HUMAN CITIES

Going beyond "smart" cities

AmCham

Human cities :
Going beyond "smart" cities

AmCham France
White paper

Executive summary

"Smart" cities or human cities?

Smart cities have increasingly been associated with multiple forms of technological innovations aimed at optimizing urban infrastructures and services. Technical tools used by cities have been rapidly evolving since the 1980s. Today, cities now feature the latest innovations and in particular, digital ones. Due to their prevalence in modern cities, "smart cities" are now being assimilated to the very technologies they based their development on. As a result, a certain unease has surfaced about smart cities' development through technical tools alone.

In Toronto, the Quayside project by SideWalk Labs (by Alphabet, Google's parent company) lacks public consultation measures and transparency regarding how the data collected is used, which has triggered major backlash. Despite criticism, smart cities remain largely defined by the development of new technologies that act as plug-ins to pre-existing urban systems, and that are deemed necessary advances, if not unavoidable ones.

Beyond this broad techno-centric understanding of smart cities there is no specific definition or clear outline as to what a "smart" city might be today. However, common challenges for cities are easily identified, whether they regard responsible use of digital tools, optimizing flows of individuals, information or goods, or developing sustainable public services, from waste collection to public lighting.

Technologies have undeniably benefited the development of cities and allow an improved quality of life in urban areas. However, if being innovative in and of itself is not the sole purpose of a city, its innovations must be designed with the objective to serve its inhabitants and surrounding areas.Digital tools put in place must respond to citizen needs and expectations, and provide solutions for today's pressing challenges, such as climate change or energy transition.

As such, the realization of smart cities should move away from a purely technologically-oriented execution. Instead, it should focus instead on solving contemporary urban issues, such as sustainability, resilience, inclusiveness, data protection or the occupation of public space, through a holistic and collaborative approach. All in all, it is necessary to collectively rethink smart cities and the issues they entail through a broader, more inclusive lens.

Our recommendations

AmCham France's "smart cities" working group, led by Cisco and Ipsos, has identified a number of recommendations for the implementation of smart cities, which touch on and address three overarching issues:

- Existing infrastructure should be optimized and reused as much as possible, in order to reduce costs and optimize the utility of existing equipment.

- When digitalizing cities, stakeholders must thoroughly address citizen's fears regarding recent technological developments and what they entail: rather than concentrating on technologies, humans need to be the focal point in smart cities.

- There should be a reconsideration of how public space is perceived and shared among its users, and how operators, public or private, make use of it. Ultimately, it boils down to asking the three following questions: for whom is public space intended for, according to what rules, and who defines those public rules?

1. Make use of what already exists
- Develop a new perspective on cities and infrastructure
- Make use of data generated in public spaces
- Change the way public space is shared, taking into account new forms of mobility

2. Put the 'human' aspect back at the heart of any project
- Base any project on the inhabitants' expressed needs
- Promote citizen participation

3. Optimize urban governance
- Make collaboration between stakeholders simpler
- Monitor the development of digital tools and supervise the development of solutions for urban issues
- Raise awareness among public operators about issues related to sustainability, connection, transparency, and inclusiveness
- Create a regulatory framework that is geared towards experimentation

Foreword

Founded in 1894, AmCham France has been bringing American and French experts together for over 120 years. AmCham France counts 250 American, European and French member companies of all sizes and from a great variety of economic sectors. Over the past two years, AmCham has undergone a major shift in fostering public debate, pushing forward innovative solutions, and promoting discussion between business leaders, politicians, and representatives of academic and intellectual spheres.

AmCham's evolution was motivated by the shared conviction amongst our members that companies have an increasingly important role to play in responding to the general interest. At a time when France's civil society is facing increasingly complex challenges in economic, social, and geopolitical fields, it is essential that companies, which possess many unique talents and expertise, draft and push forward innovative and concrete proposals.

With this in mind, AmCham members launched several working groups that bring to the fore innovative, and sometimes disruptive, ideas relative to subjects of major interest. These working groups bring together business leaders, civil society actors, as well as academic experts.

This context has fueled AmCham's decision to focus its third working group on the conception and development of smart cities. Its co-chairholders are Yves Bardon, Senior Director at Ipsos' Knowledge Center, and Philippe Dumont, former Managing Director of Cisco France and now of Prevision.IO.

In fact, many AmCham company members are key players, and some even pioneers, in smart city development. Thanks to their international outreach, and the expertise they have developed on the matter, they offer formidable insights and innovations that can help resolve major challenges and contribute to building the cities of tomorrow.

Knowing that the literature available on smart city topics was already abundant, the "smart cities" working group members chose to focus on governance-related issues. It entails increasingly involving citizens, public authorities, and companies that can help generate and replicate solutions. Indeed, the methodology that was adopted throughout is based on the expertise and feedback of major international companies and e-mobility start-ups, as well as the analyses articulated by public stakeholders, urban planners, and architects.

This white paper does not shy away from questioning what it means for a city to be 'smart' in order to better highlight the acuity and complexity of the topic. Indeed, while looking for solutions that could accommodate the cities of tomorrow, 'smart' initiatives themselves raise many challenges, such as the preservation of privacy, individuals' status in public spaces, the benefits actually perceived by users, as well as territorial inequalities that the digital revolution has generated. Another crucial issue is operators' ability to interweave urban infrastructure and technologies, thereby contributing to cities' digitization, while trying to integrate digital technologies into people's lives in a concrete way.

Finally, this white paper points out that there is no single, universal "smart city" model that could, and should, be replicated across the world, regardless of local context and circumstances. On the other hand, there are concrete and innovative recommendations that make it possible to build the cities of tomorrow while also considering contextual differences.

In France, reflections and recommendations outlined in this white paper allow us to draw a smart city model that is characterized by inclusive governance, citizen participation, and the regulatory framework's adaptation to innovation. These characteristics could frame a European smart city model based on those three pillars.
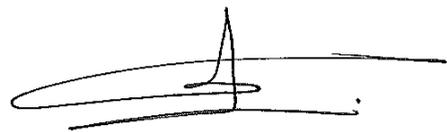
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Editorial

What does "smart" stand for?

The notion of "smart cities" has become increasingly present in everyday language, from politics to media or business, but covers many different perspectives on cities and and what "smart" entails. Overall, it is characterized by a multitude of contemporary aspects and challenges that are faced by urban systems.

Smart cities tackle notions of mobility, innovation, respect for private life, citizen involvement, sustainability, and even the role of the public sector in the development of these urban topics. Furthermore, these challenges require adopting specific orientations: for example, should innovation be considered a breakthrough or a continuity? Should innovations be imposed or should various stakeholders be involved in topics pertaining to private-data or citizen-participation?

Smart cities have imbued contemporary debates on urban planning so much that rankings were even created to hierarchize among the 'smartest' cities. For instance, the Smart City Observatory, part of the International Institute for Management Development (IMD) World Competitiveness Center, in partnership with the Singapore University of Technology and Design (SUTD), publishes its Smart City Index on a yearly basis since 2017. The 2019 ranking looks at 102 cities of various sizes around the world and gives each one a score that reflects the municipality's ability to integrate collective well-being's improvements through the addition of technologies into the functioning of the urban matrix. The ranking assesses how citizens and users perceive technologies and how they contribute to shaping more sustainable, resilient, and inclusive urban environments.

However, a city cannot claim to be 'smart' just by integrating technologies to its streets. In order to reduce congestion and pollution in the city, the city of Paris launched with JC Decaux the Vélib', an open access bicycle sharing system, in 2007. In 2014, the Velib' fleet was comprised of close to 14,000 connected bicycles. However, five years later,

the French capital ranks 51st out of 102

cities across the world in terms of improving quality of life via new technologies.

When asked whether pollution was a problem in Paris, Parisians surveyed as part of the Smart City Index gave their city a score of 22 out of 100. Zurich, in comparison, scored a high 60 out of 100.[1] In other words, city dwellers expect technologies to first and foremost make their lives more enjoyable.

Part of history now...

Smart cities intend to bring solutions to persisting urban and architectural problems. Modernism, New Urbanism, or the 'Soft Architecture' movement have already provided their own solutions to density, sanitary, or transportation issues.

Modernism, for one, is the 19th century avant-garde's heir. It tried to foresee and adapt to the consequences of the rural exodus towards cities that are now referred to as megalopolises. Attracting communities to urban areas, city growth and the industrial revolution brought out a number of questions. How could cities possibly accommodate millions of people? How should space be structured and organized? Should history and the diversity of existing systems inspire us, or should we start from scratch?

The Bauhaus school of design and architecture later theorized Modernism and put it into practice. It gained considerable fame in the World War II reconstruction period and followed the rise of the car-oriented, consumerist society of the 1950s. It framed the landscape we know today, and which has been replicated with international standards: vast peripheral areas (whether commercial or industrial), housing units made of hundreds of identical dwellings, residential or suburban areas with uniform layouts, all the while road infrastructure provide for linkages and commuting opportunities between those spaces. In France, Le Corbusier is well-known for trying to implement those sort of urban planning principles, building on them

1. Arturo Bris, "Smart cities : world's best don't just adopt new technology, the make it work for people" Theconversation.com, 10 October, 2019. URL [Online] : https://theconversation.com/smart-cities-worlds-best-dont-just-adopt-new-technology-they-make-it-work-for-people-124939

to improve quality of life and convenience. Yet this very type of urban landscape cannot be thought of without individual cars, which entails urban sprawl due to the enormous amount of land required to build roads, suburban homes, etc., even reaching all the way out to rural areas. Even if new mobility solutions are currently emerging, they are struggling to challenge car-dependence, as its role proves essential outside major cities.

Throughout the 1980s, New Urbanism advocated for a return to a human scale as a response to and a critique of Modernism. It focused on putting the emphasis on heritage, tradition, local styles, while refurbishing city centers and providing them with shopping areas that would render them attractive once again. In France, L'Architecture douce ('Soft Architecture') inspired Port-Grimaud's urban planning, the refurbishment of the city of Le Plessis-Robinson and the development of Val d'Europe. It is this kind of European urban planning, that the Ministry of Territorial Cohesion and Relationships with Local Authorities aspires to replicate when focusing on a strong urban core with mixed-use amenities through its social housing

program. It specifically does so through its "Action cœur de ville" local economic development program, which was carried out in partnership with the Banque des territoires (part of the Caisse des Dépôts group), the National housing agency (Agence nationale de l'habitat) and Action logement. Together, they aim to improve medium-sized cities' living conditions, as well as to encourage the role of these cities in the French territorial network so as not to rely exclusively on metropolitan areas as vectors of development.

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A 4.0 revolution of the city?

Today, smart cities correspond to the technological and digital phase and urban form of New Urbanism, to which one could add a new facet: climate. The environmental aspect of smart cities became unavoidable thanks to the French energy transition law. It also fostered the development of not only pleasant, lively, harmonious and beautiful cities, but also sustainable ones. The latter must take into account data such as energy consumption and pollution and create the possibility to recycle water through urban greening. In other words, cities must be able to create their own local solutions.

As ecosystems that can be managed across different aspects (human, material, natural), smart cities call into question their status as an innovation (of rupture or continuity) and the vision they hold of human beings.

On the one hand, an innovation is considered a breakthrough when the transformations it engenders radically changes people's lives, thereby creating a 'before' moment and an 'after' one. This type of innovation involves a transformation that irreversibly replaces the previous situation, causing a strong emotional reaction. For instance, the invention of light bulbs, the steam locomotive, the internal combustion engine, the transistor, likewise cars or ships – which are both a mobility solution and an imaginary of freedom and conquest – are representative of this.
It is much easier to consider smart cities as cities of the future when cities are created in the desert or in dry marshes, such as Masdar City in the United Arab Emirates. Another example of the sort is the new city of Songdo in South Korea, although it also presents problems inherent to its development and functioning as an entity as it was mainly conceived as a technological city in and of itself.[2]

2. Keryer, Erwan, Hamoumi, Ismaïl, « Smart city en Corée du Sud : Quels enseignements pour un modèle français? », KPMG, August 2019.

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When thought about as the implementation of imagined urban environments, smart cities embody the idea of a space that is geared towards optimizing control thanks to Artificial Intelligence (AI) technologies, at the service of Ubiquitous computing. This represents the ultimate stage of smart cities. Here, unlimited interface networks and connectivity of all objects (license plate, packaging, waste, etc.) provide continuous information about the population, as well as practices to guide them. But what about the emotional benefits these experiences provide?

On the other hand, an innovation is continuous if we consider that it essentially involves making preexisting objects or situations 'smart'. In other words, when it comes to improving services, managing resources and energy in a better way, or meeting residents' needs and tailoring services to them. In this sense, 'smart' is another way of referring to a cybernetic city. The latter brings new systems into the existing state of affairs whose perceived benefit should be to make people's lives easier. Indeed, most cities are anything but "new" in France.

The city's "smartness" would therefore lie in its capacity, particularly through machine-learning, to anticipate, support, and solve problems that inhabitants and users have, based on all the information available on various topics: security, infrastructure and transport, urban lighting, watering of parks and gardens, social links, etc.
Why not then talk about "Human cities", whose governance is organized around the lives and concerns of their inhabitants? Technology would be an ever

more sophisticated tool, but always serving human beings' well-being and comfort.

Smart Cities or Human Cities?

Cities' digital transformation cannot overshadow two major subjects: the financial resources that are necessary to materialize it, and the nature of the relationship with inhabitants.

We will skim through the first topic, as its economic and social implications are obvious: it either reduces or accentuates all forms of territorial gaps that exist in France. Cédric Verpeaux highlighted this in the 2016 report for the Caisse des Dépôts, "Smart Cities Versus Stupid Villages": "Large cities and metropolises have already taken advantage of digital technologies in order to optimize their services: places of innovation, new mobility, intelligent lighting, innovative water and waste management, etc. What about small(er) municipalities? While their elected representatives and decision-makers are aware that digital technologies can help improve public service management and strengthen territorial competitiveness, they often still do not know how, and point out shortcomings in terms of awareness, engineering and financing."[3]

The second subject is related to the wider notion of local democracy: citizens' acceptance and commitment is key to the image and perception of smart cities, which cannot be conceived nor exist without big data.[4]

3. French Association of Small Towns (Association des Petites villes de France (APVF)), Groupe Caisse des Dépôts, Assembly of the communities of France (Assemblée des Communautés de France (AdCF)). « Guide 'Smart city versus Stupid village'? ». Paris : Caisse des Dépôts. September 2016 : 70 p. URL [PDF] : http://publi.caissedesdepots.fr/DDTR/PublicationsSige/CommunicationDIDL/GuideSmartCities/?page=72 [Accessed 23/10/19].

4. Douay, Nicolas. Henriot, Carine. « La Chine à l'heure des villes intelligentes. » L'information géographique 80, no. 2 (2016) : pp. 89-102. URL [PDF] : https://www.cairn.info/revue-l-information-geographique-2016-3-page-89.htm?try_download=1 [Accessed le 23/10/19].

However, the "Global Citizens Data Privacy" report, which Ipsos and the World Economic Forum unveiled at Davos 2019, shows the qualms and fears associated with information technologies: 2/3 of the world's citizens say they know little or nothing about how companies and public authorities use their personal information, 1/3 have confidence in the way they process personal data, and 62% even say they should be able to refuse companies the right to use their personal data.[5]

The issue of data control is decisive in a context where geolocation, facial coding, web listening or profiling can do everything, for better or for worse. The best being technologies that improve lives and the worst being monitoring systems that constantly evaluate and alienate citizens and users. We can predict even worse than the nightmares envisioned by TV show Black Mirror. In this regard, it should be noted that Dubai or Singapore do not exactly fit our definition of an ideal democracy.

While the power of technology is clear to everyone, reassuring public opinion about it could also prove useful. Now unavoidable, useful, and ever smarter, how should we go about limiting the two risks that smart cities' digital and architectural transformation bear, along with their corollaries, which have a clear bearing on individual freedoms by developing intrusive omniscience. Should we accept that operators may have access to our private data? Or can we impose such technologies and therefore choose what is good for people in spite of their opinions? Or on the contrary, should we not remember the link, if not etymological, at least symbolic, between City and Life.

As the Smart City Index points out, collecting individual opinions from urban dwellers or public space users is paramount to carrying out any project. Neither public authorities, nor private operators can act against their will.

Our title "Human cities: Going beyond 'smart' cities" underlines this paradigmatic shift towards affirming that the city's purpose is not to be innovative per se, but rather to benefit inhabitants and communities. Digital technologies are deemed 'smart' when they meet human expectations and needs, when they address challenges such as climate change or the energy transition, or when they anticipate demographic shocks in certain regions of the world. "Human cities" means rethinking cities in terms of a crosswise, theme-oriented approach that features engineering, economic and social sciences, digital technologies, etc. It also entails improving modes of governance, well-being, and sustainability. "Human cities" means transcending "smart cities". Indeed, "smart cities" may appear to be an already outdated concept by taking a new look at what already exists: what to do with the subway after closing hours? What to do with a high school on weekends? What could cars be used for at night?

By providing many different perspectives and opinions on smart cities, this White Paper also aims to stimulate reflection, and makes nine recommendations that can foster a collective debate. Perhaps it also aims to safeguard the spontaneity and uniqueness that is so dear to human cities.

5. This survey was conducted on an online Ipsos platform, Ipsos Global Advisor, from October to November 2018. It involved 18 813 adults from 26 different countries. Source: Ipsos, Forum Économique Mondial « Global Citizens & Data Privacy », Ipsos, October-November 2018.

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Points of view: Rethinking « smart » cities is a collective endeavor

Businesses, civil society and public stakeholders share their vision on smart cities

Points of view of smart cities experts

Fahrenheit**212**
Part of **Capgemini Invent**

Is the "smart city" continuously reinventing itself?

Fahrenheit 212 is an innovation consultancy, part of Capgemini Invent that aims to guide their clients through future challenges, particularly those related to innovation, in order to foster sustainable growth dynamics that benefit the greatest number.

"If the 19th century was defined by empires, the 20th by nation-states, the 21st century belongs to cities."

Sadiq Khan's words resonate deeply when looking at global urban data figures. Today, 80% of the world's population is affected by living conditions in urban centers. Solving a problem related to urban life means solving a problem for 80% of the world's population. But how?
Here at Fahrenheit 212 – an innovation consulting firm – we investigate and guide our clients through the often-turbulent waters of contemporary and future challenges. We had the chance to study urban centers to evaluate the opportunities they can generate for several of our clients, who are major players in the urban, services or energy sectors. Oftentimes, when talking about a "future city", a city that is yet to come, the terms "Smart City", or "connected city" seem to be the consensus, but for how long?

Throughout this white paper, we decided to tackle the concept of smart city and its modes of design and governance:
How are regulators positioned and what role(s) do they hope to play? What is their vision? How are opportunities defined for smart city inhabitants who decide to take part in this collective urban project? Is the smart city concept still useful in order to meet demographic challenges and climate requirements of resource organization? What is the real knowledge generated by data and how does this translate into infrastructure implementation and management?

Inventing and conceiving the city

In order to build a Smart City, one needs to conceive it in the first place. A smart city is a platform city, through which access to services and their distribution to users is facilitated by technologies, and by the data they collect and analyze. It paves the way to more ecological, more fluid, more sustainable and generally better-managed cities: an ideal city where people and machines live in total harmony.

Nevertheless, many experts question the way in which these technologies are implemented and promoted, as well as issues related to governance, accessibility and respect for individual freedoms.

- Considering territorial diversity when conceiving the smart city

Urban territories display different typologies that are inherent to their respective geographical, historical, socio-cultural and economic contexts. This results in infrastructure gaps and, consequently, in disparities in the capacity to improve existing ones or in the ability to build new ones. Territorial diversity and how each territory is equipped in terms of utilities can be analyzed at district, city, or regional scale. In addition, the sprawl of metropolitan areas which smart city projects bring about means that these scales are increasingly interconnected.

In order to understand the way cities function, the interconnection of various territories must be considered when public authorities and private actors design a smart city.

Cities must assimilate their systems and methods so that all components (homes, cars, offices, etc.) are harmoniously interconnected. Real-time notifications to prevent traffic jams and transport delays can help integrate all parts of the city, regardless of their level of maturity, and reduce urban-related stress. Dijon Metropole's example is enlightening for it has just implemented a central command station through which all urban utilities and services are being monitored and managed. In order to do so, the metropolitan authority worked in collaboration with a consortium composed of Capgemini, Bouygues Énergies & Services, and Suez and Citelum (a subsidiary of the EDF group).

- Consideration for the needs and desires of inhabitants when conceiving the smart city

When data makes it possible to understand the context and to identify problems related to urban development, solutions are often provided by local elected officials and partner companies without consulting their constituents prior to implementation. Even though some of these solutions may be relevant, they can still be rejected by users if they do not match their vision, short-term priorities, or their sensitivity to innovation.
For the co-construction of cities to be perceived as efficient, various consultations must be followed

by concrete results that truly meet the needs and expectations of users. It is therefore imperative to build a whole new city culture, a culture to be shared between citizens, elected officials, and companies so that they can make the city grow together.

Public authorities must create participatory initiatives to collect citizens' opinions and integrate their feedback into the basic infrastructure of cities. This will not only increase the city's revenue, but also strengthen its community's well-being.

For example, the City of Singapore, as part of its Smart Nation project, launched a survey to find out what is expected from home automation. The survey revealed that, contrary to what the public authorities thought, Singaporeans were more sensitive to adapting housing for the elderly than to managing their energy consumption. This has made it possible to adapt the service proposals by public and private actors to the real needs of the city's inhabitants.

A French startup has also taken up the challenge of co-constructing citizen participation by developing a dialogue application for town halls and their inhabitants: the FluiCity mobile application enables elected officials to inform residents about current events in the city. In return, they can give their opinions on the community's proposals. Both municipality of Vernon in the department of Eure and Paris' 9th arrondissement have already adopted the application.

A four-dimensional city

Cities need to rethink how they relate to time! In the coming years, an increasing number of people will be living in cities.

According to a United Nations report, 68% of the world population will be urban by 2050, compared to 38% 100
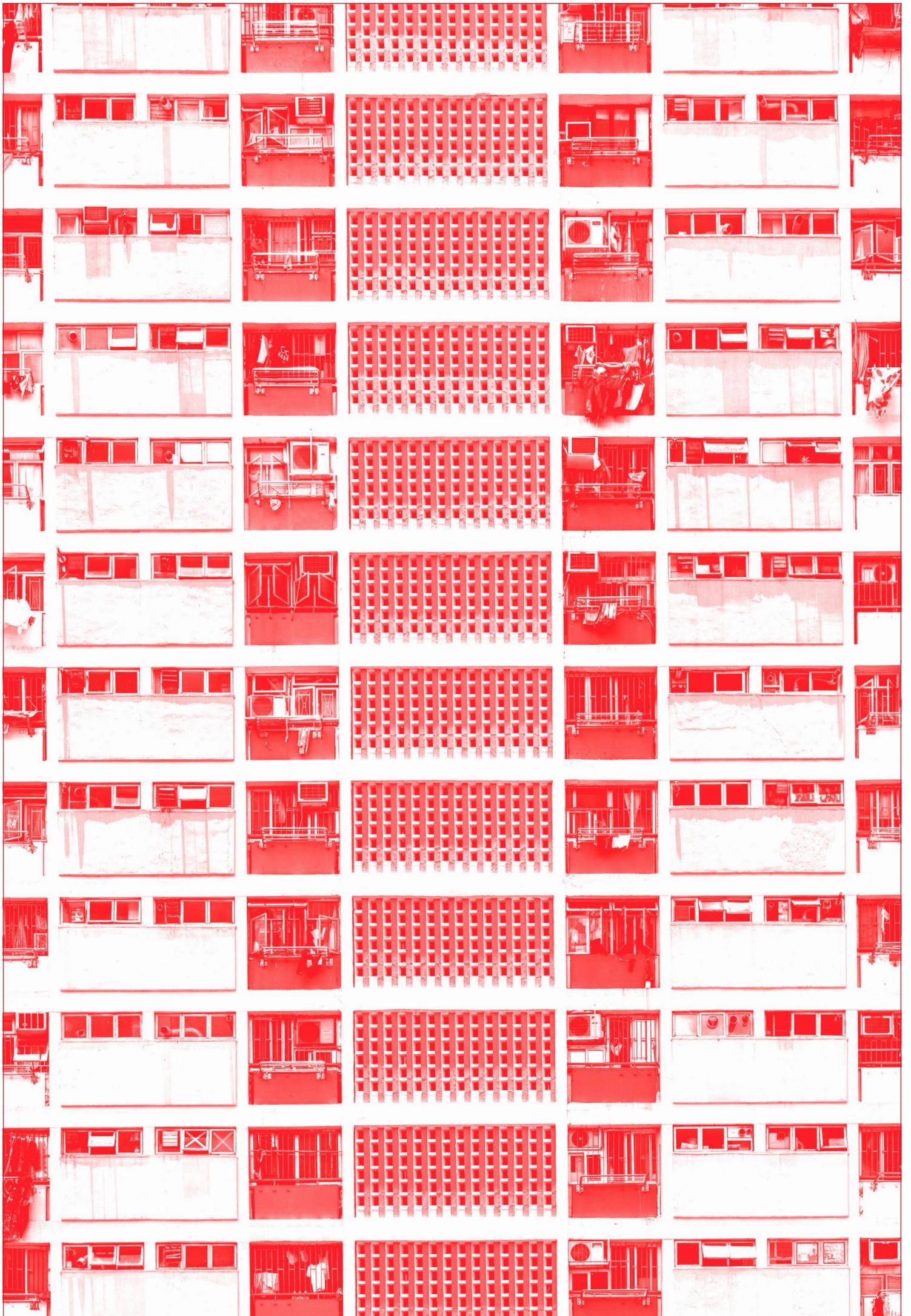
years earlier. However, we are already living in a context of hyper-saturated cities.

- <u>Optimizing the use of resources</u>

As cities' resources are limited, simple horizontal and vertical urban developments are no longer sufficient and may already create additional problems (power and water cuts, lack of space, transport congestion). For many years, public and private actors have been trying to deal with a lack of resources by encouraging energy savings or carpooling. But these actors fail to take the notion of time into account. Places that are congested at one time of the day are empty at other times, leading to a loss of space in cities that are in dire need of it.

Indeed, it is essential that the temporality of cities be integrated into reflections on smart cities. Understanding the use of resources within the city through data collection and aggregation would make it possible to map the city's untapped resources and appeal to collective public and private innovation.

Since 2014, Detroit Mayor Mike Duggan has instructed the city's land bank to buy or seize abandoned real estate parcels in order to sell them to private investors, sometimes for one dollar, should they undertake their rehabilitation. The objective is to promote urban revival by facilitating the re-appropriation of spaces by residents, associations, artists and businesses. Many innovative projects are emerging and finding a new space to rethink tomorrow's society with a local, responsible, and concerned approach that takes the optimization of urban resources into account.

Zen Park, which is a leader in shared and connected parkings, offers its users the opportunity to easily find a parking space in cities, either for an hour or for several months. The idea is to use the often under-occupied car parks that companies, hotels and administrative buildings possess, in order to relieve street congestion and to alleviate urban car traffic.

Following the same objective of optimizing resources, Accor launched the concept of Accor Local, a platform on which they make use of their hotels' available space during off-peak hours, and allow city dwellers to occupy it. Accor is committed to the shared economy on which digital companies such as Uber or Airbnb have built their business models. This strategy could be implemented by city administrations at a larger scale.

- <u>Foster public/private partnerships that drive forward public interest, and accelerate implementation processes</u>

Public authorities shouldsee their role evolve and become platforms where various services could be hosted, bred and grown. They must integrate more agile project processes, or at least help in collaborating with experts in these methodologies, in order to overcome potential inertia and to adapt more rapidly to supply and related infrastructure transformations.

For example, the Spanish government is working with one of the leading international audit firms on smart information and accident prevention systems. In October 2018, a €3.4 million contract was signed between the DGT (the Spanish General Directorate for Traffic) and this firm in order to develop, over the span of four years, a platform called " connected vehicles 3.0" to create a real-time information exchange system between these vehicles and the rest (V2X communication).

Similarly, the American quasi-public company Amtrak has been collaborating with Lyft (an Uber competitor on the United States carpooling market) in order to offer customers who purchase an Amtrak train ticket a first or last mile travel option based on Lyft's services.

A database city

A wide range of expert stakeholders and a city that goes through an "open-reinvention" process.
The city is no longer be designed, built, or orchestrated in a top-down fashion. Public actors are no longer the only ones defining service standards and the ways in which urban life is organized. They are forced to react to new urban service offers for which they are neither sponsors nor distributors. The emergence of

these multiple private actors, on demand or on our sidewalks, shows that in terms of urban experience, the right of veto and curatorial responsibility, usually allocated to public and/or traditional actors, will soon be nothing more than a Gascon promise.

- Restore the role of local and public authorities as leaders of the smart city social project

For years, public authorities have driven urban development projects, both technically and financially. New urban services are being developed without authorization and with self-financing. A smart city is not defined behind closed doors, with only public authorities and major urban stakeholders involved. It is likely to self-organize, following self-financed models, those of the GAFAs. The risk for the public actor and the associated traditional actors is that GAFAs or new technological actors break in and disintermediate that process. The user would no longer become an urban actor, whereby smart cities would integrate them and co-build urban environments along with them, but rather an exploitable resource, part of a chain of potential data that could be collected.

In a smart city, winners are not always the city dwellers, but sometimes rather data aggregators. GAFAs see in it the possibility of justifying access to all dimensions of citizens' lives. In 2016, Gartner estimated that 50% of people in large cities will share personal data with their "smart city" by 2019. Here we are. AI and technology can, and should, be tools that make us more insightful. Yet they lack a discourse as well as a human social project in which everyone can identify themselves. Is it desirable that, one day, a mayor awaits an algorithm's recommendations to decide and act?

It is a matter of conceiving and narrating smart cities in a different way than through a simple and endless addition of "features" and additional services. It is rather about telling how we will live in these cities and why. Shouldn't communities consider, in doing so, not only calling on experts from the technical and commercial world, but especially those from the storytelling, advertising, or cultural industries?

Initiatives are moving towards this, as shown by how several ministries, including the Ministry of Ecological Transition and Territorial Cohesion, organized in

2018 an online citizen debate to collect citizens' expectations, perceptions, and projects for the cities of tomorrow. In parallel to the online discussions, citizens were invited to write utopian stories about their vision of the city of tomorrow. Results were finally displayed and illustrated in comic strips, spread via the press and online media. Many other media and tools are then used by decision-makers to illustrate and describe this city to come.

One can also notice projects whose primary aim is to develop a collective imaginary and social link – and not a market goal or a rationalization/performance goal – to modify the urban landscape in a sustainable or gradual way.

Projects such as "Paris Plage" ("Paris Beach"), or "Le Voyage à Nantes" ("Travel to Nantes"), have changed urban developments, traffic flows, uses, to transform purely functional facilities and spaces (roads on riverbanks, parking spaces, industrial zones/lands...) into living spaces, through which a city is experienced/encountered in a different manner. Terms such as "beach" or "travel" are not ordinary when associated with these city names. Through this project, Paris introduced itself as a seaside resort and city of water, and no longer as merely the City of Light.

In Nantes, there are convivial spaces like 'gourmet stops: urban vegetable gardens where everyone can come and pick fruits and eat them on site thanks to picnic areas. These stops are located in the city-center and in working class neighborhoods, which eventually promote social cohesion. The same goes for collective barbecues set up in the "Hangar à Bananes", a rejuvenated industrial wasteland. These are imaginary and rustic practices that are being brought back into hyper-urbanized environments, and which make it possible to imagine the city of tomorrow. There is no technology or data use here.

- Access to data should be facilitated in order to allow for a joint-operation of infrastructure

A city is a living and complex organism. The coexistence of different networks and streams as well as their respective patterns (citizens' behavior; spatial planning and occupation; location and supply of shops; distribution of service offers; mobility

modalities; resource allocation; etc.) requires open and data-driven governance models. To perform adequately, a city must rely on the way data flows and is distributed to these different systems.

The London public transport company, Transport for London (TfL), has decided to open its data, free of charge, to new mobility companies in order to improve user experience. A Deloitte study (July 2017) shows that TfL's data release generates significant benefits and has saved approximately €145 million per annum. TfL data is now being used by more than 600 Apps that are changing the way people interact with the London public transportation system.

Similarly, in the United States, Waze has decided to share its data in real time with selected cities and states to allow authorities to analyze it and react accordingly. Cities also share planned roadwork with Waze so that it can indicate appropriate shortcuts, which minimizes inconvenience for drivers.

Conclusion

It is therefore possible to imagine smart cities as fully integrated environments. Technical and digital utilities are not a prerequisite to the emergence of an ideal city. It is possible to propose blueprints that are more open, more flexible, and more in tune with people's ecological and social expectations.

So, what about a "fab city", or, in other words, a city project whose main characteristic is to produce local, while remaining globally connected thanks to its reliance on self-sufficient models? These models would make technology accessible to all and make available the necessary tools for one to be autonomous – like fablabs do – so that urban spaces can be brought back to the people. It certainly appears to be a major opportunity for public authorities, who could also participate in driving the whole project forward.

In the fab city, inhabitants are not helped, they help themselves.

The current model of the PITO city (Product in, trash out), where goods are imported and mainly produce waste, is shifting towards the digital city (smart city?) model, where information streams flow at a higher pace than material streams, thanks to the recycling of these resources at the local level (DIDO: Data in, data out).

What about an internal production system where the production of services, goods, food, energy, etc., is brought back to urban dwellers and partly ensured by them?

In that sense, couldn't urban intrapreneurship be the city's future?

BETC

Rémi Babinet
Founder and President of BETC.

A story for the city of the future

BETC is a French advertising agency created in 1994. BETC has faith in the power of creativity and helps transform the relationship between branding and creative innovation. BETC launched the creative project that is the "Magasins généraux" in Pantin, where the agency moved in 2016, and which became a new place for creation, innovation, production, and exchange in the Greater Paris, d'innovation, de production et de partage du Grand Paris.

The term "smart city" itself is open for debate: I never liked this wording. It is controversial. It gives the impression that we have been desperately waiting for its inception for cities to become smart. It is misleading and raises questions regarding the current 'digital' obsession.

A city's intelligence cannot be independently managed by remote technical systems, or ready-made ideas.

The words "smart city" distort our perception of cities. They are used inappropriately to define a variety of different objects and places, and consequently, loose their true meaning.

"Smart city" refers to a result, as if we could build a standard based on the preconceived idea we have of cities, or of its services, and the type of efficiency they ought to provide its citizens.

The question of the efficiency of city services is interesting and the tools that can contribute to this efficiency are fantastic, but this cannot truly determine the future of cities. A city is a political matter per se, and therefore it involves a vast and complex array of public actors, citizens, and other private stakeholders. They are extraordinary places to live, to practice, but they also generate monstrous problems.

The mass of complex problems that cities currently face cannot be solved by waving a 'smart' wand. Cities involve men and women, and they are part of world history. We have a lot to learn from cities' past, and these cities did not wait for us to be smart and produce beautiful stories.

Smart or stupid building?

Our move to the Magasins Généraux, in Pantin, has been feeding a multitude of approaches, discussions, and hesitations concerning the location of our headquarters, the building's refurbishment works, and the form it has ultimately taken. I had to constantly fight against the weight of regulations, as well as a certain status-quo of process formatting: what to do,

under what circumstances, by which means. This building was considered exemplary for several reasons. Today, we can say that it was the result of a series of disobedience and resistance. We chose to be different by mixing actors who are not usually associated with this type of project: BETC employees, designers, experts, developers, but also actors with a different approach to the subject. For example, I chose to free myself and the building process from space planners, so that everyone could think about spatial layout without thinking in terms of pre-established principles. We interwove know-how and experience in order to produce something that is deemed smart. This was a construction project, but this type of logic can also be applied citywide.

Thinking global solutions at a local scale

A city is closely linked to how lasting its local urban policies are.

The city of Medellin, in Colombia, is an interesting example. In 2012, the Wall Street Journal ranked it the "most innovative city in the world".

In fact, Medellin succeeded in evolving from a crime-ridden city into one that prioritizes its most vulnerable inhabitants and places, through pioneering social planning. This is all thanks to politicians' commitment over time, and despite alternating mandates, to one shared objective: make Medellin a better city. It is the orchestration of a certain durability of urban policies that was part of the solution.

We generally tend to look for global solutions, thanks to efficient systems that function on enormous scales but are often based on general rules. However, regarding digital issues, it would be beneficial to experiment with problem-solving at a very local level,

such as in villages, to refine needs and find more relevant and replicable solutions for large cities.

Even street-wise or public square-wise, the bench, for example, is a relevant illustration of a symbolic cultural element in urban spaces which allows people to rest or to get together and discuss. Their removal from public spaces equates losing a key element of cities' civilizing power.

The Greater Paris: a new urban era factory

When we moved BETC headquarters to Pantin on the other side of the Paris ring road ('le périphérique'), we wanted to tell a different story. It was about moving towards a larger city, the Greater Paris, which would not be limited to a city-center surrounded by suburban areas. Besides, water was a key element in my decision to move the agency to Pantin. The canal de l'Ourcq is a curve that goes between Paris and adjacent municipalities. It is a permeable space that pedestrians and cyclists use, like a natural axis, particularly under the périphérique. One expects this fluidity and softness from a city. Water can entirely articulate and connect the center and peripheral areas.

These questions also led me to focus on the Grand Paris Express, an amazing project directly designed for Greater Parisians. When I was asked to take over the presidency of the Grand Paris Express endowment fund, I realized that there were massive efforts aimed towards building a larger and wider transportation system for the Greater Paris, which makes it possible to move to places that may not have been considered beforehand.

The Grand Paris Express is the largest urban project in Europe, and it features a cultural dimension that is unprecedented at this scale. Throughout the construction period we are organizing, in partnership with "Le 104" cultural center, the KM (standing for "kilometers"), construction site festivals, cultural and festive celebrations, and many other types of events along each new kilometer that is built for the Grand Paris Express. It is an opportunity to bring together inhabitants, and other driving forces of the territory to celebrate the achievements of the construction site, such as crane installations, or the launch of a tunnel boring machine. Culture does not simply

mean displaying paintings or building museums, it is also about telling a story that involves architects and that showcases to the people the new train stations and activities that the project will bring to their neighborhoods.

This cultural component is eminently part of the whole narrative. New cities that are conceived today lack a narrative that strikes the public and gets it onboard with the project. Cities used to be magical, but today they are seen as problems. One needs to be parachuted into the future by the urban narratives we decide to tell. That is why I chose to take part in the Grand Paris Express project: someone needs to argue that the Greater Paris is going to be exciting or at the very least interesting.

The Grand Paris Express' transportation plan features a multi-local aspect that will reduce the already extreme centralization of Paris' core administrative functions and economic activities. It was conceived to make these streams explode across the Greater Paris area in order to generate connections. No one can foresee the effects that these new train lines and reduced distances will have (let alone the effect on employment and ecology). The factual impact is not yet sufficiently analyzed and shared. A city that does not change is a doomed city. But politically, the central government has yet to take the leap and relocate all institutions outside Paris. Today, it remains extremely difficult to establish political institutions as well as administrative buildings beyond the périphérique: the Ministry of Defense, or even with the Philharmonie de Paris, are a good illustration for this.

The smart city as a construction site

My recommendation is the following—When talking about smart cities, we consider the final result. However, talking about a city in terms of results is not reasonable because it only serves a political stance on what a city should be and is therefore frequently nothing more than a childish promise. I prefer referring to the concept of the construction site… Why not assert that the smart city, or the city of the future, is a construction site? When speaking of construction sites, we acknowledge that there is always a difficulty in reaching the final objective, that there are multiple stakeholders involved in the construction of tomorrow's cities, beyond only experts. It is thus

paramount to develop new models that get citizens, public authorities, and businesses involved without ever moving away from the core urban narrative.

Antoine Courmont
Doctor of Political Science, Associated Researcher at the Center for European Studies and Comparative Politics, Scientific director of the Cities and Digital Technology Chair at Sciences Po

'Sociologizing' technology

The Cities and Digital Technology Chair is a teaching and research chair founded in 2017 at Sciences Po Urban School and in partnership with the Center for European Studies and Comparative Politics. With the support of Cisco, La Poste, RTE and La Caisse des Dépôts et Consignations, this chair focuses on the impact that the digital revolution may have on the transformation of cities.

Smart cities are part of a long trend of digitalization of territorial organizations and public/private relations. A turning point was reached in 2008 when we entered the era of digital technologies and computer solutions in order to penetrate all types of environments: urban, personal, individual, etc. This was the case with the first iPhone, or with platforms such as Uber, Airbnb or Google Maps, that have dramatically changed the way we move and live.

Smart cities make use of existing technologies and cooperate with current stakeholders

IT manufacturers deliver a smart cities model that aims at optimizing the delivery of urban services thanks to technologies and dashboards capable of managing the city in a cross-disciplinary fashion. Technologies can allow for increased operationality and efficiency, yet many technical and organizational obstacles remain. Today, city issues such as waste, transportation and roads, are approached separately, rather than through a holistic approach, thus adding complex administrative layers. This is why the deployment of digital technology is often carried out on a sector by sector basis.

In France, cities function rather well according to this model and revamping of technical networks will not automatically render them more efficient. In addition, for the sake of safeguarding their independence, local authorities are reluctant to sign a contract with a single private actor and prefer to increase the number of contracts and partners.

Today, technology has been fully integrated to cities, and has a number of new issues to deal with:
·   Revamping of collective governance,
·   Arbitration between private interests and the general interest,
·   Management of aggregated data.

Integrate new solutions into the functioning of urban systems

The emergence of Uber, Waze, Airbnb, etc., and the transformations they have brought with them have dramatically destabilized public authorities. Yet destabilizing does not mean overtaking, which draws questions regarding the regulatory framework. In an attempt to implement new forms of governance and limit the negative effects of this transition move, public authorities have been able to restructure themselves. The end goal was to coordinate the activities of public, private, and civic actors, as well as to develop a contractual relationship with private actors. For example, in Barcelona or Berlin, Airbnb's business expansion is greatly circumvented by local regulation. Regarding the latter, I noticed a change in the stance taken by some platforms: when it emerged and as it grew bigger, Uber used to directly confront municipal governments; whereas now, the company is engaged

in more of a partnership approach, following a logic of experimentation, which serves the mobility policy. Nevertheless, such negotiations between public and private sectors are still highly uncertain.

As far as data management is concerned, I would say that we are in a phase of great uncertainty, everyone thinks of data as highly valuable, but few actors today

know how to make it concretely valuable. But we also see that people are much less docile than we had imagined: in Toronto or South Korea, the arrival of centrally-monitored systems provoked some resistance, doubts, and even protests, which are asserted in activist movements concerned with the risks of surveillance behind technological performance. In Singapore, for example, apartments were equipped with motion detectors to send an alert in case of a falling resident, the residents have hijacked them: seniors do not want to be reduced to the situation of aging dependents

Multiple solutions based on the same approach: "sociologizing technology"

To me, there cannot be a single recommendation, or a single solution, given the fact that cities, actors, and even services differ greatly. But there can be a three-fold homogeneous approach, "sociologizing technology":

•   This approach should be aimed at reducing territorial inequalities, or the exacerbation of pre-existing inequalities (the urban center versus peripheral districts, metropolitan areas versus small towns). Instead of increasing central districts' attractiveness and real estate prices, public policies should shift their focus towards other districts.

•   This approach should help tailor services to citizens' needs and expectations. In other words, it should promote the idea of looking at technology as nothing more than a means, which could be integrated into urban systems bearing in mind social networks, as well as the various institutional or personal uses it could serve. In fact, after implementing new technologies, it is often realized that their actual use is not what they were initially meant for.

•   Finally, this approach should be collaborative. It should urge public and private stakeholders, as well as citizens, to work together, identify the requirements each party bears, etc. One should not come up with a solution to a problem nobody, neither elected officials nor citizens, had previously identified as such.

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GAME CHANGERS Ipsos

Vincent Dupray
Global Chief Client Officer – Automotive, Ipsos

Should a smart city get rid of personal vehicles ?

Ipsos is a French global market and public opinion research and consulting firm with international reach. They carry out market and opinion evaluations as well as various surveys in order to extract the necessary information to develop a detailed understanding of societies, markets, and individuals.

Cities must evolve to limit pollution and congestion while respecting mobility aspirations, which have more or less remained the same for half a century and can be summed up as a demand for freedom, security and simplicity.

Smart city aspirations cannot ignore these expectations. Whether they come from people who live, work or visit cities, nothing today indicates that one group is willing to give up a mobility option according to changing circumstances.

Another unchangeable dimension that has to be considered is that of average time spent in transportation. It remains singularly similar and stable across all major cities, averaging at one hour a day, according to Zahavi. Since travel time is constant, the speed of travel has a direct influence on urban sprawl. Even if reality is probably more complex should all economic factors be taken into account, this theory shows at least that cities must consider both movement and territory. On the other hand, the level of cost and comfort of trips observed determine the modes of transportation used, according to their availability.

The private car: main mobility solution in France

All these factors have contributed to making the private car relatively unavoidable, not only because it is

the best practical solution for a majority of people (for example,

58% of French citizens say it is difficult to use public transportation services to commute to work

while we acknowledge there is a considerable gap between the inhabitants of the greater Paris urban area (43%) and inner-city Parisians (13%)), but also because public transport is considered according to a negative stance (45% of French urban residents rate the comfort of public transport in their city as negative and 42% do not consider themselves safe).

In France, private cars still account for 75% of home-to-work journeys and make up the majority of transportation modes in Île-de-France. The average daily journey to work and back home takes up to 52 minutes in France, and up to 75 minutes within Île-de-France. It should be noted that a quarter of Île-de-France residents consider transport conditions "unacceptable", with public transport users being much more negative than motorists, despite the time lost in traffic. A huge amount of work therefore remains to be done, in order to make public transport

more attractive, or at least non-dissuasive, but also to integrate it more into multimodal systems.

For short distance journeys, new solutions are being developed. In total about 10% of Parisians use bicycles, scooters and other overboards to get to work, with a clear generational effect.

Carsharing services (including self-service electric vehicles) havze also started off in Paris with about 5% of users. Ride-sharing companies have taken an important place, both in terms of space occupied as well as in terms of the number of leisure-related trips, which raises the question of future autonomous shuttles and electric robotaxis, the future stars of Mobility As A Service (Maas). Even if their technical development seems to be delayed compared to the first projections, these on-demand, driverless vehicles, will necessarily play a significant role in transport supply, especially when they are integrated into a neighborhood or citywide strategy. Their impact on the difficult time-cost equation will also have to be assessed.

As far as medium-distance or peri-urban journeys are concerned, much remains to be invented or implemented. By far, car users make up a majority of commuters, as the current provision of public transport options does not cover existing needs. Even if carpooling is on the rise, planning and lack of flexibility remain sustainable obstacles: mobility ultimately remains an individual affair.

It is premature to envision city life without cars to move about.

Admittedly, mentalities are changing: more than 60% of French people believe that in the future, "it will be more appropriate to use mobility services rather than their own a car", while many countries think the same. But shifting to a service-oriented approach requires huge investments, and we do not yet see who will be able to decompartmentalize the various initiatives. Major tech companies, start-ups and even car manufacturers are dreaming of kicking off applications that can bring together all mobility services, but there are still many challenges to be met, including convincing the various public and private actors that such a platform would be in their interest. It also goes without saying that, in order to function, these new services will have to generate real financial savings for customers, while making their lives easier.

The challenge to be met must be managed over a long period of time, as these changes rely on the technology that is available for use by companies and public institutions. But they can in no way be shaped solely by it. They will first be conditioned by the establishment of local ecosystems, adapted to very diverse cities and lifestyles: smart cities must, in any case, give an important place to a form of mobility that is individually chosen and ecologically responsible.

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CASTRO
DENISSOF
ASSOCIÉS

Roland Castro,
Architect-Urban planner

"*Smart cities* sounds innovating... it fits perfectly in a politician's speech for municipal elections."– Roland Castro.

Roland Castro is a French architect and urban planner who has participated in several architectural projects for the construction and revamping of social-housing complexes. He has also supervised the publication of a report in 2018 for the French President Emmanuel Macron ("Du Grand Paris a Paris en Grand"), which highlights the need for inclusion and transparency in the Greater Paris project. Roland Castro co-founded and currently directs the Castro Denissof Associés architecture and urban planning workshop.

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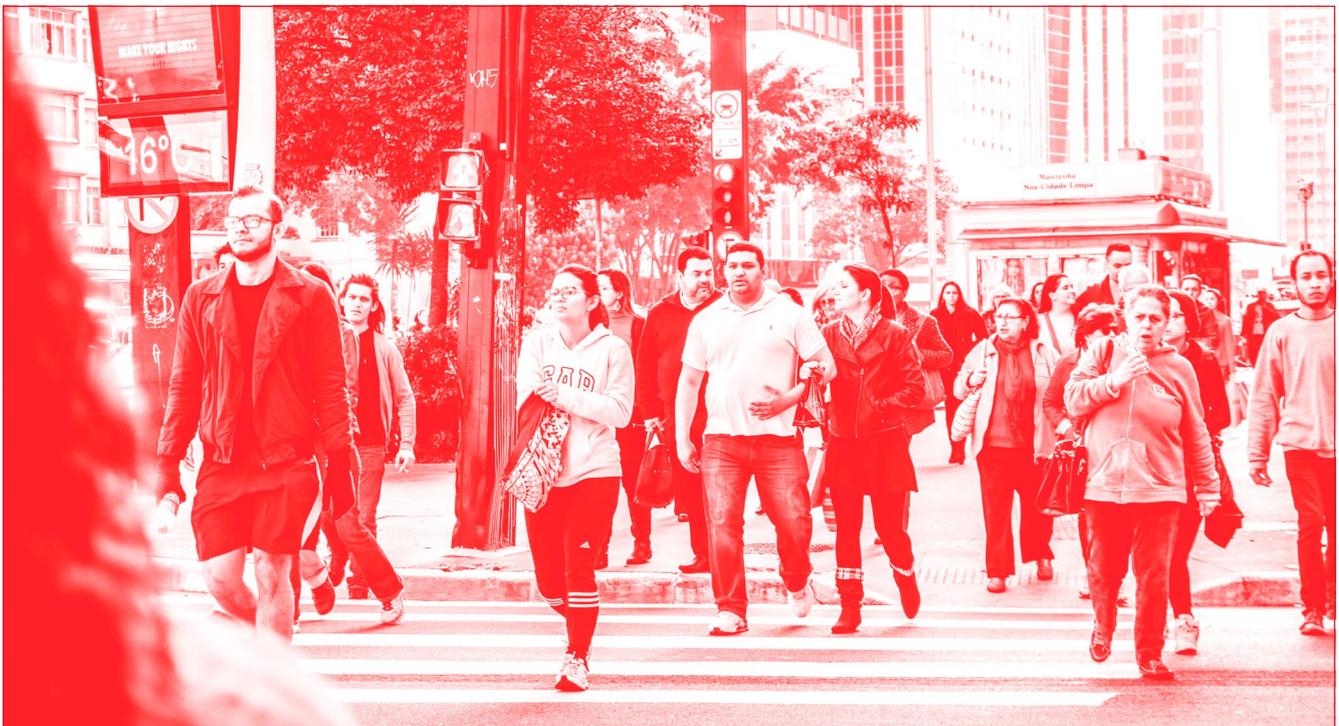
With the term "smart city", we want to make people believe in innovation. For some obscure reason, these two words put together are meant to seduce.

Today, we are supposed to be connected to everything, but communication is not the same thing as a dialogue or a conversation. I don't believe in the paradise of connectivity of the so-called "connected city". This ideology of communication, this conception of the city dominated by communication, is in contradiction with my own vision of the city: beautiful, free, cheerful, animated, like a spontaneous promenade. The danger of this high-tech wishful thinking is that it pretends to be progressive, when it is really about services with no backbone, no plan, nor philosophy.

City is life

I put "city" first, because cities equate life and individuals, just as I would put "neighborhood" first in "eco-neighborhood": ecology does not make a neighborhood. For me, it's an abuse of language. Of course, I am not against intelligent energy management, but talking about "smart city" is an exaggeration, it is a farce of the modern movement. This terminology seems taken from the IT sector and simply transplanted onto cities. On the other hand, "smart" is full of dangers: directing consumption, alienating free will with algorithms that take over, and all the risks to privacy that this entails.

Camus said that it was necessary to preserve and develop what is permanent and not focus on the future at all costs.[1] The same is true for the city: we must preserve the achievements of a good urban

character. In other words, we must not invent a "new city" made of technology alone. Today, we have all the experience before us and we can sort it out; we know that good social-housings often have low turnover rates. In urban matters, you have to move forward while keeping an eye on the rearview mirror and seriously bearing in mind the fact that "modern" ideas might not necessarily be enough.

Develop citizen representation

It is therefore necessary that citizens and voters pay close attention to political spiels. Making the city "safe" with drones, dividing Paris into districts monitored by these intrusive objects, replacing humans with cameras, these modern transformations will not improve behavior or safety. There is no technological solution to the serious issues that our civilization faces, but there are cultural responses to them, such as school development. A citizen that is connected and controlled at once is not civic, this is rather a form of abstract civism.

Putting people back in the heart of the city

A city's purpose is not to be innovative, but to be a part of a story. Even Silicon Valley is changing: the craziest people in the virtual world are trying to be in the real one, to become physical again, it's a new age of High Tech. In the Sentier in Paris, we have our own Silicon Valley as well: people want to work and live in a charming, attractive, and pleasant neighborhood, full of leisurely activities. Connection and technology are important elements, but they do not replace humanity.

"The wo most important challenges[...] are the environmental challenge and the social one. The two challenges intersect: a metropolitan oasis can be built, with the aim of ensuring a good urban character for all. Mankind and climate work together, that is the good news I'm trying to deliver.[2]

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1. Albert Camus, L'Homme révolté, Paris : Gallimard, 1951, 384 p

2. Roland Castro, « Du Grand Paris à Paris en Grand, » Paris : Ministry for Territorial cohesion and Relations with local authorities, September 25 2018, 161 p. URL [online] : http://www.cohesion-territoires.gouv.fr/du-grand-paris-a-paris-en-grand-le-rapport-de-l-architecte-urbaniste-roland-castro [Accessed on October 20 2019]

Points of view: Rethinking « smart » cities is a collective endeavor

Businesses, civil society and public stakeholders share their vision on smart cities

Points of view of public actors

Vincent Gollain
Director of the Economics Department of the Paris Region Institute (L'Institut Paris Région)

Cities are first and foremost a societal project

L'Institut Paris Région (formerly known as "l'Institut d'Aménagement et d'Urbanisme d'Île-de-France") is a large regional urban planning and environment agency that delivers academic research as well as necessary workforce for the decision-making processes of the Île-de-France region and its partners. From the local to the vast metropolitan scale, it focuses on various disciplines such as urban planning, transportation, and mobility, as well as environmental, economic, and social issues.

"Smart city" is a controversial and anxiety-filled term. Originally, it was about implementing digital technologies in an urban context, in order to make life easier for its citizens. Now, it has become increasingly associated with notions such as remote surveillance or camera-based tolling systems, a whole Orwellian world that is far from the friendly city that residents and citizens dreamt of at first. This may have happened as a result of the push by private operators, who insisted on what makes the digital city function, and forgot about the "human" aspect. I think the same goes for "Intelligent cities"! People want a city where they can live, and between a natural city and a connected city, the former seems to have gained more support.

Prioritizing technology over human and social aspects

The city-state of Singapore is a good example of what a smart city may look like. It is the city that goes the furthest in terms of monitoring tools, but it also raises questions regarding citizen-oriented projects. Beijing is elaborating the "Social Points" notion, which clearly assimilates technologies as devices to further control rather than systems simply designed to optimize the functioning of the city, traffic, services, etc.

Yet a paradox lies at the heart of the definition of smart cities: as we are undergoing a society-wide digital transformation, we welcome these new technologies and use them with ease. A similar digital transformation affects most urban infrastructures, improves relations between public services, between people, and creates new uses. But people feel lost and worried when technologically-oriented discourses become more prominent than those focused on the inhabitants themselves. While they are looking for friendliness and sociability, they are "sold" functional devices with no immediate collective utility. A city is a place where people meet, it is a small version of a national society, in which technologies serve individuals, rather than constitute an end goal in and of themselves. Technologies can foster efficiency through the management of public and private money, which is good, but this does not necessarily imply a collective benefit.

Experimenting and collaborating in order to create the best urban environments

Modernizing cities and making them more agile is important but the perceived benefit is fundamental in order to accelerate the adoption of technologies. If we think of smart cities as something that will revolutionize cities, people will fear it. The smart city concept has become a fashionable trend that has reached its pinnacle with a vision of hyper-functionality. On the other hand, European cities on the social aspect of smart cities through creating conviviality, through the organization of micro-

societies, and through investigating how to set new rules. Above all, it is essential to facilitate conviviality among territories, to get citizens involved, to have regular discussions with them… Public spaces are rare and shared, they are also a place to experiment with the best way to regulate them, and to mediate conflicts between the various public actors who make use of them. We are now talking about tactical urban planning, a new approach that involves all the stakeholders of a territory. For example, this approach consults permanent users (companies, inhabitants…) and temporary users (tourists) for shared management and entails a reinvented form of urban planning as well as valuable propositions (mobility, leisure, work, commitments…).

One major urban evolution is the end of suburbanization or, in other words, the end of urban sprawl that was made possible by road development. Today, this does not appear as a viable model for developing cities in the future. We are just rediscovering that we live in a finite universe, that we must preserve the planet, that we must learn to manage density by working on a different model. Today, public and private stakeholders are heading back to city centers. From this point of view, the European city model is a laboratory for the city of tomorrow, and it is already receiving much attention in international calls for tenders. In this respect, Paris is Europe's densest urban area, with a population density of more than 20,000 inhabitants per km² (the 7th most densely populated city in the world, ahead of Seoul), and this does not prevent new projects from being designed, as in Boulogne-Billancourt when redeveloping former Renault factories.

Making life simpler through technology

After "smart cities", we often hear about a newly-coined term, "happy cities". They are about living comfortably thanks to an optimal use of digital technology which facilitates our lives daily. It is often said that the best technology is invisible: Apple has long proven this, with a simple and refined design that hides the complex architecture of machines. John Maeda, one of the great web designers of our time, theorized it in "The laws of simplicity" (Payot). When applying it to smart cities, we think about making relationships and people's lives simpler, and working towards something that they can get a hold of.

My recommendation is threefold:

1.   Build a discourse that is focused on the benefits for citizens and territories without exclusively pushing for technological solutions. While the digital is receiving much public attention, we cannot afford to overlook the necessity of a project that is in tune with its unique context, in other words, with the motivations, expectations, and irritants specific to each territory.

2.   Highlight what digital technologies can provide for citizens in concrete terms, particularly when the process is co-managed with them, as a way to reassure elected officials of small municipalities.

3.   Showcase experiments: include citizens who can no longer be excluded from the decision-making process and who must be heard.

Hervé Boisguillaume
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Ministry for the Ecological and Inclusive Transition
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Smart cities are sustainable cities

Hervé Boisguillaume is in charge of the "sustainable cities" mission launched by the Ministry for the Ecological and Inclusive Transition and the Ministry of Territorial cohesion and Relations with local authorities. Indeed, these two ministries are responsible for implementing French policy on the development of sustainable cities, all the while formulating and integrating smart technological solutions.

Today, we talk more about "sustainable cities" than "smart cities". In order for a city to correspond to the concept of "sustainable cities", four dimensions must be integrated:

- The city's capacity to be resilient to climate change and other types of risks
- Its ability to be thrifty, particularly with regards to natural resources, in order to preserve green spaces and biodiversity and to promote low-carbon and circular economy solutions
- Its "smartness". In other words, its technologies' ability to provide solutions to the two aforementioned issues while preserving and even enhancing quality of life through, for instance, traffic management, pollution reduction, sustainable and affordable housing, safety, etc.
- Its "inclusive" character, through citizen participation in consultations, projects, as well as in providing feedback so as to constantly improve the quality of urban developments.

In smart cities, technologies are given the priority

Most cities, particularly in Asia, foster a technologically-oriented future, even though it sometimes means creating high-tech ghettos for the upper classes, or public transport systems that do not meet populations' needs but simply follow a political logic of prestige. Our commitment, both in France and in Europe, is to consider the city as a whole. We simultaneously articulate the four approaches mentioned earlier, and therefore we focus on answering citizens' requirements first.

The Ministry integrated this "smart" aspect into many of its programs. In its "Eco-Quartiers" (green-neighborhood) program , aimed at developing or refurbishing parts of large or medium-sized cities, for instance, this is undertaken through the interconnection of urban services. Mobility is a problem that can be solved, as in Cusset, near Vichy, with the Secondary Intermodal Exchange Centre, which improves integration by facilitating connections, improving users' comfort when waiting (street furniture and passenger information), and by securing pedestrian paths.

Not to mention car-sharing services, LED-lighting that allows savings, the centralization of urban areas, which are all technical aspects. But the human dimension remains essential: when renovating a district, or making the city center attractive by revamping old housing, relocating shops and local trades, the end goal is to bring people back and fight social deprivation. This is the objective of the "Action Cœur de ville" (heart of the city action) program.

"Smart cities vs. Stupid village"

The report "Smart Cities vs. Stupid Village", by

© Ondrej Sponiar, Pixabay, 2019

the Caisse des Dépôts et Consignations, already highlighted, in 2016, the risk of a growing division between two parts of France. On the one hand would be a couple of large smart cities, while on the other hand, there would be a multitude of "stupid villages"[1]. So actually, everything here is done on a city scale to avoid any dichotomy. We use tools that adapt to different territories, regardless of their size or budget, with, for instance, the association of cities below twenty thousand inhabitants.

Within the Vivapolis Network, we also produced fact sheets presenting know-how on 10 themes related to sustainable cities, energy, mobility, soil, citizen participation, etc. They provide best practices in terms of technological innovation or of urban project governance.[2]

Given the current context of social division, citizen consent is systematically addressed. Some do not know how to use "smart" technologies, others do not know that they exist or what services are available... Citizen consultations, in the case of our "Eco-Quartier" (green-neighborhood) program, for example, proved useful and made it possible to gather constructive feedback, or even to evaluate homes, businesses, and services. Criticism focused on applications that cannot be used, architecture that is too neutral and uniform, energy efficiency, sound insulation problems. Going forward, these types of feedback help us correct the issues for future projects.

Valuing French expertise in terms of sustainable cities

With the Industrial Demonstrators for the Sustainable City (Démonstrateurs Industriels pour la Ville Durable, DIVD), we push projects forward that aim to showcase French excellence in the context of the ecological and energy transition. These pilot projects are based on the joint work of businesses along with mayors from chosen cities where these innovations are being tested.

For instance, projects such as OnDijon, or the DIVD Saint-Etienne (the Jacquard district also obtained, in December 2018, the Ecoquartier stage 2 label), are implementing policies towards the creation and implementation of digital technology in all areas, ranging from resource management to security. These examples can be useful to other cities.

Obviously, city governments' capacity, or that of public/private governance, is a decisive element in framing the success of sustainable city projects. In order to secure funding and accelerate innovation dynamics, large groups, SMEs, and startups need to work together in close partnerships.

Thinking about sustainability as a whole

My sole recommendation is to base every future development on the sustainable city's four pillars. Both because risk prevention is a subject that needs to be systematically integrated in the context of global warming, and in order to prevent the emergence of technological ghettos for the very rich and technological deserts for the rest. No sustainable city can exist without having adjacent sustainable territories that keep the area attractive with economic, social, cultural, and touristic activities.

1. French Association of Small Towns (Association des Petites villes de France (APVF)), Groupe Caisse des Dépôts, Assembly of the communities of France (Assemblée des Communautés de France (AdCF)). « Guide 'Smart city versus Stupid village'? ». Paris : Caisse des Dépôts. September 2016 : 70 p. URL [PDF] : http://publi.caissedesdepots.fr/DDTR/PublicationsSige/CommunicationDIDL/GuideSmartCities/?page=72 [Accessed on October 23 2019].

2 Ministry for Territorial cohesion and Relations with local authorities, « Vivapolis : Le réseau des acteurs publics et privés de la ville durable, » Paris : Ministry for Territorial cohesion and Relations with local authorities, August 6 2019. URL [online] : http://www.cohesion-territoires.gouv.fr/vivapolis [Accessed on August 20 2019].

BANQUE des TERRITOIRES | Caisse des Dépôts GROUPE

François Panouillé
Smart cities policy officer at the Caisse des Dépôts et Consignations

Avoiding the privatization of cities

Caisse des Dépôts et Consignations and its subsidiaries constitute a public group serving the public interest and the country's economic development. The Group carries out missions of public interest in support of public policies implemented by the State and local government bodies, and may also carry out competitive activities. Caisse des Dépôts et Consignations recently put in place a Smart City department, dedicated to helping territories carry out smart development projects, through funding and consultancy.

There is no single definition of a smart city, for it is inherent to each city's vision of its future. They each develop projects according to the local context, their needs and priorities, their geography, and their plans for future developments. Should I want to frame a definition, I would say that a smart city offers efficient urban and environmental services. Digital technologies play a pivotal role in optimizing services, by making them more efficient and less costly. Take the example of smart street lighting, or energy flow management: all save money on your energy bill. On the other hand, smart cities bring new services that meet specific needs in various locations. For example, shared bicycles are a new service that has emerged thanks to digital technologies. Obviously, this is intended to move towards a more sustainable, attractive and desirable city.

Designing smart cities in a transversal and human-centric way

One of the major challenges smart cities face is to break down the silos of urban and environmental services, and to promote transversal and multi-sectoral approaches. In a city, there is, for example, the department of transport, energy, roads, etc. All these services are brought together thanks to "smart" projects, to work in collaboration and no longer in separate silos.

There has recently been a turning point in the definition of smart city. The concept of a technology-oriented "smart city", reflecting the image of a city full of sensors, cameras, and completely lacking a human component, has been evolving. Today, cities are considered "smart" on the basis that they put citizens at the heart of territorial planning issues, and at the heart of urban environments. In French, "smart city" usually translates as "ville intelligente", which is not always the correct translation, as "smart" could also means agile, savvy, clever. The Banque des Territoires (part of the Caisse des Dépôts group) considers that a smart city is also a city that knows how to rely on collective intelligence: that of its citizens, particularly supported by the civic tech movement.

Rethinking the role of the public sector in urban governance

The Banque des Territoires' vision of governance is geared towards avoiding the private sector from having too much of a presence in deciding how a city should be developed. Oftentimes, we advocate an alliance between public and private sectors. However, such contracts entail a strong involvement in the contractual relationship on behalf of the public stakeholder. The latter shall set performance objectives, but also control and sanction mechanisms. In addition, it is essential that the public actor keep full control over the data produced and collected as part

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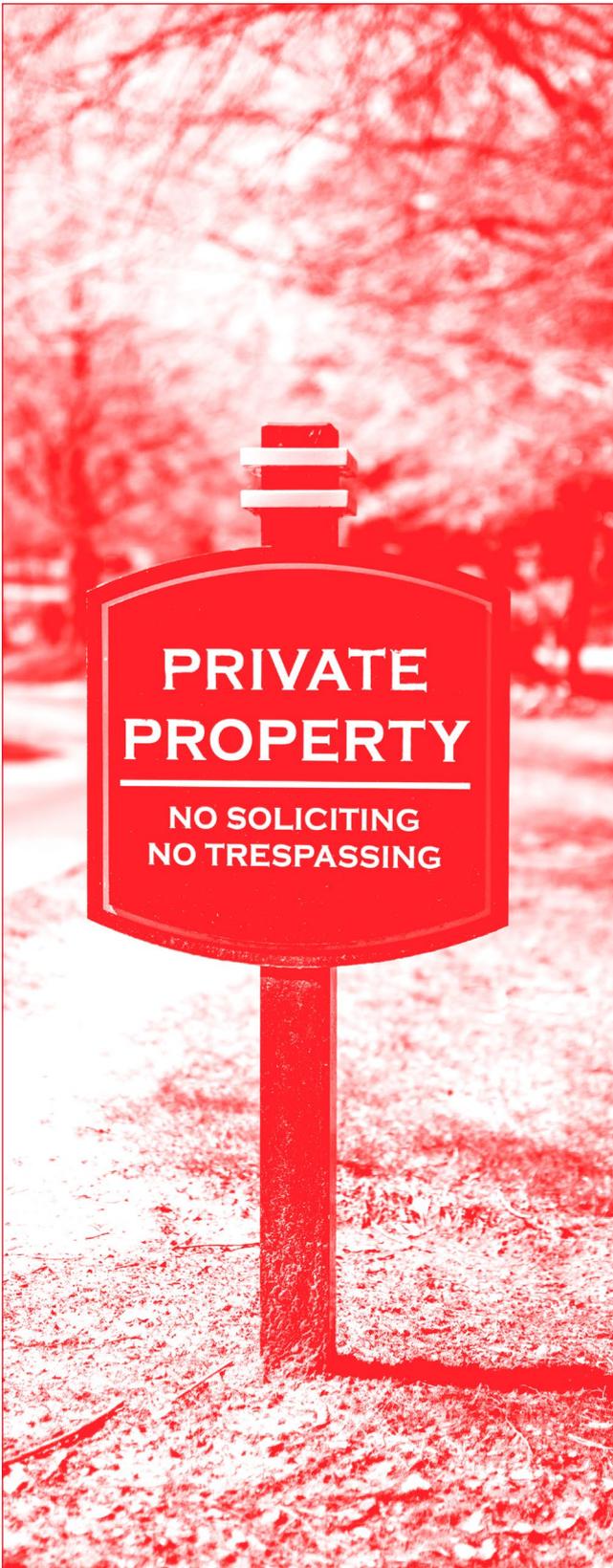
of a service provided by a private operator. In fact, it is key to maintaining control over the management of territorial or urban services, as well as guaranteeing the protection of citizen data. Finally, interoperability and reversibility of technological choices is also essential.

Smart cities also entail an inequality challenge, particularly between urban and rural areas. Besides, it accrues the risk of a growing gap between metropolitan areas and small and medium-sized cities. The Banque des Territoires is thus trying to avoid a widening of that gap, and demonstrate that "smart cities" are not just designed for metropolitan areas. As a partner in the "Action cœur de ville" (heart of the city action) program, which aims at revitalizing 222 medium-sized city centers, the Banque des Territoires has earmarked an envelope that is specifically dedicated to innovation. We are also hearing more and more about "smart rurality" and frugal innovation. Once again, technological advancement is not the only answer, as social and environmental innovations can be found outside major cities and also help in making cities thrive.

My recommendations are as follows:

•   Above all, "smart" solutions must serve inhabitants, and contribute to making cities more sustainable, attractive and inclusive.
•   The issue of cybersecurity should not be neglected. In addition, the issue of privacy and personal data is paramount, as is the place of the citizen/user.
•   There is a clear need for training city employees and departments to data issues. Regarding this matter, the Banque des Territoires helps support local authorities by providing funds as well as consultancy resources.

Nicolas Ferrand
Executive Director of SOLIDEO (Société de Livraison des Ouvrages Olympiques)

Towards green Olympics, make use of what already exists

The Olympic Buildings Delivery Society (Société de Livraison des Ouvrages Olympiques, SOLIDEO) is the public body responsible for financing, supervising, and delivering the works and development operations necessary prior to the Paris 2024 Olympic and Paralympic Games. The works carried out are designed with a consideration for the legacy of the Olympic Games and, as such, will eventually be converted into public amenities, housing, and offices.

I spent fifteen years working in urban planning, first in Saint-Etienne, then in Rennes, and now in Paris on the construction of buildings for the 2024 Paris Olympic games.

An engineering background

My analysis of smart cities is as follows:
First of all, there is an intellectualized conceptual field of the "smart city". In a sense, it is an improvement from the underlying technical conceptualization of smart cities, based on the combination of engineering and advanced technologies. For instance, this is illustrated by the idea that adding sensors to urban spaces will allow for more efficient service deliveries. This conceptual model is relatively old, and operates in silos. Even today, it follows a logic that is highly dependent on engineering. The underlying idea is to optimize existing infrastructures and to improve them via new technologies. In doing so, the latter are preserved from rapid replacement, and long-term costs decrease. Yet, by considering this type of activity a 'smart' one, we also acknowledge that it has been around for a long time!
Secondly, the notion of smart city invites us to reflect on the more strategic issue of data use (both that of users and consumers). Analysis of personal data allows for the development of a whole range of individualized options, as opposed to a consumption model where

there exists a single option for everyone. One striking example is the emergence of Waze [a mobile GPS application that displays real-time traffic and decides which way is the quickest]. Waze is now replacing the French public service Bison Futé, which is supposed to predict traffic in advance. Thanks to the use of location data from thousands of users, Waze is able to provide real-time traffic updates and individually recommend best routes, whereas Bison Futé operates at a macro scale and provides the same service to all its users.
In my opinion, the true conceptual revolution lies in the development of these technologies, which allow for the emergence of a whole range of individualized practices, without any form of public intervention or regulation. However, platforms such as Waze raise the question of the role of public authorities in the face of a profound change in individual uses.

Tailor services and the public space to individuals

Through the individualization of services offered by private companies, we notice a decoupling between users and consumers on the one hand, and citizens on the other. From a more philosophical point of view, this division goes against an egalitarian stance on public services. Consumers and users have different perceptions of events and therefore adopt different behaviors. Hence, should the public actor adopt an a

priori mode of governance or should the problem be addressed a posteriori?

Take the example of Google glasses, which allow us to see an augmented version of reality, an individualized image of it. This is the next frontier, although technology is not quite stable (keep in mind that Apple's Newton prefigured in the early 1990s the iPad of the 2000s). This type of technology lays the bedrock for the implementation of a new and expanded urban digital space. The very concept of augmented reality allows a complete change in our individual understanding of the city, because our entire perception of community life is now distorted by new information and commercial offers. Ads we see today are the same for everyone, while in the future we could imagine that they will change depending on the data each individual generates, as is already the case on the Internet.

Therefore, we notice a gradual incursion of the private sphere into the digital public space. Private actors cannot totally obliterate public ones. Private city frameworks may work in some locations: think about large American malls that act as de facto private city centers, or gated communities, or even some private cities in India that offer services for a fee. The question becomes epidermal when it comes to data. The incursion of data makes recent developments of the private sphere more controversial, as data reshuffles the cards and redefines norms, rules, and behaviors. Take the SideWalk Labs' project in Toronto (by Alphabet, Google's parent company). It uses personal data to generate individual city practices, and actually generates a new model of private city. This is made possible as the city increasingly delegates the management of public services to private operators. The main issue is that we do not know optimization rules, nor users' predictable behaviors. In my opinion, what is new lies in the birth of a new digital city model, and not quite in offering urban services at a cost. Building on this new model of a digital city, we understand it would feature a lot of data, but we yet have to develop an economic and societal model around its use. I think it will be interesting to observe the developments in Toronto, and how Google's creativity can be implemented in an urban context. In addition, such a project raises questions about the future of these new digitalized urban environments

twenty or thirty years after implementation. Will these new "smart city" projects last and become integral parts of the urban fabric, as nineteenth-century developments did (like the sewage system for instance)?

A pragmatic approach to infrastructure for sustainable and urban Olympics

In the context of the Olympic Games, this type of city use, for the purpose of optimizing services, should explode. Tokyo, as part of the 2020 Summer Olympics, or Beijing, for the 2022 Winter Olympics, are already trying to cross all urban-related topics in a centralized way, using digital tools as much as possible. For our part, we favor an empirical and pragmatic approach. We chose to conceive a model in the first place, and then to focus on setting up the infrastructure, so that solutions developed today do not become obsolete by 2024. The main challenge for us is to build a sustainable, long-lasting conceptual and physical basis by 2050, without being too pressed by 'smart' development injunctions. At this stage, we are deploying an extremely precise BIM model, whilst looking forward to attaching new digital devices and characteristics to this structure, as a way of making the city more digitally-oriented. The question is rather what relevant services will be offered by then, and what services should be considered, depending on the fields concerned. On the other hand, we are deliberately determined to make sustainable Olympics: we aim at re-using what already exists. Regarding that, one must also acknowledge that the Summer Olympics will not just take place in Paris, but also in neighboring municipalities. Although Paris has already been addressing the aforementioned issues, other municipalities sometimes lack expertise and insights. Our project management capacity is more traditional, even sometimes limited as some local authorities will not necessarily have the technical capacity to take over certain infrastructures once the Olympics are over. It raises a crucial question for a transitional operator like SOLIDEO: that of its legacy and sustainability (in terms of infrastructure maintenance).

We have to meet several deadlines. First, as we are about to build about 300,000m2, new technologies will allow us to optimize specific issues regarding
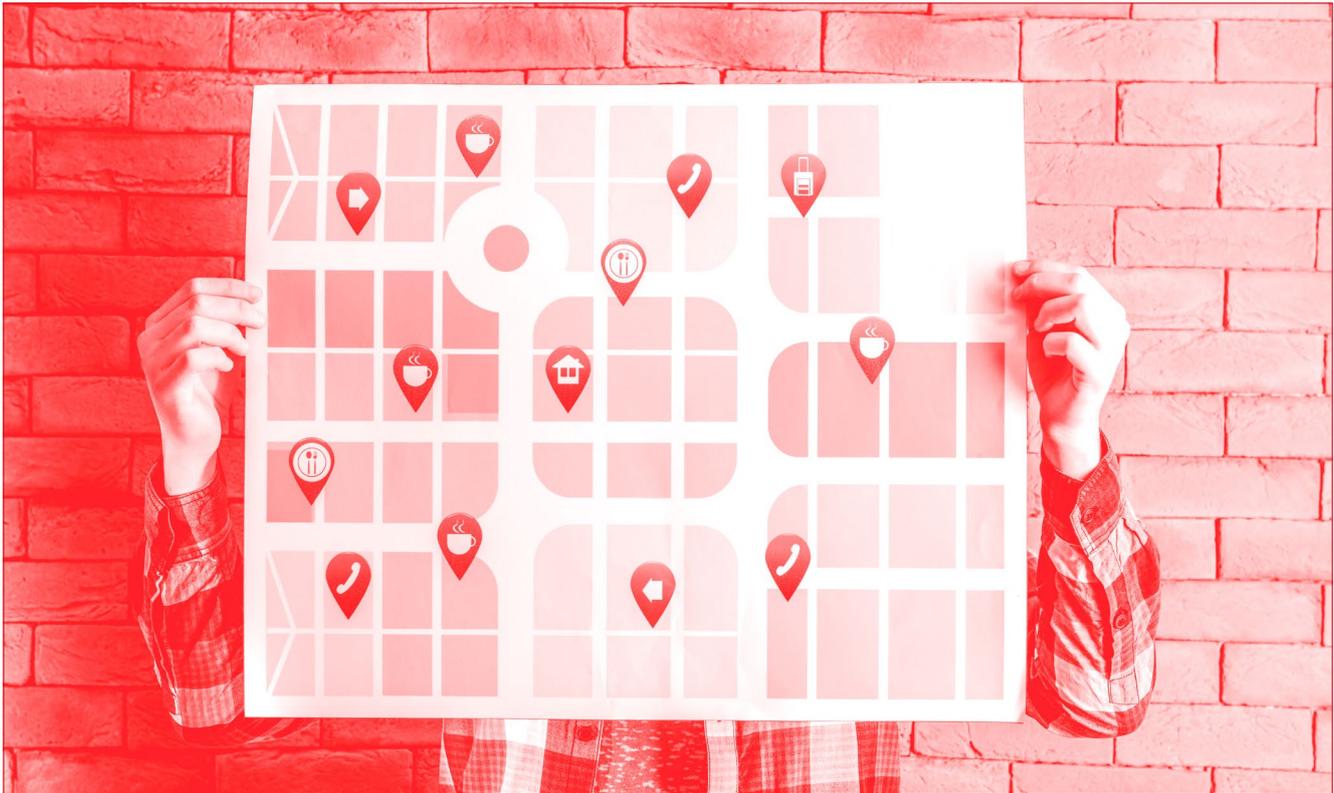
the management of construction sites – for example noise, air pollution, etc. But our real contribution to the reflection on smart cities is set in improving infrastructure, but most of all in offering new services that truly address residents' needs and requirements. In order to meet citizen requirements, smart cities must allow for inhabitant participation in building urban environments that are a little more technologically-focused, while also being environmentally-friendly. This is the only credible response that we should bring to the table.

Data is a public asset

My main recommendation concerns data. I think we need to rethink the model of free provision of public data that has been generally accepted and widely spread out until now. I am referring here to all the data related to the functioning of the city, which can be considered as a public good in and of itself and should be treated as an economic resource whose commercialization must be carried out in the benefit of users and in the interest of the general public, according to a logic of supply and demand. Otherwise, it amounts to selling off elements of public heritage, which have required work to collect and maintain. Today, a private operator can access and use data collected in the public space free of charge. The same goes for the provision of data from public operators – RATP, SNCF, etc. Access to all of this public data, including personal data, should require a fee. The most significant analogy is that of parking spaces in the city. They are part of the public domain, yet you can park wherever you want, as long as you pay for it and respect rules.

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Feedbacks: Companies' new approach to building « smart » cities

Companies share their firsthand experience on smart cities

Gérard Wolf
President of the MEDEF International Sustainable City Task Force and
President of BRICS Access

Thinking smart cities globally, governing them locally

Within the International division of the MEDEF, the Sustainable Cities Task Force promotes a transversal and integrated approach. It studies the relationship between urban governance, innovation, the training of local managers, and technology transfers, and also seeks to understand the needs of foreign decision-makers with a view to promote the French know-how internationally.

Smart cities are born from the inclusion and collaboration of multiple actors

Above all, it must be said that smart cities are the tip of the iceberg. Below the surface, there are demographics, social bodies, and resilience issues that contribute to the global challenge of tomorrow's Sustainable Cities.

By 2050, the number will be closer to 70%. In other words, the share of the urban population will increase by 2.5 billion inhabitants, mainly in emerging countries.

In fact, with one billion urban dwellers in Africa, five hundred million more in India, and two hundred million more in China, about 80% of these 2.5 billion live in emerging countries. We cannot talk about "smart cities" if we do not immediately integrate this data and if we think only of cities like Paris, Madrid, Copenhagen, Mexico City, or Bandung. It is necessary to think of a "whole" where technologies are adapted to the local context, and where a city is also technologically "sustainable", in the temporal (life span of the infrastructures) and environmental sense. There is no "smart" city without thinking about the issue of inclusiveness: you cannot reduce a city to its business district! We will only be credible if the project applies to the whole city. Social inclusiveness is important: a smart city is above all a territory of services and uses that must meet the basic needs of all its inhabitants.

In addition, climate disruptions, rising water levels, hurricanes and floods will increase in number, so the smart city must make it possible to anticipate the response to these phenomena and integrate them into the very development of the city. It is for these reasons that, for me, a "smart city" is born from the interaction between decision-makers, residents, and creators, i.e. companies, for a new governance and a new ecosystem.

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A French approach to the smart city
I see three French particularities :

· 	A holistic approach.

It is no longer possible to design a new city or an extension segment by segment. First, because time is short: urban population growth is strong; second, because people want housing, transport and, of course, all basic urban services such as water, electricity, sanitation, garbage treatment, hospital services, etc., all at the same time.
Home-to-work accessibility is a subject that should be systematically addressed. It is essential to think of the city by its inhabitants. What is the point of building a multimodal hub if you do not know what people want to do, or how they move from one type of transport to another?

· 	The importance of training.

We know how to install a water and sanitation network, infrastructure, transport systems, etc. But if local operators are not adequately trained, the functioning of such systems will deteriorate, as seen in several cities around the world. In other words, it is necessary to agree to pay significant CAPEX (investment costs) (often including initial training costs) to have much lower OPEX (operating costs): this urban equation is decisive. There is no point in creating wastewater treatment plants, resource management systems or other systems if they fail after two years. Companies install the required equipment, but behind it is the quality and professionalism, the know-how of the local operator, on which everything really depends. Our French companies are very involved in this aspect, because the training of their employees is part of their DNA.

· 	Governance.

Involving Authorities and inhabitants is a prerequisite for people to understand that societal utility is greater than technical utility. Governance is crucial: when you make a project, you explain that you have to involve people in the operation; it works if the inhabitants themselves are convinced of the usefulness of the project. This is the condition for monetizing it with users willing to pay more for the service. But this issue of governance is complex, because mayors do not like to receive advice from companies. They are right, because that is not our role!

The "Sustainable City" Task Force: involving local decision-makers in French companies' solutions

Created at the end of 2014, the MEDEF International Sustainable City Task Force is a pool of 600 French companies of all sizes operating throughout the city's "value chain" (planning, programming, construction, development, urban services, maintenance) and covering all urban sectors (transport, construction & construction, energy, waste, water, smart & connected cities) with a strong capacity for projection on all markets on five continents.

Our characteristic is to consider that we must treat the requests of local decision-makers in a global way: us, companies, for technical solutions; and associate French elected officials to talk about governance (the mayor is ultimately the one who speaks best of the city). With Cités Unies France (CUF), chaired by the Mayor of Strasbourg, Roland Ries, we have a network of French local authorities involved in international action. CUF supports all these local authorities in the implementation of actions to promote their international expansion.
Finally, we cannot ignore the subject of Public Private Partnerships (PPPs), which are developing all over the world. Our credibility on this major concept in urban management is due to the fact that France has a long history of public service delegations. EDF, Générale des Eaux, Lyonnaise des Eaux, etc., these historical players give French companies an extremely competitive legitimacy, knowledge and vision of the territories.

Smart cities: global framework, local governance

1. Think and act in a global landscape, do not reason in silos: "France", "Europe", "industrialized countries". The problem of cities is general, even global. People migrate to the cities because that is where jobs are concentrated, as well as education and health care. It is therefore necessary to provide technical and social solutions to these large cities in a sustainable and intelligent, and therefore connected, way.

2. Define local governance, synthesize the different decision-makers, involve and empower residents so that they feel they are actors, not just spectators.

3. Be pragmatic, and I am convinced it is in the DNA of AmCham and its members!

Smart Chemistry, Smart Cities

As a chemical corporation, Dow is committed to providing solutions that can be integrated into its customers' final products. Dow operates in all urban areas, particularly in road construction and housing, to adapt these structures to societal needs, in terms of connectivity, access to services, efficiency, infrastructure quality, and air quality.

More than half of the world's population now lives in cities and this proportion is expected to reach about 70% by 2050.

This dynamic generates various challenges, such as a rise in population density in most urban areas, as well as issues related to infrastructure, service delivery, sustainable development, waste management and energy efficiency. In order solve this situation, we need to combine technology and services.

Main challenges - The smart city is a city that improves the sustainability of urban environments, whilst meeting the needs of its inhabitants

Today, the concept of smart city goes beyond simply improving the environmental or technological aspects of the city. It also corresponds to the way in which the evolution of economic and social conditions is foreseen and thought out, in order to enable citizens to better

assimilate and benefit from the various changes that exist in today's cities. The ultimate goal is to live in a city that is increasingly in tune with their needs and where quality of life is constantly improving. The smart city needs to use technology to improve the quality of life of its inhabitants, as well as create a model for economic, social and environmental development that can be tailored to the needs of its citizens and users.

The definition of smart city is based on a simple question: what more can it bring, and how can it improve people's quality of life?

The answer is threefold:

· First, with regard to housing:

A smart city is a city that offers improved living conditions in sync with innovations. On that matter, Dow focuses on energy efficiency, safer and more energy-efficient access to infrastructure, buildings and transport, but also on promoting various streams with a particular concern for efficiency, both for people and objects, as for water and air quality. Smart cities are therefore a package that include transport infrastructure, buildings, utilities, etc.

© Joseph Chan on Unsplash

- Then comes the aspect of tailoring solutions to the needs of populations

particularly in terms of connectivity and access to services. In general, needs are increasing, and it is important for each city to be up to the task, if only to be competitive in the labor market and to be able to compete by using these technologies.

- The third aspect is that of the sustainable development of services

It encompasses the two points afore mentioned and is a question of providing improvements that take into account future generations.

Dow solutions for smart cities - Providing solutions and product innovations for various fields

As a chemical manufacturer, Dow operates well upstream in the value chain. 95% of manufactured objects are made using a product from the chemistry industry. Dow therefore provides solutions and innovations in material science that benefit infrastructure, packaging, or consumer product sectors. The solution is first presented within a clear and defined legislative and regulatory framework. Dow then offers to link their customers with their clients, including a Dow solution in their training.

FASTRACK™ in Barcelona

Dow has carried out a number of tender bids for smart city projects, notably for Barcelona, Dubai, and a few cities in the United States, Australia, France, Italy, or Poland,that have been operating in the smart cities field of research and development.

- The project

In Barcelona, Dow proposed a solution for road marking called FASTRACKTM. This system makes it possible to make road markings more economical in terms of durability, more sustainable on the long term, and that also reduces emissions of volatile organic compounds. In Barcelona, the FASTRACK solution was implemented on a small scale on road portions in a specific district of the city.

- Difficulties encountered

As part of the promotion and implementation of this product, Dow encountered two types of obstacles.

Firstly, the municipality of Barcelona had specific criteria for the development of road marking solutions, and the company's options were limited by the cost factor of large-scale development.

Secondly, and although this was not the case forFASTRACK™, one of the main obstacles that can be encountered when identifying and adopting an innovation are preexisting, and inadequate, technical standards to which the technicians in charge of preparing calls for tenders often refer to, The teams that are subsequently responsible for the implementation of these technologies are not systematically very well trained. Sometimes, implementing these new technologies is not allowed without reviewing preexisting standards, which can be very costly and time consuming.

In addition, a number of subcontractors or contractors with whom Dow collaborates already have their own public contracts. As a result, they persist in using technical standards that do not always include the latest innovations, because of contractual obligations. It may therefore be difficult for a solution with completely new technical characteristics to align with the standards and norms required by a smart city project.

## Creation of a road pavement composed of recycled plastic – Depok City, Indonesia

The objective here was to develop a road that would be as efficient as with conventional asphalt but using a mixture of recycled plastic solutions and basic asphalt solutions.
The novelty of this project was well suited for an implementation in an emerging market, since these countries have fewer regulatory barriers.
Launching such an innovative product in a developing market nevertheless carries its own risks. This implies first obtaining the authorizations and then that the necessary regulations follow, as the solution is proposed outside the usual loops of the legislative framework. In addition to the cost and difficulty of

adapting the country's standards to an innovative solution, the legislative framework may not keep pace with the adaptation or development of the solution.

Dow's recommendations to meet the challenges of smart cities:

1. Know and determine priorities for investments to be made, regarding the elements that you want to change in the city.

2. Have a real knowledge of existing regulations and take into consideration the need to develop standards or regulations according to new technology or innovation.

3. Consider the entire value chain (subcontractors, civil servants, suppliers of the new solution) to estimate short and long-term costs. Failure to do so would result in only a partial view of the final costs and would reflect only part of the potential of the project in question. A global vision of the value chain and stakeholders allows the different actors to better understand how costs are shared and leads them to accept more easily to bear their share.

4. Keep in mind the training aspects necessary for the implementation of certain innovations or solutions.

5. Have open communication channels between public decision-makers and private actors.

6.Ensure that the people carrying out the project have the capacity to apply the regulations in effect.

For more information on Dow's solutions:
www.dow.com — https://consumer.dow.com/en-us/industry/ind-building-construction/icity.html

ORACLE®

Transparent data sharing towards building a relationship of trust

Oracle Corporation is an American multinational company that designs and manages databases and system infrastructures. As such, it plays an important role in data systems and seeks to make data-use more transparent, for the purposes of better governance and greater trust and involvement of civil society. As a digital company, Oracle is actively involved in the development of smart solutions in urban areas.

Oracle considers data to be an essential component to all developments, such as the Internet or the mobility revolution. However, an evident form of mistrust has been emerging between citizens and institutions, specifically regarding topics related to smart city such as data collection or use.This context, rooted in politics, generates fear and questions from the public.
In order to understand these dynamics, Oracle is resolutely human-focused, down to the core of its strategies, and particularly regarding the collection of personal data, where individual consent is crucial.

Main challenges identified – Oracle's smart city aims at simplifying citizens' daily lives through data use

Oracle works more specifically on the use of data in cloud computing, i.e. with the infrastructure, technology platforms, and applications that are required to collect, store, and use data.

Our smart city concept also features a "gov tech" and a "smart governance" dimension, through which Oracle helps change its customers' business all over the world, so that citizens can contribute to the development of their smart city, and as a way of making their own lives easier. No matter how willing individuals are to get involved, they should all be able to thanks to a participatory process enabled by smart cities and technologies. Technology equates a means

through which citizens report issues and potentially trigger an intervention by city operators. Incidentally, devices that use sensors must be able to trigger the same interventions, and thus complement the shortcomings of participatory models mainly based on the goodwill of citizens.

In the coming years, our company will face a transparency challenge regarding the use of individual data as a key element of the proper functioning of smart cities. It seems necessary to open access to data, and to guarantee that it will be used in a transparent manner. However, unlike in other countries, the French legal framework lacks flexibility, which could be detrimental to innovative approaches to smart cities. The public tenders code, or that of local and regional authorities, was conceived in a top-down manner, as the requirement for flexibility and adaptability was less pressing than today. Oracle supportsthe evolution of legal frameworks that could promote experimental measures towards the realization and implementation of smart cities. Such an evolution would encourage experimentation both on the regulatory and technical levels, with the possibility of benefiting from a high degree of flexibility over a defined geographical and temporal perimeter.

Solutions adopted

Oracle aims at making people's lives easier through smart and transparent data management and analysis. To this end, and in order to reassure users about how their data is used, while bearing in mind proper functioning of smart cities, Oracle is evolving along several dimensions:

• Education of users about the importance of data as a raw material for the smart city: users can therefore agree to the collection of personal data since they understand the whole process and its necessity. Communication must be at the heart of smart and participatory data collection processes.
• Development of collection means, such as sensors: these systems must be reliable and able to operate in a transparent way, in order to foster public confidence.
• Organization and classification of data in receptacles that are both access-controlled and accessible. It is paramount that individuals have an easy access to their stored data.
• Use of algorithms that allow operating without human-induced cognitive bias and that do not introduce new biases themselves.

The project - Developing transparency in administrative processes at CNAF (Caisse Nationale des Allocations Familiales, part of the French Social Security)

This project was developed by Oracle and Accenture for the CNAF and illustrates a concern for transparency and communication when it comes to data. The CNAF was contemplating setting up the activity bonus ("prime d'activité"): individuals would need to be informed whether they were eligible for an activity bonus, and if so, how much they could get from it. The solution that was ultimately implemented uses a natural and understandable language (as opposed to technical and complex), so that forms can be directly and easily filled out by individuals. Participants in the program would then discover the amount for which they are eligible, along with a short paragraph that would describe how the amount was calculated and what influences the level of their allowance. Thanks to Oracle, the CNAF has been successful in opening its access to information, building trust between the institution and its users.

Oracle's recommendations to meet the challenges of smart cities

1. Develop openness and transparency while collecting, sharing, and using data. Also, make data more transparent in such a way that it is intelligible for everyone.

2. Include a regulation component in industry R&D systems to increase compliance. Regulations must also be more flexible themselves.

3. Foster an experimental approach to developing new technologies, in a given territory and at a given time. Public space must be able to continuously improve thanks to technology.

4. Reuse preexisting urban furniture, adding to it a layer of technology to make it more interactive, through installing sensors that can produce data and further tailor services to specific needs of users.

Honeywell

Sustainable energy systems for smart cities – The case of the Navy Yard of Philadelphia

Honeywell is an American Fortune 100 technology company that delivers global industry specific solutions including aerospace products and services; control technologies for buildings and industry; and high-performance materials. Honeywell recognizes that a smart city encompasses many urban themes such as safety, security, energy efficient buildings and infrastructures, which all lead to a better urban experience and an enhanced quality of life.

The adoption of technology and analytics capabilities addresses the growing number of social, economic and environmental challenges that emerge as growing numbers of people live in cities. The concept of the Smart City covers many different aspects that aim at improving the quality of life of its citizens. Technology enabled by better connectivity and Internet of Things (IoT) improves the use of existing buildings and infrastructure, making the built environment smarter and able to respond to changes. This provides the people living in these cities with a better quality of life and an improved urban experience.

Honeywell addresses the needs of a Smart City by providing different solutions and technologies for smart and connected buildings, city wide safety, security, sustainability and environmental needs. Honeywell not only equips buildings and public infrastructure with many of the field devices and hardware components required for a Smart City, but also provide the technical data analytics generated through these devices to enable insights, optimization and improved decision-making.

One key component of any smart city is energy. Balancing energy generation to demand is a difficult process if blackouts are to be avoided. Utilities conventionally use gas, diesel or coal fired power plants to meet variable demand and achieve this balance. However, as these power plants age and emission

reduction targets become stricter, an alternative is required.

One energy solution Honeywell is offering to utilities and larger energy consumers is the Virtual Power Plant (VPP). Using the Enbala grid-balancing software platform, Honeywell's VPP aggregates many distributed energy resources (DERs) such as solar panels, wind turbines, batteries and smart electrical devices in buildings (including air conditioning chillers and motors), to operate like one complete power plant.

In city-centers, electrical capacity is often limited, so utilities and energy providers charge energy users higher tariffs during peak demand periods of the day. Honeywell's VPP enables organizations with multiple buildings to co-ordinate their operation and reduce these charges. An example of this VPP concept is well described in the project implemented at the Urban Outfitter corporate campus in the US.

The project

The Philadelphia Navy Yard is a 1,200-acre, centrally-located, waterfront business park, developed and managed by the Philadelphia Industrial Development Corporation (PIDC), a non-profit organization founded by the City of Philadelphia and the Greater Philadelphia Chamber of commerce. In 2006, Urban
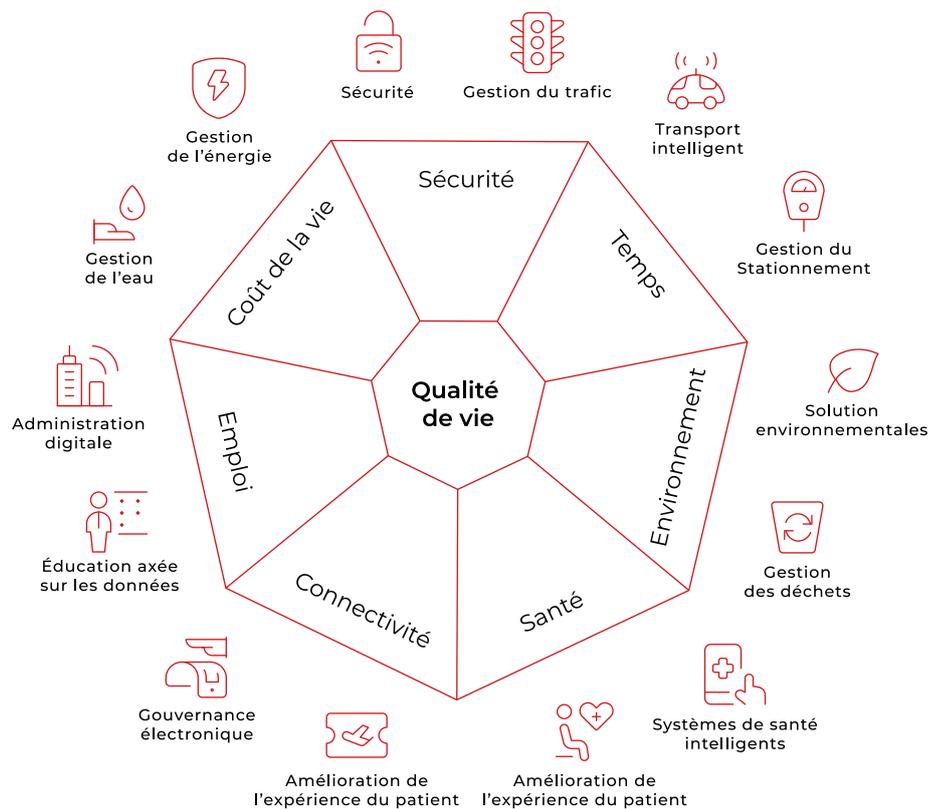
Outfitters Inc., a leading US apparel brand, joined the Navy Yard, identifying the business park — with its commitment to smart energy innovation — as the ideal place to streamline its multiple retail brand offices into a single location. Comprised of 14 buildings, 280,000 square feet and more than 2,000 employees, the Urban Outfitters Corporate Campus is one of the Navy Yard's largest tenants.

The challenge

Utility company PECO supplies the Navy Yard with electricity as a single account, and PIDC then bills individual building owners and tenants, including Urban Outfitters, for their electricity use. The increasing use of renewable generation and distributed energy resources (DERs) such as solar and energy storage, along with business customers' changing energy usage patterns, are leading to greater uncertainty and variability in the electric

grid. To help manage peak demand and mitigate risks associated with these uncertainties, PECO has implemented demand time-of-use (TOU) tariffs. PIDC is considering changing the fixed or block rates currently billed to their tenants to better reflect the TOU charges they are incurring. As an alternative, the Navy Yard tenants have the opportunity to participate in capacity relief programs to protect themselves from potential electricity cost increases.

The solution

Utilities implement capacity relief programs to incentivize customers to reduce load during peak demand. This encourages reductions in energy waste and prevents rising costs while also allowing utilities to increase the reliability and economics of renewable energy initiatives. A new generation of communication and control technologies such as virtual power plants (VPPs) allow utility customers to enable their loads

*Source: MGI *Smart City* Report 2018

to continuously respond to peak demand forecasts, changing
renewable supply levels and other applicable market signals in order to save on their energy bills.

As there are multiple flexible assets across Urban Outfitters' buildings, an onsite gateway was installed at the campus which communicates with a cloud-based, real-time control and optimization platform.

Implementation focused on PJM Demand Response (DR) and reduction of PJM Peak Load Contribution (PLC) charges — both of which are dispatched by PIDC to generate DR revenue and reduce PLC costs for the entire Navy Yard. The VPP solution takes local constraints into account, allowing Urban Outfitters to provide automatic capacity relief to realize bill savings while minimizing impact to their employees and operations

The results

After identifying demand-side flexibility at Urban Outfitters, nine buildings were integrated into the VPP platform. Local communication gateways were integrated with the building automation system to dispatch over 1,000 HVAC assets, including chillers, air handling units, heat pumps, chilled water distribution pumps and chilled water system cooling towers.

The VPP platform has been in operation at the Urban Outfitters campus since January 2018. To date, the Urban Outfitters' Corporate Campus has responded to a range of DR events of two-to six-hour
duration, curtailing an average of 230 kW per event by automatically orchestrating the contribution of different plant devices depending on their availability and the length of time they can individually be turned on/off or up/down.

Smart cities – A multi-actor business

3M is an American conglomerate producing a wide variety of products, including abrasives, electronic components, and adhesive tapes. 3M is involved in urban development through the many products that its companies manufacture, which are foundational to various urban aspects, such as transport or energy supply infrastructures.

Today, urban performance not only relies on physical infrastructure, but also on knowledge and social infrastructure.
Integrated Smart Cities investments in human and social capital, and traditional yet modern infrastructure like transport, are complemented by modern communication infrastructure that fuels economic development, improves quality of life, and underpins a wiser management of resources.[1]

3M's experience with cities moving in this direction shows that businesses, workers, and families in smart cities create a fulcrum of growth and prosperity. Smart cities are citizen-centric.

The challenge: Business Model & Execution

For Smart Cities to be developed, governments, investors, and companies/contractors have to all meet their respective organizational and fiscal expectations. Four main models are used to build infrastructure through which companies can engage with city authorities to develop smart cities:
- Build Own Operate (BOO);
- Build Operate Transfer (BOT);
- Build Operate Manage (BOM);
- Open Business Model (OBM).

Smart city products and service providers will assume one or more amongst four roles in order to meet such objectives:

- Integrators (the end-to-end service provider);
- Network operators (connectivity providers);
- Product vendors (hardware and asset providers);
- Managed service providers (third-party providers overseeing management / operation of smart solutions / services).

As reference, 3M predominantly is a Product Provider to other three parties.

Examples of best practices from 3M experience

- An inventory of successful 3M Projects

Success in developing a smart city requires engagement and partnership amongst three key entities: Governments, Project Financiers and Prime Contractors and their Suppliers.
3M is a global supplier providing solutions today to the majority of smart cities that are under development in the world, with product portfolios in national infrastructure, healthcare, safety, security and defense.

3M technologies and services help address smart city needs. Amongst 3M's 55,000 products, we decided to showcase examples from six categories summarized in the table below.

1. Caragliu et al. (2009).

- 3M in France

3M is starting smart city experimentations through partnerships with Security System Valley, a cluster within Val d'Oise territories. The main areas of focus are road infrastructure and workers' safety.
The cluster is designed to build cooperation and experimentation among public and private stakeholders.
The main impact onto the city is estimated to be:

- A safer city for citizens thanks to improved infrastructure that can solve everyday issues
- New ways of preventing and implementing safety and security issues
- Best practice experiments ready for replication in other locations.
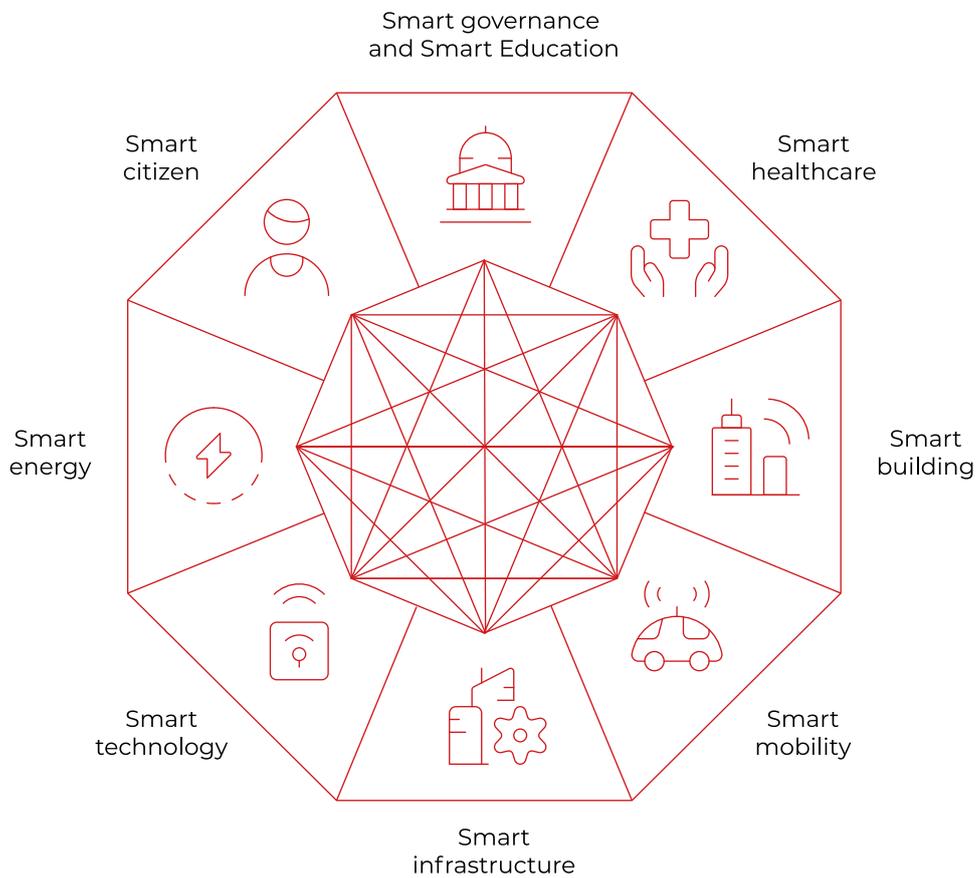
Fɪɢ. – Frost et Sullivan « Strategic Opportunity Analysis of the Global *Smart City* Market » 2013

Theme	Smart Segment	3M Solution
Traffic Management	Smart Mobility	3M TrafficMaterials enhance road infrastructure for better, more accurate and readable road markings for autonomous vehicles.
Worker Safety	Smart Healthcare	Improve physical security at work through appropriate and enhanced processes and solutions to companies and public organizations
Protection against pollution	Smart Healthcare	Prevent high levels of pollution from occurring, in order to protect people's breathing.
Data/ Asset Management	Smart Technology	Sensors and electronic components need data centers to perform correctly. Consequently, smart cities spend about 20% of energy on data centers. 3M cooling fluids provide energy efficiency means to dramatically reduce data center energy footprint.
Power	Smart Energy Smart Infrastructure	3M AACR cables reduce the number of transmission towers by two-thirds, as they can carry three times the amount of electricity that steel cables usually carry. 3M car electrification solutions for enhanced vehicle performances, including reduced energy consumption.
Energy Efficiency	Smart Buildings	3M infrared reflective, yet visible light transparent films, reduce building heating and therefore lowering cooling costs.
e-Health	Smart Healthcare	3M Diagnostic Related Group data dictionaries ensure consistent and high-quality care everywhere in the city.
Waste, Pollution	Smart Buildings and Smart Mobility	A variety of 3M products minimize energy consumption for both vehicles and buildings, fostering a reduced environmental impact through reduced pollution levels.

Concluding remarks and recommendations

1.   Develop a government initiative to create a French Experimentation Agency working with all stakeholders, public and private, to coordinate experiments made both at the local and national level, thereby leveraging common benefits and increasing speed of replication.

2.   Create three national roadmaps on major challenges:
•   for drastic reduction of energy consumption by heating and AC device within existing buildings;
•   for acceleration of mobility transition through enhanced infrastructure for automated and electrified vehicles;
•   for integration of people resilience, safety at work and reduction of fatalities through modernized processes and smart technologies.

Cisco helps turn Jaipur into a smart and safer city

Cisco is the global technology leader that has made the Internet possible since 1984. Cisco employees, products, and partners connect society securely and enable us to seize the future opportunities that are offered by digital technology.

"Jaipur is a historical city that attracts tens of millions of tourists from all over the world annually. Jaipur is focusing on technology innovation as a Digital City to showcase greater connectivity and information access for our citizens and tourist visitors. Working with Cisco has made this vision a reality, and our city is benefitting in every aspect – from safety and security, to easy access to information, to overall improvement of our image and our stepping into the "Smart City" arena."
•   Shikhar Agrawal – Commissioner, Jaipur Development Commissioner

Jaipur, the capital city of Rajasthan, has a rich and colorful past dating back to the time it was founded, in 1727. Its cultural heritage and unique sights have made it a popular destination for tourists, both domestic and international – the "Pink City" attracts over 40 million tourists each year. The city authorities were under pressure, facing an urgent need to improve the quality and efficiency of services provided to both visitors and the city's 3.5 million residents. The Jaipur Development Authority (JDA) came into being with the mandate of providing benefits and improving the life of the citizens of Jaipur.

Main challenges

•   Improve traveler safety & the tourist experience and the quality of life for residents

With the city emerging as a hub and drawing such large numbers of visitors, the JDA knew it had to up its game. The mandate was twofold – increase quality and level of services and information access available to residents, as well as offer a stellar tourism experience to visitors. A further need was to focus on safety for visitors and residents alike.

•   Safety First

Having safety and security solutions in place would enable JDA to monitor activity and movement in high traffic areas. This was a key factor towards improving safety for specific audiences, such as female or solo travelers. It would also improve conditions for year-round residents and reduce the crime rates in the city.

•   Simplifying the Tourist Experience

Jaipur, a city almost 300 years old, is rich with Indian history and culture. As such, generations of infrastructure have built upon each other within the confines of this city. Jaipur's transition into a Digital City includes simplifying the tourist experience. The challenge was to help tourists spend more time

learning and seeing the culture and sights, rather than searching for locations within the maze of a city.

- Digital Empowerment for Citizens

Another aim was to provide quality infrastructure and services to meet the ever-growing population and earn Jaipur a place as a metropolitan digital city. Jaipur was struggling to offer the kind of services to its citizenry that would make it one of the most desirable places to live.

In keeping with the government's Digital India program, there is a strong focus on the digital empowerment of citizens, where infrastructure will be offered as a utility to every citizen and citizen-services will be made available to them on- demand.

So, as part of the journey towards making Jaipur a Digital City, JDA wanted to provide easy access to information, across multiple devices, to the residents and tourists of Jaipur. At the same time, the JDA needed to maintain an eye on cost-effectiveness and manageability.

The JDA wanted to develop Jaipur into a smart and secure WiFi city. To do this, they needed to partner with a strong technology-provider who could manage such a large undertaking and provide quality, reliable implementation and solutions.

©Cisco, 2019

Solution: Always connected means safe and informed

Cisco helped JDA with their vision to develop Jaipur city into a Smart & Secure Wi-Fi City by implementing the right-fit solutions and technology. We empower the creation of new digital connections to make cities more desirable places to live with better services and safety and thriving economies. The foundation for 'Digital Rajasthan' will be intelligent networks which will transform the delivery of citizen services.

Cisco has developed a framework for addressing the challenges that cities are facing and how those challenges are reflected in the milestones along their digital journey. This framework successfully addresses the shared challenges cities face and also preserves a city's uniqueness in how solutions are implemented and supported. Digital transformation when done well will enable government leaders, city administrators, local businesses, and citizens to realize outcomes needed to survive and thrive. Through this approach, we work with various sensor and application partners to provide solutions to cities to improve operations and optimize services delivery to engage citizens and improve quality of life.

In the case of Jaipur Development Authority's (JDA) Infrastructure Management Center, nearly all the solutions are integrated into a digital platform. The

digital platform built by Cisco can aggregate data from various sensors and solutions conduct data analytics and support a number of urban services. Cisco created smart Wi-Fi hotspots at selected locations which meant that tourists and residents alike could take advantage of this smart city feature and have access to the internet.

Interactive Information Kiosks were installed at designated locations with high traffic, to provide a quick and user-friendly way for tourists to gain information.

Having Information Kiosks at hand allows tourists, both domestic and international, to find their way around more easily and efficiently as well as learn about the myriad tourist attractions and activities that Jaipur has to offer.

Cisco also installed IP based Surveillance Solutions at key locations to implement the safety component of the JDA's plan for Jaipur. It was important from a citizen point of view, to have surveillance to help control crime and make the citizens feel safe and secure in their city. For tourists too, especially solo and female travelers, the sense of security could be enhanced, and such an audience could be catered to, by touting Jaipur as a safe city.

Furthermore, we set up Environmental Sensors at key locations to provide air quality status reports in real time. Given the pollution in India, and the specific desert conditions related issues that could arise, this feature means that Jaipur can market itself as a place where environmental and health conditions are important and taken into consideration.

To improve city infrastructure, especially with regard to facilities and parking, Cisco installed Parking Information and Remote Kiosks along with Facility Management Services at select locations of Jaipur city. Now that JDA has the power of robust, fast and secure hot spot based services in the Pink city, the department has been able to reach out to and interact with both residents and tourists through smart mobile apps. All the major tourist spots like Amer Fort, Hawa Mahal and others have Interactive Kiosks which show the various smart apps and other portals so that tourists can access information and get exploring quickly and efficiently. This has led to happier visitors and a more organized tourism experience. Both in terms of providing information and services, as well as monitoring and crowd control, the initiative has been a great success.

As a result of the installation of Smart Pods for the provision of government services, citizens now have access to customized content and information, and can also be secure in the knowledge that their personal details and privacy are being maintained to a great extent.

The advanced IP cameras that have been installed closely monitor and record various incidents that occur throughout the city. The live feed has been extended to the Jaipur Police control room, helping the administration tackle crimes with a faster response time and improved success rate.

Concluding remarks - Making Jaipur a digital city

All these initiatives by JDA to make Jaipur a smart city have received accolades from residents and are also highly appreciated by the millions of tourists who flock to the city. Tourism, safety and security, and government services and information are all now better, faster and "smarter" in the city of Jaipur.

Cisco's technology solutions, strategic support, and trusted partner ecosystems deliver unmatched digital innovation opportunities for government and city organizations to create new revenue streams, improve access to public services and better community experiences, and create new operating models to drive both efficiency and cost value.

Cisco brings to Jaipur

• Public Wi-Fi
• Incident Management and monitoring use cases
• REGS for application processing, status, submitting proofs for land using the JDA Call center at the back-end
• Environment Sensors for environment
• health monitoring, this data is displayed to citizens real-time and also data
• is being used to increase green belt coverage in areas where the levels are high
• Smart Parking to ease congestion, display information for citizens for available slots
• Smart Lighting on a 2 km stretch with all use cases including real time dimming, increased

illuminance on movement
· Information Kiosks which are interactive which not just provide locational features, city information but also interfaces for mobile charging, train schedule, status of reservation, flight timings/delays etc.
· Traffic Nodes for traffic analytics so that cars traffic, pedestrian traffic congestion information can be used for better planning
· Cisco Project Management Services for Smart City Project Management

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To find out more about Cisco Government and Physical Safety and Security solutions visit: www.cisco.com/web/IN/solutions/ strategy/ government/index.html

Driss Ibenmansour
Managing Director, Bird France

The new usage for e-mobility, actors for smart cities

Based in Santa Monica (California), and founded in 2017 by Travis VanderZanden, Bird is a last-mile electric vehicle sharing company. Bird has now launched its dockless, electric scooter rental business in more than a hundred and twenty cities across Europe, the Middle East, and Northern America. In France, its services are provided in a number of cities, among which Paris, Bordeaux, Lyon, Annecy and Marseille..

Dockless, shared electric scooters did not exist in Paris up until the summer of 2018. Yet, over the course of just one year, demand for these electric vehicles skyrocketed, and the modal share of this new micro-mobility solution has already reached significant levels compared to other transportation options.

According to the Paris municipality, there are approximately 20,000 electric scooters across the city.

Business dynamics are strong, and a recent study by 6T about "Users and uses of electric free-floating scooters in France" showed the very impressive modal share of transportation taken in Paris by electric scooters, between 0.8 and 2.2%, in less than 12 months.[1]

Bird has settled in France as a first step in its international development. We started in Paris with a couple hundreds of scooters at the end of July 2018, and we now have over 4,000 vehicles used daily in Paris. We also operate in several major French cities: Bordeaux, Lyon, Annecy and Marseille, in which we

were recently selected as the first operator of electric scooters as part of a tender bid. On average, more than 500,000 trips are made every month in Paris with Bird's scooters. When looked at over the course of a year, it roughly corresponds to about 15% of Parisians and inhabitants from adjacent municipalities that have already used Bird's services at least once.

Bird's electric scooters are acting towards sustainable mobility

Electric scooters, along with other personal electric mobility devices, meet the needs of new mobility demand and innovative means of transportation.

Today, about 40% of car trips are less than three-kilometers-long.

To this end, shared micro-mobility services as those offered by Bird, offer a serious and sustainable alternative to private cars in dense urban areas, as they complement public transit. Current mobility trends that seek to be more environmentally friendly favor ride-sharing devices and services, multimodality of transportation options, and soft mobility.

These new services are also helping cities achieve

1. 6t-research consultancy, Uses and users of free-floating e-scooters in France. 2019 : 158 p. URL [online] : https://6-t.co/en/etudes/uses-and-users-of-free-floating-e-scooters-in-france/ [accessed on 6/11/19].

their 2030 decarbonation objectives, as underlined in Carbon 4's White Paper on The role of electric scooters and light electric vehicles in reducing urban CO2 emissions. The latter argues that the way we move about is undergoing structural changes, which could allow bicycles and light electric vehicles, such as electric scooters, to account for about 21% of all trips in a city like Paris, contributing to a 68% decrease in all emissions from energy consumption.[2]

The long lifespan and good environmental performance of light electric vehicles are paramount in meeting current sustainable mobility objectives. Throughout several experiments, Bird has developed robust electric scooters with an average lifespan of 18 months. It allows scooters to carry out thousands of trips without any negative impact on the environment or air quality in the city. The environmental quality of shared mobility services must also be measured over the scooter's whole life cycle, including recycling. We have set up a partnership with Landbell, which provides us with optimal waste management and recycling for all parts of our scooters, in accordance with French and European legal requirements.

A public-private partnership which guarantees a coherent operating framework for the development of micro-mobility solutions

For these new modes of transportation to develop and ultimately help create smart, innovative, multimodal, and sustainable cities, collaboration with local public authorities is key. Micro-mobility companies must meet users' needs for safety and responsibility, and cities must commit to providing space for this transition, chiefly by rethinking parking design and traffic management.

For instance, in March 2019, Bird signed a commitment to good behavior dedicated to electric scooter operators in Paris, in order to ensure that the use of electric scooters is controlled, safe, and sustainable. Cities across the worlds increasingly commit to promote new mobility solutions in urban areas. In Paris, this is illustrated by the creation of new bicycle paths, opened to electric scooters, or also by the plan to develop 2,500 additional parking spaces dedicated to free-floating vehicles. Following the pattern of developing cooperative public-private frameworks to

implement free-floating mobility solutions, Bird has chosen to restrict the growth of its fleet to about 4,000 vehicles, in order to improve their social acceptance.

To make our services safer and more accessible to everyone, Bird organized several educational events on safety, and distributed helmets free of charge to its users. In doing so, Bird anticipated the coming into effect of the decree dated 23 October 2019 on new motorized personal transport equipment. This decree aims at fighting anarchical use of personal transportation devices. Beyond Paris, other cities have recognized our commitment to a cleaner city and responsible mobility solutions, which take into account the diversity of public space users. Marseille and Antwerp, for instance, recently selected Bird in tender bids.[3]

When sharing data between mobility actors and public authorities, one has to strictly respect user privacy, otherwise cooperation between public and private actors cannot occur. In order to better understand social and societal patterns at stake, Bird is working extensively on monitoring sharing activities and travel data. Here, data sharing encourages new innovations, fosters inclusiveness, and increases synergies between public transport modes and shared mobility. Cities have become places to experiment with new uses, for the benefit of all citizens. New mobility solutions provide means of transport located closer to users and can make certain neighborhoods or villages more accessible, thus reducing discrimination among users. Finally, technological innovation must improve accessibility for elderly or disabled people who may not be able to travel by bicycle, scooter or other motorized two-wheelers.

New mobility stakeholders must also commit to addressing cities' specific social expectations. For instance, starting August 31, 2019, Bird has committed to no longer work with self-employed entrepreneurs in Paris. We also work with specific local partners such as "Emploi et Développement", in order to facilitate the integration of people who are very far from the labor market (former convicts, long-term unemployed, etc.). Following up on that responsible and socially-dedicated approach, we signed the "call for road safety for our employees" of the Road Safety Delegation of the Ministry of Interior.

2. Aurélien Schuller, Maxime Aboukrat. White paper: The Role of e-scooters and Light Electric Vehicles in Decarbonizing Cities. Paris : Carbone 4, Septembre 2019 : 24 p. URL [PDF] : http://www.carbone4.com/wp-content/uploads/2019/09/Carbone-4-for-Bird-E-Scooter-and-Cities-decarbonization.pdf [accessed on 7/11/19].

3 Decree n ° 2019-1082 of 23 October 2019 relating to the regulation of personal travel motors, JOFR, 25 octobre 2019. URL [online, FR] : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000039272656&categorieLien=id [accessed on 6/11/19].

We are also promoting ourselves as sustainably-oriented on the French and European markets, and intend, as such, to set up a second hub on the continent, in Paris, with nearly 1000 new jobs created in the coming years.

Finally, the law on transportation solutions, still under discussion in Parliament, should answer these various challenges by institutionalizing and updating the legislative framework, thus providing public authorities with the possibility to implement micro-mobility services at a local scale. This framework should make it possible to balance between users' needs for innovative mobility in tomorrow's cities, and the need to regulate shared-mobility services and how public space is shared.

Smart cities must therefore be innovative, inclusive, responsive, connected, and sustainable

1. Cooperate with public authorities in order to integrate new mobility into the urban landscape, particularly with regard to traffic lanes and the parking of shared micro-mobility vehicles

2. Share data, something which Bird did upon arrival in France, through the opening of its data to city governments in order to optimize trips

3. Offer the best possible conditions for sustainable mobility solutions in urban areas, thanks to a social and responsible commitment

4. Develop sustainable services that meet the challenges of reducing CO2 emissions and improving air quality. Smart cities should only promote sustainable services

5. Meet people's habits and lifestyles through innovation, which is at the heart of smart city's definition

Guy Pekle
Global Program Director City as Partner chez Michelin

Smart cities must facilitate the progress of intermodal modes of transportation

The Michelin Group contributes in a sustainable way to advancements pertaining to the mobility of goods and people, in particular through the design and manufacture of tires for all types of vehicles. In 2018, Michelin launched the "City as a Partner" program to support the Group's sustainable development approach by forging partnerships with both cities and citizens in order to create more participation from all stakeholders involved in the mobility of people and goods

The subject of smart cities is of interest to the Michelin Group, and to myself personally: it is one of the major challenges of our time because of the complex nature of problems facing cities, such as pollution, congestion, and safety. This observation is made obvious by cities' need for attractivity and improved efficiency.
The Michelin Group's commitment to a sustainable development approach is showcased every year at the Movin'On Summit, held by Michelin, on sustainable mobility. It is open to any actor sharing this vision "of moving from ambition to action, for mobility for all".
I am in charge of Michelin's contribution for future urban developments and innovations. The program "City as a Partner" was officially launched at the end of 2018. We aim to be as inclusive as possible, involving both public and private actors. The solutions considered must clearly be beneficial to citizens, in terms of quality of life, air, noise, etc. "City as a Partner" is intended to become the partner of cities, citizens, and mobility operators.

Smart cities: no single definition, yet multiple dimensions

There are about as many definitions of smart cities as there are respondents. A smart city is based on several main characteristics: an inclusive and sustainable stance on the future, supported by new technologies, and citizen participation in decision-making processes. It is important not to boil down smart cities to a simple

technological improvement based on high-tech. Building on this, we should also consider low tech or frugal innovation, since they are pragmatic, relatively simple to implement, and can provide an answer to immediate needs.

Michelin deals with mobility of people, goods, and waste. Changing demographics will certainly increase mobility needs, which can be met by both public and private transportation operators. In people's transport there is a strong need for the multimodality of means of transportation. This approach requires seamless solutions for users, supported by digital applications. In terms of the mobility of goods, the last mile delivery will require redesigning the approach to logistics. The latter also entails a radical societal shift, as storage facilities need to be located closer to transportation facilities and residential locations. We are at crossroads in terms of mobility, both of people and goods.
Various stakeholders need to come together around a table in order to discuss the benefits for cities and citizens. The issues that cities are facing today require interdisciplinary approaches: no one can claim to have the solution alone.
When dealing with mobility-related topics, it is essential to have a holistic vision and to know how to anticipate future needs. This requires a global and interdependent approach to such topics, while the sovereignty of municipal governments over strategic decision-making remains indisputable.

Infrastructure will need to be reconceived, especially in terms of development and use. For instance, with car parks or roads: these spaces are currently saturated, but tomorrow they could be freed up by car-limiting regulations aimed at decreasing congestion levels and optimizing service delivery.

A need for a regulatory framework

Large cities are going through experimentation issues today. In Paris, for example, the use of electric scooters has highlighted the need for increased and wide-reaching regulation. Experimentation goes beyond the market of public tenders, and makes it possible to launch something new, despite negative externalities that may not be foreseeable. In Paris, the electric scooters' experiment has shed some light on a dire need for flexible regulatory frameworks, as well as renewed safety requirements or public space management.

Today, cities are becoming a remarkable field for experimentation. A wide range of actors can all contribute to the creation of smart cities, from historical actors to new ones, such as burgeoning startups. Today, radically new models are yet to be built, which makes this moment particularly interesting.

The need for intermodal trips

The mobility issue clearly illustrates how we should plan for experimentation. For example, digital players, such as Whim, offer to facilitate intermodal trips between urban areas, and can even offer a solution that replaces car ownership. A similar thinking was launched around "Mobility as a Service" (MaaS), which is at the heart of tomorrow's urban mobility challenges.

However, data collection and management, in relation to intermodal trips, is now a sensitive issue. First of all, because smart cities need data to allow autonomous vehicles to function or to develop enhanced urban services. But a clear impediment is that no one truly knows how data is used today, which strikes concern on behalf of local authorities. The Quayside project in Toronto, developed by SideWalk Labs, a Google subsidiary, is a good example. Initially, the project was intended to be very open and modern. It was set to be a showcase for the smart cities of tomorrow. But as concerns grew regarding data collection and use, there was a public outcry in Toronto about the need to address these privacy issues. More than ever, data use requires a contract of trust among actors, as well as to develop information and communication means tailored (and dedicated) to individuals, so that they can take part in the development of these new technologies.

Build a relationship of trust and promote an inclusive approach

In the coming years, the evolution of digital technologies is going to be a major source of progress, and we are already seeing many benefits. However, privacy must be guaranteed, as trust cannot be created overnight. There are many examples of major digital players who have omitted users' agreements relative to the use of their personal data. Over time, digital stakeholders must demonstrate their will and their internal capacity to answer all questions and avoid system failures and errors that could lead to cyber-attacks.

My recommendations would be as follows

1. First of all, it is necessary to develop an inclusive approach towards citizens, and between public and private actors. All stakeholders must be able to come together in order to be part of an inclusive approach that takes citizens and their well-being at heart. The societal approach is just as important as the technical one.

2. On the other hand, regulation must be supported, developed, only where it makes sense, i.e. as soon as the safety of people, property, and privacy are affected.

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OTIS

Innovations by Otis for the smart cities of tomorrow

As an elevator manufacturer, Otis seeks to improve and optimize the functioning of the equipment it develops, in particular through the use of travel data, but also through new digital technologies, allowing objects to be connected to each other or to a central office. The solutions developed by Otis are based on an improved model of passenger habits, an increase in their safety, as well as a densification of urban spaces. Otis's solutions make it possible to optimize the use of existing installations and prevent their over-use.

We transport billions of people every day, but we remain attentive to the needs and expectations of each and every passenger. Since we invented the secured elevator over 160 years ago, we continue to be the benchmark in the industry we have created.

We are ready to inspire the next generation

As cities take on new heights and the digital revolution transforms everyday life, our customers are looking for new solutions to keep evolving. As always, we are ready and we have a bold vision for the future and of the cutting-edge technologies necessary to get there.

Reinventing the industry, redefining service excellence

We were among the first elevator specialists to use remote diagnostics and predictive analytics to improve our service. Today's connected and intelligent elevators allow us to harness the power of the IoT (Internet of Things) to offer an even more personalized service. Our digital ecosystem combines the advantages of global presence and local implementation.
We provide the largest team of industry service professionals. With our 31,000 technicians in the field, now supported by our digital ecosystem, we combined the advantages of an international presence and local execution. Our objective is to anticipate your needs.
We are working in partnership with Microsoft in areas

such as data analysis and Customer Relationship Management (CRM) to lay the foundation for our new digital service environment. We are also working with AT&T to create a single gateway to aggregate device data from different mobile networks around the world and connect to our new and improved cloud environment.

Key elements for success

We provide a richer experience as we constantly improve to make each trip more enjoyable. Information is made available to users in real time to anticipate their whereabouts and warn them in the event of an unavailable elevator.

Clear and elegant systems to facilitate traffic flow, advanced predestination systems and on-board technology. We want travel to be a source of inspiration.

Finally, the implementation of predictive maintenance using sensors and IoT prevents failures from occurring because we intervene before they take place.

The solutions put in place for smart cities

1. To inform users and allow them to prepare their elevator trip:

- eOtisline.fr allows you to consult the status of the device and the follow-up of an intervention in direct access. Through this, a person wishing to prepare their journey in the city in advance (public transport, road traffic and vertical travel/lift & escalator & EPMR) may see if the equipment they regularly use is functional (e. g. people with reduced mobility).
- With Otis ONETM, we equip our elevators with sensors and allow our customers to monitor in real time the elevators of a site or a park in a city or, more broadly, in France. The vision and therefore the real-time understanding of the flows of users using certain elevators rather than others also make it possible to anticipate equipment needs, improve on-site information to guide users, and to better understand and reduce elevator failures. Cities will benefit from a smoother flow of passenger movements and a better use of equipment.
- eCallTM allows you to call the elevator at a distance from a free application and facilitates access to the cabin (people in wheelchairs).
- CompassPlusTM predestination – The CompassPlus system manages passenger flows by providing more efficient passenger transport through destination grouping. SmartGrouping, Otis' patented technology, organizes trips by grouping passengers and stops. Passengers travelling to the same destination are assigned to the same cabin. SmartGrouping also affects cabins to serve a group of contiguous floors or an area, resulting in faster, better organized trips.
The CompassPlus system represents a major step forward in terms of flexibility, customization and intuitive design. With its easy integration into building security systems, it can be integrated into any type of building, from hotels to hospitals, from industrial to residential. People use our innovative CompassPlus system on a daily basis in over 250 cities in 50 countries.

2. To improve our customers' experience during their elevator trip:

- eViewTM screens allow a community to share information between the inhabitants of a building through the elevator. Users spend an average of 30 seconds on each trip and can consult news or the latest relevant information on the daily happenings of their building.
- In addition, the connection of the elevators to our OtisLine call center now makes it possible to improve safety in the elevator when a user is blocked thanks to the video on the eView screen, which allows you to see and talk to the OtisLine operator, whereas previously only their voice could be heard.
- Finally, in the event of a minor incident, thanks to Elite Service, our exclusive remote intervention service, a technician from our Call Centre can connect to the cabin, move it safely and release passengers in a few minutes. This further improves the availability of the devices and their proper use.

3.   For clients who manage an elevator fleet in the city:

Campus View provides real-time visibility on all your devices and the Customer Portal allows you to track your contract, view your device information, and communicate with your Otis service team as needed.
We transform data into action in order to improve the elevator's availability and to prevent malfunctions from happening.
Whether there are hundreds or thousands of passengers travelling through a city, every elevator trip sends a message. Otis ONE interprets these messages to assess your elevator performance, prevent breakdowns, and help our customers plan their future investments.

The "service city": putting use at the heart of the city

Founded in 2017, SmartHab is a solutions operator for digitalizing homes and transforming them into "smart" housing. SmartHab supplies real estate clients (developers, building administrators, registered social landlords, etc.) with a comprehensive and integrated system to digitalize their apartments.

As a connected homes and offices operator, SmartHab aims at making the benefits from Smart Home and Smart Office projects available to all. SmartHab advocates for a bottom-up approach to the digital transformation of the city: it is the irrigation of connected objects and digital services in infrastructures, as close as possible to users, that will make it possible to set up innovative public services and improve public goods.

The Internet of Things (IoT) is quickly spreading into offices, housing, and urban facilities. These objects produce a huge amount of data, the strategic and intelligent use of which will fundamentally change the way people produce, consume, and live in cities.

The challenge: using data according to a bottom-up approach

In our opinion, "smart city" is a generic and polysemous concept that describes the new informational state of cities, which gives a central place to city dwellers, organizes the implementation of physical infrastructures, and facilitates the use of renewable energy. This concept has yet to be made more accessible, since it is oftentimes used as part of industrial processes which are too costly and too hard to carry out for municipal administrations.

SmartHab advocates a different approach, based on use and focused on smart systems in residential and office buildings, in order to gradually create an urban grid of data networks.

This innovation logic echoes Metcalfe's law, which states that the utility of a telecommunications network is proportional to the square number of connected users. We believe that the utility of an urban digital public service is proportional to the square number of connected and intelligent real estate spaces located in an area.

With regard to the energy transition challenge, the implementation of Smart Grids at the neighborhood level requires a rapid and massive deployment of smart meters. SmartHab thus integrates into its measures a digital and connected electricity meter whose data, consolidated anonymously, helps the smart grid react to demand peaks. Urban environmental efficiency lies in an integrated approach, from connected housing to eco-neighborhoods and smart buildings.

By encouraging the production of data by the city's buildings, as well as the implementation of applications making it possible to control their equipment, it becomes possible to connect users and their living environment to public services. Daily data feeds public services while municipal information flows efficiently and quickly to inhabitants.

Key elements for success

The city of Rennes' urban transportation network is a good example of the model's effectiveness: based on the analysis of data on the inflow and outflow of university students, the city recommended that the timetable of some courses be shifted to reduce the burden on its public transport network and thus avoid heavy investment.

Other interesting examples concern security, such as the use of smoke detectors alarms to flag out urban issues (earthquakes, pollution, etc.), or the implementation of urban control functions in remote home automation applications, such as in Germany, where some cities have allowed its residents to remotely activate their own street lighting.

SmartHab projects' key insights

The issue of access to data is paramount in allowing for a successful collaboration between various urban stakeholders. The quality of data collection, whether it comes from individuals, businesses or public services, is essential to manage and use citizens' data in a reliable and relevant way. The anonymized collection of data allows for the analysis and optimization of energy efficiency measures, in order to improve comfort of living.

It is therefore by following a collaborative and "co-constructive" logic that companies, public and social actors, administrations, and elected officials must work together on smart city projects. Beyond physical hardware and software, a smart city is built in collaboration with its inhabitants, consolidating data and applications that meet their expectations: security, comfort of living, and energy savings.

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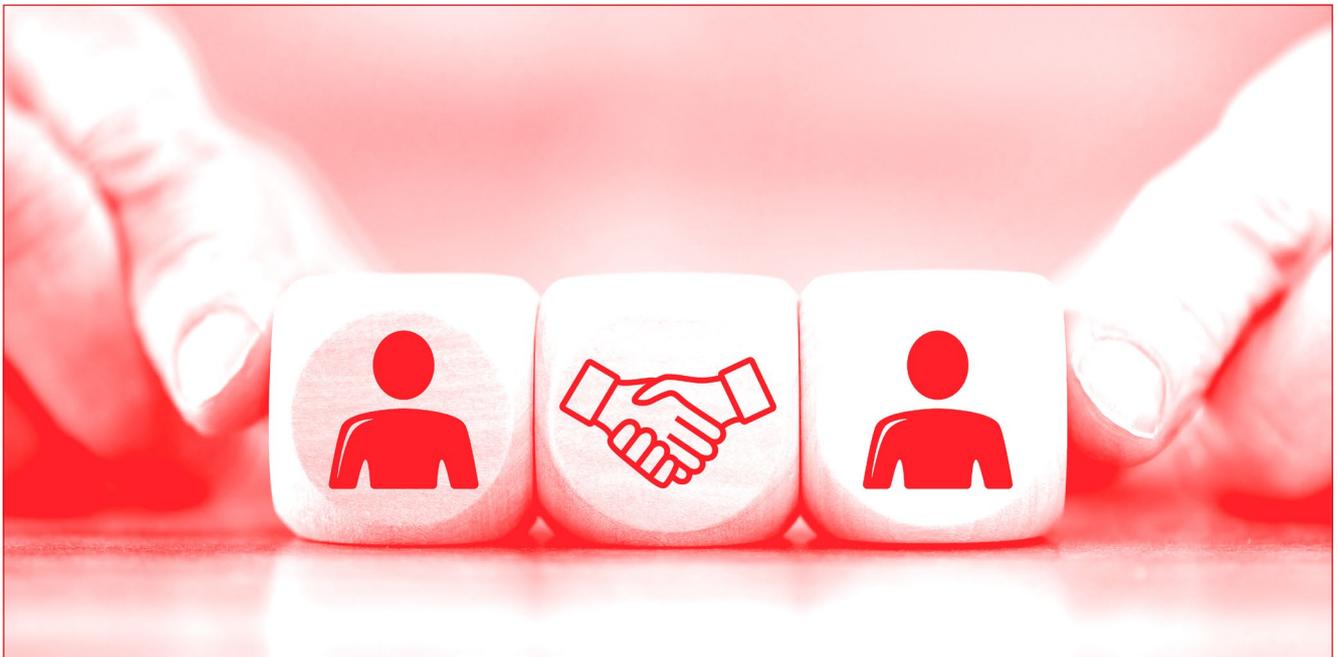
Will mixed-use become the norm in the future?

BNP Paribas Real Estate is a real estate services company operating in thirty-two countries and part of the BNP Paribas financial services group. It brings together the expertise of six business lines covering the entire real estate cycle: Real Estate Development, Transaction, Consulting, Expertise, Property Management and Investment Management. Through the use of digital tools, BNP Paribas Real Estate has developed a methodology for consulting local residents and users in the context of real estate development projects.

Cities are constantly rethinking their organization and are constantly deploying new models of urbanity. By promoting mixed-use patterns of development, smart cities are thus acquiring new virtuous building complexes that give greater importance to sustainable development issues and a complete use of spaces. We note that the success of smart cities is fully visible in metropolitan areas that are user-focused, mostly through urban and collective intelligence, social inclusion, resilience, and technological innovation. This objective drives our projects and must be taken into account when developing and implementing major urban compounds for the cities of tomorrow.

Main challenges and the chosen solution: Trust and rely on those who give substance to the project

This is exactly what BNP Paribas Real Estate and Hardel + Le Bihan Architects did when designing and conceiving the 17&Co project, one of the winners of the Inventons la Métropole du Grand Paris tender competition. The project promoted collaboration and participation throughout the design phase by bringing together the most innovative actors of the 'Makers' community along with the district's inhabitants. The goal was to make the district a living space, day and night, which truly met the expectations of local residents and innovators.17&Co aims to restore the functional and urban character of La Porte de Saint-

Ouen (Department no. 93). Over a total surface area of nearly 18,000 m², this program features offices, a mobility center, shops (such as flea markets), food shops, fab-labs, a hotel, a co-living area, an open karaoke room with modular spaces that can be used as meeting rooms during the day as they are connected to the adjacent office building. Located within the Arc de l'Innovation, where exchange and sharing serve co-living and co-construction, the 17&Co project has sought to combine traditional craftsmanship, food shops, creative trades, social and solidarity economy, cultural enterprises, etc.[1]

Key elements for success: How to build a successful mixed-use smart city?

The use of collective thinking, the involvement of various economic actors, and the interconnection of services are all critical elements of success in order to create real estate programs that take part in asustainable and responsible approach.

- Choosing collaboration

Thus, during the first phase of the competition, along with our partner Potloc, and as part of the 17&Co real estate program, we conducted a survey among the inhabitants and workers of La Porte de Saint-Ouen, and among all Parisian makers and DIYers to invite

[4] The Arc de l'Innovation is an economic development initiative launched in 2015 by the City of Paris and the inter-municipal structures Est Ensemble, Plaine Commune and Grand-Orly Seine Bièvre to meet the challenges of urban transformation of working-class neighborhoods on the other side of the ring road.

them to give their feedback on the project. It was a risky bet as it involved publicly unveiling the concept before the tender competition was over. However, it further underlined our views. Another digital partner with whom we worked throughout the citizen consultation phase was Fluicity, who helped with the collection of ideas. Their participation supported the outlining of the program at conception stage. Such SMEs, who benefit from being close to people and have increased flexibility as well as an extensive knowledge of how to run digital platforms, seem well-equipped to face the challenge of active participation during the citizen consultation phase. Out of 1003 respondents, more than 80% wanted to be informed about the coming events and the project's progress. Support from SMEs for citizen participation is also a plus when facing the challenges of dense cities such as Paris: solving, for instance, the paradox of the simultaneous need for more housing and more green spaces. As Nike argues in their contribution, digital tools, when combined with field action, can encourage residents to discover the vicinities, whether it be sports facilities or green spaces. BNP Paribas Real Estate is therefore deeply convinced that smart cities can optimize the city experience and offer simultaneously more nature and more housing. This project can be undertaken by getting local residents interested in the development of their green spaces, by revealing local biodiversity, or by stimulating the discovery of the 17&Co refuge garden and greenhouse.

In order to offer innovative business concepts that convey meaning, social cohesion, and local employment, 17&Co has been using the concept "From PITO [Products In, Trash Out] to DIDO [Data In, Data Out]". The latter had already been tested in other cities such as Barcelona, and it promotes the exchange of information rather than the transport of goods, with a clear impact on a local economy's carbon emissions. The data thereby collected is made available to all as a way to create added value. It is paramount to address data governance in a collaborative way in order to help this type of project succeed. While data provision can be handled through regulation, we are more inclined to think and propose a framework to involve the data provider in the added value generated.

·   <u>The challenge of interconnecting services</u>

The challenge of interconnecting services within a single smartphone application raises the issue of the interoperability of services offered by different operators. Just like the "From PITO to DIDO" concept, interconnecting services will benefit from data sharing in a transparent and economically fair way. But for the user experience to be complete, this interoperability must be so that it is able to associate different services with 17&Co according to the users' desires and uses, from going out of the office to the karaoke, from booking a spot at the laundromat to attending a conference. The co-living operator Melt will therefore take up the role of animating the project in a bottom-up manner, "from the street to the roof", and will ensure the district's inclusiveness at all times thanks to interconnected services.

The sharing of data across different services must be done with respect to the right to disconnect. The General Data Protection Regulation (GDPR) offers a good framework to be sure to use neighborhood digital services with trust

Key insights from this experience: Best practices towards a smart city

·   Citizen consultation can be supported by Civic Tech startups, whose small size and mastery of digital tools are better suited to field campaigns and can serve as a powerful integrator to succeed in the dual challenge of developing both more housing and green spaces.

·   The mixed-use and intelligent city will benefit from positive externalities if data sharing among economic actors is promoted. Data sharing will be better accepted if all economic actors are involved in the added value thereby generated.

·   User-oriented smart cities entail a full interoperability of services for the benefit of the user. In order to achieve that, such projects must require and implement adequate data protection tools, in order to ensure trust by users. It is the user who must control the interoperability of their data. Integrating citizens, data producers, and economic actors through a fair and transparent sharing mechanism for data and the added value of data, is undoubtedly the key factor for the success of a smart city.

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Building on human capabilities using data and public-private partnerships

Nike is a sports equipment manufacturer with its global headquarters in Oregon, USA. In urban areas, Nike seeks to encourage the practice of sports and the construction of dedicated infrastructure, in particular by promoting the use of data generated in the public space.

Today's kids are part of the least active generation in history. This is particularly true in large Cities. In Greater Paris, only 14% of kids between 8 and 14 get the 60 minutes of daily physical activity recommended by the World Health Organization (WHO), and the problem is even worse with Girls who are twice less active than Boys. Physical inactivity is one of the top four risk factors of death in the world today according to the WHO, linked to cancer, diabetes, mental illness and Heart disease.

Main challenge encountered

When Kids are active, they do better in every way. Not only are they healthier, they have improved attitudes and behaviors at school, learn better and faster and are generally more confident and sociable. This is an opportunity Smart Cities need to urgently address.

Nike believes in the power of sport to unleash potential and move the world forward. The company does this through a portfolio of programs and investments called 'Made to Play'.

Nike's solutions

In Paris, Nike has recently completed a pilot project in conjunction with DataCity, a program designed by the start-up incubator NUMA, and in collaboration with the City of Paris and Paris Habitat. Together with the incubator and government institution, the Company put out a call for action to the startup community here in Paris. The challenge was simple: to encourage the 10-year old girl in Paris to move, on her terms, and to use a digitally forward approach to fit seamlessly into her life and the lives of future 10-year old girls as the world gets increasingly smart and digital.

The aim was to map out the friction points for her in Paris and learn about her relationship to health & fitness. Nike would then tailor a solution to her needs and way of communicating, building an innovative solution that was not just for her, but by her. Through this project, the idea was to identify key factors encouraging children to be more active in their daily life and identify the most natural ways for kids to be involved, especially when technology was in the picture.

The Pilot ran over a period of 6 weeks in collaboration with the Sports associations of the 19th District of Paris, in the Curial-Michelet Neighborhood. The Physical activity of 150 Girls, aged 9-13, was tracked over this period through a digital bracelet, coupled to an application developed by the Start up WePulse. The Curial Gymnasium was chosen as a key Physical Hub to follow up on the experience and engage with this "Girls Crew". Various challenges and rewards communicated through the application led to an increase of 26% of the daily activity of the Girls. Even more importantly, while 35% of the girls declared

themselves as non-active before the experiment, 92% of them declared they feel like doing more sport moving forward after the 6 weeks pilot.

Nike will continue to measure the impact of the study after the trial to assess for scalability and how other areas of Paris can benefit, and eventually other cities in general.

Barriers faced

On the way, the team in charge faced many barriers and obstacles. On the civic side, they found that despite involvement & introductions from the city hall, the school systems and local "mairies" were not necessarily aligned to take on a project like this and could not easily reach their constituents to ask for participation and involvement. Each one operates fairly independently from the other, making it a long process to try to reach the citizens of even a small community. Second, as the team focused on the 19th arr., they discovered an already rich fabric of options for kids to play, be active, and do sport through community organizations and activities, but these organizations faced challenges recruiting and making their services known in the neighborhood. On the technology side, there were many hurdles to overcome including data privacy (GDPR), information safeguards for minors, kids without cell phones or e-mail addresses, complex log-in processes, and more.

Concluding remarks and Nike's recommendations

Following this Pilot, the recommendations are three-fold.

1.   First, this project would have benefitted greatly from further local government involvement to reach their populations. Without a solid network or means of talking to communities of citizens, it becomes extremely laborious to find participants and scale the project to be extremely impactful in an area. Projects like this need to be championed by schools, local community leaders, and local organizations in order to build trust and frankly, to advertise that the solution exists.

2.   Second, in this target population of kids and parents, we are hampered by a lack of

best practices in how data privacy & sharing, parental consent, and technology come together. Continuing to test and learn in this area will be critical as the younger population gets more and more digital in the future.

3.   Finally, we saw great benefit from 3 different types of partners, an established Brand, an agile Start up and the Public sector coming together to bring their expertise to this project. In considering how to activate smart cities going forward, we see the tremendous and critical value in public, private, and tech close partnership to solve citizen challenges, making living in the city a happier and healthier place.

The working group's conclusions underline the central roles that public actors should play in the development of sustainable and inclusive cities. The analysis of corporate contributions and interviews with public decision-makers, private entrepreneurs, architects, and investors demonstrates the lack of involvement of public authorities in issues related to data collection and use, urban resilience, and citizen participation.

Three elements stand out from this reflection:
· Existing infrastructure should be optimized and utilized as much as possible, in order to reduce costs and maximize the operations of existing equipment.
· The latest technological developments have generated public concerns that the current discourse on digital cities should take in consideration.As such, the 'human' aspect should be at the core of any smart city project.
· There should be a reconceptualization of how public space is conceived and shared among its users, and how operators, whether public or private, utilize it. Ultimately, it boils down to asking the following questions: for whom are public spaces intended, according to what rules are they governed, and who defines these rules?

Recommendations building real « smart » cities is a collective endeavor

From businesses, civil society and public sector stakeholders

Make the most of what already exists

I. Develop a new perspective on cities and infrastructure

Beyond budgetary and environmental constraints, this is about making the most of existing infrastructure, which is key to developing the "smart" aspect of cities. For example, this could include installing technological solutions on preexisting urban furniture such as benches or streetlights or any other public space amenity with the aim to innovate, rationalize operating expenses, and promote energy efficiency.

In France, the European Cycle route network is often built on railways that had previously been abandoned after the rapid growth of automobile transportation throughout the second half of the 20th century. They provide a route for new bike paths, needing minimal material and time to build.

Similarly, Paris' Petite Ceinture railroad track has been classified as an "Area of major urban services" according to the current version of the Local Urban Plan.Its assignment to this category underlines the importance given to this area, which represents a significant infrastructure stock for the Parisian metropolitan area.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· Nicolas Ferrand, Executive Director of SOLIDEO (Société de Livraison des Ouvrages Olympiques) "Towards green Olympics, make use of what already exists";

· Oracle: "Transparent data sharing towards building a relationship of trust";

· Vincent Gollain, Director of the Economics Department of the Paris Region Institute: "Cities are first and foremost a societal project".

II. Make use of data generated in public spaces

All activities taking place within public spaces generate a significant amount of data – traffic, activity, consumer habits, etc. – that can be recorded by installing sensors. Such data 'mines' should be better exploited in order to optimize services and improve decision-making models.

In 2012, the Greater Besançon metropolitan authority decided to extend to its entire territory an incentive fee system for household waste. The metropolitan authority installed 49,600 waste bins, connected by means of identification chips, to accurately measure the amount of household waste produced by each household. The data generated during collection and weighing of the bins allows for direct invoicing of users according to their consumption, and lead to a 34% reduction in household waste over ten years.[1]

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· Cisco: "Cisco helps turn Jaipur into a smart and safer city";

· Fahrenheit 212: "Is the "smart city" continuously reinventing itself?";

· Honeywell: "Sustainable Energy Systems for smart cities – The case of the Navy Yard of Philadelphia";

· Nicolas Ferrand, Executive Director of SOLIDEO (Société de Livraison des Ouvrages Olympiques): "Towards green Olympics, make use of what already exists";

· Oracle: "Transparent data sharing towards building a relationship of trust";

· Otis: "Innovations by Otis for the smart cities of tomorrow".

1. Olivier Devillers. « Les poubelles connectées du Grand Besançon facilitent la réduction des déchets » Banque des Territoires. 20 November, 2018. URL [Online] : https://www.banquedesterritoires.fr/les-poubelles-connectees-du-grand-besancon-facilitent-la-reduction-des-dechets-25 [Accessed 4/11/19]

III. Change the way public space is shared, taking into account new forms of mobility

Both public and private operators have to adapt to new mobility needs. This is particularly relevant on an individual scale, with scooters, bicycles, and other self-service vehicles. What matters is also the development of new mobility experiences in collaboration with all users – citizens, tourists, other occasional users –, and stakeholders – digital platforms as well as operators whose physical infrastructure is being used. Furthermore, ageing demographics will also lead to redefining mobility requirements.

Mobility as a service (Maas) provides an interesting example of a new way to share public spaces. It consists of a mobility experience, mainly urban or interurban, that emphasizes one's thinking in terms of journey and user experience, rather than in terms of the mode of transport used. Solutions thereby developed make it possible to plan a journey throughout each stage, from start to finish. Today, tech giants mostly dominate the conception of Maas solutions because of the digital infrastructure that is used (mainly smartphones, by providing access to these platforms), as well as their positioning as intermediaries at the very beginning of the customer experience. Nevertheless, transportation operators and experienced infrastructure managers, such as Transdev or RATP in France, remain the main institutional investors, for they have the financial capacity and the expertise to carry out complex infrastructure projects. They must keep a pivotal role in the transformation of different modes of transportation and ensure that the latter does not lead to a privatization of public spaces

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· Guy Pekle, Global Program Director City as Partner at Michelin: "Smart cities must facilitate the progress of intermodal means of transportation";

· Ipsos: "Should a smart city get rid of personal vehicles?";

· Otis: "Innovations by Otis for the smart cities of tomorrow".

Recommendations building real « smart » cities is a collective endeavor

From businesses, civil society and public sector stakeholders

Replacer l'humain au cœur du projet

The digital city narrative has to go beyond technological implementation, towards putting citizens and their needs at the heart of smart city projects.

IV. Base any project on the inhabitants' expressed needs

In order to adopt a transparent and inclusive approach regarding data collection and use, smart cities must facilitate the expression of citizens' needs and expectations. This requires, in particular, outlining and adopting a discourse that is focused on the benefits and uses of citizens.

The City of Paris has successfully set up the Paris Participatory Budget, aimed at submitting citizens' initiatives to local vote, the winner is then financed by public funds. This makes it possible to highlight projects that are truly supported by citizens.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· BNP Paribas Real Estate: "Will mixed-use become the norm in the future?";

· Nicolas Ferrand, Executive Director of SOLIDEO (Société de Livraison des Ouvrages Olympiques): "Towards green Olympics, make use of what already exists";

· Oracle: "Transparent data sharing towards building a relationship of trust";

· SmartHab: "The 'service city': putting use at the heart of the city".

V. Promote citizen participation

Citizen participation is the cornerstone of any smart city project, as it paves the way to establishing a project's legitimacy. While digital tools make it possible to define an intervention framework, they are by no means a solution per se, but they can support the definition and implementation of agreed-upon solutions.

Citizens' participation in approving or amending major development projects is necessary. One example is the expansion of the Heathrow Airport in the Greater London area, for which a metropolitan consultation was held between June 18, 2019 and September 13, 2019.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

• Antoine Courmont, Doctor of Political Science, Associated Researcher at the Center for European Studies and Comparative Politics, Scientific director of the Cities and Digital Technology Chair at Sciences Po "Sociologizing Technology";

• BNP Paribas Real Estate: "Will mixed-use become the norm in the future?";

• Fahrenheit 212: "Is the "smart city" continuously reinventing itself?";

• Gérard Wolf President of the MEDEF International Sustainable City Task Force and President of BRICS Access: "Thinking smart cities globally, governing them locally";

• Hervé Boisguillaume, Project Director "Sustainable Cities", Directory of European and international affairs, Ministry for the Ecological and Inclusive Transition, Ministry for Territorial cohesion and Relations with local authorities: "The smart city is a sustainable city";

• Rémi Babinet, Founder and President of BETC: "A story for the city of the future";

• SmartHab: "The 'service city': putting use at the heart of the city".

Recommendations building real « smart » cities is a collective endeavor

From businesses, civil society and public sector stakeholders

Optimize urban governance

VI. Make collaboration between stakeholders simpler

A healthy and transparent collaborative framework makes it easier for citizens and/or users to get a hold of digital tools. It makes collective progress towards common objectives possible, while better integrating proposed solutions into everyone's daily lives. These collaborations aim not only at maximizing information sharing, learning, and experimentation based on each other's experiences, but also at thinking about all urban issues from a transversal perspective.
This requires close collaboration between local authorities, such as Intercommunal Cooperation Institutions (EPCIs, or Etablissements Publics de Coopération Intercommunale), metropolitan areas, and departments.

The case study Nike provided illustrates how collaboration between a local authority, a large company, and a start-up, allows better contact with inhabitants, as well as a more flexible development framework, and secured financing scheme.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· Antoine Courmont, Doctor of Political Science, Associated Researcher at the Center for European Studies and Comparative Politics, Scientific director of the Cities and Digital Technology Chair at Sciences Po "Sociologizing Technology";

· Cisco: "Cisco helps turn Jaipur into a smart and safer city";

· Dow: "Smart Chemistry, Smart Cities";

· Fahrenheit 212: "Is the "smart city" continuously reinventing itself?";

· Gérard Wolf President of the MEDEF International Sustainable City Task Force and President of BRICS Access: "Thinking smart cities globally, governing them locally";

· Guy Pekle, Global Program Director City as Partner at Michelin: "Smart cities must facilitate the progress of intermodal means of transportation";

· Ipsos: "Should a smart city get rid of personal vehicles?";

· Nike: "Building on human capabilities using data and public-private partnerships";

· SmartHab: "The 'service city': putting use at the heart of the city". «La ville «servicielle» : l'usage au cœur de la ville».

VII. Monitor the development of digital tools and supervise the development of solutions for urban issues

Local authorities must no longer simply react to problems by recruiting the private sector but should rather outline each solutions' modalities. They must retain the right to define and frame solutions, particularly digital solutions, that are supposed to affect the lives of their citizens or impact their long-term development strategy. Everyone must be able to find their place again: the public sector as organizer and facilitator; the private sector as solution provider.

As Nicolas Ferrand, Executive Director of SOLIDEO, mentioned, data should not be left at the disposal of private actors, free of charge. Since they have been compiled and formatted at a cost, they are public assets. As part of an open data and open city strategy, access to data, even personal data, should be made profitable.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of

· Driss Ibenmansour, Managing Director for Bird France: "The new usage for e-mobility, actors for smart cities";

· Fahrenheit 212: "Is the "smart city" continuously reinventing itself?";

· François Panouillé, Smart cities policy officer at the Caisse des Dépôts et Consignations: "Avoiding the privatization of cities";

· Roland Castro, architect and urban planner: " "Smart cities" sounds innovating… it fits perfectly in a politician's speech for municipal elections."– Roland Castro.

VIII. Raise awareness among public operators about issues related to sustainability, connection, transparency, and inclusiveness

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· Dow: "Smart Chemistry, Smart Cities";

· François Panouillé, Smart cities policy officer at the Caisse des Dépôts et Consignations: "Avoiding the privatization of cities";

· Gérard Wolf President of the MEDEF International Sustainable City Task Force and President of BRICS Access: "Thinking smart cities globally, governing them locally";

Elected officials and public contract holders must be trained on the issues that shape cities today, and which oftentimes require "smart" answers: economic, environmental and social resilience, transparency in the use of data, and the need for participation in consultations.
More specifically, this challenge is made obvious within local governments' departments, which have not always taken the measure of digital development. It must be tackled through raising awareness among elected officials. These training challenges must be particularly addressed in small localities, which do not always have the necessary human capital.

As shown by Horizons Publics in April 2019, of the 600,000 elected officials in France, only 5,000 are trained every year, namely on digital technology and its consequences on community management, despite the fact that since 2015 an individual right to training has been made available. Dow therefore recommends focusing on training aspects that are most needed to implement certain innovations or solutions.

IX. Create a regulatory framework that is geared towards experimentation

Experts and operational actors have highlighted the importance of developing a legislative and regulatory framework that is conducive to experimentation and that fosters private initiative. In fact, the current regulatory framework in France is perceived either as hindering the development of innovative solutions or, conversely, as not regulating it enough, such as for the development of self-service electric scooters. The adaptation of regulations must not follow technological innovations, but should instead foresee them, for example through calls for bids, or specific regulatory frameworks that apply to innovative solutions.

The Industrial Demonstrators for Sustainable Cities (DIVD) is an innovative call for bids aimed at supporting urban projects within the framework of the ecological transition. It was initiated in October 2015 by the French Ministry of Ecology and Housing. This invitation to tender makes it possible to gather both public and private actors around themes that are related to the future of French cities.
More specifically, 3M insists on the necessity to develop a French Experimentation Agency, working with all stakeholders, both public and private, in order to coordinate experiments at the local and national levels, thus leveraging common benefits and accelerating their replication.

For further information and practical suggestions in line with this recommendation, please refer to the interviews and contributions of:

· 3M: "Smart cities – A multi-actor business";

· Driss Ibenmansour, Managing Director for Bird France: "The new usage for e-mobility, actors for smart cities";

· Dow: "Smart Chemistry, Smart Cities";

· Vincent Gollain, Director of the Economics Department of the Paris Region Institute: "Cities are first and foremost a societal project".

Acknowledgements

Experts interrogés

- **Rémi Babinet**, Founder and President, BETC
- **Hervé Boisguillaume**, Project Director "Sustainable Cities", Directory of European and international affairs, Ministry for the Ecological and Inclusive Transition, Ministry for Territorial cohesion and Relations with local authorities
- **Roland Castro**, Architect – Urban planner, Castro Denissof Associés
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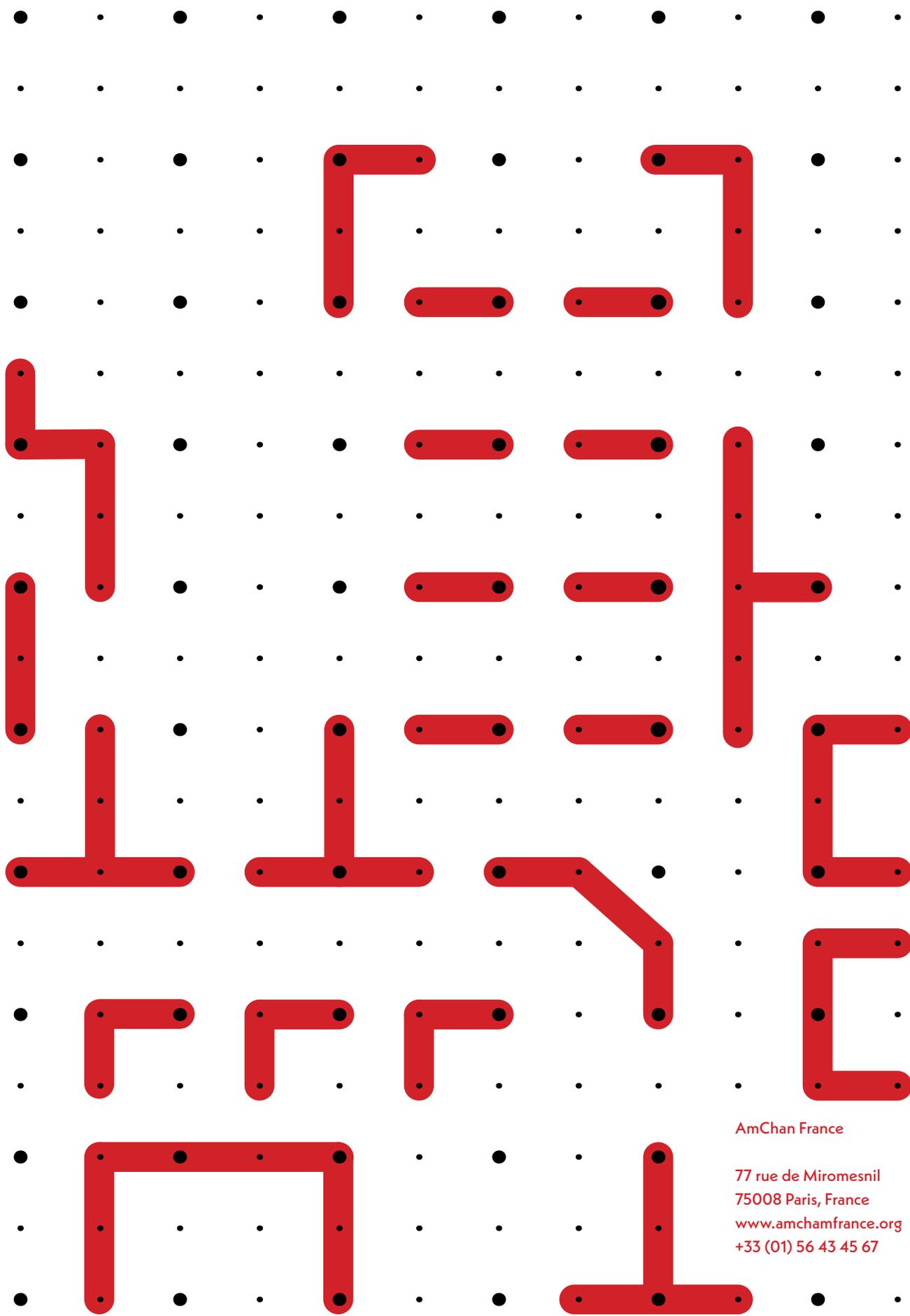
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