Capital Region — that seeks to foster industrial symbiosis in Brussels by identifying and seizing economic opportunities for material reuse and sharing of facilities, resources and services among enterprises. In particular, the programme aims to invest in the creation of a container park in an industrial area along the canal for the collection and reclamation of organic waste through a collaboration with a local farm. IRISPHÈRE faces some of the challenges described above, such as the question of determining the right scale for governing circular economy projects.

BBSM is a research project coordinated by UCLouvain that aims to show that construction materials are resources whose recirculation can improve the sustainability of the region. The project tackles some major socio-economic challenges for Brussels, such as the steadily increasing amount of construction and demolition (C&D) waste, the reinforcement and implementation of local value chains, and the creation of new jobs. It explores potential waste material flows in the construction sector in order to steer waste planning and management and examines the opportunities of the construction sector's value chains, the technical and legal aspects related with material recovery (reuse and recycling) and the role of design. The final objective is to develop a tool for an efficient management and exploitation of local C&D waste in Brussels. While BBSM has developed a clear model of material reuse, it seeks a governance model to steer the circular transitions in the construction sector.

Discussions of the workshop unfold some common issues in recycling and the circular economy such as the absence of appropriate regulatory frameworks to incentivise reuse over disposal, the uncertainty of business models and lack of space to store materials in dense urban contexts. At the time of the conference, the recircularization of organic matter projected by IRISPHÈRE faced difficulties due to the lack of environmental authorisations required for waste transport and treatment by the project stakeholders and technologies chosen for this purpose. Experts from BBSM, instead, raised the question of the lack of skilled workers, appropriate planning and storage space for materials in C&D sites in Brussels, three necessary conditions to enable materials sorting and sending to recycling. These questions shed light on the complex and intricate system of actors, knowledge and practices that underlie and challenge the project of circularity.

In January 2019, the MasterClass on 'Designing Brussels Ecosystems' brought together again academics and researchers, regional stakeholders and professionals from different fields for a two-week intensive workshop in order to address some of the questions previously identified during the conference. We chose to propose the topic of circularity within the construction sector in Brussels as one of the four themes to be discussed. In addition, and in concertation with the ULB Chair on Circular Economy, we suggested addressing the issue by focusing on a particular neighbourhood of Brussels — the Northern Quarter, a mono-functional business district neighbouring the city centre — and leveraging the concept of hotspot of the circular economy.

Construction materials and minerals make up 20% of total material import in the Brussels-Capital Region (BCR), or 2.239 kt (in 2012). Unlike other imported material flows, which are for the most consumed or accumulated within the region (e.g. food products, fuel, etc.), construction materials and minerals are exported outside Brussels in even larger quantities (2.422 kt in 2012). The construction sector is the main economic activity in the Brussels region. As a consequence, construction and demolition (C&D) waste is the most important waste flow for the region, accounting for more than one third of its total solid waste (EcoRes, ICEDD and BATir, 2015)[3]. In addition to the demolition of existing buildings, C&D waste is generated as a result of design errors in new construction, improper procurement and planning, inefficient material handling and changes in building design and regulation. Composed of building debris, rubble, earth, concrete, steel, timber and mixed site clearance materials, at present, these materials are largely hauled, landfilled or

3 see map of main urban transformation projects and plans p. 68-69

downcycled (e.g. used as inert material for the foundation of roads and buildings) outside Brussels.

Is decoupling the use of material and natural resources from economic development a fundamental challenge for the Brussels construction sector? As new constructions and renovations (e.g. of mobility infrastructure) are growing in Brussels, current circular economy policies are pushing for some of these materials to be reused and exploited within regional boundaries. It thus remains to understand how to manage this material in Brussels, as it is bulky, hard to compress and requires large storage space that might not always be available on site. The challenge is also to rethink the collaboration of stakeholders (building construction and demolishing contractors, construction site managers, architects, construction material providers, construction waste companies, etc.) at different scales (construction site, neighbourhood, region, etc.). On the one hand, waste characterisations showcase increasingly refined accounting methods that integrate factors affecting waste generation such as building design and structure codes, material quantity take-off, material wastage levels and mass balance principle (Jin, Yuan and Chen, 2019; Yeheyis, Hewage, Alam, Eskicioglu and Sadiq, 2013). Building Information Modelling (BIM), for instance, virtually reproduces a project in a way that all facets can be properly planned before site construction begins, including spatial coordination of all materials, labour and sequencing for the construction of the project (Goedert and Meadati, 2008). BIM can be used in the building design stage to estimate the amount of construction and (eventual) demolition waste produced in the construction stage. Emilie Gobbo has developed a similar tool within the BBSM project to predict the amount (and type) of waste generated from the renovation of a typical early xxth century Brussels' house. But very little has been said concerning the actual process of demolition and construction and agency of its stakeholders.

On the other hand, planning strategies to minimise waste and improve reuse and recycling are still rare. These include sustainable procurement of materials, design, construction scheduling and site layout, where proper management of materials plays a major role in site waste reduction (Ekanayake and Ofori, 2004). Demolition methods used to remove materials from a structure are also an important factor that affects the amount and quality of waste generated in a form appropriate for reuse and recycling. For instance, recycling aggregate requires demolished concrete to be screened on-site to sort out impurities and stored beside the construction site to be readily used as aggregate for new concrete. Other aspects include the workforce, the lack of which is a major impediment to on-site sorting requiring extra labour; the existence of a market for recycled materials, without which contractors might not be interested in performing on-site sorting; the ease of disassembly of construction components, which affects the quality of recovered materials.

From these few lines, we can clearly see sustainable territorial metabolism and the project of circularity require active coordination (also in terms of temporality) between C&D sites, standards, agents, materials producers and waste collectors, in order to enhance the effective exchange of materials for reuse and recycling.

The design task: scaling circular economy hotspots

The MasterClass questioned how to steer circularity into the construction sector building on the notion of hotspot — intended as a spatial catalyst and key urban sector for rethinking urban flows. The Brussels Regional Programme for the Circular Economy (PREC) supports the circular economy in order to enhance the competitiveness of regional companies and create new job opportunities. One of the biggest challenges of the Brussels-Capital Region is now to understand how to territorialise generic programmes and strategies at the regional level. The Chair on Circular Metabolism suggests reorienting this territorial axis of the PREC by deploying the concept of 'circular economy hotspots'.[4] The concept focuses on the idea that the territorialisation of circular economy policies requires catalyst places (urban districts, neighbourhoods, etc.) that play a strategic role in the spatial and quantitative organisation

4 https://www.circularmetabolism.com/output/7

of important flows of the region's material economy. Those are also places where proximity allows to trigger synergies between multiple projects, actors, and programmes. The notion of hotspot remains open to various scales, and is not delimited to a specific area. It allows to investigate the multi-scalar complexity of material exchanges and stakeholders' agencies while addressing a concrete case.

In the MasterClass, we proposed exploring and developing the notion of circular economy hotspot in Brussels by focusing on the case of the Northern Quarter. As a place of concentration of business activities located next to large-scale infrastructures (canal and railway) and a former industrial area (Masui), the district is currently invested by a process of significant transformation of its physical structure and outdated built environment, supported by the pressure of the residential sector. Given its strategic role and importance for the future of Brussels, this place and its development could benefit from the experience gained by the many actors and projects of circular economy in Brussels. The goal of the design exploration is to address the complex network of stakeholders and material flows that the important physical transformation of this environment will entail. To do so, we asked the participants to seek out and build synergies with the (eco)system of material reuse and recovery projects (among which ERDF projects BBSM and Usquare) and inspiring practices such as Rotor and BC Architects, which have gained relevant experience in the field in Brussels (Ghyoot, Devlieger, Billiet and Warnier, 2018; Lefebvre and BC Architects & Studies, 2018).

During these two intensive weeks, we have pushed to radically rethink agency within the current material economy (in the conception, production and application in the construction sector). We questioned current compartmentalised visions and practices in the C&D sector, trying to imagine, in the time available, the mix of policies and integrated actions needed to support greater circularity of construction materials. We questioned regulatory issues, as well as issues of material lifecycle, of collaboration among material producers, designers, university and schools and labour, in order to promote the use of materials that better meet criteria of repairability, durability and upgradability. We question whether Brussels is able to metabolise its material construction flows within new productive cycles with positive relapses for the whole citizenry as to escape its destiny of being 'modernity in a state of ruin' and rise from the vestiges of its industrial past to build, collectively, a more circular territorial metabolism.

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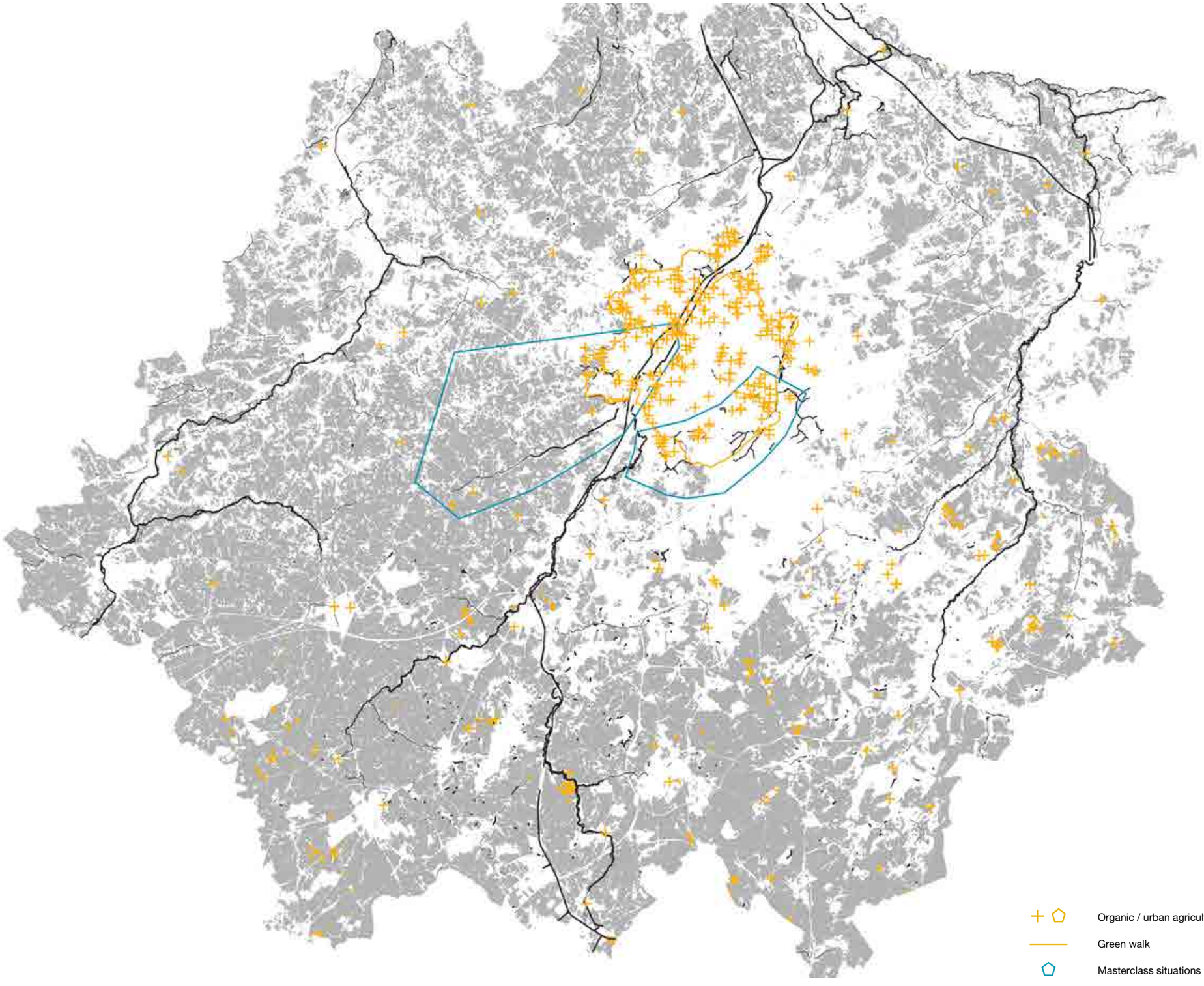
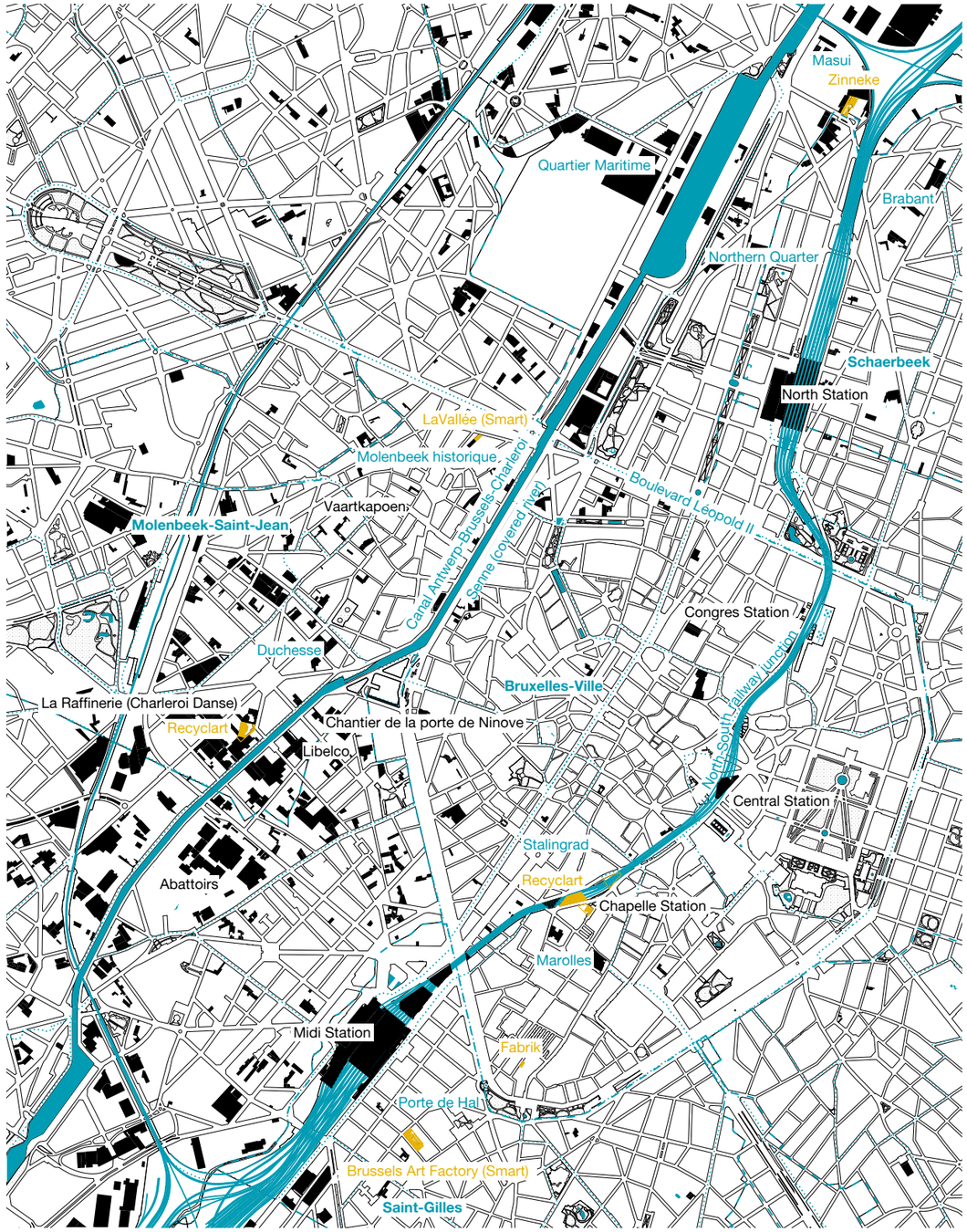


Bruxellian Bioregion: Agricultural matrix
and (some) agroecology initiatives



Workplaces and third-places of social economy: three situations

Source: URBIS, Observatoire des activités productives

0 500 m

Situations

Workshop and warehouse spaces > 1000m² and places mentioned in the text

Carrying metropolitan infrastructures

Municipalities

Districts

Green areas

Urban blocks

Temporary occupation projects mentioned in the paper :
Past projects:
1. L'Ilot Soleil
2. L'hôtel Tagawa
3. 123 rue Royale
4. Rue du Progrès (Woningen123logements)
5. Programme PRECARE
6. Recyclart
7. Pic nic the street

Ongoing projects:
8. Recyclart
9. La ferme du Chant des Cailles
10. Commons Josaphat
11. Parckfarm
12. Allée du Kaai (Toestand)
13. La Serre (Communa)
14. See U at Usquare
15. WTC (Up4North)
16. Tri postal
17. Studio CityGate
18. Pop up Canal

Authorized Housing Permits by Statistical Sector between 2003 and 2018:

-2.0 – 9.0

9.0 – 25.0

25.0 – 53.0

53.0 – 106.0

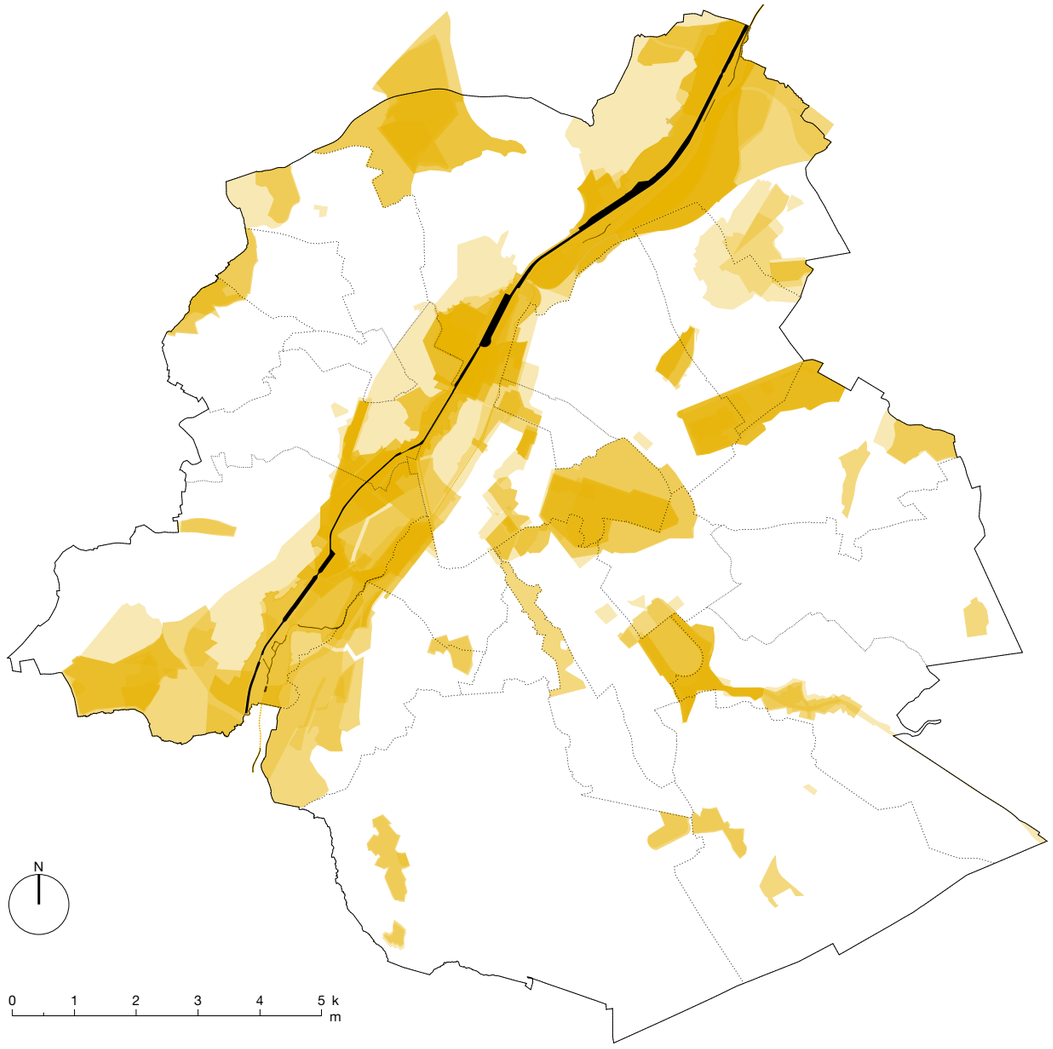
106.00 – 220.0

Source: Observatoire des permis de logement
1:100000

Public actions, actors and projects

- Existing (Canal and administrative boundaries)
- Transects and strategic neighborhoods (Nature Plan)
- Public and parapublic management spaces (Brussels Mobility, Brussels Environment, citydev.brussels)
- SAU projects
- citydev.brussels (SDRB) projects
- SLRB projects
- Brussels Mobility projects
- Beliris projects
- Urban renovation projects (neighborhood contract, urban renewal contract, EFRO)
- Green promenade path (Bruxelles Environnement)

Source: Pauline Varloteaux's research 'Anatomy of Brussels Urbans Projects'



Planological persistence

- Existing (Canal and administrative boundaries)

Plans intensity

- 5
- 4
- 3
- 2
- 1

Source: Varloteaux Pauline research 'Anatomy of Brussels Urbans Projects'

Design Explorations

Agriculture

Urban Agriculture COOP's on a Shared Landscape

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Stefania D'Altiero
David D'Hondt (stakeholder)
Maarten Dieryck (stakeholder)
Sarah Dujardin (stakeholder)
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Introduction: evidence of fragility

Food has an enormous impact on our lives and on the city. The food sector is responsible for approximately a third of carbon dioxide emissions in Belgium and a quarter of the overall environmental impact of Brussels households, which makes it a key area in addressing climate change and sustainable urban development.

Policy makers, food producers, and citizens who are aware of this fact are increasingly producing their food locally. As a result, a considerable range of pioneering urban agriculture projects have popped up in the Brussels-Capital Region, connecting city residents, producers, and consumers around the production of high-quality food. A lot of pioneering farmers seek purpose and meaning in their daily lives, making a radical shift from their previous jobs and lifestyles to start urban farming. Recent policy initiatives aim to nurture and empower these pioneers through coaching programmes and financing instruments such as Good Food and BoerenBruxselPaysans. However, despite these government initiatives, it remains extremely challenging for urban farmers to build a livelihood and break through the traditional food system.

The reasons for this, which emerge from the field research underlying this project, are manifold. First, agricultural land in Brussels is scarce, with barely 1.5% of the city's designated for farming. Land is difficult to acquire, since farmers have to compete with other development needs, such as housing, sports infrastructures, and industry. As a result, many farmers are forced to settle for small, less desirable plots with relatively high land prices. Second, low market prices and difficult permeability in the consolidated retail chain limit the growth of local farming initiatives. The price that consumers are willing to pay is too low for the actual cost of high-quality food. Many urban farms rely on subsidies, voluntary labour, or rent-free land to make their businesses run. Third, many of the farmers interviewed refer to the complexity and unpredictability of their daily work. Most pioneering farmers operate alone or as small teams, and are therefore responsible for all aspects of cultivating, distributing, and selling food.

The above-listed dynamics make pioneering practices very fragile and jeopardise their future. During the Designing Brussels Ecosystems MasterClass, we took these fragilities as a starting point from which to imagine an alternative ecosystem, in which long-term viability of pioneering practices could be assured.

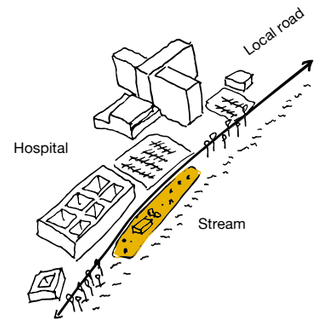
Ecosystems & situations

As mentioned above, during the MasterClass we visited 5 urban agriculture projects (Les Moutons Bruxellois, La Grange en Ville, Cycle Farm, Chant des Cailles and Atelier Groot Eiland) and interviewed 6 pioneers in urban farming (one from each project visited, and one from Linked Farm, a cooperative for urban agriculture logistics). The visited projects were very diverse and included farms focused on innovating and optimising their production methods, educational practices providing training to students and local job-seekers, and community-based projects producing food in close collaboration with the neighbourhood. This showcases the diversity of over 600 existing urban agriculture projects and initiatives in the greater Brussels area.

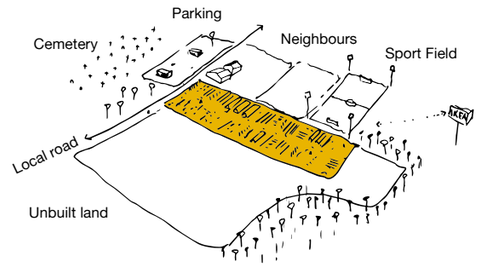
Even though all five projects were very different, they had a common ambition: produce food in a sustainable way, activating a wider range of networks and mechanisms than many practices in the conventional and industrialised food system. The farmers interviewed knew most of their customers personally, worked with yearly subscriptions, and were very transparent about their methods of production. Through these actions and connections, they were actively contributing to and building an alternative ecosystem. To unravel the processes, networks, and geographies underlying this alternative ecosystem, we used a dual perspective in which we looked from the outside (system wide perspective) and the inside (farmer's perspective).

In the outside perspective, we compared the processes involved in current, market-driven models with those of emerging agricultural practices. On the other hand, the farmers' perspective gave us insight into what it means to establish an urban agriculture practice in Brussels today. After this dual analysis, we decided to further focus our attention on the ecosystem that is emerging in the Neerpede, Vogelzangbeek, and Pajottenland area, in relation to the practices of David (Les Moutons Bruxellois) and Nathalie (La Grange en Ville).

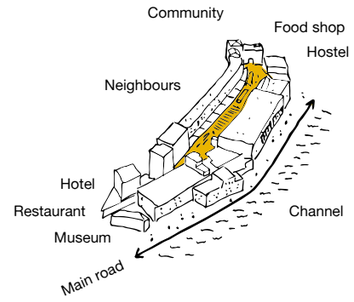
Les Moutons Bruxellois is a private initiative run by David, a school teacher and urban shepherd who takes care of a 10-sheep herd in the city. David's aim with his project is to produce wool and meat in order to create a short supply circuit and raise awareness of issues of meat consumption and biodiversity. Not far from David's site is La Grange en Ville, run by Nathalie, a former nurse who made a career switch and became an urban farmer, producing vegetables on a one-hectare plot of land. Her goal is to produce healthy and sustainable food inside the urban landscape.



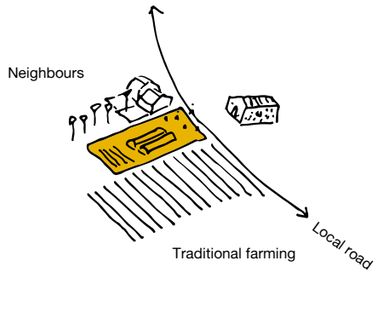
Situation 1: Les Moutons Bruxellois



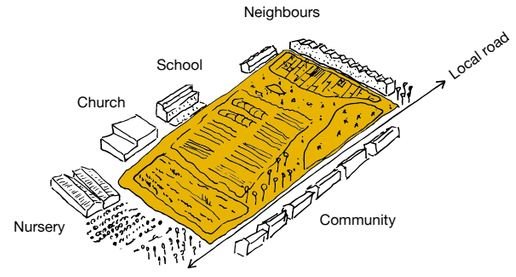
Situation 2: La Grange en Ville



Situation 3: Atelier Groot Eiland

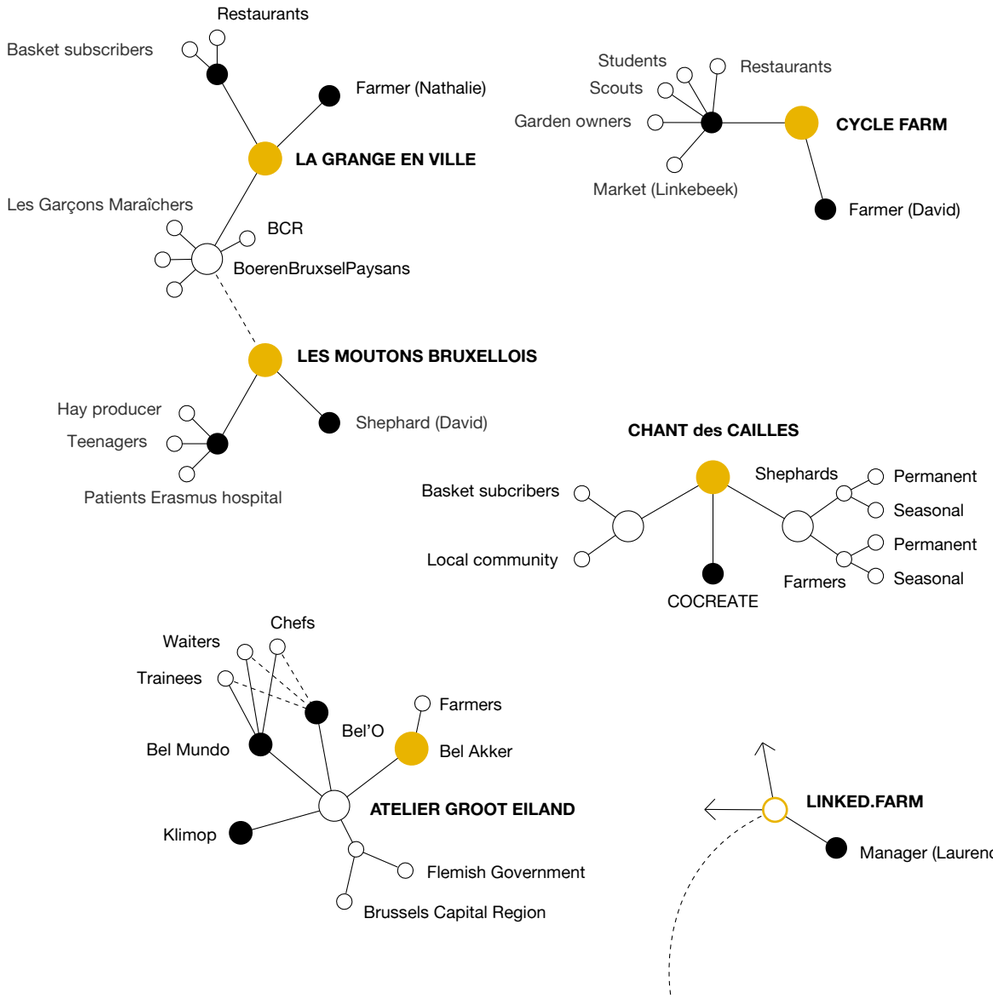


Situation 4: Cycle Farm



Situation 5: Chant des Cailles

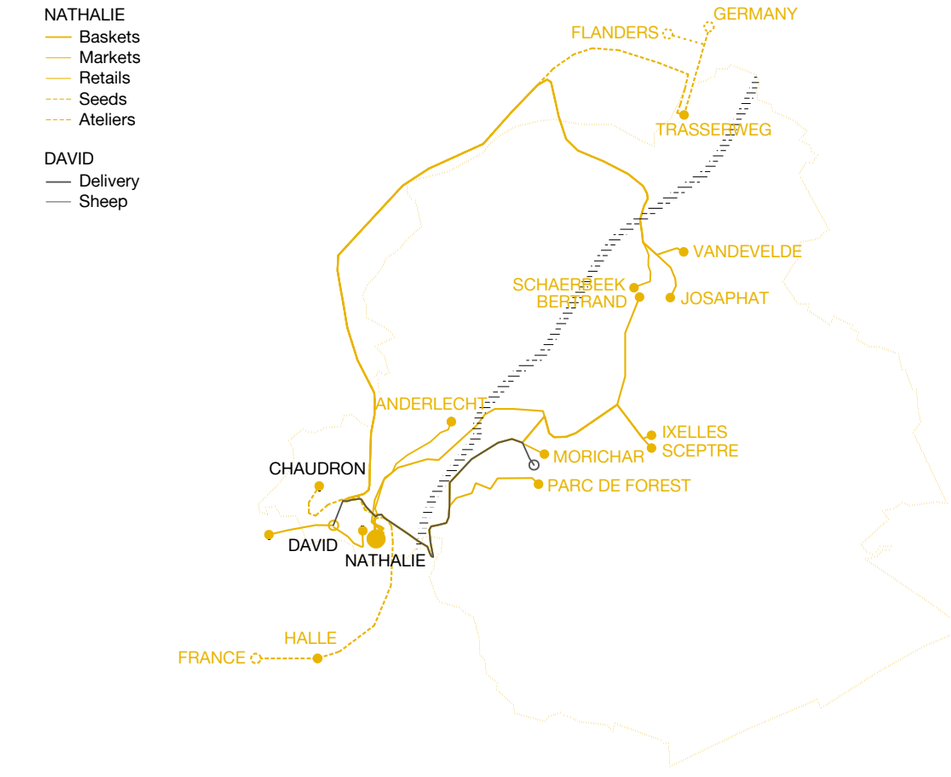
In the course of the masterclass we visited 5 urban agriculture initiatives where we had the opportunity to interview different urban farmers. David from Les Moutons Bruxellois, Nathalie from La Grange en Ville, Maarten from Atelier Groot Eiland, David from Cycle Farm and Antoine from Chant des Cailles. We also had a talk with Laurence from Linked. Farm (not pictured).



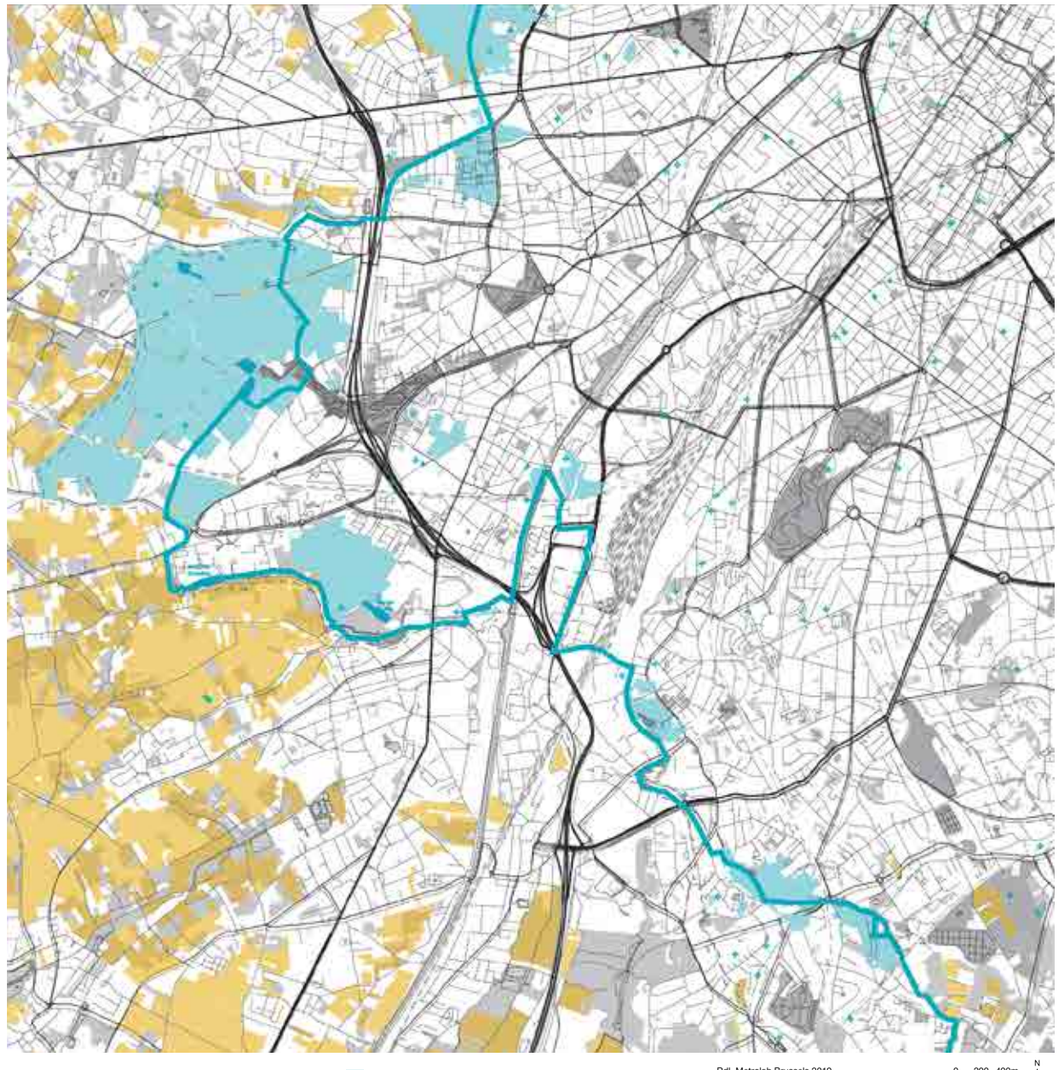
Most practices worked autonomously, covering all aspects from cultivating to selling food. Some were more networked, such as the farm of Nathalie, which was initiated under the umbrella of BoerenBruxselPaysans. Alongside the independent pioneering urban agriculture practices, initiatives such as Linked.Farm are emerging, focusing on the distribution of vegetables and aspects of accounting.

During the workshop, we focused on the establishment of practices in the Neerpede valley. On the one hand, because it's an area with a long history in farming on smaller plots (the so-called 'Boerkozen'). On the other hand, because of the BoerenBruxselPaysans initiative, which gives pioneering practices already a rather networked state.

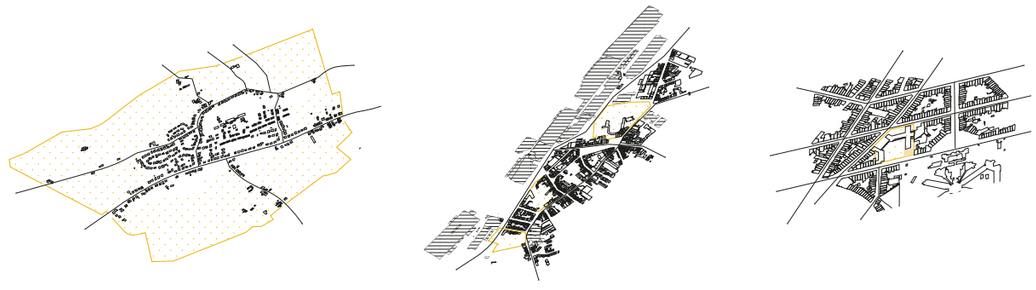
The first practice we further investigated was the practice of Nathalie, one of the urban farmers of BoerenBruxselPaysans, who owns a small vegetable farm on test site in the Vogelzangbeek (top). Additionally, we also looked at David's practice (bottom), a shepherd who keeps his sheep on one of the meadows next to the Erasm hospital in Anderlecht.



We mapped the farmers daily routines in time and space to understand their impact on the physical environments and the social networks they build. Through this exercise, we unraveled new geographies being activated by the farmers.



We observed that the mapped geographies followed the orientation and places of the green network (Green Walk). Through a GIS-analysis, we investigated a pattern of urban agricultural fields that could be identified along the green network, embedded within a larger continuous and diverse landscape of agricultural fields.



The green network is in close proximity to different types of neighbourhoods, with different morphologies, qualities, needs, etc. As a result, there are very different conditions to be found around it for the cultivation and consumption of food, which could be turned into a continuous productive urban landscape.

Designing ecosystem transition

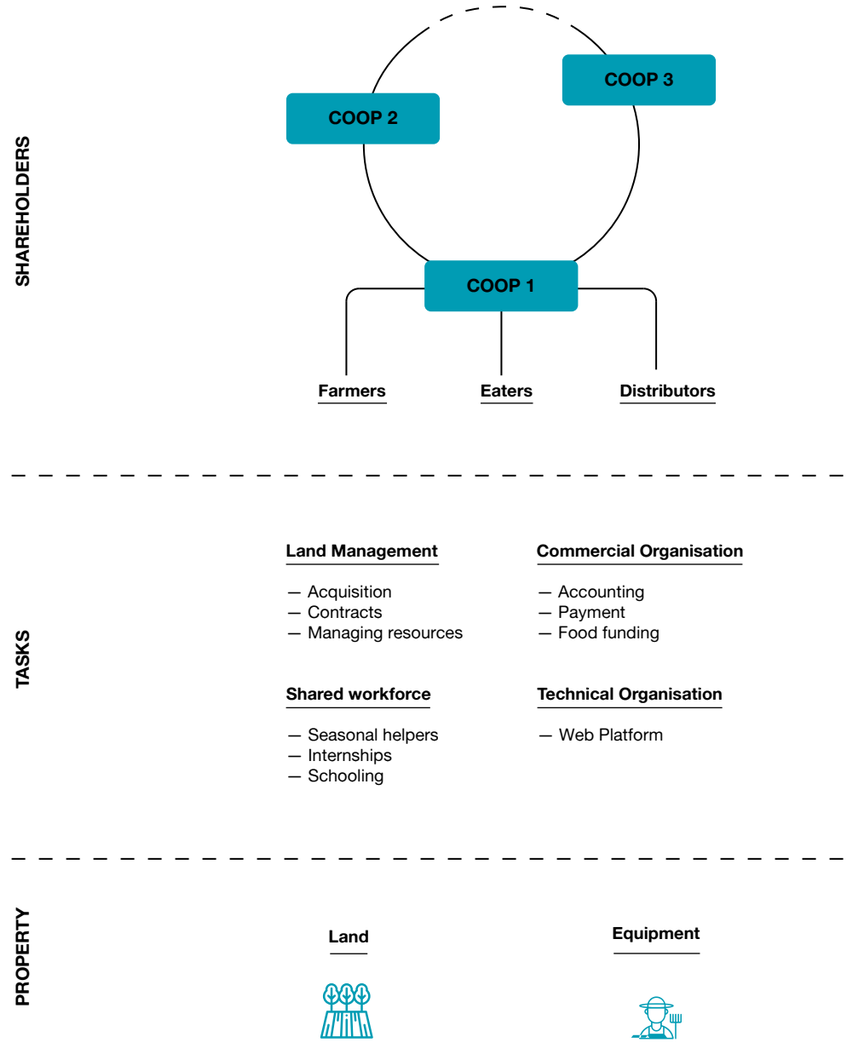
During the MasterClass, we investigated if and how a multi-scalar, cooperative model (COOP) on a shared landscape could improve the daily working conditions of pioneering farmers. This cooperative model is inspired by the activities of umbrella organisations such as BoerenBruxselPaysans and Linked.Farm, but is more strongly tied to a landscape development strategy, including a physical design dimension.

Urban agriculture COOPs…
Many urban farmers today operate in loose, not yet well-consolidated networks, which makes their practice very complex. The urban agriculture COOP suggests a horizontal business model, connecting farmers together, with consumers and distributors as shareholders. Additionally, it also pools technical and commercial resources and includes a more proactive land acquisition strategy.

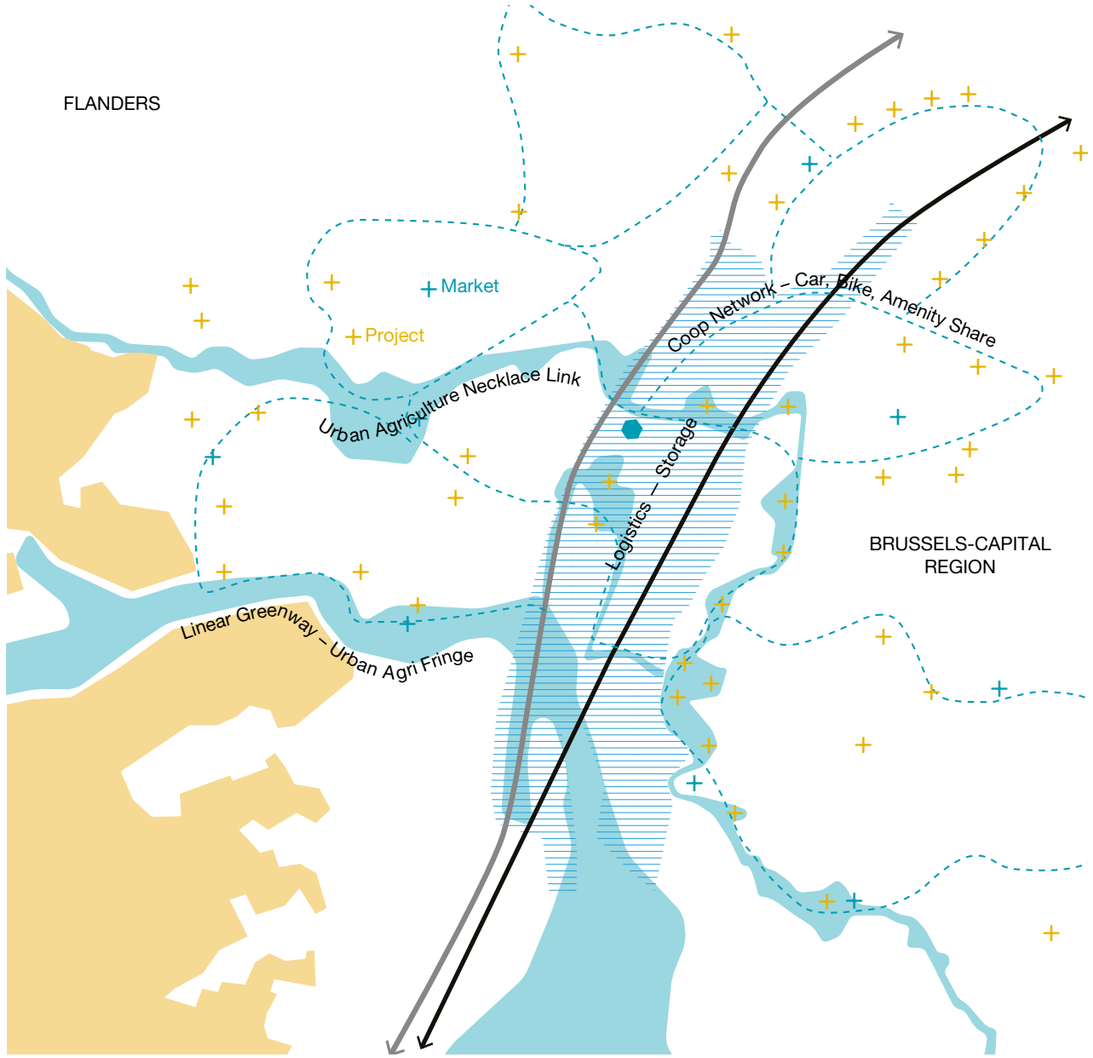
This gives the urban farmer a clear organisational and financial advantage. While the development of pioneering practices currently relies on the individual farmers' inventiveness, enthusiasm and will to innovate, the COOP could facilitate and redistribute some of these tasks, with each farmer becoming a shareholder of a larger organisation. This way, they have guaranteed income during their start-up years, or in case of illness. Land and tools are the property of the cooperative. This also implies smaller start-up costs.

… on a shared landscape
Existing and planned zones designated for urban agriculture were researched as an opportunity to re-organise the fragmented and dispersed small grain urban agricultural plots. A pattern of urban agricultural fields was identified along the region's 'green belt' linking it east to west, as well as a means for proposing diverse and multifunctional activities related to urban agriculture, blue and green infrastructures, and public space activities.

Hotspots were suggested with additional markets and community gardens, based on a catchment zone with a 3 km radius. Collaborations in sharing freight (cargo bicycles & electric vans), collective refrigerated storage, joint retail space and manufacturing plants, or common facilities for manufacturing products are some of the suggestions. Conceptually, the territory promotes the existing blue-green corridors with proposed projects: an 'urban agriculture belt' that would link Flanders to the Brussels-Capital Region.



The urban agriculture COOP is a horizontal organization, in which farmers, as well as eaters and distributors can be shareholders. The COOP eases the farmers work through the organization of administrative, commercial, financial or technical aspects of the urban farmers practice. The organization builds on core values such as transparency and involvement.



The COOP is situated on a shared landscape, which follows the orientation and patterns of the agricultural fields along the Green Walk, as an urban agriculture necklace linking the Brussels-Capital and Flemish Regions. Multi-functional use is designated along the blue-green corridors including the canal, with diversified land uses and related operational activities. One or many COOP's can be in charge of neighbu,0orhood hotspots for the sale and distribution of food.

The neighbourhood hotspots have a catchment area with a diameter of 3km, for all activities related to the production and processing of food.

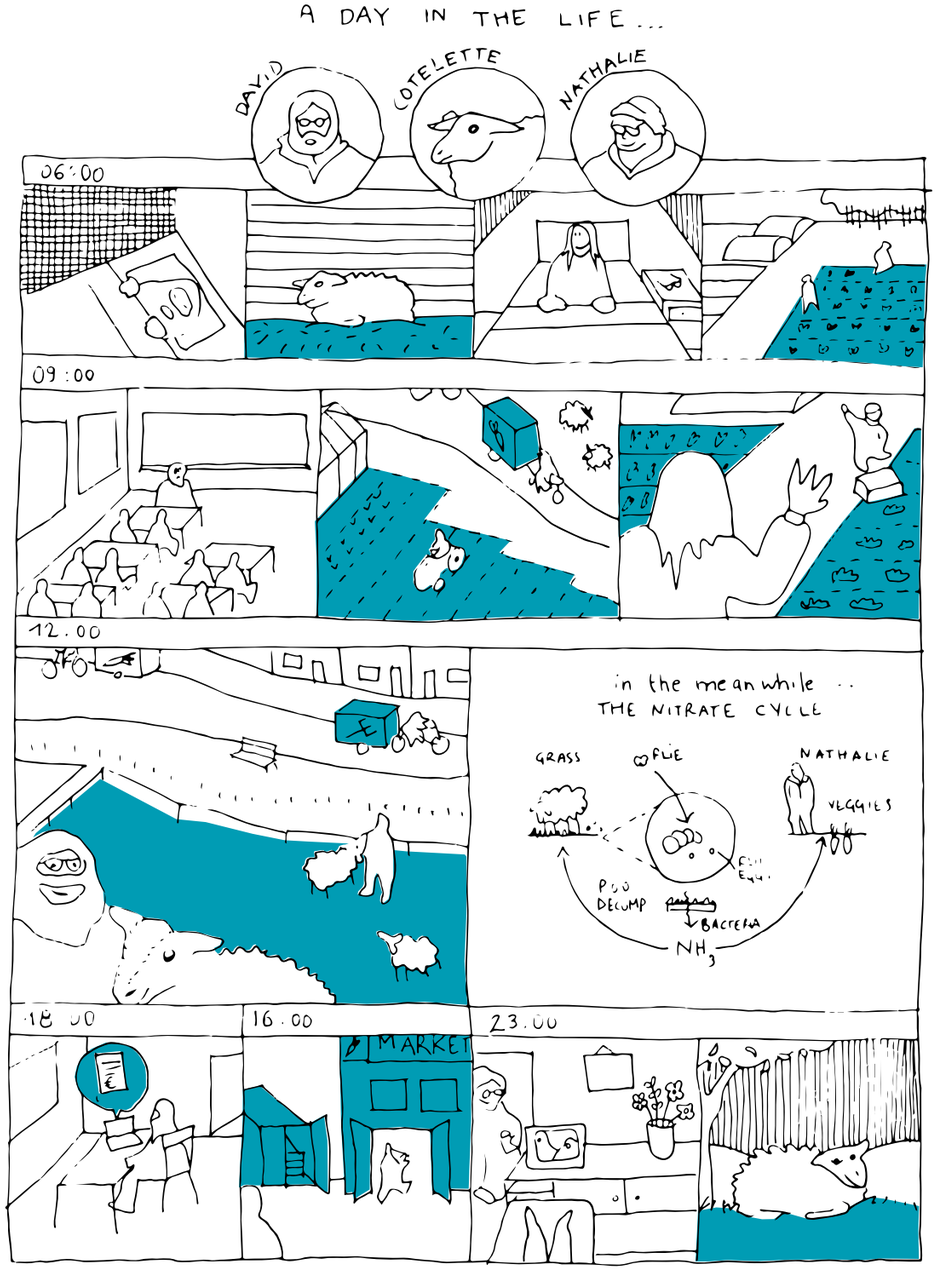
catchment area
soft mobility loops
hotspots coop
existing ua dynamics
potential ua sites
conventional ua sites
urban parks

Rdl, Metrolab Brussels 2019
Sources: BE, CadMap, Agiv, IGN, Terre En Vue, OSM

0 200 400m

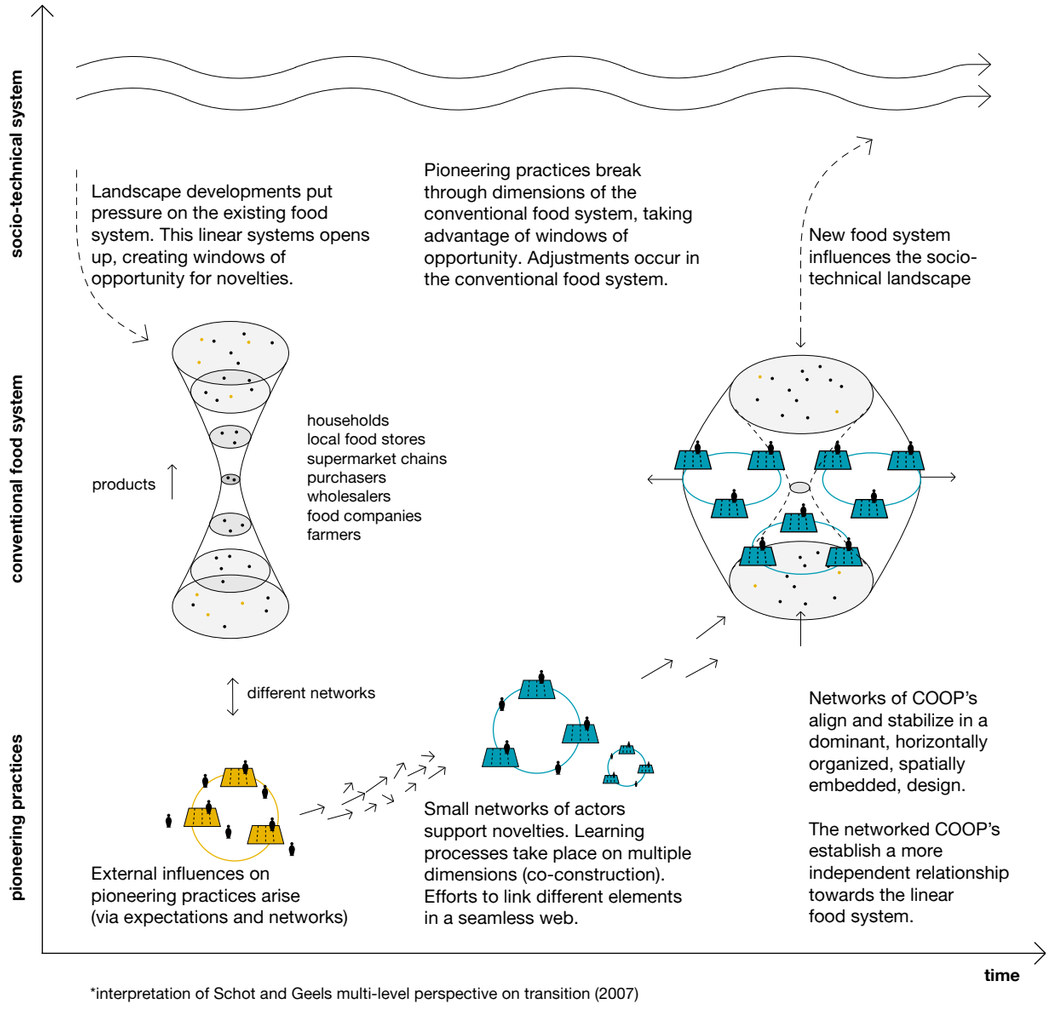
N

The different catchments are spread and multiplies, covering the entire region. Specific local streets were mapped and identified as physical networks and linkages between potential cooperative project sites. Shared storage and refrigeration facilities are located in the post-industrial buildings located next to the canal.



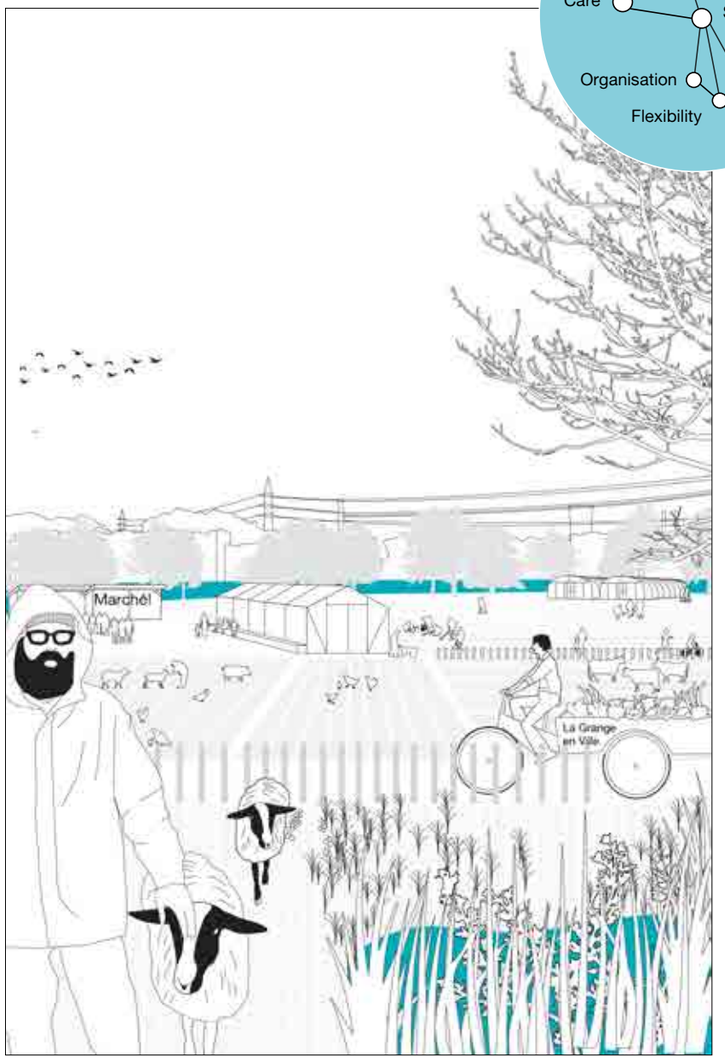
Through the urban agriculture COOP on a shared landscape, the daily routines and practices of urban farmers become more integrated and intertwined. The comic illustrates how the daily lifes of Nathalie, David and Cotelette the sheep become more intertwined.

Increasing structuration of pioneering urban agriculture practices in the conventional food system



*interpretation of Schot and Geels multi-level perspective on transition (2007)

However, for this evolution to take place, shifts will have to be made. The diagram makes an interpretation of Schot and Geels multi-level perspective on transition (2007), and shows how the pioneering practices could break in to the conventional food system.



In this shared landscape, different types of social networks are being built that are based on trust and engagement. The urban agriculture COOP enables productivity as well as a system of trust and care, through the sharing of resources.

Conclusion

Jolein Bergers, Rafael Carmago Consolmagno, Stefania D'Alterio, Elena Ferrari, Sylvie Nguyen, Daniel Otero Peña

To conclude, we would like to refer to pioneering urban agriculture practices as 'transformation seeds', sown over the urban fabric, scattered across the entire area, germinating in urban 'cracks'. Like seedlings, their initial development relies on their own resources.

Today, individual initiatives cannot stand by themselves, and are highly reliant on incentives, subsidies, policies, networks, agencies, and the will of the players involved. However, in their modus operandi, we discover aspects that could contribute to their empowerment.

Like seedlings, pioneering projects are fragile and need favourable conditions to overcome the stress of their initial development phase. In our design, we have investigated how urban agriculture cooperatives on a shared landscape could provide such conditions.

This alternative ecosystem favours community bonds, building up trust relationships and consolidating social dynamics, while also reducing ecological impact and enhancing (bio)diversity.

The latter two points are crucial: it is in this hybridisation with other territorial issues — biodiversity, transport, services, etc. — that the viability of a pioneering agricultural strategy probably lies. This raises the question not only of breaking down the barriers between public governance entities, but also of identifying operational scales, landscape invariants, and multifunctional patterns — that is, sketching out a reference geography.

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Stakeholder insights – Atelier Groot Eiland

**Maarten Dieryck, Bengt Hendrickx,
instructor and coordinator for Bel Akker**

As urban farmers who are in the fields on a daily basis, we get inspired by the professional look from researchers. They broaden the approach to urban farming. In this case, in just a few sessions, they have developed a holistic way to look at urban farming as a structural program of urban development.

Access to land is the main problem of both our own organisation and other farmers. Despite the theoretical intent to develop a farming strategy through existing blue-green urban structures, it doesn't answer this aspect of access to this land.

Our example of using multiple smaller urban plots has inspired the researchers to develop a strategy that could be extrapolated to the entire urban region.

Our organisation focuses on cooperative farming as described by the researchers. We farm within a short distance of our head office in Molenbeek, on small plots and even for short-term land uses. The plots are often located in the in-betweens, in the gaps in the urban fabric. They are never legally described as farmland. Our system aims to pioneer and inspire others to do the same, and to use all given land opportunities. Atelier Groot Eiland's contribution to the fight against climate change is to use urban land frugally. The quality of the soil is also a key topic as urban farming on fringes and post-industrial plots touches upon the problem of polluted soils. Researchers did not focus on this topic but it could be studied in a later MasterClass, as could the issue of access to land.

Stakeholder insights – La Grande en Ville

Nathalie van den Abeele

While an interdisciplinary approach addressing agriculture as an integral part of urban issues is necessary, it is also essential to work on the basics: planners must learn that they cannot always anticipate and be in control; they must accept that living soil has its own rules and that seasons are always changing.

Regarding the MasterClass' proposals, creating a cooperative is an excellent idea. I believe that the ideal scale to consider such a project is the municipality ('commune'), because the territorial base is essential and because it offers a number of opportunities for collaboration and mutualisation such as pooling greenhouses and growing equipment, collectively maintain open spaces, or teach organic growing techniques.

Including logistics, administrative management, and land ownership into the cooperative's objectives is ideal. But the more integrated the cooperative is, the more complex its governance becomes. This is why I believe we need a cooperative dedicated specifically to urban agriculture, and anchored in a territory ('terroir'). The municipality and its residents should be involved, in order to allow direct governance and stability over time.

Urban agriculture is good for the residents as well as the environment, and it creates jobs; the city should seize this opportunity. Maybe we'll have to find solutions to improve aesthetics at certain seasons. But if we make sure that people cross the barrier, that they understand this new landscape, they will appreciate it more. Through education, children are an excellent vehicle for that. There is a civic interest, and public action can contribute to giving it a stable structure that can only strengthen it.

Work

Balancing work and life
A project of doors

Lucile Ado
Romina Cornejo (stakeholder)
Elsa Coslado (stakeholder)
Stéphane Damsin (stakeholder)
Bernard Declève (tutor)
Marine Declève
Lieza Dessein (stakeholder)
Verena Lenna
Dima Mannoun
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Introduction

Brussels is still dealing with what remains of a not so distant industrial past. Bringing back production to the city cannot be only a matter of competitiveness, demand and supply, or a matter of efficient organisation of the material and infrastructural supports. It is also a matter of working conditions and work spaces. As a group, we consider that working today should not be about making money but about remaking life.

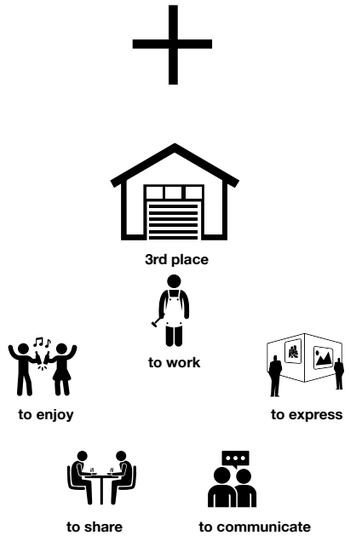
A variety of situations — including those illustrated in the three case studies we consider here — suggests and experiments a different approach to the concept of work. The concept of ‘a third place’ could provide a pertinent entry point for describing emergent work spaces, by allowing to question the balance between work and other activities, e.g. between work and life. What seems to be at stake and at the core of the current transformations is not only the compatibility of these two realms, but also the fertility of their interweaving, in terms of both socio-spatial conditions and individual needs. What if work was about collective emancipation rather than just wages? What spatial conditions would be involved? Flexibility — and the resulting precarity — is as much about time as it is about space. And if we live while working and work while living, this requires appropriate conditions — as much as they have an impact — that go beyond the physical boundaries of a building. It is a matter of ecosystems, generated by the inter-weaving — in the same building or in the same neighbourhood — of the flows and rhythms of a different approach to work — or a different approach to life. The ecosystems approach is therefore understood as the relationship between work and life fuelled by a different system of values that generates specific spatial and social patterns and embedded different scales of analysis. As designers, we hence explored the work-life relationship looking at the different spatial implications, at the different scales and their atmospheres, from architectural to urban. We have observed that the balance between work and life is no longer about segregating, but rather about negotiating, playing, exploring. It is a project of doors, regulating compatibilities and incompatibilities, engendering the exchange of expertise, making possible the emergence of new solidarities. It is a matter of urbanity.

Ecosystems & situations
Attracting, protecting and voicing

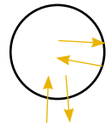
The three case studies of Recyclart, LaVallée and Zinneke are different, both in terms of new values and rights and of socio-spatial characters. Recyclart is an art centre, a workshop for the manufacturing of metal and wood objects called ‘Fabrik’ and a restaurant. Started as a reclamation of the space of Chapelle railway station, where various art projects and cultural activities have been successfully developed for 20 years in collaboration with the Brussels-Capital Region, Recyclart supports a work training programme allowing vulnerable individuals to become self-sufficient by developing skills and starting a professional path. In terms of socio-spatial dynamics, Recyclart works as a magnet, attracting people and having a powerful impact on the perception of the surrounding urban fabric. LaVallée provides not only a co-working space but also legal, tax-related and financial support to freelancers and small organisations. While maintaining friendly relationships with the neighbouring activities, LaVallée is an ‘introverted’ space, working as a bubble of protection, spatially enclosing and providing an alternative form of security to flexible — and precarious — workers. Zinneke is a non-profit association mainly working around the production of a biennial parade — ongoing since 2000 — but also agglomerating projects such as ‘l’Atelier Métal’, for the training of those interested in special skills for the creation of metal artefacts; or ‘Matos’, for the collection and the recycling of waste materials. In the spirit of ‘love for humanity’ and ‘curiosity towards the unknown’, Zinneke celebrates solidarity and stimulates the public space to allow free expression. After a long nomadic life across the available vacant buildings in the city, Zinneke has finally gained the opportunity to occupy a former stamp factory for 20 years in the Masui neighbourhood, thanks to an ERDF (European Regional Development Fund) funded project. The challenge today is to embed the life of the organisation in the neighbourhood, while involving its inhabitants in the governance of the building. The articulation of the needs of different actors around the same space is a matter of rhythms, accessibility, compatibility of different activities and requires what Zinneke’s team defined as a ‘project of doors’.

ART
Soft infrastructure
Mobile Furnishing, Flexible spaces
Horizontal organisation
Informal relations
Expression related
Spontaneous, Personal
Community
Self-mobilisation

WORK
Hard infrastructure
Fixed Machinery, Defined Working Spaces
Hierarchic organisation
Formal Relations
Task related
Evaluated, Efficiency
Individual
Scheduled activities

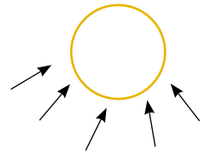


A NEW SYSTEM OF VALUES



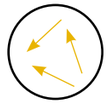
A DOOR

ZINNEKE
Cooperation
Voicing
Self-expression
Valorising spaces and people
New relations work-art
Creativity
Informal training



A MAGNET

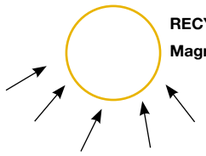
RECYCLART
Cooperation
Emancipation
Self-expression
Offering spaces and tools
Mixed uses
Creativity
Pedagogy



A BUBBLE

LA VALLÉE
Cooperation
Protection in the job market
Self-expression
Appropriation of spaces and tools
Welfare protection

Third places as a new system of values
Working places are often characterised by fixed spaces and scheduled activities. Time and work have no quality, are only a part of the same equation in which profit is the only goal. Third places seek to impose a new system of values. Each of the three situations we have investigated act in different ways with different levels of reformism or radicalness. They are three situations of resistance that redefine rights and values around the concepts of protection, voicing and emancipation as they redefine the relationship between work spaces and the ecosystem of the city around the figures of the magnet, the bubble and the door.



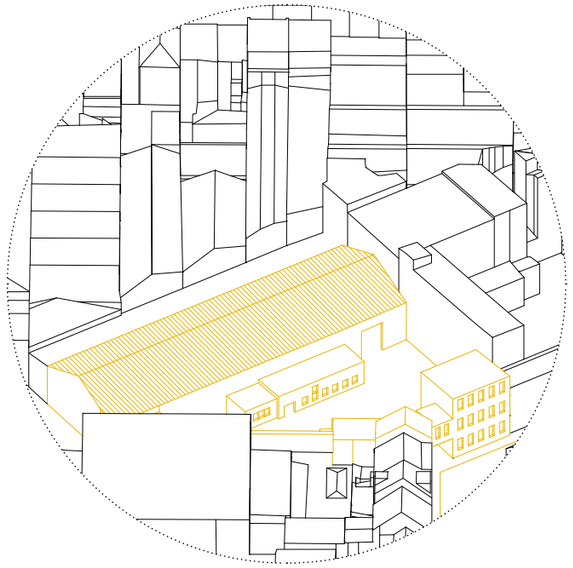
RECYCLART
Magnet

Les Brigittines
Restaurant

Fabrik
Workshops

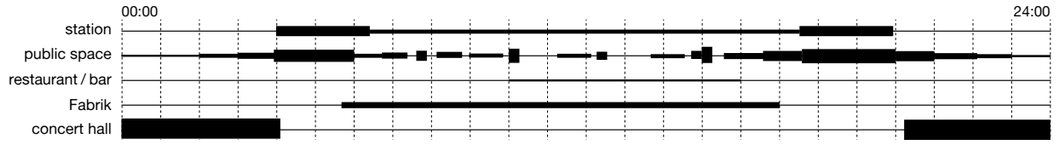
Arts center
Concert and
exhibitions hall

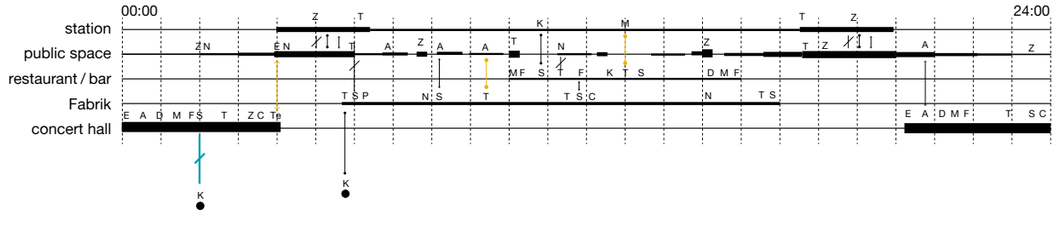
Offices
Administration



Re-centralisation of the project
In the Chapelle railway station, Recyclart has been a successful experience interacting and impacting the neighbourhood. Nowadays, the project is scattered across different places. Moving to Rue Manchester can be an opportunity for the project to re-centralise all its activities. This new location generates a new condition of accessibility (from the city and from the street) and of integration within the urban tissue.

Recyclart (a magnet)
This picture was taken on January 28, 2019 around 5 p.m. It shows the new entrance of the Recyclart project recently displaced near the canal, in a former printing factory located on Rue Manchester in Molenbeek. On the left side, the showcase is used to promote the production made by Recyclart Fabrik currently still located in the Marolles neighbourhood.





Exchanges

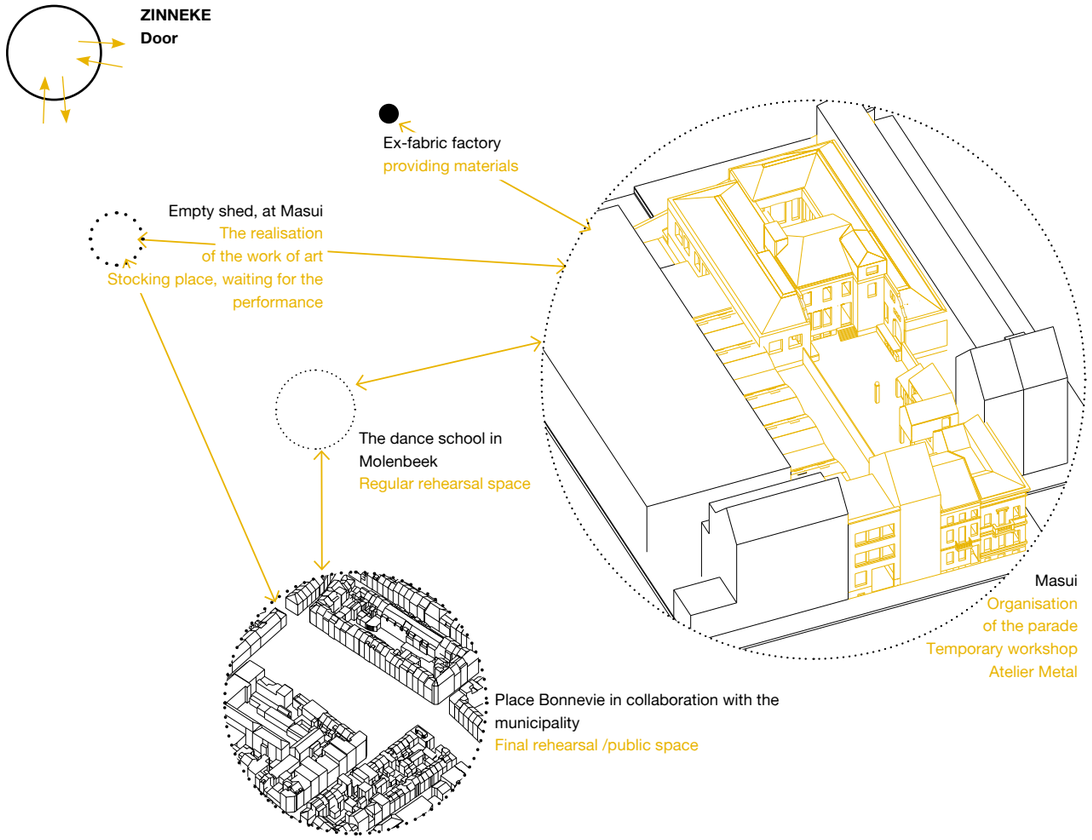
Conflicts

Transactions

Transmissions

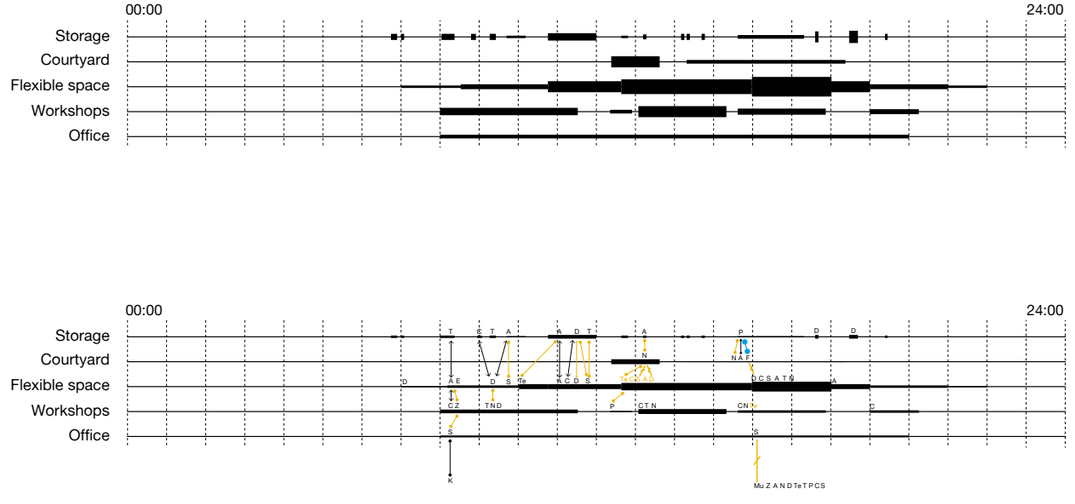
Z Neighbour
E Entrepreneur
T Trainee
S Staff
A Artist
D Designer
M Media
F Food
K Stakeholder
P Provider
C Craftsman
Z Citizen

Describing a specific ecosystem, ‘One working day at Recyclart’
The diagram shows the multiple uses of the place and the social interactions through a day. The lines represent the spaces while the columns are the hours of the day. The arrows are the three types of exchanges between the agents. We highlighted here the conflict that opposed the railway company and the project regarding security issues.



The rhizomatic spatial pattern of a Zinnode
A Zinnode is a group composed of various partners creating a common artistic project. Through workshops they develop a theatrical concept around the Parade's theme (www.zinneke.org). For each biennale around 20 Zinnodes are composed and interact with various places and public spaces in the city at different stage of the creation process.

Zinneke (a door)
This picture was taken on January 29, 2019 around 11 a.m. The Zinneke association is transforming a former general stamp factory into a large permanent space for meeting, creation, training and production adapted to the needs of the Zinneke project and, more broadly, to those of the city and its neighbourhoods. The transformation of the building is a pilot project for the development of infrastructure through the reuse of building materials, with maximum respect for the existing building. As much as possible, the work is carried out by people trained in the versatile trajectories of artisanal reconstruction work.

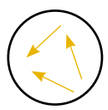


Exchanges

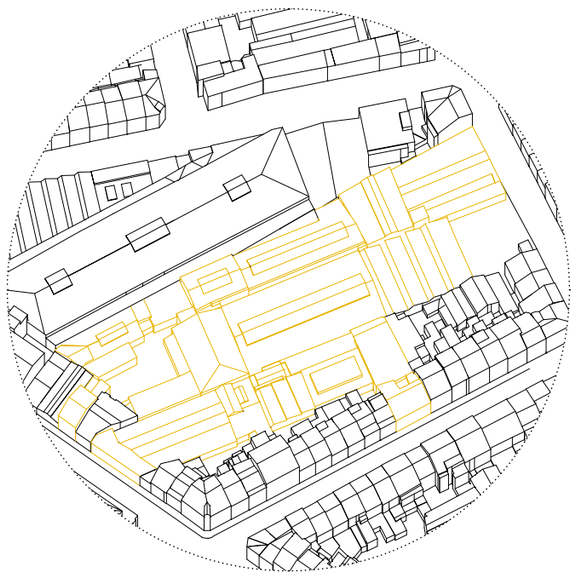
- Conflicts
- Transactions
- Transmissions

Z Neighbour
E Entrepreneur
T Trainee
S Staff
A Artist
D Designer
M Media
F Food
K Stakeholder
P Provider
C Craftsman
Z Citizen

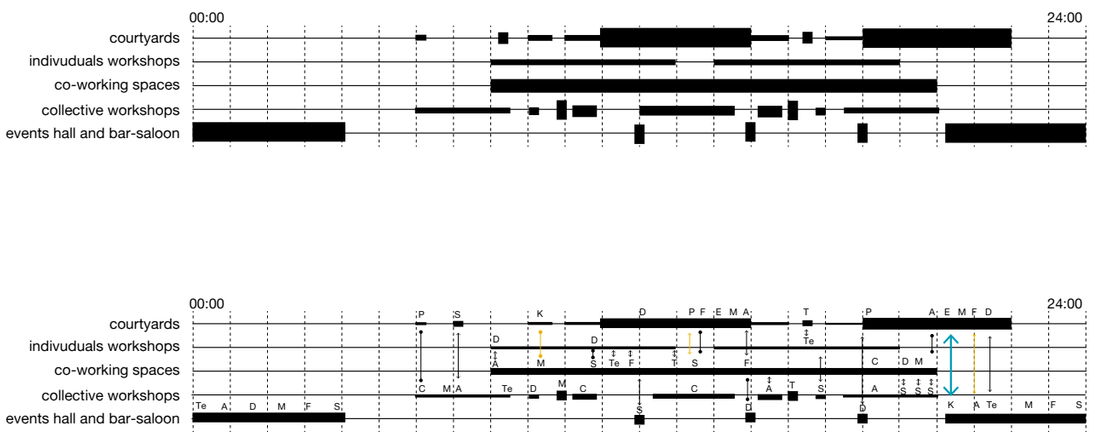
Describing a specific ecosystem 'One working day at Zinneke'
Showing the different uses of the spaces, we highlighted how this new place can impact the local economy becoming for example a client for the food providers settled in the neighbourhood.



LA VALLÉE
Bubble



A specialised equipment
LaVallée is a specialized equipment from Smart (which headquarter is in Saint-Gilles) that integrates different kind of co-working spaces and ateliers. Individuals or collective workshops and working spaces for creative activities are organizing around two courtyards and a big event hall that can host all kind of activities.



Exchanges

Conflicts

Transactions

Transmissions

Z Neighbour
E Entrepreneur
T Trainee
S Staff
A Artist
D Designer
M Media
F Food
K Stakeholder
P Provider
C Craftsman
Z Citizen

LaVallée (a bubble)
This picture was taken on January 30, 2019 around 12 p.m. at LaVallée in Molenbeek. LaVallée is a shared space provided by Smart. As a mutual society for artists, Smart has been the largest cooperative in Europe since 2016. Its objective is to relieve artists, creators and technicians of administrative burdens related to their professional activities. LaVallée is based in a former laundry building and is organised around several common spaces that foster intimate interactions (such as kitchens, salons, courtyards, terraces).

Describing a specific ecosystem ‘One working day at LaVallée’
The space favours the proximity and exchanges between autonomous workers having complementary activities to work together on a project or working in the same sector in order to mutualise functional costs.

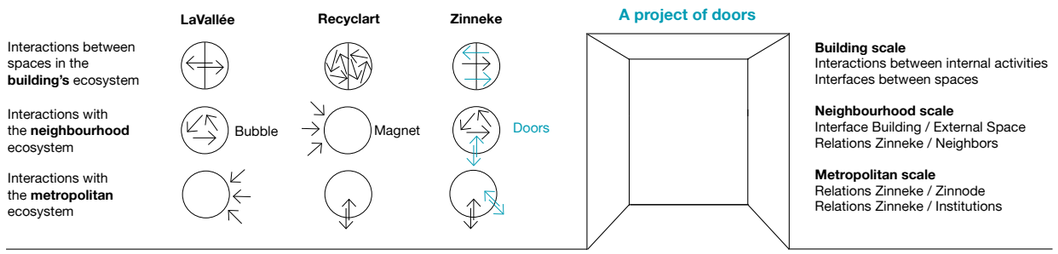
Designing ecosystem transition
A project of doors

The combination of the socio-spatial framework within which Zinneke operates and of the challenge this actor set itself in terms of governance and relationships with the neighbourhood defines an interesting situation to be explored from a design perspective. The project of doors of Zinneke, by involving other local actors in the governance of the building promises to expand beyond the walls of the building, having the potential to transform the ecosystem of the whole neighbourhood. The concept of doors can be read as a metaphor rather than an operation.[1] Doors can refer to the entrance of a home, the security gate of a city or a neighbourhood but also to a psychological barrier or a way to isolate oneself. The coexistence of life and work in this part of the city allowed us to identify three possible relational situations concerning actors and the character of spaces. Conflict situations are those where some kind of friction is perhaps inevitable, requiring acknowledgment more than pacification. Transactions describe forms of material exchanges such as those of a market, implying a temporary shift in the role of the space, allowing the interweaving of life and work. Transmissions are about filtering and hybridisations, of spaces and expertise: from the private to the public, through semi-public and semi-private conditions, allowing to experiment different work rhythms and mixed forms of governance.

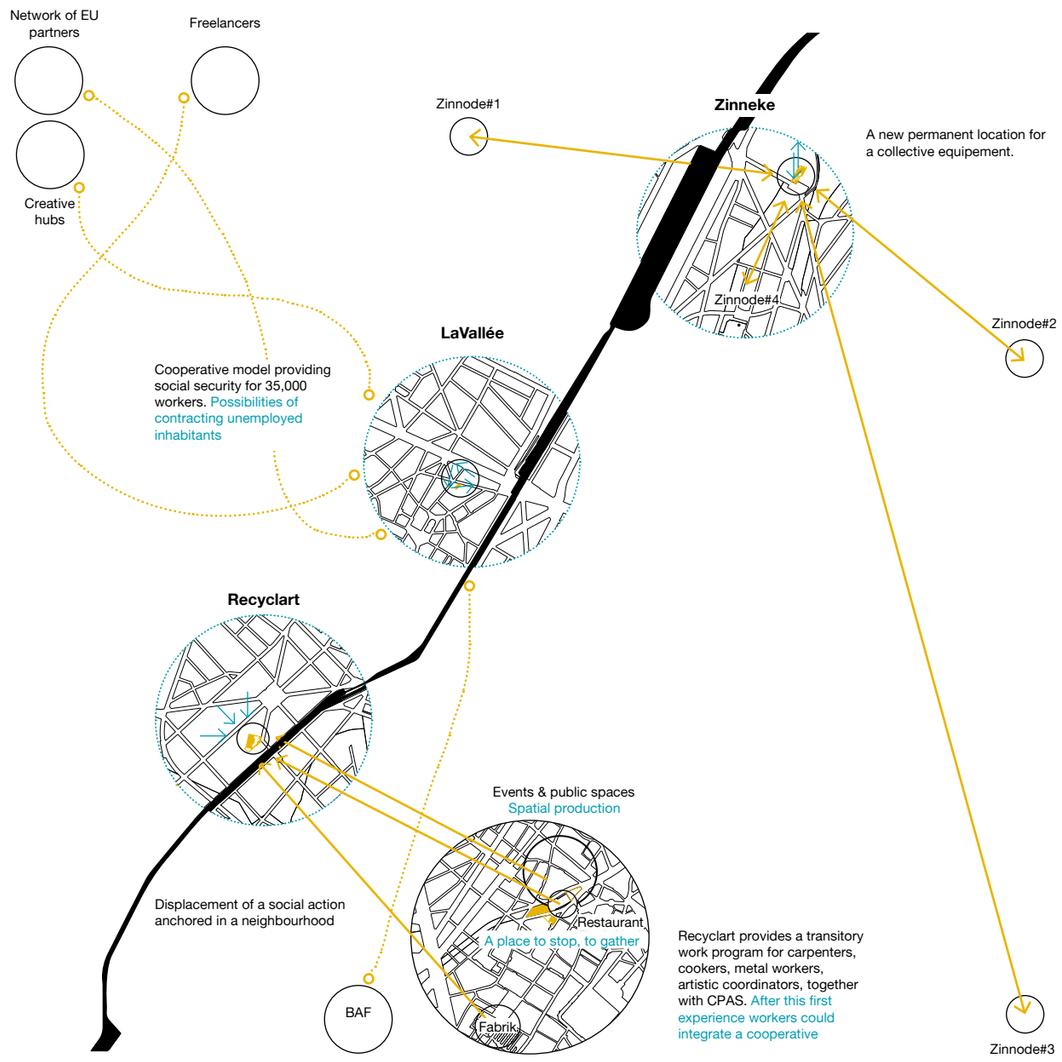
We asked ourselves how doors could intervene on these three different situations, and we tested three possible ‘door sites’ and related to their nature, three possible actions developed as part of Zinneke’s spatial-relational strategy. The first is about invading the heavily industrialised front of the canal for unusual walks or ‘disruptive’ events, thus taking advantage of the industrial landscape. The second is about negotiating along the Parc de La Senne, still under construction, as an alternative marketplace, while establishing some forms of collective life — e.g. community gardens and workshops for arts and crafts — along the long corridor of the park. The third is about experimenting theatrical performances in Place Masui, as an occasion to extend Zinneke’s operational space beyond the walls of its building.

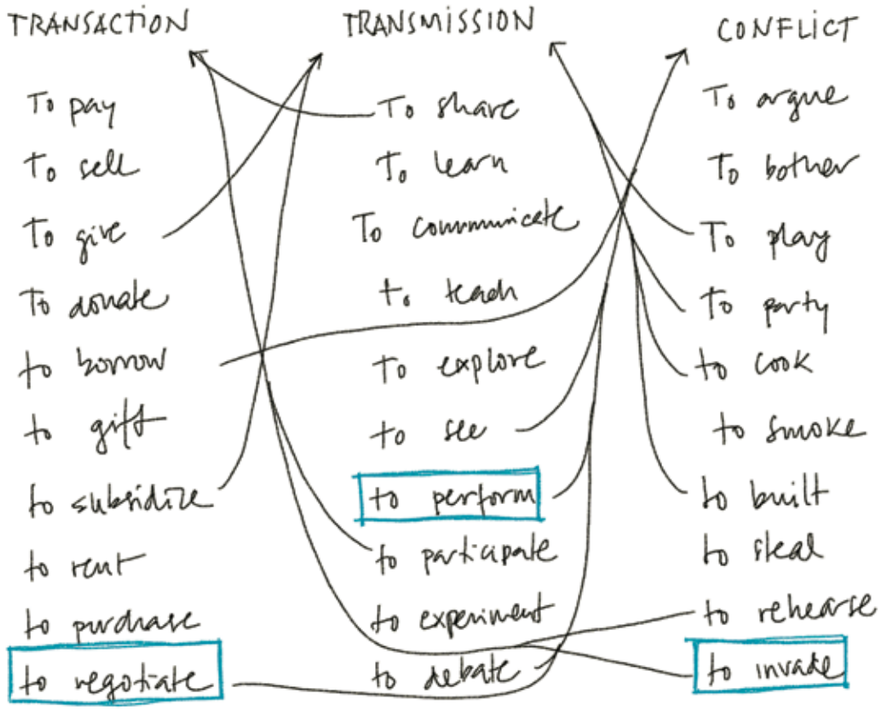
While reflecting on the governance and the spatial impact related to the activities of Zinneke, based on the understanding of the modus operandi of this organisation, two scenarios seem to combine: the first of temporary activation of local actors and sites, responding to short-term actions and initiatives, more or less related to the organisation of the parade. The second is the long-term establishment of a neighbourhood governance, which would concern Zinneke’s former stamp factory and other surrounding vacant sites and buildings, for example, in the form of a Community Land Trust.

1. The third place as a door answers the statement raised in Elements of architecture by Koolhaas, Westcott and Petermann (2017, p. 257): ‘Door. A traditional element once invested with physical heft and graphic iconography has turned into a dematerialized zone, a gradual transition between conditions registered by ephemeral technologies (metal detector, card readers, body scanners) rather than physical objects. The transformation took place concurrently with a transformation in society: whereas isolation was once the desired condition, our aspirations now are for movement, flow, transparency, accessibility — which the door, by definition, stands in the way of’.

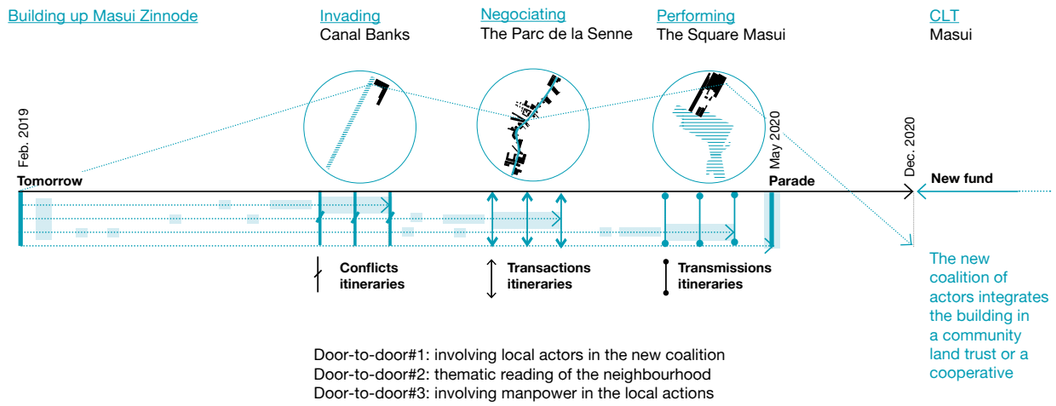


A matrix of ecosystem interactions
The interactions between the projects and the city is complex and changes in relation to the various scales. However, by analysing the projects at the scale of the neighbourhood, it is possible to understand three different ways in which the ecosystems of LaVallée, Recyclart and Zinneke interact with the wider ecosystem of the city.





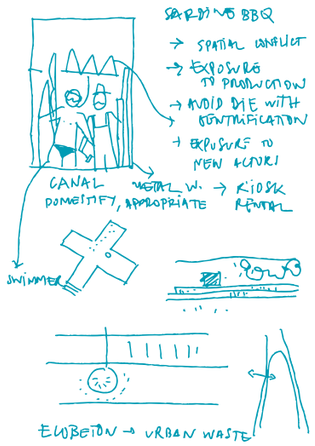
Verbing the actions
In the process of designing, we brainstormed how to turn the three types of exchanges into actions. The results are a list of verbs that can interact in the three types. As the idea was to attract people to collective events, we choose to keep the verbs that express some radicalness but stay positive.

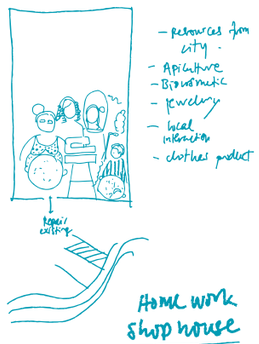


Door-to-door#1: involving local actors in the new coalition
Door-to-door#2: thematic reading of the neighbourhood
Door-to-door#3: involving manpower in the local actions

Short-terms actions
The short-term project is an ecosystem of actions that precedes the project of community land trust and the Masui cooperative. Each type of exchange is challenged in a cycle of three itineraries through the neighbourhood that ends up in a collective action (and festive event), which aims at revealing the synergies Zinneke can have with other economic, social actors and inhabitants present in the neighbourhood. In the long term, the cooperative becomes the manager of the three public spaces that have been activated (banks of the canal, Parc de la Senne, Place Masui).

Poster campain





Actions

Invading The Canal Banks

This action aims at allowing the appropriation of the canal banks for activities related to metal transformation. It aims at creating a synergy between a metal recycling factory, the metal workshop in Zinneke and skilled migrants.

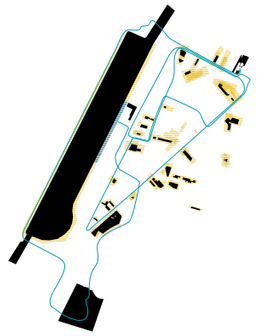
Negociating The Parc de la Senne

This action aims at allowing the residents living along the parc de la Senne to open their doors and sell homemade food, crafts or offering a service for repairing objects, clothes etc.

Performing The Place Masui

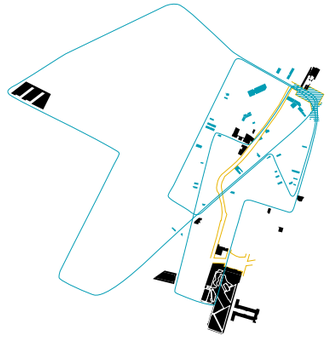
This final action aims at bringing the activities of Zinneke on the Place Masui. A small theater built by students from a carpentry high school will stage a play with the children involve in the associations of the neighbourhood. The vacant buildings and working sites are activated by the activities.

Itineraries



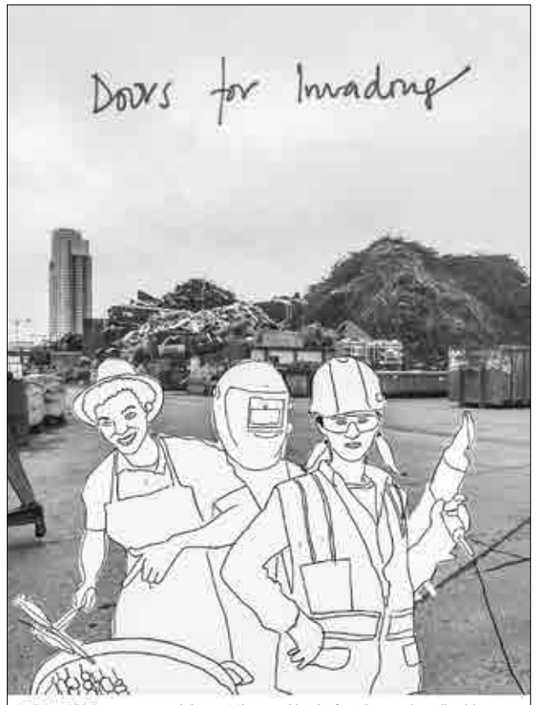
Door-to-door#1: Involving A.Stevens & Co
Door-to-door#2: Fluxes of material. Metal in the neigbourhood
Door-to-door#3: Energy flow. Manpower from Parc Maximilien

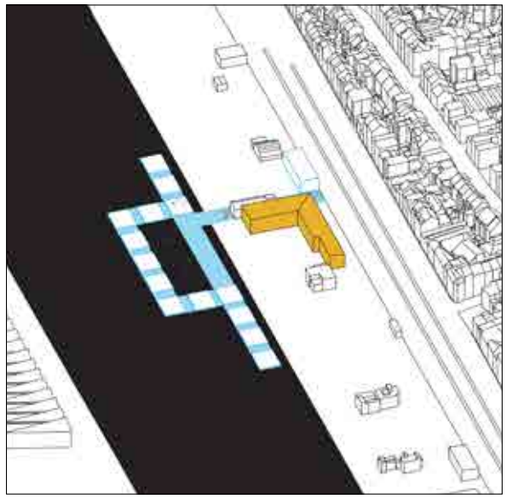
Door-to-door#1: Involving the residents from Parc de la Senne
Door-to-door#2: Fluxes of material. Food, clothes, objects...
Door-to-door#3: Energy flow. Unemployed people and local shops



Door-to-door#1: Involving schools and social actors
Door-to-door#2: Fluxes of material. Wood transformation
Door-to-door#3: Energy flow. Students and wood workers

To invade: Doors for Invading





Enterprises door opened on the canal banks

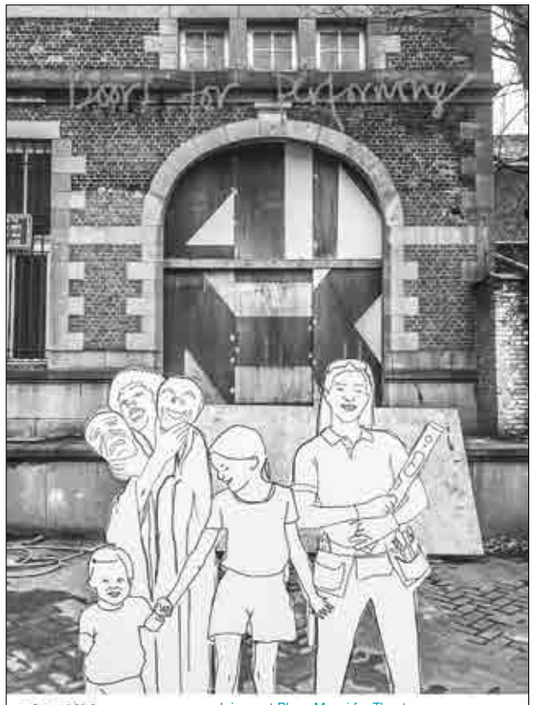
Doors for invading
For each type of exchange, we identified a public space to be activated through an action that characterised a socio-political change, a specific material to work with and the manpower it needed in order for the cooperative to provide work. Here, we turn the conflict exchange into the action of invading. This action aims at appropriating the canal banks for activities related to the transformation of metal. It intends to create a synergy between a metal recycling factory, the metal workshop in Zinneke and skilled migrants from the Parc Maximilien. The poster promotes the event as a festive time (barbecue and party) showing the public it intends to attract. The axon shows the principle and the potential setting of the partying event.

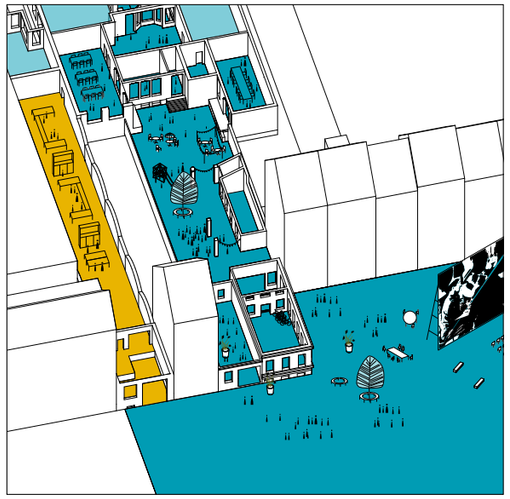
● canal banks
metal workshop, barbecue and party

Metal
coming from recycling companies and car repairing activities

work provided by the cooperative
5 bike fixers, 5 jewellers, 20 welders ...

To perform: Doors for Performing





Associative door opened on the square

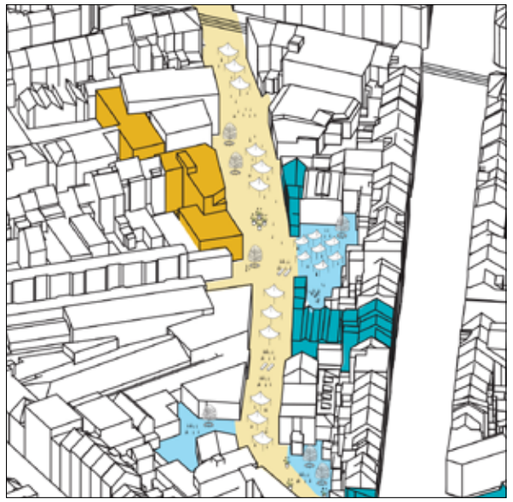
Doors for performing
For each type of exchange, we identified a public space to be activated through an action that characterised a socio-political change, a specific material to work with and the manpower it needed in order for the cooperative to provide work. Here we turn the transmission exchange into the action of performing. This action aims at activating the square in front of the Zinneke building to overflow the associative live inside the public on the public space. A small theatre built by students from a carpentry high school will stage a play with the children involve in the associations of the neighbourhood. The poster promotes the event showing the public it intends to attract. The axon shows the principle and the potential setting of the theatre.

● Place Masui
wooden stage & theater play

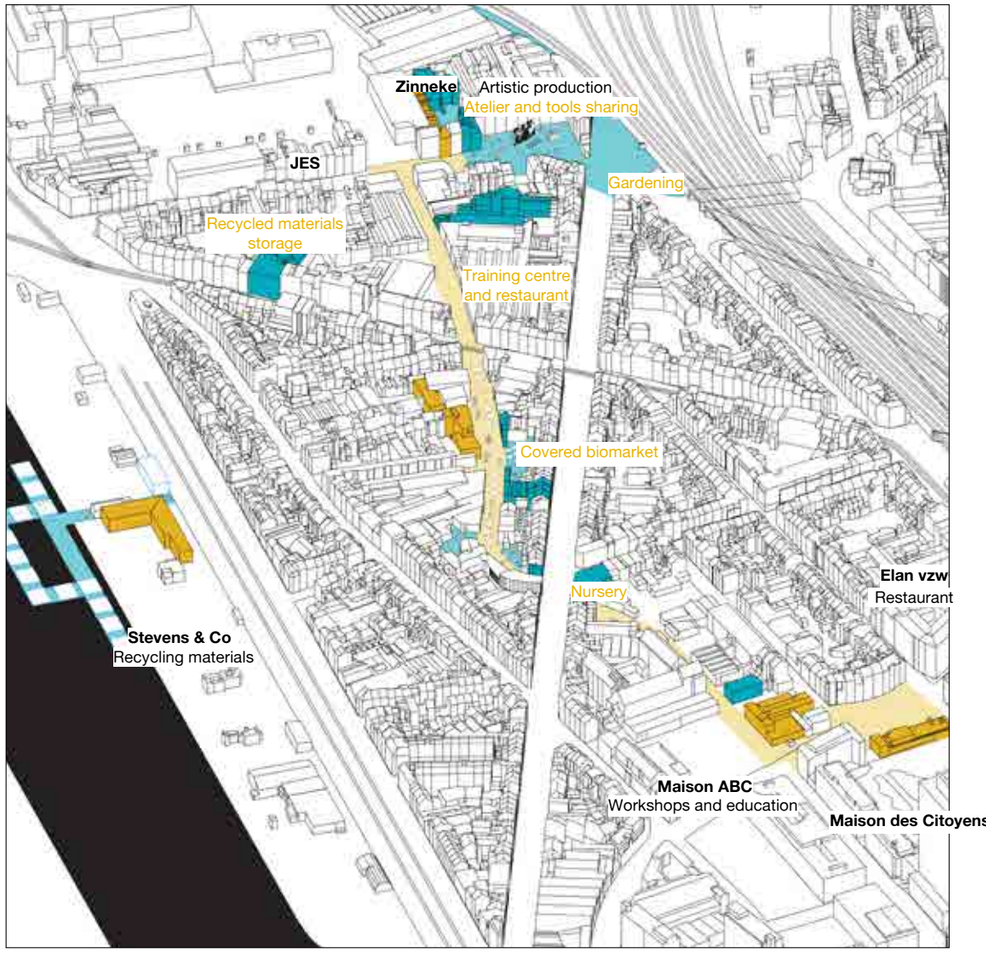
Woodcraft
coming from recycling companies and from the Sonian Forest

work provided by the cooperative
10 carpenters
1 artistic director
20 actors (children from local associations) ...

Doors for Nagotiating



Private doors and public equipments
opened on the green walk



Interface 3

Vacant plots, transformed by temporary and long term uses

Existing associations and local actors, involved in the CLT project

Doors for negotiating
For each type of exchange, we identified a public space to be activated through an action that characterised a socio-political change, a specific material to work with and the manpower it needed in order for the cooperative to provide work. Here, we turn the transaction exchange into the action of negotiating. This action aims at activating the Parc de la Senne (going from Place Masui to Place Gaucheret) to allow the residents living along the park to open their doors and sell homemade food, crafts or offering a service for repairing objects, clothes, etc. The poster promotes the event showing the public it intends to attract. The axon shows the principle and the potential setting of the local market.

Parc de la Senne
local market

Clothes, objects, food
homemade and second hand

work provided by the cooperative
50 street traders, 1 jeweller, 2 welders, 1 carpenter, 15 cookers 6 sewers, 1 shoemaker...

Community land trust and the Masui cooperative
The community land trust is built on the long term at the scale of the neighbourhood. The actors and spaces we identified as resources are either public, associative or private. The cooperative manages public spaces and activates some vacant plots providing equipment, facilities and work for the neighbourhood and its inhabitants in gardening services, building maintenance, food market, cultural activities, training and educational services, in which they would have the opportunity to invest in order to reduce their time at work and spend more time at life.

Conclusion

**Lucile Ado, Marine Declève, Verena Lenna, Dima Mannoun,
Luis Antonio Martin Sanchez, Alberto Squizzato, Natalia Vera Vigaray**

The project of doors has been designed based on Zinneke's purpose and project and is based on a double move: to embed in the neighbourhood while involving local actors in the building's governance.

However, this could be tested in relation to other territorial conditions and adapted to the needs of the related actors. LaVallée creates an 'introverted' dimension of protection that also suggests the relevance of a project of doors. The ability of Recyclart to establish conditions of accessibility in the dense urban fabric of Molenbeek will be the result of the identifying doors and rhythms so that culture could become part of the daily lives of the inhabitants of this municipality, while transforming the very idea of work. A door is not only about opening: it is also about closing, regulating, protecting. Especially in consideration of the fact that most of these initiatives are established in neglected neighbourhoods, hence having a gentrifying potential. In a similar perspective, a project of doors provides the occasion to address the governance of a neighbourhood: to regulate accessibility and uses according to the needs and rights of the communities involved. The Community Land Trust model that we suggest is only one among other possible examples of a form of governance acknowledging the right to decide on different converging communities — the inhabitants, the local actors, the administration — and enabling the interweaving of different scales and their related concerns and responsibilities. And most importantly, allowing to resist gentrification processes. Still, the intuition and our working hypothesis is that more broadly, a horizontal, plural governance is a matter of increasing the capacity of resilience of an ecosystem, allowing to draw on the site-specific resources of a neighbourhood and the communities involved, not to mention their motivation to preserve their living environment. At the moment of looking at the balance between work and life, it looks like the reflection goes beyond labour conditions or the concept of work. It looks like an ecosystemic approach is what is needed to come to terms with the complexity implied by a more human-friendly approach to work. To come to terms with the city as what it is by definition: the natural environment where work and life intersect

and synergise, beyond functionalist attitudes. As a result, the city is reclaimed on the grounds of a capacity to re-establish urbanity, thus resisting the alienating processes increasingly triggered by the interventions of multinational corporations and their speculative interests. As a project of doors, third places appear to make a political statement and can be read chronologically as exit doors from the current system (they may prefigure an alternative that is no longer an alternative), as gateways (between two modes with contradictions), as doors to enter another world.

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Stakeholder insights – Smart

Lieza Dessein, Strategic project manager formerly working at Smart

Social interactions and work dynamics are increasingly digitised and automated, which results in a hyper-individualisation of society. This process is intensified by a lack of diverse spaces offering adequate environments for socialisation and work. This is why we need to design inclusive gathering spaces. The work undertaken during the MasterClass has been a boost to express this issue.

Many buildings that were formerly used by industries or transportation infrastructures that are now shrinking could be repurposed. These buildings are often located near city centres, and their surrounding neighbourhoods suffer from this lack of proper repurposing. Additionally, there is a need for cities to attract (creative) entrepreneurship. In Brussels, creative hubs could provide a wide array of possibilities to do so.

Creative hubs bring back a collective dynamic to a scattered workforce, by hosting artists, freelancers and SMEs. This unique environment creates a resilient ecosystem for entrepreneurship. Creative hubs have a positive social impact on their environment, but political support is essential to fostering an inclusive regeneration of neighbourhoods.

The positive impact that hubs have on their communities is strongly linked to their business models. Granting precarious occupation too often results in gentrification. Private initiatives struggle to adopt a social approach, while top-down public initiatives often fail to be economically sustainable or to reach their target audience. Inclusive creative hubs can emerge through long-term ventures involving multiple stakeholders. We need to design economic models that take into account the needs and contributions of cities, inhabitants, workers and hub managers.

Stakeholder insights – Zinneke

Sandrine Tonnoir, Coordination of Masui site renovation

We used to say amongst ourselves that renovating a building is actually a project of doors. Referring to this expression, the contribution of the MasterClass has been fruitful because it is a topic we want to further explore. While the door has been more studied as an abstract concept in the contribution, we could also approach it as an actual physical object. This is especially true in terms of chronology. Indeed, as physical objects, doors are really one of the last parts of the construction process.

Only at the very end do we think about how to place them, how to reflect on the dynamics of extreme openness or confidentiality. For the Zinneke organisation, this question is important because as much as we want to remain as open as possible, there are also questions of management and security.

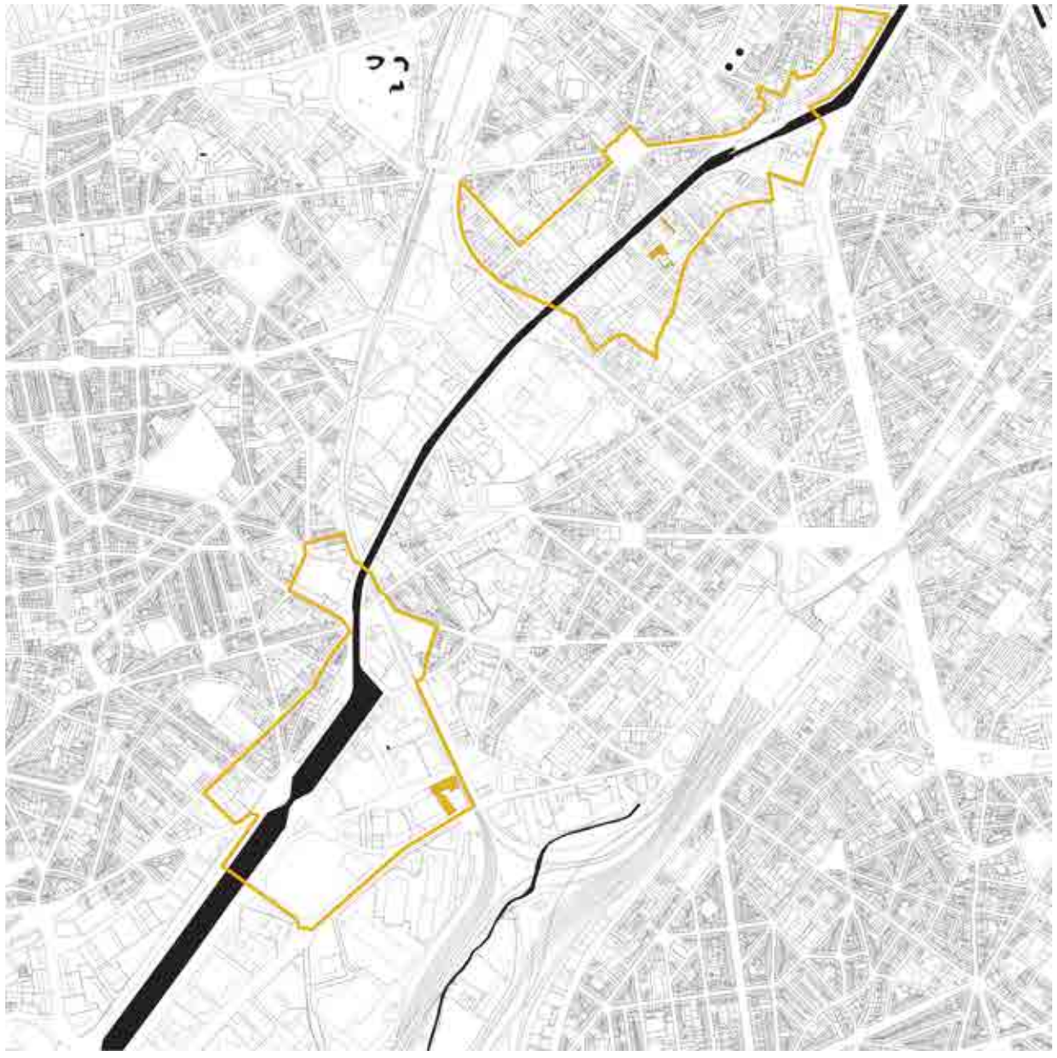
As long as the doors are open, you need to care about what is outside. It is a question of management, but also one of logistics. You offer a public space and provide something to it, but this raises the question of how you work and how you manage the underlying logistics of your activity. Even though we don't see it, this requires as much energy as the event itself.

In Masui, we interact with the neighbourhood in order to integrate our activities into the local life. Meanwhile, the place we intend to create is a place where people from the neighbourhood can meet people from other parts of Brussels and build something together. It is a general dynamic geared not just towards events in Masui, but also towards something bigger in the entire city of Brussels.

Density

Rythms in-between the city. Occupation of Time

Valentina Bonello
Julie Collet (stakeholder)
Gerd De Wilde (stakeholder)
Bernard Declève (tutor)
Ernesto Diez
Johans Figueroa
Nicolas Hemeleers (stakeholder)
Ellen Jacobs (stakeholder)
Géraldine Lacasse (stakeholder)
Didier Ledocte (stakeholder)
Dongxue Lei
Sâm Rosenzweig (stakeholder)
Anna Ternon
Ivana Vukelic



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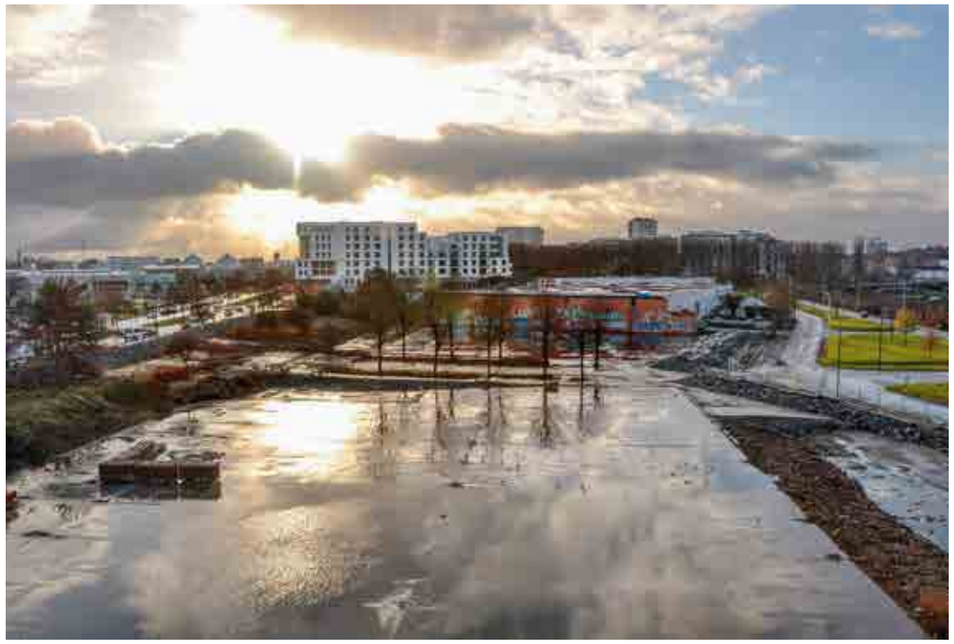


Introduction

The horizontal metropolis of Brussels (Vigano, 2018) is facing demographic growth as well as an increasing number of commuters. By 2020, the population will reach 1.2 million inhabitants, with 10,000 more each year until 2025 and up to 9,000 each year until 2040. Through its PRDD, the Brussels-Capital Region promotes a densification plan to develop dwellings, distribute them spatially and promote the urban economy and the attractiveness of urban spaces. This densification agenda, based on the quantitative aspects of urban growth, lacks a direct approach linked to the residents' origins, socio-economic factors and complex urban ecologies.

The canal area has once again become a new place of centrality of the city and its transformation processes (Plan Canal, 2016). New housing developments in the former industrial areas along the canal appear as islands in the urban landscape. In the canal neighbourhood, spaces as well as players are in transit. Old industrial plots are vacant or underused, and therefore transformed into new housing and mixed-use developments. Local players also adapt to these transformations, e.g. with second-hand car dealers giving way to real-estate companies. From the significant historical 'momentum' of these transitions to future scenarios arises the question of a new agenda based on qualitative values towards a more resilient, ecological and inclusive urban growth. In this transformative city, various occupation patterns find their place in space and in time, designing multiple cities within the city (Lefebvre, 1968). From a structured market-driven mechanism of occupancy to forms of solidarity and philanthropy. Temporary occupations attract and generate new dynamics within the city, based on economic activity, reciprocity or solidarity.

The workshop's goal is to tackle the challenge of urban growth by transforming an existing industrial heritage site using a time-based strategy. Time is understood as a tool and an instrument for urban planning.

A historical reading of current challenges and city settings provides us with valuable information about how to design for the future. Time is about temporary occupation, uncertainty, evolution, unpredictability and adaptation. A historical reading of the urban fabric teaches us that cities are constantly changing in terms of assets, goods, people and ecologies. The city has never been a static ecosystem. Nevertheless, most of our administrations and private players approach cities and neighbourhoods from a limited perspective, not taking into account constant urban adaptation.

Ecosystems & situations

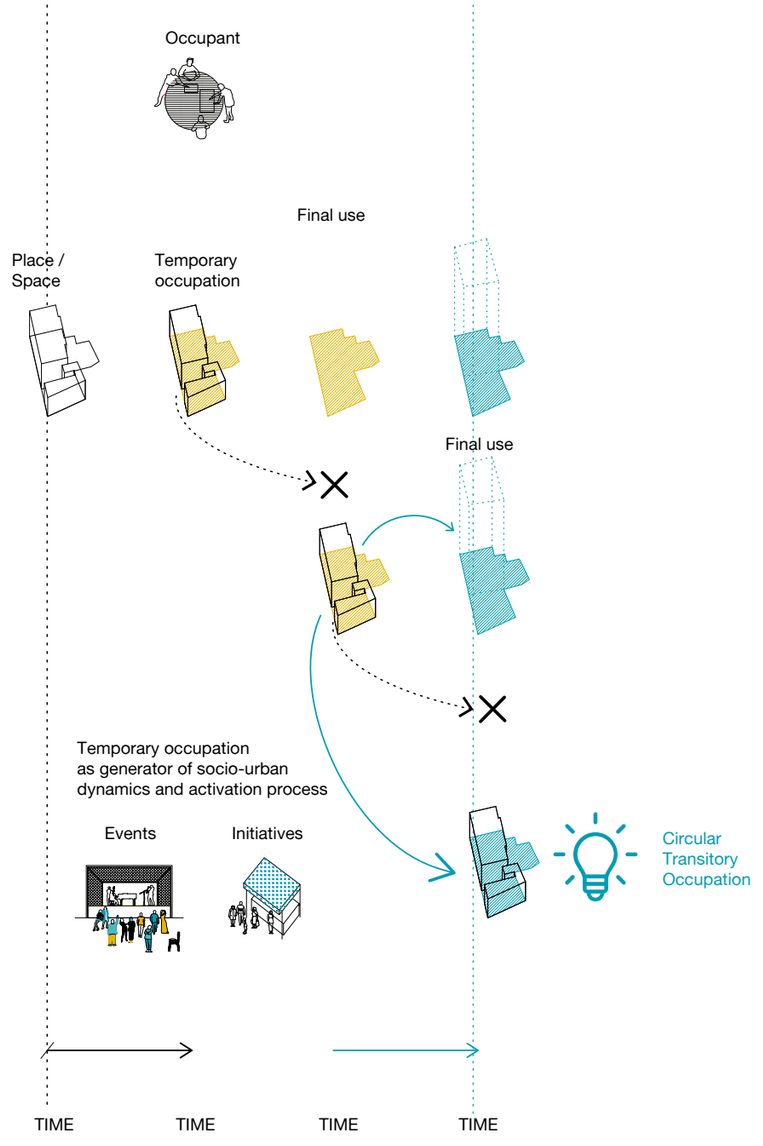
The relationship between density and temporary occupation is a complex ecosystem of players, opportunities, urban contexts and socio-economic situations. Through an interpretative mapping of the various periods of transformation of the city, we can gain insight into the link between transformational processes such as densification and the temporary occupation of urban assets. The first settlements that eventually became the city appeared during medieval times, at the intersection of trade routes and near the river. The valley and the river were valuable assets for the new settlements.

The Senne valley suffered a drastic transformation during the Industrial Revolution, switching from agricultural land to an industrial region. Industries occupied the valley with new infrastructures, while the city continued its growth in opposite directions and towards its outskirts.

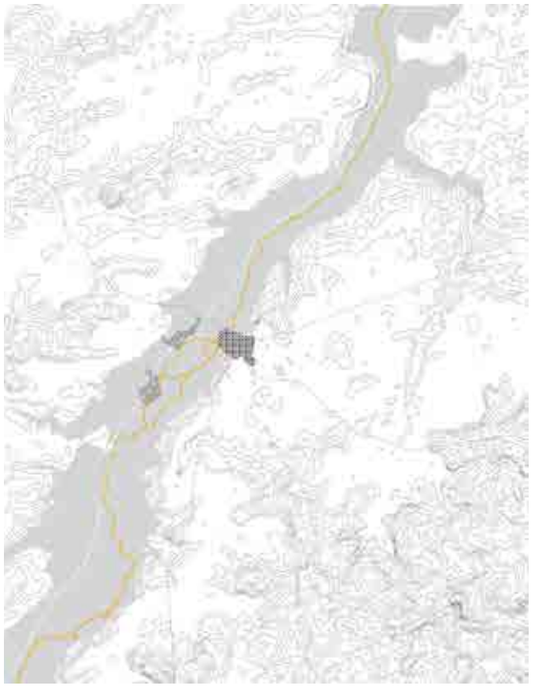
Nowadays, the city can no longer keep growing outwards, due to a suburbanisation process based on a spreading model. The valley and canal are seen, once again, as places of opportunity for a new model of the city. Currently, vacant plots and former industrial sites are under pressure from the densification agenda as well as from population growth.

The historical reading of the city of Brussels through an interpretative mapping shows the history of temporary occupations and the transformation processes that have occurred within the city. Temporary occupation is neither a neologism nor a current trend: it has always been a driver of the city's transformation and densification processes.

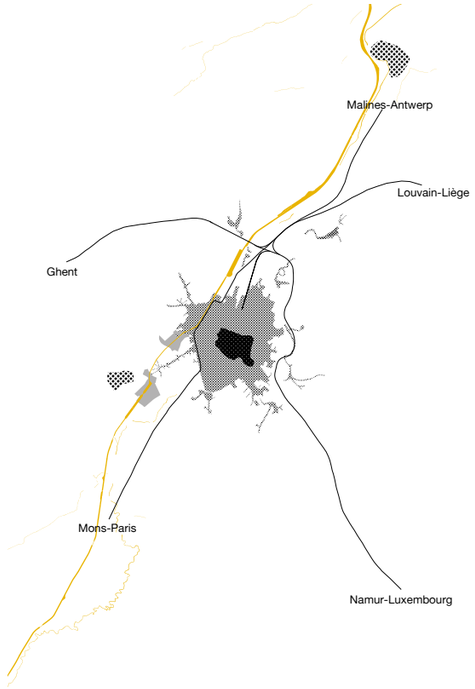
The interpretative mapping (see next page) shows the densification processes throughout history and the patterns of urbanisation. We can clearly see the various densification processes' preferred spatial patterns. The relationship between density and temporary occupation becomes clearer. Transformation processes such as densification allow transitory spaces to appear. The two are strongly related. Without a transformation of the city, there will be no transitory and temporary uses. The waiting spaces or transformative spaces defined as 'terrains vagues' (vacant lots) by Sola-Morales (1995) attract alternative and less obvious users (Desmet, 2013). The uncertain nature of these spaces allows them to be used for temporary uses. These generate dynamics and complex ecosystems in the city, as they enhance the urban context's ability to satisfy and include needs, while also increasing the agency of very different social actors. Understanding these ecologies is important in order to identify patterns of temporary occupations.



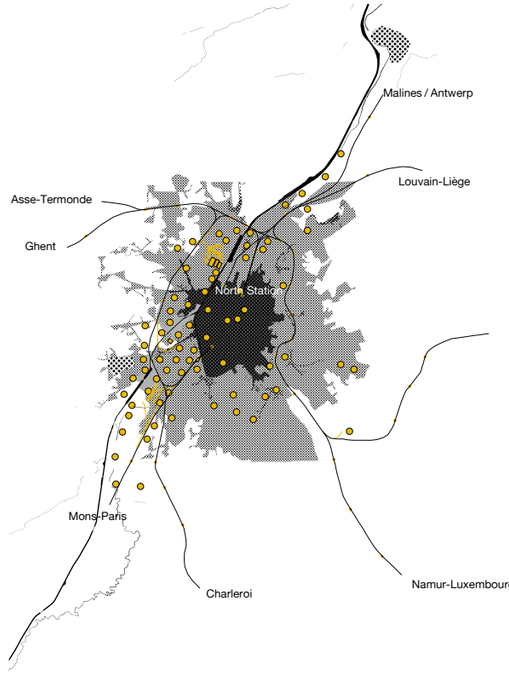
From temporary occupations to circular transitory occupations
The diagram shows how temporary occupations contribute to urban changes over time. During their conversion process, unoccupied spaces can host activities or generate new initiatives that can either find a place in the permanent project or relocate to a new space in the city and enter a cycle of transitory occupation.



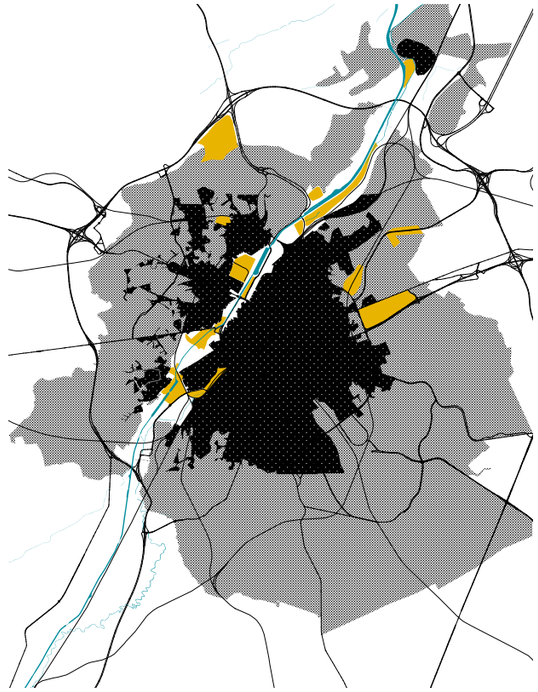
The Valley
The city
Research area
The Senne river



The city and towns in 1860s
The city in the xth century
Research area
Passengers and cargo lines



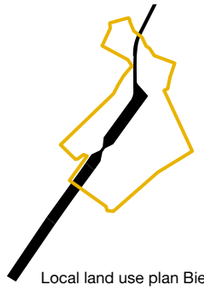
The city and towns in 1810s
Expansion of the city till 1930s
Industrial enterprises in 1910
Passengers railway stations
Goods and training lines
Passenger and cargo lines



The city and towns in 1830s
Expansion of the city till now
The boundary of Canal Plan
Strategic pole
Road network

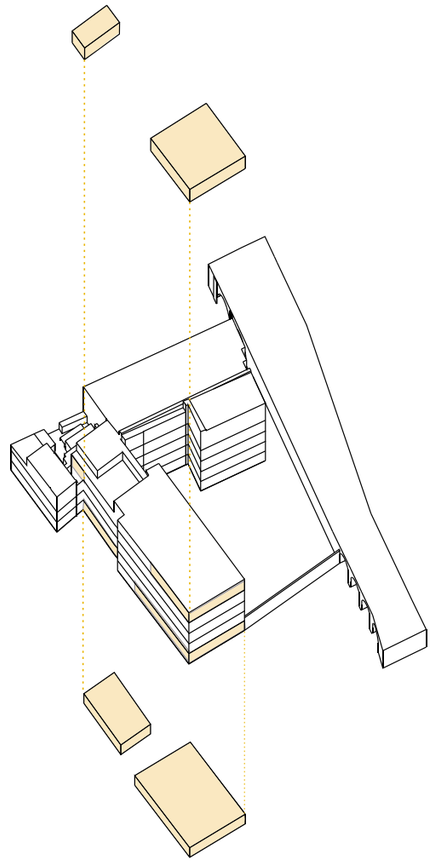
The historical reading of the city of Brussels through an interpretative mapping:

1. The first settlements
2. Transformation from agricultural land to industrial region during the Industrial Revolution
3. The city continues its growth in opposite directions and towards the outskirts
4. The city can no longer keep growing outwards due to a suburbanisation process based on a spreading model

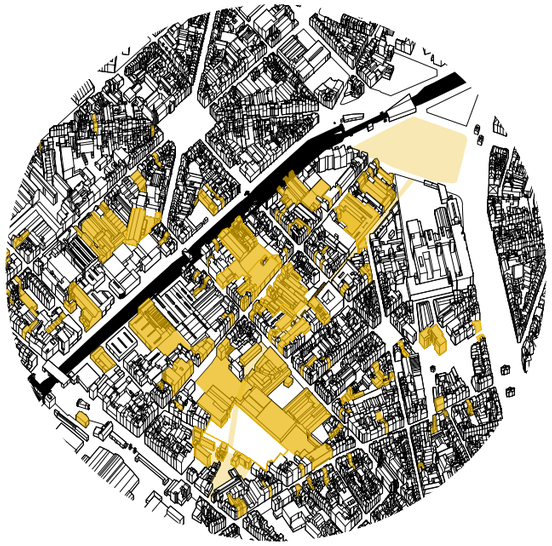


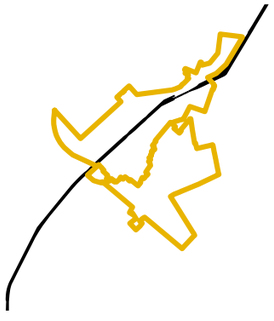
Local land use plan Biestebroeck

Case 1: Biestebroeck
The Biestebroeck basin is a priority site for the development of the canal neighbourhood. It is one of the areas subject to a new type of affectation ZEMU to the PRAS and subject to a PPAS. The objective is to promote the integration of port and productive activities in urban areas by developing innovative mixed solutions.
Yellow areas on the map represent plots affected by conversion projects.

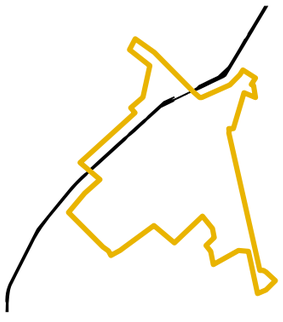


Studio CityGate
Studio CityGate is a transitory occupation project on the CityGate project site developed by citydev.brussels. Pending the start of the project, citydev.brussels has called on Entrakt to manage this transitory occupation. Entrakt is a corporation whose main business is the management of unoccupied properties by temporarily reallocating them. Spaces are rented between 1 and 10 euros per square metre and occupied by artist studios, cultural, social and economic activities, community facilities and a covered skate park.

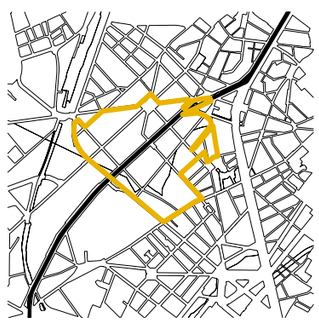




Neighbourhood Contract (CQ)
Petite Senne & Compass



Urban renovation contract (CRU)
Heyvaert-Poincarré



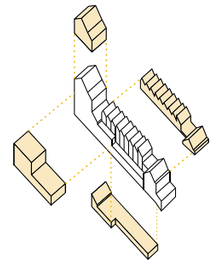
Urban renovation contract (CRU)
Heyvaert-Poincarré

Projects under urban renewal projetcs

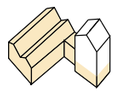
Automobile dealers that could change in the future

Case 2: Heyvaert
The Heyvaert district is known for its many automobile dealers as well as for the presence of slaughterhouses. A number of public revitalisation strategies (neighbourhood contracts, urban renewal contracts) and neighbourhood reconversion initiatives (master plan) are underway in this area.

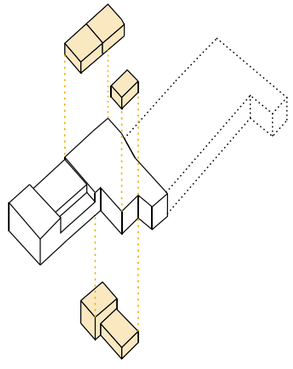
L'uZinne



WIM (Wood in Molenbeek)



Decor atelier



Pop-up Canal
As part of the sustainable neighbourhood contract 'Petite Senne', a global subsidy of 100,000 euros is made available for the implementation of project 'Pop Up Canal'. Its goal is to activate abandoned or unexploited places and, at the same time, activate the neighbourhood's social and relational fabric. 'L'uZinne'—coordinated by non-profit association DAK-Domus Art Kunst—, project WIM (Wood in Molenbeek) and Decor atelier are three examples of projects supported by the municipality as part of 'Pop Up Canal'.

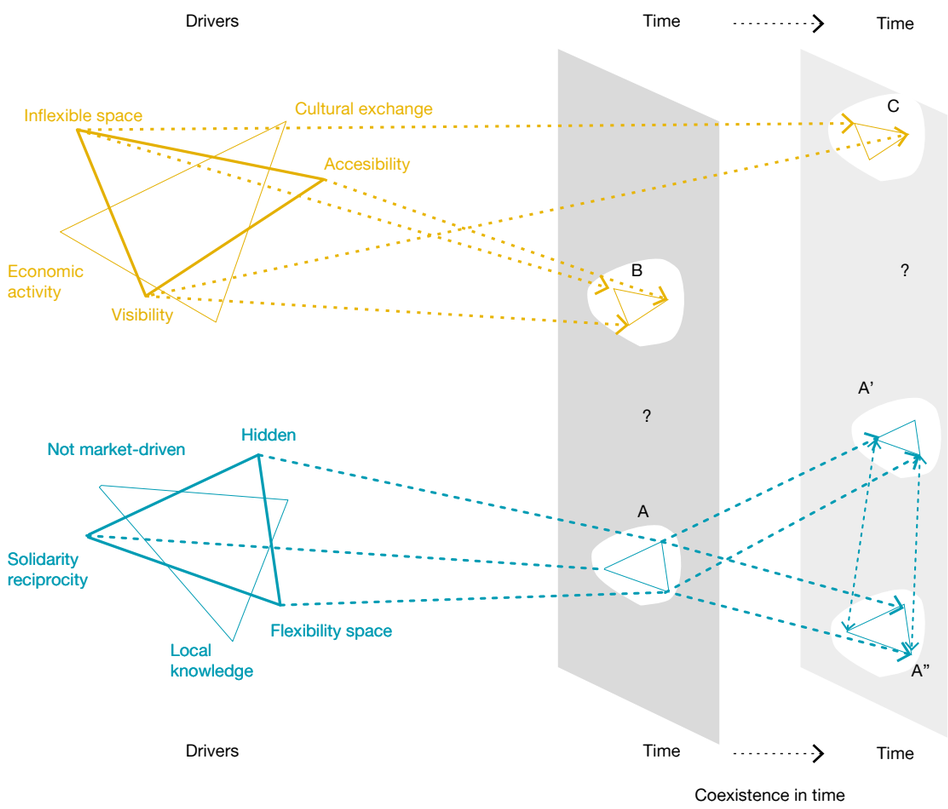
Designing ecosystem transition

In the current ecosystem, and in the general system of temporary occupations, we can find two main patterns or drivers: opportunism and activism. The ‘opportunism’ pattern of temporary occupation is related to transitional spaces located in upcoming projects. They are moved by creating added value (mostly economical) in the temporary space, and are answers to the neoliberal agenda’s capacity of adaptation to densification pressure and new urban models. Connectivity, visibility and economic value are important values of this pattern.

Such spaces are seen as valuable economic assets by the city and private players, and their reach goes beyond the borders of the neighbourhood in which they are located. These spaces are mostly market-driven and follow certain constraints in terms of accessibility, inclusiveness and management. Visibility within the city is an important value. This model does not guarantee the permanence in time and space of the temporary uses. Projects are temporary in time and space and mostly volatile. CityGate is an example of a transitory occupation pattern driven by opportunism. The ‘activism’ pattern of temporary occupation exists even before spaces become available. They are moved by cultural or social values. They follow a strategy of changing the urban models’ regime and are driven by solidarity, reciprocity and philanthropy (Iveson, 2013). They are well acquainted with the social fabric in which they exist, and hiddenness is often an important value. Flexibility in the use of the space and in its accessibility is appreciated. These spaces are a permanent reality in the city. The temporary activities deployed in the spaces are seen as an asset, but their continuity is also essential. Each of these spaces is unique and has a strongly self-organised model. Despite their meaningful impact in the city, they do not consolidate or establish. Volatility, contingency and adaptation are important values.

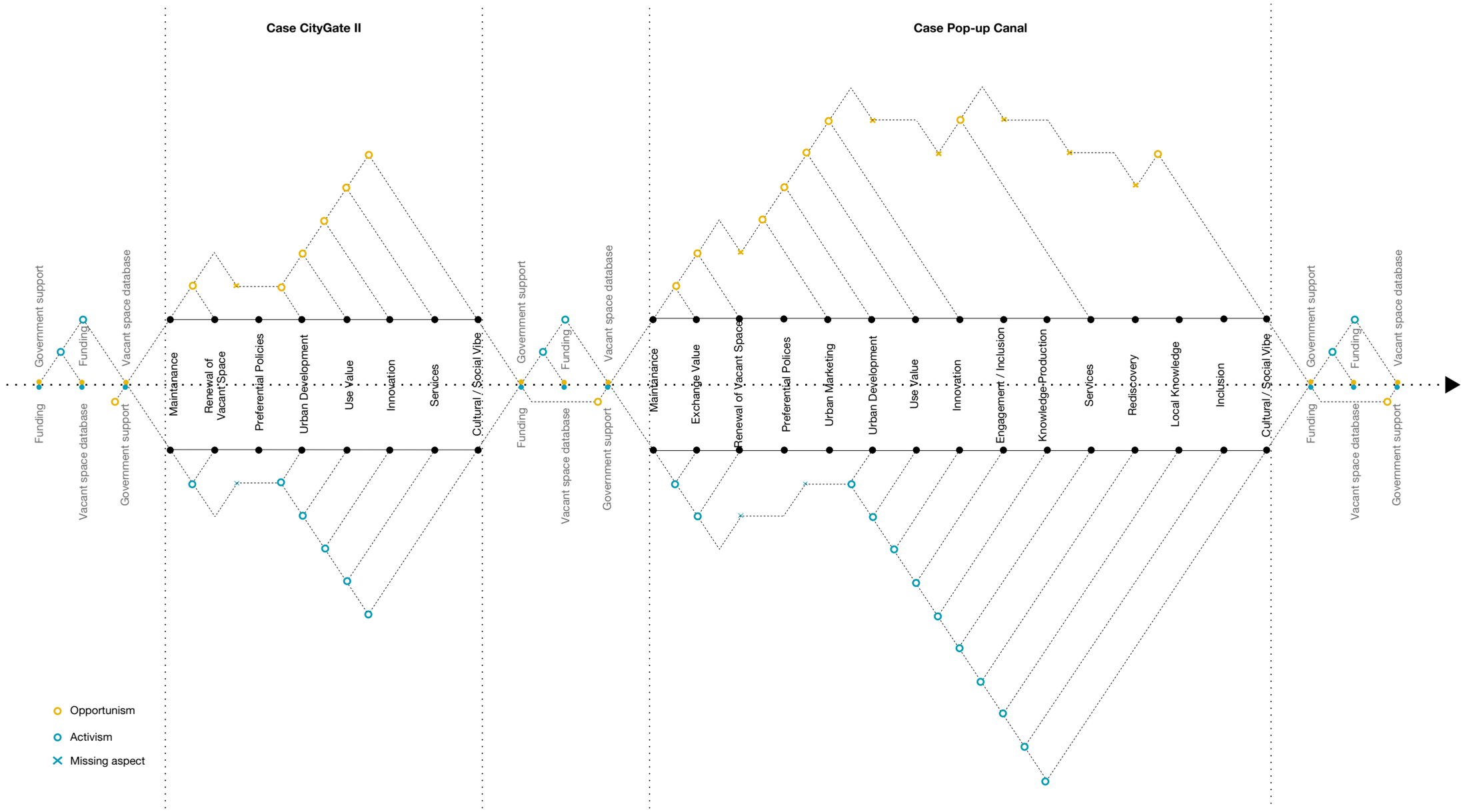
Both patterns of temporary occupation coexist within the city, bringing different dynamics and ecologies. Their coexistence might, in some cases, be a source of conflict. The various ecosystems in presence and the urban context of each site give priority to one model or the other. In some cases, both patterns are present and the Opportunism pattern is most likely to be preferred. The space in itself and the difficulties in term of regulations (perspective.brussels and BMA, 2018) might be significant obstacles to activism patterns.

Opportunism pattern



Activism pattern

Question of time of coexistence
How can new city models meet the need for a permanent temporal use of the spaces? Allowing and empowering spaces following activism patterns is an increasingly important strategy to keep a meaningful ecosystem in the city. Activism spaces can provide resilience and inclusiveness models that can deal with the city’s current problems of housing, unemployment or economic disparities.



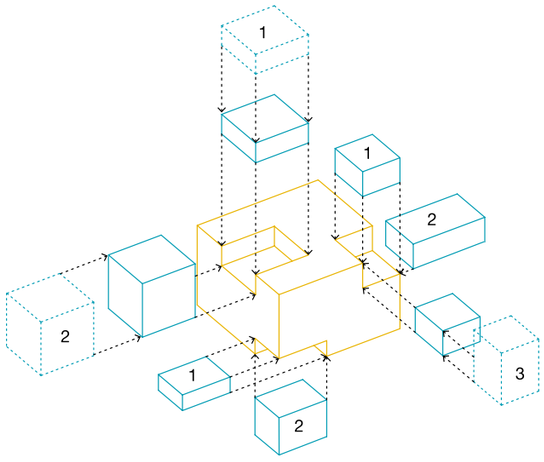
Regime change strategy
The two patterns of occupation in the densification process provide us with a system of strategies and drivers that affect the existing urban fabric and generate various dynamics and processes. Both patterns have their own values and aims, and they apply different strategies.

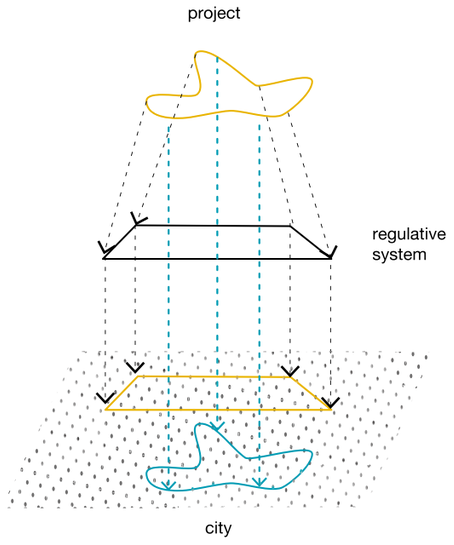
1. From temporary uses to transitory spaces:
Bringing underterminancy and uncertainty in future design models

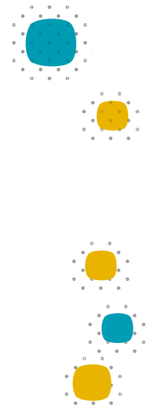
2. Flexible bureaucratic system:
Towards a regulatory system that takes into account the ecology of the transitory spaces

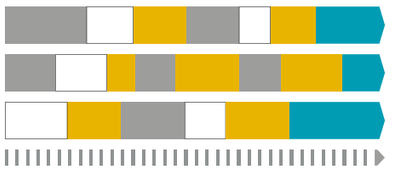
3. Urban context-theory of the holes
Urban context as an input for
The temporary spaces

4. Time phasing
A time based approach in
a densification process

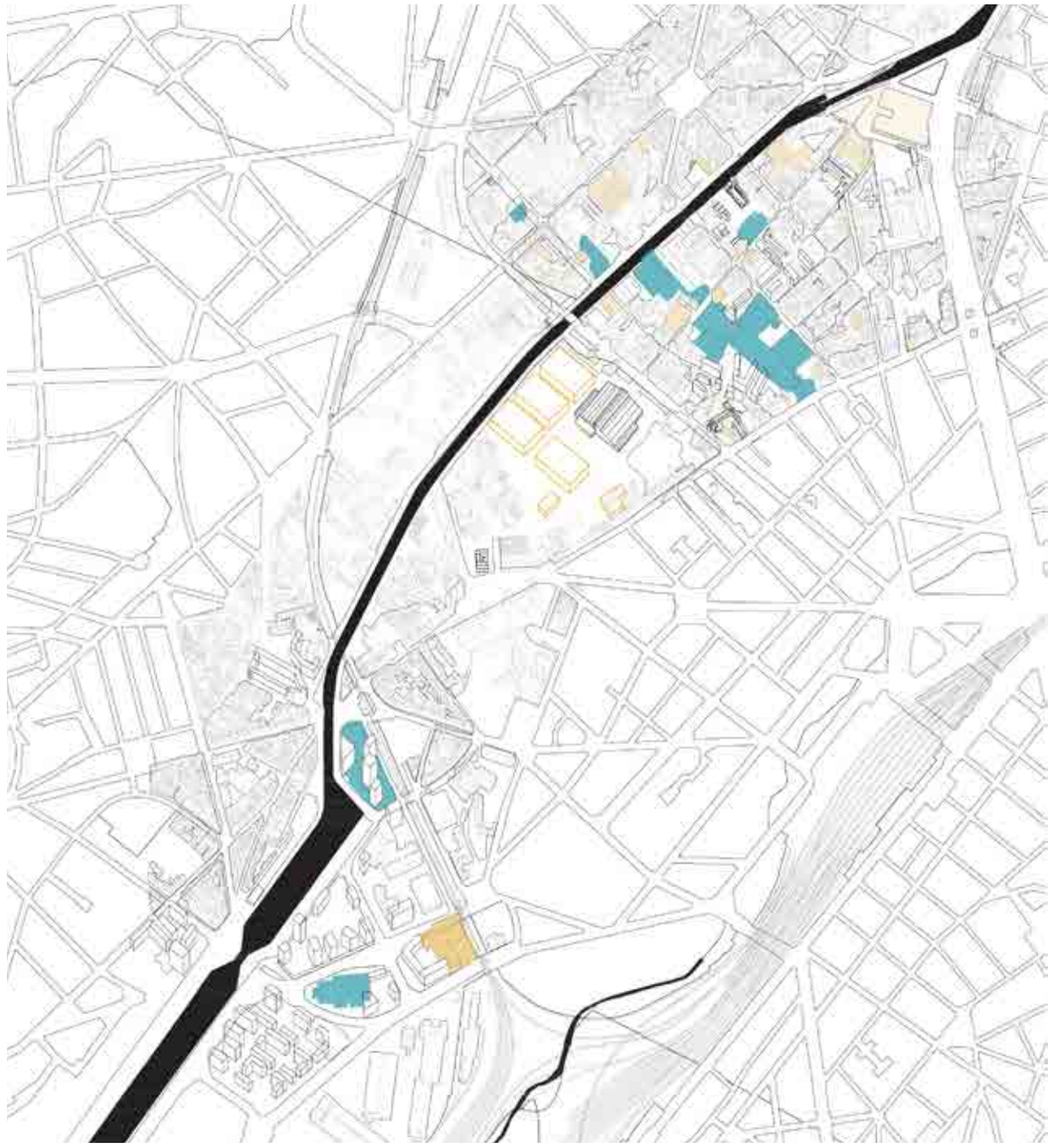




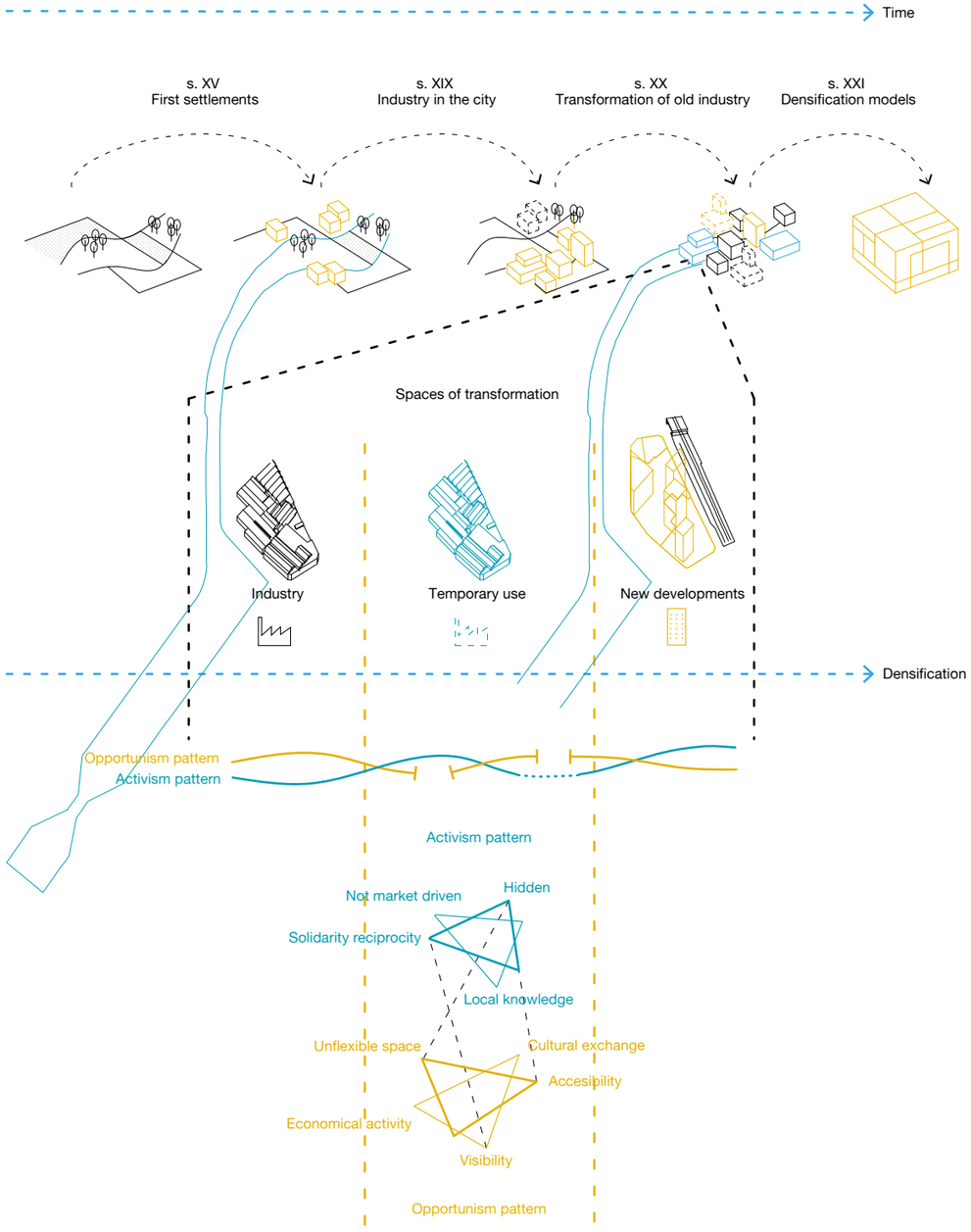




A combination of strategies is suggested in order to build a more qualitative density and help multiple patterns coexist in the same ecosystems; it also questions the idea of how temporal uses of the space could have a place in a densified city.



Transitory spaces are a temporary spatial phenomenon, but they are a permanent reality in the city. They are an important part of the whole ecosystem of the city.



Conclusion

Valentina Bonello, Ernesto Diez, Johans Figueroa, Anna Ternon, Ivana Vukelic

Densification is probably one of the city's most important transformation processes. An inherent process in the city, densification has never been a linear process. The current urban fabric is the result of the various waves of densification processes.

Urban transformation has constantly dealt with the multiple dynamics of urban growth or decline, urbanisation and economic flows. It has been a flexible model of evolution. During the various transformation processes, spaces characterised by indeterminacy, uncertainty and flexibility have appeared. Historically, these places have been spaces of opportunity and inclusion. Vacant plots or buildings have been extremely important places that help build a resilient and inclusive city. They help empower various mechanisms of self-organisation, activism and day-to-day survival in the city. New arrivals, disadvantaged population and natural landscapes have found here a place and a time for their inclusion in the city. These spaces have been neglected by the administration and the private market. Temporary occupations are strongly linked with these spaces, where they find a place to operate. However, today, new models of occupation appear linked with market-based profit systems. As we have seen, different patterns of occupation occur under a densification agenda, coexisting in time and space.

Today, in the city of Brussels, former industrial sites are developed in order to address the challenge of democratic growth. However, the current agenda deals with the transformation of uses in a quantitative vision. Transitory spaces are a temporary spatial phenomenon, but they are a permanent reality in the city. As an important part of the city's entire ecosystem, their existence must be guaranteed. Their dynamics of empowerment provide a constant source of inclusiveness and resilience. Still, the coexistence of two models must be understood as an opportunity to enrich the temporary uses of places in the transformation process.

The transitory spaces that have always existed in the city are no longer considered as part of a long-term strategy. Temporary uses of space are only envisioned during a short period of time until the final project is implemented. Still, we consider that — as history has shown — the temporariness of spaces must be a constant strategy in order to always provide spaces that promote inclusion and resilience and, at the same time, provide value and knowledge to a densification agenda. In order to design the city, we need to ensure the continuity of these spaces in order to develop a model of city based on values of inclusiveness, ecology and resilience.

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Stakeholder insights – Entrakt

Interview with Gerd De Wilde, Former manager of Studio CityGate
This text is issued from an interview by Anna Ternon regarding the project produced by the 'Density' group.

Studio CityGate is a very complex project to begin with. The size of the site, as well as the state it was in, meant a lot of money had to be invested, including to bring it up to code. This investment put pressure on the projects developed on the site, especially because they could only be active during a limited time frame and because — in the case of private companies — their presence had to be profitable. In addition, while the occupation of CityGate is planned over a period of five years, each project's actual period of activity is never really five years, as occupants come in gradually.

The practice of temporary occupations is still developing, and there is not much expertise available yet; on top of that, legal aspects are not adapted to real-world practices. Public institutions are starting to take part in these initiatives, but there are many parameters that could make projects difficult and prevent them from reaching a positive conclusion. CityGate is an interesting case to learn from, considering its size, the building's state and the various players involved in the project and who are active on the site; this is a case study that will enable us to question what is meaningful and what isn't. As of now, the exercise is still ongoing.

Regarding the coexistence of the various players, I think it's important that different approaches are used. There is a huge difference, to me, between commercial players and non-profit players, and both are necessary. They do not work at similar scales, nor on the same types of projects. When you have money to invest, you can do many things that are not within reach for socially oriented projects with little money and subsidised employees; conversely, when you work on a commercial project, it's very difficult to dedicate much time to the project's social impact. Still, the data from the Saint-Vide-Leegbeek campaign shows that millions of square metres in Brussels are vacant; more than enough for everyone to find what they need, and for practices to develop in all directions.

Regarding occupations that prefigure the site's future permanent use, this largely depends on what this permanent use is. It can be difficult for a temporary occupation to offer functions related to those of a planned school, for instance, or a hospital. On the other hand, temporary occupations are ideally suited to any future use related to creation or cultural events. It can also contribute to activating an area and energising a neighbourhood, even though this can be difficult to implement. In the case of CityGate, we have attempted to build relationships with the neighbourhood, but you also want to avoid setting people up for disappointment by creating something that will not necessarily last. The occupants of each location, who remain the main players involved, put significant efforts into just launching their project; and developing relationships with the neighbourhood only comes second. In addition, neighbourhood residents do not necessarily interact directly; it can take some time for people to socialise with a new entity, and this is not always compatible with the time frames involved in temporary occupation. What's more, projects will often reach the people who are receptive to such initiatives in the first place, and these are not always the same people who are in need of this type of activation.

Stakeholder insights – Communa

Sâm Rosenzweig, in charge of finances Interview conducted by Anna Ternon, following Dessiner la Transition seminar in April 2019, during which the ‘Density’ group’s work was presented.

For Communa, what is most important in how temporary occupation practices evolve is the concept of transient urban planning, i.e. the idea that the temporary phase influences the public or private owners’ long-term plans. Communa attempts to include this aspect in its projects. For instance, the ‘La Serre’ project in Ixelles should prefigure the community space planned as part of the future housing project. We have tested multiple uses, and the bicycle workshop has been very successful. We would like to explain what worked to the authorities of Ixelles municipality, so that they may include certain conditions when selling the building next year.

The practice of temporary occupation is becoming increasingly common, but there is no framework enabling the development of transitory urban planning. Temporary occupation is systematically activated at the end of the process, whereas it could be a valuable tool for ‘upstream’ reflections on urban planning, for instance in the context of neighbourhood contracts and urban renovation contracts. Adapting the regulatory framework should enable reflection on prefiguration with players beyond public or para-public organisations. The Region is considering this, keeping in mind the risk that it could benefit for-profit stakeholders whose management conditions often place occupants in an even more unstable situation. On this question, Communa has gathered with other associations to create Saint-Vide-Leegbeek, Brussels’ ‘20th Municipality’. Our demand is that the regulatory framework would be made more flexible only for actors active in the social sphere and that the generalisation of temporary occupation contributes to the public interest. This division between stakeholders that are active in the social sphere and others is not only about their business model but also about the status you give to the occupants, the rights you grant them, how you treat them, what your goal is in terms of integration in the neighbourhood and the model of your organisation itself.

Some also claim that generalising and institutionalising temporary occupations could make them inaccessible to minor players. However, I believe that the territory’s resources are such that the temporary occupation movement enables different players to coexist, because the projects involved do not overlap. For instance, I do not think squatters would have occupied a building like the former mail sorting centre or the Ixelles barracks (Usquare). Smaller-scale occupations target a different type of building. Communa was born out of smaller occupations, and we will continue to support these projects and collaborate with the groups behind them.

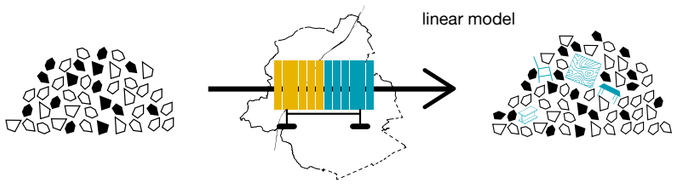
Circularity

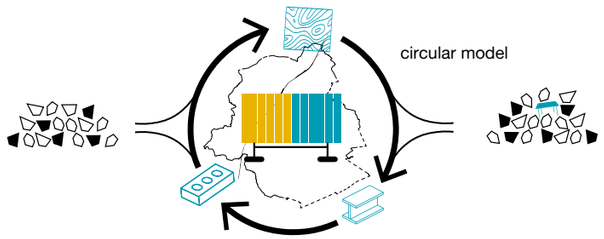
Territorializing Circular Economy in the construction sector

Alice Bassan
Andrea Bortolotti (tutor)
Martin Casier (stakeholder)
Elsa Coslado (stakeholder)
Ken De Cooman (stakeholder)
Mathieu Depoorter (stakeholder)
Elisa Donders (stakeholder)
Emilie Gobbo (stakeholder)
Ophélie Goemaere
Geoffrey Grulois (tutor)
Laurence Hendrickx (stakeholder)
Stephan Kampelmann (stakeholder)
Sven Lenearts (stakeholder)
Maria Leonardi
Dieter Leyssen (stakeholder)
Mae de Monchy
Géraldine de Neuville
Luca Nicoletto
Victor Ooghe (stakeholder)
Marc Renson (stakeholder)
Frederik Serroen (stakeholder)
Jean Souviron (stakeholder)
Marine Spor

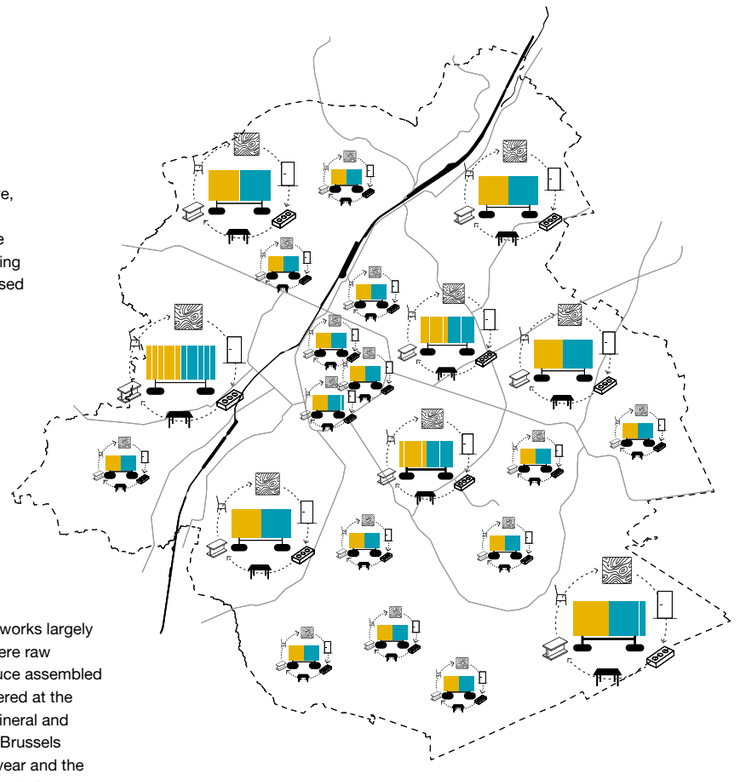
2.239
Kt/year raw materials
25% of all incoming flows into the Brussels Region

2.422
Kt/year waste
35% of all outcoming flows from the Brussels Capital Region





In a more circular perspective, each construction site can be considered as a mine, the materials of the buildings being dismantled, recycled or re-used



The construction sector still works largely with an economic model where raw materials are mined to produce assembled materials hardly to be recovered at the end of their lifecycle. The ‘Mineral and construction’ flows entering Brussels represent 2.239 kt/year per year and the waste of it going out of the capital reaches 2.422 kt/year

Introduction

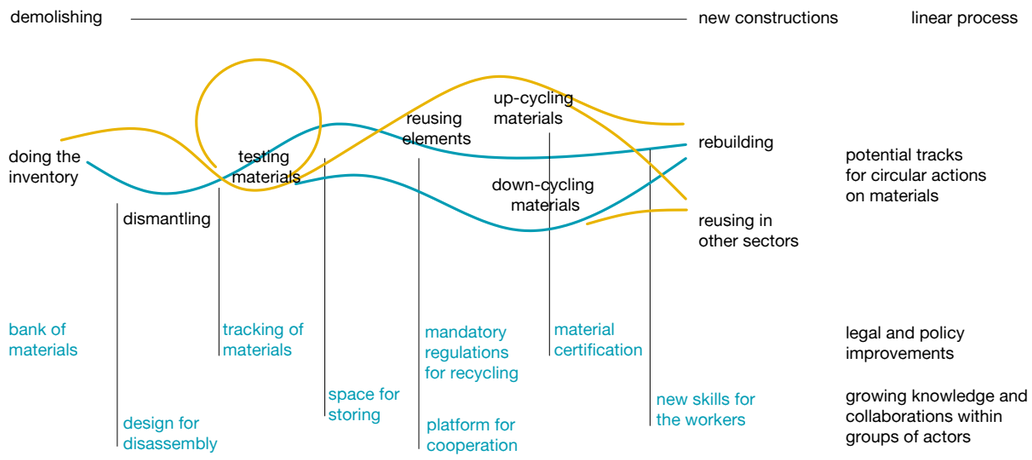
Due to constraints on the availability of resources, it is urgent to move from a linear economy towards a circular model of production and consumption. The many definitions of circular economy (CE) all revolve around the idea of 1) closing material cycles and 2) increasing resource efficiency (Moreau, Sahakian, van Griethuysen and Vuille, 2017). Circular economy is a blooming research topic and policy objective across the world, for instance in Brussels with the PREC. Still, there is a need to assess the effectiveness and impact of CE policies and initiatives at the level of regional ecosystems. There is a risk of CE becoming only a container concept, encompassing various conflicting practices and discourses and making it meaningless in practice. In the traditional linear economy, capital flows are transformed into material flows, seeking profit by building new elements in physical space (Harvey, 1976). As an example following this argument, the demolition of buildings is epitomic of the linear production and consumption economy.

Steering the transition towards a CE, it is vital to look at the management of material flows and the organisation of space and labour in the construction sector. When applying circular strategies in this sector, it should be underscored that circularisation is not a sufficient criterion if the intensity of material flows is not reduced (Arnsperger and Bourg, 2016). In assessing the territorialisation of CE strategies for the construction sector at the regional level, we apply the concept of a hotspot: a physical parameter (urban plot, block, and district) that is key in the spatial organisation of future regional flows (Kampelmann and Athanassiadis, 2018). The scale of this spatial parameter requires an analysis that extends beyond discussing 1) flows of urban metabolism to 2) the spatial structure in which these flows are embedded in, as well as 3) the socio-technical regime that governs them (Broto, Allen and Rapoport, 2012). Controversies surrounding intensity, spatial structure, and socio-technical agency are relevant in the practical context of designing strategies to improve material circularisation in the regional ecosystem (Kampelmann, 2018). A three-dimensional analysis is better for the complexity of implementing CE strategies, which is as much a material issue — related to technical expertise and manual know-how — as it is a governance issue — an ongoing negotiation and creation of new business and governance models. The former requires increased sharing of knowledge across sectors, whereas the latter presumes a shift in the logic underlying these models.

Ecosystems & situations

We adressed two potential hotspots in Brussels, the Ixelles former Barracks (Usquare) and the Northern Quarter (NQ), whose scale and stakeholders differ. Both sites are planning large-scale reconstruction and regeneration, and are intended to become more vital mixed-used neighbourhoods. Usquare is a publicly managed project, the result of a collaboration between two universities, with the purpose of renovating an early xxth century military complex. It will be developed as a test site for the application of CE in the construction sector. The project translates into an innovative and interconnected cooperation of stakeholders, as opposed to ‘closed’ independent activities, because stakeholders are trying to cooperate and collaborate at every stage of the process. This means the site has a clear CE strategy and already carries out concrete circular actions. Work on this site is experimental and time consuming, but more materials are reused and recycled. Usquare’s relevance lies not so much in quantity of material flows, but in the fact that it is considered a ‘niche practice’, which is analysed in terms of a governance model, and in how the players interact throughout the design and reconstruction process, in order to steer a transition towards interactions at the scale of the ‘socio-technical regime’ that is dominated by market parties in the case of the NQ (Geels, 2011). In a context of public supervision and EU funding, there is no business model at Usquare, which can be translated to a model that encourages private players to adopt CE strategies. This is all the more surprising that local experiences such as ROTOR have existed in Brussels since 2000s, proving a capacity to integrate the principles of CE into a local and successful economic model (Ghyoot, Devlieger and Billiet, 2018).

The NQ is a 1960s administrative district consisting in a series of office towers located between the Brussels-North railway station and the Canal. These towers are owned by large private corporations and state-owned enterprises. The strategic location of NQ is characterised by a multiplicity of urban regeneration projects underway in the neighbouring industrial zones. The NQ is more significant in accelerating CE application in terms of quantity of construction materials that will be circulating in the coming years, fuelling new business models and skills. However, the NQ lacks synergies between the timelines of the various construction sites and connections between stakeholders in terms of CE strategies beyond individual sites and real estate properties. Both Usquare and NQ are missing a strong link to a contractor, which is needed to perform a central function not only in the execution, but also in informing the design process and coordinating the creation of the new kind of labour that is needed. Another essential component that is lacking is the cross-sectoral exchange regarding the future purpose of materials beyond the construction site.



An economic transition also involves a transformation of disciplines pertaining to the actors involved in the construction process and their interaction at different stages. There is the need to radically rethink the relationships between actors that are present in the current material economy, from a less individualistic and compartmentalized process towards collaboration between the sectors that perform a part of the process.

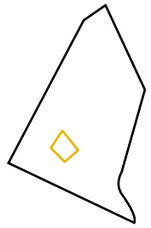
Heritage

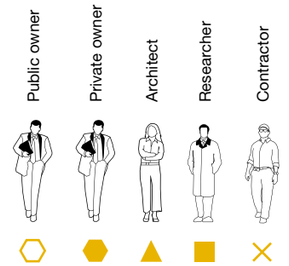
Inventory

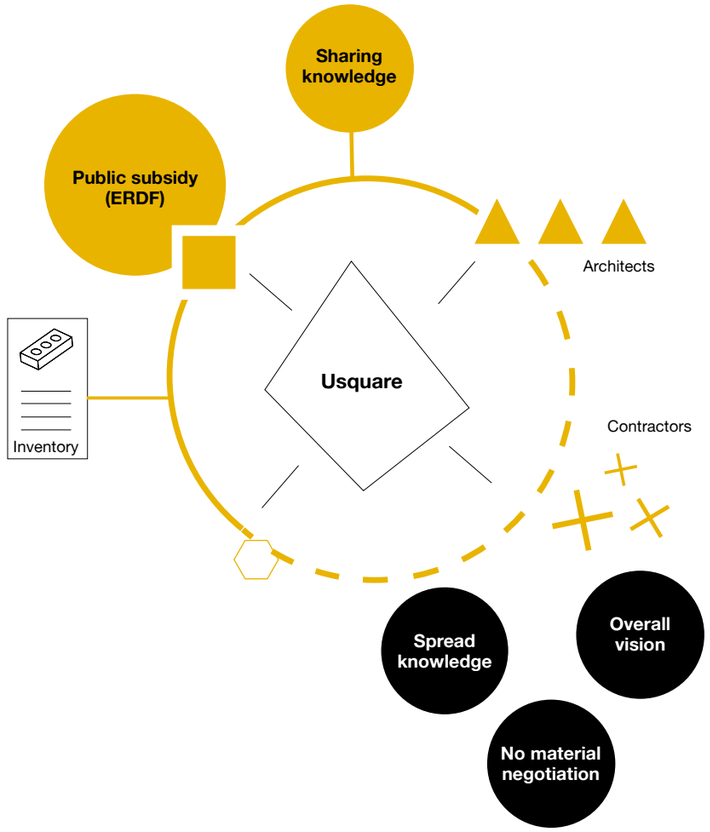
Assortment

Quality

Usquare has a demonstrative value for CE application in construction. Maintenance of buildings is one circular action. For other buildings the regeneration or demolition is preceded by an inventory of all materials, following circular actions in cooperation with industries and contractors. Part of the site is temporarily used as material bank during construction. A significant amount of bricks is reused on site, unusable bricks have influenced architectural design of the staircase using granite made from crushed bricks.







It is important for the application of CE at this site the cohesion of different actors, before execution and designing a plan. Namely, the formulation of a common vision on CE, and clear strategies by the universities, architects and landowners, leading to a back and forth dynamic between the possibilities (circular actions) and the design (plan) made by architectural firms. The three architectural companies – all specialized in a different domain – have worked together on a holistic vision for the site.

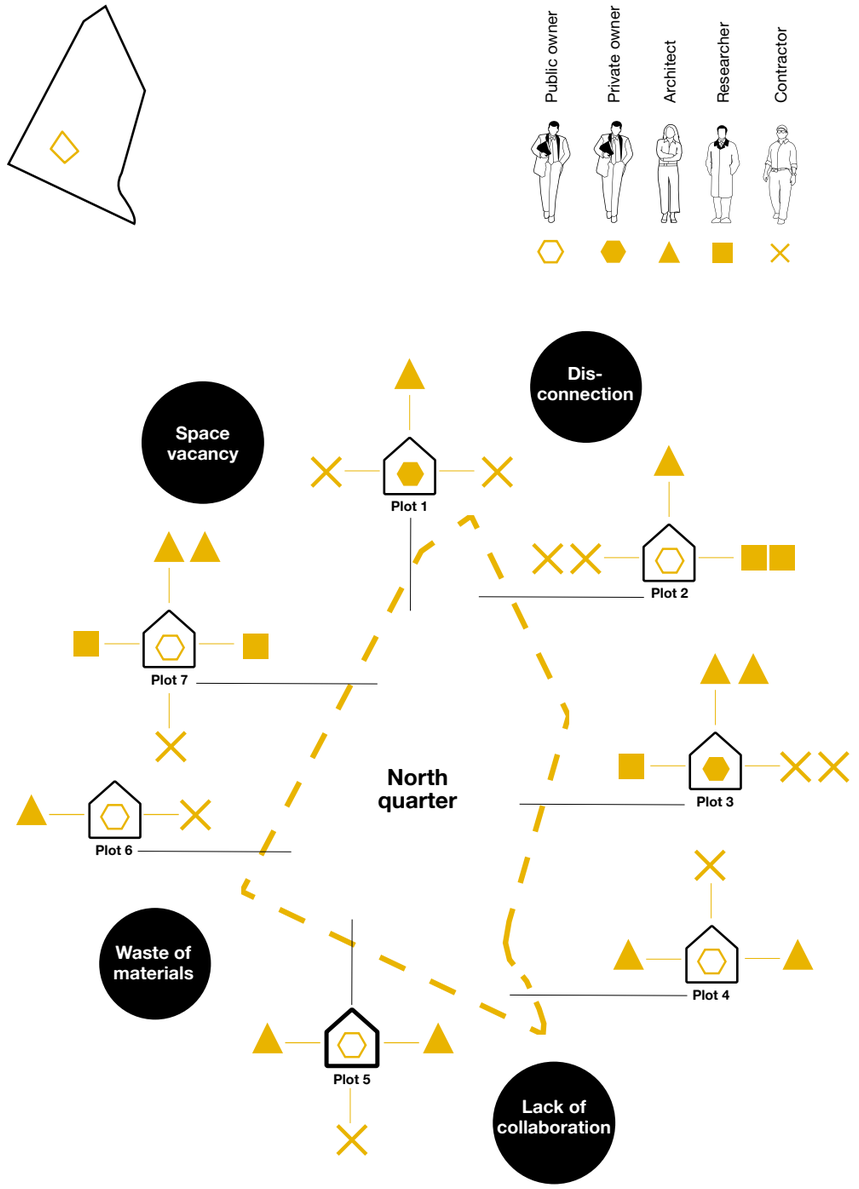
Port industry

Vacant space

Inadequate storage

City in process

The monofunctional administrative high-rise district – 1.6 million m² (618,000 sq. mi.) of offices – with a significant number of vacant offices, poor quality of public spaces and a lack of basic amenities and services at the ground floor underlies the need to rethink the value of this district for the city of Brussels and reinvent its urbanity.

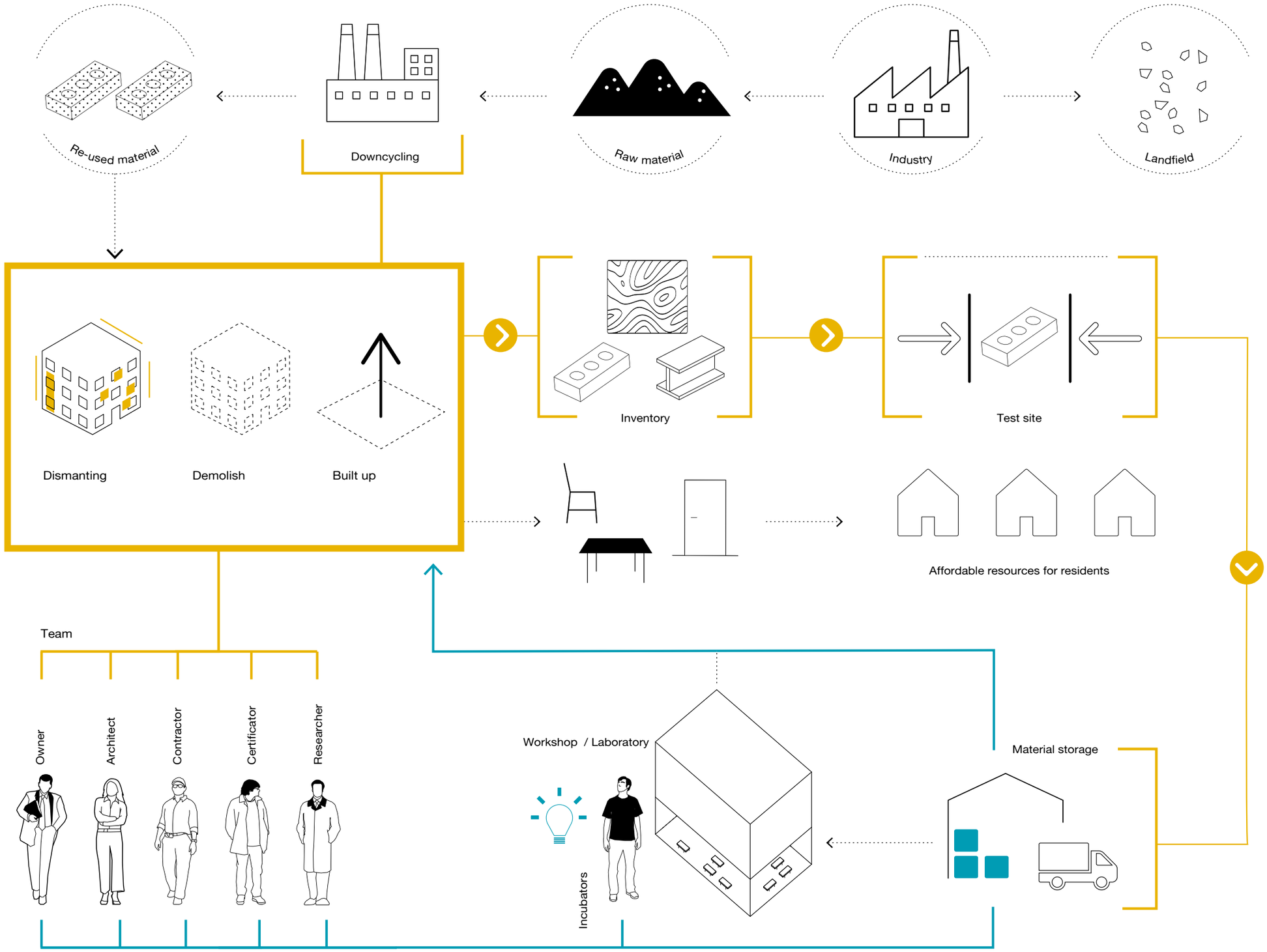


In NQ the regeneration is privately initiated, which increases the complexity of the interaction between stakeholders and decreases the centrality of CE strategies in the planning process. The challenge is the negotiation between landowners, who pursue independent plans for their sites, with different architectural companies. There is willingness to cooperate, exemplified in Up4North, as well as a growing sensitivity to CE, but there is no overarching vision for identifying CE strategies, between the different construction sites.

Potential

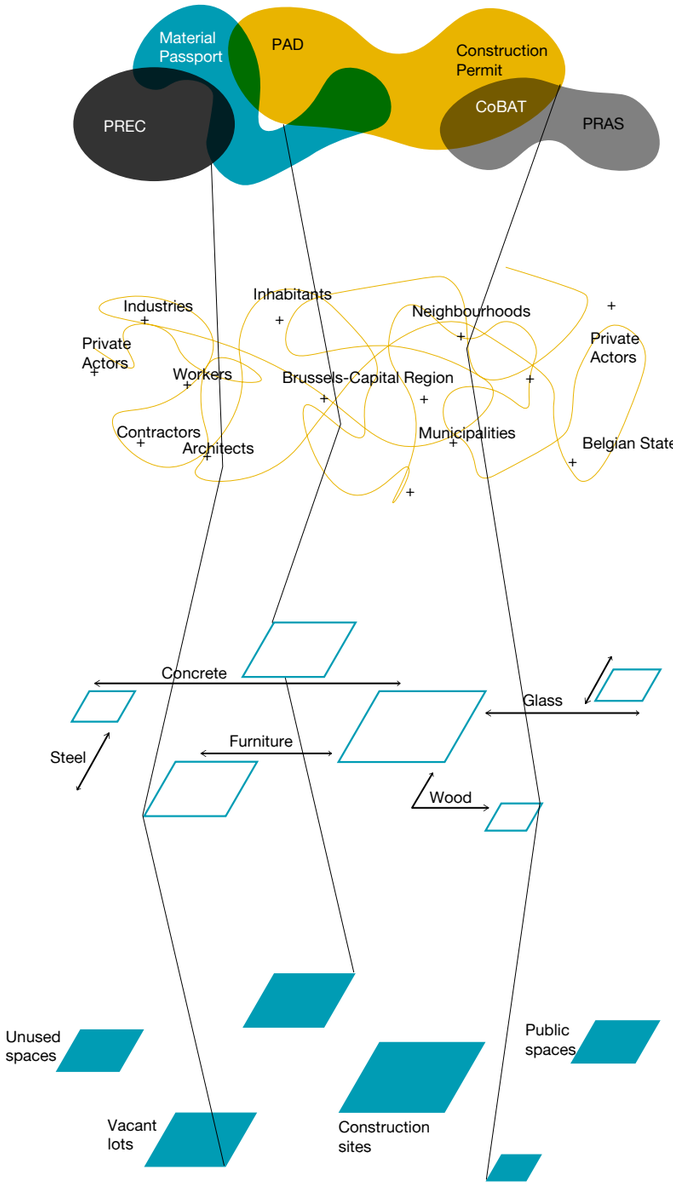
Missing link

Weakness



A different approach is needed within the construction and demolition sector in order to consider waste materials as raw materials and the built environment as a potential mine. It is important to provide sufficient time, space and manual knowledge to plan a process which allows for inventing new circular actions along the way. The owner of a construction site should integrate a multidisciplinary team that will execute the project.

The selective dismantling of building components and materials must be preceded by an inventory of elements and materials to be broken down. With this inventory, specific circular actions can be formulated, depending on their quality and demand. The sum of these circular actions constitute a material management plan for the site as a whole.



A a multi-layered platform for circular projects should respond to 1) the need for space, 2) increased efficiency of material flows exercised by a 3) decentralized network of actors with overlapping functions, giving rise to new knowledges and 4) a legal landscape – with clear regulations outlined by the PREC – to incentivize the adaptation of circular strategies by a range of actors.

Legal and Policy framework
Land use and policy regulations decide the actor's incentives. The PAD could be used as tool to combine the strategic visions outlined in the PREC with regulatory plans, for instance, setting a minimum standard for the application of reused and recycled materials within construction sites.

Actors & Knowledge
Circular actions need a different way of cooperation and linkages between actors and their expertise.

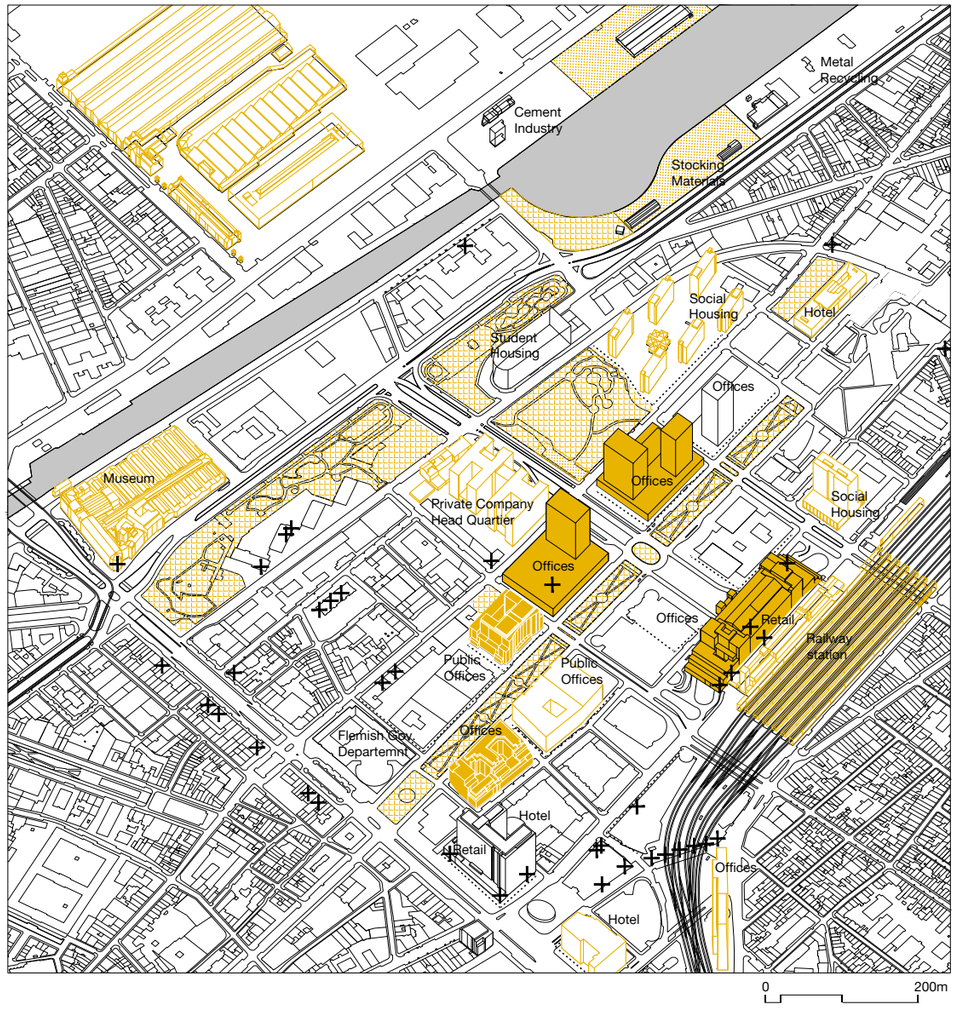
Material Flows
Buildings are complex assemblages of materials, composed of different construction layers, differing in terms of their life cycles.

Space
Space is a crucial element for enabling material and knowledge exchange.
CE requires a shared space (that is not only virtual) for the actors of the construction sector.
Spatially, at least 10% of the project area needs to be dedicated to a 'transition zone'. This transitory multifunctional zone will perform different functions according to the stage of the construction process.
Material banks – covered (parkings, tunnels) and uncovered (canal area, parcs, in situ) – will be stocking and distributing the different materials.

Designing ecosystem transition

Our proposal for the NQ implements a multilayered infrastructure for the creation and exchange of circular actions. We propose to spatialise the interactions and knowledge sharing between actors in order to reach a common vision and strategies. This hotspot offers an ecosystem of accelerated interconnections and infrastructures in the NQ to steer that transition. The proposal emerges from the conviction that the knowledge necessary to accelerate both the quality and quantity of circular actions is designed, developed, and tested within a network of players in multiple sectors, rather than with a select group of technical engineers. Legal or economic regulations alone are not sufficient to radically rethink the relationships between these players in order for them to cooperate. The platform is designed to spatialise and present the different stages in the process of testing and redistributing materials. We identified the various spots necessary to collect and redistribute materials within different life cycles. Creating an active public market for the recovery of materials and components could cover the costs of dismantling, storage and resale in the long run. To this end, however, the recycled materials must be sufficiently available, attractive, and certified as suitable for reuse. We see that current CE initiatives score lower in economic terms than conventional techniques. Given the private-led development of the NQ, incentives to invest in a more complex and sustainable public process are limited. The European Commission stresses that buildings must be analysed regarding their material context in the phase before their demolition (Romnée and Vrijders, 2018). To ensure this, we suggest that construction permits only be granted to projects that conduct a material inventory — producing a ‘material passport’ for the property. This passport presumes a legal obligation to test the percentage of reusable materials in cooperation with a contractor. If a significant amount of reusable materials is used, the property owner is responsible for ensuring their future repurposing.

In addition to the objectives of public and private players to turn the Northern Quarter into a mixed-use office and residential district, we propose the public integration of foundational economic activities in the district, in the form of workshops that ensure a central position of manufacturing industries beyond the construction site (Bentham and al., 2013). Through remanufacturing, material flows will be managed and redistributed in spatial nodes. Through reverse logistics, the urban metabolism would be enhanced by shortening the supply chains of materials that find a new purpose on site or in other sectors beyond construction (Dowlatshahi, 2005).



Potential to be dismantled

Planned to be demolished

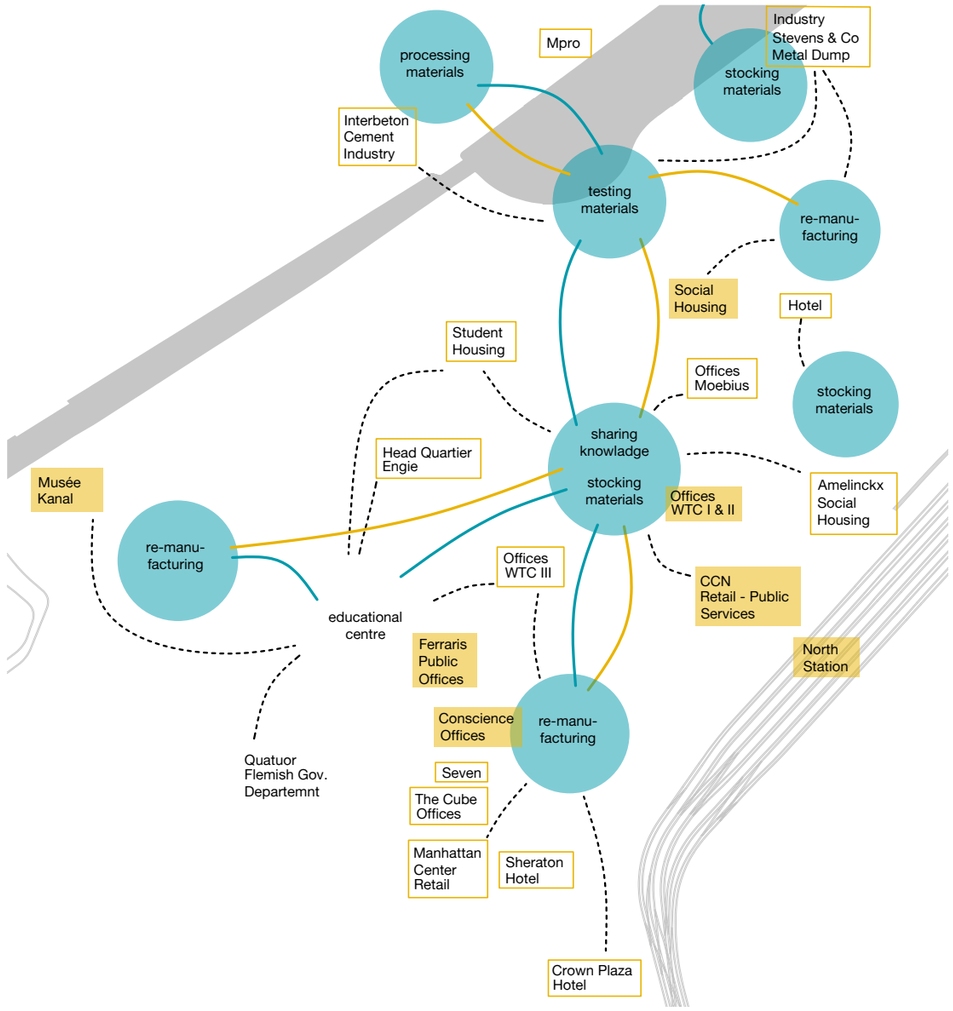
Ongoing or future renovation projects

Renovation process almost completed

Potential areas for renovation

Unused underground parking lots
Unused commercial spaces

We identified several spots in the NQ as potential urban mines and spatial resources for material dismantling, redistributing, and remanufacturing. The nearby post industrial areas and the port are strategic for negotiating the convergence of spatial and economic development in this way.



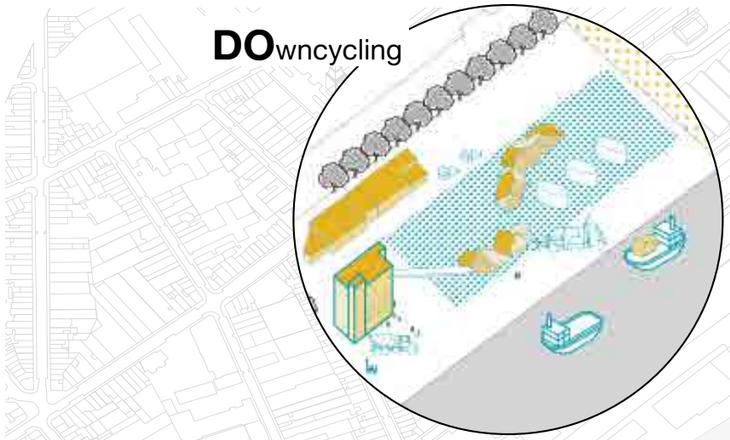
Circular Actions

Mostly publicly owned land but fragmented across different institutional levels.
Most of the ongoing projects (75%) are led by private actors.

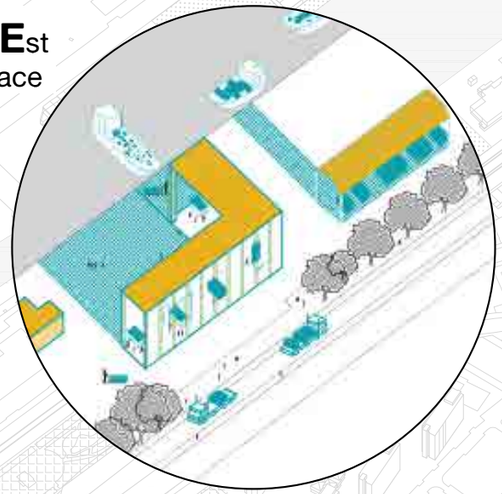
Public — Municipality / Utilities
Communities / Para-regional
Autorities / Brussels Capital Region / Belgium

Private — Real estate companies
Private land owners
Construction sector firms
...

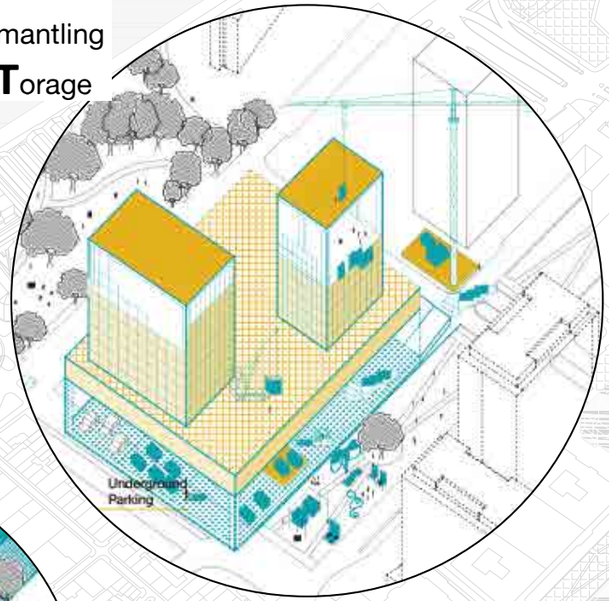
The platform stresses a needed interaction between private and public actors. Consolidated by appropriated rules, these interactions generate flows and knowledges for new circular socio-economic activities. This would reinforce and reinvent the cycles of making, dismantling, testing, storing, reusing and recycling construction materials as a part of a natural feedback loop.



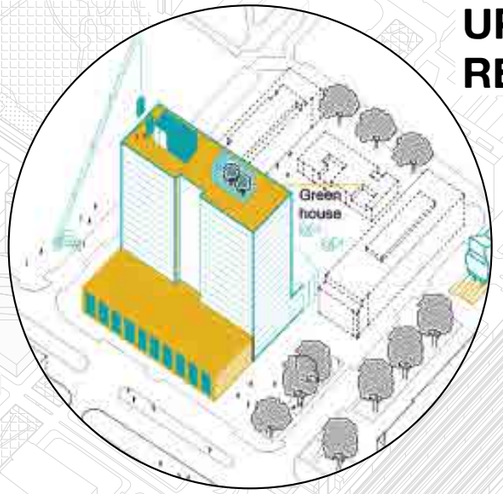
DOwncycling



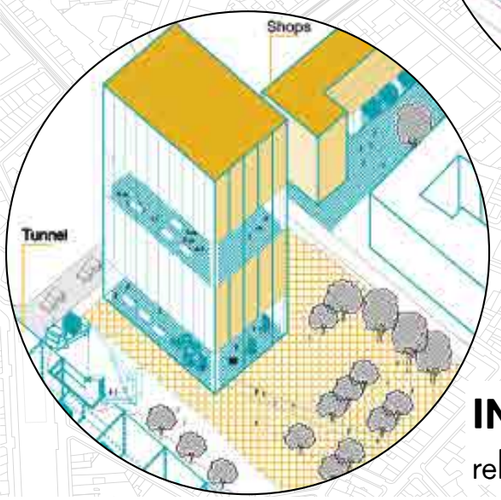
TEst place



DIsmantling + **ST**orage

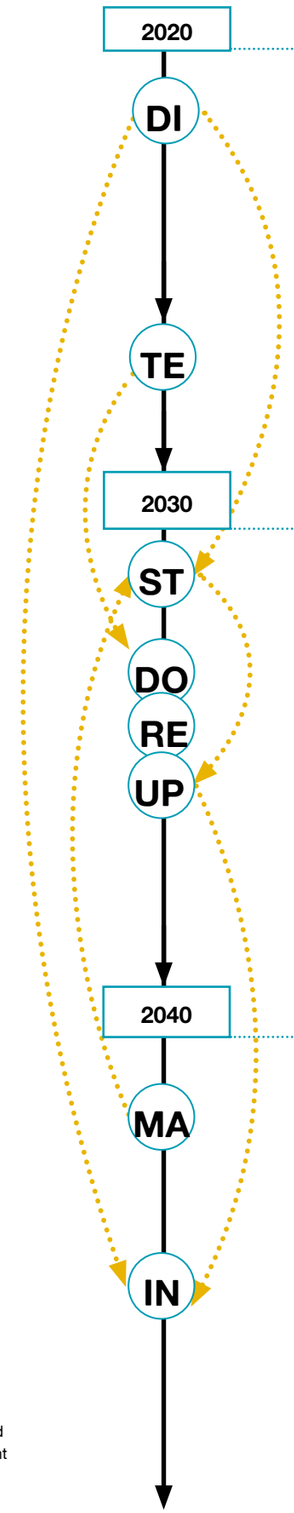


UPcycling **RE**-use



INcubator reMAnucturing

The nodes account for the different actions required to reuse and recycle a specific type of material. One circular scenario we investigated concerned glass.The manufacturing labor should gain a more permanent urbanity in the district. This would attract qualified employees, specialised in reusing and recycling of materials.



Project of multidisciplinary team + 30% recycling materials

Because of the huge stock of windows at the NQ (e.g. around 25,000 m², ~ 9,600 sq. mi.) for the WTC I), dismantling them could be interesting. Possible storage spaces are: underground parkings, boulevards, tunnels and vacant shops.

A part of the Vergote dock of Brussels port could be used as testing place before the reuse of glass and so the creation of a 'material passport'.

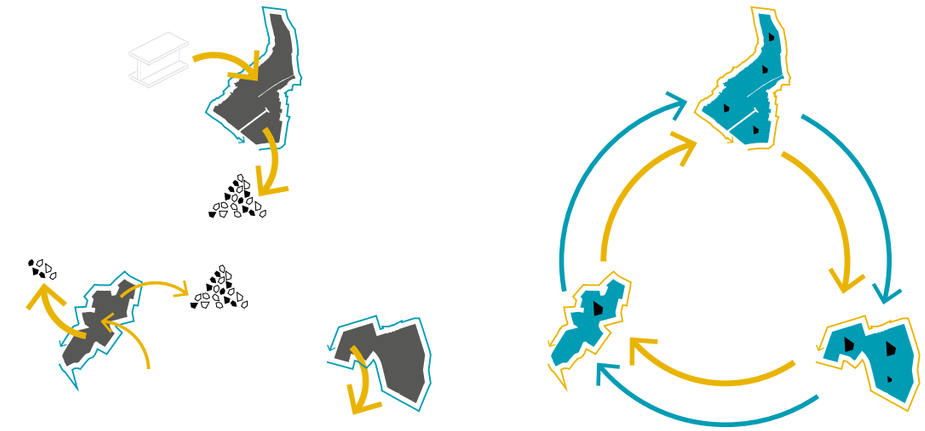
Materials passport 60% recycling materials

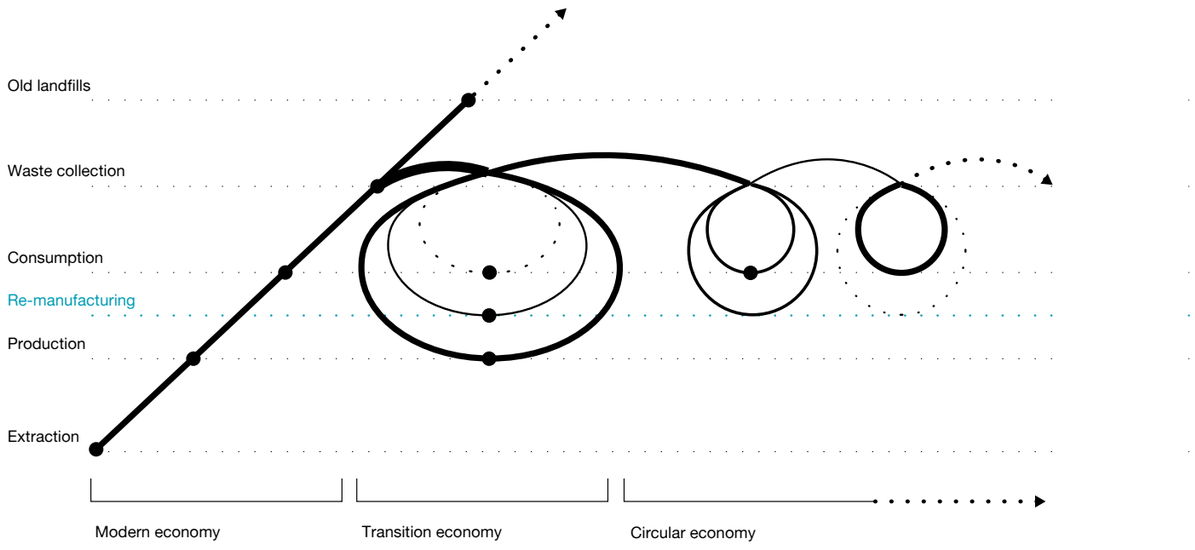
After testing the samples, the glass would go to a specific local industry to be downcycled (e.g. granulates) or go out of the hotspot using soft transport along the canal.

The glass could also return into the hotspot (in situ) to be reused or upcycled (e.g. renewed facades or greenhouses).

100% recycling materials

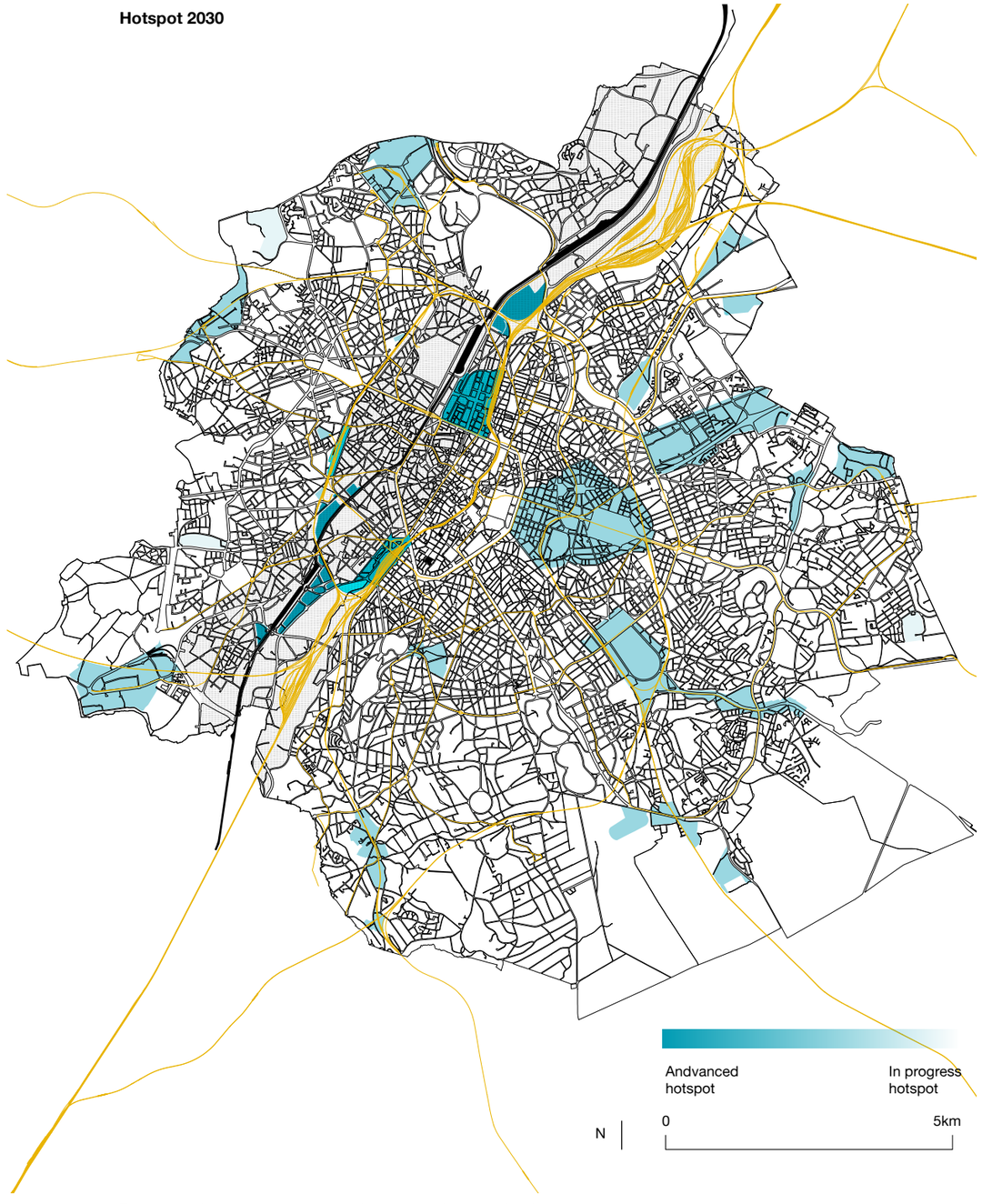
The crucial exchange of knowledge would happen in re-manufacturing ateliers – specific incubators – where actors of different sectors could meet and reinvent future purposes for glass (e.g. design furniture).





The transition phase is more time consuming, because it requires experimentation, but will result in more efficient reuse of construction materials. Following the transition phase, raw material consumption will progressively decrease, allowing the transition to circular economy.

Hotspot 2030



The hotspot is a subsystem, that participates to a larger regional dynamic where multiple nodes play a role in construction material flow management. Acceleration of the interactions with other industries and new enterprises will be the gatekeepers in this process.
NQ is a strategic hotspot because of its proximity to the canal, where logistic infrastructure and spaces for manufacturing are historically present. More areas could become potential hotspots in the future, starting with those strategic areas indicated by the regional development plan.

Conclusion

Alice Bassan, Ophélie Goemaere, Maria Leonardi, Mae de Monchy, Géraldine de Neuville, Luca Nicoletto, Marine Spor

We have identified various types of hotspots depending on the following criteria: 1) a strong platform of mixed and connected stakeholders, 2) sustainable logistics and infrastructure, 3) free space, 4) high quantity and quality of material flows. A hotspot is not as a closed system, but a subsystem that connects to a larger ecosystem: 'in progress' hotspots need 'advanced hotspots' to manage circular actions.

In a transition to CE, initial costs are unavoidable. In the quest for a new business model beyond the scale of a small niche, CE has more potential when applied to large areas, significant stocks of materials, and high amounts of flows. The governance challenge involves connections between stakeholders, both private and public, pushing towards a cultural shift. However, in order to encourage a socio-technical regime dominated by the private sector to invest in CE, a coherent legislation framework is a necessity, e.g. by connecting the PAD of the NQ with the PREC. Beyond legal enforcement, cooperation between the stakeholders — inside and outside the project, at any level — facilitates CE initiatives. This means a holistic view of construction plans shared by multiple players rather than fragmented sections. This interaction should be promoted spatially, creating spaces where multiple players involved in the construction process can meet. One lead is connecting the NQ to the reactivation of Brussels' post-industrial canal zone.

The next step is integrating CE in building design. Materials and building structures need to be designed in order to avoid issues related to reuse or recycling after dismantling. Anticipating the future of new buildings will lead to a 'repair-based' economy, and circular actions will become more efficient. The workshops in the hotspot should produce this knowledge, in the long run, by designing solutions with convenient assemblages and right materials. Redefining the ground space in the NQ for these foundational functions is a necessity: production workshops will ensure a continuous circulation of materials that have a shorter life cycle (e.g. furniture and surface materials). Such activity is compatible with CE and takes care of a reinvented urbanity in the NQ, with a multiplicity of functions. In the context of limited urban space and resources, the question of whether to rebuild after demolishing should remain a serious consideration in order to reduce the intensity of material flows.

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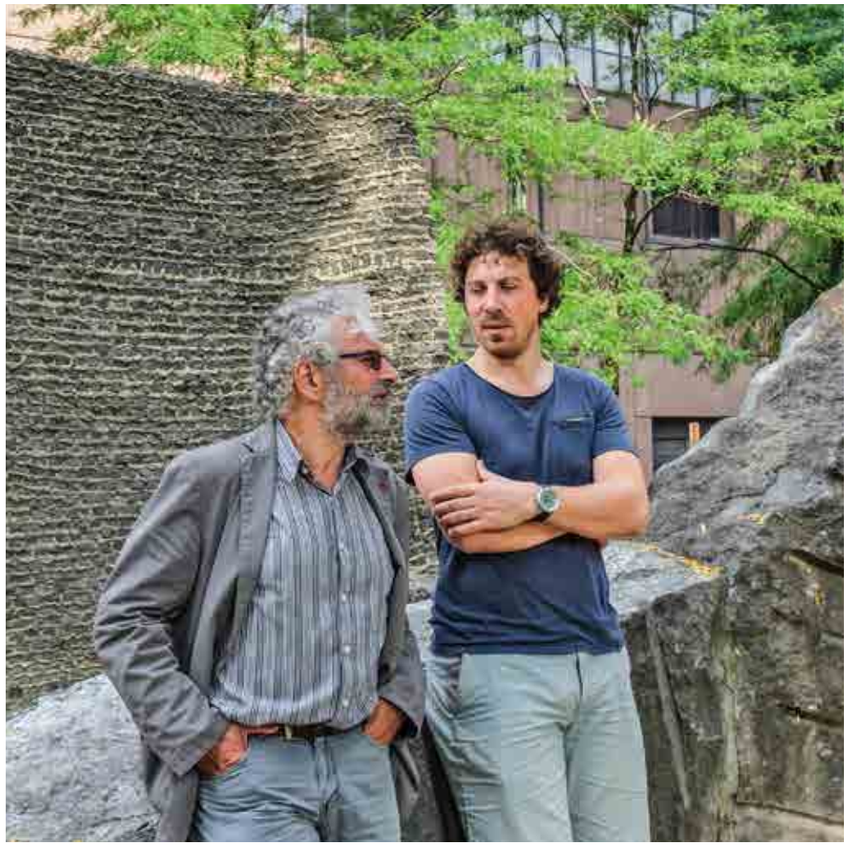

Stakeholder insights – IRISPHERE

Mathieu Depoorter, Marc Renson

The IRISPHERE programme, coordinated by citydev.brussels, seeks to boost the development of the circular economy in the Brussels-Capital Region. Its ambition is twofold: help Brussels companies improve materials cycles, and reinforce cooperation between companies at the regional level.

Applying a tried and tested methodology, the IRISPHERE team provides individual or collective guidance in order to identify, assess and seize economic opportunities between companies on a local scale.

The IRISPHERE programme is led by a broad consortium of Brussels players who are circular economy pioneers. The consortium consists of citydev.brussels, EcoRes, Lateral Thinking Factory, Greenloop, BECI, La Ferme Nos Pilifs, Bruxelles Environnement, Bruxelles-Propreté, the Port of Brussels, the Communauté Portuaire Bruxelloise, and hub.brussels.

In parallel with the setting up of the Brussels Ecosystems MasterClass and in collaboration with the Chair in Circular Economy, IRISPHERE has been looking into reusing the glass panels from the World Trade Centre 1 & 2 buildings (WTC1-2), in Brussels' Northern Quarter.

This synergy aims to avoid recycling the 600 tons of double glazing that cover the towers when they undergo major renovation work in 2020. The goal is to find ways to give a second life to this specific material on a large scale, with 5,000 copper-tinted double-glazed panels. The project requires calling upon many different players in order to study its technical and economic feasibility, dismantle the panels, transport them, store them and install them for their final use.

The challenge of this synergy is to find added value, in terms of either money or differentiation, both for the owner and the new user. We are looking into large-scale operations because our idea is to find a new use for flows of reclaimed double glazing in general. The first use we have studied consists in reusing the panels in other buildings. Unfortunately, the technical specifications of glass produced in 1971 no longer meet current energy performance standards. A second possible use is in large greenhouses used to grow vegetables (at least 1 hectare, ~ 2.47 acres). This idea was considered on a space belonging to IDEA (Mons). However, based on feedback from experts (glazing installers, produce specialists, glass manufacturers), this solution is not suited to productive greenhouses.

The difficulties encountered when looking for ways to reuse the WTC buildings' glass panels illustrate the social, technical and economic barriers, within the construction industry, that prevent the emergence of a truly circular economy. In this regard, these difficulties echo the discussions held during the MasterClass on the issue of sustainable transition in socio-technical ecosystems.

Stakeholder insights – Usquare

Martin Casier (project leader), Victor Ooghe (researcher in circular economy), Laurence Hendricks (assistant project manager)

The Ixelles barracks are a large space that has a rich historical and architectural heritage and features a wide variety of construction materials. Transforming them from a single-function site closed off from the city to a venue open to all requires that especial attention be paid to respecting the place's history. In addition, rehabilitating such a large area in a city necessarily raises important questions related to the optimisation of resources and spaces and the new ways in which we build, inhabit, work and collaborate.

This makes the Ixelles barracks especially well-suited to experimenting with various aspects of the circular economy. For instance, for the process to respect the venue's heritage, it must take care to reuse existing materials. It used to be possible for a transformation project to confront the site's heritage, but the current approach of reuse is more geared towards architectural integration and preservation.

In terms of circular economy, the goal is to reuse as much material as possible on the same venue, taking into consideration the buildings' history. In line with this idea, the architectural approach consisting in preserving existing volumes and spaces is the most circular and the most respectful of the venue's heritage.

Reusing existing materials requires a solid comprehension of their history, how they were made, their technical characteristics, and how they are used. This makes it possible to study the most viable solutions based on a hierarchy of values ranging from keeping the space unchanged to recycling the original materials for new uses, and including reusing them for other phases of the project.

Usquare's ERDF-funded project follows this approach and attempts, to the largest extent possible, to keep the building and its materials unchanged, reuse part of the materials (e.g. repurposing outdoor glazing panels into indoor glass partitions) or recycle them into new materials (e.g. crushing slates and bricks into terrazzo).

In order to encourage this dynamic, a team of researchers (BATir-ULB, SECO) is working hand in hand with the project owner (ULB-VUB) and the team of architects (BC Architectes, EVR, Callebaut Architectes, VK and others). This collaboration will let them not only develop new working methods (circular specification, resource management plan, physical and digital platforms to exchange materials, etc.), but also document their work in order to reuse and adapt it to other similar initiatives in Brussels. During the Metrolab MasterClass, we have investigated — together with the study group on circularity — the potential for reuse and recycling of the construction materials used in Brussels' Northern Quarter. As the group has demonstrated, it is important that all players involved in construction and in reusing materials be included in the reflection process.

Conclusion

What compass is needed for socio-ecological transition in Brussels?

Bernard Declève, Geoffrey Grulois,
Roselyne de Lestrange and Andrea Bortolotti

Introduction

The purpose of the Designing Brussels Ecosystems MasterClass was to think about the notion of ecosystem in its relationship with public policies. The MasterClass offered about thirty researchers an opportunity to conduct a collective survey on different urban transformation processes underway in Brussels. The aim was to describe them from an ecosystem perspective.

Applying the notion of ecosystem to Brussels is a theoretical, methodological and political challenge. Theoretically, it is a question of testing the potential of a notion that has now been adopted by many disciplinary fields. In what way is it really a resource for public policies? How can the ecosystem approach help us ensure the conditions for a public action of 'socio-ecological transition'? How can it help us take into account both the local and global scale of the issues? How can it help us integrate the system of interdependence between human and non-human agents mobilised by public policies? In this article, we seek to contribute to a deeper understanding of certain transversal lessons to be drawn from this experience.

Innovative projects and niche situations in the socio-ecological transition of ecosystems in Brussels

Over a two-week period, the researchers took up the challenge of the ecosystem approach and attempted to make a critical and prospective analysis of socio-spatial innovation processes identified during the Brussels Ecosystems Conference. The focused on four thematic fields:

— Agriculture, through a description of the Brussels archipelago of agri-urban practices;
— Work, by studying the phenomenon of 'third places' as new social economy ecosystems;
— Density, by exploring the impact of temporary occupation processes on urban densification;
— Circularity, by developing the concept of hotspots in the circular economy.

One of the main theoretical references discussed in the MasterClass was the multi-level perspective on transition toward sustainability drawn up by Schot and Geels (2008; Geels, 2011). The discussion, however, revealed a significant difference between the position of these authors and that of the MasterClass group: while Schot and Geels conceive of socio-ecological transition as a process whose key factor is technological innovation (see diagram 1 below), the MasterClass group explores the hypothesis that socio-ecological transition results from an evolution of daily socio-spatial practices. It redirects the idea of technological ‘innovation niche’ towards that of a socio-spatial innovation system. Schot and Geels ‘s multi-level perspective is based on what Dominique Bourg calls an ‘economy of technological promises’ (Bourg, Kaufmann and Médal, 2016, p. 15), while the MasterClass proposal is based on a critical description of the potential for change conveyed by the ecosystem of daily socio-spatial practices. Although both approaches are distinct, we shall see further that they are also intrinsically linked.

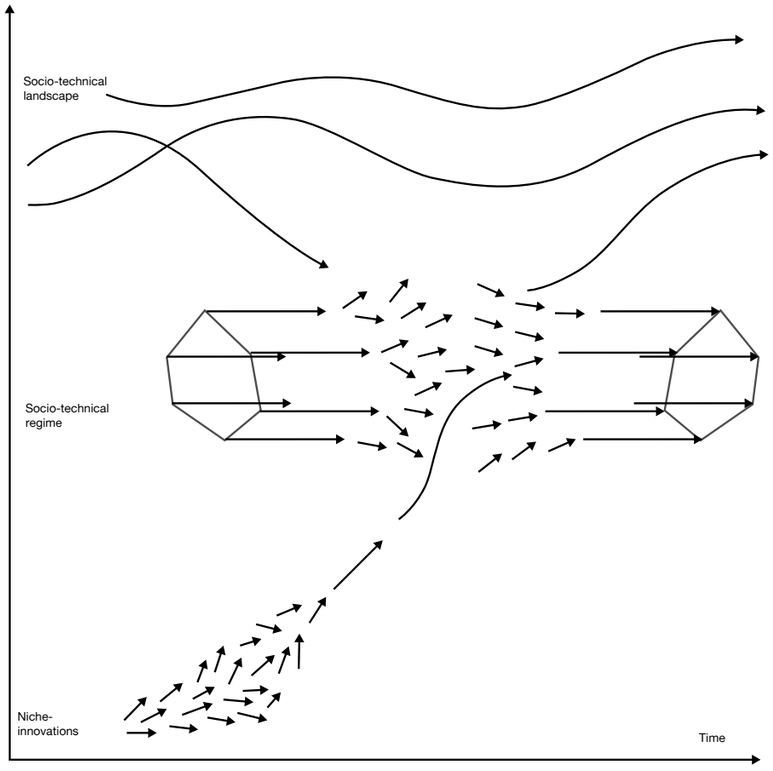

Diagram 1 — The multi-level perspective on transition toward sustainability according to Geels

Innovative projects

In the MasterClass perspective, an ‘innovating project’ is a spatial and socio-organisational system that transposes regional and European transition policies (smart, green and inclusive) into socio-technical projects (see diagram 2). These take shape in a spatial layout and underpin the socio-organisational dynamic over time. European Regional Development Fund (ERDF) projects are a good illustration of what this idea covers. They are socio-technical infrastructures financed by public authorities at the intermediary level of the multi-level perspective; their format is framed by European policy and related values carried out, at a higher level, by European and regional narratives and policies: sustainability, circularity, social inclusion, etc. They follow a top-down trajectory, where the values and narratives (top level) are translated into specifications, operational standards or infrastructures (intermediate level) in order to orient the socio-spatial dynamics in the field, in what we call niche situations (base level) (see diagram 2b) . On the other hand, the project dynamics generate interactions and feedback from the ‘field’ (or the socio-spatial context in which the innovative project is located), which may (diagram 2a) or may not (diagram 2b) generate adaptations or changes at the intermediate or even, with time, at the higher level.

Niche situations

Some of the MasterClass groups described another kind of trajectory, inspired not by broad narratives at the higher level but from what the MasterClass identified as niche-situations. This term refers to a situation where the project promoters (ERDF and others) are present in the field long before they seek support from innovative projects. They first invest energy in revealing and developing potentials of socio-spatial innovation, put into place by civil society and social movement, that may further the transition process in the Brussels-Capital Region. These niche situations develop their own socio-technical systems and networks (see diagram 3 — lower level). Only some of them are looking for support (logistics, financing, infrastructure) and applying to calls for innovative projects such as ERDF (see diagram 3 — intermediate level). By answering the call, they translate the idea of project into ‘project file’ in order to comply with the technical-administrative framework of urban policies. If financing is granted, the project enters the implementation phase and follows a twofold pathway back at the lower level: at the same time they transform spatio-environmental forms and adapt socio-organisational structures. Emphasis should be placed on the system of interactions between both the lower and intermediate levels during the implementation cycle: administrative and regulatory constraints that define the European and Regional frameworks can occasionally hamper the development of the project’s innovative goals and the niche situation’s layout. Work on third places has shown how cultural organisations such as Recyclart and Zinneke social economy locations (niche situations) take root in their neighbourhoods by making use of financing in sustainable neighbourhood contracts, urban renewal contracts and subsidies from the ERDF programme (innovative projects, intermediate level) that help develop a niche situation by consolidating it.

Designing Brussels Ecosystems has demonstrated that the layout of niche situations and innovative projects come with a socio-ecological transition. The MasterClass also demonstrated the interactions among the three levels — niche situations (low), innovative projects (intermediate) and European policies (top) — needed to carry out the transition process. Niche situations tend to lose steam without support from innovative projects which, in turn, depend on European policies. On the other hand, innovative projects not backed by an existing niche situation do not tend to make a place for themselves in the field and disappear when their financing runs out. In terms of public policy, the MasterClass raised the question of identifying niche situations with the potential to lead to a socio-ecological transition in order to orient the strategic choice of which innovative projects are to receive support from authorities and public policies. This raises the question of the ecosystemic interdependence between niche situations, innovative projects and public policies (regional and European) in undertaking and developing a socio-ecological transition.

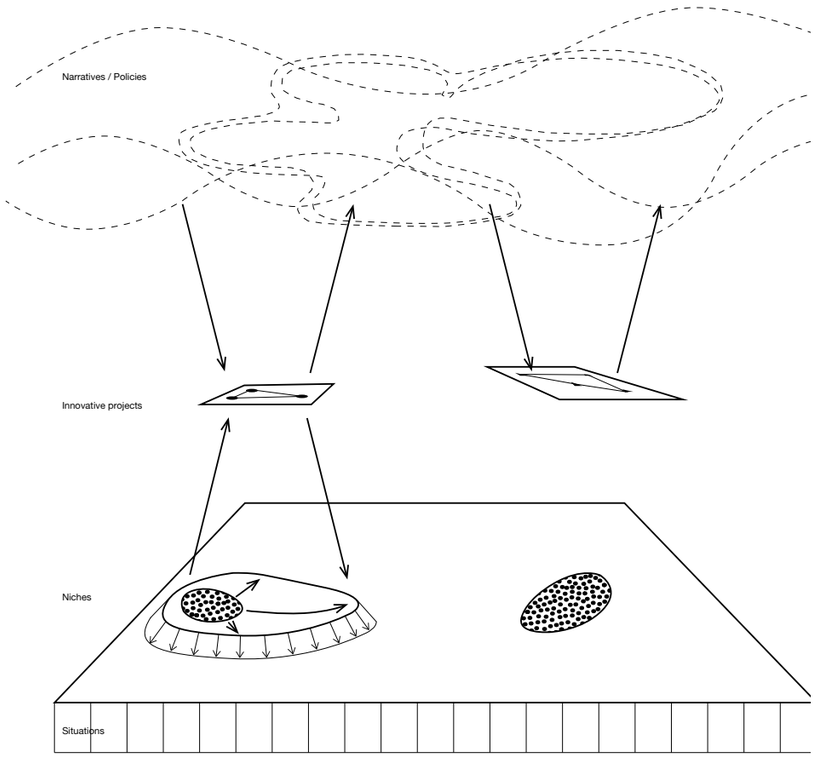

Diagram 2 — Interconnecting an innovative project with a niche situation in order to ground socio- ecological transition

What orientations should the transition follow?

The descriptions produced during the first week of the MasterClass contributed to an atlas of ‘ecosystems’ with multi-level interdependencies among stakeholders, innovative projects and niche situations related to four themes linked to regional and European policies: agro-urbanism, transitory densification, work-territory relations and circularity. The second week was devoted to drawing up scenarios to orient the transition of these ecosystems.

One of the main difficulties the groups encountered was that of identifying an adapted ‘orientation system’ for conducting the socio-ecological transition. By ‘orientation system’ we mean, following Bruno Latour, ‘an agent and a principle capable of reorienting the world’s compass, of drawing a project horizon, of enabling us to share the same culture and of dealing with the challenges of the new climate regime. This orientation system must be a cultural, political and ecosystemic movement that mobilises coalitions of stakeholders and generates a collective experience (Latour, 2017).

The MasterClass work highlighted the tension between two competing systems that orient the socio-ecological transition. The first one is the left-right orientation indicated by Schot and Geels in their multi-level perspective diagram for sustainability transition (see diagram 1): when adapted to the technological regime, innovative projects help further the ecological modernization advocated by the dominant narratives on sustainability (smart, green and inclusive). The so-called modernization implies a technological adaptation without calling into question the fundamentals of Modern Thought nor the social and political forms of advanced capitalism. As we will see in the following paragraphs, this is not necessarily the preferred orientation of the change trajectories studied by the MasterClass. The four pioneering trajectories described hereafter provide other clues about a reorientation of the socio-ecological transition process within the territory, including the socio-political challenges of integral ecology. Tending more towards a bottom-up direction, they demonstrate the role played by niche situations and innovative projects in the socio-ecological transition process.

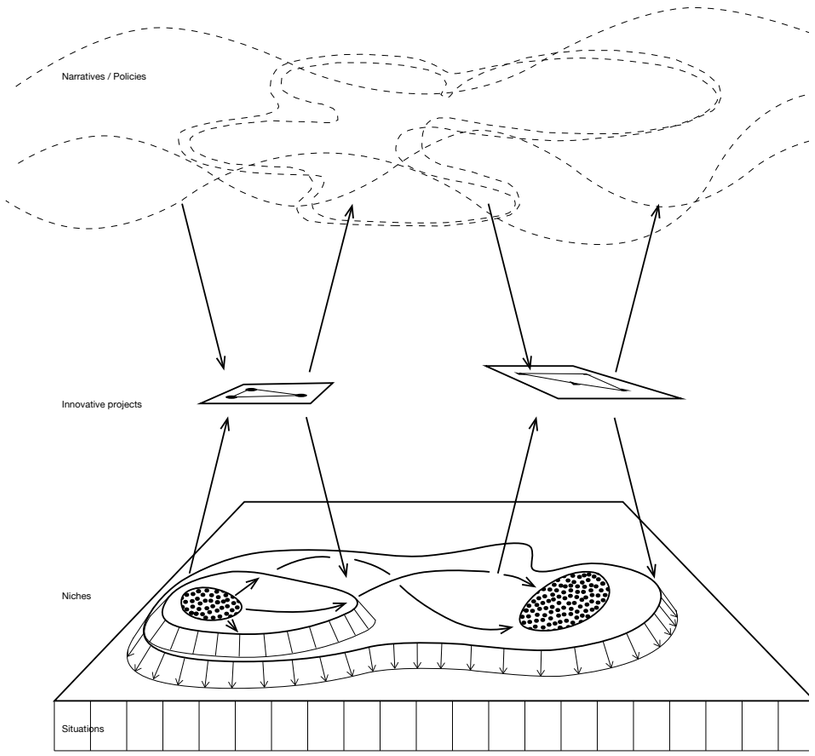

Diagram 3 — Agglomeration of innovative projects and niche situations in order to consolidate the socio-ecological transition

<u>The four pioneering pathways identified during the MasterClass</u>

Pioneering trajectory #1: A network of agro-urban practices

The agro-urbanism group focused on a pioneering trajectory entailing the emergence of a 'yellow network' (de Lestrange, 2019) at the scale of the 'Bruxellian bioregion' (de Lestrange , 2017) that creates a network of isolated, unconventional agricultural practices disseminated throughout the territory, taking advantage of the niche situation in virtue of the social importance of food supply. This constitutes a latent potential for a project, whether at the scale at which each isolated practice is developing or else at the Bruxellian scale where the yellow network achieves ecosystemic consistency.

Taking into account this agro-landscape network – which fulfils a nourishment role, but also ecological and sociocultural roles — integrates innovative projects such as BoerenBruxselPaysans into a multi-scale geography in which neighbourhoods in the dense city form interrelations with the spatial, ecological and agronomic resources of the bioregion and where the forms of the 'little horizontal metropolis' (Secchi and Vigano, 2010) are conceived in a spirit of reconciliation between the city and the countryside, corresponding to

what the urban farmers in question are building close-up from the inside. This is also a pioneering trajectory in that it invites us to reorient policy actions in the perspective of a 'Bruxellian metropolitan community', a neologism whose invention could, paradoxically, restore the threads of Belgian territorial history. This distinguishes us from our English, German and French neighbours in that it bears witness to the Belgian territorial system's resistance to the city-country division established by the industrial territorial regime. As Bénédicte Grosjean clearly showed (2010), quite early Belgium adopted diffuse cities as the principal behind its territorial organisation, resisting a territorial structure centred on large cities surrounded by an industrialised countryside. This territorial vision handed down through history, together with ecosystemic common sense, was reduced to a utopia. It was supplanted by a forced realism requiring Brussels institutions to dream up densification on 162 km² of land, without taking into account the risks of expanding impermeable surfaces and rapid exhaustion of unconstructed land resources.

Pioneering trajectory #2: Transitory densification

A second pioneering trajectory uses time as the active partner of quality urban densification. Here, the niche situation is the entire real estate production system in a city covering 162 km² and confronted with demographic growth that exacerbates contradictions. This pioneering trajectory mobilises temporary occupation practices at sites and buildings, produces new forms of accepting the short timeframe of real estate projects and designs new sustainability figures that could bring new meaning to Brussels' densification strategy. The narrative of the researchers in this group reveals a project horizon organised around a non-commercial occupation programme for occupied properties and an economic ideal of collaboration and negotiated management of community property within the framework of the open perspective described by Elinor Ostrom (2010). It is in contrast to the prevailing view (business as usual) promoted by the dominant socio-technical regime in real estate development, which views demographic growth as a social constraint to be managed by a policy of urban densification that places priority on new construction based on commercial value rather than the value of how space is used. In this mainstream outlook, temporary occupation is at most an opportunistic promotion and a momentary management measure with no lasting constraints on the spatial form and its social organisation.

Using two examples to show how 'niche' situations of temporary occupation slip into the property production system, this narrative not only outlines a pioneering trajectory, it also shows the change in orientation needed for this pioneering trajectory to become a movement. The new map of projects in the city arising from this change in orientation shows that time has been integrated as a project resource and an active agent for innovation: its acceptance as an ally in the transition enables temporary occupation to take root in the territory, step-by-step prefiguring another possible future different from the one programmed by the socio-technical regime responsible for public densification policy. This map and the existing buildings also appear as priority resources rather than as constraints for real estate project.

The leading edge of tensions between these two worldviews is the field of transitory urban occupation, an expression of the sustainable insertion of the transitory into the project's technical programme.

As a pioneering trajectory, transitory urban occupation invites us to call into question the Brussels densification strategy, which remains confined to an outlook of major real estate projects and an economy of new housing production, while the Brussels building stock contains reservoirs of under-exploited real estate resources whose activation would let us view the demographic challenge from an angle that is more respectful of ecological balances. From the pioneering perspective of transitory urban occupation, densification is no longer an irrefutable condition in housing rights and the right to the city. It is a territorial regime in which democracy plays its role as a mediating authority through systems centred on 'the division of power against itself' and on the multiplication of spaces of 'free organised discussion' (Paul Ricœur, quoted by Declève, 1994).

Pioneering trajectory #3: Reinventing work as an urban value

This line of narrative is based on the observation of three social economy projects. The purpose is to describe how each project leads to a situation in the city by weaving a system of relations between the place(s) where workers live (first place), their workplace(s) (second place) and third places where public life is exercised. It puts into perspective a niche situation, the 'hatching of a third place ecosystem of social economy' for which we can develop a typology based on three images: the magnet, which attracts or pushes away (Recyclart); the door, which opens and closes (Zinneke) and the bubble, which lives for itself and flies away (Smart).

The heart of the narrative is the acceptance of work as an urban value. The inquiry shows how this narrative is based on roots and a re-composition of the relationship between productive labour and personal life within a domestic sphere. The group borrowed the term 'roots' from Simone Weil. Roots refer to the objective dimension of work (meeting the body's needs — finding sustenance or improving the work situation) and its imaginative dimension (nourishing the soul — projecting an individual, community or social dream into reality).

Some practices observed in the third places visited illustrated attempts to recompose the relationship between two complementary experiences of the city that modernity and capitalism have carefully divided through spatial, social and functional separation of the productive sphere and the domestic sphere. We can see signs of this re-composition in the acoustic environment of the Zinneke workshops, where music selected by the artisans repairing the metal frames covers the noise of the machines; or the collaborative implementation of certain services traditionally related to the domestic sphere: community bar/restaurant (Recyclart, Smart), gym open to the neighbourhood, day-care, extracurricular activities, package reception (Smart). In the cases of Recyclart and Zinneke, training is a major factor in this re-composition.

The inquiry also describes contrasting modes of internal governance: a cooperative model for Smart, a consensus model for Zinneke, an enlightened guidance model for Recyclart. A common trait emerges in all three situations — the question of property is reformulated towards a model of acceptance based on use rather than a legal property status.

Pioneering trajectory #4: Circularities

How can we integrate circularity in the socio-technical ecosystem of construction in the Brussels-Capital Region? That was the initial challenge set by the circularity group at the Brussels Ecosystems MasterClass. Closing the loop in the use of material resources is now one of the pillars of European urban policies. In Brussels, the PREC (Regional Circular Economy Plan) initiated in 2016 defined a general framework for transforming waste into resources while creating jobs in strategic sectors (construction, foodstuffs, etc.). The ERDF projects that we worked with during the MasterClass (BBSM — Brussels Building as a Source for new construction Materials, Usquare, IRISPHERE, Recy-K) defined a range of innovative projects. The ERDF project, BBSM, sees itself as a precise technical model for reuse of construction materials. This project is producing a socio-technical model of a given sector (construction) in order to integrate the circularity transition into it. The IRISPHERE project has a multi-sectorial position, integrating socio-technical issues (network of stakeholders) using the concept of symbiosis. Unlike Usquare and Recy-K, IRISPHERE is not connected to a specific part of the region, but rather seeks to use a large number of niche situations where the circularity of material resources could be developed through collaboration between stakeholders and flow exchanges.

In order to delve deeper into the field and into niche situations, the circularity group applied the concept of hotspots to the circular economy in connection with the construction sector. The two hotspots (Ixelles barracks and the Northern Quarter) studied during this MasterClass demonstrated the importance of coordinating innovative projects both with policies in the field and at the European level. If the circular economy is viewed mainly as a socio-technical model operating at the upper level of European and regional policies, transition from a linear system toward a circular economy in the field calls for in-depth change to the socio-technical ecosystem in the construction and real estate sector. The transformation dynamics in the Northern Quarter, studied during the MasterClass, were clearly demonstrated. The existing socio-technical blockages — independence of the property owners and developers, independence of construction and demolition businesses, independence of the storage and construction-demolition sites, etc., are a major block to the territorialisation of the circular economy. The example of the demolition-reconstruction of WTC I (ZIN) shows that policies and narratives on the circular economy remain at the top level without any anchorage in the field. While the ZIN project displays the circular economy slogan (circular tower), in reality only the lift shafts and a few components of the furnishings were actually reused in the field. The sustainability demands for the new ZIN project are delaying the general reuse of materials in short supply circuits. Collaboration at the Metrolab MasterClass between stakeholders and circular economy projects (IRISPHERE, Chaire en Economie Circulaire, Up4North, etc.) served to identify possible niche actions to drive the transition of the socio-technical construction ecosystem in the Northern Quarter. One concrete example of this is the temporary storage of windows for WTC I for future use in the Brussels-Capital Region. Unfortunately, this niche action ran up against the economic logic of the developer who did not want to pay expensive storage costs without being assured of the return on investment.

The material resource circularity set up in the niche situation at Usquare demonstrates the importance of coordination (steering) and collaboration with the stakeholders involved in the Ixelles barracks for anchoring resource and material circularity in the field. This coordination and cooperation among stakeholders at the barracks are ensured by the ERDF project with a view to applying circularity (on-site disassembly and storage of materials organised by the stakeholders in the ERDF project).

If innovation in terms of circularity, as experienced in the Usquare project, will be able to bring about a general transition in the overall socio-technical ecosystem of construction, public policies must remove the existing socio-technical barriers: independence of the property owners and developers, independence of construction and demolition businesses, independence of the storage and construction-demolition sites, etc.

Four tactics for reorienting socio-ecological transition in Brussels

For the four themes studied, the Designing Brussels Ecosystems MasterClass was able to see an interdependence between niche situations and innovative projects in the transition process. Several of these innovative projects are financed by the ERDF. Both the innovative projects and niche situations, each in their own way, provided us with information on the paradoxes of a transition guided by the narrative on modernisation and sustainability. They also gave us clues and tactics for guiding a socio-ecological transition that better includes the ecosystem of the stakeholders and niche situations in Brussels. In this third part, we identify five methodological tactics pinpointed during the MasterClass for reorienting the socio-ecological transition by anchoring it in the Brussels territory.

Tactic #1 Grounding and scaling

The first methodological tactic involves anchoring the transition in the territory. This is Metrolab's fundamental epistemological position: we must abandon the detached position of scientific observers who consider themselves outside the world they are studying. This position has been confirmed in recent works by anthropologist Tim Ingold (2017), sociologist Bruno Latour (2017), and philosophers Catherine Larrère (2017) and Jean-Marc Besse (2018). Designing Brussels Ecosystems sought to participate in experimenting a new way to, scientifically, have their 'feet in Brussels'. The researchers sought to move beyond the dead end of detached research on the 'Great Outside' (Latour, 2017). They took the risk of abandoning a purely objective and quantitative approach that considers the scientist's role to be one of drawing up a model of an ecosystem from the outside and then objectively predicting how it will evolve. In contrast to this approach, they sought to take a closer look at things from the inside, insinuating themselves into the complex network of interdependencies between spatial situations and stakeholder configurations. Giving priority to the city's geography as a system of daily practices, this approach confirms the paradox of the institutional definition of the Brussels Region's territory. For the four fields of practices studied in the MasterClass — unconventional agricultural production, building materials economy, distribution of population densities and social

economy — the scalar layouts and spatiality of the innovative projects do not necessarily correspond to the official borders of the Brussels-Capital Region. This raises the question of the institutional capacity of the Region to face on its own the spatial dimension of the problems it has to manage. We could make a similar observation for other fields such as urban transport networks, aquifer management, the soil decontamination economy, cultural activities or education.

The group that worked on third places notably showed how, increasingly, the equipment of the 'five times capital' metropolis is interwoven into the fabric of 118 neighbourhoods, leading to often original 'multi-scalar neighbourhoods' (Ananian, 2009) between the local city and the global city, between residents and newly arrived migrants, as well as social groups whose interests and living habits are increasingly diverse. With the help of an original map of time use, this group also showed how, from one time of the day, week, season or year to another, the third places analysed revealed different spaces and social mixes that 'momentarily' change the uses and spatial layout of the locations and the conditions for them to open up to the world. These attempts at representation suggest the hypothesis that, in Brussels, we no longer go from Local to Global via a series of embedded levels, as the illusion cultivated by Google Earth would suggest.

Tactic #2 Transdisciplinarity and interculturality

The required knowledge approaches needed to get through the natural, social and political ecosystems laid down by the MasterClass's introductory methodological framework are a major challenge. This is first of all — and obviously — a transdisciplinary challenge. The MasterClass adventure showed how much these approaches bring about change. It also demonstrated that, when research wants to put down roots in a territory, running inside of the ecosystems and navigating as close as possible to social practices, the demand for interculturality grows beyond the issue at stake in the interdisciplinary dialogue between geographers, anthropologists, sociologists, town planners, landscapers and architects. More generally, what is called into question is the system of interrelations between researchers and socio-technical, political and cultural structures of the territory. The transition is to be considered as a cultural move from one world to another, from academia's ivory tower to the city of practices. It is a challenge at each step of the research process: when defining the main question, the goal and the proceedings of the research, when gathering and processing of information, when producing analysis, when choosing representation techniques and language of communication and when negotiating the uses of the results.

This kind of knowledge approach is fundamentally process-oriented. It does not leave behind any of the activities or stakeholders involved in the causal chain at work in territorial organisation. It requires interactions with ecosystems that the research seeks to represent. These ecosystems are also what enable the research to be carried out. The ecosystem is no longer just a framework, an environment or an object of research, but rather becomes the subject. One aspect of the research is to try to grasp, understand and foresee how it will react to the researchers' questions, hypotheses and proposals.

In such a process-oriented, 'grounded' perspective, the ecosystem contains the research as much as it, itself, is contained in the research. The epistemology

never allows the research system to completely ‘frame’ the ecosystem in which it is embedded. A direct consequence of this is that researchers involved in this kind of knowledge process have no hope of keeping out of controversies. They need a different type of psychological equipment and must be organised to resist.

Tactic #3 Collective experimentation

A third convergence between the pioneering trajectories detected by the different groups was the distance taken from the green and smart urban policies and narratives that give priority to technological answers.

From an urban planning point of view, smart cities seek to optimise their energy consumption and transports by combining digital and high technologies. They define a regime based on an ‘economy of technological promises’ (Bourg, Kaufmann and Médal, 2016, p. 15). This regime assumes that new technologies can provide an answer to the environmental crisis while preserving growth and the lifestyles that come with it. By claiming to meet the needs of the ecological transition through technology, smart cities and geo-engineering merely update the modern belief in technology and science as the answer to our environmental problems. In contrast to this position, the Brussels Ecosystems MasterClass and conference provided arguments supporting the idea that the transition cannot be envisaged with purely technological solutions.

The difficulty caused by the economy of technological promises is the preponderance of technological and industrial answers, which undermines the exploration of contextualisation and understanding of the territory (the ‘Terrestrial’ according to Latour, 2017). Urban policy runs the risk of turning into a set of standardised, context-insensitive technological solutions. Yet, the environmental price of (high) technologies (consumption of fossil fuel, rare metals and pollution due to extraction processes) should lead us to foresee other horizons. If the citizen and the decision-maker have a hard time finding room for themselves in the scientific development of high technologies, they can, on the other hand, claim to have a fine understanding of the environmental context, the ground and the local material economy. These questions were especially covered by the participants in the circularity and agriculture theme groups.

The Brussels Ecosystems MasterClass reinforced the hypothesis that answers are to be found in collective experimentation by identifying interdependencies between humans and non-humans rather than in the development of technological solutions. It notably demonstrated that circular economy projects and agriculture projects are mainly faced with ecosystem problems. Technical solutions usually are clearly identified (reuse of construction materials, recycling organic waste, transitory occupation of abandoned buildings, new channels, etc.). Implementation of these solutions requires a socio-spatial experimentation with a twofold objective: first, to help overcome resistance (legal, administrative, political, economic, social or cultural) that may arise from their integration into the socio-technical ecosystem; secondly, to establish the new regime of interdependence that they require (interdependencies between human stakeholders, but also between humans and non-humans).

That is a conclusion to be drawn from the analysis of certain ERDF projects such as RecyK, IRISPHERE and BoerenBruxselPaysans, all three of

which display their ambition to contribute to the ecological transition movement and to be seen as innovative from a technical point of view. The stakeholders at BoerenBruxselPaysans openly discussed their difficulties in maintaining and consolidating a sustainable local agriculture sector in Brussels. They are not only confronted by economic and legal constraints; they are also up against the configuration of agriculture’s socio-technical ecosystem whose layouts do not correspond to the regional space in Brussels. The IRISPHERE project is confronted with similar difficulties: even if it perfectly fits into the circular economy paradigm put forward as a Brussels priority, in reality its promoters are struggling legally and economically in implementing its projects for reuse of materials and recycling waste.

These case studies confirm the capacity for resistance to innovation and the inertia found in the existing socio-technical ecosystems and regime (construction, agriculture). The more the innovative projects are designed as technical objects independent of the context, the stronger the resistance from the ecosystems and regime. Thus, the abstract model of the circular economy (material waste as a resource) and its technical tools (biomethanisation unit, material disassembly unit, etc.) can only provide concrete solutions if they are integrated into the interdependent construction and agroecology ecosystems. In general, the case studies used during the MasterClass indicated the interest in instituting a regime of collective experimentation for testing innovative socio-spatial agencies.

Tactic #4 Designing with

All of the above invites us to adopt a renewed critical mind to revisit the modern view of territorial projects calling for plans imposed from the outside in a given context and an inert material. Instead of this model projected *on* a material and an inert context, contemporary authors such as Catherine Larrère (2018), Tim Ingold (2017) and Jean-Marc Besse (2018) have suggested substituting a design process *with* the material, the context and the ecosystems. Their work confirms that the distinction between humans and non-humans, between natural and artificial, is now irrelevant to studying ecosystems. This requires a real epistemological revolution: referring again to the example of the construction materials economy, we need to stop thinking that it is enough to take into account the material and energy flows deployed to demolish and/or (re)build the city — whatever the level of expertise required — to define a project to reduce the carbon footprint. Urban operators must understand that (de)constructing the city is not just an abstract manipulation of formal representations of space, but rather implies an in-depth transformation of environmental materials (Ingold, 2017). This was the basic meaning of the exercise the researcher groups did during the MasterClass: shifting focus so as no longer to be stuck on objects and physical infrastructures and to move towards an ecosystem of interdependencies between objects / stakeholders / communities / territories and, within this ecosystem, to try to understand or forge relations that can shift the processes observed in the direction of the socio-ecological transition.

The Masterclass also contributed to highlighting the tensions between two models of coordination within the ecosystems analysed. The first is based on mastery of the project plan or specifications. This works hierarchically,

determining the ecosystem's dynamics in relation to certain themes or certain phases of the project cycle. The financing and legal status of the actions usually depend on this system of coordination. The second model focuses on a principle of transversal actions. It targets mastery and control less than movement, responsiveness and networking. Most of the time, both systems are embedded in a kind of symbiosis process where antagonism does not prevent coexistence. This can be tricky, but over time it gives rise to often original formulas for synthesis. This is the case at Masui, for example, where the cultural ecosystem of the Zinneke Parade — governed by a method of transversal coordination — cohabits with the public economic ecosystem associated with the ERDF project for transforming buildings and recycling materials.

Epilogue

The research carried out at the Brussels Ecosystems MasterClass demonstrated the importance of socio-spatial innovation beyond the technological issues at stake. It also showed the interdependence of niche situations, innovative projects and certain pioneering trajectories. Lastly, it showed the choice of possible orientations for the socio-ecological transition from modernisation towards sustainability (left-right) and on to the territorial anchoring of socio-spatial innovations. Today, although Brussels is energised by many micro-projects for socio-spatial, economic and environmental innovation, its institutional, administrative and legal complexity sets up many obstacles to a generalised transition of these ecosystems and socio-technical regimes.

The phenomena indicate the need to redefine the guidelines for research on Brussels and urban policies as local objects and global objects. Not only do they call for a transdisciplinary approach to ecology, including the ecology of natural systems, political ecology and social ecology, but more importantly, they indicate that we must build a knowledge ecology if we are to achieve this transdisciplinary change. Designing Brussels Ecosystems is part of a knowledge ecology process that is reshuffling the cards, clouding the references and forms of reasoning in place, running the risk of coming up against increasingly questionable scientific objectivity. The goal is to experiment with research practices that foster training in individual and collective capability to react to the accelerated destruction of terrestrial ecosystems and to break with the lifestyle imposed by the alliance between modernisation and contemporary capitalism.

This need for experimentation applies to all the fields in which the goal is the empowerment of humans firmly anchored in their environment — in other words, political action as well as independent work, leisure activities, artistic, educational and solidarity-based activities, nourishing activities, etc. This means — and this is why we have a radical shake-up and reorientation — that it also covers the city and all its production processes. Between radicalism and reformism, it is up to the Brussels ecosystem to work out the trajectories of its transition. We hope that some of the proposals from the pioneering projects put forward by the four groups in the MasterClass can contribute to giving an orientation and meaning to this process.

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Critical insights

Towards an Integrated Architecture and Ecology of the City

Brian McGrath

Beyond the urban ecosystem double bind

I came to this workshop from New York City, part of the US' north-east megalopolis, stretching from Boston to Washington and primarily made up of timber houses and lawns within inhabited forests structured by watersheds. Historically, rivers became the productive sites of mill towns and industrial neighbourhoods, while business centres of glass and steel — such as Manhattan — attest to accumulation of wealth of the megalopolis; currently, however, sprawling office campuses, distribution 'fulfilment' centres and retail strips are the backbone of this sprawling conurbation. During this MasterClass, I came to understand Brussels' territorial history as a stone city built by agricultural and craft merchants along the Senne River, a tributary of the North Sea, protected by a duke with his magnificent hunting forest to the south-east. In the xixth century, the Brussels-Charleroi Canal connected the coal fields of Wallonia to the North Sea, creating an industrial city along the length of its transect at the nodal city of Brussels, leaving the forested south-west of the city-region as an elite enclave. The aftermath of World War II saw the development of a service economy as Brussels became the seat of NATO, then the European Union. Territory and history are the architectural and ecological destiny of cities. Brussels exists as a bilingual artefact between sea and forest, with its own history of manufacturing complexes and clusters of glass towers as well as its own sprawling conurbations.

Architecture is the art and practice of designing, constructing and living in buildings, cities, landscapes and territories. Ecology is the scientific study of the patterns and processes involved in the distribution and abundance of organisms, the interactions between them and between organisms and the environment and flows of energy and matter. Designing urban ecosystems through the lenses of ecology and inclusion demands a multi-scalar and multitemporal material project located at the intersection of the architecture and ecology of the city. Both mineral and forested, green and grey, dense and dispersed, the design of urban ecosystems is caught in a double bind in which two irreconcilable demands or choices between diffusion and density must be made. The current design debate, between a dispersed city structured by green infrastructures and a high-density urban future, results in difficult choices between the architecture and ecology of the city.

We are in a time when the ancient cultural heritage of the city's architecture is being usurped by the novel concept of urban ecology. While architect Aldo Rossi (1982) distinguished the collective artefact *of* the city from building *in* the city, ecologist Steward Pickett (1997) made the same distinction between the ecology *of* the entire city — mineral and vegetal — from the 'green stuff' that is the object of most ecological research. Likewise, the architecture of the city must expand its concerns to ecological structures, spatial patterns, processes and functions as well as flows of organisms, materials and informational. Based within the historical distribution, interactions, flux and feedback between humans and the city's territory, the future city needs to move beyond the double bind of architecture and ecology as conflicting demands. An inclusive architecture and ecology of the city must also begin with a process of coproduction with urban residents, not be dictated from on high by urban specialists.

Intersections between the architecture and ecology of the city

Five potential intersections between the architecture and ecology of the city move beyond the urban ecosystem's double bind and provide a framework for designing urban ecosystems: 1) the architecture of the city is a collective artefact that can also be understood as a social-ecological patch structure; 2) the city can now be both an object of long-term ecological research and the subject of history and civic memory; 3) an integrated architecture and ecology of the city become operative through historical typo-morphogenetic analysis enhanced with land cover classification of both built and vegetated urban ecological patches; 4) the architecture and ecology of the city both focus on the cyclical relations between the structural and functional patch dynamics of urban artefacts at nested scales, from the furniture in a room to the territory and from the leaves on a tree to the entire forest; 5) patterns of habits, behaviour, disturbance, feedback and learning are understood both in the physicality of the city and the study of human and non-human life within nested time scales, from daily cycles to geological time frames (McGrath, 2018).

For example, the Hubbard Brook Experimental Forest in New Hampshire (Likens and Bormann, 1995), continues to collect data on forest dynamics drawn from small instrumented watersheds. This research model has been translated in the Baltimore Ecosystem Study (Grove, Cadenasso, Pickett, Machlis and Burch, 2015) in order to understand individual and community changes in the built environment in a wide range of neighbourhoods across the Baltimore region. It is a pattern that extends across the entire north-east megalopolis of the US. Exurban subdivisions and central city row houses share the same watershed and a nutrient cycle depositing into coastal estuaries such as the Chesapeake Bay. With industrialisation, a string of coastal colonial ports transformed to specialise metropolitan centres. Car-based suburbanisation and exurbanisation fragmented these manufacturing centres into hubs of knowledge (Boston), finance (New York) and governance (Washington), with uneven development leaving cities like Baltimore in severe economic decline.

The European city, in spite of the post-war investment in historical centres and high-speed train links, has similarly fragmented into unevenly developed post-industrial megalopolitan regions. In Brussels, the duke and his forest, together with the traders and their canal to the North Sea, formed an urban ecosystem that still socially and ecologically stratifies the urban region. Brussels' industrialisation occurred when the city's merchants connected the North Sea to the coal fields of Charleroi. In the second half of the xixth century, the king of Belgium built a colonial empire and the city became a modern metropolis, with bourgeois extensions reaching deep into the forest. Today, as a remnant of the coal-based metropolis, think tank Architecture Workroom Brussels suggests that the post-industrial city is divided into those trained to be makers or thinkers (Architecture Workroom, 2016) and an economy that is creating extensive zones of gentrification along the industrial canal as well as in the historical centre.

As a way of linking the architecture to the ecology in the progressive social coproduction of the city, the concept of the metacity (McGrath and Pickett, 2011) was developed. The metacity recognises new forms of planetary urbanism that are both highly segregated to local coherence, yet globally linked through leisure and tourism, supply chains and communication networks. Lefebvre's (2011) prophecy of a global urban revolution has arrived, yet the city needs to be socially appropriated from the concentrated wealth of a global elite. Metacity theory is based on the distribution logics of metacommunity and metapopulation research in ecology. It recognises the healthy diversity of low-density urban dispersion and high-density agglomeration, and the role of new global communication and distribution logics in combating the segregation of patches of poverty and wealth. In addition to being a social and biophysical necessity, the intersection of the architecture and ecology of the city must challenge the political architecture and ecology of the present.

Hotspotting the metacity

The four projects produced during the Metrolab MasterClass on urban ecology can be seen as operative of a multi-scalar and temporally based architectural and ecosystem approach to address the social and environmental impacts of Brussels' inherently fragmented urban form. The projects are situated as both an architecture and ecology of patches and boundaries, rooms and doors, walls and gates, courts and gardens, forests and fields, making and growing, recycling and circulating. Each project focuses on new architectural and ecological cycles that are being coproduced with governmental and non-profit organisations as well as community groups throughout the Brussels-Capital Region. Demographic data shows that the region is both densifying and diversifying, so the double bind between green and grey is acute. Local agriculture is regaining a foothold and a circular economy of construction techniques, temporary occupations and small-scale reconfigurations of live and work is emerging in the cracks of a fragmented metropolis. These innovations in managing material flows and new types of living and work form an ecosystem of situations and stakeholders, patterns and patches, geographic and temporal scales, flows and fluxes that forms multiple 'hotspots' within the

Brussels ecosystem as a metacity. The conclusion will address how each of the MasterClass's four groups are 'hot spots' in the matrix of possible interrelations between the architecture and ecology of the city mentioned above.

The land along the Brussels-Charleroi Canal is the site of gentrification and rapid real estate speculation. Government development agencies promote the conversion of land to higher density residential uses, displacing workplaces as well as poorer residences and new arrivals to the city. The 'Density' group explored the transitory occupation of two former industrial areas slated for redevelopment along the canal: the Biestebroeck Bassin and Heyvaert. Sanctioned programmes for the temporary occupation of land in transition offer an alternative model of incubating new ways to integrate the architecture and ecology of the city rhythmically in time. While there is temporary support for these kinds of experiments in normal development cycles, the Brussels ecosystem project of the 'Density' group seeks to sustain these types of cyclical occupations by providing a much more heterogeneous and ecological city than the one currently being planned. The project points to a more integrated approach by aligning patterns of habits, behaviour, disturbance, feedback, and learning in the physical fabric of the city with the study of human and non-human life within nested time scales, from daily cycles to geological time frames.

The distributive logics of the global neoliberal economy has resulted in vast distances between the production and consumption of even basic needs. The zoning approach of modern city planning has resulted in the nature/culture divide and the current double bind between the architecture and ecology of the city. Food is a crucial area for creating new local productive economies and mixing grey and green land uses. The 'Agriculture' group focused on new agricultural patterns emerging in fragments of open space along infrastructural corridors at the periphery of Brussels. An integrated approach would diversify the monocultural fields just outside the city and promote new, local food logistics. An integrated architecture and ecology of the city becomes operative through historical typo-morphogenetic analysis of leftover spaces in the gaps, vacancies and planned open spaces of post-industrial Brussels. Enhanced land cover classification combines both built and vegetated urban ecological patches of mixed urban and agricultural patches. New patterns of the flow and movement of perishable food counters the centre/periphery zone pattern of regional agricultural markets and the peripheral logistics of global agribusiness and supermarkets. This social-ecological patch structure provides opportunities where urban agricultural coops are creating a shared landscape for new social and mobility patterns within gaps in the dense mineral city.

The disruption of regional food markets is matched by efforts to reverse the enormous waste that results from a construction industry as part of a global supply chain by 'hot spotting' the circular economy. The 'Circularity' group looked to territorialise the circular economy by closing the material flows within hot spots under redevelopment. The Northern Quarter in Brussels was developed after World War II as a single-use central bustiness district, and it has already become

obsolete. The transformation of the district within the framework of a circular economy would require the development of new demolition and construction skills at the scale of a city district, but also initiate a new kind of high-density mixed use and socially integrated neighbourhood. The Northern Quarter can now be both an object of long-term ecological research in circularity and the subject of history and civic memory.

Balancing work and life through a project of doors was inspired by the Zinneke association. The proposal developed by the 'Work' group is a remarkable example of urban ecosystem design through the fundamental restructuring of the basic materials of the architecture of the city. Zinneke inherited several adjacent properties in a fragment of the xixth century metropolis, near the old industrial canal and behind the work zone of the Northern Quarter. Employing a feminist concept of space as matrix that questions both the forced enclosures of Victorian room arrangements and the openness of the modernist free plan, their carefully designed renovation uses flexible openings and closures at different time frames to modulate between the needs of privacy and publicity. Work and play, privacy and publicity are not binaries. The project of rooms extends Zinneke's project first to the institutions and public space of the surrounding neighbourhood. The architecture and ecology of the neighbourhood around Zinneke promotes a dual focus on the cyclical relations between the structural and functional patch dynamics of urban artefacts at nested scales, from the furniture and doors in a room to the territory, through the renewed green infrastructure of Parc de la Senne, reconnecting the forest to the sea.

The canal is a collective artefact defining the industrial era of the city, and it structures the projects as social-ecological patches along it. Density, agriculture, circularity and work are lenses used to demonstrate how the buildings, districts, gardens and farms of the Brussels-Capital Region are probes or hot spots that can be both objects of citizen-led long-term ecological research and ongoing subjects of history and collective memory. These hot spots have both typo-morphogenic legacies and form different land cover structures. The cyclical relations between the structural and functional patch dynamics of urban artefacts at nested scales, from a few sheep in the regional food system, reconfiguring doors in a former factory, or replacing windows within a cycling construction system to temporary occupations of buildings and the reconfiguration of room and property relations. Patterns of habits, behaviour, disturbance, feedback and learning, such as temporary uses, are understood both in the physicality of the city and the study of human and non-human life within nested time scales from daily cycles to geological time frames.

Together, the four projects point to the multiple ways of overcoming the architecture/ecology double bind of irresolvable contradictions. When culture and nature are seen as inseparable, and buildings and organisms are seen as part of the same ecosystem, the line separating architecture and ecology is blurred. In fact, the word ecology was derived by Ernst Haeckel from the Greek 'oikos', meaning the study of house, dwelling place or environment. The future

city must be inclusively coproduced as an integrated architecture and ecology of a collective civic consciousness. As architects gain knowledge in social and biophysical sciences, ecologists will take on the role of cultural figures speculating on future urban ecosystems. Patchy social and ecological disturbance and dynamics are current norms in our complex contemporary conurbations, not an idealised predictable balance and harmony between culture and nature. While the future city is an open system, social groups as well as ecosystem science and typo-morphogenetic research demand nested boundaries for scaled analyses from the room and garden, to the neighbourhood fabric and regional territory. An architecture and ecology of a collective mind reminds us that we make that world and the world makes us within daily, seasonal, historical and geological cycles.

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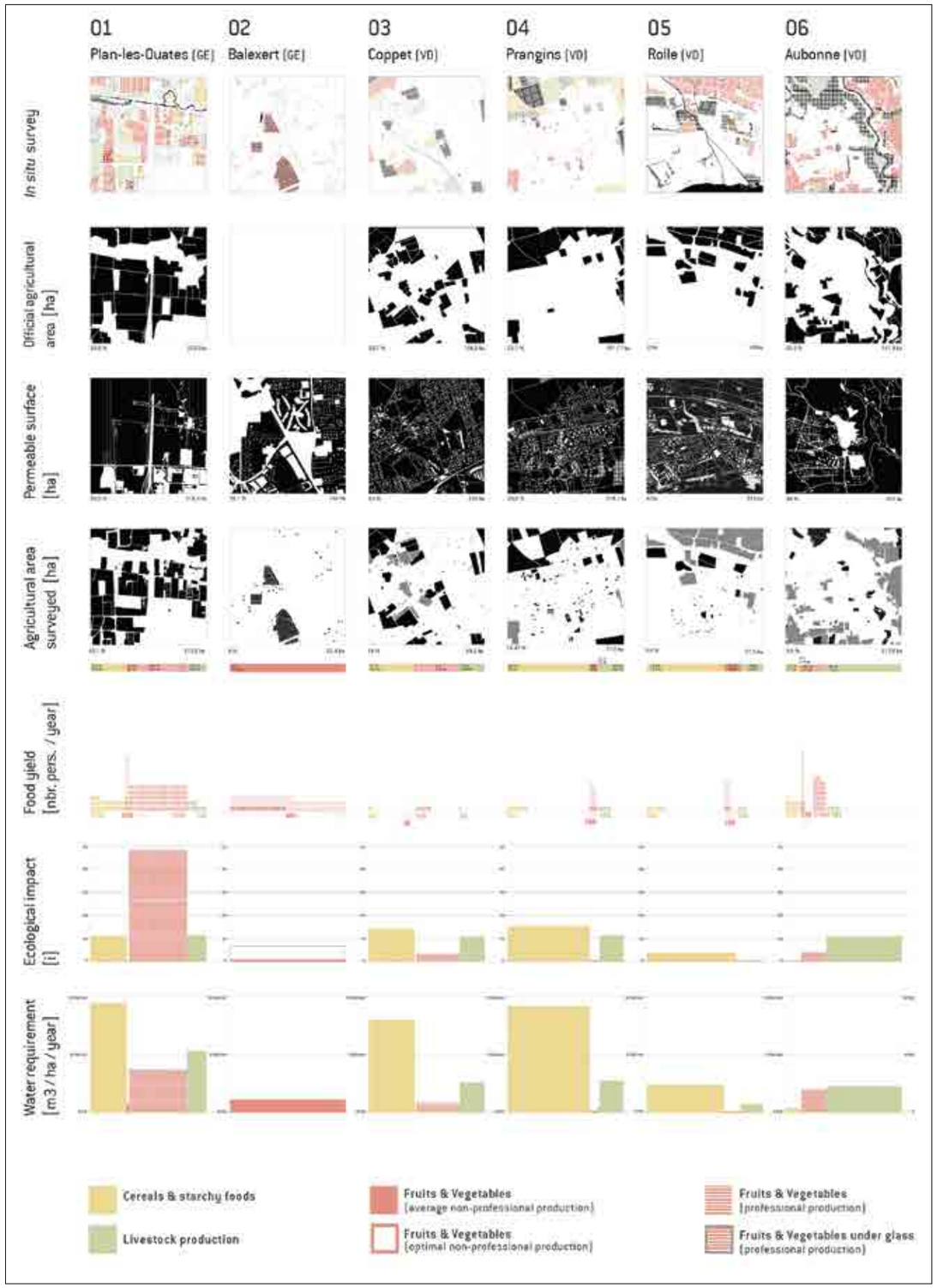

Brussels ecosystems in space

Solving the paradox between non-spatial ecosystem and design distance criterion

Elena Cogato Lanza

Some transdisciplinary ‘metropolitan laboratories’ created to improve the global transition by renewing concepts, analytical tools and project approaches have demonstrated a certain vivacity and capacity for experimentation. Metrolab in Brussels, for example, has joined the ‘Eco-Century Project’ programme launched by the Braillard Foundation in Geneva to develop a synergy and confrontation on the subject[1]; the interdisciplinary Habitat Research Centre of the EPFL and the Urban School of Lyon[2] pursue scientific objectives of fundamental and general importance by cultivating a privileged relationship with the urban regions where they are based.

All these initiatives share the urgency of a systemic understanding of urban phenomena and use the category of ‘metropolis’ less to designate a hierarchical role in the territory (from this point of view, the function of the ‘capital’ of Brussels is an exception in the face of Lyon, Geneva or the Alpine and Lake Geneva metropolis), but more to stress the various and transversal components and processes of the urban realm that are indissoluble from the present global socio-environmental conditions. It is about the ‘urban of the Anthropocene era’, as the distinctive formula of the Urban School of Lyon expresses it so well.

The reflections I will develop here in relation to the MasterClass ‘Designing Brussels Ecosystems’ are related to this intellectual context, which is marked, among other things, by a desire to renew both an understanding of the urban environment and our intervention tools in light of the notion of an ecosystem and its theoretical and practical applications. Some research projects led in Brussels resonate directly with the observations and questions we have developed on the urban region between Geneva and Lausanne[3], which we will mention here to cultivate some more general remarks. Was it not, in fact, in very direct bilateral exchanges, putting in resonance and in comparison with singular contexts, that

1 Namely, by the two editions of the seminar ‘Dessiner la Transition’ (spring 2018 and spring 2019) see https://www.braillard.ch/fr/eco-century

2 More information at https://www.epfl.ch/research/domains/habitat/ and https://ecoleurbainedelyon.universite-lyon.fr.

3 See our current research ‘Metropolitan Agriculture’, developed in the framework of the Laboratory of Urbanism at EPFL: https://www.epfl.ch/labs/lab-u/agriculture-metropolitaine/.

urban planning became a discipline? (Sutcliffe, 1981)[4] Would it not be topical again to conduct these exchanges in the spirit of empirical and experimental revision of our tools, taking some risks of mismatching with our own normative or legal frameworks? [5]

The variety of graphic languages used in the Brussels workshop is symptomatic of both a wealth of analytical and perspective tools, as well as a more fundamental problematic node. Indeed, since the objective is to design — in terms of urban planning projects — an ecosystem, two distinct traditions of visual representation clash. The visual representation of an ecosystem is usually done by means of a diagram, in continuity with the tradition of representing a system and its structure — the prefix 'eco' expressing the criterion of vital exchange that characterises the homogeneity of the system (and which therefore sets, in the negative, its limits). The urban planning project is part of a tradition of representation by the plan homologous to the Euclidean map, as well as by other representation techniques, such as the cross-section or the perspective view, whose accuracy is also established by respecting the Euclidean coordinates of the map.

If the diagram refers, in a synthetic way, to the spatialisation of exchanges, it certainly does not do so by homology with the Euclidean representation; above all, it is totally devoid of a spatial unit of measurement because the criterion of distance is not relevant. The length of the arrows in the diagram does not reflect the space in any way, either in its distance or in its material character.

In visual representations that are homologous to the map, on the other hand, space is given as an invariant: its coordinates, relative positions and distances are objective and stable, which ensures the very conditions of readability and implementation of the project. In summary: in the ecosystem diagram, distance does not matter; in the map, it is fundamental.

How can one deal with these two different relationships to spatial coordinates and distance criteria? In view of their irreducibility, we will never be able to claim a linear transition from one mode of representation to another — would it be desirable, moreover? On the other hand, when designing an ecosystem, it is inevitable to confront this fundamental paradox and take a stand. This is what the four works carried out in the MasterClass do, each one resolving the paradox in a different way by following three fundamental strategies — which are also three 'tricks', with serious consequences. The first consists in neutralising distance, and thus removing its relevance as a criterion; the second, on the other hand, creates the conditions for inscribing all exchanges in space, until space represents exchange by metonymy; the third identifies a third dimension, distinct from the two dimensions of space and ecosystem exchange, which works as an edge, intermediation and negotiation dimension. My remarks will be voluntarily provocative, and this is for a heuristic purpose.

4 According to the always valid interpretation by Anthony Sutcliffe.

5 On the opportunity to continue the comparative tradition in urbanism, see Cogato Lanza, Barcelloni Corte and Graezer-Bideaux (2019).

Without distance

Cancelling the distance factor to allow a linear translation of the ecosystem into the project and vice versa is tantamount to creating the conditions for which all ecosystem exchanges take place in a space within which the greatest traversable distance is equal to zero: in other words, to creating the conditions by which distance does not matter. This seems to be, at best, a very sophisticated or, at worst, absurd reasoning, but in fact it is much more banal than we think. To favour the neighbourhood scale over all the others, to give the neighbourhood the reference scale value a priori, does it not amount to establishing a spatial extent within which distances do not count because they do not make a difference? Building the ecosystem design at the neighbourhood level avoids directly addressing the metropolitan ecosystem; starting with the neighbourhood provides an uncomplex ecosystem structure and creates the illusion that the transition to the metropolitan scale is to face a higher degree of complexity. Do the sociological arguments put forward to defend the relevance of one scale of proximity over all the others not tend to support a search for ease? In the same vein, are the strategies advocating acupuncture — through specific actions, apparently of limited scope, to achieve a more fundamental overall transformation — not also part of the desire to make an elementary reduction in the terms of the problem? Doesn't the degree of effectiveness of an urban planning approach by acupuncture always remain subject to a halo of mystery or the unfathomable? Obviously, this approach must overshadow the space of the actors, their different trajectories of action and distinction within multiple networks that only partially coincide to a neighbourhood scale or to an acupuncture area.

In the 'Circularity' group's proposal, each hotspot is captured in its components and processes; its relationship to the metropolitan level is dealt with by 'de-zooming' the same elements (i.e. with broadening the framework) than by taking into account the synergies between hubs or the understanding of components, resources or processes that are not already included in the hotspot. In this de-zooming movement, it is objectively difficult not to mobilise the figure of the 'mosaic' to grasp the relations between the hotspots and the metropolis — nor the figure of the 'island', by giving in to the temptation of the closed cycle and its intrinsic facility. The closed cycle is reassuring for the project (it identifies and limits its actors) and carries with it a strong conservative implication (the maintenance of a status quo, including that of the cycle itself). It is clear that, today, we are widely willing to hear a discourse of isolation and conservation: sensitive to criticism of linear logic (including that of the concepts of development or progress) and interested in designing a project that captures resources without consuming them or compromising their renewal cycles.

However, the fact of engaging in a project at the neighbourhood level can be limiting on another level: that of the imagination of the cycles of matter. The material moves, it disintegrates, but as long as we take for granted that we build through demolition, that we will not build far from where we demolish and, above all, that demolished buildings will lead to new buildings built or repaired, we will have no reason to move our focus, that is, to leave the hotspot to look elsewhere. On the other hand, based on large-scale construction-demolition themes, doesn't

the geography of hotspots deserve to be reconsidered? If we consider that from the demolition of buildings we can build infrastructures — aqueducts, banks, walls, viaducts, etc. — what geography of the circular economy of matter could we sketch out? The history of urban matter, whether mineral or organic, should help us. How were circular economies of matter organised? Did Hausmann's Paris come from its material substrate, and how? What were the routes taken by the stones from the underground quarries, the water that irrigated the parks and was distributed in the apartments, the plants grown in the greenhouses and nurseries? The circulation of material from building to building tends to simplify the identification of ecosystem actors. What about an ecosystem that organises exchanges between landowners, construction companies, cooperative societies or other partnerships that rent or occupy the built property, with industrial services or other monopolies? Or, better still, what economic and governance approaches make it possible to build an ecosystem based on this variety of public, private and associative actors? If the material is sought from the re-use that is envisaged, and not from the pure availability of the material itself, will the most appropriate principles and authority of governance not be different?

Exchanges shift into spatial patterns

The opposite attitude is based on the belief that the ecosystem is subject to spatial conditioning. Space is seen as an actor, an agent that conditions exchanges because it facilitates, encourages, limits, resists or prevents them. On the basis of this premise, we can design the ecosystem as equivalent to the spatialisation system of all exchanges: its existence is displayed, by metonymy, by the spatial framework that hosts it; this spatial framework can be objectively described and represented. The ecosystem does not only exist through spatial connectivity; moreover, it is expected to depend entirely on it. In this case too, the apparent abstraction of reasoning is quickly overtaken by the evidence of the associated design approaches. The fortune of the concept of *porosity*, referred to the most disparate spatial scales and all types of flows, can be understood as a desire for infrastructure exchanges by the design of the space. The book by Bernardo Secchi and Paola Viganò (2011), which sets out a theory of the *Porous City*, demonstrates both the immense openness of the concept and the rational precision required by the project — assuming as an objective to design the ecosystem, the pursuit of porosity requires an exact and fine-tuned drawing of the exchange space.

In this approach of observing and designing space as infrastructure, beyond the infinite categories that detail its components (types of roads, planted spaces, watercourses, bridges, gantries, doors and windows, squares, courts, parking, stairs, corridors, galleries, tunnels, etc.), we see a profound resonance with Ildefonso Cerda's theoretical concepts. The concept of porosity is at the same level as that of movement and rest, with the consequent distinction between the urban forms of the first and the second. Through this return to the archaeology of urban planning, we identify here two milestones — *The Theory of Urbanization* (Cerdà, 2018) and *The Porous City* (Secchi and Viganò, 2011) — of an approach attentive to connectivity as the fundamental dimension of the city; an essentially progressive approach, privileging structures, grids and patterns. To this tradition,

we easily associate the 'Urban Agriculture COOP's on a Shared Landscape' proposal. The attention for patterns, the green network, the representation of situations by their association with a mobility infrastructure, as well as the sketching of networks from the narrative of individuals, lead to a project that follows an approach opposite to the one that seeks cycles or loops. The blue and green corridors define a metropolitan infrastructure, while each situation, hotspot or place, is represented as a crossroads.

These patterns allow actors to cooperate — space, in its geometry and matter, being confirmed here as 'actor' of the ecosystem. The framework it offers — and the framework that porosity as a reference principle of this approach aims to guarantee — is a framework of freedom. In the sense that the framework serves to allow, and not to determine exclusively: the infrastructure is such in the fundamental sense of the term, avoiding any intention of specialisation. The 'way' is the space of movement: in the last images showing the future landscape of urban agriculture COOPs, the cart loaded with potatoes could also lead, at the same time or alternately, the elderly to the care centre or the children to school. The roads, which are from now on intended for no-automobile traffic, will not work as longer specialised and waterproof pipes. Finally, as soon as the paradox between the non-spatial structure of the ecosystem and the criterion of distance is resolved by representing the ecosystem through the infrastructure that allows its exchanges, the pattern is the privileged if not exclusive object of the project.

Third measures

A third trick is to articulate the two irreducible dimensions of the space project and the eco-systemic structure through a third dimension, distinct from both. The term 'dimension' is deliberately chosen, referring to its synonym, in the vocabulary of physics, of 'value'. A specific unit of measurement corresponds to each dimension, each value: the metric unit of measurement for space is distinct from the one used, for instance, to quantify an ecosystem exchange (related to quantity of matter exchanges, its change in status, and the temporal delta, for instance). The introduction of a third quantity is used to establish a quantitative transition between the first two dimensions. An extremely clear example is the work 'Interweaving work and life. A project of doors'. The title itself is indicative of an approach that focuses on transitions, thresholds, shifts and equilibrium conditions, including a non-static but evolving equilibrium that is built over time. Time represents the third dimension proposed in this work. The representation of the occupation of the site by the actors and the activities over time is used to visualise the exchanges, meetings and constituent avoidances of the three ecosystems (current and potential) that can be associated with the authorities of Recyclart, LaVallée and Zinneke. The search for a third unit of measurement — the hour or the day — is all the more significant, as we are faced with instability in the area (abandonment of the headquarters and new installation for Recyclart; annual reconfiguration of the geography of Zinneke; opening onto spatial typologies not pre-established according to the needs of the workshops in LaVallée). The use of rhythm in Density: Rhythms in-between the City. Occupation of Time is of the same nature, whereas the confrontation between strategies (opportunism

and activism), while being just sketched, is important because it implies that the ecosystem is, within it, plural. In these two works, designing an ecosystem means describing the movements and transfers of people or materials directly in time and indirectly in space; identifying before/after sequences; representing the stakeholders' time and objectives. In the first work, the operation of 'verbing the actions — transaction, transmission and conflict — also reveals an emphasis on transitions and translation as a key aspect of the process. The function of time as a translation dimension in both works is consistent with the project's use of the narrative register: this identifies a third form of enunciation, the narrative, different from those specific to the diagram or the Euclidean map, which we introduced at the beginning of our essay and both of which are visual language.

Positions

The three strategies for resolving the paradox between the spatial dimension of design and the non-spatial dimension of the ecosystem cannot be exhaustive. However, they are sufficiently distinct to serve as the initial coordinates for a mapping of design positions on a metropolitan ecosystem. There would be a risk of caricature if the characters were too extreme, so that the temptation to associate the first strategy with the theme of the limit, the second one with that of the grid and the third one with the threshold is only mentioned here with the aim of guaranteeing maximum clarity.

The three strategies as coordinates could prove very useful in structuring exchanges between metropolitan laboratories, including those mentioned in the introduction. Our "Metropolitan Agriculture" research project, for example, can easily fit into the third strategy. Its objective is to develop an analytical and prospective tool capable of considering synergies between modes of occupation and land use that are rigidly distinct by the legal and normative framework in force in Switzerland: on the one hand, urban areas and, on the other hand, agricultural areas. These two planning domains are now in competition because, as they are in need of expansion, they are governed in such a way that an increase in the surface area of one is gained at the expense of the other, and this occurs in configurations that tend to eliminate the situations of entanglement. By taking the opposite approach to this struggle between land use efficiency in terms of building density and agricultural production efficiency, we are putting in place a complex description with many intermediate parameters — such as permeable surface, water requirement, ecological impact, caloric efficiency, etc. — that make it possible to consider multiple scenarios of co-existence alternatives to the mainstream and to submit them to debate and negotiation.

In principle, the design domain is not limited to scenarios, but includes the sketching of various contents and forms of occupation, in tension with conventional categories (agricultural use can be declined according to a variety of techniques not currently provided for by law, just as built density is declined itself in plural forms). Our quest for intermediate dimensions draws its inspiration directly from the Wahlen Plan for Food Autonomy of the 1940s (Cogato Lanza and Villaret, 2019), an extraordinary experience of land planning at the national level where resources and forms of use were structured into a system thanks to the adoption of the calorie as a unit of measurement capable of relating them all from a quantitative point of view: the ecosystem approach was possible in consideration of animal yield either as food or traction force; the yield of a plot was evaluated according to the type of crop, and considering it in proportion to its food yield, the need for manpower, for fuel or for fertiliser; the overall food yield according both to diets and the recycling of waste from meal preparation, etc.

If we insist on the inspiration that comes to us from a planning process led by agronomic competence, it serves us to address a final implication of the three strategies, relating to the status of design competence. The third dimension strategy is the one that, more than the other two, exposes design competence to strong hybridisation and non-exclusive control by architects and urban planners. On the other hand, the second strategy — the eco-systemic pattern project — implies a strong proposal of the architectural designer's competence, while the first strategy is not ready to give up this exclusive, but in a more defensive, posture. That in the ambition to design the metropolitan ecosystem, there is the risk — and the opportunity — of exposing oneself to a profound revolution in the roles and prerogatives of design, scientific, technical and ordinary knowledge, it is still an urgent subject of debate, right at the heart of metropolitan laboratories.

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Ecosystem: a spatial or aspatial notion?

Marine Villaret

‘But the more fundamental conception is, as it seems to me, the whole system (in the sense of physics), including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment of the biome – the habitat factors in the widest sense. Though the organisms may claim our primary interest, when we are trying to think fundamentally we cannot separate them from their special environment, with which they form one physical system.

It is the systems so formed which, from the point of view of the ecologist, are the basic units of nature on the face of the earth. Our natural human prejudices force us to consider the organisms (in the sense of the biologist) as the most important parts of these systems, but certainly the inorganic ‘factors’ are also parts – there could be no systems without them, and there is constant interchange of the most various kinds within each system, not only between the organisms but between the organic and the inorganic.’

– A. G. Tansley, 1935, *The Use and Abuse of Vegetational Concepts and Terms*, p. 299.

Since its introduction in 1935 by British botanist Tansley, the **notion of ecosystem** has raised a debate about the spatial or aspatial dimension of this ecological unit, an ecosystem that can be understood both as an environment (territorial space) or as a system (reticular space). As a result, two fundamentally distinct branches of ecology have arisen, both of which are now studying the metropolitan ecosystem with a potential complementarity.

Ecosystem ecology supported by Howard T. Odum ‘s work, considers the ecosystem as a homogeneous and aspatial entity, structured by exchanges of energy and matter. It has been applied to the study of urban ecosystems, evolving towards an ‘urban ecology’ where the city is understood as a metabolism which is described with a diagram of incoming flows (biogeochemical cycles, water, food), and outgoing flows (pollutants, sewage, waste), thus allowing to identify a possible ‘urban waste’ (Barles, 2002).

Landscape ecology, on the other hand, proposes to define an ecosystem according to its spatial dimension and its heterogeneity (Forman, 1986) which it calls a ‘landscape’ (Burel and Baudry, 1999). To do so, it studies the links between ecological processes and patterns, combining the functional approach of ecology with the structural approach of geography, and inducing various and multiscalar kinds of representations. For example, it uses a set of graphs, quantitative indicators, and Euclidean representations to understand how a *bocage* influences biodiversity and agricultural production in a given location. Whether it focuses on an agrarian or silvicultural *milieu*, it aims to identify the landscape pattern that induces the expression of specific synergies (distinct from another landscape) between living communities and their environment.

Today, ecosystem ecology and landscape ecology seem to be converging towards the study of **metropolitan ecosystems**, the complexity of which requires a deepening of interdisciplinary approaches that bring together environmental, spatial and social sciences. A new proximity that could identify a cohesive spatialization of this ecological unit.

The systemic approach in ecology now recognizes the need for a contextual and multiscalar approach, as highlighted by the fact that urban ecology is evolving into a **‘territorial ecology’** (Barles, 2010). The latter being a field approach that aims in particular to establish an environmental indicator called an ‘ecological footprint’. This would allow, for instance, to measure the water footprint of the Parisian metropolis by looking at water resources and the whole water cycle at the scale of the Seine river (Barles, 2010).

As to the ‘landscape approach’ has always considered ‘landscape as the result of an interweaving of natural processes and human activities, expressing know-how, technical developments and human needs. Reflecting the interactions between nature and societies, [landscapes] evolve at the same time as the latter, under their impetus’ (Lefeuvre, in Burel and Baudry, 1999). Landscape ecology is currently seeking to fully integrate in its approach the sociological dimension as a determining factor of a landscape structure. It no longer deals with a natural ecosystem, but with a **socio-ecological system**.

In conclusion of this brief excursus, the aspatial ecosystem is gradually anchoring itself in a territorial context, and is acquiring a social dimension in addition to the spatial and functional ones. Could it then be that the ecosystem is both a spatial and aspatial concept? The debate remains open about a paradox that Tansley had already stated by presenting an ecosystem as ‘one category of the multitudinous physical systems of the universe’ (Tansley, 1935, p. 299), the expression ‘physical system’ referring to an oxymoron.

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Ecology of Urban Knowledge

Notes from the Metrolab experience

Mathieu Berger

In this text, which reformulates some of the remarks made at the end of the *Brussels Ecosystems* conference, I put forward some ideas for an ecological approach not to the city, but to knowledge about the city and 'research action' on urban problems. Since the various ecological niches and spheres of knowledge in which knowledge about the city is produced are also 'semiotic niches' (Hoffmeyer, 2008) and 'semiospheres' (Lotman, 1991), i.e. spaces characterized by the prevalence of certain types of signs and certain modes of signification over others, we refer to this approach as 'semiotic ecology', or 'eco-semiotics' (Berger, 2018; Van Hollebeke, 2020).

The Artist, the Bulldog and the Mathematician

The ecology of knowledge begins at the individual level, with an ecological development of the mind: the subject of knowledge recognizes and appreciates the plurality and interdependence of the forms of intelligence of a phenomenon. For example, American philosopher Charles Sanders Peirce (1998, pp. 146–147) believed that a proper appreciation of the phenomena of the world required philosophy to bring together different faculties of human intelligence:

> The first and foremost is that rare faculty, the faculty of seeing what stares one in the face, just as it presents itself (…). This is the faculty of the artist who sees for example the apparent colours of nature as they appear. When the ground is covered by snow on which the sun shines brightly except where shadows fall, if you ask any ordinary man what its colour appears to be, he will tell you white, pure white, whiter in the sunlight, a little greyish in the shadow. (…) The artist will tell him that the shadows are not grey but a dull blue and that the snow in the sunshine is of a rich yellow. That artist's observational power is what is most wanted (…). The second faculty we must strive to arm ourselves with is a resolute discrimination which fastens itself like a bulldog upon the particular feature that we are studying, follows it wherever it may lurk, and detects it beneath all its disguises. The third faculty we shall need is the generalizing power of the mathematician who produces the abstract formula that comprehends the very essence of the feature under examination (…).

These different faculties, which together produce a complete phenomenology — not reduced to aesthetic sensitivity (the artist), nor to a watchful eye for facts (the bulldog) or to abstract logic (the mathematician) — can be articulated in the intelligence of a single individual. Each of these faculties corresponding to an elementary mode of being-in-the-world, which Peirce respectively calls *firstness* (the phenomenon is grasped as a mere quality), *secondness* (the phenomenon is grasped in its actuality and tangibility) and *thirdness* (the phenomenon is grasped in its generality), we constantly mobilize in very ordinary forms. It is up to us to elaborate each of these relationships to the world, in more or less dissociated or associated modes. If Peirce is considered an authentic genius, it is because of an intellectual ethic that falls within what Gregory Bateson later called 'an ecology of the mind' (1972), and which led Peirce to distinguish himself as a logician and mathematician, but also as an oenologist and even a detective (Eco and Sebeok, 1986). These diverse abilities are combined in his very singular practice of philosophy.

Interdisciplinarity and Transdisciplinarity

While the faculties referred to can be elaborated and articulated by a single brilliant spirit, an ecology of knowledge also invites us to pursue this cooperation of faculties through communication and collaboration. Is it not preferable to have the artist, the bulldog — or 'tracker' — and the mathematician collaborate, through a certain division of labour, within an interdisciplinary team? The answer is less obvious than it seems. One must first ask whether these different faculties can together compose a phenomenology, which seems to require a fourth faculty, a faculty of articulation of the other three, and which is not necessarily represented in this team. Other problems arise:

Who — artist, tracker or mathematician — initiates the collaboration; who sets the framework, formulates the problem and defines the objectives? Who is the host, who 'plays at home'; who is the guest, who 'plays away'? Where does the exchange take place? In the office of a mathematics department, among books and exam papers? In the studio of an artists' collective, among unfinished canvases and leftover pizza? In the open air and on the move, on the tracker's familiar ground? What is the atmosphere and what 'cognitive mood' does it stimulate? What objects, instruments, equipments are available? What medium (visual, verbal, textual, etc.) is emphasized, indicated or suggested by the situation? What categories of signs dominate the exchanges (Peirce, 1991)? 'Icons', which signify by resemblance, evocation, open up potential significations? 'Indexes', which stick to the facts and actual features of a situation, and which we use to ensure that we have a grip on reality? Symbols, which develop a general signification, based on laws, conventions or habits?

These puzzles and challenges, which characterize interdisciplinary collaborations, are 'eco-semiotic' ones. Let us try to clarify the meaning and relevance of this term. The artist, the tracker and the mathematician develop different faculties because they become familiar with different modes of significations, paying attention to a certain type of signs rather than to others. The first is distinguished by iconic intelligence, the second by indexical intelligence,

and the third by symbolic intelligence (Ferry, 2007). The development of interdisciplinary communication and intelligence in this group involves 'inter-semiotic' transactions between different universes of signification, and these transactions must be understood and controlled using certain methods and procedures (while Jürgen Habermas has theorized in detail the procedures for controlling the quality of linguistic exchanges between interlocutors and for promoting the 'communicative rationality' of a deliberation, he has left aside the problems of semiotic heterogeneity and the plurality of intelligences that mark human communication — Ferry, 2007; Berger, 2017; Genard, 2017).

So why not simply speak of 'semiotic' obstacles? The term 'eco-semiotics' adds this important point: if the artist, the tracker and the mathematician do not pay attention to the same signs, if they draw from different universes of meaning, it is also simply because they 'do not live in the same world', because they inhabit different worlds (Cefaï, 2015), where 'meaning is cultivated' differently (Rochberg-Halton, 1986). For instance, the indexical intelligence of the tracker or the hunter imposes itself as an adaptation to a world (a hostile forest, for example) and to the 'knowledge interests' that it encourages (knowledge = feeding oneself; being intelligent = surviving); this world and these knowledge interests are in principle foreign to the eminent mathematics scholar. An epistemology of interdisciplinarity must take an interest in the matter: the problems of interdisciplinarity are not limited to technical questions of transcoding one 'language' into another, or of the choice of medium (oral speech, drawing pencil, PowerPoint slideshow, etc.), but raise the socio-anthropological question of the belonging of these three characters to semiotic niches that are themselves embedded in different ecological niches.

When re-examined in these new terms, the difficulties of interdisciplinary communication can no longer be thought of as mere problems of translation from one language to another, but rather as problems of circulation and accessibility from one niche to another; as problems of reception within the host environment, where exchanges take place; in short, as problems of *hospitality* (Stavo-Debauge, 2018; Berger, 2018). This eco-semiotic conception also casts a singular light on the notion of 'transdisciplinarity'. While the word 'interdisciplinarity' postulates — in a consensual but unrealistic way — the symmetry and complementarity between the disciplines represented, between equally respectable intelligences in a supposedly neutral communication space, 'transdisciplinarity' better recognizes the irreducible asymmetry of these collaborations between *host* and *guest* disciplines, and the fact that the latter can only step into the communication space by encroaching on the former's 'domain' (*domus*: house, home). Transdisciplinarity occurs when episodes of encroachment introduce a fertile tension within the epistemic host environment.

What is called 'fertile tension' here? Not disruption or transgression celebrated for its own sake, for the 'beauty of the gesture', the thrill of breaking into the domain of the other (on the contrary, such an aesthetic conception of encroachment between disciplines is detrimental to transdisciplinary initiatives). Nor is it a mere 'irritation' between knowledge systems, to which the hosts react allergically, after which they become defensive and withdraw into their own discipline. Rather, 'fertile tension' characterizes what might be called *problematic encroachments*, encroachments that have the merit of giving rise to a problem

within the hybrid collective and that mobilize its members (hosts and guests) in a process of investigation, of progressive and collective clarification of the difficulty; this process is intended to clarify this epistemic dispute and to evaluate together the gain or loss in intelligence caused by the encroachment.

Metrolab: Housing Urban Transdisciplinarity

Let us leave Peirce's example aside to consider the Metrolab experience. This collective adventure involving architects, urban planners, sociologists and geographers, initially thought of as 'interdisciplinary' and now experienced as 'transdisciplinary', has given rise to all sorts of tensions — not all of them 'fertile', by the way! The most interesting tensions happened, for example, when a geographer or an urban planner tried to tackle a sociological problematization, or when a sociologist attempted to appropriate the cartographic tool or to sketch a design of a public space or building. While these attempts have occasionally given rise to irritation or even rupture, they have also, fortunately, been 'problematic' in the good sense of the word: taking these encroachments seriously required the group to question their potential to examine new, possibly relevant insights into the phenomenon under study; insights that had hitherto been absent from the disciplinary corpus of reference.

While the sociologist's encroachment into the architect's field and their appropriation of the instruments of architectural/urbanistic design can only produce 'sub-architecture' or 'sub-urbanism', several possibilities arise: this attempt can provoke annoyance, mockery, contempt and be dismissed out of hand; it can be considered seriously by the architect but rejected on the basis of an argument; lastly, it can be taken up again, reworked by the architect in order to give it a finished and sophisticated form. In the latter case, the sociologist has initiated a design (in itself unfinished) on the basis of premises, ideas and intentions that are 'undisciplined' and therefore perhaps new. Conversely, sociologists will benefit from paying attention to the attempts by which architects or geographers 'sociologize'. Mastery of configurations and spatial relations, attention to practical details, aesthetic sensitivity to the qualities of experience and to atmospheres, all these skills that architects are likely to possess can give rise to intuitions or sociological hypotheses that will have the originality and strength to grasp a social relationship in its most concrete, situated and material form. The geographer's intelligence of territorial scales, as well as their understanding of urban situations in their relativity and interdependence, can help initiate sociological reasoning that avoids short-sightedness.

Whatever the collaborations that have brought together these disciplines, sometimes two by two (architecture and sociology, urban planning and geography) and sometimes all three at the same time, transdisciplinarity within Metrolab was also expressed through processes of socialization, sociability and acquaintanceship that were determined neither by disciplinary affiliations, nor by institutional affiliations (between researchers at UCLouvain and researchers at ULB). After all, another way to ascertain the 'transdisciplinary' ability achieved by the Metrolab collective is the fact that, after four years of intense collaboration, I no longer work, talk, laugh or argue with a sociologist, an architect or a

geographer, but rather with Louise, Pauline, Christian, Geoffrey, Sarah, Simon…

This is undoubtedly because, over time, through the multiplication and deepening of collaborations whose leadership was provided in turn by sociologists, architects and geographers, Metrolab has opened and then consolidated a new habitat for urban research, a 'semiotic niche' where shared significations have flourished; maps, designs, problematizations and concepts that have become inseparably sociological, geographical and architectural. This is the case, in particular, of the concept of the 'inclusive enclave' (Berger & Moritz, 2018) which, after emerging from a MasterClass at Metrolab, was presented and discussed in numerous seminars and conferences, operationalized on different sites in Brussels and elsewhere, and even inspired an artistic work (a play by Joseph Wouters and Globe Aroma, 'Underneath Which Rivers Flow', presented as part of the Kunsten Festival des Arts). A concept that has now been taken up by new collaborators (in particular Lemaître, 2019) and applied to a situation of prime importance in Brussels: the work of reception, help and support provided by citizen platform BXLRefugees for the population of transmigrants gathered in Brussels' Northern Quarter (ARCH, 2020).

Research and Action

The relationship to practical commitment and action is a further eco-semiotic challenge, and one that is, of course, quite decisive for our work. The difficulties raised in the previous paragraphs, while significant and not to be taken lightly, are mere in-house arrangements for the urban actors with whom we intend to work. The fact that we have managed to establish proper conditions for transdisciplinarity within the Metrolab niche, within the framework of our seminars, is of little value if it cannot guide and assist the practices of the actors involved. Moreover, the question could be asked: does the eco-semiotic challenge encountered in the context of exchanges and attempts at communication between the disciplines represented in Metrolab distract us from the more crucial eco-semiotic challenge that the mission of 'action research' — that is, the situation of communication and collaboration that unites the researcher and the practitioner — opens up? If opening up and strengthening a new sphere of transdisciplinary knowledge increases internal complexity, researchers who are engaged in these efforts may be tempted to limit transactions with the outside world; to avoid a new increase in complexity, by opening up to the reality of the actor.

While this concern arose several times during the first two years of the Metrolab adventure (Van Hollebeke, 2020), it is less present today, considering the multiplication of practical collaborations with a number of ERDF 2014–2020 project leaders and other public or citizen actors, and their acknowledgement of Metrolab's role. The Designing Brussels Ecosystems MasterClass in January 2019, compared to that of 2017, marked a clear improvement in the communication between Metrolab researchers and Brussels actors, around the works presented by international doctoral students.

It seems to me that for many of us, the eco-semiotic challenge of transdisciplinary communication and collaboration within the Metrolab group was an important prerequisite for the more decisive challenge of communication

and collaboration with Brussels' urban actors. Nobody in the group lost sight, throughout the seminars and conferences with sometimes very theoretical contents that we organized, that these reflexive activities were justified by their necessary extension into practical commitments with the actors involved. The transdisciplinary communication operating within the laboratory would have been in vain if it had not received 'its goal, its specificities and its mandate' (Dewey, 2014) from the urban reality with which the Brussels actors are grappling. The aim of these exchanges between disciplines and across disciplinary boundaries remains, in the end, to clarify 'a confusing situation so that reasonable ways of dealing with it can be suggested' (Dewey, 2014). It is only because real-world problems know no boundaries between disciplines or fields of study that spheres like Metrolab and many others are needed. The real world is transdisciplinary!

Knowing That, Knowing How

Having raised the issue of closer collaboration between academic researchers and urban actors in urban policies, we must now consider the desirable forms of such collaboration. Even if things have changed in recent years, with a multiplication of living labs and applied research experiments, the interaction between researchers and actors is still conceived most of the time in terms of a caricatured complementarity whereby researchers bring their 'knowledge' and actors bring their 'practical skills'. Such a stereotypical division of labour is at the origin of many collaborations that are not very fruitful, because they depend on miscommunications between *subjects of knowledge* on the one hand and *subjects of action* on the other, engaged in relationships to the world that are very different, and probably more incompatible than complementary. More often than not, the actor *does not know what to do* with the knowledge acquired through contemplative observation of urban phenomena (a relationship to phenomena freed from the constraints of action). The scholar, on the other hand, *does not know what to think* of the practical skills of actors, which are best demonstrated *in situ*, through the reproduction of daily acts, the formation of habits and know-how that are difficult to convey through discourse.

It is important to rethink the terms of the collaborative interaction between researchers and urban actors, starting with a more realistic and symmetrical approach to the relationship that each of them has with knowledge and practice, i.e. with 'knowing that' and 'knowing how', in the words of Gilbert Ryle (1945). The idea that researchers engage only in the *knowledge-that* mode in the context of a complementary relationship in which actors would limit themselves to mobilizing a know-how (*knowledge-how*) is erroneous. It is excessive, immodest (it presupposes a superiority of the researcher's knowledge over that of the actor) and, at the same time, too timid and falsely modest (the researcher renounces their own use of practical know-how). To put it another way, academics engaged in 'collaborative research' processes have an unfortunate tendency to overestimate the depth and relevance of their knowledge, while underestimating the usefulness and interest of their know-how.

If academic researchers tend to overestimate their own knowledge (knowledge-that), it is, first of all, because they misunderstand the extent,

diversity and complexity of the knowledge developed by the actors. For example, after years of practice, a given actor in a given policy will have gained detailed knowledge not only of the thematic area of their action (e.g. green spaces), but also of the plans in force, the legal provisions, the budgetary realities, the political and electoral strategies, the institutional relations between the different levels of government involved and the interpersonal relations between the protagonists of this policy. They will have memorized thousands of names of people, bodies, agencies, streets, places, buildings, projects, etc., giving a very concrete and specific character to their knowledge of these entities that make the city and intervene in a project or policy. In fact, it is rare that an academic researcher working in urban studies, even if they have specialized in a city or a territory, develops such a rich, diversified and contextualized knowledge ('indexicalized', we might say with Garfinkel [1967], precisely to underline that the type of sign that characterizes this knowledge and intelligence is the 'index', the concrete and contextualized sign).

If academic researchers overestimate their own knowledge (knowledge-that) in relation to knowledge built in the sphere of action, it is then because they often misunderstand the simplifications and reductions that academic research uses to generate knowledge. These 'scholastic reductions' (Bourdieu, 2000), due to the academic's seclusion in campus life and active avoidance of practical concerns, far from fading with experience, generally only worsen as the academic becomes more established in both their professional field and their cognitive mode, and gains exposure and prestige. It is difficult for academics (who tend to see themselves as repositories of the world's complexity) to acknowledge that their mode of knowledge, both theoretical and conceptual, considerably reduces complexity, through, among other things:

- operations of generalization and decontextualization;
- bracketing praxeological constraints and practical consequences related to the production of their discourse;
- the selective shaping of the reality represented by their research prooblem, adopting a certain focus (micro or macro), concentrating on this or that aspect of urban reality (social, or ecological, or economic, etc.) to the exclusion of others.

Some of these reductions are inevitable, inherent to the profession of researcher. But acknowledging them should encourage an attitude of modesty; it should at the same time make the researcher aware of the very particular complexity of the knowledge developed by a number of actors, these *subjects-knowing-under-constraint-of-action*. Once this type of knowledge is better recognized, better understood in its importance and depth, the challenge is to open and organize spaces for the co-constitution of knowledge about the city in which the knowledge of academic experts and the knowledge of urban actors are placed in a more symmetrical relationship, rather than spaces in which one form of knowledge dominates, crushes, scorns the other.

In addition to these considerations on the need for sharing and the symmetrization of knowledge (knowledge-that) between academic observers and urban actors, it is necessary to look at interactions and exchanges concerning

their respective know-how. The problem is reversed here. From the point of view of promoting and sharing their own know-how, researchers are often too reserved. Intimidated by the practical skills of urban actors, accustomed to the idea that their knowledge is not directly useful for action, or even that their knowledge is 'useless' outside the academic semiosphere, scholars often too quickly abandon the idea that they are the bearers of a know-how and that this know-how can legitimately be considered valid and useful by the stakeholders of a policy or a project. While they are indeed 'observers' of urban life, academic researchers must also understand themselves as 'operators' (since their observations are in principle taken in an investigative process, it is based on methods, on a certain modus operandi). These investigation skills, drawn from their interest and taste for problems (identifying, imagining, formulating, solving problems), are relevant and needed in the worlds of action.

Just like it is well understood today that urban actors, including citizens, must invite themselves into scientific research circles (i.e. the idea of 'collaborative research'), too little emphasis is placed on the importance of the reverse movement: more professional researchers must seek to invite themselves into the field of urban public action and to engage their own knowledge-how, that particular practical knowledge produced by an ability to investigate, problematize and solve problems (Dewey, 1938).

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Glossary

Corentin Sanchez Trenado

Brussels' main urban public policies

CoBAT, Code Bruxellois de l'Aménagement du Territoire
The Brussels Regional Planning Code is the legal basis for urban planning in Brussels. The CoBAT establishes a number of urban planning tools used to regulate and supervise urban and regional planning: strategic plans (PRDD, PCD), land use plan (PRAS, PPAS), urbanistic regulations (RRU, RCU).

CQD, Contrat de Quartier Durable
Part of an action plan supported by the Brussels-Capital Region, Sustainable Neighbourhood Contracts deal with a specific area of one of the Region's municipalities, within the ZRU. CQDs have a limited scope in terms of space and time, and involve: building/refurbishing social housing, improving public spaces, providing cultural and sports facilities/equipment for young people, creating green spaces, supporting social and economic integration, organising the residents' participation, and more. Each CQD includes a participation process with the area's residents.

CRU, Contrats de Rénovation Urbaine
Urban Renovation Contracts are part of an action plan supported by the Region and deal with a specific area within the ZRU. CRUs have a limited scope in terms of space and time, and aim to improve areas at the junction of different municipalities and across different neighbourhoods. Like Sustainable Neighbourhood Contracts (CQDs), Urban Renovation Contracts work on multiple levels: housing, economic, public spaces, environment, etc.

Maillage vert et bleu
The Green and Blue Network is a programme carried out by the Region's administration in charge of environmental matters (Bruxelles Environnement). Its goal is to implement green areas in the Brussels Capital Region and connect them all together to form a network. On an ecological level, it should preserve and reinforce the Region's biodiversity. On a social level, the Green and Blue Network is intended to improve living conditions for residents.

PAD, Plan d' Aménagement Directeur
A Master Development Plan is a new urban planning tool that focuses on one of several strategic areas identified in the PRDD. Both a strategic plan and a planning tool, it sets general guidelines for urban development but also specifies which functions are allowed in the area. This tool defines: land uses, building typologies, mobility patterns and the general framework of public spaces. The development and implementation of PADs is carried out by perspective.brussels.

PC, Plan Canal
The Canal Plan focuses on the area of the Brussels-Capital Region through which the Brussels–Charleroi Canal runs. This area was historically the Region's main industrial area, and it is now undergoing a major transformation process. The Canal Plan identifies various strategic actions and specific projects intended to improve public spaces, housing and economic development in this specific area.

PCD, Plan Communal de Développement
The Municipal Development Plan is a document that defines each municipality's main development strategies, according to the guidelines laid down in the PRDD. It describes specific goals for the municipality and sets development priorities. It is an indicative document that includes the municipality's guidelines for all aspects of municipal development.

Plan Nature 2016–2020
The Nature Plan is a strategic plan whose goal is to combine the development of the city with nature and make it accessible to all. It defines a set of objectives intended to foster biodiversity, protect green spaces and develop nature in the city.

PRDD,
Plan régional de développement durable
The Regional Plan for Sustainable Development aims at tackling some of the Brussels-Capital Region's major challenges. A strategic tool for the development of the city, it defines the main guidelines of the urban project at various levels — social, economic and environmental.

PG, Plan-Guide
The Guide-Plan defines new regional strategies for urban renovation: strengthening urban centralities by focusing on urban boundaries within the ZRU — margins, fringes — in order to improve connectivity between neighbourhoods. The overall plan is implemented using various tools (such as CQDs or CRUs).

PPAS, Plan Particulier d'Affectation du Sol
The Local Land-use Plan is a local tool of urban planning that defines and prescribes what functions are allowed in the various areas and plots of the municipality's territory. It is the reference plan for urban planning.

PRAS, Plan Régional d'Affectation du Sol
The Regional Land-Use Plan is a regional tool of urban planning that defines and prescribes what functions are allowed in the various areas and plots of the Region's territory. It is the reference plan for urban planning. The plan is binding and superior to the regulation plans.

PREC,
Programme Régional en Economie Circulaire
The Regional Programme for Circular Economy implemented by Bruxelles Environnement aims to replace the current linear economic model — based on resource consumption and waste production — by a circular one. The PREC has three main objectives: 1) transform environmental objectives into economic opportunities; 2) anchor the economy into Brussels' territory by fostering local production, reducing travel distance, optimising land use and generating new added value for Brussels; 3) contribute to creating more job opportunities.

Stratégie Good Food – Good Food strategy
The Good Food strategy is public policy developed by the Brussels-Capital Region that aims to foster and coordinate food-related initiatives in order to produce and transform food locally and make these local products available to all. This policy mostly focuses on increasing local food production in Brussels, reducing food waste and raising awareness about this topic.

ZIR, Zone d'Intérêt Régional
An Area of Regional Interest is defined to allow the re-urbanization of major urban disused areas, the development of new urban areas or the rehabilitation of buildings benefiting from heritage protection. This zones are defined in the PRAS. Some of them have been the subject to a master plan and a PPAS.

ZEMU, Zone d'Entreprise en Milieu Urbain
An Urban Enterprise Zone is allocated to productive activities and integrated services for businesses but also to housing, trade, wholesale trade and facilities of collective interest or public service. The ZEMU is therefore an area in which businesses and housing can coexist.

ZRU, Zone de Revitalisation Urbaine
The Urban Revitalisation Area defines the territory of the Brussels-Capital Region where the actions of public policies are reinforced. This perimeter is defined on the basis of 3 criteria: unemployment rate, median income and density.

Brussels' main institutions

Bruxelles Environnement
Environment Brussels is the administration in charge of environmental and energy management in the Brussels-Capital Region. Its field of activity covers the environment in the broadest sense, including: air quality, energy, soil, noise pollution, electromagnetic waves, waste management, production, construction and maintenance, sustainable consumption, nature and biodiversity, animal welfare, green spaces and natural areas management, runoff water management and the fight against climate change.

Bruxelles Logement
Bruxelles Logement's purpose is to provide access to quality housing for all, by supporting decisions made by the Region's government to implement its housing policy, granting allowances to individuals under certain conditions, identifying and fighting unoccupied housing, informing all audiences, subsidising certain actors in the housing sector and guaranteeing compliance with the standards set by the Brussels Housing Code.

Bruxelles Mobilité
Brussels Mobility is the Brussels-Capital Region's administration in charge of equipment, infrastructure and transportation. Its main objective is to combine economic development — and growing mobility needs — with improved quality of life and sustainable development. Brussels Mobility manages the setting of mobility strategies, the development, renewal and maintenance of public spaces and roads as well as public transport infrastructure, road safety and taxis.

Bruxelles-Propreté
Bruxelles-Propreté is the public agency in charge of waste collection, waste treatment and street cleaning. It also raises awareness among the general public about recycling practices and circular economy.

citydev.brussels – Société de développement pour la Région de Bruxelles-Capitale (SDRB)
citydev.brussels is a public institution that contributes to the Region's economic and urban development. Its main purpose is to attract and maintain high-added-value companies and middle-income households in the Brussels-Capital Region by offering them attractive infrastructures (land or buildings) at affordable prices, using public subsidies. In doing so, citydev.brussels also aims to promote functional diversity inside the city.

COCOF – Commission Communautaire Française
The COCOF is the public institution in charge of culture, education and health care for the French-speaking community within the Brussels Region.

hub.brussels – Agence bruxelloise pour l'accompagnement de l'entreprise
hub.brussels is a public institution that aims to foster Brussels' economic growth and attractiveness. Its mission is to advise and support new economic projects in Brussels; attract and create economic, technological and commercial opportunities; and assist public authorities in developing and implementing a proactive economic policy, ensuring a stimulating entrepreneurial ecosystem.

Infrabel
Infrabel is the infrastructure manager and operator of Belgian railways. Infrabel is in charge of building, maintaining and modernising infrastructures on Belgium's rail network.

Innoviris
As a regional organisation dedicated to research and innovation, Innoviris aims to connect, stimulate and financially support citizens, businesses, research organisations and non-profit organisations. Innoviris plays a pioneering role and provides the financial resources to feed the innovative Brussels ecosystem.

perspective.brussels – Bureau Bruxellois de la Planification
perspective.brussels is a public institution that conducts analyses on many aspects related to Brussels' territory: demography, economy, urban planning, housing, mobility, etc. perspective.brussels brings together several actors involved in the development of Brussels' territory and is in charge of the overall supervision of Urban Renewal Contracts (CRUs) with the help of BUP. They also contribute to the elaboration of several development plans and strategies (e.g. PAD).

Port de Bruxelles
The Port of Brussels is the public operator in charge of the port area located along the Brussels–Charleroi canal, which hosts about 200 companies. The Port also manages Brussels' waterways and is therefore responsible for the maintenance and proper functioning of the canal, mobile bridges and locks in Brussels.

SAU – Société d'Aménagement Urbain
The Urban Development Agency is the public operator in charge of implementing development plans in strategic areas identified by the government of the Brussels-Capital Region. The SAU acts as a project manager or a mediator between the various actors involved in these projects. The SAU works in close collaboration with perspective.brussels.

SLRB – Société du logement de la Région de Bruxelles-Capitale
The SLRB is a regional institution in charge of social housing and SISP (Sociétés immobilières de service public). As such, it is involved in the construction and renovation of social housing in Brussels.

SNCB
SNCB is the operator that organises and commercialises Belgium's rail transport services. It is also in charge of maintaining and renovating trains and stations.

STIB
STIB is the public company mandated by the Brussels-Capital Region to manage public transportation on its territory. STIB therefore contributes to the enhancement of Brussels' environment and quality of life through sustainable and safe mobility.

urban.brussels – Bruxelles Urbanisme et Patrimoine (BUP)
urban.brussels is an administration of the Brussels-Capital Region whose main objective is to support the Region's sustainable territorial development by implementing regional policies on urban planning, cultural heritage and urban regeneration (e.g. through CQDs and CRUs). urban.brussels also provides administrative services relating to subsidies for the renovation and embellishment of facades, as well as legal advice.

VGC – Vlaamse Gemeenschapscommissie
The VGC is the public institution in charge of culture, education and health care for the Dutch-speaking community within the Brussels Region.

Profiles

Guest professors

Elena Cogato Lanza, architect and PhD, is a *maître d'enseignement et de recherche* (senior teacher and researcher) at EPFL Lausanne's Laboratory of Urbanism. Her field of research is characterised by a continuous intersection between the history of urbanism and the theory of urban and landscape design. She is also highly active in the publishing sector, as director of the vuesDensemble collection at publishing house Metispresses and a member of several international publishing committees. Since 2015, she has been Chairwoman of the Board of the Braillard Architectes Foundation in Geneva.

Brian McGrath is Professor of Urban Design and former Dean of the School of Constructed Environments at Parsons School of Design. His books include: *Urban Design Ecologies Reader* (2012), *Resilience in Ecology and Urban Design* (2012), *Digital Modelling for Urban Design* (2008), *Cinemetrics* (2007) and *Transparent Cities* (1994). McGrath is a Principal Investigator in the Baltimore Ecosystem Study. He has served as a Fulbright Senior Scholar in Thailand in 1998-99 and was an India China Institute fellow in 2006–2008.

Miodrag Mitrašinović is an architect, urbanist and author. Miodrag Mitrašinović is a Professor of Urbanism and Architecture at Parsons School of Design, The New School University. His scholarly work focuses on the role design plays as an agent of social and political change, and as catalyst for critical urban transformations; his research argues for the centrality of designing in the conceptualization, production, and representation of democratic and participatory urban space. His work also focuses on the generative capacity and infrastructural dimensions of public space, specifically at the intersections of public policy, urban and public design, and processes of privatization of public resources. He is the editor of Concurrent Urbanities: Designing Infrastructures of Inclusion (Routledge 2016), co-editor of Travel, Space, Architecture (Routledge 2009) and author of Total Landscape, Theme Parks, Public Space (Routledge 2006).

Guest researchers

Chloé Salembier is an ethnologist and lecturer at the Catholic University of Louvain (Belgium). She teaches social sciences and co-coordinates the 'Uses&Spaces' research team. She conducts research on housing at different scales based on qualitative methodologies at the crossroads of human sciences, architecture and urban planning. These current research topics focus on precariousness, gender and the commons.

Stephan Kampelmann is passionate about reconciling contemporary urban life with the restoration of nature, and has had the chance to lead cutting-edge research and hands-on projects related to various areas of urban ecology such as circular economy, resource management, local production systems and nature-based solutions. Stephan is currently teaching urban economics at L, where he was appointed as Chair of **circular economy and urban metabolism**.

Participants

Lucile Ado is an architect (ENSAPVS/2011) and urbanist (IUAV – KU Leuven – UPC Barcelona EMU/2014). She has worked on urban planning and design projects with international firms in France and Switzerland. After winning an international competition in 2018 (Europan 14), she co-founded 'Platform-archi', an open platform dedicated to supporting both professionals and researchers in the fields of architecture and urbanism and whose goal is to offer a flexible framework to all those who want to reflect, design or be engaged in the sustainable construction of the city.

Alice Bassan (23) is from Italy. She is currently attending the last year of a Double Degree programme in 'Green Economy and Sustainability' with the University of Ferrara (IT) and the University of Southern Denmark. She has also completed a Bachelor's degree in Foreign Trade at Ca' Foscari University of Venice. During this Masterclass, she had the opportunity to exchange views with students with different backgrounds from hers and put her academic knowledge into practice in a real-world context.

Jolein Bergers (31) is a PhD researcher at KU Leuven. She investigates the agency of social practices in the development of Brussels' ecological network. Jolein is trained as an engineer-architect (KU Leuven, 2011/University of Ghent, 2013), but has developed a strong affinity for urban and systemic design questions at think-and-do tank Architecture Workroom Brussels, architecture practice 51N4E, and in the University of Antwerp's Research Group for Urban Development.

Valentina Bonello is an urban anthropologist with an MA in Cultural Anthropology (Ca' Foscari University of Venice) and a PhD in Anthropology and History (University of Verona). Her latest work is centered on the aftermath of deindustrialization in inland Venice in terms of new forms of entrepreneurship and labour patterns. Her main research interest is the gap in knowledge and agency between experts and non-experts in the context of social production and construction.

Rafael Consolmagno (34) is a biologist and student in the Master's in Urban Studies at Vrije Universiteit Brussel (VUB). He is currently researching Nature-based Solutions for Cities through Urban Metabolisms and Ecosystems multidisciplinary perspective, and holds a Master's degree in Ecology & Evolution from the Federal University of São Paulo (UNIFESP) as well as a Bachelor's in Biology from São Paulo State University (UNESP). Previously, Rafael was a researcher on tropical amphibians' behavioural ecology at UNESP's Herpetology Lab.

Stefania D'Alterio is an urban planner and PhD candidate in urban planning at the University of Naples Federico II. She is currently a visiting PhD student at the Université Libre de Bruxelles. Her research interest lies in the emerging issue of green and blue infrastructures in the redesign of contemporary cities. Before starting her PhD, she gained professional experience in a planning and urban design firm.

Géraldine de Neuville is an architect and urbanist. She has studied in Brussels (UCL 2012), Barcelona (UPC 2014), and Delft (TU Delft 2015), and worked in various offices in Belgium and Holland. Since 2017, she has been pursuing personals design and architecture projects and working at the Université Catholique de Louvain as a teaching assistant and PhD candidate (2018). Her interests and research focus on informality and solid waste as a common resource in Northern cities, from the perspective of Southern theories and practices.

Ernesto Diez is an urban planner (KU Leuven – MaHS-MaUSP) and an engineer-architect (ETSA Madrid) based in Brussels, who has broadened his education to the field of the anthropology (UC Madrid). His research primarily focuses on topics related to urban sociology, inclusion, and co-design processes. His Master's thesis was dedicated to inclusive urban design strategies in the neighbourhood of Annessens in Brussels. He currently works as an urban architect and takes part in workshops and debates on urban topics.

Elena Ferrari studied in Milan where she received an MA in architecture. After working at Politecnico di Milano as a teaching assistant and in publishing at Domus magazine, she moved to Berlin in 2013 where she worked as a landscape architect in several offices. She is currently a PhD student in Urbanism at IUAV (Venice) and her research focuses on the ecological and sociological aspects of marginal spaces and urban nature with a particular focus on the city of Berlin.

Johans Figueroa is an architect (UCHILE) and urban planner (UNIGE). During his years of academic and professional development, he has developed a deep interest in the concept of research by design. By using architectural design, urban design, and large-scale interventions as infrastructures, he researches processes that converge in the development of cities. He focuses on the activation of social space as a catalyst for sustainable development processes.

Ophélie Goemaere started her studies in Geography at ULB, and finished in 2012 at UGent. She then worked for 4 years at Escaut sans Frontières, promoting integrated and transboundary management of water in the Scheldt Basin, considering that river management is regionalised in Belgium. In 2017, she joined CIVA's Landscape Department and is now working on coordinating a cultural programme related to the work of Paul Duvigneaud and his concept of Urban Ecosystem.

Dongxue Lei is a PhD student in Architecture from Nanjing University, China. Her main research focuses on theories of place, data visualisation, and urban-rural interfaces. She also has an interested in research on the history and theory of architecture and the city. For her doctoral research, she is focusing on the representation of place by providing empirical evidence from written sources, interviews, and fieldwork in a specific Chinese rural area.

A graduate in Architecture in Venice, **Verena Lenna** continued her studies in urbanism at KU Leuven and Parsons — The New School (New York). She has worked in Venice, Rome, Milan, and Brussels, exploring among other topics the interweaving of art, culture, and daily life and their role in the making of territories. She is currently finishing her PhD dissertation on the role of the design process in the implementation of Community Land Trust projects in Brussels. As an activist, she is a co-founder and member of community platform Commons Josaphat.

Maria Leonardi is an architect and PhD student in urban planning at IUAV University of Architecture in Venice. Since 2016, she has been an assistant professor in various urbanism courses at IUAV University. She has also worked on a research project funded by the European Social Fund, entitled 'New life cycles for the Pedemonte Veneto', where she had the chance to explore the reuse of existing cultural/productive heritage. In addition,she has worked at architecture firms 70F Architecture in the Netherlands (2015) and João Luís Carrilho da Graça in Portugal (2013). She graduated in architecture at IUAV University in March of 2016.

Dima Mannoun is Syrian architect with a Bachelor's degree from Damascus University. Most of her education on urban development comes from her enrolment in a joint Master's programme in Sustainable Urban Development, between the University of Damascus & the University of Paris-Est Marne La-Vallée (France) during which she conducted research on compact cities, from theories to implementations. During the Syrian war, she worked in the humanitarian field, rehabilitating communal collective shelters for internally displaced people. She is currently completing an Advanced Master in Transition Urbanism at ULB's Faculty of Architecture. Her dissertation focuses on privatisation and its impact on urban development.

Luis Martin graduated from Politecnico di Torino in 2015, with a thesis on spatial inequalities in Marseille. Since 2016, he has been conducting PhD research at IUAV University in Venice on the relationship between production and territory in post-crisis Italy. He is also a member of the City &

Production Lab, a research group of Politecnico di Torino, since 2017. Luis Martin collaborates started collaborating in 2016 in urban planning courses at Politecnico di Torino's Faculty of Architecture. He is currently a visiting PhD student in Tongji University and Xi'an Jiaotong-Liverpool University (China).

Sylvie Nguyen is an aspiring urbanist with teaching and working experience in urban design, architecture, landscape and regional planning. In 2014, she joined Hong Kong University as an assistant lecturer in the Master of Urban Design. Last year, she started her PhD as part of the Laboratory of Urbanism at the École Polytechnique Fédérale de Lausanne. Under the direction of Prof. Paola Vigano, her research deals with water transformations of peri-urban territories in the Mekong Delta in Vietnam.

Luca Nicoletto is an architect and PhD student in Urbanism at IUAV University in Venice. He graduated in architecture in 2013 (under the supervision of Maria Chiara Tosi and Stefano Munarin), and has been working as a teaching assistant since 2014. In Venice, he has been involved in various transdisciplinary research groups on urban studies. His research and practice focus on public spaces, common goods, and urban regeneration.

Daniel Otero Peña is a Venezuelan architect living in Brussels. He is a co-founder of architecture collective *ADJKM* and works as a research and teaching assistant at the Université Catholique de Louvain. In 2006, he received his Architecture degree from the Universidad Central de Venezuela, and a post-Master's degree in urbanism in 2009 from the École Spéciale d'Architecture in Paris. His main research interest is the study of topography, landscape, and their relationship to architecture and public spaces.

Marine Spor (1993, Marseille) is a PhD student with a Master's degree from Sciences Po Toulouse (2017) and a Bachelor's degree in Geography/Regional Planning (2015). She has started her PhD studies in January 2018 in the Sasha laboratory (ULB), under the supervision of Ludivine Damay. Her PhD focuses on circular economy consumers, their motivations, knowledge, and spatial practices through a bottom-up perspective and focusing on empowering consumers.

Alberto Squizzato is an architect and PhD candidate at the Faculty of Architecture La Cambre-Horta, Université libre de Bruxelles. He completed his Bachelor's and Master's degrees in Architecture at IUAV University in Venice. After a few years of professional activity, he started academic research at ULB. Alberto's research is centred on urban regeneration, with a focus on the role of professionals and citizens in bottom-up projects.

Erdem Üngür is an architect from Turkey. He graduated from Istanbul Technical University in 2008 and holds a PhD in architectural design from the same university. He worked as a research assistant at Istanbul Kültür University's Faculty of Architecture between 2008 and 2017, and as a part-time lecturer at Istanbul Okan University in 2017–2018. He is a member of Turkish NPO Architecture for All (Herkes İçin Mimarlık). Currently, he is working at the Université Libre de Bruxelles with ULB's solidarity fellowship as a postdoctoral researcher.

Natalia Vera Vigaray is an architect and urban designer who graduated from ETSAM in 2012 and has completed several academic programmes at TUDelft, ETSAV, and Vastu Shilpa foundation. She is a founding partner at OfficeShophouse, focusing in design and creation, from objects to urban scales. She has also worked as an adjunct professor in Chulalongkorn University in Bangkok. From 2015 to 2018, she conducted teaching and research along various topics and methodologies; from construction and documentation workshops to studio projects.

Ivana Vukelić was born in Belgrade, Serbia. She completed a Bachelor's degree and a Master's degree in architecture in 2016, at the University of Belgrade's Faculty of Architecture, which included student internships in architecture offices in Chennai, India and Foshan, China. Besides, She has worked as a project coordinator on restoration and conservation projects in Serbia, Montenegro, and Kosovo. She is currently studying in a Master's programme in Urban Studies at VUB and ULB in Brussels, Belgium.

Metrolab

Mathieu Berger is a researcher and professor of sociology at the Université Catholique de Louvain (UCL). He teaches urban sociology, theories of power, and qualitative research methods, among other things. His research deals, on the one hand, with the theories of democratic public spaces and political participation, and on the other, with the social aspects of city planning and urban policies in Europe and the US.

Andrea Bortolotti is an architect and urbanist, currently a PhD candidate at the Université libre de Bruxelles' Faculty of Architecture. He is conducting his research on the politics of waste management and recycling through the lens of urban metabolism, within the framework of Metrolab and various studies sponsored by Bruxelles Environnement.

Louise Carlier is a researcher at the Université Catholique de Louvain (UCL). Her PhD in social and political sciences (2015) focused on cosmopolitanism, and more specifically on the relationship between its urban and political dimensions. Her research interests are the relations of cohabitation and co-presence in urban public spaces, from the perspective of human ecology.

Sara Cesari is a professional project manager specialised in the cultural and social fields. Before joining Metrolab, she worked as a project manager in various institutions and NGOs in Morocco, Italy, and Belgium. Her professional background combines experience in the public management of culture and strategic know-how in the field of human rights. Sara holds a master's degree in cultural anthropology from the University of Bologna (Italy) and a post graduate master in peace studies from the University of Rome (Roma Tre).

After completing a Master in Geography at the Université libre de Bruxelles, **Simon Debersaques** started a PhD at Institute for Environmental Management and Land-use Planning (IGEAT) in 2016. His interests and research questions focus on urban, social, and cultural geography (or the geography of art/culture), in particular on the evolution processes of urban spaces related to cultural and artistic actors, activities, places and institutions.

Bernard Declève is an architectural engineer and an urban designer. He is a full professor at the Université Catholique de Louvain (UCL), where he heads the School of Urbanism located in the Faculty of Architecture, Architectural Engineering and Urban Planning. His area of research is the evolution of the living conditions in large cities and its influence on the urban and territorial project as a spatial concept and as a collaborative scope of action. He has an extensive international experience in Europe, Africa, and Latin America, with expertise in the collaborative urban research processes that involve public operators, economic actors, NGOs, and researchers.

Marine Declève (BE) is an urbanist (KULeuven-IUAV EMU 2015) and art historian (UCL 2009), PhD candidate at the École Polytechnique Fédérale de Lausanne (EPFL) with Metrolab (UCL-LOCI). She is conducting research on the territories of Brussels economic activities, using historical analysis and prospective design to investigate the possibility of reconciling habitat and economic activity at the heart of the metropolis.

Jean-Michel Decroly is a professor of human geography and tourism at the Université libre de Bruxelles, where he leads the research unit 'Applied geography and geo-marketing' (GAG). While pursuing research on the spatial variations of demographic behaviour in Belgium and Europe, he also focuses on the contemporary transformations of urban spaces, the modes of insertion and influence of some singular groups (elites, artists, expats) in the Brussels area and how tourism shapes territories.

Christian Dessouroux is a researcher in urban geography at the Institute for Environmental Management and Land-use Planning (IGEAT). After examining the role of public spaces in contemporary urban policies in Europe during his doctoral thesis, he is conducting research on the urban development of Brussels the 19th and 20th centuries. Interested in cartographic analysis as well as urban history and economy, he has contributed to several publications on urban policies, transportation, and the history of Brussels. His recent work focuses on the social and demographic challenges of residential real estate dynamics.

Natasha Fischer holds an architecture Master's degree in Architecture from ULB. During her final year, she worked as an assistant professor for first-year students, both for architecture workshops and lecture classes. She has taken part in various workshops conducting in-depth analyses of urban situations and specific architectural projects. During the MasterClass, Natasha has been providing logistics assistance and, later in the preparation of the maps of Brussels, case studies and photographs for the publication. She also started working for ARCH, in charge of the project's coordination.

Geoffrey Grulois holds a master in engineering and architecture (FPMs & Tokyo University) and a PhD in urbanism (ULB). He has been teaching at La Cambre school of Architecture since 2004, and at ULB's Faculty of Architecture since 2011. Since 2012 he is the coordinator of LOUISE — research Laboratory on Urbanism, Infrastructure and Ecologies.

Roselyne de Lestrange is an architect and landscape designer. She has worked as a project leader in public administrations and private offices in France, Belgium, and Argentina. Her PhD in urbanism focused on landscape as a driver of reterritorialisation from a mesological perspective. She collaborates with the Université Catholique de Louvain both as a teacher and a researcher. Her research interests are bioregional dynamics, transition landscapes, and metropolitan agro-ecological networks.

Benoit Moritz graduated in architecture (ISACF-La Cambre) and urban planning (UPC Barcelona). In 2001, he cofounded MSA office in Brussels with Jean-Marc Simon. He also developed a teaching and prospective research activity at the Faculty of Architecture (ULB), where he coordinates the Laboratory on Urbanism, Infrastructures and Ecologies (LOUISE). His research focuses on urban projects currently developed in Belgian cities and the players involved. Benoit Moritz is also the author of many articles on the topic of urbanism.
In 2017, Benoit Moritz received the MIES AWARD in the category of the 'Emerging Architect'.
Since 2017, he is a member of the Académie Royale de Belgique.

Louise Prouteau graduated in Political Sciences, with a major in European Policies, after studying in France and Germany. Before joining Metrolab, she gained experience collaborating with European cultural NGOs as well as networks in France, the Netherlands, and Belgium. In addition to project management, she has worked on communication and on the strategic monitoring of European policies.

M**arco Ranzato** is an architect and holds a PhD in Environmental Engineering. He has worked and collaborated with various academic institutions such as the Delft University of Technology, Tongji University (China) and the Université libre de Bruxelles. His research interests are ecology in urban design and, co-design processes, and the co-production of services.

After completing a Master in Geography at the Université libre de Bruxelles, **Corentin Sanchez Trenado** started a PhD at the Institute for Environmental Management and Land-use Planning (IGEAT), in 2017. His interests and research questions focus on urban and social transformations of city centres, and in particular on gentrification and urban renewal processes.

Anna Ternon graduated in architecture at UCL-LOCI in 2015, and in urban planning at UCL-LOCI in 2016. Since September 2016, she has been a teaching assistant for the Master's in Urban and Regional Planning at UCL-LOCI. Since April 2017, she has also been working as a researcher and doctoral student in the LOCI team at Metrolab.brussels. Her dissertation focuses on the spatial impact of the evolution of the relationship between players involved in territorial transformation processes.

Sarah Van Hollebeke is a PhD student in sociology (with a grant from Fresh-FNRS) at the Université Catholique de Louvain (as a member of the interdisciplinary research centre Democracy, Institutions, Subjectivity, CriDIS) and also a PhD student in urbanism at the Grenoble School of Architecture (as a member of the Research Centre on sound space and urban environment, CRESSON). Her work focuses both on official and more experimental observation tools of urban mutations in the context of urban renewal policies.

Pauline Varloteaux (FR) is an architect. She is graduated in 2012 from ENSAP Bordeaux, where she was an assistant professor in 2011. She has participated in several international workshops in Belgium and Japan and collaborated with such high-profile practices as Bureau Bas Smets in 2010, Studio Secchi-Vigano in 2012-14, and 51N4E in 2014-15. Since 2016, she is a PhD candidate in the Laboratory on Urbanism, Infrastructures and Ecologies (LoUIsE). Her research focuses on urban projects currently developed in Belgian cities and the players involved.

Baptiste Veroone graduated in Sociology and Political Science at the University of Lille. He enrolled as a PhD student at the Université Catholique de Louvain (UCL) at the end of 2014, and joined Metrolab.brussels in October of 2016. His scientific interests are social movements, civic participation and empowerment processes, and the politics of sustainable food. Using ethnographic methods and interactionist theories, he is looking at how urban agriculture reveals insights on Brussels' urban democracy, and in particular at how this topic supports civic participation and democratic values. He also takes part in grassroots initiatives related to food justice.

Maguelone Vignes graduated in Political Science (Rennes, France) in 2001 and holds a master in sociology of local development (Paris I – Pantheon Sorbonne) since 2002. She has worked in research-action organisations in Morocco and Indonesia on poverty issues, agriculture in rural and suburban areas. Her PhD in sociology (2015) addressed urban health pathways of people living with a chronic illness. At Metrolab, she focuses on the city as a supportive environment for health. She is also in charge of the scientific support in a Belgian non-profit organisation in the field of health services for people with complex needs.

Colophon

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