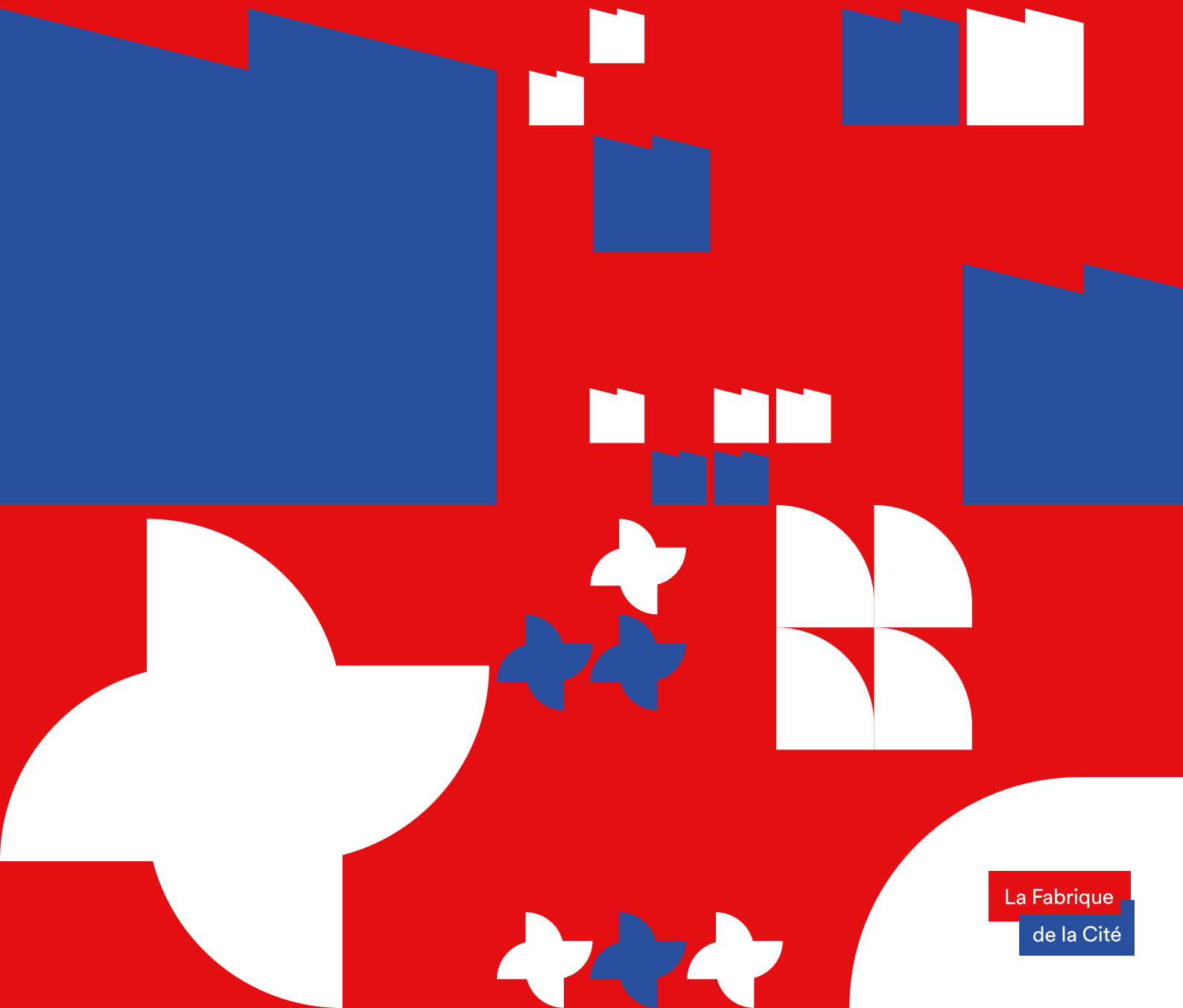
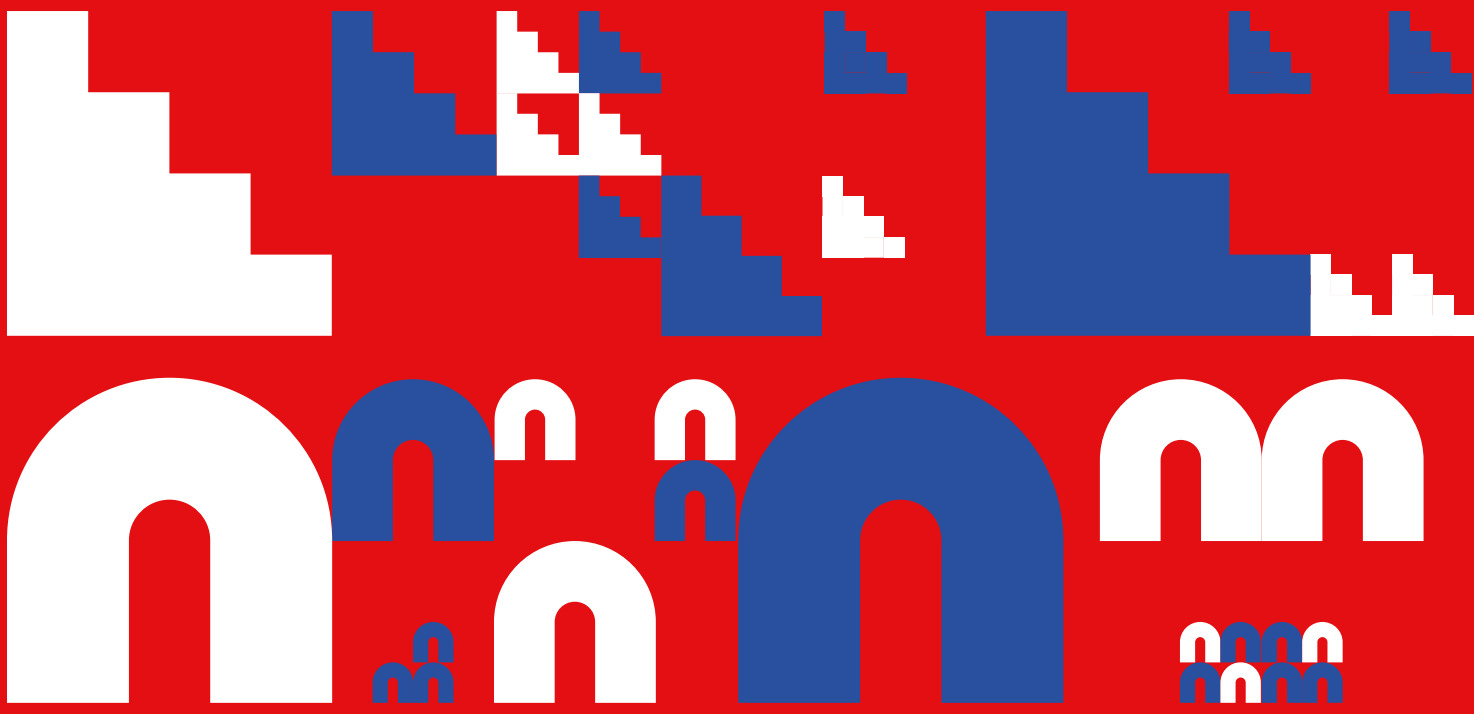
A YEAR WITH *LA FABRIQUE DE LA CITÉ*

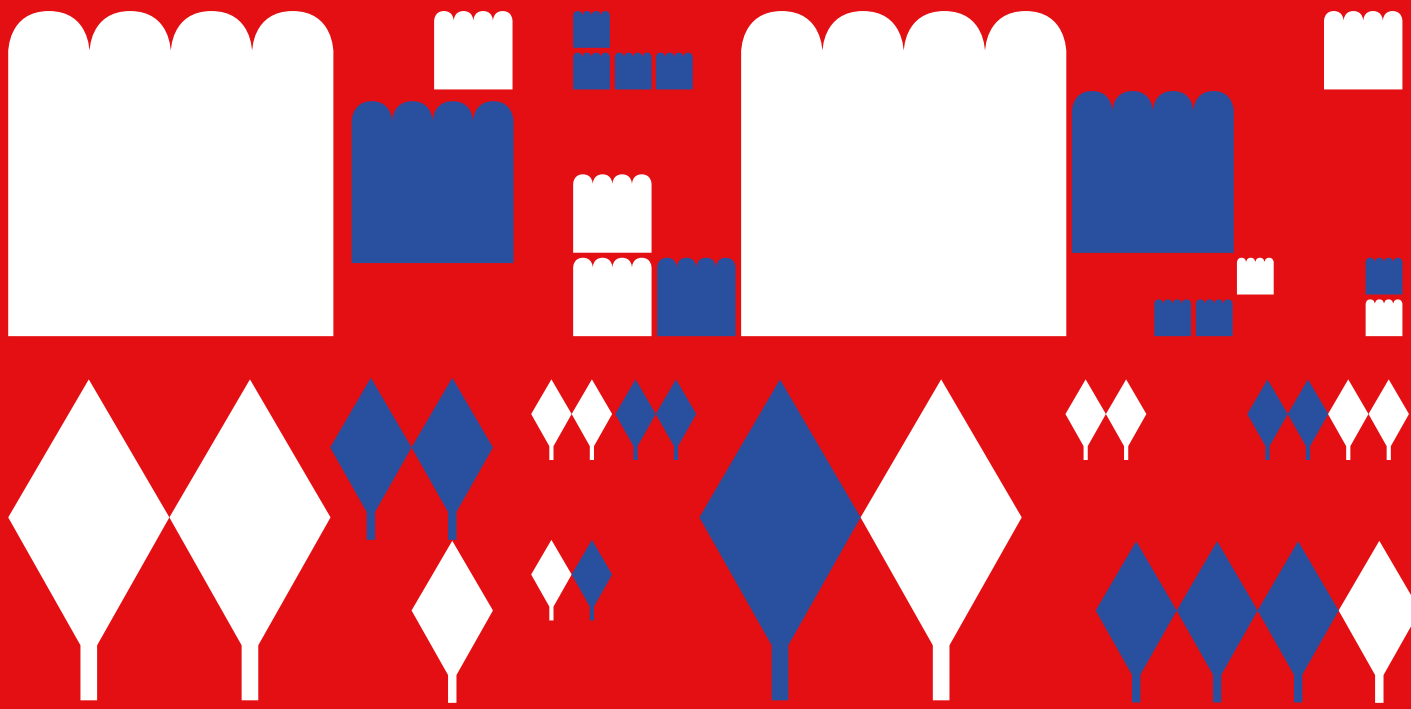
The acceleration

Urban realities 2019



La Fabrique de la Cité





Transitions are in fashion. Ecological transition, digital transition, and even “societal” transition: we are transitioning in every possible way and in all areas.

At the same time, it is not hard to find countless statistics, facts, and figures proving that inertia remains strong and that the same macro trends are still at work when it comes to urban congestion, the struggle to find appropriate housing in tight markets, or the consumption of fossil fuels. Yet the final goal of these transitions is well-identified in the urban domain: it is the egregious “sustainable, smart, and inclusive city”, “green and smart”, in short, the city of tomorrow, which nourishes our imagination and our actions.

This divorce between words and facts causes impatience and sometimes triggers radical opposition. Since transition (which, etymologically, means “to chart a path towards a goal”), is a dead end, a philosopher’s aporia, some might be tempted to say: “let us brutally shift paradigms. Here and now, let us stop feeding the urban monster, let us do less with less, in short, let us degrow. The transition has failed, long live the revolution!” The radical approach never fails to seduce, particularly in a country, such as France, with an old revolutionary streak, except that the Enlightenment and its revolutionaries believed in progress and prosperity while the current degrowth... prospers thanks to (but does not always align with) an a-scientific or even anti-scientific, obscurantist streak.

Scrutinizing cities on a daily basis provides incentives to set on the transition path again. We are witnessing the emergence not of a single path but of several inspirational, fascinating, and even wildly exciting ones that spark desire for the future. How can one not feel the energy of the high-speed trail Toronto has been on? This “accidental metropolis” may not have always known where it wanted to go, but by welcoming half of all immigration to Canada, Toronto reminds us that the urban dream is stronger than ever, especially for those running from war and violence. How can one not be fascinated by the royal road (however sanitized and devoid of peripheral byways it might seem) that Singapore drew out of what was once only a narrow pathway?

Even though we are still only clearing the path when it comes to finding a way to decarbonize mobility and the related funding model, even as we go back and forth on a route filled with pitfalls when it comes to inventing citizen participation in the implementation or abandonment of major projects, we must chart paths and go forward.

Let us not forget that transitions are rarely linear. To advance towards a goal does not mean advancing at the same pace all the time. As is now becoming clear, there are accelerating trends that should lead us to increase the pace of our transitions. For instance, very low interest rates, compounded by metropolization, are increasingly pushing middle-class households out of urban cores. In those circumstances, how can we work faster on metropolitan accessibility and inclusiveness? Likewise, in the face of accelerating loss of biodiversity, putting an end to urban sprawl is becoming more urgent than ever.

Let us not forget either that the most interesting pathways are often located off the beaten path: in urban matters, they alone can help us grasp complexity and systemic effects and see the infinitesimal and the connections between trends, weak signals, and details that weave the urban fabric every day. It is thus, with Bruno Latour’s “revolution of details”, that we will give substance to transitions... and be true revolutionaries.

Cécile Maisonneuve

President,
La Fabrique de la Cité

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A year with *La Fabrique de la Cité*

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JANUARY

TERRITORIES AND METROPOLIZATION

21.01 "In the face of present crises, action for tomorrow", a debate with Michèle Laruë-Charlus (*Bordeaux Métropole*), Jacques Lévy (Swiss Federal Institute of Technology in Lausanne), Cyril Roger-Lacan (Tilia), and Pierre Veltz (*Grand prix de l'urbanisme 2017*), Paris.

FEBRUARY

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

20.02 "Major projects: should citizens have the last word?", a "*Tribunal pour les générations futures*" (Tribunal for Future Generations) organized by *La Fabrique de la Cité*, with Marion Roth (*Décider ensemble*), Catherine Larrère (philosopher), Audrey Linkenheld (Vilogia), and David Lebon. (EuropaCity), Paris.

MARCH

FUNDING MOBILITY

20.03 "Funding mobility in a post-carbon world", a debate with Yves Crozet (*Laboratoire aménagement économie transports*), Hervé Nadal (Mensia Conseil), and Cécile Maisonneuve (*La Fabrique de la Cité*), Paris.

TERRITORIES AND METROPOLIZATION

21.03 "Mobility fault lines in French territories", a debate with Jacques Lévy (Swiss Federal Institute of Technology in Lausanne) and Brice Teinturier (Ipsos), Paris.

TERRITORIES AND METROPOLIZATION

27.03 Launch of the "*Action cœur de ville*" Plan by the French Ministry of Territorial Cohesion; this five-billion-euro scheme targets 222 mid-sized cities and aims to increase the attractiveness and dynamism of their cores.

TERRITORIES AND METROPOLIZATION

Publication of an Ipsos survey for VINCI Autoroutes about mobility fault lines in French territories.

APRIL

SINGAPORE: THE CONQUEST OF A RESTRICTED TERRITORY

Inauguration, within Singapore's Changi Airport, of Jewel Changi, a 137,000-square meter complex complete with stores and the world's largest indoor waterfall, the Rain Vortex.

FUNDING MOBILITY

The municipality of New York City adopts a plan for the implementation of an urban toll in Manhattan.

TORONTO: THE "ACCIDENTAL METROPOLIS"?

The Ontario province unveils a 30-billion-dollar investment plan for the development of the Toronto region's public transport network and offers to take ownership of Toronto's four metro lines, which, until then, were municipal property.

FUNDING MOBILITY

03.04 First reading of the mobility orientation bill by the French National Assembly.

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

15.04 Professor Philippe Subra, director of the French Institute of Geopolitics of the University Paris VIII, is heard by *La Fabrique de la Cité*'s working group.

TERRITORIES AND METROPOLIZATION

19.04 "Living in 20 years: what scenarios for the future of French territories?", a debate with French Minister of Towns and Housing Julien Denormandie and Frédérique Lahaye and Marc-Olivier Padis (*Terra Nova*), Paris.

MAY

FUNDING MOBILITY

In Denver, Uber now offers public transport tickets for sale through its app.

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

16.05 Pierre Crétois, senior lecturer at the University of Bordeaux-Montaigne, qualified teacher in philosophy, is heard by La *Fabrique de la Cité*'s working group.

JUNE

TORONTO: THE "ACCIDENTAL METROPOLIS"?

The Ontario province enacts a law that allows it to seize the Toronto Transit Commission's assets without compensation. This new legal episode is the latest in a series that signals a crisis in governance for this fast-growing region.

SMART CITIES

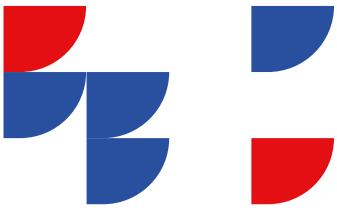
24.06 "The cyborg city, full-fledged urbanity?", a debate with Sylvie Allouche (Catholic University of Lyon), Antoine Picon (*École des ponts Paris Tech*, Harvard University), and Jean Danielou (*Mines Paris Tech*), Paris.

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

25.06 Robert Herrmann, president of the Strasbourg Metropolis, and Vincent Giret, Director of France Info, are heard by La Fabrique de la Cité's working group.

TORONTO: THE "ACCIDENTAL METROPOLIS"?

Sidewalk Labs submits its Master Innovation and Development Plan, a project for the development of a smart neighborhood on the shores of Toronto, to Waterfront Toronto, the public entity in charge of the waterfront's regeneration.



JULY

TERRITORIES AND METROPOLIZATION

01.07 "Cities, global actors of the ecological transition", a debate with Cédissia About (City of Paris), Alain Guillaume (VINCI Energies), and Silvia Marcon (C40 Cities), Paris.

TERRITORIES AND METROPOLIZATION

01.07 "Airports 2050: urban scale commutators", a debate with Stéphane Crétel (Air France) and Laurent Terral (*Laboratoire Ville Mobilité Transport*), Paris.

TERRITORIES AND METROPOLIZATION

02.07 "The city, infinitely", a debate with Marc Bourdier (Architecture School of Paris La Villette), Renaud Le Goix (University Paris Diderot), and Jérôme Ansaldi (*Bateg,* VINCI Construction), Paris.

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

03.07 "Can there still be consensus around major projects?", a debate with Lucile Schmid (*La Fabrique écologique*), Laurence Monnoyer-Smith (former vice-president of the French National Commission for Public Debate), Xavier Huillard (VINCI), and Cécile Maisonneuve (*La Fabrique de la Cité*), Paris.

TERRITORIES AND METROPOLIZATION

04.07 "Living in 20 years: what lifestyles and what territories in France in 2040?", a debate with Arlette Fructus (vice-president of the Aix-Marseille Metropolis), Marc-Olivier Padis (Terra Nova), and Carles Llop (Architecture School of the Polytechnic University of Catalonia), Marseille.

SINGAPORE: THE CONQUEST OF A RESTRICTED TERRITORY

10-12.07 Urban expedition to Singapore.

FUNDING MOBILITY

11.07 New reading of the mobility orientation bill by the French National Assembly.

LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

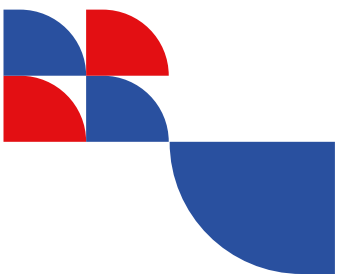
18.07 Jean-François Carenco, president of the French Energy Regulation Commission and former *préfet* of Paris and the Île-de-France region, is heard by *La Fabrique de la Cité*'s working group.

FUNDING MOBILITY

Germany announces an 86-billion-euro investment plan for the maintenance of its rail network between 2020 and 2030 (versus 34 billion euros in France over a ten-year period).

SINGAPORE: THE CONQUEST OF A RESTRICTED TERRITORY

Malaysia announces a ban on its sand exports, upon which Singapore is strongly dependent for the expansion of its territory towards the sea.



SEPTEMBER

FUNDING MOBILITY

New York City announces a new funding plan for the renewal of its infrastructure and transportation network.

SMART CITIES

10.09 "Surveillance, security, data... is the smart city authoritarian?", a debate with Régis Chatellier (*CNIL*), Myrtille Picaud (*Sciences Po*), Maurice Gourdault-Montagne (former Secretary-General of the Ministry of Europe and Foreign Affairs), and Cécile Maisonneuve (*La Fabrique de la Cité*), Paris.

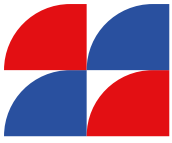
LARGE INFRASTRUCTURE PROJECTS AND DEMOCRACY

13.09 Amélia Rung (director of network development for ASF, VINCI Autoroutes), Jean-Luc Fournier (director of project communications, Arcos), and Lena Cordova (technical director, VINCI Construction Grands Projets) are heard by *La Fabrique de la Cité*'s working group.

TORONTO: THE "ACCIDENTAL METROPOLIS"?

23-25.09 Urban expedition to Toronto.

OCTOBER



TERRITORIES AND METROPOLIZATION

29.10 "Olympic infrastructure and urban centralities", a debate with Marine Oudard (Dominique Perrault Architecture) and Geneviève Zembri-Mary (University of Cergy-Pontoise), Paris.

NOVEMBER

SMART CITIES

12.11 "Urban mobilities in the digital economy: autonomous vehicle, from promises to reality", a debate with Niels de Boer (Centre of Excellence for Testing & Research of Autonomous Vehicles, Nanyang Technological University), Uli Braun (Atos Asia Pacific), Justin Dauwels (Nanyang Technological University) and Camille Combe (*La Fabrique de la Cité*), Singapore.

TERRITORIES AND METROPOLIZATION

13.11 "Planning public and open spaces in vertical cities: an international comparison", a workshop with Andrea Cassi (Carlo Ratti Associati), Uli Braun (Atos Asia Pacific), Limin Hee (Centre for Liveable Cities), and Charu Kokate (Safdie Architects), Singapore.

SMART CITIES

25.11 "The sidewalk: a plug-and-play space in the smart city?", a debate with Isabelle Baraud-Serfaty (ibicity), Alain Guillaume (Omexom), Emmanuel Mussault (Michelin), and Nicolas Machtou (Enedis), Paris.

TORONTO: THE "ACCIDENTAL METROPOLIS"?

Publication of the city of Toronto's new Housing Plan 2020-2030, in response to demographic growth and a strong increase in real estate prices in Ontario's capital city.

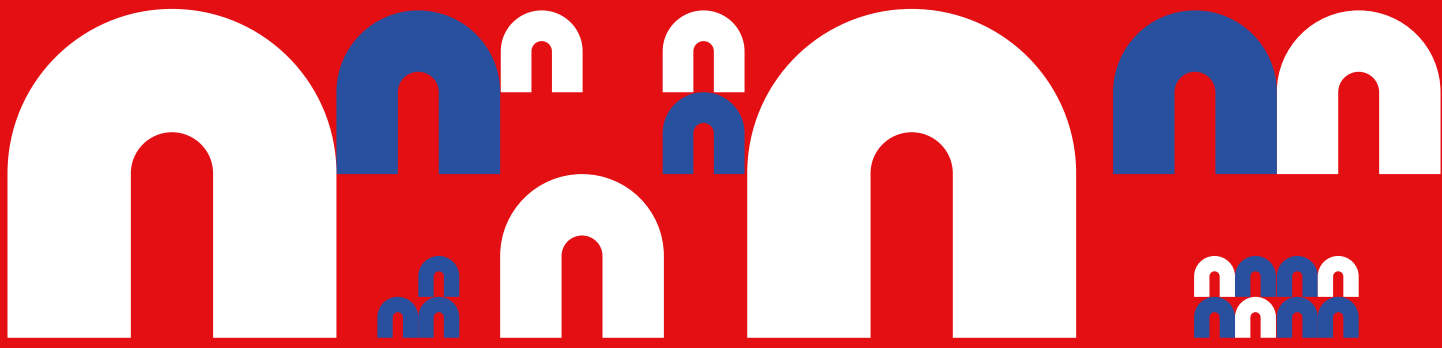
Funding mobility

How to fund a mobility system adapted to a post-carbon society

The urgent financing and maintenance of ever more strained mobility services and infrastructure is compounded by the need to implement and fund the transition towards a mobility system that can address the urban challenges of the future. Yet cities now find themselves in a financial dead-end that suggests an imminent and systemic crisis in mobility funding. Indeed, in a context of dwindling public resources, they must imperatively improve their services both quantitatively (in order to adapt networks to contemporary urban dynamics) and qualitatively (in order to modernize networks and increase their reliability). Meanwhile, the revenues historically used to finance mobility are now running into their limits, while the taxpayer or user's willingness to contribute continues to shrink.

Historically, infrastructure funding models have tended to rely mainly on the taxation of fuel consumption; the transformation of these models now appears unavoidable. Since its introduction in the early 20th century, this type of taxation had been relatively proportional to the use made of road infrastructure. Yet in recent years, taxation has tended to become increasingly disconnected from the use of infrastructure, due to several factors born from the transformation of the automotive industry: improvement of thermal engines, rise of hybrid vehicles, development of new types of motorizations (hydrogen, electric), etc. In addition, the commitments linked to the implementation of the Paris Agreement should lead to a decrease in the use of fossil fuels.

In this context, how can the historical infrastructure funding model be reformed? Can this system be a tool in the service of new urban mobility policies? Finally, to what extent can this change in paradigm affect urban morphology?



Key Figures

Evolution between 2018 and 2019 of the ranking of the French road network	7th → 18th worldwide
In France:	50% of road surface area is in need of repair One out of ten bridges is in poor condition
In September 2019, the Metropolitan Transportation Authority, the public transport agency for the New York metro area, announced a	51-million-dollar investment plan for 2020-2024, a 70% increase from the previous plan.
The amount of the fiscal earnings lost by California's Highway Trust Fund due to the rise of electric vehicles, which pay no tax on fuel.	250 million dollars
The loss of earnings annually if free public transportation was implemented in the Île-de-France region	400 million euros

OP-ED

Let's talk about the future of mobility funding!

Flying cars, high-speed pods, smart cars… No one really knows what mobility will look like in the future. The only certainty is that mobility should address three major challenges. The first is to make the energy transition possible by reducing the transportation sector's dependence on fossil fuels. Secondly, the ecological transition requires that the transport sector reduce its emissions, a complex task for the only sector in Europe that has not managed to reduce its CO_2 emissions since 1990. Thirdly, mobility should make cities more livable and metropolization more acceptable at a time when commuting distances are getting longer. Mobility is changing. The reduction of carbon emissions from transportation is underway, thanks to the development of shared mobility (public transport, carsharing), active modes (walking, biking) and electric vehicles. However, one question remains: how to fund a mobility system that fulfills the urgent need to build and maintain increasingly used infrastructure and services.

The development of electric vehicles is stressing one of the major sources of mobility funding in the United States: the fuel tax. With autonomous and shared vehicles, we might see a strong decrease – perhaps a disappearance – of taxes related to vehicle ownership. The issue is not new. Public authorities are looking for new solutions. Among them, urban tolling schemes and managed lanes are often mentioned. Are they efficient? Yes. Are they sufficient? Nothing could be less certain.

Mobility is a fast-growing sector. Behind this obvious statement, a reality: solutions must take into account the complexity of future stakes. While priority lanes are still being experimented in France, they are already congested in California due to the spread of electric vehicles, which are allowed to use them. This observation has led California to rethink its priority lane scheme and introduce pricing mechanisms. The overall reduction of citizen's willingness to pay was one of the catalysts of the yellow vests movement in France. Countries fearing the emergence of such movements are reluctant to raise mobility tax levels, even though such taxes allow cities like London and Stockholm to fund mobility infrastructure and services that are subject to growing demand just as their condition is deteriorating.

However, other tools exist. The state of Oregon and the city-state of Singapore are experimenting respectively a mileage tax (which varies depending on the number of kilometers driven) and a GPS-based urban tolling system. While the former is quite accepted, the latter raises questions about data privacy. Indeed, the new Singaporean tolling scheme will allow the public transport authority to tax car users depending on traffic conditions, localization as well as time of the day. More than mere funding tools, these experimentations show the crucial role of funding mechanisms when it comes to changing mobility behaviors, toward a more shared and low-carbon mobility.

We ought to set our dreams of height and speed aside for a moment to focus on the sustainability of our mobility system by thinking, with the same ambition and energy, about the future of mobility funding. Let's take a look around and imagine how to make transport more financially sustainable as well as efficient, equitable, and virtuous. •

A WORD FROM THE PROJECT MANAGER

Why study the issue of mobility funding?

Camille Combe

Project Manager

> Per-kilometer charging, tolls, land value capture mechanisms… International examples show that there is no shortage of solutions for funding tomorrow's mobility infrastructure and services. The question of mobility funding is more about method than it is about means. The issue is not technical, it is political.

● INSPIRATION

How to fund mobility in a post-carbon world?

TAXES ON FUEL TO FUND MOBILITY (AND MOBILITY ONLY)

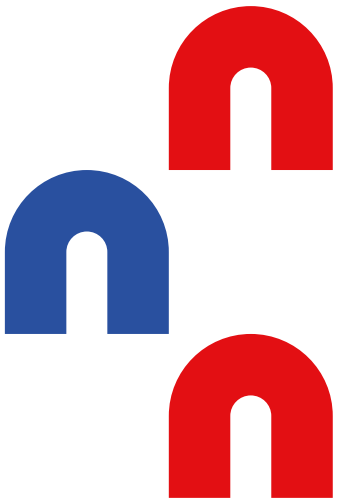
The improvement of thermal engines and the development of hybrid and electric vehicles have increased the disconnect between road use and fuel consumption. In California, the loss of fiscal revenue caused by the development of electric vehicles has reached an estimated $250 million, i.e. 3% of the fuel tax's total revenue. Although this proportion remains low, it will only increase as the use of electric vehicles grows more common. This long-term decrease in fuel tax revenue is worsened by the fact that the level of taxation is not automatically indexed on inflation. In other words, the increase in the cost of road work and maintenance is not offset by an equal increase in total fuel tax revenue. This raises concerns about a potential decrease in the resources available to fund roads, resulting from infrastructural wear and tear. But states are not helpless in the face of this trend; they can decide to raise the tax level to offset the drop in revenue. However, the unpopularity of this policy may lead them to prefer upholding the status quo, even if doing so jeopardizes the funding of mobility. The state of Illinois has thus resigned itself to increase its fuel tax level, which had been frozen since the 1990s.

URBAN TOLLS, AN OPPORTUNITY AT THE SERVICE OF MOBILITY FUNDING

The negative externalities generated by mobility in urban areas (congestion, noise, pollution, stress, loss of productivity, road network wear and tear, etc.) have led several major metropolises around the world to implement urban tolls. By imposing a payment on motorists, congestion charges aim to increase the total revenue related to urban traffic. They are generally part of a broader mobility policy. Thus, in London, revenues from the congestion charge (now complemented by the "T-Charge", a tax on CO_2 emissions) are assigned to London's public transport authority, Transport for London (TfL). From 2003 to 2013, London's congestion charge allowed TfL to invest approximately £1.2 billion (i.e. 46% of net congestion charge revenues) in transport and road improvement (highways, bridges, bike paths), £960 million of which were allocated to improve the bus network.

IN THE CITY, SIDE EFFECTS OF PUBLIC TRANSPORT SUBSCRIPTIONS

In the 1970s, public transport authorities started to offer tickets in the form of weekly, monthly or annual subscriptions, offering users unlimited access to all means of transport for a single price, which generally depends on geographical criteria (zones). Subscriptions are thus convenient for regular users of public transport: they facilitate the use of public transport by unifying ticketing with a system in which a specific ticket corresponded to each mode. Subscriptions allow users to save money on the cost of their trips. This new formula benefits the operator too: revenues are more predictable, as they no longer depend solely on the (potentially volatile) sale of individual tickets. Subscriptions thus offer a guaranteed income over a given period of time, regardless of the use of transport. However, from an economic point of view, it is not an ideal incentive for the use of public transport. Indeed, subscriptions induce a zero-marginal price of the public transport trip; in other words, the cost of an extra trip will be zero. This can lead to overuse of public transport, that is to say a disproportionate use that does not create value for the community. This is particularly the case when a trip could have been made through active modes (cycling, walking...).



FUNDING TRANSPORT THROUGH AN INCREASE IN LAND VALUE

The value created by improving the accessibility of an area can be a source of funding for mobility, provided that the added value associated with the construction of new transport infrastructure is recovered. If the rise in accessibility is good for the community as a whole, most of the land value created goes to landowners. This so-called "land-value capture" mechanism therefore allows for partial recovery of the value created to fund transport infrastructure. In addition, this type of tax does not affect the cost of using infrastructure. •

POINT OF VIEW

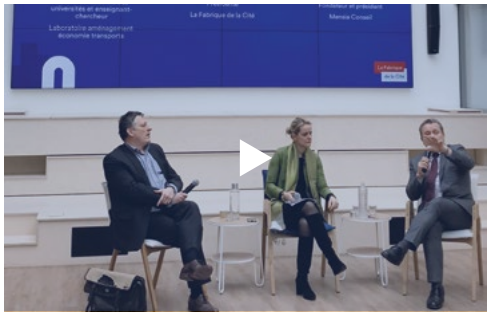
Can a constitutional right such as the freedom of movement be subject to taxation?

Hervé Nadal

President, Mensia Conseil

"A developed country [such as France] with a tax rate that amounts to 56% of its GDP has the means and the duty to ensure that its mobility infrastructure be considered a collective good, borne by the public body. If we are to put in place infrastructure taxation, the chosen system will have to be virtuous to help mobility evolve, allow for temporal regulation of infrastructure, and decrease externalities linked to congestion or small particulates, and only for that. Infrastructure contains gross fixed capital formation; it is a mission of the national or public body in the case of a decentralized state. The use of infrastructure can trigger congestion or quality of life issues for local populations and can legitimize the implementation of even a modest urban toll in metropolises. This system would not aim to fill the coffers of one local authority or another but to send a price-signal to influence user behaviors. In our country, the real issue is that of territorial equity. Public transport mobility is barely funded by the user and almost not at all by the taxpayer". •

Scan the QR Code with your phone to discover the entire intervention



POINT OF VIEW

User-pay models for road funding: the social acceptability challenge

Jean Coldefy

Director of the 3.0 mobility program, ATEC ITS

"To be acceptable, a user-pay model for road funding:

- **must provide a direct benefit to contributors**: revenues must be allocated to a clearly defined mobility program, with a significant gain for the largest contributors, i.e. those who live outside the cordon. The mobility package should allow users living 40 km away from their workplace to save 30 minutes of travel time and €10 per day. For the residents, it means more public transport in the first crown of the metropolis and a very significant decrease in traffic (-30 to 50%), meaning that a quasi-disappearance of congestion and pollution episodes is expected;

- **must be a simple**, understandable pricing system;

- **must be fair**: the pricing system should protect the most fragile and guarantee territorial equity for residents and non-residents alike;

- **must be deployed after the introduction of effective alternatives to the car** (especially the express bus plan that connects the conurbation to its suburbs);

Northern European cities implemented this system almost 30 years ago. It has proven its effectiveness, and, in the era of global warming, taxing consumption seems common sense. Acceptability is key to the system: the abovementioned principles and the timing allow for increased acceptability." •

CITY PORTRAIT

In July 2019, *La Fabrique de la Cité* explored Singapore, the world's densest state and a global city on the rise. This urban expedition resulted in the publication of a City Portrait in December 2019, analyzing the way in which this city-state successfully associates political and technological innovation to address present and future challenges. Singapore has always been innovative: in 1975 already, the city implemented a cordon charging scheme in its business district; it would become the world's first urban toll. Since then, faced with growing congestion, several cities have implemented similar schemes or plan to do so. The Singaporean approach continues to be a reference.

SINGAPORE: A SYSTEMIC APPROACH TO MOBILITY

The growth of Singapore's economy came alongside an increase in the number of cars in the post-independence period. Due to its limited road infrastructure, the network is rapidly saturated in the city center. While urban planning intends to decentralize by creating secondary towns bringing together housing, economic activities and services with a view to limiting long journeys across the city to the CBD, Singapore requires a broader mobility policy, based on the promotion of public transportation and limited use of personal vehicles. Singapore thinks of and acts upon mobility using a systemic approach founded on three principles: integration of territorial planning and transport, restraints on the use of the private car, and development and prioritization of public transport.

In light of the city-state's geographic situation, the relevance zone of the automobile is de facto limited. Indeed, contrary to other areas, long-distance, interurban motorized commutes are rare, if not non-existent. International travel is exclusively aerial and maritime. This situation is characteristic of Singapore's isolated territory. Elsewhere, the automobile can fulfil multiple uses and find relevance beyond the boundaries of the mere city. In the city-state, the automobile is exclusively an urban mode of transport, and can thus be replaced by other modes, provided they are equally efficient.

In light of the economic effects of road congestion and the specific situation of cars in Singapore, an urban toll was implemented in 1975, the first of its kind in the world. This toll system with manual checkpoints around the business district was replaced in 1998 by the Electronic Road Pricing system (ERP). This cordon toll system - a toll must be paid each time a vehicle passes a gantry - targets strategic transit points on roads which are very subject to congestion at peak hours, according to the "user pays" principle.

The specificity of this toll is its dynamic pricing. The cordon prices vary according to the time of day and level of congestion. Passing under a gantry at a peak hour is more expensive than at an off-peak hour. Every three months, according to changes to the congestion levels recorded by the gantry sensors, pricing is reassessed. The idea is to influence drivers' behaviors through a price signal and to smooth demand across the day in order to improve traffic fluidity and maintain an average speed of 40 km/hour. To identify the vehicle and automate the toll collection, an in-vehicle unit immediately debits the

● POINT OF VIEW

Singapore: towards a new generation urban toll

Lam Wee Shann

Chief Innovation and Technology Officer, Land Transport Authority, Singapore

"Now we are looking at our next generation of road pricing, going from a gantry-based to a satellite-based system. This system is more responsive in terms of traffic management and requires less reliance on infrastructure. On top of this, it provides very good datasets that ensure safety, improve traffic control, and foster R&D. Today, vehicles have In-Vehicle Units for the Electronic Road Pricing. This device automatically detects when the vehicle passes a gantry and deducts the relevant fee. Through the new In-Vehicle Unit, a device adapted to the new satellite-based system, we will be able to push information to the motorist. We will for example be able to inform drivers if there is congestion on the roads they are travelling on". •

amount from the driver's credit card or EZ-link card, a public transportation card, regardless of the class of vehicle. For taxis, toll fees are paid for by the client. According to INRIX, drivers in Singapore lost 10 hours per year in traffic jams in 2017, compared to 102 hours in Los Angeles. In 2014, Singapore's urban toll system brought in $152 million net (€95 million) for the state. The Singaporean toll's dynamic nature allows the Land Transport Authority, the agency responsible for managing and operating public transportation in Singapore, to influence mobility behaviors. The toll's interest lies in its ability to encourage car users to favor other modes of transport (modal shift) or to postpone their travel to periods of time when traffic is more fluid (load-shifting).

In 2020, the ERP will be replaced by a satellite toll system, which will cover the entire territory of Singapore. Several reasons motivated the shift to satellite technology. Firstly, the renewal of 93 gantries requires heavy investments from the LTA (approximately $1.5 million for a three-lane gantry). Secondly, the use of real-time, geolocalized data opens up new possibilities for traffic management. This technology, applied to the urban toll, marks a shift from a traffic management system to a mobility management system. While the implementation methods are as yet unknown, several avenues have been discussed: the toll may enforce pricing per kilometer or, along the lines of the current system, identify in real-time the sections which are likely to become congested. To continue to have a positive effect on driver behavior and to encourage them to use the collectively optimal route - the least congested and therefore the least expensive -, the toll price should be known in advance. The in-vehicle unit will be replaced by an on-board unit (OBU) which will be used to pay parking fees in public streets in addition to instant toll payments and to provide real-time information on traffic and price variations. However, despite operational technology being available and a contract for $556 million (€348 million) signed between the Singapore government and the consortium consisting of NCS Pte Ltd and Mitsubishi Heavy Industries Engine System Asia, the implementation of this toll system is facing the sensitive issue of social acceptability. •

> We will be able to apply a congestion tax in all the streets of Singapore.

Lam Wee Shann

Chief Innovation and Technology Officer, Land Transport Authority, Singapore

● EVENT

26-27 NOVEMBER 2019

Oliver Wyman Global Mobility Executive Forum - Workshop on “Funding mobility in a post-carbon world”

In August 2018, the collapse of a motorway viaduct in Genoa brutally illustrated the hazardous situation of mobility infrastructure and raised the issue of funding for construction and maintenance. The crisis of mobility funding is systemic and reinforced by several deep trends: a disconnect between the fuel taxation product and the use of infrastructure, an increase in average trip distances, the digital revolution, the arrival of autonomous electric vehicles... In November 2019, *La Fabrique de la Cité* organized, with Yves Crozet (*Laboratoire aménagement, économie et transport*) and Erik Verhoef (Vrije Universiteit Amsterdam), a workshop gathering about 30 mobility experts to develop mobility funding scenarios that take these major trends into account. •

● EVENT

SEPTEMBER 2019

La Fabrique de la Cité participates in the ITS4Climate summit

In September 2019, *La Fabrique de la Cité* took part in the ITS4Climate summit, the world’s first international conference dedicated to innovative mobility in the service of the fight against climate change. *La Fabrique de la Cité* presented its work on the funding of mobility services and infrastructure and on the fiscal solutions currently being deployed. •

ITS4C
@ITS4Climate

DAY 2 #ITS4Climate 4th conference
Making it happen, enabling deployment: getting it done

💸 Incentives, funding & finance
📜 Policy, legislation
🛣️ Economics and business models
👍 Changing behaviours

9:26 AM · 18 sept. 2019

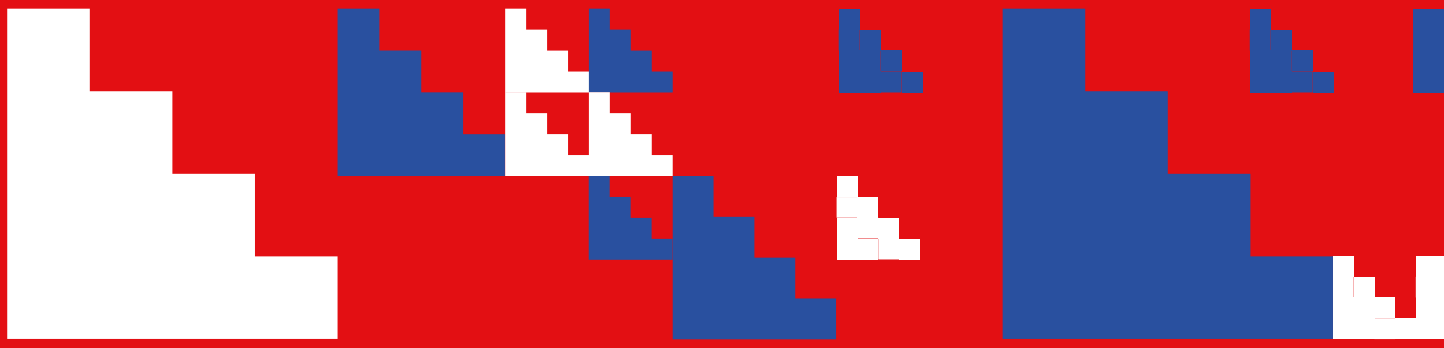

15:20-17:30
Siemens
Smart traffic management
November 27
13:00-15:00
BNP Paribas Real Estate
Integrating mobility
into real estate services
15:20-17:30
Fabrique de la Cité
Innovative mobility
financing schemes

Large infrastructure projects and democracy

How to carry out major projects in an age of uncertainty and transitions?

The dam in Sivens, the Notre-Dame-des-Landes airport, the deep repository in Bure, the outer bypass in Strasbourg, the Stuttgart 21 project and the construction of electricity transmission lines in Germany... countless projects have been deemed "useless" or "imposed". What underlying tensions and mutations do these opposition movements reflect? What do they tell us of the friction between political institutions and citizens' new expectations, born from growing individualization, rising concern over the environment, or the digital revolution?

Who can legitimately say whether a major project is in the public interest? When and how should citizens be involved in the design and implementation of major projects? In a context of generalized crisis of consensus, what responses can private actors offer? These questions are at the heart of a research project launched by *La Fabrique de la Cité* in 2019, with the assistance of a working group composed of thirty actors of major projects and urban issues: builders, elected officials, philosophers...



Major projects are long…

Time elapsed between the end of the public debate and the commissioning of the infrastructure

Grand Paris Express line 15 south	12 years	High-speed rail line between Bordeaux and Toulouse	19 years
Express rail link between Paris and the Charles-de-Gaulle Airport (CDG Express)	20 years	Saint-Nazaire offshore wind farm	6 years

…and costly…

Grand Paris Express	35 billion euros
Montpellier-Nîmes high-speed rail project	1.8 billion euros
EuropaCity (estimate, pre-cancelation of project)	3.1 billion euros

…yet also necessary and urgent.

The need for infrastructure investment at the global level should reach 40 times France's GDP, or:	94 billion dollars by 2040

● OP-ED

Large infrastructure projects head to head with 21st century democracy

The ecological transition is urgent, as heat records are continually broken and points of no return passed, whether they relate to biodiversity or resource depletion. The urban transition is just as urgent, as cities draw ever more men and women in search of a better present and future, and as the question arises of the negative effects of urban concentration on health, the environment, and social inequalities.

These two transitions posit another emergency: that of the investments required to bring these transitions from diplomatic and legislative commitment to tangible reality for the former, and from established fact to controlled development for the latter. These investments relate to R&D in clean materials and technologies and new economics models (for instance, power market models that take into account flexibility and storage), but also to social infrastructure (health, education), and mobility network infrastructure for persons, goods, electrons, bits... The urban and ecological transitions will necessarily be highly capital-intensive.

It is, however, in this very context that tensions around large infrastructure projects appear to be multiplying. A geography of contestation is emerging, characterized by diverse, more or less violent manifestations: civil disobedience and peaceful demonstrations as in the Hambach forest, resort to violence, use of media, judicial proceedings, etc. In light of the crucial aforementioned issues, it is time to question these movements and their meaning. Let us formulate five non-exclusive hypotheses:

· Are these movements evidence of the collapse of existing legal tools, against the backdrop of our evolving relations to political representation and decision-making, which partly result from the digital revolution? Dialogue, consultation, public debate, public inquiry are, in this perspective, to be re-appraised and re-founded. "Other times, other customs": law is, after all, a social science.

· The second hypothesis gives an even more central place to the question of technology. Descartes and the 17th century created the individual philosophically, with "I think, therefore I am", while the Revolution and the Declaration of Human rights created him politically a century later; today, technology is completing the process by giving the individual a singular voice in the physical

space of the multitude – the notorious "industrialization of individualization" mentioned as early as 2014 by Emmanuel Davidenkoff. In this context, how may we respond rationally to "not in my backyard" reactions, the infamous NIMBY, the indignant outcry by an individual who pits his subjectivity – his experience, as some today would say – against a discourse founded upon (political, scientific) arguments presented as rational and objective?

· Third hypothesis: the emergence of the individual into real space gives the local, the previous frame of daily life, newfound importance. Short circuits, cities of small distances... these are all notions that attest to a political over-investment into the local. The global is questioned alongside everything that is regarded as distant, as large. In this perspective, may the tensions raised by large projects be proof of a broader refusal of what is perceived as the pride of the "glorious thirty", a remainder of the hubris of a bygone era?

· This refusal of the "large" – large project, large company, goes hand in hand with a fundamental reconsideration of financial capitalism. Borderless, ultra-mobile, this capitalism is by very nature non-territorial and, in a mirror effect, rejected by transnational movements (Occupy Wall Street, Indignados...) which capitalize on their dual status as both cross-border and ultra-spatialized. This revenge of territories would thus be another manifestation of the opposition to financial capitalism that appeared in the 1980s.

· Finally, we must question our relation to the world on a more fundamental level. During the "glorious thirties", a modernizing frame of reference prevailed, leading to the construction of all the infrastructure of that period; this referential applied to all projects and was discussed among senior branches of civil service, local elected officials, and unions. This frame of reference no longer works. Is it currently being replaced by a new one, ecology, whereby man is part of a more global ecosystem in which an unprecedented place is given to animal and vegetal species? •

A WORD FROM THE PROJECT MANAGER

Why a research project on major projects and democracy?

Marie Baléo

Head of Publications

Opposition to major infrastructure and urban development projects is driven by perceptions, motives and claims that are often very symptomatic of the tensions currently exerted on our democratic and societal model. The study of these oppositions is both fascinating and necessary.

POINT OF VIEW

Can a consensus around major projects be recreated? Does the notion of general interest still exist?

Lucile Schmid

Vice-president, La Fabrique écologique

"It is necessary to structure a practical general interest which combines the interests of citizens, on a local level, corporate interests and the interests of the local authority, because otherwise each party views themselves as the legitimate holder of the general interest. Yet the practical aspects must not obscure symbolic elements such as culture and history. When some rivers are granted legal rights in New Zealand or India, this is due to the place they have always occupied alongside humans and societies. Individual interests are not the general interest, which instead is the result of a wide range of elements and reflects what a society wishes to share. We must continue to think about the concept of general interest and stop using it to close off avenues for discussion.

Today, the question of counterweights is also raised. Why is environmental action so difficult? What does adjusting to climate change entail? When you hear what climatologist Hervé Le Treut, who has worked extensively in Nouvelle-Aquitaine, has to say on what adjustments can be made in a region which is already experiencing coastal erosion, it is clear that it is still very difficult to consider a form of development that includes adaptation to climate change and the preservation of biodiversity. Perhaps the principle of local adaptation should now guide the definition, design and implementation of large infrastructure projects and be used to qualify their utility and democratic nature. How can this adaptation principle be placed at the forefront of considerations both in terms of scientific evidence and in terms of negotiation and democracy? I believe this is essential. Citizen opposition should not be viewed as something wrong or illegal. The law depends on a majority, on a political balance, of those who are in power. I also believe that for action to be taken, there should be constant interaction. Some companies should make the choice of being the pioneers in this regard.

From an environmental standpoint, compromises must be considered that mark the shift from warning to action. The IPCC says that we have ten years to act if we want to limit global warming to 1.5°C. It believes, however, that this scenario is highly improbable. When this report was published in October 2018, for the first time, a political argument was added that stated that this is only possible if those in power change their projects, working methods and policies drastically. I believe that this is a call to all those in power, whether this power is political, economic or citizen. What is the method and action plan that will put us on the path to limiting global warming to 1.5°C?" •

POINT OF VIEW

What is the origin of the difficulties participatory democracy mechanisms appear to be running into?

Laurence Monnoyer-Smith

Former vice-president of the French National Commission for Public Debate (CNDP)

"For it to be legitimate, the decision-making process must include shared decision-making. This is something that is deeply rooted here and is unique worldwide: the *CNDP* does not have an equivalent anywhere in the world. It is a unique tool that must be developed and organized differently to support the changes underway. We will have to create infrastructure which allows us to design the cities of the future, to change our behavior. We will have to be more imaginative still. The *CNDP* and the public debate system are very well suited to infrastructure projects. They are less suited to major decisions that are extremely pivotal, and which concern public policy: tax, the major energy choices to be made for tomorrow, etc. The idea that the government creates a citizens' conference is probably an avenue that should be explored. It would have to be rolled out on a regional level to be adapted to the different challenges in local areas. Depending on the area, people have specific vulnerabilities that must be studied to gain a better understanding of how best to support them." •

> We must continue to think about the concept of general interest and stop using it to close off avenues for discussion.

Lucile Schmid

Vice-president, La Fabrique écologique

> It is crucial to find the time and the courage to launch consultations at a time when the project still enjoys great leeway.

Xavier Huillard

Chief Executive Officer, VINCI Group

POINT OF VIEW

What responses can a major actor of large projects, the energy transition, and construction and concessions bring to the crisis of consensus?

Xavier Huillard

Chief Executive Officer, VINCI Group

"Our work, on-site, is to create the conditions required to ensure that the project entrusted to us can be conducted successfully, to try to build up sufficient local consensus for the project to continue to prosper. I believe there are three necessary conditions.

The first condition is decentralization. The Notre-Dame-des-Landes project was designed forty years ago, in a different paradigm. It should have been adapted in line with the paradigm we are living in today. This concept of time is of great importance. The fact that the discontinuation of the Notre-Dame-des-Landes project was announced in front of the Prime Minister's office was a key mistake. Why is this? Because projects must be supported locally by opinion leaders, politicians and associations and the debate with regard to their collective utility must be held on a local level. The discontinuation of Notre-Dame-des-Landes should have been announced from there. It is easier to build a consensus locally, due to a kind of *affectio societatis* inhabitants feel in relation to their region, than nationally. Fostering support for projects on a local level does not require additional texts, it requires a decentralization which places trust in the people who live in these local areas and who know better than us what is good or bad for these areas. They know better than us how to achieve a local consensus.

The second condition is to find the time and the courage to launch consultations at a time when the project still enjoys great leeway, room for negotiation and creativity, and not at a time when the project is already set in stone. How can we expect people to look kindly upon the consultation process in any other circumstances? Much time is therefore needed, possibly years if necessary: what the Swedish did with the project for the deep geological storage of nuclear waste is a prime example. You have to take a lot of time to organize discussions, dialogue and consultation on a local level, at a time when the scope for alterations is sufficient to take on good ideas, insights that we had not seen, so that people really feel that the consultation process has been useful.

The third condition is as follows: once these last two conditions have been fulfilled, there is no room for doubts or hesitations, as these would be used by residual pockets of opposition to argue that there is still time to block the project.

It is therefore essential to change our operating method through decentralization and to use local stakeholders to foster support by organizing local consultations and taking the time for this negotiation process, and then move forward without hesitating." •

● EVENT

2019

Expert hearings – Working group on “Large infrastructure projects and democracy”

A subject as rich and complex as that of the connections between major projects and democracy calls for a multidisciplinary response based on collective intelligence. This observation led *La Fabrique de la Cité* to create, in 2019, a working group composed of thirty experts of major projects and urban issues: corporate stakeholders working directly on major projects, local authorities, members of think tanks, philosophers...

The working group meets monthly to hear experts on topics as diverse as the general interest, the crisis of media, or the tools of participatory democracy. •

Smart cities

Power struggles and rent capture in the modern urban system

References to the smart city have multiplied since the turn of the 2010s. Yet the concept is criticized for its lack of consistency and clarity. Beyond the great diversity of information on the subject, four approaches to the smart city seem to coexist:

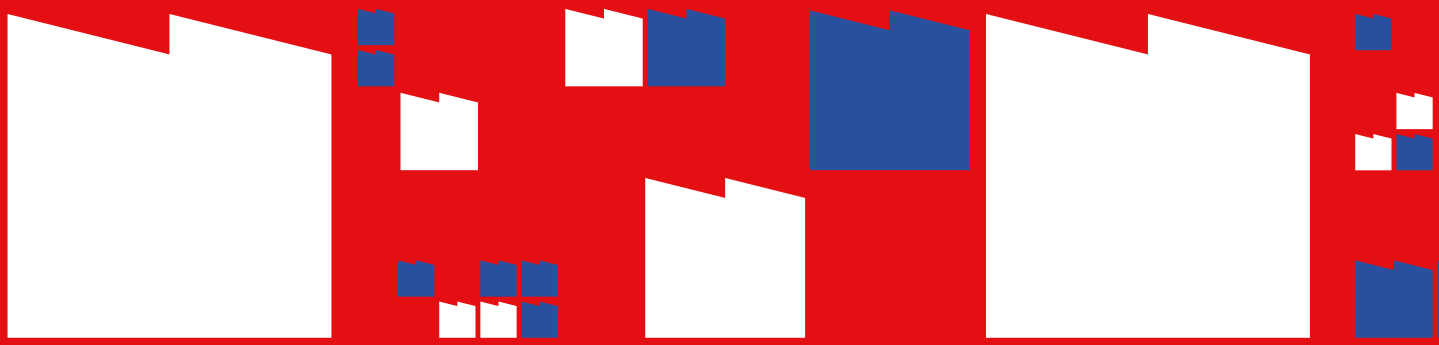
· A network-based, technicist approach that considers the smart city as a space structured by the automated generation, collection, management and processing of big data produced by urban technologization.

· An approach influenced by the sociology of science and techniques, that defines the smart city in terms of its digital deployment optimization regimes. As opposed to the technicist approach, the aim here is not to consider the smart city as an operation intended to rationalize the urban environment, but rather as a movement that complexifies city governance, due to the uncontrolled effects of the diffusion of digital technology and its uses.

· Inspired by the libertarian values promoted by the Internet's founders, works based on the collaborative economy, open source and direct democracy make the smart city a space where the bottom-up logic allowed by the diffusion of the web through connected objects meets the inhabitants' civic emancipation aspirations. The smart city would then become the place for a digital empowerment of urban societies.

· Conversely, a top-down approach centered on institutional actors (particularly private actors) and the capitalist thinking of urbanization processes considers the smart city as the last frontier for the growth of capitalism and authoritarian regimes.

With this research project launched in 2019 and set to continue in 2020, *La Fabrique de la Cité* will question these four approaches.



Explosion of the smart home market

Global market

2014	$6 billion
2017	$17 billion
2020 (estimate)	$43 billion

French market

2013	$176 million
2017	$624 million
2020 (estimate)	$1.4 billion

The smart city market could weigh as much as $1.4 trillion in 2020, as opposed to $568 billion in 2013 (source: Grand View Research, 2016).

The smart economy generates 2.5 quintillion (or a billion trillion) bytes of data daily, essentially via connected objects and sensors placed in our cities and buildings.

As a consequence of this "smart revolution," 90% of all the data ever created by mankind was generated after 2017.

● OP-ED

Psychoanalysis of the smart city

The emergence of data in cities has given rise to a federating narrative built around the term "smart city", which appeared some fifteen years ago. This narrative was written with a multifaceted promise in mind: that of a city which would be more livable, more sustainable, more resilient, more efficient, more...etc. We all wanted to subscribe to this promise and have all fed on this vision of a future city disrupted by technology.

There is a long way from promises to reality. In fact, one may rightfully ask whether technology, in the way it is currently being applied to all things urban, far from being disruptive, is not in many ways eminently conservative.

The example of urban congestion is striking: the "smart" approach was to solve this issue that is inherent to the very existence of cities; in reality, it has only worsened the problem. As shown by studies conducted in New York City or Boston, tech has added on new kinds of mobility which, far from filling up individual cars and combating solo-driving, have emptied out public transit and replaced active modes (cycling, walking). We venture a question: to what extent does tech in cities feed off the flaws and malfunctions of our urban systems? And when one feeds off a system, does one really have an interest in changing it?

Tech is also conservative with regard to environmental issues. Curiously, the narrative around the smart city has always posited that it would be sustainable. Such is not the case at all today. The physical infrastructure behind tech on the one hand, and the collection, processing, and storage of data on the other hand, require colossal, ever-increasing quantities of energy, as noted by The Shift Project. Tech uses more, much more energy than air transport, and the growth of its consumption is in the double digits. Data is often called the new oil: the fact is that we have interpreted this analogy literally and have adopted a very 20th century approach to tech in cities. Just as the economics of fossil fuel require ever more surveying, drilling, and commissioning, so we blissfully accept the claim that tech will require ever more data to function. This, in the name of the famous

Moore "laws" which, far from laws, are mere conjectures. "The smart has captured the green," Antoine Picon writes in *La ville rêvée des philosophes*, a book co-edited by *La Fabrique de la Cité* and *Philosophie Magazine*.

The ecology of technology has yet to be built, along with that of the smart city. Let us get on with it! Time has come to challenge technology, and particularly its urban applications, as our cities concentrate energy consumption and CO_2 emissions: to overcome its addiction to "always more" (more well-being, inclusiveness; in short, more urbanity) using less data. Utopian? Not really! Firstly, the minimization of data collection has been at the heart of the personal data protection regime ever since its inception, and has since been picked up by the GDPR, which could become a soft law tool beyond EU borders, as evidenced by the strategies of certain international (notably, American) companies. Secondly, beyond the issue of personal data, research is currently being conducted in the field of artificial intelligence regarding data minimization, which shows the interest of this approach both from an economic and security standpoint.

To become more urban, tech must work on its addictions. And so must we. We have tried to make tech a product meant to simplify cities, when the goal should have been to make it an ally, an indispensable tool at the service of an indispensable and rich urban complexity. The ultimate justification of the smart is not to always do more. It is to ensure that we can move around in our daily lives without degrading our environment in Los Angeles, Paris, Beijing or Bogota; it is to ensure access to drinkable water in Indian cities, to put an end to urban sprawl in Western countries, and to promote sustainable electrification of the African megacities that are growing before our eyes. •

A WORD FROM THE PROJECT MANAGER

Why investigate the smart city?

Raphaël Languillon-Aussel

Senior project manager

> The digital revolution is not just an economic phenomenon. It is also an immense spatial and political process that leads to renewed reflections on urban planning, governance and the democratic essence of our cities.

> Public institutions are not dead: they regulate private players and platforms in particular. Uber and Airbnb have undergone stricter regulation in recent years.

Antoine Courmont

Scientific director of the Cities and Technology Chair at Sciences Po

POINT OF VIEW

Antoine Courmont

Scientific director of the Cities and Technology Chair at Sciences Po

"Today, data production in the urban sector costs much less than it used to; this has resulted in new digital stakeholders emerging in this field. The restructuring of power relationships in relation to data is interesting. Now, major administrations are not the only ones who are able to produce data: these new stakeholders are testing the 'state's semantic power', to quote Boltanski – the ability of public institutions to define a reality and to coordinate a number of individuals in relation to it.

Public bodies have therefore been disrupted, sometimes to a great extent in some areas. It is nevertheless important to stress that there are factors that recompose their power: this is not the death of public institutions, they regulate even private players and platforms in particular, even if this is done retrospectively. Uber and Airbnb, which are both emblematic urban platforms, have undergone stricter regulation in recent years and are for example prohibited in certain cities. This regulation will most likely contribute to a change in behavior for these players; even if Airbnb is still in a confrontational mindset, Uber is increasingly leaning towards a partner-based approach.

We must also remember that private players need a stable legal framework to develop their business and that, in this respect, they require regulation in a form most favorable to their activity. The digital urban markets are for the most part jointly developed between public and private stakeholders. The differences in balance are in the power relationship between these players.

While there is the additional matter of expertise in public administrations, I have been struck in recent years by the fact that we tend to focus on the lack of expertise and undermining of public players and not enough on the fact that digital technology has kicked off an era of major uncertainty, for both public and private players in equal measure. When there is any form of technological innovation, there is necessarily an increase in society's skills. This must happen but does take time." •

POINT OF VIEW

Is the smart city bound to become a city of mass surveillance?

"One of the biggest dreams of the smart city, expressed in the 1960s although the term did not exist at that time, was to monitor the whole city. This seems possible in states where private stakeholders have no choice but to cooperate with the public sector, such as China. Indeed, a system of highly-developed social control is conceivable in China because the private sector is at the service of the state. In more democratic regimes, the multiplicity of stakeholders ensures that no single stakeholder can exert widespread surveillance." •

Régis Chatellier

Foresight project manager at the CNIL

"One of the risks with always developing more security devices in the public space has to do with socio-spatial inequalities, which comes with stigmatization of working-class neighborhoods and of certain social groups, over which control increases first. In addition, the banalization of these security devices goes hand in hand with the development of a culture of anticipation, prediction, or 'alertness', in the words of Emmanuel Macron, that transforms our representations and customs". •

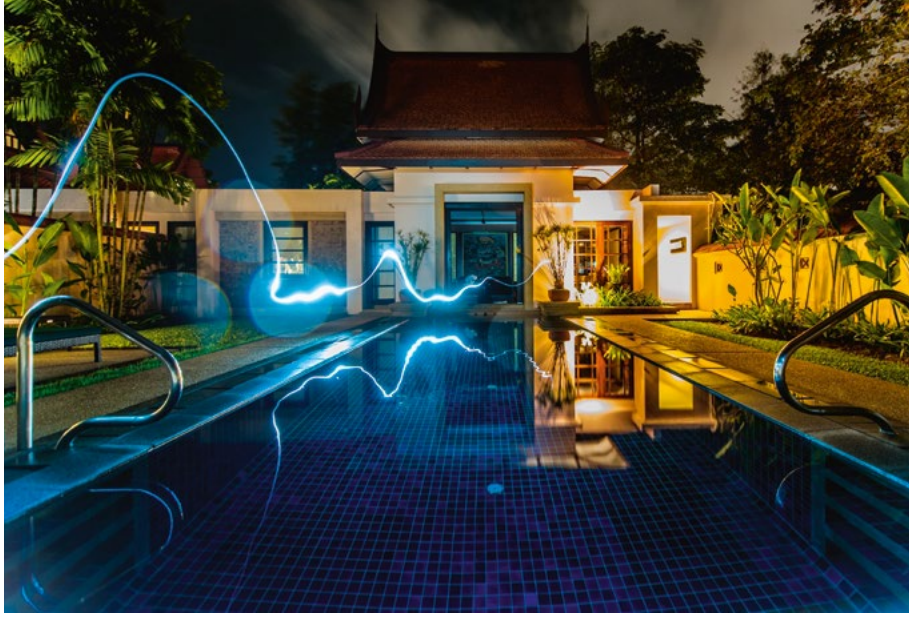
Myrtille Picaud

PhD researcher at the Cities and Technology chair at Sciences Po

> In more democratic regimes, the multiplicity of stakeholders ensures that no single stakeholder can exert widespread surveillance.

Régis Chatellier

Foresight project manager at the CNIL



CITY PORTRAIT

In its Singapore City Portrait (2019), *La Fabrique de la Cité* analyzed the city-state's smart city strategy, which, by blending political vision and strategic governance, has successfully used technological innovation to create a fluid and efficient city. What does Singapore's Smart Nation strategy entail?

SINGAPORE, A SMART CITY IN THE SERVICE OF SMART CITIZENS

In November 2014, Prime Minister Lee Hsien Loong announced the launch of the Smart Nation program. The program aims to create physical and digital structures for the collection and use of urban data. In other words, to put Big Data at the service of territorial problem-solving.

Following this announcement, 1,000 sensors were installed across the territory and 50,000 cameras on residential buildings between 2012 and 2016 as part of the Smart Nation Sensor Platform, the national Internet of Things medium. 3,600 other cameras were installed in public spaces. These instruments collect data on water levels, air quality, urban safety, flows, brightness, etc. In an open data approach, such data is then made legible and available to all on the government website data.gov.sg. Data can be used by the various government bodies, the private sector and citizens, who are all encouraged to propose solutions for what can be optimized.

The aim of the smart city is to make the city more fluid and efficient. Partnerships between government bodies, public companies (Singtel, the state telecommunications company) and private companies (Samsung, ARUP, etc.) have been signed to analyse and leverage data. These collaborative initiatives have resulted in the creation of new services such as the implementation of smart lighting systems in the city and residential buildings, predictive maintenance for lifts and pipework, the development of the autonomous vehicle, etc.

Yet this Smart Nation strategy does not simply entail providing tools. It also aims to educate smart citizens. Cooperation between users, in particular through the transfer of private data, is essential for the completion of the smart city. Yet this potential for contribution goes further still: citizens can produce data and can also notify of everyday obstacles or, through the open data tools made available, propose solutions. Despite all this, this intrusion into daily life and public services heightens the gap between those who master digital tools and those who do not. •

IN THE NEWS

LA GAZETTE DES COMMUNES, 17 SEPTEMBER 2019

"Is the smart city authoritarian?"

"Should we be wary of the smart city and its declination based on 'safe-city' security? This is the question asked by *La Fabrique de la Cité* at a conference which took place on Tuesday 10 September. 'With the smart city, the city has become a space where individuals can be traced. And we all carry the surveillance infrastructure along inside our cell phones', notes Régis Chatellier, in charge of foresight studies at the *CNIL*. With this device in hand and the proliferation of CCTV cameras, 'can there still be a mode of private navigation in the city?', the *CNIL* asked in a foresight booklet published in October 2017. For Raphaël Languillon-Aussel, senior researcher at *La Fabrique de la Cité*, this evokes the notion of the 'digital panopticon', a contemporary version of the panopticon imagined by philosopher Jeremy Bentham at the end of the 18th century. In this device, a guard, located in the center of the structure, can see all the cells distributed in a circle around him and thus ensure security. Each prisoner can feel as though they are being watched, even if that is not the case. Today, this situation may well apply to the state and citizens, and questions 'not only governance, but also political regimes, with their potential authoritarian excesses'. Indeed, in addition to traceability, 'video surveillance, in particular via facial recognition, organizes the end of anonymity', says Cécile Maisonneuve, president of *La Fabrique de la Cité*". •

EVENT

25 NOVEMBER 2019

The sidewalk, a plug-and-play space for the smart city?

While it is on everyone's lips, the smart city remains, most of the time, an abstract reality, invisible to the eyes of both users and residents. Its development does not imply radical transformations of landscapes, forms or logics of urbanization and is based on the discreet diffusion, in the urban space and its infrastructure, of connected sensors and digital technologies.

However, the spatial deployment of the many innovations of the digital revolution is neither ubiquitous nor random. On the basis of this observation, *La Fabrique de la Cité* hypothesizes that the physical anchoring of the smart city would essentially take place at the level of the sidewalk, on which "smart" stakeholders would plug in via their innovations, technologies, digital interfaces and services. Thus, sidewalks would capture and accumulate a share of the added value generated by the urban deployment of the digital ecosystem. In order to discuss sidewalks as deployment and experimentation spaces for the smart city, *La Fabrique de la Cité* organized, on 25 November 2019, a roundtable with Isabelle Baraud-Serfaty, founder of ibicity, Alain Guillaume, business development and marketing manager at Omexom, Nicolas Machtou, deputy Île-de-France director at Enedis France, and Emmanuel Mussault, leader of Michelin's smart city program. •

Territories and metropolization

Political reorganization and new spatial dynamics of urban globalization

Territories are the crucible of individual and collective identities and are built in the long term. While the term "territory" originally referred to the national scale, it is now mobilized at all levels, right down to the local scale. This is due to three major processes: urbanization, "Europeanization" and the globalization of spaces.

Metropolization plays a particularly important role in this territorial reconfiguration. The "*loi de modernisation de l'action publique territoriale et d'affirmation des métropoles*" (Law on the modernization of territorial public action and the affirmation of metropolitan areas) is its direct translation. As suction pumps and scale commutators connected to globalization, metropolises are often accused of dissociating themselves from their regional roots and confiscating the resources necessary to the harmonious and equitable development of territories.

Besides creating new types of territorial organization, does metropolization produce spatial inequality? As part of its reflection on globalized urban dynamics, *La Fabrique de la Cité* has launched, in 2019, a new research project on the ambivalent and complex relationships between metropolization and territorial restructurings.

Key figures

In 2020, 30 cities will have over 10 million inhabitants.

With 37 million inhabitants, Tokyo is now the most populated city in the world

1st European city, Russia aside: **Paris, with 11 million inhabitants, ranked 28th**

First commercial airport worldwide: Atlanta, with 103.9 million passengers in 2017

Paris Charles-de-Gaulle: 69 million passengers, 10th position

First container port worldwide: Shanghai, 42 million TEU

1st French port: **Le Havre, 2.8 million, ranked 61th**

First passenger station worldwide: Shinjuku, 1.2 billion passengers in 2017

1st European station: **Gare du nord (Paris), 270 million passengers in 2017 - RER and metro included**

● OP-ED

Time to put an end to urban sprawl

While mobility was the catalyst of the yellow vests movement, housing, on the other hand, has been conspicuously absent from the movement's demands. Housing is also nowhere to be found in the fundamental questions raised by Emmanuel Macron in his 13 January letter to the French. The ubiquity of mobility in the public debate, at the expense of housing, may seem paradoxical, as housing is a far bigger financial burden on households than mobility ever was; French geographer Aurélien Delpirou thus remarked that "the weight of car-related expenses has been stable since 1990, contrary to housing-related expenses (which are constantly increasing, particularly in city centers and for underprivileged households)". The average household affordability ratio (the portion of household income allocated to housing expenses) increased from 16.1% in 2001 to 18.3% in 2013 (*INSEE*).

This is a paradox in appearance only. Household mobility costs, while often regarded as unavoidable expenditures, are actually the direct consequence of households' housing choices. In reality, mobility and housing costs are thus intrinsically linked. In fact, the events that triggered the yellow-vest movement (a decrease of the speed limit from 90 to 80km/hour and a fuel tax increase) have led the issue of the cost of car ownership to take center stage, with no attempts made to understand the determining factors of car dependency. The financial burden of daily mobility for car-owning residents of the suburbs is merely the direct effect of urban sprawl, itself born from the long-time adoption of policies favorable to the individual detached home, a vector of suburbanization. Thus, Aurélien Delpirou explains that suburbanization was "strongly encouraged in the 1980s and 1990s – i.e., after the decentralization of urban planning – by mayors bent on expanding their municipalities at all costs, even if it meant scattering individual housing lots, malls, and large public services in the peripheries, while keeping them separate from each other [...] This urban dispersion, the most marked in Europe, was also encouraged by the state, via the multiplication of access-to-ownership mechanisms".

Urban sprawl, which has marked the history of French metropolises for several decades, partly explains the attrition of the affordable

housing supply for low- and middle-income households, which was the subject of a study published by *La Fabrique de la Cité* in November 2018. It is obvious, as soon as one incorporates the mobility costs induced by the localization of housing into the calculation of housing costs, that the affordable housing supply is actually, in many of our metropolises, far smaller than it should be. Metropolization also increases the polarization of jobs, which, despite sometimes naïve hopes of a fast rise in telecommuting, are still largely anchored in the residential economy and located in the center of metropolises. This polarization of jobs is only increasing the current stress on the real estate market, making daily mobility more difficult in metropolises, and thus making urban sprawl intolerable. Through the protests born of measures related to daily mobility, it is the interconnection of housing, employment, mobility and urban policies that has been revealed. The solution does not lie in one-time measures or in silo-ed approaches, which have wreaked sufficient havoc. It is high time to ask ourselves what kind of urban model we want for 21st-century France. •

A WORD FROM THE PROJECT MANAGER

Why a research project on territories and metropolization?

Raphaël Languillon-Aussel

Senior project manager

Globalization and Europeanisation lead to a profound transformation of the nature of our cities and their relationship to the territories. In this sense, the resulting metropolization is part of economic, political and social dynamics in which legacy systems and those stemming from contemporary dynamics coexist, sometimes in a confrontational way.

POINT OF VIEW

Which geographies are emerging from the current crises?

Pierre Veltz

Winner of the 2017 Grand Prix de l'Urbanisme

"The effect of globalization, in France and in other developed nations, has been to give metropolises greater weighting. In particular, there has been a very high concentration of employment – skilled jobs above all – at the center of metropolises. This does not allow us to claim, however, as Christophe Guilluy has, that there is a divide between healthy cities and peripheral areas in France. In reality, the situation is more complex. Admittedly, major cities have benefitted from globalization but they have also seen inequalities increase very sharply. If you look at the median incomes, contrary to what one may think, there is a certain levelling between low-density non-metropolitan areas and metropolitan areas. There is of course a major axis of demographic and economic decline which runs from the Ardennes to the Massif Central region. In this diagonal void, according to the latest data from the French statistical institute (*INSEE*), the situation is worsening. However, in other areas, there is a very surprising patchwork. In relative terms, a certain number of small and medium-sized towns such as Figeac, Vitray and Laval, regardless of whether they are directly under metropolitan influence, are enjoying economic dynamism that is not the case in other areas. This is why I prefer the terms 'dense' and 'low-density' areas to 'metropolitan' and 'peripheral' areas because this terminology allows us to consider the interrelations much more than the oppositions: many low-density areas are under metropolitan influence. I believe that the main divide today, reflected in the current protests, is cultural in nature, with population groups that are failing to communicate because they no longer live in the same environment. In that respect, the static inequalities in income or cultural resources may be secondary to the ability to plan for the future."•

> Spatial justice cannot be considered solely based on a redistributive approach, ignoring this aspect of individual choice.

Jacques Lévy

Professor of geography and urban planning at the University of Reims and the Swiss Federal Institute of Technology (EPFL)

POINT OF VIEW

How has the mobility revolution reshaped France?

Jacques Lévy

Professor of geography and urban planning at the University of Reims and the Swiss Federal Institute of Technology (EPFL)

"The development of mobility with private cars made it possible to arbitrate either in favor of housing or in favor of mobility. Careful consideration shows that the share of income devoted to housing/mobility is the same in the city as in the suburbs: what is lost in property is gained in mobility and the opposite is true. It is a relatively neutral economic choice. This is why spatial justice cannot be considered solely based on a redistributive approach, ignoring this aspect of individual choice. This ability to make an individual choice also favors a 'club' approach: those who live in the suburbs can choose their neighbors, while those who live in city centers cannot. These are two very different ways of life.

The yellow vests crisis is based on grievances regarding mobility. These are political demands. I believe that ultimately, it is in a motorist's DNA to be libertarian. Any obstacle to this right to mobility, whether by tolls, taxes or speed cameras, is contested. Going beyond this right to mobility, the very idea of taxation is called into question". •

> In France, peripheries resemble the countryside much more than they resemble city centers.

Brice Teinturier

Managing Director, Ipsos France

POINT OF VIEW

Mobility fault lines and the French territory

Brice Teinturier

Managing Director, Ipsos France

"The individual car remains, with a 75% share, the most used mode of transportation for commutes in France. Part of the population is objectively stuck: it cannot abandon the individual car for lack of a satisfactory public transport offer. Handicaps are cumulative: those who most use the car are often employees, workers or among the least privileged; the cost of these trips (notably, the price of fuel) is much higher for them than it is for others. Part of the population is subject to extremely high pressure, with no alternatives.

In France, peripheries resemble the countryside much more than they resemble city centers. This observation runs counter to certain views of the periphery as fundamentally different from the rest of the territory. Reality is much more complex: we are faced with continuums. It cannot be said that there are several radically different Frances in terms of mobility." •

Scan the QR Code with your phone to discover the entire intervention

EVENT

19 APRIL 2019

Living in 20 years: which scenarios for the future of French territories?

While mobility is at the heart of countless analyses of the yellow vests movement, the question of housing, the second factor in the current crisis, has been largely left out of the equation. Housing fractures are at the heart of a study by French think tank *Terra Nova*, "Living in 20 years", the product of a working group in which *La Fabrique de la Cité* took part in 2018. In order to decipher the future of French territories, *La Fabrique de la Cité* welcomed, on 19 April 2019, French Minister of Towns and Housing Julien Denormandie, Marc-Olivier Padis, director of studies at *Terra Nova*, and Frédérique Lahaye, coordinator of the housing department at *Terra Nova*. At the heart of the debate, scenarios formulated by the *Terra Nova* study, which outline potential evolutions in modes of living and planning in France. The study helps nuance the frequent opposition between cities and peripheries and between urban and rural spaces and shows that the urban development model at work at the national level has severe limitations. The concentration of jobs in city centers has led to a rise in the number of commuters (of a labor force of 26 million, 17 million are commuters). At the same time, over half of the French population wishing to move aspires to live in a small or mid-sized town, close to a large urban center. This tendency encourages metropolitan sprawl, which further divides living areas from employment areas, as Julien Denormandie notes, and worsens social and spatial inequalities.

Housing is also a source of significant tension: 22 million French citizens live in tight housing markets, where the demand for housing far exceeds the supply, while Julien Denormandie notes that 6 million citizens are currently poorly housed. These questions have long been treated distinctly, with no attempts made to analyze their numerous and complex interactions. However, as Cécile Maisonneuve, president of *La Fabrique de la Cité*, remarks, "housing policies are a crucial component of a territorial project with decisive implications." In this regard, the speakers called for preferring the French word "*habiter*" to the French equivalent of "housing". Indeed, "*habiter*" offers a more complete vision of the urban experience, in so far as it connects mobility, construction, public space, health, leisure, well-being, and the environment, at the local scale. •

Singapore

The conquest of a restricted territory

With 7,000 inhabitants/km², Singapore is the world's densest state. Constrained by its limited surface area and resources, the city has conducted innovative public policies over the past 60 years: mass construction of public housing, creation of "towns", road pricing... In the 1990s, Singapore entered a knowledge-driven economy and became Asia's first financial center thanks to its modern transport and telecommunication networks and its attractive fiscal system. These have made Singapore a business location that cannot be overlooked. In 2017, the island hosted 788,500 qualified foreign workers. It is currently ranked first city in the world for expatriate quality of living by Mercer. This proactive policy in favor of foreign capital and knowledge retention goes hand in hand with local talent training, which benefits from one of the world's most renowned educational systems and tight cooperation between the public sector, universities, and companies. These elements have enabled the consolidation of Singapore as a world-class innovation hub, both in the technological and urban fields.

A pioneer of satellite-based road pricing, mother of algorithmic mobility and govtech expert, Singapore is one of the best-known and most studied smart cities. Its implementation has benefited from a hyper-connected population and permissive legislation, in particular as regards data collection and processing, with the promise of efficient personalization of services. Aiming to become a seamless city, Singapore has associated careful governance to the use of technology. Urban logistics, management of flows and resources, housing, nature in town, energy transition: the reinvention of practices leaves no sector behind. The administration itself has started to transform into a smart administration and citizens have followed the movement by becoming smart citizens. This process has been supported by the Smart Nation initiative launched in 2014 by Prime Minister Lee Hsien Loong, which aspires to involve all city stakeholders in the state-directed digital transition. What room do these policies leave to practices not based on service consumption, yet which also contribute to the making of the city? Is the pursuit of the smart city an ideology aimed only at performance?

Faced with the fact that the construction of the optimized city does not equate long-run personal fulfillment and satisfaction, Singapore responded with the foundation of the Centre for Liveable Cities, which aims to reconcile the performance goals of the smart city with quality of life. Running counter to the image of stone, glass and steel technological metropolises, Singapore has made urban biodiversity a major priority. Its "city in a garden" program aims to re-create an autonomous ecosystem and make nature a genuine architectural artwork, in order to achieve liveability, regarded as the synthesis of a competitive economy, sustainable environment, and quality of life. To what extent do these policies help shape an imagination meant to bolster the city's economic attractiveness and maintain political stability?

Key figures

Surface area	721 km^2 in 2017; 63 islands
Population	5.6 million inhabitants, including 152,000 millionaires
Trade openness	110%
	2nd port worldwide after Shanghai

● OP-ED

Embracing complexity: how Singapore became Singapore

The journey to modern Singapore began in 1819, when a small fishing village was turned into a warehouse port by the British, offering a new maritime route to the British East India Company through the strait of Malacca. A confrontation with complexity soon occurred, when, to fulfil British trade aspirations, the city appealed to massive immigration from Southeast Asia, China, and India. The waterfront and the hinterland, which was once a luxurious rainforest transformed into vast plantations, became a place of encounter for men from various origins, speaking diverse languages and worshipping different gods. The Enlightenment had left a trace in Europe, and, in 1822, the Jackson Plan, drawn by the British, distinguished quarters based on their activities and workers' ethnicity; the Plan, though it left an enduring legacy, failed to stand the test of time or practices. Nowadays, power and cultural institutions remain concentrated within the European city, characterized by its neoclassical and neo-Palladian architecture, although it is not rare to glimpse, at the corner of a Chinatown street, in between two shophouses, a temple adorned with shimmering Hindu deities. The invention of the automobile, tinned food, and new rubber processing methods, followed by the inauguration of the Suez Canal in 1869, firmly enshrined Singapore as a key port for trade in Southeast Asia.

The Japanese occupation (1942-1945) damaged the legitimacy of British government over the island. Anticolonial political parties emerged and helped the city gain progressive autonomy. In the midst of the Cold War, left-wing factions advocating the use of Chinese languages against the supremacy of English were seen as a threat to Western liberalism and were severely repressed. In 1954, the People's Action Party, an English-speaking anticolonial political party, was born, led by the man who would become Singapore's founding father after the nation's independence in 1965: Lee Kuan Yew.

Post-independence years elapsed to the hectic pace of cranes and cement mixers. Accommodating a growing population requires building high and fast, as does fulfilling development ambitions. In 1987, the World Bank declared Singapore a high-income country: the city-state had become a world class financial centre and nicknamed "the Switzerland of Asia". The 1997 Asian financial crisis curbed Singapore's growth only to better complete its transition to a knowledge

economy. Singapore's resounding success was reflected in the expansion of its business district, with the opening of the Marina Bay Sands in 2010, and by the designation of the Botanic Gardens as a UNESCO world heritage site in 2015. Today, the overlapping of a digital layer and the physical layer hastens our experience of the city. This acceleration has been exacerbated by algorithms, substantially reducing the processing time and adaptative capacity of governments and citizens. The smart city, as efficient as it promises to be, heralds a new era of complexity.

The English title of the "Trading Cities" chapter in The Invisible Cities echoes the mercantile foundation of Singapore's success. It nonetheless fails to translate the richness of what cities have to offer; Italo Calvino writes more broadly of exchanges, "*le città e gli scambi*" in its original version. Modern Singapore is in essence a blend of cultures, and its language, or perhaps its languages, are in the image of its history. These languages reveal a subtle complexity; in life as in town, they offer a clever mix of Malay, Chinese, and Indian idioms, Peranakan Creole and English, which is manifest in the city's toponymy: Fort Canning Hill borders Dhoby Ghaut (in Hindi, "the launderer on the river steps"), while Jalan Bukit Merah (in Malay, "the red hill street") delimits the Tiong Bahru neighbourhood, a combination of "*thiong*", ("cemetery", in Chinese Hokkien) and "*bahru*" ("new", in Malay).

Is Singapore only this straight, logical and efficient city, as its glass and steel Central Business District, where men and women linked to the world via their smartphone come and go in a hurry, would have us believe? Its richness may not be encapsulated in the mere term "globalized city". Singapore offers multiple facets, all cosmopolitan, to whoever follows its maze, through traditional quarters or through the new "towns" which blossomed in the 1970s, to discover local lives as they thrive a few kilometers away from downtown. •

> Singapore has had to deal with the challenges of urbanization throughout its history: overcrowded slums, high unemployment, water shortages, floods, polluted rivers, traffic congestion… There are 5.61 million inhabitants in Singapore living on a 722 km² territory with very limited natural resources, yet with essential needs that a city-state must cater to.

Limin Hee

Director of Research, Centre for Liveable Cities

EVENT

10-12 JULY 2019

Urban Expedition to Singapore

From 10 to 12 July 2019, *La Fabrique de la Cité* brought a group of 30-some urban stakeholders to Singapore. Demographic growth, an ageing population, the fight against climate change, and increased cybersecurity risks are only some of the challenges Singapore will have to contend with in the coming years and decades. To what extent can the articulation of governance and technology help remedy Singapore's territorial limitations? Can the policies conducted in Singapore be a source of inspiration to other metropolises in spite of the diversity of economic, cultural, and political contexts? •

POINT OF VIEW

What challenges will Singapore face tomorrow?

Lam Wee Shann

Chief Innovation and Technology Officer, Land Transport Authority, Singapore

"Our first concern is space management. The second is demographics. Singapore will have to cater to an increasing population and rising transport demand, not to mention rapid ageing of its population, which will bring an emphasis on new needs. Population ageing also challenges the labor force: by 2020, the number of elderlies will increase to close to 3.4 million (Singapore's current total population is estimated to 5.6 million). Finally, safety, health, and sustainability will frame mobility for the next twenty years. This is why we are promoting a car-lite environment, the matrix of the 2013 Land Transport Authority Masterplan. Our aim is to nudge people to use public and shared transportation, and to encourage walking and cycling as much as possible. If we could, we would have no vehicles at all on our roads, except for public transit." •

POINT OF VIEW

Singapore versus the car

Jean Coldefy

Director of the Mobility 3.0 program, ATEC ITS

"Singapore is a utopia for European cities. It has achieved something that can hardly be done in other metropolises: developing a very efficient mobility system avoiding car use and putting at the same time high pressure on car ownership and usage with high results. The results are impressive: if you compare France with Singapore, the car-to-inhabitant ratio is 2.5 times lower in the city-state. Why is car usage a problem? The biggest problem cars are causing is about space occupancy. With limited surface area, land is Singapore's most important resource. The other very important point is that all competencies are within the hands of one entity: the Land Transport Authority." •

CITY PORTRAIT

Singapore: the conquest of a restricted territory

INFRASTRUCTURE OPEN TO THE WORLD

Since Stamford Raffles' arrival, the maritime and port industry has played a key role in Singapore's economic development, and currently accounts for 8% of its GDP. Now the second-largest port in the world after Shanghai in terms of container traffic, more than 626 million metric tons transited through Singapore in 2016 to 600 ports in 120 countries. Its eleven terminals are located in close proximity to the city, in the south of the island. They are managed by private operators such as the Port of Singapore Authority and Jurong Port, under the control of the Maritime Port Authority which regulates port activities. The policy of a free port zone, which, since British colonization, exempts products transiting through the port without entering the local market from customs duties, fosters Singapore's appeal and contributes to it becoming a global logistics hub.

The leases of the current terminals will expire in 2027 and 2040 and will give way to an extension of the CBD and a developed shoreline. The Tuas mega port is set to take over some of this business by 2021, ahead of the end of work planned for 2040. Its construction requires land reclamation of 387 hectares from the sea to the west of the island. The port's capacity will be increased to 65 million containers per year, as against 40 million today. Autonomous vehicle testing is currently being conducted on the Pasir Panjang terminal and the growing automation of port activities is contributing to 20% to 25% of Singapore's port productivity: artificial intelligence, drones, connected objects, etc. This digitisation of the port is an absolute requirement for its competitiveness to counter the emergence of other South-East Asian ports which enjoy cheaper workforces. Along these lines, the Tuas port should benefit from the most advanced technologies and be part of the "smart" trend with a view to confirming Singapore's status as a major trade power.

This status is not solely related to shipping. Globalization and the growing requirement for speed are giving rise to another international transportation sector: air travel. In 1975, Changi Airport was built on the eastern tip of the island. Its future extensions were made possible through land reclamation.

Singapore's economic dynamism contributes to the emergence of Changi Airport as a regional and international hub. Its entry in the knowledge economy affords it the status of a valued business destination. Its success has followed that of the national airline: Singapore Airlines. In 2018, this airline launched the longest direct flight in the world between Singapore and New York. However, it is not the only airline to connect Singapore to the major global economic hubs. Thanks to its dynamic economy, Changi has become a key destination for the main international airlines and welcomed 65.6 million passengers in 2018. The importance of air freight has gradually been added to that of maritime cargo, boosted by the development of e-commerce and a growing demand for medication in emerging Asian countries. Given the strategic importance of such an urban asset, Singapore's airport remains state-owned.

Located half an hour from the CBD, the airport is fully integrated in the city, firstly by its direct MRT link and secondly by its ability to offer activities and a living environment to the residents of neighboring districts. Changi Airport's reputation is built on its ability to offer its customers a wide range of activities and services. The 2019 extension of terminal 1, known as Jewel Changi Airport, has provided passengers and visitors with an indoor forest over five floors, a glass dome from which a waterfall flows and a great number of shops, with a view to making the airport a fully-fledged urban space open to the public. In addition, flow optimization is a clear focus: to attract busy businesspeople and tourists waiting for connecting flights, it was essential to reduce waiting times and to automate the check-in process and customs controls. The improvement of flow management is intertwined with the consolidation of the airport's digital transition. For the sixth year running, Changi Airport was ranked the best airport in 2018 by the Skytrax World Airport Awards.

Lastly, in addition to the port, the airport and the road and rail connections which connect Singapore to the Malay Peninsula, a high-speed train line connecting the island and Kuala Lumpur in 90 minutes is set to be opened by 2031, thereby rounding off the array of international transportation options. All this is part of the drive to make infrastructure an integrated system to promote the multimodality and intermodality of freight and people. •

Toronto

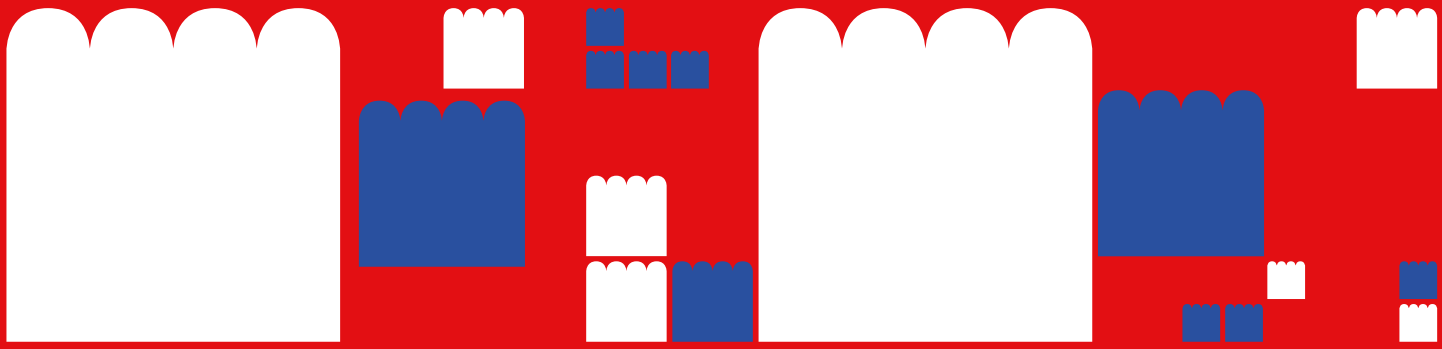
The “accidental metropolis”?

“Toronto appears as a possible answer to Canada’s search for cultural autonomy from its powerful neighbor; through combative multiculturalism, Toronto has created its own personality, both complex and contrasted. Still, from an economic point of view, the maple leaf country is very likely to face cruel disillusions if it wishes to acquire economic independence by focusing its evolution on that of its economic capital, as it is true that it is difficult, regionally, to compete with the American poles". Does this observation made by researcher Guillaume Poiret in 2005 still hold true in 2019? How is Toronto positioning itself in the competitive game of Canadian and North American cities? How can it solve the problems it is currently facing so as to reinforce its economic attractiveness and establish itself, in the coming decades, as a world city and a hub of the global economy? And how can it combine this status with its very specific DNA?

With a population expected to increase from 6.19 million to 7.1 million by 2035, the Greater Toronto Area will face unprecedented growth in the coming years; its infrastructure will have to prove capable of absorbing this growth. Yet much of Toronto’s current infrastructure appears obsolete and in need of significant investment: congestion costs the Greater Toronto Area 6 billion dollars in lost productivity each year, while the monthly public transport pass, at $150 per month, is among the most expensive in the world. Beyond saturated mobility infrastructures, Toronto’s bridges, roads, sewers also require urgent investment. “Upgrading and renewing the City’s infrastructure is essential to keeping Toronto a world-class city“ declared Toronto’s Mayor, John Tory, in 2018. The infrastructure issue is compounded by the larger challenge of income polarization, with Toronto now among the most unequal cities in North America. This inequality is made apparent by a growing shortage of affordable housing, with Toronto’s residential vacancy rate currently below 1%. How, then, can Toronto reconcile economic growth and attractiveness and quality of life and social inclusiveness for its inhabitants?

Proof of the city’s attractiveness and world-class status, Toronto’s waterfront area may soon become home to Quayside, an innovative, smart neighborhood designed by Alphabet subsidiary Sidewalk Labs. Smart cities have been the subject of much debate in the past decade. How does Toronto view the smart city? Has Canada developed its own vision of the smart city, and if so, how does this vision differ from the U.S. approach and the more global, standardized approach to smart cities? More generally, what does the term “smart city” mean today, and how has this definition evolved over the years? What are the specificities, strengths, and weaknesses of the various existing models of smart cities, and what urban futures are these different models working towards? How can cities ensure that their smart city strategy is no longer a be-all-end-all, but rather a tool at the service of a broader urban vision?

Significantly, public debate around the Quayside project has tended to focus on the proposed collection of data in the public space, proving that the matter is perceived by Toronto’s residents as highly critical. What legal, political, and social problems can arise from the widespread collection of urban data? Through which governance models and arrangements can urban stakeholders ensure the democratic use of data collected in urban public spaces? How can the need for individual privacy, the impetus for collecting data to create new services, and the need to ensure physical security of individuals in the public space be reconciled?



> Toronto is “New York, run by the Swiss”.

Peter Ustinov

Key figures

Number of inhabitants in the Greater Toronto Area (surface area: 5,903 km^2)	6,847,794
Number of Torontonians with at least an undergraduate degree	835,255
Median income after tax for a Torontonian household in 2015 (CAD)	$58,264

● OP-ED

Toronto, from "good city" to world city

A multicultural metropolis with its eye on the world, a testing ground and a meeting point for those who are creating the city of tomorrow, Toronto aspires to showcase a vision of modernity that is supported by economic growth and innovation for the benefit of the community and comes alive in luminous, lively new spaces. At the end of the 1980s, Margaret Atwood already spoke of a turning point in representations of the city. From a city with limited influence, which its inhabitants were only too happy to flee on the weekends, Toronto was said to have become a cosmopolitan city, where many aspired to settle. But the narrator of Cat's Eye does not believe in these two versions; the truth, instead, may well lie elsewhere. In spite of a political attempt to shape a narrative around its multiculturalism and cultural dynamism, it appears, in fact, that Toronto is struggling to assert a strong identity, quite unlike its historical rival Montreal.

Toronto's ambition to become a world city goes hand in hand with references to the "villages" that shape its political and physical space, producing the dual image of a city with regional influence that also projects itself beyond the borders of Ontario. This hints at a tension between what is presented and what is felt, between constructed rhetoric and daily experience; reality can only be found outside of discourses and projections. But perhaps this is where Toronto's specificity lies: in the encounter, from the mid-20th century onward, of a secondary North American city with a world city trajectory, creating new urban representations, in a blur that produces a sensation of relative misunderstanding.

Toronto also wishes to present the image of a city that produces a future that is being designed today. At the heart of the Sidewalk Toronto project is a view to create a new, replicable urban model. In Toronto, the future is not just a dream; it is to be created, incarnated. Such is, at least, the ambition put forth by public and private actors through a variety of projects, starting with Sidewalk Toronto. The city of tomorrow will not be the one pictured by Moëbius in The Long Tomorrow, a suffocating, vertical city. It will combine residential and workspaces, blending together urban functions; it will give greenery a significant place and build the possibility of a space where individuals would not live side by side but rather would come together to create a community. Perhaps Arthur Rimbaud would be fascinated with these "crystal chalets", staples and symbols of a modernity that seeks to combine technology and nature.

It would be easy to give in to a teological temptation and pretend that Toronto could only have become what it became, but that would be forgetting the ways in which unexpected events have shaped its evolution. The Second World War played an important role in Canada's economic development, particularly as it marked the definitive decline of the British Empire and the rise of the United States as a global superpower, benefitting Toronto, which had created precious connections with the neighboring country, over other Canadian cities. The political context of the neighboring province also played a part, with concerns over Quebec's political future in light of the independentist project of the 1970s leading certain industrial activities to relocate to Ontario.

A modest agglomeration founded at the end of the 18th century, Toronto, which, until 1834, bore the name York, did not seem destined to rise beyond the status of provincial capital. It is firstly through Anglican puritanism and royalist affirmation that Toronto shaped its image, in opposition to Montreal's mystical, missionary image. Trapped in Montreal's shadow for the better part of the 20th century, Toronto's elites used the originally sarcastic nickname "Muddy York" to incite the local government to take measures to improve infrastructure. The 20th century was marked by strong rivalry between the two cities, mostly on economic grounds. Toronto came out the clear winner by positioning itself as a major financial center.

If Toronto's identity remains hard to grasp today, it may well be because the city is still trapped in the tension between the Victorian image of "Toronto the good," a quiet town preoccupied with moral questions; a multicultural image which, beyond the political fiction that conveys it, has become hard to deny; and (at times) controversial visions for the future, which come through in several ambitious projects supported by an ecosystem that fosters innovation. •

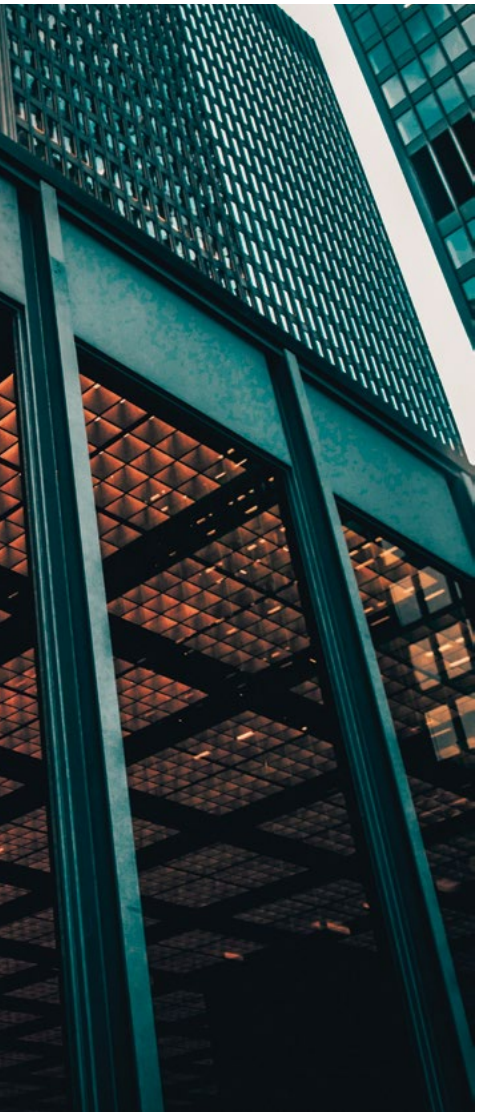
A WORD FROM THE PROJECT MANAGER

Why Toronto?

Marie Baléo

Head of Publications

Because this teenage city, whose identity is still a work in progress, suddenly finds itself facing the most pressing and fascinating urban issues of our time: an infrastructure crisis, difficulties identifying an appropriate governance model, a shortage of affordable housing, concerns about the place of private actors in the urban factory, fears of a smart city of surveillance...



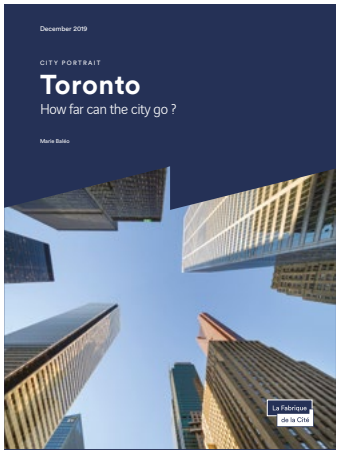
EVENT

23-25 SEPTEMBER 2019

Urban Expedition to Toronto

A former provincial metropolis with limited influence, now on track to become a global city, Toronto is a dynamic city currently experiencing strong population growth and economic dynamism. How will Toronto successfully build the housing stock and infrastructure it needs in order to absorb this growth in the coming decades? Will the city be able to assert itself in the face of an overpowering province? Finally, what will happen to the much-maligned smart neighborhood project that Sidewalk Labs is now trying to implement on the Toronto waterfront? To explore these questions, *La Fabrique de la Cité* organized an urban expedition from 23 to 25 September 2019 with an aim to discover and better understand this "accidental metropolis" (Joe Berridge).

CITY PORTRAIT



In the wake of its urban expedition and of its city portraits of Singapore, Pittsburgh, Vienna and Lyon, *La Fabrique de la Cité* has released a new city portrait dedicated to Toronto, in which Sidewalk Labs's disputed smart neighborhood project for Quayside is analyzed in detail. Why is the project subject to such strong criticism from Torontonians? What vision of the smart city does the Sidewalk Labs project promote and how does this vision differ from the Canadian conception of the smart city? While the project provides for the presence in public space of a large number of sensors, what about the protection of privacy and confidentiality of data? Finally, how can we analyze the irruption of a tech giant in the area of city-making?

A TECH COMPANY IN THE BUSINESS OF CITY-MAKING?

Concerns raised by Sidewalk Labs's project in Toronto are partly due to the unprecedented incursion of a technology giant into the arena of city-making. "Simply by wielding the 'pen' in designing the master plan for Toronto's new neighborhood, Sidewalk has exercised a significant public planning function", write Ellen Goodman, law professor at Rutgers Law School, and Julia Powles, associated professor at the University of Western Australia.

But Sidewalk Labs never hid the fact that its ambition, like that of its parent company, is to build and manage a city. Thus, in 2013, Google CEO Larry Page, spoke of "setting aside part of the world" for technological experimentation. Dan Doctoroff, CEO of Sidewalk Labs, has said of Alphabet, the parent company of Google and Sidewalk Labs, that it is the most ambitious company in history, with the notable exception of the Dutch East India Company.

In Toronto, the American company is planning to supply infrastructure systems, particularly when it proposes, in its Master Innovation and Development Plan (MIDP), the construction of a light rail line to serve the future neighborhood. The company is demonstrating a vision in matters of urban governance when it proposes the creation of no less than five new public agencies that, together, would administer the new neighborhood. However, David Robertson, an opponent of the project, notes that "all of these agencies would report to an overseer body called the Public Administrator. The Public Administrator is to be a public agency with representation from the city. None of these agencies can be set up without a lot of special permissions and changes to existing legislation and regulations at all three levels of government".

Furthermore, the company itself proposes to take on the role of a regulator: Natasha Tusikov, assistant professor at the University of York, writes that while "it wouldn't be unusual for a company to propose rolling out its prototype modular pavement, composed of interlocking pre-cast concrete pavers, for streets in Quayside, as Sidewalk Labs is proposing [...] Sidewalk Labs also proposes to grant itself the capacity to set the rules that will govern the urban infrastructure within the project neighborhood". Ellen Goodman and Julia Powles highlight the regulatory power that results, in fact, from the exclusive

control of data produced and collected in the neighborhood: "even if the government sets regulatory standards and enforces them, control over data can serve a de facto private lawmaking function".

Many observers also point out that the objectives of a private technology company differ significantly from the missions of the public authorities and that nothing indicates that a private actor pursues objectives of general interest. Thus, Goodman and Powles write that "for the tech company, the smart city is a way of capturing the value of data flows - by directly monetizing behavioral information or by using this information to design or acquire services - then to bring about the network effects and monopoly rents that characterize information technology platforms" and conclude that "we cannot be sure that the vision of Sidewalk Toronto is compatible with democratic procedures, sustainable public governance or the public interest". Nothing obliges Sidewalk Labs to guarantee continuity of its services. In this regard, critics of the project are quick to cite the example of Google's suddenly abandoned plan to deploy fiber optics in the city of Louisville.

The technical and solutionist approach specific to Google and the companies in its sector is reflected in a singular vision of the urban fabric: Sidewalk Labs announces its intention to build a neighborhood "from the Internet up", while the MIT Tech Review notes that "unsurprisingly for a company spawned, in part, by technologists, Sidewalk thinks of smart cities as being rather like smartphones. It sees itself as a platform provider responsible for offering basic tools (from software that identifies available parking spots to location-based services monitoring the exact position of delivery robots), much as Google does with its smartphone operating system, Android". Ellen Goodman and Julia Powles note, regarding Sidewalk Labs's project for Quayside, that "Urban governance is reconceptualized as facilitating the collection and transmission of data to applications and services that run on top of the platform", this in a "platform city" model which radically breaks down systems, spaces and services into groups of transactions optimized according to market logic. •

● IN THE NEWS

LE MONDE, 11 OCTOBER 2019

"In Toronto, it's all or nothing for 'Google City'"

"Waterfront Toronto, the authority that brings together the city, the province and the federal state to redevelop the waterfront, has asked the firm to clarify its intentions and has given itself until October 31 to decide whether to continue the adventure or pronounce a resounding divorce. 'We want a neighborhood at the forefront of innovation in all areas, and Google has made the best proposal. But today they are going too far', admits municipal councilor Ana Bailão, responsible for urban planning, whom we met during a study trip from the think tank *La Fabrique de la Cité*, to which *Le Monde* was invited". •

La Fabrique de la Cité

La Fabrique de la Cité is a think tank dedicated to urban innovations and prospective. In an interdisciplinary approach, urban stakeholders, both French and international, gather to reflect on good practices of urban development and to suggest new ways to build and rebuild cities. Mobility, urban planning and construction, energy, the digital revolution, and new usages are the five axes that structure our work. Created by the VINCI group, its sponsor, in 2010, *La Fabrique de la Cité* is an endowment fund, and is thus vested with a public interest mission.

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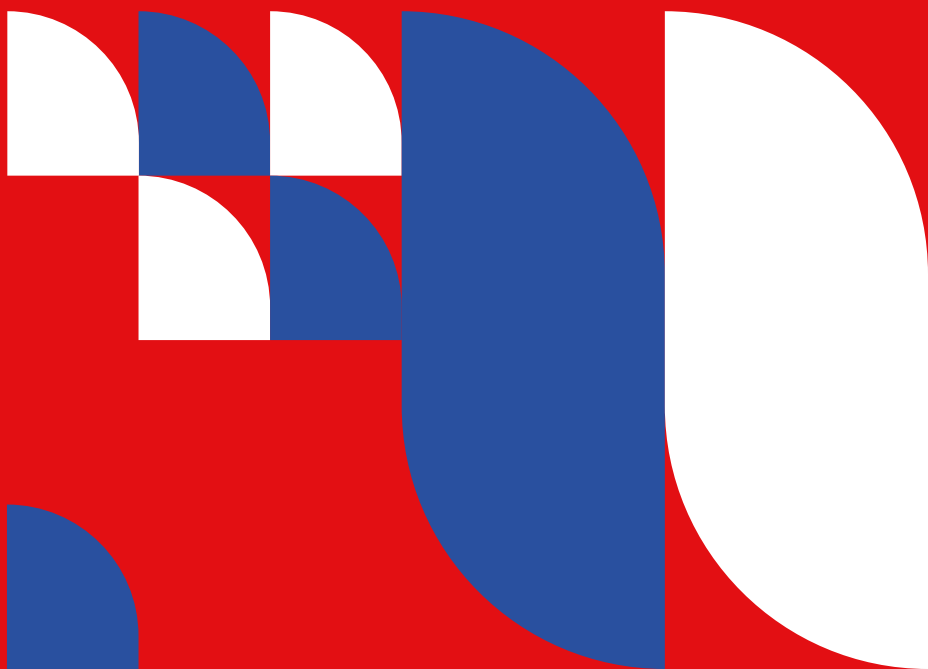

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