International seminar of La Fabrique de la Cité - Lyon 2017

BEYOND BORDERS AND BOUNDARIES

Great metropolitan issues today

LA FABRIQUE DE LA CITÉ

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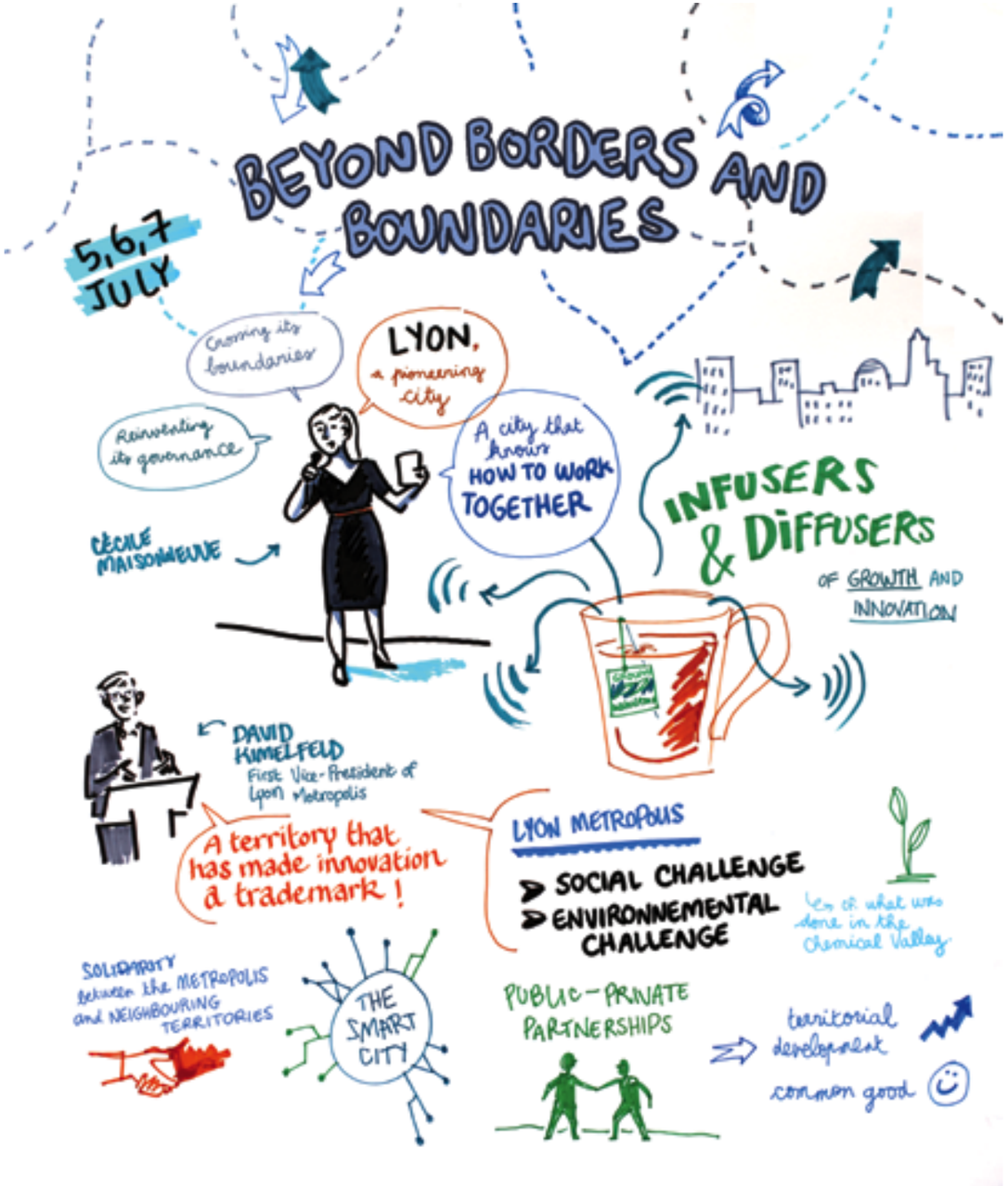


Overview of the introductory session "Beyond borders and boundaries"

Preamble

2017: Beyond borders and boundaries

The metropolization of the world is underway... In fact, it is happening before our very eyes, and the stakes are clear: **to make metropolises both infusers and diffusers of growth and innovation**. To this end, metropolises are **seeking out new approaches and new methods**.

Between July 5 and 7, 2017, La Fabrique de la Cité chose Lyon to bring together some 100 urban stakeholders to debate these issues, which permeated all the work it conducted in 2017. Indeed, the Lyon metropolis is at the forefront of institutional innovation. With extensive competencies, it has positioned itself as a world player, as an innovation hub, a cradle of entrepreneurship, and a crucible for major urban projects, with an emphasis on services: meeting the needs of its inhabitants, allowing them to live in a pleasant city. Therefore, to talk about transcending limits and boundaries is to talk about Lyon. After all, isn't it natural to do so when one is "*virtute duce, comite fortuna*" (led by virtue, accompanied by fortune), to quote Lyon's motto, born of the words of Cicero?

New operating procedures are being used, which require **breaking free from the confines of traditional limits and boundaries**.

Territorial limits first: Metropolises are breaking the powerful boundary between the "city" and "peri-urban areas". What is at stake? Nothing less than the creation of a metropolitan identity, its places, its connections. In Lyon, from the Confluences Museum to places of innovation, from the Chemical Valley (*Vallée de la Chimie*) to Ancient or Renaissance Lyon, the creation of this **identity is underway.** Whether at Part-Dieu or on the *Autoroute du Soleil*, the Lyon Metropolis is bringing forth the **developments and infrastructures (including underground) that will ensure its attractiveness and connect territories with contrasting stakes and dynamics**. Beyond the metropolitan territory, the map of geographical boundaries has been reshuffled: the metropolis is a portal that provides access to other cities and regions, even to those most geographically remote from it. With its numerous hubs and infrastructures—two major railway junctions, two airport hubs, one logistical platform, highways that include the famous "Autoroute du Soleil", which have made Lyon a centrepiece not only in Mediterranean Europe, but also in Alpine and Rhineland Europe. Lyon interfaces with the world's economies. In a way, Lyon is to France what Hamburg is to Germany.

Looking at **economic and financial** limits: like the New Deal of the 1930s, the players need to invest in innovation and growth, and thus invent new economic and financial moves. Plus Lyon presents itself as an industrial city as well as an innovative and smart city, the two designations not being mutually exclusive. Let us consider, for example, the health sector, which is a major issue for city dwellers around the world.

Next let's turn to **cultural** limits: in the digital era, building no longer means imposing top-down solutions, but rather co-building with civil society, whether city dwellers or corporations. Since the most difficult boundaries to cross are the intangible ones, i.e., cultural boundaries. Co-building, cooperation, co-working are not new concepts in Lyon. This is a city that moves ahead, because it promotes **working together**: territories with territories, economic players with public decision-makers, private and public decision-makers with the knowledge and research sector, and especially citizens with their representatives. The term "driving metropolis" can be used to define Lyon' DNA. It sums up this specific aspect very well.

Beyond limits and boundaries... Throughout its work in 2017, it is indeed in this spirit that La Fabrique de la Cité has attempted to shed light on this metropolitan phenomenon in the making. A single catchphrase has dominated its work: **thinking outside the box**. "Imagination must take too much in order for reason have enough [Translation]," said Bachelard. This ability to think outside the box, to think differently about how to build the city of tomorrow today is what we have been doing with La Fabrique de la Cité for almost ten years now. In Lyon, it is mainly the representatives from more than 30 different cities in 14 countries, who have done this with us, giving substance to the **collective intelligence, which, tomorrow, more so than today, will be a determining factor in shaping livable cities.**

Allying territories at the heart of metropolitan construction

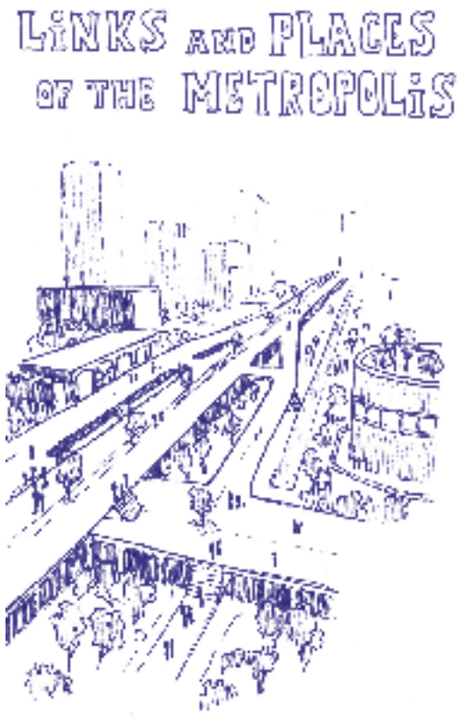
How can a metropolis be brought to a new level that is recognized and adopted by its inhabitants, who are most able to ensure the legitimacy of public action? Symbolic places and metropolitan infrastructure create open spaces for all and connections between territories. Thus, they contribute to the creation of a shared metropolitan identity.

Nowadays, metropolises are asserting themselves internationally. In France, the 2014 MAPTAM law specifically focused on the "affirmation of metropolises" by creating nine metropolises with statutory legislation and three metropolises with special status, including Lyon. **These new tiers of governance, however relevant and efficient with regard to growth and innovation policies, now have another challenge to overcome, that of also being recognized and adopted by inhabitants**—the first capable of ensuring the legitimacy of public action.

How can we make a metropolis become a "lived-in space" (Frémont, 1976), when it groups often heterogeneous territories that do not always share strong ties? The answer is twofold:

- On the one hand, **by creating the founding sites of this new metropolitan identity** and dimension: museum, library, concert halls, stadium, etc. Building and investing these infrastructures with a strong symbolic dimension—for example, through a bona fide architectural project—creates links between the city and its districts. These multi-purpose sites foster exchange between citizens and serve to overcome the city's physical disruptions (rivers, urban highways, train stations, etc.) as well as social disruptions (socio-professional segmentation) by creating cohesion around shared moments and mobilization of local stakeholders.

- On the other hand, **by building infrastructures that can create links between all territories of a metropolis**, even the most remote and segregated. This involves thinking beyond just infrastructure; indeed, it means conceiving the entire mobility system as part of urban planning. It is therefore necessary to integrate the constraints and potentialities of different users so as to break down both physical and symbolic barriers, which splinter the metropolitan territory and hinder coherent consolidation.



Since 1969, Lyon's urban community, with its innovative and special form of governance, has pursued an urban development project that brings together all of its territories. In order to achieve legitimacy in its activities, the city seeks to reinforce its identity. Symbolic sites are emerging to unite the parent agglomeration with its suburban and rural territories around a common project. The Confluences Museum and the transformation of the A6/A7 Autoroute will become icons for the metropolitan area.


Confluences Museum


Autoroute A7, downtown

The Confluences Museum

For Viennese architect Wolf D. Prix, only outstanding, modern architecture can revive the identity of a city and the quasi-emotional link between citizens and their environment. The Confluences Museum was thus designed to be an "urban icon."

The building, located at the southern tip of the Confluence District, the point where the Saône meets the Rhône rivers, towers over Autoroute A6/A7, which extends to the south. Still quite isolated, it will mark the link between the banks of these two rivers and the adjoining districts (Mulatière, Mouche, Gerland).

The museum seeks to reinforce the cohesion of the agglomeration and to stimulate exchanges and flows within it. This site is not reserved for the urban elite, but rather is intended to serve as a place to disseminate knowledge and as an optimal meeting place.

Decommissioning Autoroute A6/A7

The Decree of December 27, 2016 officialized the decommissioning of Autoroute A6/A7, the so-called "Motorway of the Sun", bringing all Northern Europe to the beaches of the south. Sometimes considered as an "urban absurdity" (Gérard Collomb), this route extends over a dozen kilometres, from either end of the Fourvière Tunnel, crossing the agglomeration from north (Dardilly-Limonest) to south (Pierre-Bénite), and is taken every day by 113,000 vehicles, making it one of the busiest highways in France.

Between now and 2030, the metropolis plans to develop a green, serene urban boulevard along with the commissioning of a highway bypass (Anneau des sciences) and a strengthening of public transportation services.

The decommissioning of Autoroute A6/7 is an opportunity to experience a new space of passage and movement —a crossroads— as in some North-American metropolises.

Turning the metropolis
into a « lived space »

THE METROPOLIS BEYOND ITS ADMINISTRATIVE DIVISIONS

Bringing together people in a space defined by administrative boundaries has never been enough to create a territory. As early as 1976, geographer André Frémont established this by showing that a space only becomes a place when its inhabitants are able to identify a territory as being a coherent whole, to make it their own, and to picture themselves living in it[1]. **Uses and representations are the foundation of the relationship between inhabitants and what becomes their lived space.** This relationship is currently being upset and must therefore be reconceived: the rise of metropolises imposes a new territorial level, designed to guarantee the effectiveness of public policies and to be a driving force for integration; growing development and acceleration of mobility results in increasingly diverse and fragmented territorial affiliations.

SPATIALLY EMBODYING THE METROPOLIS

How can the metropolis be made to exist in this tension between the aggregation of disparate spaces and a coherent whole, between places and non-places, between anchoring and mobility, between identity and openness to others? The aim is both to make the metropolis exist for its inhabitants, but also for all of its visitors, and ultimately for the whole world. A strategy as old as the city involves creating or showcasing strong symbolic places that play both the role of concentrates of urban identity and gathering places. Paintings, etchings, and postcards have effectively created this imaginary urban museum we all share. While places of political and religious power previously played this role, as Laurent Coudroy de Lille, a senior lecturer at the Institut d'Urbanisme de Paris, clearly showed by deciphering Lyon's urban landscape, today there is a greater diversity of buildings: museums (Bilbao and Guggenheim Museum), theatres (Hamburg and Elbphilharmonie), shopping centres (Birmingham and its Bullring), office buildings (Lille and Euralille), etc. What these buildings have in common is that they are urban icons designed by internationally-renowned architects. **However, in order to help the metropolis exist, the enhancement of this heritage must take place on a metropolitan scale and reflect the diversity of the territories.** Thus, the construction of the Confluences Museum in Lyon can be understood as the conquest of a new frontier. The museum was indeed built in a highly devalued and enclaved territory, the potential of which it helped reveal. The museum put this territory on the map and in the spirit of the inhabitants and its visitors.

DAILY TERRITORIAL OWNERSHIP IS THE KEY TO THE "LIVED" METROPOLIS

This visibility strategy, both in terms of landscape setting and stature dœs not, however, suffice to create a metropolitan identity. It embodies it in representations, gives it a form, but is not its source. **The identity of a territory comes from sharing a common space and its daily ownership.** In order to truly be founding elements of the metropolis and its identity, buildings must therefore also be able to be frequented and used by residents. One of the strategies developed by Lille as part of Lille 2004 consisted in creating "crazy houses" in different neighbourhoods of the city. The "houses" were both architectural objects marking the territory and cultural sites, "*prompting inhabitants to take on the cultural project of the metropolis and to take ownership of the territory on a daily basis as citizens*"[2]. As an example, the "crazy house" in Moulin hosted Leroy Merlin's do-it-yourself workshops for 18 months in 2016 and 2017: a group of machines were made available to the public to enable all to create their own objects. It is for this reason that architect Wolf. D. Prix, founder of the COOP HIMMELB(L)AU agency, strongly advocates the public space dimension of buildings. Having observed the increasing difficulty of creating public places, Wolf D. Prix strongly advocates the break between the public and private, and the opening of buildings to the public beyond their primary function. BMW Welt was not simply designed as a grand place for only a few privileged clients taking delivery of their vehicle in a private lounge, but as a public space open to everyone. The open nature of the building is supported by architecture that Prix has compared to a cloud ever since his 1968 Villa Rosa. Openness, transparency, volume, and the relationship with the outdoors matter more than walls, as the Confluences Museum shows.

A "SAUCER" BEHIND THE MUNICH IDENTITY-BMW WORLD, COOP HIMMELB(L)AU

BMW-Welt, Munich

In Munich, the BMW Museum's futuristic appearance is an eye-catcher. Located near the Olympic Park, on the historical site of the German car manufacturer, the complex is made of three buildings, two of which were built by Karl Schwanzer in the early 1970s; the last one, the 'BMW-Welt", was inaugurated in 2007 and built by Wolf D. Prix. Mr. Prix intentionally wanted it to be a new signal in the city, just as the Confluences Museum, and designed it to be a spectacular building. The aluminium half-sphere with the BMW logo exhibits cars and motors from the company. The "*saucer*", as the local residents call it, is part of the imagery of the Bavarian capital and symbolizes one of its economic successes: BMW is the fifth largest corporation in the country. The museum is a genuine attraction, drawing 2.5 million visitors a year. It is the fourth most visited museum in Munich and Bavaria after the German Museum, the Nymphenburg Palace, and the *Pinakothek der Moderne*, and therefore contributes to the identity of the city.

THE CONFLUENCES MUSEUM, A NEW PUBLIC PLACE?

Confluences Museum, Lyon

The Confluences Museum is made up of two complex architectural units that complement each other: a "crystal" that faces the city, and which transparency enables its transformation into a gateway to the city and a new, free-access agora, making the walls disappear and erasing boundaries between the inside and outside, and a "cloud" that extends the crystal. The crystal floats on pillars and houses the exhibition halls. By welcoming visitors, the museum plays an important role in connecting neighbourhoods and stimulating connections and encounters in the city. It attracts over 68,000 visitors per month, 32% of which are under 26 years of age, and 70% of which are from the Rhone-Alps region. As its director Hélène Lafont-Couturier points out, this museum, instigated and regarded by then culture advisor, now Mayor, Georges Képénékian as the "least museum-like of museums", transposed the architect's vision for a meeting space into the design of the exhibition halls. Fluidity of the path, awakening of curiosity, very strong interdisciplinarity, and attention paid to visitors' habits through a public observatory are the museum's specificity and make it a place that is consulted for its expertise by museums in Geneva, Leipzig, or Beijing. The Confluences Museum is not a place reserved for the urban elite, but a disseminator of knowledge, and a space conducive to encounters.

«The Confluences Museum serves as a beautiful metaphore for the challenge our cities must now take on: to create a connection between the most disparate elements that make up our urban and human society and that so greatly enrich it »

Xavier Huillard

[1] André Frémont (1999) La région espace vécu Champs/Flammarion

[2] Samuel Léon (2015) « L'identité, une ressource dans les stratégies métropolitaines ? », *Métropolitiques*, https://www.metropolitiques.eu/L-identite-une-ressource-dans-les.html

Beyond the city's boundaries:
links and places


A6 and Kitchener bridge towards the Fourvière tunnel, Lyon

"THE LIMITS OF IDENTITY ARE LESS THOSE OF PLACES THAN THOSE OF FLOWS"

However, architecture and construction alone cannot found a city's identity. It is in this sense that architect Elizabeth de Portzamparc said, "the limits of identity are less those of places than those of flows[3]". The example of the Confluences Museum is particularly interesting: located at the southern end of the Confluence district, where the Saône and Rhône meet, and overlooking southbound Autoroute A6/A7, it seeks to be an extension of the downtown and a new hub stimulating exchanges and flows. But a place cannot become a building block in a city's identity or exist beyond what we believe it to be unless it is also accessible... and territorial borders remain very real. Districts surounding the Confluences Museum (La Mulatière in the west, Gerland and La Mouche in the east; downtown on the northern peninsula) are separated from each other by topological and river obstacles (the Mulatière hillside and the two rivers), but especially via infrastructures that create a barrier effect: Autoroute A6/A7 and the Perrache Railway Station.

"Over the years, the city has been cut from its rivers, the layout of Autoroute A7 confirms urban development that has gradually turned its back on the river as a functional route, as well as a place of landscape and pleasure."
Laurent Coudroy de Lille

These infrastructures are in the unique position of efficiently opening up the metropolis to all its hinterland, both near and far, by circulating medium-to-long-distance flows, and of slowing down cross-traffic flows within the metropolis. The Confluences Museum, despite its central position with all mentioned infrastructures, remains paradoxically rather isolated. However, the transformation of the highway infrastructure, currently being decommissioned, opens up new prospects. Lyon is thus part of an international trend, according to Paul Lecroart, urban planner at the *Institut d'aménagement et d'urbanisme d'Ile-de-France* [Ile-de-France Urban Planning and Development Institute]: that of the transformation

[3] Elisabeth Portzamparc (2013) « Identité d'une région métropolitaine », in Elisabeth Portzamparc, E. et Christian Portzamparc, *Systèmes métropolitains*, Atelier International du Grand Paris, p. 7-54.

of urban highways into infrastructures fostering active forms of transportation—cycling, walking—or public transportation. As Samuel Léon reminds us, "*fostering identity and metropolitan practices also involves having its inhabitants set the territory into motion*"[4]. The development of a dense transportation network, for example, is a sign of cohesion and well-being and enhances the image of an attractive metropolis.
How can we recreate links between neighbourhoods, remove barriers, and stimulate flows, whatever they may be? **The answer lies not in simplistic strategies creating a sterile opposition between displacements of different scopes but rather in their articulation and the taking into account of the different territorial levels. The answer also involves renewed complex thinking regarding infrastructures in order to locally re-establish their permeability to make use of their ability to create ties.**

LINKS BETWEEN METROPOLISES AND THE HINTERLAND

Many studies, such as Nadine Cattan's work on urban systems[5] developed for DATAR or Laurent Davezie's research on residential-productive systems[6], insist on the fact that one of the drivers of the metropolis is the nature of its "hinterland" and its links. The city cannot function as an isolated insular system: it draws part of its wealth, dynamism, and attractiveness from the ties with its hinterland – which, in the archipelago economy (Pierre Veltz), no longer represents a spatial continuum, and is made up of territories that may be geographically near or far.
To clearly understand the relationship between the city and its hinterland in terms of mobility, it is useful to distinguish different orders of distance: for short distances (1 to 10 kilometres), the preferred means of transportation are walking, cycling and public transportation; for long distances (more than 100 kilometres), people turn to the car, train, or airplane. However, in the case of intermediate distances (10 to 100 kilometres), which primarily concern metropolitan infrastructures, the mobility offer is often insufficient and fragmented. Many cities have equipped their core with a dense transportation network, but have neglected connections to the hinterland. Paris is a perfect example of this: the *intramural* city is served by a dense, diverse transportation system, to the detriment of the immediate and outer suburbs.

"The real problem is the class of intermediate distances for residents in the outskirts."
André Broto

FOR INTERMEDIATE DISTANCES, THE ROAD REMAINS A RELEVANT OPTION

For several decades, cities have seen a growing disconnect between home and workplace. In France, in 2012, 17 million commuters out of 26 million working people worked outside their residential community. Since then, this trend has intensified and the travelled distances have grown. Today, the Lyon metropolis has 600,000 daily movements between downtown and the outskirts, with 90% of those concerned forced to travel by car.

[4] Samuel Léon (2015) « L'identité, une ressource dans les stratégies métropolitaines ? », Métropolitiques, https://www.metropolitiques.eu/L-identite-une-ressource-dans-les.html

[5] With urban systems, the territories are analyzed using the ties they forge with other territories (the network) and no longer as perimeters. Seven types of ties were selected: home-work mobility; residential migration; leisure mobility through the sites of secondary homes; ties with the knowledge society via scientific partnerships; those of the economy through the relations between head offices and business establishments; and high-speed mobility based on a mixed indicator for air and high-speed train transport capacities.

[6] The SPR: the space around the metropolis formed by homes of retirees who have left the core, homes of people working in the core, but living outside of it, and lastly secondary residences for people living in the core.

In order for a metropolis to transcend its borders and boundaries, it must design infrastructures that can connect centre and periphery. **The road remains a valid solution.** For André Broto, President of the French Committee of the World Road Association, and Director of Strategy and Prospective at VINCI Autoroutes, the highway ensures the social inclusion of suburban and peri-urban areas. "Suburban commuters", who often live 30 or even 50 kilometres from their workplace, have no choice but to use their cars. **However, the highway must be rethought, transformed, and integrated into a multimodal transportation system.** The road must not stifle, but rather support the development of alternative services and transportation. According to André Broto, it is necessary to widen and diversify the mobility offer over intermediate distances (carpooling, Métrobus, buses, among others) in order to better move the 19 million French citizens living on the periphery.

"We have medium-density areas around the major cities where cars cannot be the only answer."
André Broto

Some metropolises have renewed their highway network to better adapt it to intermediate distances and have integrated it into a multimodal transportation system. Seoul and Buenos Aires have undertaken two programs that are inexpensive and fast to implement (two *years of work). For André* Broto, *"we can no longer be satisfied with projects that require 10-15 years, we have to find solutions very quickly."*

CHOOSING THE RESERVED LANE IN SEOUL

In 2004, the City of Seoul (25 million inhabitants) inaugurated several dozen kilometres of highways with dedicated lanes. Each lane has an associated colour: red is dedicated to long distance, whereas blue, green, and yellow are reserved for short and intermediate distance. Several corridors connect the intra-urban highway network to the regional network.

THE BUENOS AIRES METROBUS: SLOW AND FAST FLUIDITY


The Metrobus, Buenos Aires

Buenos Aires (15 million inhabitants) has made available a fleet of Metrobuses within the city. About 40 two-lane lines criss-cross the capital: on the first, stops are close together; on the second, they are more spaced out. A third lane, for long distance, has been built underground.

IN DENSE URBAN AREAS: (RE)CREATING TRANSVERSE PERMEABILITIES

"The intra-urban highway network is plastic, it can be transformed."
Paul Lecroart

The challenge of dense urban areas, which represent the ideal scale for walking, cycling, and public transportation, is to eliminate the barrier effects and urban breaks—often caused by the construction of heavy infrastructures dedicated to cars and speed in the aftermath of World War II, drawing in particular on the model developed by Buchanan in his 1961 report. San Francisco, Seoul, Portland, Vancouver, Milwaukee, Montreal, Boston, Rochester, New York, are among the examples studied by Paul Lecroart and Lynn Richards, President of the Congress of New Urbanism, in terms of the urban regeneration potential that these infrastructures can represent if they are transformed to regain their transversal permeabilities.

Indeed, in downtown areas, where free space is scarce, the expropriation of some decommissioned urban highways represents an opportunity to recreate links between fragmented neighbourhoods, to rethink the mobility system, and to renew the link between the city and its landscape (as in the case of riverside roads in particular). In the United States, the conversion of urban highways is a significant trend that has been on the rise for the past several years.


André Broto

WEST SIDE HIGHWAY, NEW YORK: A NEW URBAN BOULEVARD


West Side Highway, Manhattan, NYC

New York has transformed its Westside Highway into an urban boulevard. The new open and peaceful avenue now accommodates many forms of mobility (walking, cycling, driving, bussing) and connects the city to the Hudson River (*West Side Hudson River Park*). Here, Paul Lecroart's analysis leads him to conclude that the observed evaporation phenomenon and the development of new green spaces offer a calmer and healthier environment and contribute to the economic renewal of the neighbourhood.

From the cross-referencing of data from various studies, Paul Lecroart concludes that the conversion of highways into urban boulevard in dense urban areas has a number of impacts: on mobility firstly, by noting a reduction in traffic and a change in behaviour leading to more numerous types of movement on the main axis; secondly, on the territory, at several levels, by noting a reconnection of neighbourhoods, the creation of transversal axes, and the freeing up of land to create quality green spaces; on the economy again, by observing an urban regeneration phenomenon, increased housing construction along the axis, and the activation of ground floors; and finally, on quality of life overall (reduction of nuisances).

OPTIMISING EXISTING INFRASTRUCTURE

Often poorly maintained, the highways of mid-sized and large American cities are eroding and collapsing, as Lynn Richards notes: *"Many roads and highways were built forty, fifty, sixty years ago; They are at the end of their lifespan."* The considerable financial effort required to rehabilitate or convert them justifies a fresh look at these infrastructures.

"We absolutely must invest in spaces that benefit the community. The time for targeted spending is over. We can no longer afford to make investments with limited results."
Lynn Richards

These existing infrastructures represent assets whose value is often insufficiently exploited. To change this trend, they must be optimised, in particular by thinking of them as multimodal axes, diversifying their use and rethinking their multifunctionality. **Existing infrastructures must—and can—meet several ambitions**: to enable mobility, develop interactions at different scales, limit the environmental impact, and even promote health and develop the economy.


Lynn Richards

ATLANTIC STATION BRIDGE (ATLANTA), DRIVING URBAN REGENERATION


Atlantic Station central park, Atlanta

The bridge erected near the Atlantic Station subway station in Atlanta is a wonderful example of the ways in which infrastructure can become a vessel for urban regeneration. The revitalisation and economic development of the site are a direct result of the new infrastructure, which for several years now has connected a former highway wasteland to the subway station. The bridge has opened up the brownfield site, now connected to the city by direct access to the metropolitan network. The site has undergone major transformations in just a few years: it now houses 400 housing units and 18,000 jobs. It has become a significant development space for the city.

The bridge is not only intended to connect two parts of the city, but has produced other effects such as greater mobility and the stimulation of employment, housing, and businesses. In addition, people who work on the site make shorter trips on average than other residents of the city.

This new way of seeing infrastructure has very direct and positive effects on the territory and its economy. Lynn Richards cited the example of the Klyde Warren Park project, which resulted in the transformation of the urban highway in Dallas, Texas: the project cost $110 million and generated $312 million in economic benefits, plus $12.7 millions in extra taxes. Trees capture 8,391 kg of CO_2, the soil permeability was reduced in a significant way and 90% of park users reported enhanced quality of life.

The reconversion of heavy road infrastructure is not the only way to reconnect urban territories. Hundreds of American malls also are reaching the end of their lifespan, as noted by Lynn Richards: *"The mall in the United States is a dead realistic project."* Once freed up, these vast spaces can be repurposed into development spaces with infrastructures and facilities that reconnect neighbourhoods that have slowly gathered around shopping centres without weaving links between one another. Lynn Richards cited the example of Lakewood, where the dismantling of a shopping centre has allowed for the construction of a new 22-block area with 2,000 residents, bringing in more than $17 million in taxes, i.e., four times more than the former mall. For Lynn Richards, the key to the success of these transformations lies in those spaces' ability to attract, bring together, and set in motion inhabitants, an ability that requires well-thought-out development of the public space thus recovered.

"We must build spaces in such a way as to make them accessible, to encourage citizens to go there. When you create well-designed spaces for people to gather, you see a dramatic increase in the way people occupy and use space, and you get the right environmental, health, and economic outcomes."
Lynn Richards

Paul Lecroart, André Broto, Lynn Richards and Anicet Mbida

Overview of the session "Connections and Places of the Metropolis"

Overview of the session "Connections and Places of the Metropolis"

Financial innovation in the service of a metropolitan project

How can we leverage our metropolitan heritage to fund future projects?

The major issue today for cities is to be able to find new levers for territorial development. The issue is two-fold: to ensure attractiveness in a highly competitive environment, and to welcome converging demographic and economic flows. **New forms for the financing of these large-scale future projects are being sought out**, especially via the involvement of private players. The role of private players in urban production is not new, but it has changed given the local financial situation, scope of capital requirements (sustainable development, digital transformation, urban renewal, etc.) and lastly new optimization and efficiency objectives for public action
The urban factory is thus set up in three steps:

1. Enhanced intervention of the private sector in the city based on a partnership-based approach in order to promote optimization of urban property and services. Public-private partnerships are one of many known examples. .

2. Financialisation of the city, with a greater role played by stakeholders such as investment funds, insurance or banks, which are searching for new support and see urban projects as financial assets.

3. Renewed affirmation of the key role of public players with the regulatory power and a certain number of assets—which are often dormant, such as abandoned property (industrial sites, derelict places, etc.). This means "leveraging the value of the metropolitan heritage," a key driver of this project to build the city on the city.

Lyon is an entrepreneurial city that has succeeded in rallying public, private and financial players early on around the production of the city and its services. To fund large-scale urban projects, such as the Cité internationale (launched in 1999) or the Confluence District (future showcase of urban innovation), the metropolis used innovative financial means: leveraging the value of our metropolitan heritage and new interactions between the public and private sectors.


Confluence District

The Confluence District: 100% Public Governance, A Management Based on Partnership
The Confluence District covers 150 hectares, south of the Lyon-Perrache train station. An initiative of Raymond Barre in 1995 and implemented by Gérard Collomb since 2001, this revitalization project aims to double the downtown's surface area to include a district dedicated to urban innovation.

Unlike the Cité internationale, the Confluence project is governed entirely by the public sector; only its management is carried out as a partnership.
In 1999, the urban community of Lyon founded the semi-public company (mixed enterprise) SEM Confluence, renamed SPLA in 2007. This structure serves as the "right hand" of the metropolis, mandated with carrying out negotiations between the private partners. The urban community also has two mixed development zones (ZAC) to guide the urban project and encourage private promoters to invest. To force these promoters to respect certain criteria, namely environmental standards, energy performance, green spaces, social and functional mix, the SPLA sells the land at attractive prices, after having developed and serviced them.

Private investments have largely influenced the Confluence site development policies. The SPLA launched several calls for tenders, in particular for conceiving and designing "business and entertainment hubs," the future "economic driver" of the district.

Cities and metropolises,
gold mines to be exploited?

Financing infrastructure and rebuilding the city on the city in a context of lasting scarcity of public resource: when posed this way, the equation seems difficult to solve. Nevertheless, it must be resolved, as the urban infrastructures developed in the mid-20th century require urgent investments, and the world's metropolisation is underway.

Yet, our cities are not forced to choose between investing *a minima* in maintenance works, which will be all the more costly if they are postponed, or attend to the most urgent needs project. Nor are they doomed to remain locked up in the debate between privatisation and nationalisation, which is not a guide for action. **They have multiple and diverse assets,** which, in most cases, are not considered as such and are therefore under-used or simply ignored. Assets that, when recognized at their fair value, can be used as a basis for ambitious urban regeneration and new infrastructure construction projects designed by public authorities and developed according to a multi-stakeholder partnership approach involving public and private sectors. In his book *The Public Wealth of Nations: How Management of Public Assets Can Boost or Bust Economic Growth* (Palgrave MacMillan, 2015), Dag Detter demonstrates that our cities and metropolises are gold mines which assets only need to be properly valued and managed. All it takes is… innovation.

The word is out: innovation is all too often confined to the technological sphere. Granted, our cities are becoming increasingly connected, and our systems are becoming increasingly intelligent. But limiting innovation to this dimension alone will not suffice to meet the demographic, social, economic and environmental challenges. **Innovation is a global concept. We also need to discuss financial innovation and governance.**

In partnership with La Fabrique de la Cité, Bruce Katz, Centennial Scholar of the Brookings Institution, and Luise Noring, a researcher at the Brookings Institution and the Copenhagen Business School, conducted a comparative study in four European cities, all of which developed "pieces" of the city and built new infrastructures based on innovative models. In Copenhagen, Hamburg, Helsinki, and Lyon, new neighbourhoods and heavy infrastructure have transformed all or part of the city over the past two decades.

Lyon and Copenhagen are banking on the increase of land value to revitalize their neighbourhoods and finance major infrastructures: they are cleaning up the plots and building public facilities. Development is thus initiated and stimulated, sometimes without any increase in tax

Copenhagen
a replicable urban regeneration model?

View over Copenhagen with Opera and Harbour

RETURNING TO GROWTH THROUGH URBAN REGENERATION

From the mid-to-late 1980s, Copenhagen suffered from a 17.5% unemployment rate and an annual budget deficit of $750 million. As a result of a policy aimed at helping families settle in the outskirts of the city, Copenhagen's population is composed mainly of elderly people and students. The challenge for the city is to recover a solid tax base and revive the stagnant economy of the city in order to make it once again attractive. To this end, Copenhagen decided to launch a major urban regeneration programme based on a new privately-run public ownership company to maximise the value of under-used public land, relaunch construction, and finance new infrastructures of public interest. **This organisation is an alternative to the usual dichotomy between the public and private sectors. It combines the powers of national and municipal governments, their legitimacy and access to low-cost financing with the flexibility, efficiency, and skill of the private sector.** It thus benefits from public assets and provides commercial opportunities. This privately-owned public company enables the municipality and the state to set ambitious resource and infrastructure targets while at the same time leading to faster and more productive operations.

"This model corresponds to a public company with private capital, which has the public assets—land and buildings—in certain parts of the city."
Bruce Katz

A DEVELOPMENT COMPANY SET UP IN THREE STAGES

The Copenhagen development company was set up in three phases:

1. A first public assets company was created in 1992, the Ørestad Development Corporation, with the aim of developing 310 ha of land between the city and the airport, previously used by the army as a mixed housing, office and commercial area. The revenues generated helped finance part of the city's public transport system (the first two phases of the M1 and M2 metros). A loan based on the value of its land assets was granted to the company so that it could begin infrastructure work before the land development was completed.

2. The second essential element is **the existence of suitable sites for urban development and revitalisation projects**, their identification and merging into a dedicated structure. While this approach is easy in cities where the municipality owns the land (Helsinki, Hamburg in large part), it becomes more complex when ownership is fragmented and private (Lyon).

3. The last phase consisted in merging the Ørestad Development Corporation and the Copenhagen Port Authority under a single banner, that of the Copenhagen Development Corporation and creating a construction company specialising in transport systems to manage the expansion of the metro. Since 2007, the Copenhagen Development Corporation has managed about half of Copenhagen's urban redevelopment projects.

PUTTING THE EMPHASIS ON POOLING OF PUBLIC ASSETS

The manner in which the Copenhagen Development Corporation has been set up reflects the **increasing focus being put on the pooling of public assets**. The merger of the various companies leads de facto to a transfer of ownership and their concentration in the hands of a single owner. The open perspective is thus threefold: firstly, that of **a better knowledge of public assets**; secondly, that of **an increased margin for action** through the mass effect allowed by the pooling of properties; and thirdly, that of a long-term global strategic vision putting an end to the practice of fragmented development, small project by small project with a weak territorial impact.

FINANCING INFRASTRUCTURE THROUGH INCOME FROM URBAN REDEVELOPMENT

Copenhagen's regeneration approach is in line with the principles of large infrastructure project financing through the maximisation of public assets that generate revenue from urban redevelopment projects. The territorial impact is thus doubled: lands are valued because of their changing purpose and development, and overall, the city as a whole is optimised and made more attractive by the construction of new infrastructures benefiting everyone (public transport, recreational infrastructures, public establishments—without recourse to taxation.

"To achieve economic, environmental and social goals, cities should focus on the public assets they have; consider the hidden value of those assets; and unlock value through institutional innovation."
Luise Noring

Luise Noring

The funding model is based on two mechanisms:

1. Increasing land values

The Copenhagen financing model: increasing land value

1. The State and the municipality transfer assets to the Copenhagen Development Corporation.
2. The Local government changes the zoning of land to allow residential and commercial use.
3. A first price increase in land value occurs.
4. The Development Corporation borrows (usually on favourable terms from the National Bank of Denmark) according to the value of the lands.
5. This capital is transferred to the Development Corporation to cover the costs of rehabilitation and local infrastructure projects.
6. A second price increase in land value occurs.
7. The Development Corporation facilitates urban development through several methods: the sale or lease of land to developers or, more rarely, by launching development projects directly.
8. The revenues generated are used to repay debt and conduct regeneration projects.

2. Access to cheap financing.

The Copenhagen Development Corporation influences the real estate development market through its access to "cheap" financing due to the high credit rating of the City of Copenhagen and the State of Denmark. They obtain loans at advantageous rates and above all, can carry a very large amount of debt without stopping working.

"Cities also need cheap funding derived from national and local government ratings."
Bruce Katz

A EUROPEAN MODEL OF URBAN REGENERATION?

For Bruce Katz and Luise Noring, it is possible to adjust and apply Copenhagen's urban regeneration model to other cities to build infrastructure and revitalize entire neighbourhoods.

"The old model of financing [urban projects] is breaking down. We are looking for different models, of how we finance the future. One model that we have found is in Copenhagen. This is a model that can be adapted and tailored to cities across the world."
Bruce Katz

Their comparative analysis of the Copenhagen model with the revitalisation strategies of Lyon, Hamburg and Helsinki, has enabled them to identify **five key factors for the success of these operations:**

1. The first key to success relates to an institutional innovation: be it SPL Confluence in Lyon or HafenCity in Hamburg, projects of this magnitude require **the creation of dedicated structures** in which cities will define the subtle balance between the public and private sectors.

2. The second essential element is **the existence of suitable sites for urban development and revitalisation projects**, their identification and merging into a dedicated structure. While this approach is easy in cities where the municipality owns the land (Helsinki, Hamburg in large part), it becomes more complex when ownership is fragmented and private (Lyon).

"The core areas have been targeted as prime sites for redevelopment."
Bruce Katz

3. The third component is the definition of mechanisms to ensure that the long-term project takes precedence over short-term concerns: the timetable for infrastructure projects is independent from the political calendar. Thus, the Copenhagen Development Corporation is largely de-politicized and managed with minimal intervention on the part of the State and the municipality. It is governed by a national law and has a clear mandate (optimising trade gains to generate profits to finance infrastructure in the City of Copenhagen) and works transparently and is insulated from short-term actions related to the election calendar.

"The most important thing is to depoliticize the operation, to make decisions based on market value."
Bruce Katz

4. Access to various sources of low-cost financing (tax revenues, public financing at advantageous interest rates, private sector financing backed by the government's credit rating or formal guarantees, etc.) is a key factor in enabling the major investments required for urban regeneration. The Copenhagen Development Corporation, for example, has privileged access to cheap credit at advantageous rates. The regeneration of the city was thus carried out without requiring any fiscal change, in other words without raising tax.

5. Lastly, **these projects are generally linked to a wider range of related benefits**: the regeneration of Copenhagen's port district aimed at financing the metro without resorting to additional taxes. Helsinki made it a project involving citizens, and Lyon placed partnership innovation at the heart of the Confluence project.

These five key factors can become powerful sources of inspiration for other European cities: **at a time when urbanisation is accelerating, environmental challenges are increasing, public finances are shrinking and when urban development must favour the construction of the city over its extension, urban regeneration based on the valuing of under-utilized public assets (because they are little known and/or fragmented) and on new forms of cooperation between the private and public sectors is becoming a particularly effective means of urban development.**

"The recent history of Copenhagen is inspiring in that it encourages cities to focus on essential elements: the public assets they have, the hidden value of those assets, intelligent institutional innovations and intersectoral collaboration in order to reveal and build on that value for the benefit of city dwellers."
Bruce Katz and Luise Noring


Bruce Katz

A complementary model

THE LIMITS OF THE EUROPEAN URBAN REGENERATION MODEL

The European model of urban regeneration dœs, however, have certain limitations. For Isabelle Baraud-Serfaty, President of urban economy consultancy firm Ibicity, this model requires three conditions: **public investment must be made** to make the land attractive; **regeneration projects must be located in areas the intended use of which can be changed** (a former military wasteland or port must be able to accommodate new activities); and the **available land must be publicly-owned**. Even with this, it should be noted that the Lyon and Hamburg examples show that these aspirations can also be met with private land tenure. Under these conditions, however, the project timeline would be extended. **However, it is becoming increasingly rare for western and mature cities to fulfil these three prerequisites.**

"Today, communities no longer have the means to hold public land and make public investments."
Isabelle Baraud-Serfaty

Moreover, the context in which regeneration projects are produced has changed: it is increasingly a matter of redeveloping wasteland or even the lively urban fabric of the city centre, which, from a financial point of view, entails very high costs (housing, compensation, depollution, etc.). **What can we do when the European model of urban regeneration dœs not work?**

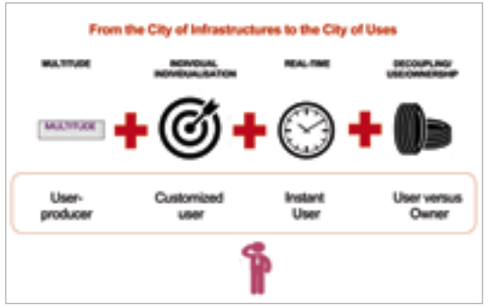
NEW PARADIGM OF VALUE ACTIVATION WITH THE DIGITAL REVOLUTION

"There is a complementary model that consists in keeping the same ingredients proposed by Bruce Katz and Luise Noring, revisited in the light of the digital revolution."
Isabelle Baraud-Serfaty

There is a need to reconsider urban regeneration (the projects studied by Bruce Katz and Luise Noring are almost twenty years old), in the light of **the recent digital revolution**. According to Isabelle Baraud-Serfaty, this revolution combines several factors: **technical innovation, changing behaviors, and the emergence of new environmental and financial constraints**. The digital revolution is profoundly transforming work, housing, mobility, consumption, and other behavior. It invites us, more broadly, to rethink the manufacturing and regeneration of the city.

For Isabelle Baraud-Serfaty, there is a complementary model, based on the same key principle—revealing the hidden value of under-used assets—but adapting it to the new workings of the economy. An economy in which it is necessary to take advantage of the four disruptions born of the digital revolution: **the emergence of the multitude**, i.e., the capacity of each individual to become a producer of data, energy, free space in his or her car or home, financing, etc., and to make the most of it; **the individualisation of the individual**, which allows for a generalisation of customisation, at the same time as **big data makes it possible to industrialise this customisation;** and lastly, **the shift from property to use**.

"With this new model, underused value evolves. The value of the city is shifting."
Isabelle Baraud-Serfaty



Excerpt from Isabelle Baraud-Serfaty's presentation "a complementary model"

TWO CHANGES TO THE CITY'S ECONOMY

"The city as a service is a growing concept."
Isabelle Baraud-Serfaty

In **this city, which has become the city of use after having been one of infrastructure, the players are diversifying, and the bricks of value are moving**, creating many opportunities to finance projects differently. This evolution has profoundly altered the design and development of the city (mobility and housing, among other things). From now on, with the service-driven shift providing urban services, we favour the user, whom we try to understand as much as possible. Isabelle Baraud-Serfaty cites two examples in this regard:

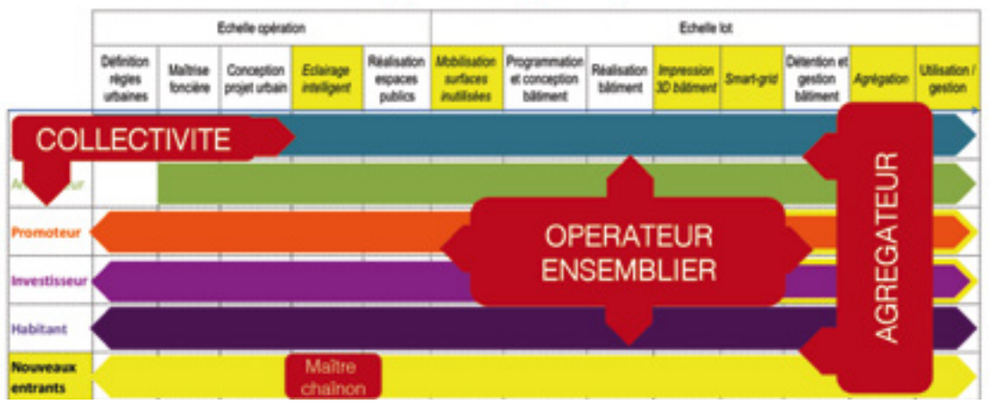
— **In the field of mobility: Mobility As a Service (Maas),** which brings together all forms of mobility to offer them as a subscription to the user (Helsinki).

— **In the field of housing:** The production of "housing as a service", which would not be limited to producing square metres, but rather would provide the user with long-term support and an offer integrating a whole range of tasks they used to take on (search for housing, resale of former accommodation, negotiations with banks, real estate agent, notary, etc.); the housing itself would not only be space made available, but rather would cover a comprehensive range of services related to housing (Internet subscription, heating, transit pass subscriptions, access to sports, educational, or cultural facilities, etc.), which could be adapted to individual needs in real time thanks to the aggregator's capabilities.

"Historically, the value of the city was in the production process. Today, the value has shifted upstream."
Isabelle Baraud-Serfaty

The story is still being written: who will the player be, who can control this project-manufactuing process that has become much more complex? Aggregators in the digital sector, complex operators with long-standing knowledge of urban area, public bodies or experts in a technological chain are all competing for the role. **The digital revolution is leading to a reshaping of the balance between the public and private sectors.** Until then, the roles of the players followed a specific sequence. From now on, new steps have emerged in the value chain. Certain steps are the result of technological innovation (intelligent lighting, 3D-printing); others are more related to the ability to free up vacant or underused spaces or to develop aggregation platforms.

The reshaping of public/ private function



Excerpt from Isabelle Baraud-Serfaty's presentation "a complementary model"

Limitations
of the complementary model

THE ECONOMY OF OPINION OR THE FRAILTY OF VALUE

For Dominique Boullier, a professor at the *École Polytechnique Fédérale de Lausanne*, the notion of "hidden value" is utilitarian and flawed. Today we live in an economy of opinion (André Orléan), based on expectations and speculation. In other words, opinion creates value. **This creates a risk that some speculations will not lead to anything**. The economy of opinion sometimes creates unfounded expectations: there is not necessarily hidden value everywhere, and making people believe this could weaken or even destabilize the system.

"The trick of increasing the value of a certain number of lots lead to the creation of expectations. And those potentially disappointing expectations can turn out to be extremely fragile."
Dominique Boullier

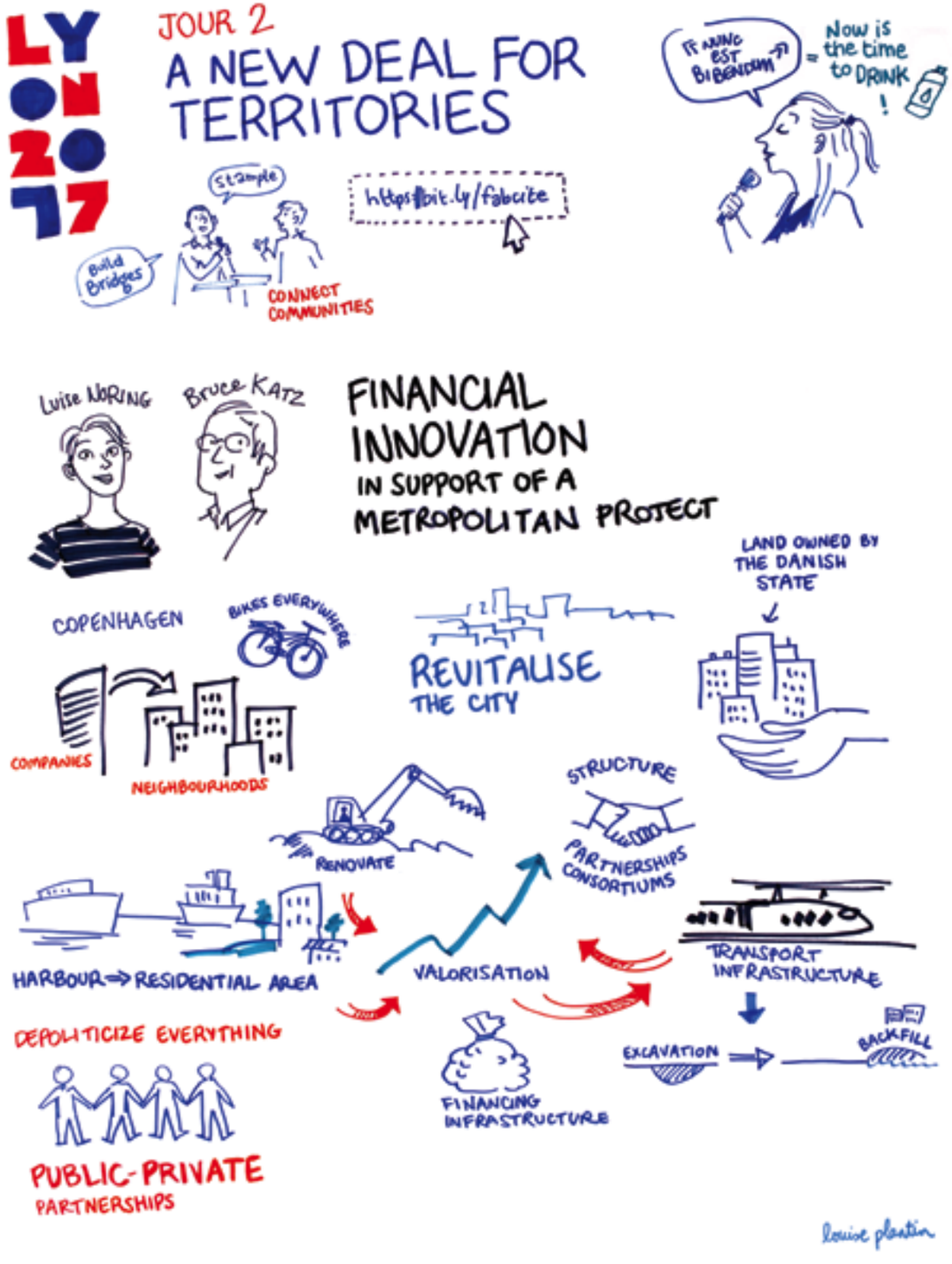
THE TIME FOR INFRASTRUCTURE IS NOT OVER

As Isabelle Baraud-Serfaty points out, **the service-driven shift in urban services does not render the need for infrastructures obsolete**, even if this is no longer the sole support for the service offer.

"While large technical networks are no longer sufficient for the production of urban services, they are still necessary. Because the multitude alone is not enough: no carpooling without roads, no smart grid without a network!"
Isabelle Baraud-Serfaty

The road network or the large water and energy networks remain the physical backbone that makes a service offer possible. While they are still necessary, however, **their funding needs to be rethought**. In fact, in the city of networks, the infrastructure was financed by its use by as many users as possible in order to achieve economies of scale. The profound change with platform economics is that ownership and control of the infrastructure with its associated construction and maintenance investments are no longer required to mobilize and generate value from them. As Isabelle Baraud-Serfaty notes: "***The supply of services remains dependent on infrastructure, but does not pay for it***. *The "scalable" and non-regulated offer could lead to competition with the non-scalable, but regulated offer."*
A certainty emerges from the complementary works of Bruce Katz, Luise Noring, and Isabelle Baraud-Serfaty: tectonic shifts are occurring in the makings of the city. **The time has come to innovate in order to fund the projects and infrastructures that will redesign our cities and metropolises.**

Isabelle Baraud-Serfaty



Overview of the session "Financial Innovation in Support of a Metropolitan Project"

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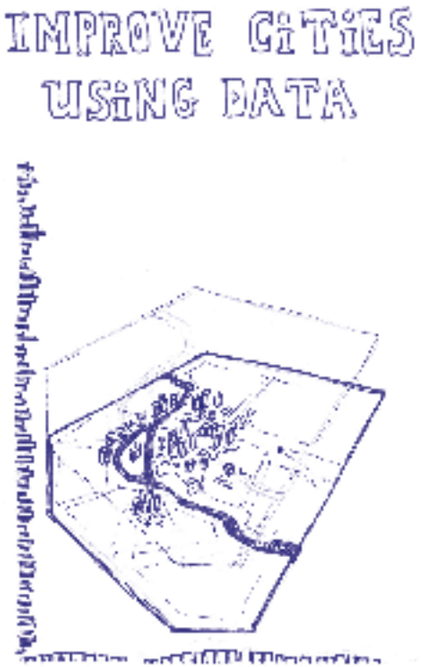
Optimising the city through digital technology

How can tools like big data and artificial intelligence be used to “rethink“ the city factory? How are they redefining stakeholder actions within the city factory?

Conceiving the alliance of territories also means building a city that serves everyone. Digital technology opens new paths and an unprecedented potency to act by revealing various uses and offering various tools and services so that citizens and communities alike can make more informed decisions. In doing so, new ways of making the urban space one’s own come into play.
As proof of their efficacy, these data services can offer, in addition to the individual value expected of a service, collective value free of charge. Generated by the city, “home-grown“ players, or produced by the economies of trans-national platforms, data services are radically changing the traditional roles of stakeholders, forging new partnerships and blurring traditional boundaries. **How can we reconcile undeniable service efficacy on the one hand while maintaining territorial control by public authorities on the other hand?** How can we facilitate implementation of this new ecosystem, which will be a source of growth, jobs and urban transformation?

Many cities have opened a digital portal so that private players can compare data and develop services that are better adapted to their purpose. Anticipating the unexpected, evaluating budgets and directing development, mobility and energy projects: the digital applications in the city are multifold. Digital services are slowly becoming more than a technological layer, penetrating the very core of the framework and infrastructure. In addition to the mass amount of data, a deeper revolution is looming on the horizon with the advent of artificial intelligence: more than just a tool, it will emerge as a major player in the years to come.



The purpose of the “Lyon Métropole Intelligente“ project is to stimulate creativity and innovation in the Lyon metropolitan area. The strategy covers three main areas: new mobilities, digital services and energy. The metropolis favours a global and collaborative approach, which brings together private, institutional and scientific players. The programme plans to accelerate the “intelligent“ transformation of the territory, which is developing spaces for innovation and experimentation in the areas of Big Data and artificial intelligence (Tubà, future Girard market).

DATA
Données métropolitaines du Grand Lyon

Grand Lyon Data Logo

Gerland district

Data Grand Lyon
Lyon is a driver in collecting, processing and using urban data.
Since implementing the Data Grand Lyon platform in 2013, the city has become an “expert“ in computer mediation.
The platform values the economic potential of public data, encourages the participation of citizens in developing new urban services and facilitates exchanges between the different stakeholders in the area.
The data are used, for example, by local contractors who deal with Tubà. These have given birth to new services, such as Optimod’Lyon, which aims to optimize urban mobility using traffic predictions.

Gerland Urban Modelisation
The Gerland Urban Modelisation project, implemented by EDF, Veolia and the start-ups CosmoTech and ForCity, plans to develop a decision-assistance tool for the Gerland District, in Lyon’s 7th arrondissement.
A demonstrator can be used to view and guide new district development projects. It takes into account the territory’s issues: transportation, attractiveness, environmental challenges, residential uses, accommodation, logistics and energy.
It develops scenarios that examine external factors, whether positive or negative, with the idea being to find the “optimal“ development.
The Gerland Urban Modelisation project stands out by its scope: it covers a surface area far greater than similar experiences in Mexico and Singapore.

A digital revolution
that transforms the fabric of the city

New technologies are fundamentally transforming the trades and rules that our societies have put in place over the last century, including in the areas of mobility (Uber, autonomous vehicles), infrastructure (smart buildings), public spaces, and even in terms of uses.
How do cities interact with actors of the digital economy who interfere with the city with a view to transform it? Dialogue, confrontation…or cohabitation?

THE IMPACT OF DIGITAL TECHNOLOGY ON MOBILITY

In an open letter to taxi drivers, published as an op-ed in *Le Monde* on 11 May 2017, Carlo Ratti, director of the MIT SENSEable City Lab, underscored the inevitable transformations of the mobility sector, which has been shaken and disrupted by new technologies. Following Uber and other digital platforms, it is now the autonomous vehicle's turn to dethrone, once and for all, the taxi. Additionally, companies such as Uber, that connect drivers and users, or Waze, that calculates itineraries, engage in dialogue with cities and other urban policymakers.

THE EFFECT OF DIGITAL TECHNOLOGY ON MOBILITY

According to Thais Blumenthal de Moræs, global business development manager at Waze, **digital technology can transform and optimise mobility in the city.** Waze offers a precise map of the influx of road networks via an application. The device invites inhabitants to identify accidents, bad weather, construction sites and other anomalies to calculate the shortest and most optimal route. The motto is: reduce the time of daily trips by 5 minutes. To date, a community of 50,000 volunteers continuously supplies the platform.

Thais Blumenthal de Moræs explains that **Waze will be able to transform mobility in a more harmonious manner, to help cities and platforms work in partnership.**

"We can help combat traffic jams and position ourselves as a partner to cities, to help them better organize their mobility strategies. Our main mission is to save 5 minutes a day, every day for every driver."
Thais Blumenthal de Moræs

The company, now present in over 185 countries and 250 metropolises, has joined forces with cities or specific actors (transport organising authorities, departments in charge of roads and traffic, police, firefighters, stadiums, major event organizers etc.) through its *Connected Citizens* program which is currently made up of over 250 partners, including the cities of Los Angeles, Rio de Janeiro, Barcelona, Rome, Jakarta, and Sydney. This partnership consists in an exchange of data which allows Waze to improve its itinerary service, while enabling cities and the different actors involved to better understand the traffic status and to work against road congestion, a major issue for cities all over the world. In Jakarta for example, where road congestion costs approximately 15 billion dollars each year, the city has decided to introduce a traffic management unit based on data from Waze. This resulted in a 20% average speed increase, a 15% traffic volume reduction, and finally, a 19% reduction in travel time.

"We are able to provide data to cities in order to help them scientifically assess their greatest challenges."
Thais Blumenthal de Moræs

Waze is not an isolated case: Other digital tools such as Citymapper, or the Google Flow program in partnership with the City of Columbus, promise better management of urban mobility. These tools aim, among other things, to reduce traffic jams caused by the search for parking spaces and to calculate user itineraries in real time. However, with **the Connected Citizens program, Waze seeks to position itself as a decision-making support tool ahead of infrastructure projects** (Rio de Janeiro) **and as an optimisation tool for urban services—especially those that require efficient time management, such as emergency services and assistance in cases of natural disasters.** Bearing in mind that 63% of emergency calls are made by people who are unable to provide their location, and that 70% of accidents are reported more quickly on the Waze application than through the 911 number, Waze has established a partnership with Genesis PULSE, an emergency call management program. The cross-referencing of GPS and emergency call data has helped facilitate the geolocation of people in distress and has shortened the on-site arrival time of ambulances by an average of 4 to 7 minutes. During Hurricane Joaquin, which struck South Carolina in October 2015, Waze users were able to stay informed in real time of road closures and shelter locations following the floods. Today, Waze is also looking to position itself as an aid in decision-making for the segment of the fight against air pollution, based on an analysis of traffic data.

CONNECTED CITIZENS PARTNERSHIP, RIO DE JANEIRO: HOW TO BETTER PREPARE THE OLYMPIC GAMES?


Rio Operations Center

Rio de Janeiro was the first city to enter into a partnership with Waze, in order to optimise its mobility system with a view to host the Olympic Games. In preparation of the Games, the data exchanged between Waze and Rio allowed on the one hand to improve the mapping base for a better coverage of roads, and on the other hand, to determine the location of three new highways intended to channel the traffic during the Games based on traffic flow analysis. During the Games, an API[7] was created to automatically update maps depending on road closures: over 430 roads were in fact closed, which affected 342 km of road spread over 41 different neighbourhoods. Through this partnership, Waze positioned itself as a decision-making support tool used before the launch of infrastructure projects.

[7] Application Programming Interface

A FEW POSSIBLE IMPROVEMENTS?

These algorithms have only one objective: to calculate the shortest route. They do not take into consideration urban transport plans set up by local communities, the prioritisation of roads, buildings that border streets, or uses and users of different lanes. Some itineraries may therefore cause negative externalities for inhabitants and neighbourhoods: road congestion, occupancy of roadways, and air and noise pollution. Furthermore, the effects produced by the app are not the same for all cities: while Boston recorded a 20% decrease of road congestion, Jakarta noted an 18% reduction of daily trips. One area remains to be explored: must we better adjust the algorithm to cities and their distinctive features?

A closer dialogue between digital companies and municipalities could lead to better coordination between development and mobility. However, no actor can offer a "miracle solution," as each is specialized in a specific segment of mobility. A city that wishes to correct and streamline travels must partner with several actors of the digital sector.

Michel Morvan, Thais Blumenthal de Moraes, Eric Cassar

The impact of new technologies
on workspaces

New technologies affect our way of life and, more specifically, our way of working. With permanent access to the Internet, the city-dweller has become a nomad. It is now possible to work on every street corner, in parks, and in train stations. However, telecommuting has not become widespread, and we continue to travel to work every day. Office spaces are constantly being built or renovated, both in the centre and outskirts of the city. Why? Because **the need to meet people, to exchange and to interact within a physical space persists.** For Carlo Ratti, *"it is in the exchange and interaction that offices still find their purpose."* Presence and direct exchange are essential factors in establishing trust and stimulating creativity. The transformation of the economy into an economy of innovation makes physical proximity essential. For this physical proximity to become a real means of exchange, there needs to be a space that can accommodate and facilitate encounters.

"Networks and connectivity have not eliminated our need of a physical space, they have transformed it. We always aspire to spend time together, to discuss and share our ideas."
Carlo Ratti

That is why Carlo Ratti advocates for the idea that we must not only abandon the city as conceived by Le Corbusier—one that distinguishes and separates work, leisure, and mobility—but also its translation into the office space, starting with isolated and narrow offices, as featured in Jacques Tati film *Playtime*. **We should design new open and shared spaces that create a ripple effect, enabling creativity and adaptable to new ways of working. The need for physical proximity dœs not mean constantly being present, or always at the same place, or even with the same people. Digital tools do not obliterate the need for contact, but rather, make this need customizable and flexible.**

"The changes brought on by digital technologies and new networks are transforming the relationship between private and public space, as well as the very structure of the buildings in which we live."
Carlo Ratti

A NEW WAY OF WORKING THAT FOUND ITS EXPRESSION IN A NEW BUILDING

Digital technologies change the relation to workspaces in two ways. First of all, it uncouples the workplace from access to work tools. With Wi-Fi, mobile connection, and laptops, it is now technologically possible to work anywhere. The MIT serves as an enlightening example in this respect: the campus was one of the first to equip itself with a Wi-Fi network. This new type of access to the Internet has disrupted activity and movements within the university: students who had the habit of working in rooms now prefer gardens and other gathering or transit spaces.

"We use the space in a different way because we are more mobile and because we have the ability of always being connected."
Carlo Ratti

Furthermore, **digital technologies, by gathering data on uses, provide a wealth of information:** it is possible to know about the occupancy of spaces, to map movements, activity, and interactions between users, or even to study how space influences productivity. **These data allow to rethink the interior of buildings so as to optimise its use and improve working conditions, such as the link between interior and exterior spaces,** by redrawing the landscape in which the building is set. It becomes possible to imagine buildings in which the balance between private and shared spaces, and interior and exterior spaces, is optimised and better-adapted to new uses and work tools.

ADAPTING SPACE TO TIME AND USERS

Today, the Internet gœs beyond the digital world and extends into the physical space. Connected objects materialise this interaction and transform, among other things, the individual's relationship with buildings and workspaces. For Carlo Ratti, **new technologies allow for a two-fold change in how to design, construct, and inhabit the building: they allow for real-time adaptation** to the amount of occupants, by taking into account the fluctuating occupancy of offices and the movement of individuals (see the the Agnelli Foundation redevelopment example).

However, **they allow for an adjustment to the person in the hopes of offering them the best comfort suited to their own needs.** Here, we witness the principle of the individualisation of the individual at work, made possible through the digital revolution.

"You can now have a personalized 'bubble' that will follow you to the interior of the building."
Carlo Ratti

With the help of digital tools, the goal is to turn buildings into dynamic systems that can be adapted to their users, offering them a new level of comfort at work.


Carlo Ratti

REINVENTING THE OFFICE SPACE: THE AGNELLI FOUNDATION


View from the outside, Agnelli Foundation, Turin

The former Fiat headquarters—recently invested by the Agnelli Foundation—exemplify today's «new workspace.» The building, which was once a series of separate and reclusive offices, now welcomes large shared spaces. It overlooks the city, nature, and surrounding urban landscapes; its broken walls encourage interactions and exchanges. The presence of management in an accessible and transparent square glass reduces notions of hierarchy.

The building takes into account new tools and work habits: individuals move about throughout the day and occupy different spaces. Finally, the building offers an interface between the physical and digital worlds: its connected objects react to the coming and going of occupants.

"LOCAL WARMING", CREATE A HEATING BUBBLE FOR INDIVIDUAL COMFORT OF OCCUPANTS


Thermal Bubble, Carlot Ratti Associati

In the context of the Venice Biennale of Architecture (2014), the MIT introduced a *Local Warming* device to respond to the fluctuating occupancy of offices. Equipment suspended from the ceiling projects beams of heat on each individual. The space is no longer heated in its entirety, but a «heating bubble» now accompanies occupants and anticipates their movements. The temperature is individualized and managed via an application. This device also exists for lighting: the light is triggered by movement, and varies in intensity according to the time of day and weather. This technology promises to achieve a 40% reduction of energy consumption in the office.

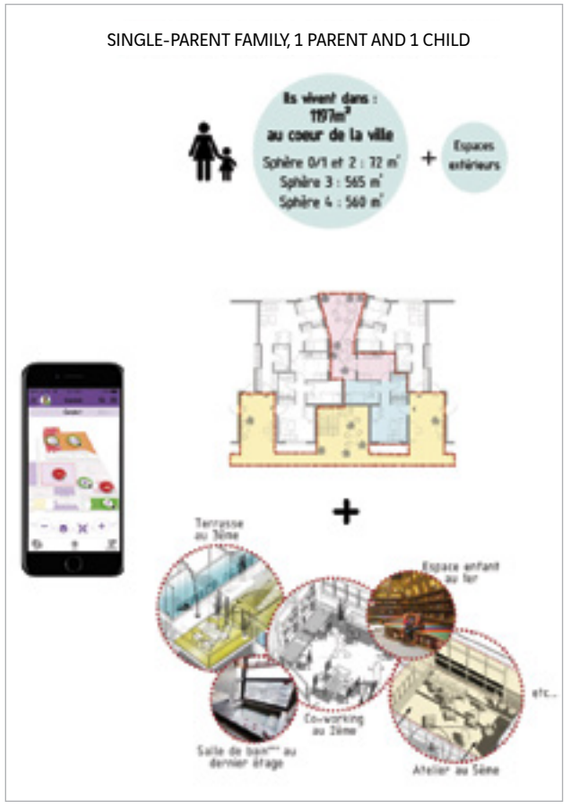
The impact of digital
technologies on housing

Beyond the impact on workspaces, **new technologies are transforming housing and proposing solutions to the housing crisis.** Éric Cassar, architect and founder of the agency Arkhenspaces, points out several factors that are profoundly changing our ways of living: on the one hand, **a growing pressure on housing with rising urbanisation, the issue of environmental protection, and increased land prices and rents,** leading to small and expensive apartments in large metropolises; on the other hand, **new potentials opening up thanks to changing lifestyles and modes of living,** which leads to homes being vacant half the time (working outside, holidays etc.) and a need in terms of fluctuating space (during the day, the year, and throughout life). For Éric Cassar, time has come to rethink the very design of housing and answer the following question: how can we better live in the city?

LIVING SMALLER TO LIVE LARGER

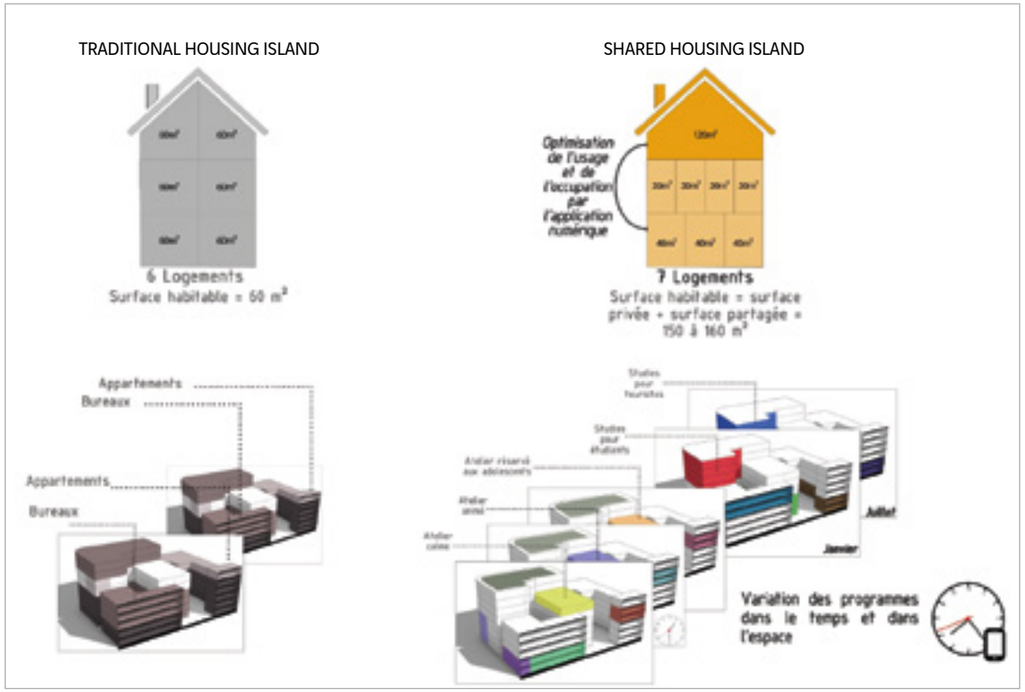
"To live in 1,000 m², we reduce the permanent intimate sphere and expand shared spaces."
Éric Cassar

The answer Eric Cassar provides can come as a surprise: ***"live smaller to live larger."*** According to him, it is, in fact, possible to live in a 1,000 m² dwelling, even in the largest, densest metropolises. To do so, **it is necessary to reconsider the private space, to reduce it to bare necessities** (eating, cooking and sleeping) **to the benefit of common or shared spaces, which can be privatized according to needs:** large dining room, large kitchen, office, guest bedroom, green roof, game room etc. **The housing imagined by Éric Cassar in his project Endless Home (*Habiter l'infini*), winner of the *Grand Prix "Le Monde" Smart Cities*, consists in an**



Excerpt from Eric Cassar's presentation "To live in infinity"

island that combines intimate spheres and shared rooms, themselves divided between noisy and quiet spaces. With this island, Éric Cassar aims to introduce a diversity of spaces and services in the building itself.



Excerpt from Eric Cassar's presentation "To live in infinity"

Although this is a not a communal housing model *per se*, it dœs share some similarities with it, as it seeks to stimulate social links through the possibility to share spaces. Yet it differs from communal housing in that inhabitants are primarily considered as tenants who do not know each other beforehand and are likely to change over time. The project is not concerned with gathering inhabitants who come together specifically to share a lifestyle and common values. "Endless Home" moves away from the community model of housing, in part due to its openness to the exterior.

The housing island is not closed in on itself, but rather, open to the neighbourhood and the city: a neighbour can rent a room on the island if it is available. **The island aims to foster a wide social mix by allowing everyone to live there according to their income, and to develop their mode of living thanks to its modularity and flexibility.** Shared spaces that are open, busy and used, bring more to the building's economy while also diminishing its expenses.

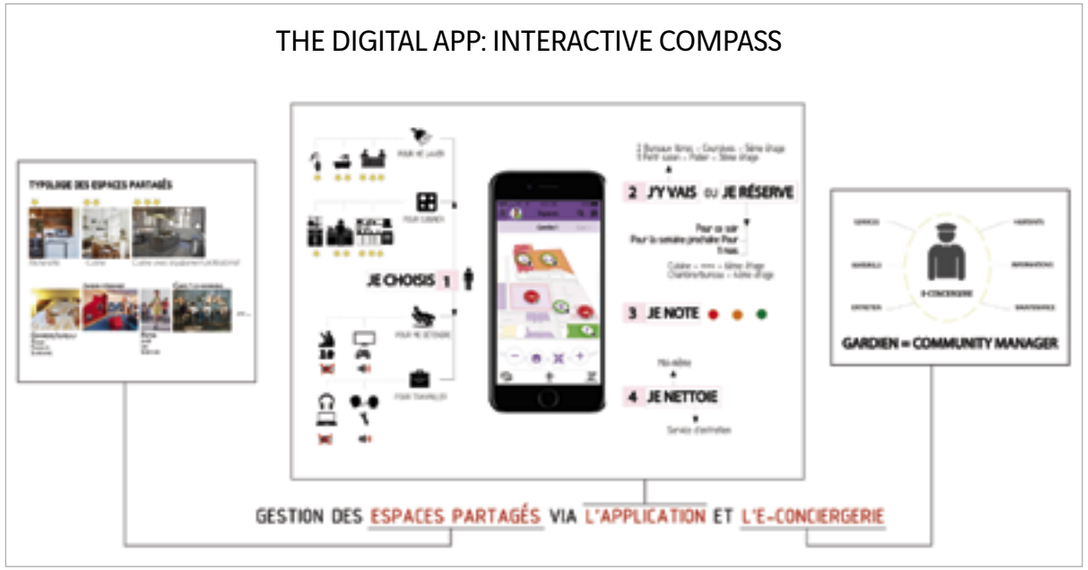
A "DIGITAL COMPASS" TO ORGANISE THE USE OF SPACE AND CREATE A NEW SOCIAL LINK

To ensure the proper functioning of the island, it is managed via a digital tool: "the digital compass." Inhabitants can access the building's services and areas via an app that displays the influx and availability of spaces. 100% of inhabitants must be connected to the application for the island to "*come to life.*"

"The housing is circumscribed by digital technology in real time."
Éric Cassar

This "interactive compass" allows, if the inhabitants desire so, for facilitated social connections: anyone can advertise their skills and offer their services (paid in local currency) or activities to share. Éric Cassar strongly believes in the ability of digital tools to foster relationships between individuals with atomized schedules and who do not necessarily meet up spontaneously, while also promoting intergenerational connections. He also considers the right to disconnect as a requirement for the project to succeed, and a defence against any slippage into the normative and enclosing "gated community".

"The Web allows us to connect individuals with common interests; This is the same principle applied on a local scale."
Éric Cassar



Excerpt from Eric Cassar's presentation "To live in infinity"

The impact of new technologies
on urban planning

Are data and artificial intelligence tools capable of solving all urban challenges? Michel Morvan, founder and CEO of Cosmo Tech and editor of decision-making solutions based on augmented intelligence, provides a more nuanced take on this issue by advocating an approach that is not only technical, but also multidisciplinary.

ARTIFICIAL INTELLIGENCE: OPTIMISING THE KNOWN

For Michel Morvan, **artificial intelligence (AI) opens up new possibilities, especially with its ability to process large amounts of data over a short period of time.** The transport sector has experienced significant optimisation thanks to AI. However, artificial intelligence relies on the principle of imitating the human brain; it cannot surpass the human. AI builds on past data to generate correlations and predict scenarios. It therefore dœs not integrate new and hypothetical elements that could occur in the future. **If an event has never occurred before, AI will not know how to analyse it.**

"The data presents intrinsic limitations and deals with the past."
Michel Morvan

MOVING FROM ARTIFICIAL INTELLIGENCE TO AUGMENTED INTELLIGENCE, A REAL DECISION-MAKING SUPPORT TOOL

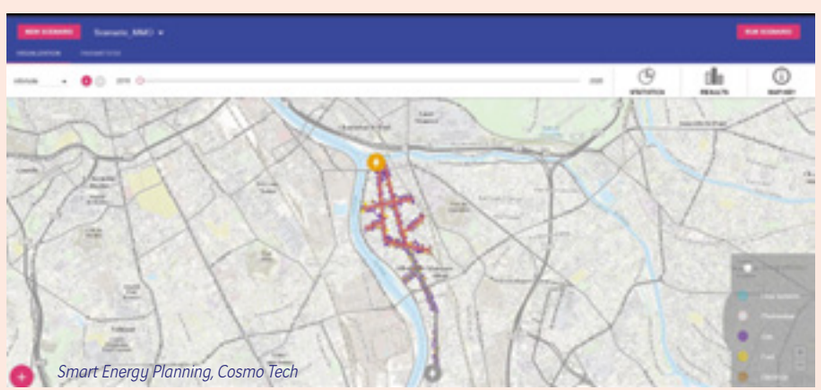
In order to cross this boundary, **it is necessary to enrich algorithms with non-technical elements from diverse disciplines, especially those of human and social sciences: ethnology, sociology, geography, economy etc.** This very idea led to the creation of the *Institut rhônalpin des systèmes complexes* at the *École Normale Supérieure de Lyon*, which brought together 250 researchers from all disciplines, and supports the activity of Cosmo Tech today. Indeed, Michel Morvan defends the idea that any system—whether a city, an energy network or the spread of an epidemic—can be modelled by the same tool. This tool must combine the technicality of basic science with the humanities approach to lead to "augmented intelligence." **Augmented intelligence alone can meet the challenge of the apprehension of the evolution of complex systems, as it allows to move from establishing correlations (artificial intelligence) to establishing causation, an indispensable basis to the development of scenarios.** To do this, we must mobilise expert knowledge, connect them, and have them contribute to the modelling. Cosmo Tech offers tools for the modelling of complex systems that allow for the visualisation of the impacts of a policy decision or of the development of systems and networks in a neighbourhood or city (transport system, energy network etc.). For example, how will the choice of a certain transport system impact the price of land and traffic? **Augmented intelligence can be used to aid with decision-making by varying the different scenarios without actually replacing them. The tool dœs not replace policymaking; it dœs not pretend to predict the future with exactitude, but allows for the mixing of different types of expertise, and can guide and assist stakeholders involved in the manufacturing of the city. The tool aims to increase intelligence and guide the actions of all urban stakeholders, from real estate investors to local representatives.**

"We should watch the different systems that will be affected: the transport system, the energy system, the parking system, social systems, or even the value of the land. The tool allows to model the whole of the systems which are and will be affected."
Michel Morvan

SMART ENERGY PLANNING OR HOW TO DEFINE AN OPTIMAL ENERGY MIX

One of the greatest challenges for cities today lies in optimising their energy consumption, with an aim to reduce and satisfy consumer demand. How will this demand evolve over time? What consequence will the ageing of the population have on consumption peaks? Will climate change increase or reduce the cost of heating?

The *Smart Energy Planning* tool, developed in partnership with General Electric, aims to address issues which, considering likely future developments, cannot rely solely on the processing of current and past data. *Smart Energy Planning* highlights the complex interconnections that are changing energy demands and analyses different series of decisions to develop scenarios. At the neighbourhood level, the device anticipates the evolution of the heat network based on new developments and facilities: connection, biomass central etc. It thus allows for the definition of an optimal energy mix.


Smart Energy Planning, Cosmo Tech

Towards a new social contract?

If new technologies are transforming our cities, our trades and our uses, it is up to us to support and guide this revolution. The disappearance of multiple jobs is inevitable, but it is possible to accompany the changes underway to mitigate certain negative externalities. **To do so, it is necessary to formulate a new social contract that protects the losers of technological upheavals and integrates them into the new economy.**

According to Carlo Ratti, we must consider a redistribution of wealth, by taxing some capital invested in new technologies and robotics to compensate for the elimination of jobs to provide financial support to those left behind. Carlo Ratti invites us to consider this period of technological, economic, and societal transition as a time of opportunities.

Overview of the session "Will Big Data Save Cities?"

Overview of the session "Will Big Data Save Cities?"

Overview of the session "Will Big Data Save Cities?"

For integrated logistics

It is endured, it is tolerated, yet it is rarely thought out or coordinated on the right scale. Urban logistics pose a considerable and urgent challenge to cities if they want to ensure long-term accessibility and quality of life. What governance models and innovations can promote integrated urban logistics?

Movements of goods and raw materials are imperative for the supply and economic development of cities. The logistical picture depends on the flow of all movements within the metropolis. Several strategies allow to correct, or at least mitigate any negative external factors caused by the movements of goods: congestion, traffic, air pollution, sound pollution, etc.

The aim is the mutualisation and rationalization of flows at the metropolitan level. The challenge lies in the possibility of mobilizing all territories toward a coordinated master plan, closer to the needs of citizens and economic players. Applying this complementary nature of the territories—downtown, peri-urban hubs and rural spaces—assumes the construction of ad hoc infrastructures: multimodal hubs to better reconcile the movement of goods and people (airports, train stations, roads and ports), Urban Logistical Spaces.

Logistics must also be rethought on a more local scale, namely the last kilometre. “Micro-logistics“ focus on the distribution of goods directly within the districts. Innovations abound: reorganizing inner-city parking, deploying automatic instructions for receiving packages, installing miniature logistical platforms to ensure the provisioning of districts, investing in vacant spaces and exploring new possibilities.

Beyond the infrastructures and innovations, however, the issue of urban logistics calls for repositioning the political decision-maker at the very heart of these reflections on mobility. And it is the decision-maker’s ultimate responsibility to provide the framework and prompt players to develop partnership logistics without supplanting them. In order to be sustainable, urban

logistics must also include the consumer-citizen, a paradoxical being whose faces and aspirations of well-being are not necessarily well aligned. In short, with urban logistics, the ability of territories to implement collective intelligence is what is at stake.

At the crossroads of France, Switzerland and Italy, Lyon remains the place for exchange and trade. Since 2013, Lyon has been committed to more effective and sustainable urban logistics to reconcile economic activity with environmental challenges. It conducts multiple trials (night-time deliveries, multi-purpose roads, urban logistical spaces) and participates in European projects (Opticities).


Optimod’Lyon application


Urban Logistical Centre - Malaga

Optimod’Lyon

From 2012 to 2015, the metropolis, the city of Lyon and eight private companies, including Renault Trucks, created the Optimod’Lyon pilot project in order to optimize the mobility of people and freight using a traffic information and management system.
A platform collects, centralizes and processes all urban mobility data across all modes of transportation.
An application delivers information about traffic in real time and predicts traffic for the following hour.
These predictions will improve the movement of people and rationalize travel for freight professionals (delivery rounds and deliveries) within the city. In addition to traffic data, the application provides information on the availability of delivery sites.

Urban Logistical Spaces at the Heart of the City

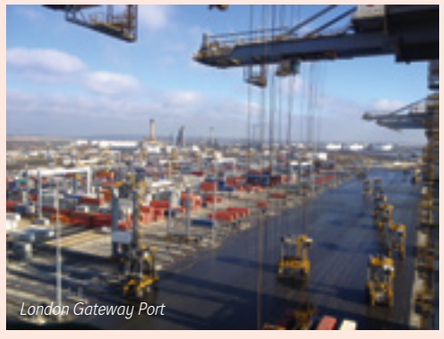
“Urban Logistical Spaces“ are multiplying throughout cities’ downtown areas with an aim to optimize the storage and transportation of goods. These spaces are storage platforms shared among various operators.
Deliveries to surrounding neighbourhoods are carried out by non-polluting, electric vehicles or scooters.
Such is the case in Lyon, where Deret and Ooshop share a logistical space integrated into the Cordeliers parking garage, which was rendered available by LPA, the parking operator for the Lyon Metropolis.
Opened in 2012, this logistical outpost allows both partners to consolidate their respective deliveries and to serve their clients in the Lyon peninsula using electric trucks on optimized routes. The supply of the Urban Logistical Space is operated by Deret from both its own and Ooshop’s logistical platforms in the periphery.
It is however important to note that the business model of this kind of logistic facilities is yet to be found and their economic balance remains fragile.

Three scenarios
to reinvent urban logistics

In 2016, La Fabrique de la Cité conducted a research project entitled "Feeding and Fueling the City"[8], devoted to the mobility of goods in the city. In partnership with weave.air, a firm specialized in design thinking and innovation, and with the support of a network of approximately 30 experts and professionals from various fields, such as the city, logistics, uses or digital technologies (elected representatives, architects, urban planners, logisticians, academics, designers etc.), La Fabrique de la Cité built three scenarios based on innovations already in use in European and American cities and referenced three case studies (Detroit, Hamburg and London) to answer the following question: **logistics are coming back to the city, but under what form?** By amplifying the trends already at work, these three scenarios form strategies that are supported by interactions between different actors, and pursues objectives which are specific to them:

— **The scenario of the city platform,** or scenario of volunteerism, sees the public actor play a lead role in the definition of the overall strategy of urban logistics and in the establishment of conditions essential for the formation of an integrated and efficient ecosystem around city actors, notably by using its competence in terms of road control.

THE LONDON GATEWAY PROJECT: A NEW PLATFORM TO DECREASE THE NUMBER OF TRUCKS



London Gateway Port

A source of inspiration for this scenario can be found in the City of London with the London Gateway project. This new port terminal and multimodal logistics platform enabled a reorganisation of the distribution system on the port and reduced by 2,000 the number of trucks entering the city every day.

[8] Find these works on the Web site of La Fabrique de la Cité: https://www.lafabriquedelacite.com/fabrique-de-la-cite/data.nsf/DBF56AD427BACAE5C1258074005A2BE6/$file/ffthecityfr.pdf

— **The scenario of the service city,** or scenario of business-as-usual, places the satisfaction of the city dweller/consumer, in all its ambivalence, at the heart of the urban system. On-demand, personalized and ergonomic logistics are preferred. The public actor creates favourable conditions for businesses to develop their solutions. City-dwellers are also involved and become actors in promoting their "potential logistics."

— **The scenario of the territory city,** or scenario of ambition, is a city that seeks to reinvent itself based on its territory and local potential. The city regains a relative productive capacity, without pretending to be self-sufficient. Suburban and rural territory is valued. Circular economy is also central. The goods and materials move through valorisation loops.

PORT OF HAMBURG

View of the harbour, Hamburg

The case of the Port of Hamburg is symptomatic of a difference of interest, with on one end an urban development focused on providing a better quality of life, and on the other, the port, which must modernise and expand itself to remain competitive and to guarantee a fluidity of transfer of goods towards the hinterland. The automation of the port and the partnership with UPS are two key actions developed in Hamburg aimed at establishing miniaturized distribution centres in the city to limit truck circulation.

THE GREENING OF DETROIT

Urban Garden, Downtown Detroit

The City of Detroit is a key example: as a consequence of the severe crisis it experienced following the collapse of its main industry, Motor City had to change its mode of organisation. The disorganisation of public transport, urban decline, rising oil prices, fall of real estate prices and lack of a solid business structure have led, on the one hand, to a tightening of the city around its downtown centre, and on the other hand, to the development of gardens and urban farms on its abandoned lots, which are maintained by inhabitants and associations (*see The Greening of Detroit*), thanks to the occupancy authorisation granted by the U.S. Department of Housing and Urban Development.

The urgency
of tackling the question of urban logistics

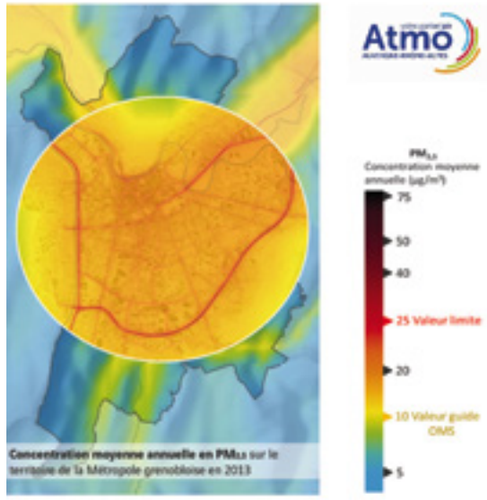
There is a consensus among actors in the sector today to admit that urban logistics contribute significantly to negative externalities such as pollution, traffic or noise. According to the figures of *Centre d'analyses stratégiques* (now *France Stratégie*), transport of goods represents 9% to 15% of city travel and contributes between 30% and 50% to the negative externalities of transport.[9] Consequently, private sector actors and local communities are increasingly interested and invested in the subject.

"ON-DEMAND" LOGISTICS WILL PUT CITIES UNDER INCREASING PRESSURE

Frédéric Delaval, director of the "Urban Logistics" program of The Post group, stresses **the urgency to act. According to him, the pressure that will be put on cities over the next few years may prove unmanageable if strong and effective measures are not quickly implemented in the sector.** Indeed, rapidly-changing modes of consumption are altering the requirements of the sector which must adapt itself to a demanding city dweller/consumer sometimes full of contradictions (i.e., who wants things delivered, from anywhere in the world, as quickly as possible, and without inconveniences). The upheaval caused by digital technologies and the rise of major e-commerce platforms are on the verge of completely reconfiguring the landscape of this industry.

"The consumers' demand is: now, for free, where I want it, and when I want it."
Frédéric Delaval

[9] Christine Raynard (2012) Analysis note 274 – For a Renewal of Urban Logistics. Centre of Strategic Analysis, April.



AN ENVIRONMENTAL ISSUE THAT REQUIRES QUICK RESPONSES

Environmental consequences—in particular an increase in pollution—can influence the attractiveness of cities and pose serious health problems. Such is notably the case of Grenoble, as noted by Christophe Ferrari, president of the Grenoble-Alpes metropolis: located in the heart of the alpine furrow and surrounded by particularly close mountain ranges (Vercors, Belledonne, Chartreuse), the city is quite prone to pollution peaks and vulnerable to climate change. The reference thresholds for fine particles (PM10 and PM2.5) and nitrogen dioxide (NO_2), main pollutants which penetrate deep into the respiratory system, are regularly exceeded, especially in valley bottoms, the downtown area and *at the edges of major roads, which poses a significant public health problem.* **How can we successfully combat pollution-inducing emissions while maintaining a strong accessibility to the city?**

"To tackle such complex issues, Grenoble must address logistics in a very transversal manner."
Christophe Ferrari

One of the components of this policy directly affects sustainable logistics and pursues two main objectives: first, it aims to progressively restrict the number of delivery vehicles polluting the city by establishing a traffic restricted zone (ZCR) for transport vehicles of goods; second, it transforms "last kilometer" logistics by creating two urban distribution centres (UDC) the goal of which is to "*receive goods from different carriers, group them by addressee, then deliver them by using more eco-friendly vehicles (natural gas, electric or bikes).*" Through this demanding policy, **Grenoble takes into account demographic trends, including the ageing of the population, which tends to strengthen the need for nearby stores and logistic services. Given the many challenges to overcome, the gap is still very significant between the current performances of the sector in most cities and the objectives set at the European level,** which accentuates the aforementioned urgency to act.


Frédéric Delaval and Christophe Ferrari

THE GRENOBLE METROPOLIS IS COMMITTED TO MORE SUSTAINABLE URBAN LOGISTICS

In 2012, in response to considerable local issues, the City of Grenoble launched a collaboration between all actors of the logistics sector in order to co-construct a new model for the territory. This collaborative committee of urban logistics is a partnership instance and a place where a common culture can be built and openness towards other territories can be fostered. By signing a plan of action in 2015 for sustainable logistics in the Grenoble metropolis, 23 local actors have committed themselves to enacting several concrete measures. Of these, two are particularly ambitious:
— the establishment of a traffic restricted zone (ZCR) around the extended downtown area, which prohibits the circulation of "ungraded" vehicles of goods, specifically those older than the threshold set by authorities, from Monday through Friday, 6 a.m. to 7 p.m. The extension of this zone to ten metropolitan municipalities is under consideration, with the aim of targeting the most polluted and congested areas.
— the establishment of two complementary urban distribution centres (UDC) (one for the fresh food industry piloted by the General Interest Market, the other as a general centre, established by the metropolis and by a private EVOL consortium) allowing for a consolidation of flows near the downtown area and the dispatch of goods in clean vehicles. These Grenoble distribution centres have the specificity of being managed by private actors (including La Poste) with the assumed intention of finding financial profitability in this still fragile logistical organisation model.

Urban distribution centre, Grenoble

The action
of territorial communities as a driver for action

Faced with these challenges (improving the efficiency of logistics to meet demand in a sustainable manner, maintaining the accessibility, and meeting the environmental challenge), **the action of territorial communities is an essential trigger for a quick and ambitious transition.** Christophe Ferrari underlines that it is not a question of creating a public service of logistics or of replacing professionals in the industry. **Rather, it is for local authorities to define, collaboratively, a clear territorial strategy that relies on strong, long-term regulation.**

The benefit of such a vision upheld by the authorities, as well as legible regulation for the economic actors, is to give such actors the time to adapt themselves, to organize, innovate, and contribute to the territory, to make it more virtuous while still protecting their interests. Frédéric Delaval adds that it is essential for regulation to reward virtuous behaviour that contributes to the implementation of the territorial strategy, and conversely, punish that which goes against it. It is under these conditions that metropolises will be able to render all means of delivery and logistic organisations compatible with environmental requirements and strategies for their territory.

"It is important for the public actor to find a full strategic capacity and regulation on its territory, so that actors, both private and public, can organise themselves."
Frédéric Delaval

AN INTEGRATED AND CUSTOMIZED TERRITORIAL APPROACH

By nature, logistics is a field that crosses borders and involves exchanges between territories. Consequently, a logistic strategy must be thought out on the scale of metropolises and intercommunal and network institutions of cooperation. Indeed, **it is necessary to act on different scales in order to coherently coordinate the various links in the logistics chain** (the scale of the "last kilometer," the scale of the city, the metropolitan scale, the scale of a business activity or life area, etc.). This expression of scale must be present in the thought process of authorities and in the regulatory framework. Despite its very technical side, logistics are essentially a matter of territorial cooperation.

"Pollution, traffic, circular economy and issues of logistics are ultimately issues of metropolitan cohesion."
Christophe Ferrari

This is all the more so since no single recipe exists, but rather, there are regulations on traffic schedules, emissions standards, road use and parking management, accessibility of vehicles, or land use, according to the territories and their issues. These issues can depend on various aspects, such as local consumption modes, the geographical location of the territory, the flows (incoming, outgoing or transversal), agricultural channels and local industries, or even existing infrastructure, thereby requiring a customized and integrated reflection.

A NECESSARY INCREASE IN COMPETENCE AND KNOWLEDGE

To the public actor, this positioning as strategist and controller involves a thorough understanding of issues related to urban logistics which, up to now, was often an afterthought. An increase of local authorities' competence over this field is necessary, as is the in-house training of the staff on these issues. Yet this also applies to a large share of private actors of the logistics, with many not yet realising their responsibility and role in the ambitious transition to be carried out (artisans, merchants, and citizens for example).

Furthermore, **there is a real deficit of knowledge of the reality of logistics on the territories, particularly on the dynamic of the flow of goods.** What are the present flows? How are they organized spatially and over time? Where are the stocks? It will therefore be crucial for actors in the sector to build a genuine common knowledge base in order to help build a consistent, relevant territorial strategy.

"To enable sharing, particularly of data, we must show that a profit is generated for all parties."
Christophe Ferrari

OPTIMISATION, SHARING AND NEW BUSINESS MODELS

Any logistical strategy in a territory will require an increase in optimisation and mutualisation of flows and equipment by industry professionals. Frédéric Delaval explains that 87% of flows are not currently shared. Development of urban distribution centres, consolidation of truck loading, sharing of delivery tours, sharing of handling equipment, and even the harmonisation of computer systems are all examples of innovations that work towards more efficient, shared logistics.

Simultaneously, due to the impetus of digital technologies and new modes of consumption, the organisation of traditional actors in the sector is disrupted by new groups, with Amazon as their lead. A large portion of actors in the supply chain must adapt themselves to transforming business models. For public authorities, the first priority is to preserve the commercial forces which make up the dynamism and appeal of city centres. To do this, all must be provided with the same weapons these major digital actors have.

LA POSTE, A CORPORATION IN FULL TRANSITION

La Poste has seen dramatic changes over the years, with a strong decline in mail and a rise in the delivery of packages, thus calling into question the functioning of the group. Aware of the paradigm shift at work, the company has adopted a proactive approach to adapt to its new environment. One of the axes of this company overhaul is that of urban logistics, which is part of five major high-priority programs selected by the group, along with e-commerce, the modernisation of public action, energy transition, and client knowledge.
This program aims to make La Poste an essential link in the new logistics of the French territory by drawing from its experience of logistics, its dense network, and its close relationship with local authorities.

This program is embodied through many innovations within the group. La Poste equipped itself very early on with electric cars and bikes (one of the first global fleets). The company is committed to new logistic organisations and is notably the operator of several UDCs (Urban Distribution Centres) and has developed a multimodal platform at the MIN (markets of national interest) of Toulouse. The group is also developing a relay pickup network (more than 7,000 in France) and automatic storage in its post offices (over 1,000 in 2017 compared with 100 in 2014). La Poste also invests in innovation via start-ups, such as ProbaYes and Shipup, which focus on client information for deliveries. Furthermore, La Poste depends heavily on its local implementation and relies on it to become an indispensable relay of services for the population for the entire territory, even suburban or rural.

Building the city under the city

How do we tackle growing urbanization without increasing the already intense pressure on farmland or energy-consuming transportation needs and their attendant negative impacts? Two solutions are possible: building the city over the city or under the city. How do we invest in underground spaces and rethink the relationship to the city's ground level? How do we maximize these vulnerable areas' potential for densification?

Cities spread out due to demographic pressure and economic activity. After several decades of urban sprawl, they are now seeking to densify. Building the city on the city is a well-trodden path to urban intensification that nevertheless retains a real potential for innovation: new typologies allowing intensification, land found on roofs and by converting abandoned spaces, or even new regulations enabling experimentation.
Another path remains largely unexplored: building the city beneath the city. The vertical city has long aroused curiosity, beginning with the imaginary worlds of cinema and science fiction. The imaginary megalopolis in Metropolis is a perfect example. An affluent, pleasure-seeking society reigns above; the workers and the oppressed toil underground. The underground city is often seen as an abject space given over to networks and technical infrastructure, and rarely as a space to conquer.

However, some cities have domesticated and invested in their underground spaces. The winding network of shopping malls under downtown Montreal is exemplary in terms of planning and economic success. Tokyo is truly three-dimensional in its use of underground, ground level and vertical spaces. London and Paris are now considering their decommissioned underground passages and subway stations with interest. The "Deep City" research programme aims to take a fresh look at the potential of often-overlooked underground spaces from a sustainable development perspective.

Developing underground spaces poses several challenges: knowing the nature of the soil, locating natural resources or what remains of them, and examining constructability while taking into account the fact that underground spaces are fragile and subject to severe constraints. Underground development entails painstaking geological and cartographic work. This new frontier potentially holds a vast array of opportunities.

In the 1970s, Lyon invested the air and its underground with the development of Part-Dieu, France's second business district. This neighbourhood is now subject to an ambitious revitalization project which works on the city's verticality while betting on elevation and new connections between the underground, the natural soil and buildings in order to create an active soil.


"To-Lyon" Tower, Part-Dieu district

Lyon Part-Dieu Project
Despite its first-rate facilities (auditorium, cinemas, media centres, among others), Part-Dieu is today often only associated with its mall and train station—and the image of an impossible-to-cross, fragmented space. Part-Dieu is emblematic of the many concrete-dominated urban planning projects undertaken in France in the 1970s. They were intended to strictly separate traffic along vertical divisions: the underground space was for public transportation, deliveries, and parking; the natural ground level was for cars; high above, pedestrians could access various concrete slabs using suspended footbridges. At Part-Dieu, the suspended slab is six metres above the ground.
The goal of the Part-Dieu revitalization project, which began in 2010, is to create a European business centre and to affirm its still misunderstood centrality. The project seeks to reveal the area's inherent potential and work on programmatic continuities to launch Part-Dieu into the 21st century and create a cutting-edge neighbourhood. The new neighbourhood must accommodate an additional 650,000 m² of offices, 2,200 housing units for 4,000 inhabitants, and 100,000 passengers per day at the train station. To achieve these objectives, work on the vertical city is crucial.


Different levels of urbanism on suspended slab, Part-Dieu district

Densifying by Building Upwards
For its business district, Part-Dieu focuses on the construction of next-generation high-rise buildings that will complete its skyline (the Part-Dieu tower, 170 metres; the Oxygen Tower, 117 metres; and the recent Incity tower, 200 metres). Next to projects Eva and Silex 2, one of the flagship projects is the "To-Lyon" Tower. The Tower will host 65,000 m² of office space and possess an "active base" (shops on the ground floor). The project involves the metropolis, VINCI Immobilier, and Dominique Perrault—who has a special relationship with verticality and underground space.

Rebuilding the Vertical City
To remake the open space in Part-Dieu into a true public space, the AUC has proposed the concept of an "easy groundscape" that reconnects the links between the currently fragmented vertical spaces and attaches the buildings to the city's ground level, which will be redesigned as an active area. "The ground level at Part-Dieu must be built to facilitate use and promote exchange and interaction (…). It must reconnect the inside and the outside, front and back, top and bottom and become an equipped and informed groundscape that orients movement. (…) It is a dense, sometimes pre-existing but redefined groundscape that organizes movement and stasis, penetrates into the tower lobbies, into the Auditorium and Library, hosts the terrace cafés and, with its escalators and elevators, climbs onto the suspended slab and crosses the rail station and shopping mall[11]."

[11] https://www.lyon-partdieu.com/wp-content/uploads/2016/11/CAHIERS-DU-PROJET1_web_FR.pdf

The underground
as a new frontier

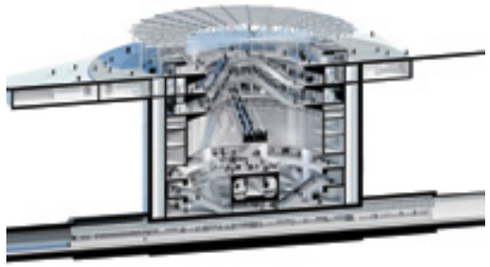
A FASCINATING AND UNSETTLING SPACE

"There is a whole psychology behind the notion of not wanting to be trapped underground."
Elizabeth Reynolds

The vertical city fascinates. From Jérôme Bosch to Kim Seung-Hun and Fritz Lang, art echœs the often-dichotomous imaginary associated to it, which is perfectly exemplified by the imaginary megalopolis in *Metropolis*. At the top lives a society of luxury and pleasure; underground are the workers and the oppressed. The question is asked: is what lies underground still part of the city? Can this repelling space become more than a space devoted only to networks and technical infrastructure? The response of experts is clear: underground space is the new frontier.

UNDERGROUND PIONEERS

This frontier has pioneers: firstly, architects such as Dominique Perrault, founder of agency Dominique Perrault Architecture and a leading figure in the field. While stressing how difficult it is for an architect to invest in the underground, Dominique Perrault states, **" walls can be torn down, but the ground needs to be fought,"** adding, "there are a thousand reasons to be interested in underground relationships." Among others, because the underground represents a protective thickness, the resilient and thermal properties (including seismic protection) of which he takes advantage of.
To counter concerns related to this space, Dominique Perrault suggests guiding natural light to the deepest levels of these buildings. For his project for the future Grand Paris Express station in Villejuif, he brings natural light up to 50 metres deep, a feat that causes him to describe the project as an "*outdoor station*." For Guillaume Lavoie, underground development is successful when one has no awareness that one is underground.



Project for the future Villejuif station of the Grand Paris Express, Dominique Perrault

Other pioneers of the underground cities are cities themselves, as noted by Elizabeth Reynolds, president of Urben, the author of a book tracing the history of underground urbanism and its current challenges[10]. In Helsinki, a bunker from the Cold War era has become a data centre. Arnhem is home to an underground school that preserves the surrounding hilly landscape. As for Montreal, the city certainly represents one of the most accomplished examples of underground development.

[10] Elizabeth Reynolds (2017) *Underground Urbanism*, Routledge

CREATING A VOID TO CONNECT THE BUILDING TO THE CITY, EWHA UNIVERSITY, SEOUL, DOMINIQUE PERRAULT

Ewha University, Seoul, Dominique Perrault

As the the sculptor's motions are guided by the grain of the stone, so too Dominique Perrault's buildings are guided by topography. There is no negotiating with matter: the nature of the soil determines the organisation and design of the underground building.
In 2008, Dominique Perrault inaugurated Ewha Womans University, of which he states, "*This project is the construction of a landscape, there are no buildings. We built a landscape, and above all, a void.*" The university looks more like a landscape than a building. Its 70,000 m² are buried under a relief of land. A tapered valley crosses the hill and university building. By creating a void, a new public space is gained; the brilliant central artery not only provides the 25,000 students with access to the university, but also opens up the university to the city and creates a strong link between the two by becoming both a place and a street.

The site is appreciated for the relationship it offers between nature and architecture and is considered an environmental model. The soil mantle offers an incredible thermal shield and protection against earthquakes. A 250 meter-long Canadian well adjusts the temperature of the building: the rock brushes against the rock by infiltrating the well to warm the interior in winter and cool it down in summer. The university is fully lit by natural light.

"Today, Ewha University has become a reference project for sustainable development and for the relationship between nature and architecture."
Dominique Perrault

Dominique Perrault

MONTREAL, AN UNDERGROUND CITY CLOSELY CONNECTED WITH THE CITY ABOVE


Cours Mont-Royal, Montréal

Developed as early as the 1960s, notably under the impetus of powerful railway companies, the underground city of Montreal is currently made up of 33 km of malls, equipped with 109 entryways and visited by nearly 500,000 people. Initially designed to facilitate travel between buildings and shield from bad weather, the malls have been progressively connected to the metro system. Today, they harbour transport networks as well as significant commercial activity with shops, offices, hotels, and convention and recreation centres. This interior city also hosts several artistic events. Guillaume Lavoie strongly defends this characteristic, which makes the underground space an extension of the city above, rather than its mere opposite. He claims: "*Whenever I see a blank wall, I see a canvas that has yet to be painted. We need [to] think of alcoves for musicians to play.*»

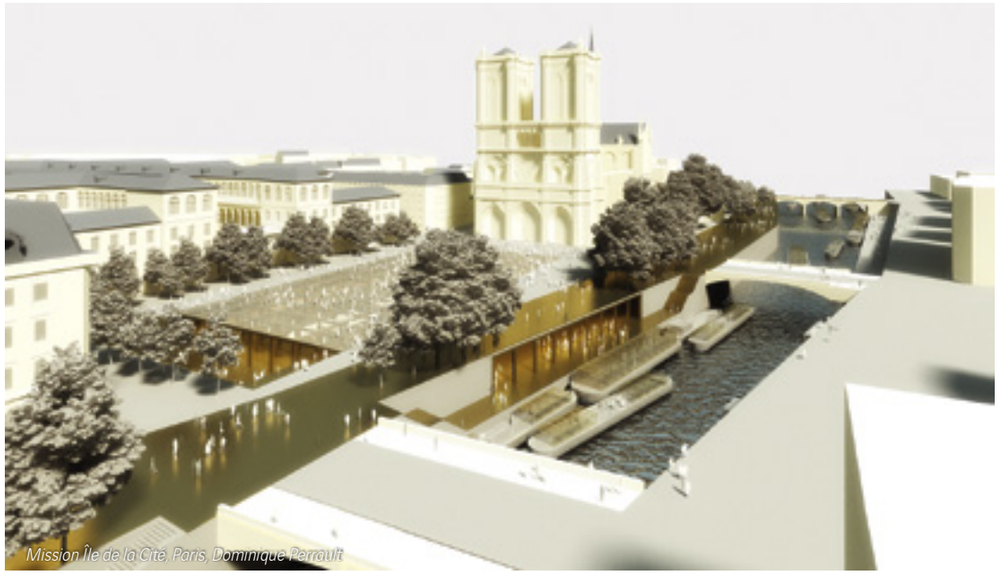
This tested example of an underground city as a complement to the city above opens up new prospects, including in terms of the connection between mobility and consumption. City-dwellers using daily underground transport could, for example, make their purchases at the metro entrance. This would spare them additional travel and decrease «last kilometer»-related issues. However, one challenge remains: to cohesively bring together both the underground and aboveground networks, the former having been developed without a comprehensive master plan.

"The underground city of Montreal has been subject to progressive, disorganized, and unplanned development."
Guillaume Lavoie

Guillaume Lavoie stresses that the underground space remains to be conquered, especially as the network was expanded without dialogue or planning. **A challenge remains: that of cohesively bringing together the various underground networks, while connecting them to the exterior city.**


Han Admiraal and Guillaume Lavoie

Connecting the underground city
to the city above


Mission Île de la Cité, Paris, Dominique Perrault

UNDERGROUND CITY AND ABOVEGROUND CITY: ONE AND THE SAME

The underground city and exterior city are in fact complementary. Dominique Perrault aims to demonstrate this through a plan he has developed for the *Île de la Cité* (a mandate entrusted by then-President François Hollande and Philippe Bélaval, president of the National Monuments Centre). The place in front of Notre-Dame is to become a glass foundation that would connect with the banks of the Seine via the activated underground.

"The island has a base, an underside, which is not independent from what is above. The underside of the island is its future."
Dominique Perrault

Rethinking **the interactions between under- and above-ground, for example in terms of drawing shops and public transport closer together, can allow for a reduction of travel aboveground as well as an opening of new routes for urban logistics.** Amsterdam is considering this reconfiguration, as explained by Han Admiraal, president of the International Tunnelling and Underground Space Association's Committee on Underground Space (ITACUS). For example, why not hide urban logistic devices in wells that were dug out and then neglected during the construction of the metro?, asks Dominique Perrault.

"If we do not unite city planners, engineers, architects, and geologists, and if we fail to discuss themes of the underground and its use within the very heart of the city, we will never manage to find optimal solutions."
Han Admiraal

It becomes a matter of changing our view of the underground so as to no longer perceive it as a simple receptacle of networks operating in silos. As noted by geographer Manuel Appert, a specialist of tower-planning policies, **the need to maintain and develop these same networks, just like the densification objective, forces us to consider the inconceivable: the underground must be seen as a space for daily flows and as a contested resource space, to be regulated—and no longer as a capacity reserve[11].** To do this, underground development must become systemic; it must be linked to the development of the surface, and must be subject to a reflection on interrelations, both in terms of synergies and risks, as noted by architect Michæl Doyle, postdoctoral fellow at the *Technische Universität Wien*, and associate researcher for the *Deep City* project at the *École Polytechnique Fédérale de Lausanne*.

ESTABLISHING A DIALOGUE BETWEEN DIFFERENT ACTORS AROUND SHARED KNOWLEDGE

All experts agree: **the 3D vertical city is only possible if dialogue and collaboration are established between the different stakeholders of its development.** That is why Guillaume Lavoie, municipal councillor of the City of Montreal, calls for the creation of a framework aimed at encouraging this dialogue.

"Mapping can bring about a detailed appreciation of the link between resources and spatial relationships, between the underground space and surface."
Michæl Doyle

However, Michæl Doyle notes that **the lack of cooperation between stakeholders stems mainly from their lack of understanding of the underground they are investing in,** whether in terms of the nature of the soil or the various networks—and as a consequence of their inability to consider synergies. That is why, in the framework of the *Deep City* project of the *École Polytechnique Fédérale de Lausanne*, Michæl Doyle has developed a mapping tool based on big data to allow for a distinction between the different strata which make up the underground and an identification of the main resources (space, geothermal energy, groundwater tables, and geological materials). This specific image of the underground reveals developable spaces and their specific vulnerabilities. An aid for decision-making and prioritisation rather than a development tool, this new mapping provides grounds for a long-awaited discussion between development stakeholders.

"My role is to stay behind the planning process but also to collect and present data."
Michæl Doyle

Michael Doyle

[11] https://villeverticale.sciencesconf.org/

DEEP CITY, *A MAPPING TOOL TO REVEAL THE POTENTIAL OF SUBSOIL*

The researchers of the *Deep City* project of *the École Polytechnique Fédérale de Lausanne* started out with a dual observation: the development of the sustainable city can no longer be obtained without calling on the "3rd dimension," yet cities do not know their subsoils, especially as few of them have geological maps displaying the entirety of their galleries and buried networks. **How can we overcome this sector-based approach to the underground, which produces an understanding limited to what we want to draw from it?** Relying on a methodology developed by geologist Aurèle Parriaux,[12] a former professor at the EPFL and his thesis codirector, Michæl Doyle has developed a mapping that aims to establish a multipurpose approach to the underground to allow for its long-term operation.
In this regard, through the analysis of massive data and machine learning, the mapping tool distinguishes the different strata that make up the underground of cities and identifies four main resources: space, geothermal energies, groundwater tables, and geological materials. Each resource has a cœfficient system assigned to it. The goal is to reveal the overall potential of underground resources and to analyze interactions on the long-term—both positive and negative—between resources and developments, in order to reveal underground spaces with more or less sustainable-development potential. As Aurèle Parriaux reminds us, "*subsurface construction offers no second chances, unlike a building that can be destroyed or renovated, so it is essential to plan ahead.*" [13]

This method is not intended to indicate what infrastructure must be built at which location, but rather, to enable planners to better anticipate their underground projects and best protect the resources. Michæl Doyle has used this method to study and map the cities of Dakar, Hong Kong, San Antonio, Montreal, and Geneva.

[12] Aurèle Parriaux,. (2010) Projet *Deep City*: ressources du sous-sol et développement durable des espaces urbains, Rapport de recherche / PNR 54, vdf Hochschulverlag AG

[13] https://actu.epfl.ch/news/a-la-conquete-de-la-ville-souterraine/

ENSURING A SUSTAINABLE BASE FOR OUR CITIES

"We should realise many natural processes take place in the underground, in what is called the earth. The underground is the foundation of life on the surface."
Han Admiraal

Regardless of densification targets, there is an urgent need to rethink the underground, which is the foundation of our cities, and on which life on the surface depends. A number of natural processes operate underground: the transformation of organic matter into energy resources, rainwater infiltration and purification, etc. **A product of long timescales, the subsoil is particularly vulnerable; it is easy to destroy, but difficult to rebuild.** The main challenge is to invest in it now without denaturing it or disrupting its natural cycles, in order to guarantee a sustainable base for our cities.


Elizabeth Reynolds, Guillaume Lavoie and Han Admiraal

BUILDING THE CITY UNDER THE CITY

DOMINIQUE PERRAULT
architect

GO AGAINST WHAT SEPARATES US

WALL to be torn down

GROUND to be tamed

EWHA WOMANS UNIVERSITY

VALLEY OF GLASS

THE VOID IS A MATERIAL

What if we do the same...

... ON AVENUE FOCH IN PARIS ?

NO NETWORKS!

OPEN GROUND

2008
Séoul

DIGGING THE HILL

BUILDING A LANDSCAPE

INSULATION + INERTIA

canadian well

A HISTORICAL PLACE

REVOLTE OF STUDENTS AGAINST THE PRESIDENT

Be able to cross the Island by foot (and make it enjoyable)

LE LOUVRE

3 LAYERS

glass space

public space

archaeology

LA SEINE

ÎLE DE LA CITÉ

WE WILL START IN THE HEIGHTS AND THEN GO DOWN FAIRLY QUICKLY.

"Our cities' future lies in their underground"

MAN NOW KNOWS THE WHOLE SURFACE OF THE EARTH

NEXT STEP: THE UNDERGROUND!

HONEY, WE WILL HAVE TO MOVE

WE ARE NO LONGER HOME ANYWHERE!

URBAN SPRAWL DOES NOT STOP

WE NEED TO STOP IT.

WE ARE ANIMALS, WE DEVOUR EVERYTHING

→ A MORE CONCENTRATED CITY

⇒ NO NEED TO MOVE

IT IS A PART OF THE SOLUTION

" THERE IS A KIND OF HAPPINESS TO BEING SUBCUTANEOUS "

louise plantin

Overview of the session "Building the City Under the City"

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Healthy cities

To safeguard and promote the well-being of their residents is today an issue for cities that has significant implications for their attractiveness in the long term. Beyond access to high-quality health and social infrastructure, the development of urban space itself has an important role to play. How do we make the urban morphology a source of improvement rather than deterioration of well-being?

Urban well-being, understood as good health, social inclusion in a society that allows personal development, and a high quality of life, is currently a major issue for cities.

— **On the one hand**, there are health issues with the prevalence of certain diseases: obesity, asthma, allergies, cardiovascular and respiratory diseases, stress and certain mental illnesses such as depression.

— **On the other hand**, there are social issues: in a society with a deteriorating social contract due to growth of socio-spatial inequality, Jaillet notes that "the city is breaking apart (...), being arranged in socially differentiated cells in extreme geographical proximity (...) [that hinders] urban space's capacity to undergird social relations and open up 'shareable' spaces."[16] (Jaillet, 1997)

— **Finally**, it is an issue of attractiveness: in inter-city competition, well-being is increasingly becoming a decisive criterion.

Faced with this threefold challenge, cities have an ace up their sleeves.

First, because **the city is indeed conducive to innovation and possesses a dense ecosystem of actors who can meet these challenges**. New technologies integrated in buildings or public spaces are mobilized to safeguard urban health (the use of sensors to measure air quality in real time throughout the city or buildings, "connected health," windows with solar cells, etc.). Furthermore, public spaces, as common areas, free, open to all by right, and managed by public authorities, bring together all the fundamental conditions to become the weapon of choice of cities for promoting more social inclusiveness and better health. A place of alterity, urbanity, anonymity, and encounters with the other, public space remains one of the last areas where rethinking society through urban development makes sense. Finally, by its scale and morphology, the metropolis can not only protect but also foster health and well-being. Morphology and architecture attentive to health and well-being, eco-friendly transportation, sports, public spaces, green spaces, planning on a human scale, meeting places and so on constitute a number of promising avenues for innovation and scaling up. Preserving and promoting urban health and well-being are challenges that must be addressed on a metropolitan scale—otherwise everyone may not reap these benefits.

[16] Marie-Christine Jaillet (1997). *« Vivre "en ville" et "être ensemble" »*, Empan, n° 28, p. 9-15.

Lyon has implemeted an active policy aimed at promoting well-being, whether it is about public health in a context of frequent pollution peak or about social inclusion, which has become since the 1970s' urban riots a necessary political preoccupation. The city mobilizes a vast ecosystem of stakeholders coming from the healcare sector, (pharmaceutical industry, hospitals, digital start-ups). It has also redeveloped its urban space as a means to favour metropolitan integration.


Lyon pollution spike, 2015


Rue de la République

The OXYGEN Plan

Over the past ten years, air quality has improved significantly in the Lyon metropolitan area: the rates of fine particulates and nitrogen dioxide have decreased by half, while sulphur dioxide emissions have fallen by 74%.
In 2015, the city launched the Oxygen Plan, which aims to strengthen clean air measures.
The programme seeks to transform urban mobility (doubling traffic-calming zones, reclassifying highway A6/A7, and investing one billion euros in clean transportation by 2020), encourage eco-renovation projects (the ECORENO'V platform), regulate economic activity (completing energy audits and implementing a "clean worksite" charter), and promote innovation in the smart city field.

A Lyon Method

Since the development of Rue de la République in 1990, the city has put its residents' uses of space at the heart of designing public spaces.
For urban planner Jean-Pierre Charbonneau, "the role of public planning isn't to eliminate conflicts, but to make them liveable." Therefore this develoment methodology is based upon observation of users and of use, as well as citizen participation. Mechanism of consultation brings users and makers closer in order to reinforce public space's specificity following the "one audience for one space" principle, in such a way that people may benefit from public space in law as well as in practice.

Shifting
the perspective

"We have to take a different look at what we are delivering in terms of square meters: this means rethinking the relationship between the building and the body to enhance the way we live and work."
Jérôme Stubler

To face the sanitary, social and economic issue of urban health, a double change of perspective on how cities are built is required:

1. The World Health Organization (WHO) defines health as a "*state of complete physical mental and social well-being.* [It is] *not merely the absence of disease or infirmity*". **It is not enough to simply not be a threat to health or well-being**. I**t must also succeed in promoting and developing them** and **developing areas that create health.** To this end, multilevel, multisectoral action is essential.

2. We must start from the body and all the environmental specificities (climate, wind, sunshine, pollution, etc.) **and build the city accordingly.**

Three levels of complementary action must be considered: the building, its façade, and the public space.

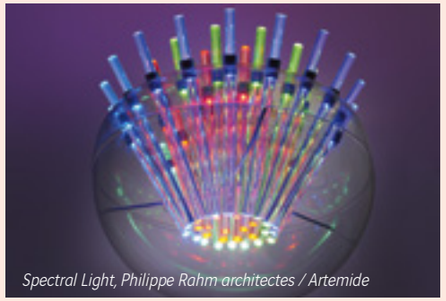
Essential interactions between the building
and the human body

Today, most of us spend 80% to 90% of our time inside a building. However, the impact of the built space on human health is still very rarely or very partially taken into account. Not that this idea is new to architecture: in his *De Re Aedificatoria*, Leon Batista Alberti, an Italian Renaissance architect, reinterpreting the Vitruvian triptych "*utilitas, firmitas, venustas*", already emphasised that apart from the pleasure produced by beauty (*voluptas*) and the solidity of the building from complying with physical and mechanical laws (*necessitas*), the art of building should respond to the imperative of *commoditas*: guarantee the well-being and health of residents. **Pollution of the air indoors, allergies, thermal and acoustic discomfort, eye strain, psychosocial stress, etc., are some of the many harmful effects of certain constructions on the human body and often cause silent pathologies that are difficult to identify and to trace to the built space**.

Jérôme Stubler, President of VINCI Construction, and architect Philippe Rahm, founder of the Philippe Rahm architecture agency, suggest, based on different, complementary perspectives, **to reconnect with the Albertan triptych by working mainly on three main interactions between the building and the human body: the temperature felt by the user, the quality of the air breathed, and the quality of light inside. Thus, Philippe Rahm advocates for a physiological and physical approach to architecture through the design of "interior meteorology" and "climates" in the building**. As for the ventilation of the building, Philippe Rahm shows that by studying convection movements in the building and adapting its layout using the "air stream" concept, it is possible to control air circulation naturally. In his university library project for Nancy, the air circulates more quickly in the workspace than around the books to ensure both comfort of users and protection of books. The same control can be achieved by working on the form of the building to optimise air temperature in the habitat, as exemplified in the *convectible apartments* designed by Philippe Rahm in Hamburg. Starting from Swiss standards that prescribe ideal temperatures for each room in the house (16°C for bedrooms, 18°C for the kitchen, 20°C for the living room and even higher for the bathroom), he suggested deforming the concrete slab to create highs and lows. The goal is to act on natural air convection to guarantee an ideal temperature in each room without additional energy and thereby create an internal thermal landscape.

University library project for Nancy, Philippe Rahm architectes

SPECTRAL LIGHT, MILAN: ADAPTING LIGHT TO PHYSIOLOGY

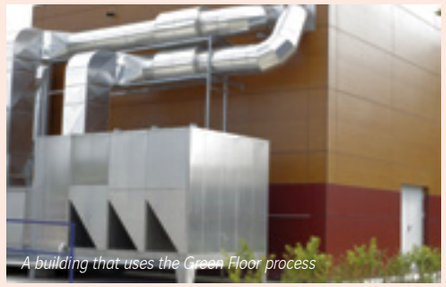


Spectral Light, Philippe Rahm architectes / Artemide

Indoor lighting often causes eye strain and headaches. Philippe Rahm has developed a special lamp called the Spectral light, which only emits wavelengths perceptible and useful to the human eye by using a method that emulates Monet's impressionism and Seurat's pointillism. This lamp can be adapted to individual physiology and non-human physiologies like those of animals or plants. The light thus diffused is significantly more comfortable for users, and the lamp more energy-efficient. It thus fulfils the double objective of health protection and sustainable development.

As for Jérôme Stubler, he proposes a method in which **some technological innovations may help improve the comfort of users significantly through dynamic management**. For instance, VINCI *Énergies* and VINCI Construction have developed a system called *Green Floor*, which allows air temperature and radiation (sun, flooring, walls) to be adjusted at the same time because, as Jérôme Stubler reiterates, the human body only draws 60% of its heat from the surrounding air, the other 40% coming from direct radiation.

GREEN FLOOR, OR HOW TO CREATE A RADIATIVE SLAB



A building that uses the Green Floor process

Green Floor is a new air conditioning-ventilation-heating system developed by VINCI *Énergies* and VINCI Construction. *Green Floor* integrates a network of six centimeter ducts through which air is blown and used as a heat transfer carrier in the flooring and ceiling of the building. It transmits its heat or coolness to the concrete slab and at the same time refreshes the air in the building. Thanks to this radiating system, it is possible to control the temperature of the air and the concrete slab. In this way, we can also control its radiation, which is essential to heating, because the human body warms up for 40% through direct radiation. The *Green Floor* process aspires to offer more stable and optimal thermal comfort through more pleasant circulation of heat in the building at the same time as good air quality.

Starting from the body and using complex management systems enable the individual control of comfort in the building: as Arjan van Timmeren, Scientific Director of the Amsterdam Institute for Advanced Metropolitan Solutions (AMS) says, there is no single type of comfort, as everyone has a different metabolism.

"Trying to obtain comfort for everyone is always suboptimal."
Arjan van Timmeren.

The façade:
a new temperature regulator?

"The major problem with global warming comes from the need to maintain our bodies at a certain temperature."
Philippe Rahm.

A critical issue for today's cities is the fight against the global warming phenomenon, and more specifically urban heat islands (UHIs). The latter results, on the one hand, in a comparatively high death rate, and on the other hand, when combined with pollution specific to dense urban space, in an increase in severe cardiovascular and respiratory problems. In this context, **building façades can play an important role: actively contributing to UHIs through their thermal and radiative capacities, they can also help fight UHIs thanks to the very same attributes.** As such, Philippe Rahm shows that it is possible to act on façade materials and colours to limit the warming of our city warming. In his project for the exterior spaces of the *Maison de la Radio*, he uses the purple, for its low infra-red emission to avoid heating the body through radiation.

Façades should no longer be considered as a simple protection against the outside (noise, cold, heat or overlook) , but as a dynamic interface between external and internal environments, and one that can adapt to the one and the other's variation. VINCI Construction has exemplified this by transforming the façade into a micro power plant using the Horizon window.

THE HORIZON WINDOW: MAKING THE FAÇADE A MICRO POWER PLANT

Horizon window, VINCI Construction and Sunpartner Technologies

The Horizon window uses photovoltaic glass panels that, either automatically or on command, adapt the opacity, generate electricity using external radiation, and enable temperation regulation of the building in order to fight urban heat islands. The window absorbs light and converts it into electricity rather than letting it transform into heat. Thus, the façade contributes to the health and comfort of citizens and users while offering for an optimised use of buildings: Jérôme Stubler points out that the three first meters by the window of buildings facing South cannot be used because of thermal discomfort.

Urban and public spaces:
at the heart of the plan for improved health in the city

Building a healthy city must be perceived as an overarching action that integrates and articulates various scales of action: health seen from the scale of a single building makes no sense, at least for three reasons. Firstly, building has an impact on the environment and biodiversity; then, the way the urban space is laid out can balance harmful consequences on climate; finally, the design of public space may help engance residents' health by promoting social inclusion and physical activity.

REDUCING THE ENVIRONMENTAL EFFECT OF THE BUILT SPACE AND PROMOTING BIODIVERSITY

The building is in constant interaction with its environment and has a direct impact on it. That is why the "Eco-Design of Buildings and Infrastructure" Chair, in partnership with AgroParisTech and VINCI, has developed Biodi(V)strict®, a tool to assess the impact of an urban project on its environment and identify paths for action to reduce negative impact and contribute to biodiversity. The greening of the city is thus promoted by a better urban project design which may reduce the average temperature by 2°C, according to Jérôme Stubler.

Eco-designed bulliding, Biodi(V)strict.

BIODI(V)STRICT®: A DECISION-MAKING AID TO DEVELOP BIODIVERSITY

The construction of a building has an impact on the overall environment (which a life cycle analysis can quantify and assess properly), as well as on biodiversity on a double scale: on the scale of the lot, the built space affects the functioning of the local ecosystem; on the neighbourhood scale, it can alter ecological continuity or help re-establish it. Biodi(V)strict®, the tool developed by the ParisTech-VINCI "Eco-Design of Buildings and Infrastructure" Chair, aims not only to reduce the negative impact of the built space on ecosystems, but also to promote biodiversity, thereby taking into account residents' expectations for a better lifestyle and successful integration between built spaces and spaces that support biodiversity. To this end, Biodi(V)strict® carries out a double evaluation of biodiversity, one evaluation before operation and an estimated one after. Following this, an analysis of the variations in potential before and after construction may be conducted based upon five indicators (habitat diversity, vegetation stratification diversity, site permeability...) so that the project may be adapted accordingly.

Biodi(V)strict® is therefore a tool that allows, going beyond current regulation in terms of biodiversity by evaluating all ecological potentialities of one site and on the other hand help decision-making by integrating a long-un vision and enable dialogue between all stakeholders by making aims concrete.

CREATING MICROCLIMATES FAVOURABLE TO HEALTH

The exterior urban space plays a major role in the promotion of health in the city. The way it is designed can have both positive and negative consequences. This is what Philippe Rahm has demonstrated in his Taichung Jade Eco Park development project in Taiwan, in the tradition of the first major London parks of the 19th century, developed following the statement living near a park could increase life expectancy up to 10 years. This project is based on a cross-cartography of temperatures, air circulation and humidity, pollution and noise around the park. This aims at developing natural and technical mechanisms that may balance negative impact of the environment in real time using sensors (depolluting trees, air humidifiers, ventilation columns, etc.) and define functional zones more adapted to human physiology, in accordance with environmental specificities (sports grounds in drier places, children's games away from pollution, etc.).

Taichung Jade Eco Park, Taiwan

TAICHUNG JADE ECO PARK: CREATE MICROCLIMATES ADAPTED TO DIFFERENT ACTIVITIES

Giving back outdoor space to Taiwan's citizens: this was Philippe Rahm's ambition for Taichung Jade Eco Park, built on 70 hectares of the old airport site. For this, it was necessary to counter the main effects of a subtropical climate and pollution. **Thanks to computational simulation of fluid dynamics, the climate variations of the park could be studied and different zones could be mapped based on their climate quality (naturally dry, hot, cool, polluted or unpolluted, etc.)** The design aimed to strengthen the best feature of three of these microclimates (fresh, dry, unpolluted air) through the action of natural and connected climate equipment.

— Refreshing the air: trees with large leaves or white flowers were planted to create shade and reflect light. Different devices are used for support, such as the "*anticyclone*" which blows fresh air through an underground thermal exchange, the "*night light*", which through water streaming on a black and cold surface, cools the human body nearby.

— Drying up: this implies providing protection from the rain with large-leaved trees and installing shelters and drying the air with the "*Dry cloud*" machine, which blows air which humidity is first absorbed by silica gel.

— Fighting pollution: trees capable of absorbing large quantities of nitrogen oxide and other ærosols and of forming a noise barrier were planted and accompanied by machines such as the "*ozone eclipses*", which process the air of various fine particles.

The creation of these microclimates determine the most conducive areas for children's game, relaxation and sports. Thus, the park is transformed into a climate landscape in such a way that people may enjoy various environments according to their physiological needs.

PUBLIC SPACE, A SPECIAL TOOL FOR INCREASED SOCIAL INCLUSION AND HEALTH IN THE CITY

"We underestimate the importance of public spaces and the importance of making them inclusive."
Arjan van Timmeren.

The exterior urban space plays a crucial role in citizens' mental health and well-being in the city. This is what the "The future of public spaces" project led by La Fabrique de la Cité in partnership with the Amsterdam Institute for Advanced Metropolitan Solutions (AMS) is committed to demonstrating. **In principle, public space meets all requirements to become a favoured tool for increased social inclusion and health in cities. A common free space that is open to all by law and managed by the state, public space is in fact a space both for mobility and sociability. It has the capacity to bind society together – but this mechanism can be easily blocked, depending, in particular, on the development options that are chosen.** Our project worked from the hypothesis that **practising open and free sports in the public space has the capacity to promote social inclusion and health for all** and verified this on the ground in Amsterdam and in Plaine Commune. Statistics about Amsterdam that identify groups of population lacking physical activity indicate a strong correlation with people who are socially and economically disadvantaged.

Sports in public space brings partial answers to the following questions: **How to give access to public spaces?** It is not enough for the space to be available, especially for those who are most excluded. We must be able to facilitate its use and appropriation. Physical exercise is one of the easiest uses for everyone in that it gives a place and a reason to occupy it. **How to bring together people who do not know each other?** Sports can be a vehicle for encounters, by letting people share a common practice that transcends cultural and social differences.

How to open up spaces to the outside? The creation of courses develops social mixing by encouraging movement. **How to promote health for all?** New studies show that the positive effect of sports is felt even at low levels of practice and intensity – perfectly adapted to public space due to its immediate and free availability, if development enables and all the more favours it.

Our study has highlighted four types of more or less extensive design that can promote this sports practice:

— **redevelopment of public space**: this type of intervention offers a great variety of solutions to promote sports practice from the most directly encouraging forms, linked to a specific sport (e.g., installation of sports equipment, based on the Kompan example) to subtler ones (e.g., leaving enough free space for open practice alongside other use of public space).

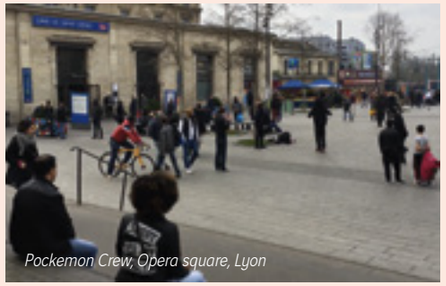
— **temporary set-up**: this offers a double advantage in terms of time. It first optimizes the use of space though its development according to time-design perspective: streets and squares may be dedicated to sports practice at certain times of the day. This set-up may be supported by retractable or removable equipment. Then, by promoting temporary set-up projects for a period of a few weeks to a few months in such a way as to experiment with new use of public space – which can may be made permanent if successful. This type of intervention has the benefit of raising the significant investment barrier that permanent redevelopment of public space represents.

— **new technologies**: firstly, they serve as a decision-making aid by mapping uses and enabling various set-ups to be better-sized and placed to support or develop sports practice, as exemplified by startupTrack Landscapes, which mapped joggers' routes in a park to improve the design based on Strava and Runkeeper data; then, they serve as an encouragement for practice through connected sports equipment allowing the practice to be guided as by a coach, measuring performance, or offering a way to create communities around a given sport.

— **activation without set-up**: open and free sports practice in the public space dœs not necessarily need a specific set-up. Some of it manages to make use of the potential in a public space, which in itself allows a new look at this. Practising parkour or dancing in the public space are perfect examples of this as shown by the experience of the Pockemon Crew, which agreed to participate in an experiment at Plaine Commune as part of this study.

Running Amsterdam, Track Landscapes

THE POCKEMON CREW OR THE CONQUEST OF PUBLIC SPACE



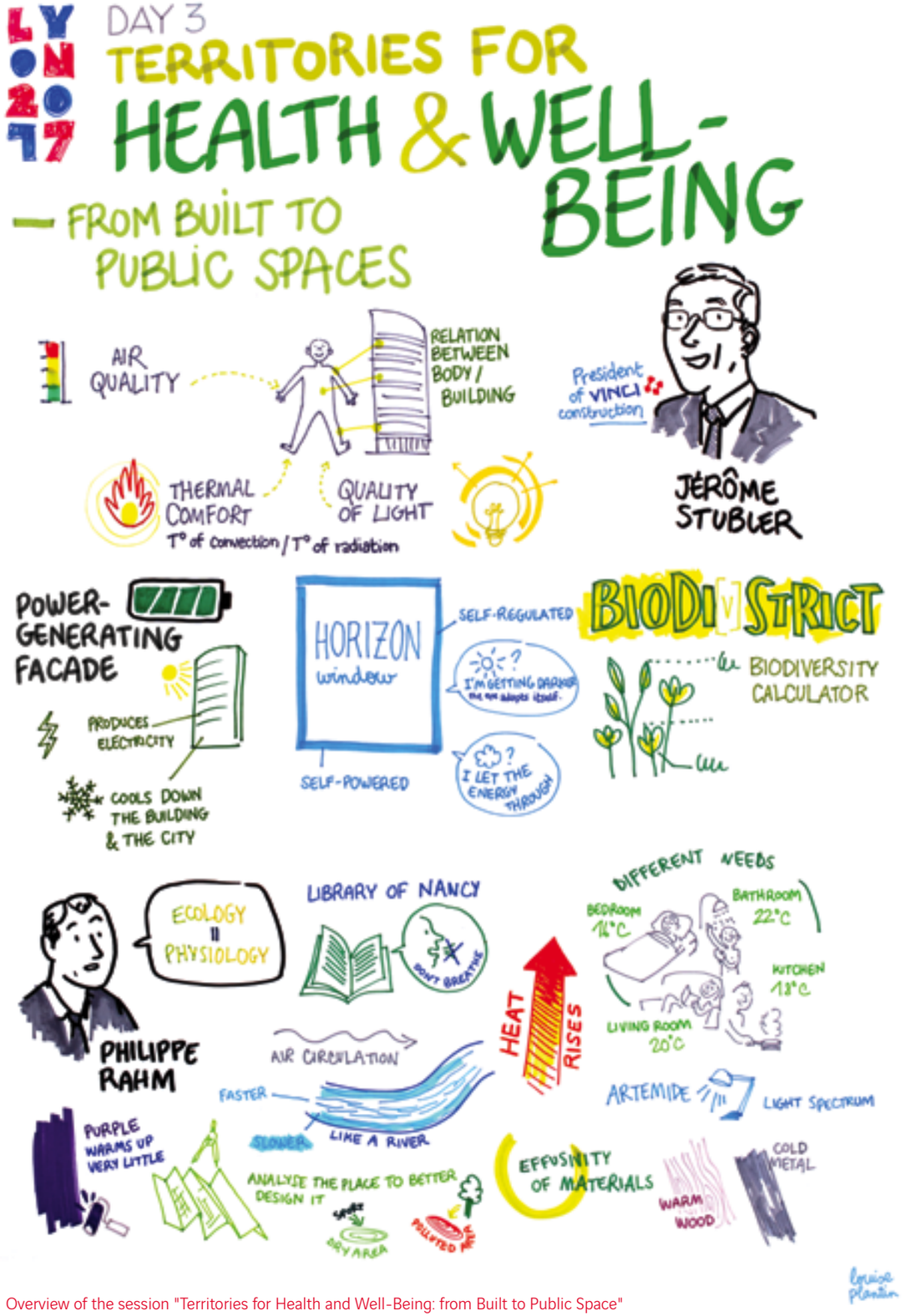
Pockemon Crew, Opera square, Lyon

The Pockemon Crew is a hip-hop troupe born in the streets of Lyon. Looking for places where they could perform, they found an ideal location in the square in front of the *Opéra de Lyon*. Very quickly, the square became an attraction for both residents and tourists, who flocked to see the dancers. After several years of practice in public space, which led to the creation of an actual troupe under the direction of Ryad Fghani, the Pockemon Crew finally entered the Opéra and produced several collaborative performances.
As part of our study, two performers came to dance in several public spaces in Saint-Denis. This experiment resulted in the observation of a close link between the configuration of space, the practice of a sport, and its capacity to create social connection.
All places are not adequate for the practice of sports and only some of them can transform the practice into a show to create attraction. However, in all places, even the least adequate, social contacts were made, rendered more direct and personal by the less conducive to pratice nature of the place, especially with people with very little right to public space, including the homeless, children, but also with other dancers..

Two central factors can be singled out to guarantee the success of a policy in favour of sports in public space: firstly, taking into account the body (as much its physiological as social and cultural dimensions) **– and through this, the individual**. **Then, seeking the support of the local population by associating it ahead of the installation of new equipment and finding relays in each community**. It is also through a participative approach that the promotion of physical activity in public space can be really inclusive and contribute effectively to the enhancement of the health and well-being of all citizens.

"We have a sandwich strategy: We associate top-down research and monitoring with a bottom-up implementation by citizens and this is how we get good results."
Arjan van Timmeren.

Architecture and morphology that pay considering health, well-being, soft mobility, sports, public space, green space, the physical dimension of development, places for socialisation and meetings: these all offer prospects for innovation and upscaling. Protecting and producing health and well-being in the city can only be achieved at the metropolitan scale, failing which it may otherwise benefit only to a minority.



Overview of the session "Territories for Health and Well-Being: from Built to Public Space"

Overview of the session "Territories for Health and Well-Being: from Built to Public Space"

Beyond borders – the strength of networks

The appeal of a metropolis lies not only in its ability to offer a set of on-site resources, but also in its capacity to provide access to resources located elsewhere. Links fostered with other cities become resources in themselves.

In a world dominated by exchange, the scale of the metropolis, a major player in global transformations, is no longer accurate. We need to overcome our view of the metropolis as a place where people, goods, services, and infrastructures are accumulated, and stop analysing networks solely in terms of localization and distribution. We must take into consideration what Nadine Cattan calls "mobile territorialities" and "network society." "Gateway" cities experience and organize movements, and in doing so, become interconnected with other territories by means of interdependent relationships and shifting articulations. Purely competitive thinking is put aside to favour more complex strategies that merge competition and cooperation, and play up complementary aspects in such a way that "territories no longer play against, but rather, with other territories."

The challenge for cities is no longer to engage in a never-ending quest to offer the same as their competitors, but rather, to use relational logic to provide the best possible access to other territories, rich in other comparative advantages. The city therefore asserts itself as an interface, and on multiple levels.

— **Local networks can be reinforced** by developing the potential of each territory, exceeding to some extent the traditional, and at times hardening, hierarchical relationships between metropolises and peripheral communities.

— **City networks are also reinforced on a global scale**, since the strengthening and diversification of links signifies a gain by each urban sector in terms of influence and effectiveness. Indeed, these new cooperative relationships allow cities to deal with complex mutual challenges that benefit from a sharing of perspectives, such as climate change, upheavals caused by new technologies, and revolutions in mobility.

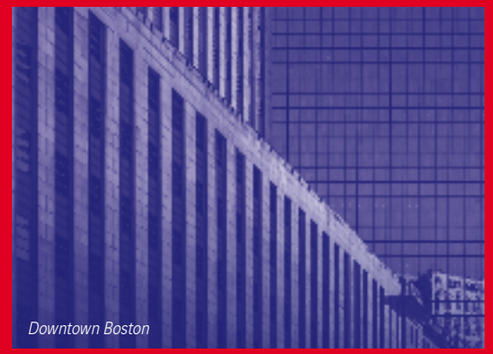
— These new types of global challenges, paired with a new logic of relations, can bring about **a different form of collaboration. Using the smart city as an example**, a new space for dialogue can be established between cities

of the emerging world and developed countries, which can surpass the traditional segmented and culturally dominant forms of cooperation.

Today, the balance is to be found between the link and the place within multistakeholder and multiscale partnerships.

Very early on, the city of Lyon sought to conquer the international scene. It tended to its reputation as a city open to the world, with entrepreneurial ambitions. Beyond the resources offered by its territories, the metropolis gradually equipped itself with a network in order to develop new resources on a national (Saint-Etienne) and international (Geneva, Boston) scale. It established academic, cultural, economic, and scientific partnerships. According to Gérard Collomb, this is a case of "economic diplomacy."

OnlyLyon sign, in the Confluence District



Downtown Boston

OnlyLyon
The metropolis ensured its own international promotion through the OnlyLyon brand created in 2007. This programme provides national and international visibility, on both an economic and a cultural level.

Lyon equipped itself with 22,000 "ambassadors" (business persons, researchers, academics, and artists) who live around the world and volunteer to promote the city during their private and professional travels.

This approach allowed the urban centre to develop an international network, and to fashion a strong image for itself: that of a "metropolis of entrepreneurs." Proof can be seen with ADERLY (the Lyon Area Economic Development Agency), which recorded 22,700 businesses in 2014, a 122% increase in ten years.

This strategy allowed the city to rise on international charts.

Lyon-Boston collaboration
Since 2014, the Lyon Metropolis has increased its exchanges with Boston, a pioneer city of urban innovation in North America.

The partnership was made official on February 10, 2016, with the signing of a Memorandum of Understanding in which the two cities committed to closer collaboration in the sectors of economic and urban development, innovation, culture, and tourism.

Lyon and Boston harbour similar economic ecosystems which promote biotechnologies, health, and robotics. The development of closer ties led to the establishment of the Big Booster programme in 2016, which aims to ramp up businesses and stimulate the emergence of new entrepreneurial ventures on both sides of the Atlantic.

For a relational approach to territories

CITIES ARE BORN FROM THEIR INTEGRATION INTO A NETWORK

Understanding a city requires two complementary approaches: first, understanding the setting and transformations that a human society, through its mastery of techniques and cultural specificities, experiences (vertical relations); second, understanding the relations that the city maintains with other places (horizontal relations). This second approach, also called spatial analysis, is particularly interesting: it highlights networks and brings to the surface the fact that **cities draw their strength from their integration into a more or less dense bundle of relations with other territories**.

"Lyon was always a platform for exchanges and owes its rise to its various interactions with both near and far perimeters."
Karine Dognin-Sauze

The concept of network also invokes the idea of spatial discontinuity: the network never covers the whole territory, but rather connects points and leaves others out. In this approach, **connection routes (material or informational), hubs, and even more so, network entry points, become especially important because they are the ones capable of capturing the value of movements through their control and redistribution**. The study of all these interactions between territories brings out city systems, which are more or less spread out spatially, regulated by relations that are simultaneously functional (exchange of information, goods, people, etc.), hierarchical, and competitive (or synergetic).

AN ARCHIPELAGO ECONOMY THAT ACCENTUATES SPATIAL DISCONTINUITY AND POLARISATION

One of the specificities of our era is the accentuation of movements and exchanges. Mobility – goods, people, information – has become both easier (because of a rapid reduction in the cost of transport in particular) **and more indispensable**. François Ascher said it well: in the era of metapoles, we do not find all that we need nearby, both on the individual scale (work, housing, leisure, relations, etc.) and on the business scale[14]. Pierre Veltz explained this by analysing the increasing labour division on the global scale caused by globalisation and the increased capacity for storage and the movement of goods, information, and people. **We are not witnessing a homogeneous movement of distribution at the global level, but on the contrary, the emergence of an archipelago economy**. **This takes the form of a double movement of concentration in hubs – the metropolises – and increase in interrelations among these hubs,** guided by actors such as multinational companies, diasporas, and civil society worldwide. The guiding principle is not spatial continuity or proximity or the nation-state, but the node. **Metropolises, "*crossover and switch-over node[s] [...] like a condensation point in a vast and indecipherable grid*[15]", join the different scales** and find, in this global system, a significant comparative advantage. They enable the flexibility of relations made necessary by the unpredictability of contemporary economies. **The network, as it emerges, is "a *discontinuous and layered system*[16]".**

[14] François Ascher (1995) *Métapolis ou l'avenir des villes*, Odile Jacob
[15] Pierre Veltz (1996) *Mondialisation, villes et territoires. L'économie d'archipel*, PUF
[16] ibid

GATEWAY METROPOLISES THAT CONNECT VARIOUS SCALES

The emergence of these mobile territories and networked societies leads to a radical change in how urban systems are viewed: **criteria for location and distribution analysis matter less than their interdependence and connection, thereby promoting a relational reading of spaces**[17].

From this perspective, it appears that urban systems are more multipolar than single-centred. That is the reason why Nadine Cattan prefers to speak of "the metropolitan archipelago" rather than the metropolis. Besides, it appears that each territory, independent of its size and position in the urban hierarchy, can contribute to innovation (even if all do not). **The capacity to remotely mobilise other resources than those from its territory through its interconnections count as much as its capacity for accumulation and attraction. Nadine Cattan highlights the role of gateways that cities and more specifically, metropolises, play today. This paves the way for a new complementarity between territories** by freeing them from administrative perimeters.

The analysis of **the transformation of the traditional logics of competition, accumulation, and hierarchy to new logics of cooperation, valuing territorial differences and multi-scale networks** found a special resonance in the dialogue between Lyon, Saint-Etienne, Turin, Geneva, Ouagadougou, and Pittsburgh.

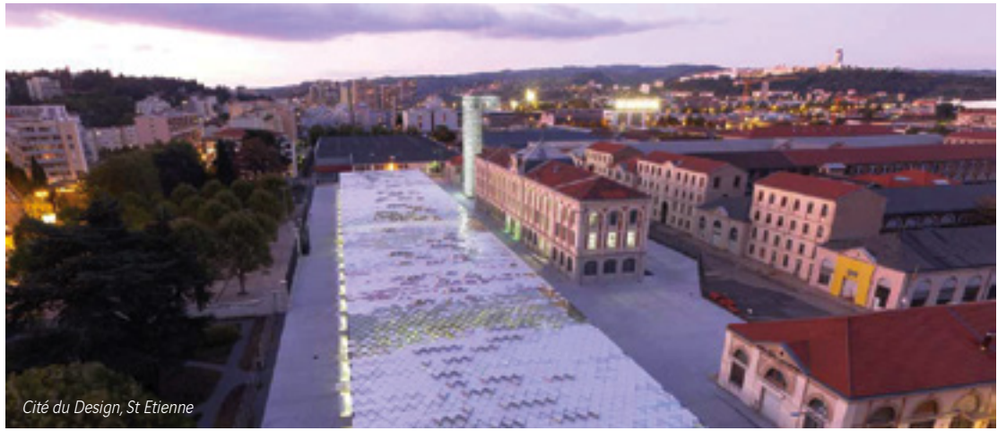
[17] Sandrine Berroir, Nadine Cattan, Marianne Guérois, Fabien Paulus, Céline Vacchiani-Marcuzzo (2013) *Les systèmes urbains Français*, DATAR, Travaux en ligne, N°10

FOR A RELATIONAL VIEW OF TERRITORIES: URBAN SYSTEMS ANALYSED THROUGH THE PRISM OF RELATIONS BETWEEN CITIES

In their work for DATAR on French urban systems, Sandrine Berroir, Nadine Cattan, Marianne Guérois, Fabien Paulus, and Céline Vacchiani-Marcuzzo analyse urban systems from the sole angle of relations that interconnect cities. Seven indicators of links between cities were chosen: home-work mobility, residential migration, high-speed system (plane and high-speed TGV rail); the institutions-headquarters links in technologically innovative sectors; those in all fields of activity; European scientific partnerships; main residence-secondary residence links. These seven indicators cover three current transformations in the structure of French society: the dominance of a mobility and leisure society, the emergence of a knowledge and information society (a decisive factor for competitiveness) and finally, the advent of a globalised tertiary society.

This approach has the double specificity of being multi-scale (nearby, transversal, inter-metropolitan and connected to Paris) and multidimensional (several movements of different nature are jointly analysed). It can go beyond the classic approach of urban systems according to the centre-periphery model or hierarchical model. It reveals the existence, in France, of 26 urban systems that break the borders of metropolises in terms of administrative perimeter and much more in terms of spatial continuity.

New forms
of cooperation


Cité du Design, St Etienne

BEYOND THE LIMITS AND BOUNDARIES OF METROPOLISES

Karine Dognin-Sauze, Vice-President of Metropolitan Lyon, Gaël Perdriau, Mayor of Saint-Etienne, Rémy Pagani, Mayor of Geneva, and Anna Merlin, City Councillor for Turin: all agree that their territories are part of a network, and the interrelations that they maintain with other territories have exploded the perimeter of the metropolis as a relevant criterion for analysis. For this, they list several reasons:

Firstly, movements that pass through metropolises do not originate in the metropolis, although some of them may have it as their destination. This is the case of Metropolitan Lyon: To date, 27% of the people who work in Lyon do not reside there. **Urban proximity systems are organised not on the scale of the metropolis, but on the living area scale.**

Then, **metropolises function as network gateways and junctions that allow movements to cross and different actors to meet**. This is what Rémy Pagani indicates by pointing out that 22 international organisations are headquartered in Geneva; Karine Dognin-Sauze, indicating that Lyon has a Swiss consulate that stimulates exchanges with the neighbouring country, invites the Swiss community to settle in Lyon; and finally Gaël Perdriau, explaining that Saint-Étienne has become a UNESCO City of design in the creative city network, which shows its wealth of exchanges with other cities in the field of design and its capacity to serve as a meeting place. The *Cité du design* and the organisation of the International Design Biennial, which enables it to be part of a structured network of cities, testify to this.

Integrating multiple territorial affiliations and the emergence of a globalised civil society, metropolises are more and more careful about taking care of their local networks relocated overseas, which are perceived as resources for a new form of territorial marketing and entry points for new exchanges. This is the case, for instance, of the network of ambassadors structured by the ONLYLYON brand, which has more than 24,000 members. They are committed to promoting Lyon and the network in their City of residence and "*identifying a development opportunity, which will attract new events, investment projects, businesses, talent, cultural actors and tourists to Lyon*[18]" in exchange for being put in touch with other ambassadors to broaden their business network and participation in events organised for ambassadors in countries where they are present.

The importance given to interconnection, the gateway metropolis and mobilisation of remote resources give rise to a new form of interrelations between territories guided by cooperation and complementarity.

NEW FORMS OF COOPERATION

These new forms of territorial cooperation are firstly founded on the identification of common interests or challenges to be faced. This is what makes Anna Merlin say that Metropolitan Turin, made up of multiple small and medium cities, is better off building relations with French metropolises than with Metropolitan Milan, which is dominated by a powerful city-centre. **Geographic or national proximity becomes a less relevant criterion than sharing a common interest to establish exchanges**.

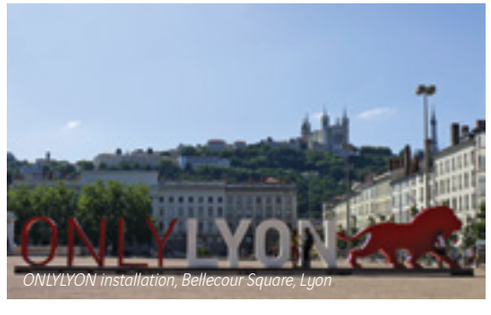
"Today, we must think in terms of common areas of interest rather than in terms of national borders."
Anna Merlin

This sharing of common interests can go further and lead to creating forms of cooperation founded on the promotion of resources specific to each territory and the highlighting of complementarities, which also falls under the approach of competitiveness on the international scale and which demands the attainment of certain critical volumes to exist.

[18] http://ambassadeurs.onlylyon.com/inscription.html

"The bonds between Lyon and Saint-Etienne are natural and very profitable. The two cities each have their own ecosystem of actors. The cooperation that we can build makes us stronger and more visible in certain markets."
Gaël Perdriau.

Lyon and Saint-Étienne, formerly rival cities, have in the past few years committed to a reconciliation: they have an industrial base that is still solid and a common economic history. Saint-Étienne is home to metallurgical and textile trades and Lyon, activities related to silk, chemistry, and cars. Today, the two metropolises maintain industrial relations and share the same chamber of commerce and the same labour pool. As Karine Dognin-Sauze points out, there is a living area and movements common to the two cities. They must not be ignored, but rather, structured. They must above all be "*accelerated to make them an engine for development*". This acceleration is done through the construction of unique governance tools: the economic development agency and the territorial brand ONLYLYON, which allow to build a consistent offer and reach new markets. Anna Merlin in fact confirms **the necessity of expanding the benefits of the territorial brand to its space of interrelation to be able to activate new territorial development resources**, tourism in the case of Turin.



ONLYLYON installation, Bellecour Square, Lyon

"We have built a joint economic development agency that allows us to develop an international offering, which is more consistent and coherent to share the economic impact. Our territorial brand is called ONLYLYON, but benefits both Lyon and Saint-Etienne."
Karine Dognin-Sauze

In the digital economy sector, Lyon, Saint-Étienne, and Grenoble are coordinating their "French Tech" project, which operates in a perfect synergy. The three agglomerations advocate for a common digital transition for all territories. Thus, the Saint-Étienne digital workshop concentrates on optics and design, the one in Lyon on software and robotics; and the one in Grenoble on nanotechnologies and connecting objects. In 2007, Lyon and Saint-Étienne founded a community of institutions to constitute a university and scientific reference centre on the European and international scales. Today, the *Université de Lyon* has more than 137,000 students and 168 public laboratories and enjoys an excellent reputation.

However, we must note that the logic of cooperation dœs not supplant the logic of competition, as Rémy Pagani points out by referring to the discussions that Lyon and Geneva had about their airports. **The links that connect territories are far from homogeneous**. In an urban system, some links can be very strong (scientific cooperation, for instance), weaker (secondary residences, for example) or even practically non-existent, thereby reflecting the logic of competition (airport links). This multicriteria, multi-scale analysis enables links to be qualified in fine detail so that the complexity of contemporary networks can be understood.

"There is as much competition as cooperation. The new complexity of the world in which we live leads us to learn how to connect several scales simultaneously with agility and skill."
Karine Dognin-Sauze

FORMALISING AND CREATING NEW COOPERATIVE RELATIONS

The study of these cooperative relations is a continuation of historical links: in the same way that royal roads sustainably structured interrelations on French territory and continue to do so; until the 19th century, at the height of the silk commerce, Geneva turned to Lyon rather than Bern to trade with the city through a railway line, **and even today, large infrastructure networks formalise and embody urban networks**. Rémy Pagani observes that the road, which connects Geneva to Annecy facilitates cross-border travel, strengthens the economic cooperation between the two cities and stimulates the emergence of a centre of regional competitiveness.

"Before the creation of the Geneva-Annecy motorway, the relation was much slacker."
Rémy Pagani

Other infrastructures can encourage closer relations between cities. Geneva has started the construction of a monumental theatre, *la Nouvelle Comédie*, which will have a major impact on the whole urban area. It is right next to the Eaux-Vives station and residents of communes that are around it or even farther away will be able to go there to enjoy a show. According to Rémy Pagani, *"you can take the train directly to the theatre"*.

THE NEED FOR A NEW FRAME OF REFERENCE

Although networking territories manages to remove physical boundaries, Karine Dognin-Sauze notes that invisible boundaries remain very present. The networking of territories in fact poses a real challenge: how can we think beyond governance perimeters? And what kind of governance should be imagined for these archipelago territories? A subsidiary question: how to organise movements that do not come from the territory and for which data is missing? Metropolises today suffer from a lack of tools available to obtain relevant data about the movements they receive. Under these conditions, how can traffic be made smoother?, Karin Dognin-Sauze rightly asks. Thus, the networking of territories requires a new frame of reference that connects the different scales and disregards institutional parameters, a prerequisite for the good governance of these movements and a rewarding cooperation between territories. This new frame of reference must be underpinned by work on relevant data to be collected, starting with data on motor transport on the scale of living areas, which has a major territorial impact on their organisation.

"We must craft new policies that are based on these new dynamics and frames of reference."
Karine Dognin-Sauze

This new frame of reference should be useful to recognise **the complexity of territorial interrelations**. As Karine Dognin-Sauze points out, **these play out nation to nation and city to city at the same time, without one level having to exclude the other. The whole issue is to be able to let these different levels, and sometimes divergent interests, cohabit.**

CURRENT BORDER DEVELOPMENTS?

In the same way that Pierre Veltz affirms that the archipelago economy is not sounding the knell for the nation-state, which retains the mission of organising the social and territorial links in the global economic engine, a requirement for economic efficiency, Rémy Pagani points out that the nation-state remains the guarantor for socio-territorial equality. In fact, **the new highly-polarised network taking form risks leaving behind entire swathes of territory and society. He advises caution in the face of the temptation to "*leap over all borders*"**. In societies with mobile territories and where belonging to a single territory makes increasingly less sense for many, it is a real challenge to articulate territorial scales and define perimeters that make sense for all residents.

"The complexity of the current situation rests on the following paradox: I am for the free movement of goods and people, which is the basis for Europe, but at the same time, I am in favour of borders, virtual if you like, which allow a social identity to be formed."
Rémy Pagani

Rémy Pagani

Major urban challenges,
a call for international cooperation?

A new factor also results in the redefinition of interterritorial relations: **the existence of challenges that, as much by their scale as their complexity, make it impossible for a metropolis on its own, no matter how influential it is, to face them alone. Networking on the international scale finds all its relevance here.**

Climate change and the digital revolution are excellent examples that illustrate the importance of the role that metropolises have to play and the new kinds of exchanges taking place to face these challenges. In this context, **economic cooperation and partnership come before "institutional friendships" and relationships dominated by diplomacy.**

BUILDING THE SMART CITY AND ENCOURAGING INNOVATION: FLATTENING URBAN HIERARCHIES?

Building the Smart City requires bringing new answers and inventing a new model for cities. Faced with this challenge, mature cities do not at first blush start with a comparative advantage if they have not already succeeded in concentrating innovation ecosystems in their midst. Conversely, **developing cities might prove to be quickly mobilisable grounds for experimentation**: one, because of their needs, which are going to increase with metropolisation and the necessary urban organisation resulting from it to be able to prevent the increase of extreme poverty; second, because of the constraint of the existing, with **infrastructures needing to be built, not to be replaced or transformed as in mature cities**.

A technological leap in favour of the smart city could be made quickly, as was the case with mobile telephones, which did not have to wait for the penetration rate of fixed line telephones to expand massively.

"It makes no sense to be closed to new technologies. They are going be forced on us. So, we must ensure that they facilitate people's lives."
Armand Béouindé


Armand Béouindé

A new dialogue must be started between mature and developing cities. Ouagadougou, which wishes to become a pleasant city to live in, aspires to have a dense transport network and to become a territory for experimentation.

"Mobility is a primary human need. Ouagadougou, a two-wheeler capital, has seen its size multiplied 30 times in ten years to reach 300 km². The city now needs a real public transport network to tackle the triple problem of pollution, congestion and security."
Armand Béouindé

The solution does not lie in recycling the urban fabric or pre-existing services, but rather in building a "new city", quickly offering new jobs and accelerating growth. A partnership between growing cities of the African continent and urban innovation actors would be mutually beneficient: the former would gain in terms of state-of-the-art infrastructure while the latter would benefit from unprecedented feedback given the scale of possible project implementation.

"Africa has a lot to teach us, particularly on questions of urban innovation, for two major reasons: the young average age of the population and the high constraints its cities are subject to."
Karine Dognin-Sauze


Karine Dognin-Sauze

METROPOLISES ON THE FRONTLINE OF THE FIGHT AGAINST CLIMATE CHANGE

The challenge in the fight against climate change is on a global scale: everybody is concerned, above all, metropolises. As they bring together more than half of humanity and most of the economic and political control centres, they are vulnerable zones. Because the major part of emissions is concentrated there, their commitment to fighting climate change is decisive. Metropolises understand this combat and have structured themselves into networks to promote the exchange of experiences and weigh in on the global debate. This is the case of the C40 Climate Leadership Group, created in 2005 on the initiative of London Mayor Ken Livingstone, and supported by Bloomberg Philanthropies: today, it gathers 91 of the largest cities in the world from more than 50 different countries, representing more than 600 million residents, 25% of the global GDP, and 70% of greenhouse gas emissions. Around 10,000 actions to fight against climate change were taken by cities in the network.

The case of Pittsburgh is particularly enlightening to understand the new role that metropolises can play – going against the grain of even national decisions. On 1 June 2017, the President of the United States justified the withdrawal of his country from the Paris Climate Agreement signed in 2015, asserting that he was not elected to represent Paris, but the residents of Pittsburgh. By the answer he tweeted, the Mayor of Pittsburgh Bill Peduto became a symbol of the resistance put up by cities in the face of federal policies.

"As Mayor of Pittsburgh, I can assure you that we will follow the guidelines of the Paris Agreement for our citizens, economy and future,"
Bill Peduto.

Mayor Peduto also announced his opposition to the withdrawal from the Paris Agreement and his will to continue to comply with it, and affirmed **the new importance of cities in the face of what he sees as a failure of the State:** *"It is now up to cities to take the reins"*. The basis for this commitment is less the opposition to Washington through political means than **the proof provided by the example that cities are the relevant and effective level to fight against climate change**.

"We are not going against Trump or Washington. It's something else. We are going to create a program to show that there is a solution to better solve our problem at the local level and show that we can learn from each other."
Bill Peduto

The City of Pittsburgh has demonstrated this, which has had climate change on its agenda for a long time. Pittsburgh voluntarily defines itself as one of the best examples of a resilient city. Leading city of the second industrial revolution, an international steel city developed under Andrew Carnegie, it suffered the full impact of the iron and steel industry crisis and lost a large number of jobs and residents. A policy bent on restructuring the local economic fabric in favour of new technologies (Uber, Google, Tesla are present there and Pittsburgh is home to Carnegie-Mellon University) and of the fight against atmospheric pollution (the first Clean Air Act to be signed in the United States) has enabled the city to take a major turn.

From a city perceived as dirty and polluted, Pittsburgh has become one of the cities with the best quality of life. Pittsburgh is resilient in many ways: first, having overcome a major structural crisis and being reinvented by a resolute choice in favour of the new economy; then, **being able to achieve several objectives through a single policy of fighting against pollution and climate change has also become a platform for economic and territorial development**.

"Clean energy can serve as a catalyst to rebuild the economy."
Bill Peduto


Bill Peduto

International networks
marked by reciprocity and the importance of non-institutional partners

EXCHANGING EXPERIENCES WITHOUT TRANSFERRING MODELS

"Good ideas have no borders."
Anna Merlin

Karine Dognin-Sauze, Armand Béouindé, and Bill Peduto all agree on a point made by Anna Merlin: "***Good ideas have no borders*". Cooperation between metropolises leads to a very rewarding exchange of experiences that contributes to local innovation**. However, all specify that this cannot be understood as, and reduced to, a simple exchange of universally-applicable recipes. **Faced with the complexity of the issues and the specificities of local situations, mere transposition of the model cannot be considered**.

"With smart cities, there is great danger of wanting to standardise cities and set standards based on the idea that new technologies lead to quite similar solutions. However, it is the opposite: we must always put the question of the cultural and contextual dimension in perspective to better invest in new technologies and map out paths specific to each."
Karine Dognin-Sauze

The temptation, however, is great, as Karine Dognin-Sauze notes: new technologies create the fantasy of control and through this, a diminution of the complexity. But new technologies are interesting because they allow the unchangeable specificities of the local context to be managed. This is why Armand Béouindé affirms the need to create cooperative relations that are not dependent on knowledge transfer and models, but on the co-construction of local solutions adapted to the context. His ambition is to be able to develop a smart Ouagadougou and not just another smart city. The creation of a network, an urban system, offers this possibility: a metropolis can use, be inspired by, and adapt the elements of neighbouring cities.

"Smart Ouagadougou means bringing modernity without losing our identity."
Armand Béouindé

Bill Peduto notes that because new technologies are developing at exponential speed, as technological solutions are barely installed in the city, they are often surpassed, better and more cheaply implemented elsewhere. He insists on the necessity **of basing cooperation between cities less on the exchange of technical solutions than on knowledge exchange and partnerships with universities to understand what kind of deployment of a technical solution can serve the common good.** It is at this level that cooperation can have true added value. It is also in this way that cities assert themselves as relevant levels of governance, both for the territory and the actors.

"The best that you can do as a city is to learn from each other, no matter what the subject is. Technologies will continue to be in competition to meet the needs of cities. But what cities can do is to start putting in place partnerships with NGOs and universities, which is what they need for their citizens. This can help guide the sector in a way that will benefit society."
Bill Peduto

"To move us closer to Boston's innovation environment, we innovated in our own way of conducting international relations. Instead of a traditional policy proposal for a city-to-city institutional relation, we favoured a pragmatic initiative. We have created an acceleration program adjusted in Lyon to network the Lyon and Boston ecosystems."
Karine Dognin-Sauze

ABANDONING TRADITIONAL PARTNERSHIPS

International networks of metropolises seem to be moving away from traditional connections and partnerships, whether they be "institutional friendships" or predominantly diplomatic relations, whether guided or not by the nation-state. Cooperation and agreement between cities, particularly in the face of major urban challenges, are built on other logics: metropolises enter into mutual relations through their actors, industries, businesses, and serve as a catalyst or sounding board for these relations, which they support. In this regard, the example of the relations between Lyon and Boston is particularly instructive. The entry point was a start-up acceleration program, the *BigBooster*, which first resulted in an economic partnership, with Boston co-organising the *BigBooster*, and then in a cultural partnership, with the Roxbury Innovation Center, and finally, in institutional collaboration.

INITIATING COOPERATION BETWEEN CITIES THROUGH AN ECONOMIC PROGRAM: LYON, BOSTON AND THE BIGBOOSTER PROGRAM

The *BigBooster* is an international acceleration program for clean tech, digital and life science start-ups initiated by Metropolitan Lyon and now co-organised with Boston. This program, meant to build links with Boston's innovation environment, is directly inspired by a measure that already exists in the city, "the Mass challenge". An initial boot camp is organised in Lyon for the 100 best candidates. The first 20 spend a week in the Boston innovation ecosystem. For its last edition, the program was expanded to a cooperation between four partners: Lyon, Boston, Shanghai/Shenzen, and North Africa. This acceleration program was the catalyst for a deeper cooperation with Boston, at the cultural level with the discovery of the Roxbury Innovation Center, which develops cultural innovations in disadvantaged neighbourhoods, as well as at the institutional level.

Francis Pisani, Gaël Perdriau, Karine Dogin-Sauze, Anna Merlin, Rémy Pagani

THE STRENGTH OF NETWORKS: ATTRACTIVENESS, TERRITORIAL & INTERNATIONAL INFLUENCE

THE CITY
OR SMALL GROUPS OF CITIES BECOME BRANDS

ONLY LYON

GOOD IDEAS KNOW NO BOUNDARIES

100 000 swiss citizens Live in Lyon

REVISIT THE ADMINISTRATIVE DIVISION ?

PEOPLE HAVE LIVING AREAS

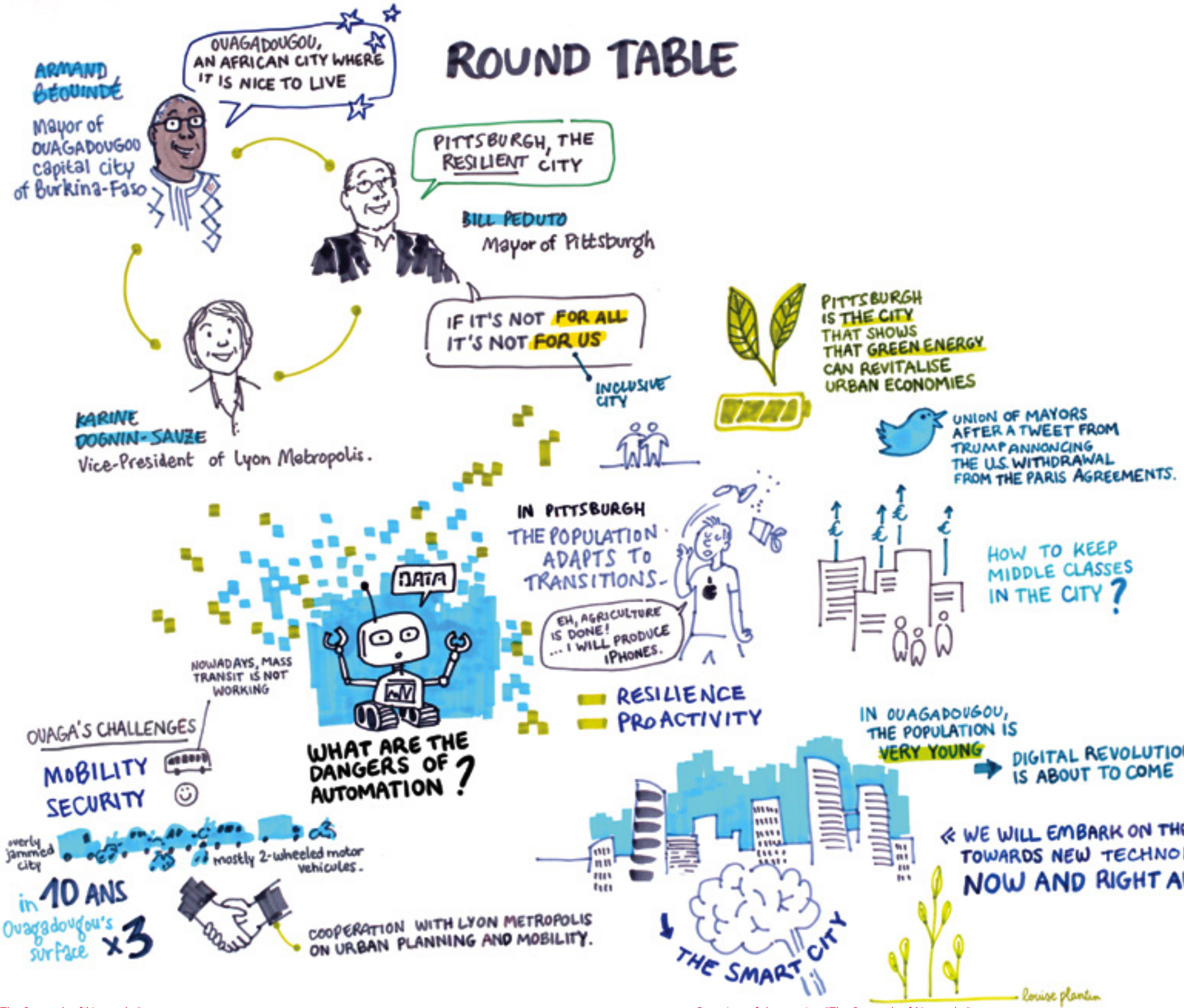
FAVOURING FLUXES TO FRONTIERS ?

WE HAVE TO PRESERVE THE NATION-STATE

louise plantin

Overview of the session "The Strength of Networks"

Overview of the session "The Strength of Networks"



Overview of the session "The Strength of Networks"

Overview of the session "The Strength of Networks"

Speakers

Johannes ADMIRAAL
Enprodes Management Consultancy
Managing Director

Han Admiraal (1959) studied Civil Engineering at the University of Applied Science in Rotterdam. He worked for the national Department of Public Works and Water Management for 20 years. During that time, he was Project Manager for the first TBM driven tunnel in soft soil in the Netherlands. Han Admiraal became Executive Director of the COB, the Netherlands Centre for Underground Construction and stayed there for 10 years. At the same time, he was a part-time Professor of Underground Space at Zeeland University of Applied Science in Vlissingen. In 2008, he became the Owner and Managing Director of Enprodes Management Consultancy in Rotterdam. He focuses in his consultancy in the field of underground space. As a practicing Tunnel Safety Officer, one of his specialties is Road Tunnel Safety. Han Admiraal is chair of the International Tunnelling and Underground Space Association's Committee on Underground Space (ITACUS). He is also President of the Dutch-Flemish Pipeline Industry Guild and promotes underground freight transport in that role. As a member of the Urban Planning Advisory Group of UNISDR, he also advises the Special Representative of the Secretary-General of the United Nations for Disaster Risk Reduction.

Isabelle BARAUD-SERFATY
ibicity
Consultant and expert in urban economics

After earning a degree from the Ecole Supérieure de Commerce de Paris (class of 1994) and another in urban planning at Sciences Po (class of 1995), Isabelle Baraud-Serfaty has worked for 15 years in public and private organisations before creating ibicity. Since 2004, she is Senior Lecturer in the master's Urban and Regional Strategies at Sciences Po. She has created a core class, which she conducts, for second-year master students on private actors in the city. Isabelle Baraud-Serfaty works in close collaboration with research facilities on urban and real estate issues: the LATTS (Laboratoire techniques, Territoires et Sociétés) of the École Nationale des Ponts et Chaussées, in particular. She is also an Associated Researcher at IDDRI (Institut du Développement durable et des relations internationales) and is a member of the scientific journal Revue Études Foncières's editorial board.

Armand BÉOUINDÉ
Ville de Ouagadougou
Mayor

Armand Roland Pierre Béouindé was elected Mayor of Ouagadougou in June 2016. He promotes "Ouaga2020, Vivre ensemble, libre ensemble", a program built around urban planning, mobility, security and environment, local governance, local finances, citizen participation in development, international and decentralized cooperation, municipal communication and social sectors of development.

Thais BLUMENTHAL de Moræs
Waze
Global Business Development Manager
Brazilian-born and Arizona-raised, and having lived in 4 countries and over 13 cities, Thais is a global citizen by nature. She holds a dual degree in Marketing and International Business, from the George Washington University and an international affairs specialization from Sciences Po Paris. Her research on legal bottlenecks for infrastructure development was published by the Institute for Brazilian Issues in 2011. Most recently, Thais was Head of Strategic Partnerships for Google for Education Latin America team, helping public governments across the Region adopt technology and bring quality education to students of all ages. After almost 5 years at Google, Thais joins Waze to lead the Connected Citizens Program bringing to the team an entrepreneurial spirit and vast public-private partnership experience.

André BROTO
VINCI Autoroutes
Director of Strategy and Foresight
Born in 1948, André Broto is a former student of the École Polytechnique (class of 1969) and civil engineer of the Ponts et Chaussées (class of 1974). He joins Cofiroute in 1990 after 17 years at GTM, dedicated to the construction of a nuclear power plant and of harbors. In 1995, he is appointed director of construction at Cofiroute and participates in the conception and construction of the highway Alençon/Le Mans/Tours, another in Angers/Tours/Vierzon and of the tunnel A86 between Rueil and Versailles. This 10km long tunnel reserved for cars which circulate on two superimposed levels is innovative in many aspects. In 2008, André Broto becomes Deputy Chief Executive Officer of Cofiroute. Since 2011, he has been Director of Strategy of VINCI Autoroutes. He was made a knight of the Légion d'Honneur and was decorated with the award of the Ordre National du Mérite. He takes part in the works of various nonprofit organisations and research facilities (AIPCR, URF, IDDRIM and TDIE).

Éric CASSAR
ARKHENSPACES
Architect and Founder
Architect and construction engineer, Eric Cassar is the Founder of ARKHENSPACES: an agile and innovative city planning + design + architecture studio based in Paris, with a focus on research, design and construction of new and sustainable contemporary spaces.
Since 2005, the studio has been working on theoretical and practical research subjects, especially concerning the concept of nspaces (connected environnements): Nd cities, digital and physical architecture relationship, subtle ar(t)chitecture. It manages projects mainly in the field of culture, transportation, urbanism and housing. In 2010, Eric Cassar received the Pierre Cardin Prize from the French "Académie des Beaux-Arts". In 2013, after a lecture tour in Taiwan, he was invited by the Kaohsiung Fine Art Museum where he presented Interstice Spaces: a heterotopia inside the city. He also finished The Case for Subtle Ar(t)chitecture, a critical essay that defines a forward-looking architectural approach based on nspaces concepts (published by HYX in 2016, bilingual edition). In 2015, he is invited to present his vision of tomorrows' smart-cities during a TEDx event. They combine fauna, flora, material and immaterial æsthetics. In 2017, ARKHENSPACES received the Great European Innovation Prize "Le Monde – Smart Cities" for Endless Home, a new concept of living in the digital era.

Frédéric DELAVAL
Groupe La Poste
Director of the Strategic Program "Urban Logistics"
Frédéric Delaval is an engineer who also holds an Executive MBA from the University of Sherbooke (Canada)/ESCEM. He has been Director of the Strategic Program "Urban Logistics" and President of Greenovia (consulting in mobility) and Mobigreen (eco-driving) of the Groupe La Poste for two years. Beforehand, he was Technical Director of the branch in charge of Services, Mail and Parcels for five years. He has built his career in Technicolor (VP Operations - 4 years), Pfizer (Supply-Chain Manager & other - 7 years) which he began as a consultant in Supply Chain (5 years) in the firm PEA. He has also taught at the CNAM (Conservatoire des Arts et Métiers). His passion: exchange to learn from everyone.

Karine DOGNIN-SAUZE
Métropole de Lyon
Vice-President in charge of Innovation, Smart Metropolis, Digital Development and Smart Mobility
Karine Dognin-Sauze is Vice-President of the Métropole de Lyon, responsible for Innovation, Intelligent Metropolis and Digital Development and Deputy Mayor of Lyon in charge of International Relations, European Affairs, Decentralized Cooperation and International Solidarity. In addition to her political responsibilities, she is a professional in international marketing and innovation in the entertainment and new technologies sectors. Karine Dognin-Sauze worked at Electronic Arts Inc., an American leader in interactive entertainment, for 18 years. She was head of the division dedicated to The Sims in Europe, Middle East and South America. She then joined the GL Events Group, an international leader in the event market, to structure and set up an unit dedicated to innovation. Since then, Karine Dognin-Sauze founded Witty Cie(s), a company dedicated to the marketing of innovation. She is also President of the Interconnectés, a network that brings together a community of innovative territories for an exchange of best practices and support for the diffusion of digital transformations. The Interconnectés organizes each year the Forum des Interconnectés which gathers 800 elected representatives, companies and territorial decision-makers on these issues. Karine Dognin-Sauze is a member of the board of directors of the FING (Fondation Internet Nouvelle Génération), Humaninov (Think-and-Do-Tank for the valorisation of human capital as innovation lever, ADERLY Lyon) and SPL Part-Dieu. She is also a member of the Science Po Paris Chair dedicated to the role of institutions in the intelligent city and is also on the Executive Committee of LUCI (International Network for Urban Lighting) and Eurocities.

Michæl DOYLE
École Polytechnique Fédérale de Lausanne
Postdoctoral Researcher
Michæl R. Doyle is currently a postdoctoral researcher at both the Department of Architectural Theory and the Philosophy of Technics at TU Vienna and the Laboratory of Environmental and Urban Economics at the Swiss Federal Institute of Technology in Lausanne. He holds a PhD from the Laboratory of Environmental and Urban Economics (LEURE) at the Swiss Federal Institute of Technology in Lausanne (EPFL) since 2016. His research interests revolve around novel sources of information for the design and planning process, from the material (geology, built form) resources of the urban volume (his PhD work) to the evolving spatial practices of mobile technology users (his MScArch work).

Christophe FERRARI
Grenoble-Alpes Métropole
President

Christophe Ferrari has been Mayor of Pont-de-Claix since 2008 and President of the Grenoble-Alpes Métropole since 2014. He is Vice-President of the "Assemblée des Communautés de France" in charge of research and innovation. Until 2014, he was the third Vice-President of the metropolis in charge of finances, budget and the assessment of public policies. Christophe Ferrari became Vice-President of SMTC (public transport authority) in 2010, where he works to reduce congestion and smooth traffic flows in his city. He has also been a member of the Institut Universitaire de France since 2003 and University Professor at the École Polytechnique de l'Université Grenoble-Alpes. Focusing in his academic research on pollution, he is currently working at the research facility Laboratoire de glaciologie et géophysique de l'environnement of Grenoble.

Xavier HUILLARD
VINCI
Chairman and CEO

Born in 1954, Xavier Huillard is a graduate of the École Polytechnique and the École Nationale des Ponts et Chaussées. He has spent most of his working life in the construction industry in France and abroad. Mr Huillard joined Sogea in December 1996 as Deputy Chief Executive Officer in charge of international activities and specific projects, and then became its Chairman and Chief Executive Officer in 1998. He was appointed Deputy General Manager of VINCI in March 1998 and was Chairman of VINCI Construction from 2000 to 2002. He was appointed Co-Chief Operating Officer of VINCI and was Chairman and Chief Executive Officer of VINCI Energies from 2002 to 2004, then Chairman of VINCI Energies from 2004 to 2005. Mr Huillard became Director and Chief Executive Officer of VINCI in 2006 and was appointed Chairman of the Board of Directors and Chief Executive Officer of VINCI on 6 May 2010. He served as Chairman of the Institut de l'Entreprise from January 2011 until January 2017. He was appointed Chairman of VINCI Concessions on 20 June 2016.

Bruce KATZ
The Brookings Institution
Centennial Scholar

Bruce J. Katz is the inaugural Centennial Scholar at the Brookings Institution, where he focuses on the challenges and opportunities of global urbanization. Katz assumed this role in January 2016 after 20 years as the Vice President and co-Director of the Brookings Metropolitan Policy Program, which he founded in 1996. He is also co-author of The Metropolitan Revolution (Brookings Press, 2013), which argues that cities have become the vanguard of policy innovation and problem-solving. As Brookings's only centennial scholar, Katz and his team collaborate with experts throughout Brookings and beyond to develop new models of finance, growth, and governance in cities and nations. He regularly advises cross-sector metropolitan, national, and global leaders on public reforms and private innovations that advance the well-being of metropolitan areas and their countries. Katz heads the Anne T. and Robert M. Bass Initiative on Innovation and Placemaking, a collaboration with the Project for Public Spaces. Before Brookings, Katz served as Chief Of Staff to Housing and Urban Development Secretary Henry Cisneros and was the Senior Counsel and then Staff Director for the U.S. Senate Subcommittee on Housing and Urban Affairs. In 2008, he co-led the housing and urban issues transition team for the Obama Administration and served as a Senior Advisor to the new Secretary of Housing and Urban Development Shaun Donovan. In 2006, he received the prestigious Heinz Award in Public Policy. Katz is a graduate of Brown University and Yale Law School, and is a visiting Professor at the London School of Economics.

Guillaume LAVOIE
Ville de Montréal
City Councillor

Guillaume Lavoie is a City Councillor in Montreal, Qc, Canada. He is particularly interested in public finance, mobility, bikenomics, the sharing economy and the role of urban art. An expert in the sharing economy and its impacts on public policies, Guillaume is the authored of Canada's first city by-law on the sharing of private spaces. He is also a lecturer at the National School of Public Administration (ÉNAP) on the sharing economy and public policy. Before entering public office, Guillaume Lavoie worked in public diplomacy, public policies and international relations. Having lived and worked on four continents, he has consulted for the public, private and non-profit sectors, both in Canada and abroad. A university lecturer, he is also a member of the Raoul-Dandurand Chair in strategic and diplomatic studies and a veteran international observer. An engaged social entrepreneur, he is the founder of Mission Leadership Quebec (international relations) and co-founder of the College neo-classique (education).
Guillaume holds a Masters in international public administration (ÉNAP), a B.A. in industrial relations and certificates in administration and law (Université Laval), and a university diploma in european integration (Jean Moulin Lyon 3). In addition, he completed executive programs at the London School of Economics and the Harvard Kennedy School of Government. Appointed Public Policy Scholar at the Woodrow Wilson Center, Guillaume is a Fellow of the Jeanne-Sauvé Foundation and Next City.

Paul LECROART
Institut d'Urbanisme et d'Aménagement Île-de-France
Urban Planner

Paul Lecroart is an experienced urban planner and designer in France and internationally. As Senior Planner with the Planning Agency for the Paris Region (IAU Ile-de-France), he conducts work on strategic regional plans and major projects in the Paris Metropolitan Region, including the Olympic Study (2014-2015). Drawing on the experience of cities such as Seoul, San Francisco, New York, he is currently carrying research on expressway transformation in the Paris Region. Paul Lecroart also works on sustainable spatial strategies and innovative approaches in cities such as London, Tokyo, Copenhagen-Malmö, the Ruhr Region or Medellin. He has extensive experience in strategic expertise and planning workshops in many cities (Bodø, Cali, Teheran, Johannesburg, Changzhou, Montréal). Since 2014, he has been a member of the International Advisory Board for the 4th New York Regional Plan. Paul Lecroart has advised the Metropolitan Projects Commission of Paris Métropole association of governments and co-leader of the Call for Metropolitan Initiatives (2010-2012). He was a Commission Coordinator for the Metropolis World Association on the Impact of Major Events on Large Cities (1999-2002). Involved in design workshops for the Planning & Design Club of the French Federation of Urban Planning Agencies (FNAU), he is also a member of the Program Committee of the International Grand Paris Workshop (AIGP). UCLA fellow, he teaches at Sciences Po and at the École d'Urbanisme de Paris, University of Paris-Est. In the past decade, he has spoken in over 30 conferences or seminars in France and abroad.

Anna MERLIN
Turin Metropolis
Councilor

Born in Rivoli (Turin province) in 1966, Anna Merlin is Councilor for communication, international relations, cooperation and European projects and a municipal councilor for the city of Cumiana. She holds a Master's Degree in International Cooperation from the Enaip Institute in Turin. She has held multiple positions in the field of translation, namely in Haiti within the Haiti/Netherlands Cooperation Committee with young children up for adoption, and in the international trade area, as director of purchasing and logistics for the company Anam snc. and as a manager in GFT's KnowHow division in Alexandria, Egypt. She was also active in the social sector as a volunteer in the Stranaidea community in Turin, that concerns itself with young drug users.

Michel MORVAN
Cosmo Tech
Co-Founder & Executive Chairman
Before co-founding Cosmo Tech Michel was Chief Scientist and Vice President for Strategic Intelligence and Innovation at Veolia Environment. He is a former Full Professor of Computer Science at École Normale Supérieure in Lyon, former Chair of Complex Systems Modeling and Senior Scientist at the École des Hautes Etudes en Sciences Sociales in Paris, and External Professor at the Santa Fe Institute in New Mexico. He is an Eisenhower Fellow and an IHEE alumnus.

Luise NORING
The Brookings Institution
Senior Research Fellow
Luise Noring is an Assistant Professor at Copenhagen Business School. Noring heads a team of researchers and project coordinators. She is also a Senior Research Fellow at the Brookings Institution and an expert in sustainable urbanisation at the European Commission. In addition, she runs her own enterprise as an independent consultant. Noring has extensive experience in implementing large-scale international initiatives related to sustainable urbanization, urban infrastructure and governance, and other urban challenges. She leads the Urban Challenge Programme, an EU-funded university education initiative, Cities for People, a three-year EU-funded Research and Innovation project, serves as an expert to the EU Commission and works with tendering both as an evaluator and successfully taking lead on tenders. Noring has a Master in Supply Chain Management and a Ph.D. in Supply Chain Partnerships from Copenhagen Business School.

Rémy PAGANI
Ville de Genève
Mayor
Born in 1954, Rémy Pagani is Mayor of the City of Geneva. After a diploma in social work, Rémy Pagani starts exercising this profession in 1974. In 1987, he becomes the union Secretary of the Syndicat Interprofessionnel de Travailleuses et Travailleurs from 1987 to 1997 then Permanent Secretary of the Syndicat des Services publics for ten years (1997 – 2007). Simultaneously, he is an MP at the Grand Conseil (Parliament) from 1997 to 2005 and from 2013 to 2015. Rémy Pagani is elected to the Administrative Council of the City of Geneva in 2007 and becomes Mayor for the first time in 2009, for a second time in 2012 and for the third time (current mandate) on the 1st of June 2017.

Bill PEDUTO
City of Pittsburgh
Mayor
William Peduto became Mayor of the City of Pittsburg in 2014. Prior to taking office, he worked for 19 years on Pittsburgh City Council - seven years as a staffer then twelve years as a Member of Council. Since taking office, Mayor Peduto has lead a collaborative effort to make Pittsburgh a leading 21st Century city. Under Peduto's leadership the City of Pittsburgh has played an active role in National League of Cities and U.S. Conference of Mayors initiatives. Pittsburgh was recently selected to join the Rockefeller Foundation network's 100 Resilient Cities, which provides resources to improve city resilience in the face of climate change, globalization and urbanization trends. Mayor Peduto also signed a unique agreement with the U.S. Department of Energy to make the city a world leader in district energy production. Mayor Peduto is a founding member of the MetroLab Network, a national alliance of cities and universities committed to providing analytically-based solutions to improve urban infrastructure, services and other public sector priorities. The Peduto administration is working to ensure that everyone benefits from Pittsburgh's transformation and growth because, "If it's not for all, it's not for us".

Gaël PERDRIAU
Ville de Saint-Étienne
Mayor
Gaël Perdriau was born in Cholet 44 years ago. He spent his childhood and studied there until 1992, when he moved to Saint-Étienne to finish his studies at the Ecole Supérieure de Commerce. With his diploma in hand, he decides to settle in Saint-Étienne. Professionally, he held senior management positions in the energy sector in Saint-Étienne. From the beginning of his studies, Gaël Perdriau has wanted to take an active part in the associative and political life of Saint-Étienne, with the main objective of being useful and effective for Saint-Étienne and its inhabitants. His commitment translated into Tremplin 42, a non-profit organisation helping people integrate through work, which he chaired for 7 years. Elected official of Saint-Étienne since 1995, he has held office as Mayor of Saint-Étienne since 2014 and President of Saint-Étienne Métropole.

Dominique PERRAULT
Dominique Perrault Architecture
President and Architect
Leading figure in French architecture, Dominique Perrault gained international recognition after winning the competition for the National French Library in 1989 at the age of 36. This project marked the starting point of many other public and private commissions abroad, such as The Velodrome and Olympic swimming pool of Berlin, the extension of the European Court of Justice in Luxembourg, the Olympic Tennis Centre in Madrid, the campus of Ewha's University in Seoul, and the Fukoku Tower in Osaka, Japan. In 2014, he delivers the DC Tower in Vienna, the tallest tower in Austria, an icon of the new business district, as well as the Grand Theatre in Albi, France. In 2016, Dominique Perrault completes three major rehabilitation and extension projects, including the Pont de Sèvres Towers – Citylights in Western Paris, the new mechanicals hall of the École Polytechnique Fédérale de Lausanne as well as the Dufour Pavilion, new entrance of the Château de Versailles. Ongoing projects include the Longchamp Racecourse and the Poste du Louvre in Paris. Dominique Perrault received many prestigious prizes and awards, including the "Grande Médaille d'or d'Architecture" from the Académie d'Architecture in 2010, the Mies van der Rohe prize, the French national Grand Prize for Architecture, the Equerre d'Argent Prize for the Hotel Industriel Berlier and the Seoul Metropolitan Architecture Award as well as the AFEX Award for the Ewha Womans University in Korea. In 2015 he was elected at the French Academy of Fine Arts and was awarded the Præmium Imperiale Prize for Architecture by the Japan Art Association for his achievements.

Philippe RAHM
Philippe Rahm architectes
Architect

Philippe Rahm (born in 1967) is a Swiss architect, Principal in the office of Philippe Rahm architectes, based in Paris, France. His work, which extends the field of architecture from the physiological to the meteorological, has received an international audience in the context of sustainability. He starts to teach architecture design at the GSD, Harvard University, USA, in Fall 2014. In 2002, Mr. Rahm was chosen to represent Switzerland at the 8th Architecture Biennale in Venice, and was one of the 25 Manifesto's Architects of Aaron Betsky's 2008 Architectural Venice Biennale. His recent work includes the First Prize for the 70 hectares Taichung Gateway Park (Jade Eco Park) in Taiwan currently under construction, an Exhibition architecture for the Luma Foundation in Arles, France, an office building project of 13,000 m2 at La Défense in France for the EPADESA, a convective condominium for the IBA in Hamburg, Germany. Monographic books include Physiological Architecture published by Birkhaüser in 2002, Distortions, published by HYX in 2005, Environ(ne)ment: Approaches for Tomorrow, published by Skira in 2006, Architecture Météorologique published by Archibooks in 2009 and Constructed Atmospheres published by Postmedia, Milan, Italy, in 2014. Mr. Rahm was a resident at the Villa Medici in Rome (2000). He has lectured widely, including at Yale, Beijing Forum, UCLA and the ETH Zürich.

Carlo RATTI
MIT SENSEable City Lab
Director

An architect and engineer by training, Professor Carlo Ratti teaches at MIT, where he directs the SENSEable City Lab. He is also a founding partner of the international design and innovation office Carlo Ratti Associati. His work has been exhibited in several venues worldwide, including the Venice Biennale, New York's MoMA, London's Science Museum, and Barcelona's Design Museum. Two of his projects – the Digital Water Pavilion and the Copenhagen Wheel – were hailed by Time Magazine as 'Best Inventions of the Year'. He has been included in Blueprint Magazine's '25 People who will Change the World of Design' and in Wired Magazine's 'Smart List: 50 people who will change the world'. He was curator for the Future Food District at Expo Milano 2015, and is currently serving as co-chair of the World Economic Forum Global Future Council on the Future of Cities and Urbanization.

Elizabeth REYNOLDS
Urben
Director

Elizabeth Reynolds is a Chartered Urban Planner and Director of Urben, an east London studio focused on planning, design and problem solving for urban environments. Over the past 15 years Elizabeth has worked in multidisciplinary teams on major infrastructure and regeneration projects including the Queen Elizabeth Olympic Park and Crossrail. Urben works from macro scale strategic city plans to detailed street design, with a common theme of making cities creative, productive and resilient places. Elizabeth is a founding member of Think Deep UK, which bring together a range of professional disciplines to tackle challenges around the urban subsurface. Following contributions to several books, and a Design Innovation Award for the reuse of underground spaces associated with major construction projects, she is currently writing a book titled Underground Urbanism about the overlooked but important places beneath our cities.

Lynn RICHARDS
Congress for the New Urbanism
President and CEO

Lynn Richards has a dual Masters in Environmental Science and Public Affairs from Indiana University. She is President and CEO of the Congress for the New Urbanism. Previously, Richards had a distinguished career at the US Environmental Protection Agency (EPA), holding multiple leadership roles over 13 years in the Office of Sustainable Communities. She worked with dozens of state and local governments to implement placemaking approaches by developing policies, urban design strategies, and environmental solutions for vibrant, prosperous neighborhoods. Additionally, she produced groundbreaking research on water and land use strategies. Before joining the EPA, Richards worked briefly in the private sector at a consulting firm. She lived and worked in the former Soviet Republics from 1988 to 1995, helping environmental groups increase their organizational and political effectiveness. Richards was awarded a Lœb Fellowship in Advanced Environmental Studies at the Harvard University Graduate School of Design in the 2012-2013 school year.

Jérôme STUBLER
VINCI Construction
President

Born in 1963, Jérôme Stubler is a former student of the Ecole Polytechnique and the Ecole Nationale des Arts Métiers. He launches his career in 1989 at Freyssinet where he manages the construction of the bridge of Normandy, the bridge of Iroise, the offshore oil platform Hibernia, the bridge Vasco de Gama in Portugal. Technical Director of Freyssinet in 1996, then in charge of large-scale projects since 2002, he has developed the company's expertise in the domain of nuclear energy and created Nuvia, a subsidiary of Soletanche Freyssinet in nuclear energy. In January 2009, he becomes Chief Executive of Freyssinet, Terre Armée et President of Nuvia. In July 2012, he is Director and Chief Executive Officer of Soletanche Freyssinet and President of Soletanche Bachy. He is appointed Chief Executive of VINCI Construction in July 2014 and becomes its President end of 2014.

Arjan VAN TIMMEREN
AMS Institute
Scientific Director

Arjan van Timmeren is full professor at Delft University of Technology, Faculty of Architecture and the Built Environment, Department Urbanism and chairs 'Environmental Technology and Design'. Besides he is also Scientific Director of the joint initiative of TU Delft, MIT Boston and Wageningen University 'AMS Institute' (Institute for Advanced Metropolitan Solutions), based in Amsterdam.
Over the years Arjan van Timmeren has played a significant role in the integration of the concept of sustainable development in the field of architecture, urbanism and building technology in both practice and academia. His research focuses on environmental technology & innovation, industrial ecology, urban metabolism, smart cities, sustainable area development and self-sufficiency. With both his office, his research group at the TU Delft and the AMS Institute in Amsterdam he is involved in many projects in and outside the Netherlands, varying from individual (clusters of) buildings, to large 'climate neutral' city districts and infrastructures. He has seats in several (inter)national advisory committees, scientific committees, and quality teams, and has received several (inter)national awards for his work.

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