LEARNING CITIES

A STUDENT JOURNEY, NAVIGATING THE SMART CITY

ACROSS THE BLOCKS

A JOURNEY INTO SMART CITIES

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Co-written by
Benoît Gufflet and Dimitri Kremp

English translation of the French edition

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PREFACE TO THE FRENCH EDITION

At last, a report that is optimistic regarding the new generation of entrepreneurs and decision-makers.

First, because the two authors took the trouble to go into the field. Alexis de Tocqueville deplored the "frightening spectacle" of French intellectuals, locked in abstract speculations: "same narrow focus on general theories, exhaustive legislative constructs and exact symmetry in laws; same contempt for the existing facts; same devotion to theory." Here the approach is quite the opposite: empirical, modest, precise. Also, brave when one gives thought to the nightmare of traveling around the world amidst a pandemic.

Field experience has enabled our authors to quickly dismiss the agreed discourse on *Smart City* to deliver a much more nuanced analysis. We see that *digital natives* no longer have the blissful gaze of Generation Y on technology, without falling into systematic "surveillance capitalism" outrage. Now is the time for informed criticism, both technologically (no *city* is really "très" *smart* today...) and politically. The report of citizens holding their ground in the face of the deployment of digital tracking tools is rather reassuring. The proposals for improvement, made to favor acceptability, deserve to be considered.

So welcome to *Learning Cities,* which will have to reinstate spontaneous order and individual liberties seamlessly with the unstoppable race of technological progress...

Gaspard Koenig

FOREWORD

Trough their work, Benoît Gufflet and Dimitri Kremp have given us a spectrum of cities across the world. What stands out is this mix of the familiar and the strange. Each of the major cities they examine contains its very own mix, and it succeeds in pushing us deeper and deeper into the innards of the urban condition as it has exploded across the world. It is mostly cities rather than governments, which are the queens of this domain in our current period.

In the midst of such complex and incomplete systems, the newfound role of digital technologies challenges the capacity of cities to reinvent themselves. The so called *Smart City* tends to forget how to engage its citizens without reinforcing inequalities. The necessity to reconcile technology and citizens has now become a prerequisite for future urban transformations.

Despite (or thanks to) the pandemic, Benoît and Dimitri were able to grasp these observations. Building upon them, they show that after all, rather than *smart,* cities are a learning process. Cities are still living laboratories for the future of our society, like they have always been.

Saskia Sassen, *Columbia University,* New York City

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BEN & DIM: A "SMART" DUO

Benoît Gufflet and Dimitri Kremp are two young double Master's degree graduates from French universities Sciences Po Paris (Political Sciences) and HEC Business School. In early 2020, to finish their studies on a high note, they embarked on the *Across The Blocks* adventure: **a year-long quest in search of the *Smart City*.** One world tour and two pandemic waves later, they relate their discoveries through this immersive and interactive narrative. Scan the QR codes (to read articles written during the trip, in French – *Google Translate* will be your friend) as you read, you will travel alongside them!

And if you have any questions... don't hesitate to contact them!

Dimitri Kremp

Benoît Gufflet

Check out the *Across The Blocks* website

Follow us on Instagram *Across The Blocks*!

UH... ACROSS THE WHAT?!

Every year, dozens of rankings are published to honor *Smart City* strategies. This concept developed at the end of the 2000s by the two giants Cisco and IBM has become a viable market that is no longer limited to tech players alone. For cities, the *smart* label is a means of to enhance their attractiveness. For companies it is a marketing tool to sell their new solutions to the public sector. As a result there has been an escalation of technical words and ideas: *Big Data, Inclusion through data, Machine Learning, Artificial Intelligence, Civic Tech...* An overload leading to a more than often fantasized vision of the *city of the future*.

As we approached the end of our studies at Sciences Po and HEC, we wanted to experience this vision for ourselves. For nearly a year, from January to December 2020 and in the midst of a pandemic, we explored and studied seven of these *cities of the future* considered to be at the cutting edge of innovation and urban technologies: Rio de Janeiro, Medellín, Toronto, Singapore, Stockholm, Tallinn, and Helsinki.

How do *Smart City* technologies actually play out in the field? Do they have a real impact on urban management? Are they really transforming cities and their residents' lifestyles? Have they already given birth to digital, optimized, augmented and... *smart* cities? When we embarked on this field study trip, our idea was simple: **to confront the abstract concept of *Smart City* with the reality of different, changing, moving cities. And, in the process, to answer one question: can we find today, somewhere in the world, true *Smart Cities?***

That's why we got up and left. It was the start of the *Across The Blocks* adventure.

THE SMART CITY

Our starting point was to identify a precise definition of the notion of *Smart City* itself. It is a concept particularly difficult to define because it has evolved over time. Born in the late 2000s, the notion of *Smart City* first referred to a set of digital solutions developed by large technology companies for cities. For the Ciscos and IBMs of the world, in search of new markets after the 2008 crisis, the city entity was viewed as a single IT system to be optimized. However, over time, faced with the complexity of an urban world that they did not master, these companies moved away from the concept[1]. They eventually gave way and let the more traditional urban players step in, the energy companies, manufacturers, transportation, and logistics operators... Today, IBM no longer has a *Smart City* offer, but Toyota or Veolia do! Finally, the cities themselves have embraced the concept in their strategies and their marketing, often giving it a larger dimension than the simple optimization of urban services[2].

This historical evolution of the concept and of the actors who give it voice has been underpinned by debates, which often bear criticism. Many experts, professionals, and elected officials would like the *Smart City* to be viewed in a broader and less techno-centric way. Worth mentioning for example, the white paper "Human Cities - to put an end to '*smart cities*'"[3], published in 2019 by AmCham France, Ipsos and Cisco: "The expansion of *smart cities* must move away from being predominately technocentric (...) It is necessary to collectively rethink the concept of *Smart City* and the stakes at play in favor of a broader and more inclusive vision." On the day of its publication in Paris, we actually witnessed a heated semantic discussion around using the term *Smart City* as is or reverting to the French translation "*Ville Intelligente*". As if talking about an "*intelligent city*" was a way to go beyond technology and designate the collaborative approach that cities must adopt. We chose hereafter to detach from trivial debate and prefer to retain the well-known *Smart City* designation.

We define this *Smart City* as the widespread use of digital data to optimize city-management and to improve the lives of urbanites. A definition that comes very close to that of researcher Antoine Courmont[4], Scientific Director of the Sciences Po's "Cities and Digital Technology" Chair. Tech-oriented, it remains faithful to the origin of the concept: to be *smart,* an urban project must first and foremost involve data exchange. But the scope remains broad. Whether it is about optimizing city-management or improving the lives of city residents, the use of data is only a means, not an end in itself. Thanks to *smart* tools and solutions, the city can become more productive, more efficient, greener, more inclusive, more resilient... The political agenda sets the targets and the technologies using data try to provide the solutions to reach them.

Moving on from this general definition, we recognize two structural constituents of *Smart City*. One is inaccessible and invisible to city dwellers; the other is perfectly visible to them.

The first component of the *Smart City* is the use of data to optimize urban services. It is the *Smart City* of *data scientists*, sensors, and control rooms. The one that works behind-the-scenes, far from the eyes of its inhabitants. The second component of the *Smart City* involves its residents directly. It relates to the use of data to offer new services to residents and to make them actors, engaged in their city's transformation. It is the *Smart City* of web portals and mobile apps and that of citizen co-creation platforms. That also of anti-*Google* protests, electric scooters, and *Airbnb*. The *Smart City* that gets the headlines. The concept therefore has two sides to it and serves two purposes: making urban processes more efficient and improving the lives of its residents by making new tools available to them. This distinction seems fundamental to us, and we will follow it throughout the two parts of this report.

But let's get this all tidied up first. On the one hand, the invisible *Smart City* is fundamental to any city aiming to become more efficient by optimizing its services (transportation, waste management, energy distribution, etc.). Pointedly, this involves two categories of complementary "digital objects". First, the *Internet of Things*[5], devices ranging from simple sensors to *smart* streetlights, allowing the collection of urban data. Second, the *monitoring platforms*, allowing public officials to view and analyze these data. To simplify, we distinguish the data collection points from the control room where they are processed. It is the combination of the two that enables the city to make informed decisions through data.

On the other hand, the visible and tangible *Smart City* relies more on its residents, seeking to change their behaviors and practices. Again, this goes through two different types of "digital objects". First, the *digital services* that aim to simplify the lives of city dwellers by making it easier for them to complete a process (paying a housing tax) or an action (moving around). They can be developed by the municipality (*mobile parking solutions*, municipal information apps), by private companies (*Uber or Airbnb* services), or even by the state in certain cases (registration for a transportation offer, search for accommodation). Second, the *citizen participation platforms* allow cities to engage in dialogue with their inhabitants and involve them in urban life (*civic tech* tools, *crowdsourcing* platforms). While city dwellers can be seen as consumers of digital services, they become contributors when it comes to using *citizen participation platforms*.

Because they involve data exchange, all these "digital objects" belong to the scope of *Smart City*. These are the tools we have been hunting down, testing and evaluating in the field for almost a year. Our goal: confront our definition of *Smart City* to the reality of today's "real world" cities.

1. Researcher Antoine Courmont, Scientific Director of the Sciences Po "Cities and Digital Technology" Chair explains this in his article: *Où est passée la smart city ? Firmes de l'économie numérique et gouvernement urbain*. (For the Link to the document cf. Bibliography).

2. American *Smart Cities* specialist and inventor of the famous *Smart City* Wheel, Boyd Cohen, summed up this dynamic in 2014: "For many years, the push to create smarter cities was led by technology companies looking for uses (and buyers) for their products. But in recent years, cities have begun to think more holistically about what being a smart city could mean, and have innovated new ways to modernize how a city serves its citizens."

3. *Human Cities - To put an end to "smart" cities.* (2019, November) AmCham France. (For link to the document cf. Bibliography).

4. By quoting the work of American researcher Anthony Townsend, Antoine Courmont defines *Smart City* as: "the widespread use of digital data to rationalize urban planning and management."

5. The IoT (*Internet of Things*) refers to the connected objects popping up in our daily lives and in our cities, from watches to connected waste bins.

OUR METHODOLOGY

EN ROUTE

Before embarking on the trip, the question of the itinerary created hesitation. How does one choose the right number of stops? Which regions to favor? Which destinations and samples to select to get a broad view of the digital presence in the city without obtaining a distorted perspective? In practice, COVID influenced our selection... Nevertheless, we were able to stay true to the route we had established long ago (in two phases – pre and post-pandemic – of course, but still!).

How did we finally decide? To settle on our destinations, we had two priorities:

- **To study different cities:** Political system, level of economic development, degree of socio-spatial inequalities, territorial governance model, culture of inhabitants... To get a good look at the multiple variations of the *Smart City* in distinct environments, we opted for cities located in disparate geographic areas.
- **To target pioneering cities in their use of digital technology:** For our decision-making process, we relied on several international rankings[6] to assess each city's level of maturity on *Smart City* issues.

Starting with a list of 160 different cities, combining these rankings allowed us to then pre-select 30 to analyze in detail. Thanks to many hours of research and survey (and some sleepless nights), we then managed to decide between those, and to settle on an itinerary with nine cities. From January to June 2020, we were to explore Rio de Janeiro, Medellín, Toronto, Singapore, Jakarta, Tel Aviv, Stockholm, Tallinn, and Helsinki. What a plan!

But all this was obviously without counting on COVID-19, which forced us to adapt and split our trip into two phases. First around the world - from January to April - with Rio, Medellín, Toronto, and Singapore. Then in Europe - from September to December - with Stockholm, Tallinn, and Helsinki. Of the nine cities initially planned, only Tel Aviv and Jakarta were not covered. In 2020, seven out of nine is a total that we are fully satisfied with!

Why didn't we go to China or Africa? These two regions are seemingly of significant interest to anyone wishing to study *Smart Cities*. China is becoming a new artificial intelligence (AI) El Dorado. *Smart City* technologies are deployed across entire cities such as Hangzhou, where road traffic is optimized by *Alibaba*'s AI *Citybrain*. In Africa, cities like Johannesburg, Nairobi or Kigali seek to become *smart* through differentiation strategies focusing on *leapfrogging*[7]. However, carrying out our mission would have been particularly difficult in China, a country where access to information is highly regulated, and where honest critical analyses of innovation can be rare. Exploring Kigali would have been interesting, but it was too big a detour and an additional budget that we did not have.

More generally speaking, we were not able to go everywhere. We do not claim to give an exhaustive overview of *Smart Cities* across the world; that would be too ambitious, even presumptuous (and including China in our study would, under those terms, be a requirement). **As we followed our route, we simply had in mind to identify common trends in cities utterly different to one another.**

That wraps up our pre-departure stint.

6. We mostly used 4 rankings available online: *Roland Berger – Smart Strategy Index 2019* (15 cities); EDEN – *Top 50 Smart City Governments* (50 cities); *Procedia Computer Science – Smart City Prospects* (20 cities); *Easy Park Group – Smart City Index 2019* (120 cities).

7. The concept of *leapfrogging* refers to the ability of some emerging countries to catch up by making technological leaps. They develop the latest technologies directly, bypassing the intermediate stages.

IN THE FIELD

To understand the digital policies of each stopover city and assess the new tools they deploy in a cohesive way, we aimed to follow the precise methodology we had defined in advance. Our city analysis grid was based on four dimensions.

The municipal digital strategy
Most large cities have a digital strategy. Whether this strategy is called *Smart City* or not does not matter. What mattered to us was understanding how municipalities collect and use urban data. During the trip, we learned about these strategies in two ways. Firstly, by conscientiously going through the thoroughly detailed official documents (our IP tracking on the websites of the Medellín city hall and Stockholm's *Smart & Connected* program can testify). And of course, by meeting the people who work on developing these strategies within municipalities. This approach served one objective: to compare the (often marketing) vision statements of cities, with the reality of the projects they deploy.

City *monitoring platforms*
In each city, we tried to visit at least one *monitoring platform* operations center. Often hidden behind closed doors and reserved for the experts who work there, these urban "control rooms" are generally not accustomed to welcoming the public. As proof that perseverance through *LinkedIn*, phone or email always pays off, we were able to get in almost every time (with one unfortunate exception: having to settle for a simple *Zoom meeting* in a Singapore getting ready for lockdown). For each platform, we had only one idea in mind: to understand what types of data are collected by the city, how they are exchanged and used.

Digital services and citizen participation platforms
Before our arrival in each city (or at times, once onsite, when we were behind schedule), we would aim to identify original *digital services* worth checking out to form our own opinions. We tested them and we interviewed the experts who work on their design, as well as the residents who use them. We proceeded in the same way for *citizen participation* platforms. Our goal: to understand if these tools are truly used, understood and accepted by urbanites, and for what purpose.

***Model districts* of the city**
Each city has its *smart* "showcases" or demonstrators of innovative, augmented, revitalized neighborhoods. We called them *model districts*. This is where the latest innovations are tested, and where new usage by residents emerge. Every step of the way we tried to explore at least one of these districts. To do this, we went onsite and directly interacted with the residents. To complete these first impressions, we met with *urban planners*, companies, and other creative minds in charge of molding these neighborhoods like no other.

In total, we were able to organize more than a hundred meetings with professionals, we visited six monitoring platform centers, tested more than 50 *digital services and participation platforms,* and explored ten *model districts*. Based on these investigations, we forged the conclusions of this report.

OUR JOURNEY

Embarking on a study trip is above all an adventure. In February 2019, as we spoke of this project for the first time during a lunch break, wedged between two lecture halls at Sciences Po, we probably did not quite realize the level of craziness. We came up with a code name, we created a *drive*, and we sent our first pitch to potential sponsors. As weeks went by, the first returns arrived. We dug into the subject and met various experts. We even went to tech fairs like *VivaTech* and handed out a dozen flyers we had printed for a ridiculously expensive price. A few months later, in September 2019, everything accelerated: our partnerships materialized, and our itinerary began to form... until came January 15th, 2020, the day of the big departure. **From then on, and for the next twelve months, our lives revolved around *Smart City*. It became the single topic of our work, of our conversations, of our debates, and of our meetings.**

JANUARY 15TH, 2020

DEPARTURE FOR RIO

After months to get everything ready, it's time to go. First stop: Rio. We want to find out how the *Cidade Maravilhosa* is using urban data to become more resilient in the face of floods and landslides. Crisis situations are frequent. As soon as we arrive, we experience it first-hand: because of heavy rains, water is no longer drinkable.

JANUARY 29TH

VISIT TO RIO'S CENTRO DE OPERAÇOES

Our dream becomes reality. We visit the urban control tower of Rio, the famous "COR". Since 2011, this operation center monitors more than 30 agencies and integrates more than 200 types of data continuously. One of the first large-scale *Smart City* projects. On-site, we are greeted by a screen wall worthy of NASA. But Houston, we have a problem. Even with *THIS* control room, the city struggles to capitalize on the data it collects.

FEBRUARY 29TH

QUAYSIDE'S PUBLIC CONSULTATION

Happy coincidence, the last public consultations regarding the *Sidewalk Labs* project are taking place during our first days in the city. We immediately understand where the issue lies. Many concerns are shared about the use of personal data in the future neighborhood...

MARCH 12TH

INTERVIEW WITH *SIDEWALK LABS*... ON ZOOM

There you have it, the emerging pandemic is now impacting our project. Our meeting with a *Sidewalk Labs* expert goes virtual. That said, it does not prevent us from asking all our questions and forming our own opinion. Even if the debate around *Quayside* is gripping, it seems a little disproportionate to the reality of the prospective solutions.

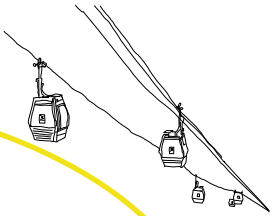
For the full interview, click here.

8. Freedman, D. H. (2019, November 18). *How Medellín, Colombia, Became the World's Smartest City.* Newsweek.

FEBRUARY 9TH

NIGHT BUS TRIP TO MEDELLÍN

After being briefed by the French Embassy in Bogota, we are ready to lead our investigation in Colombia's economic capital, Medellín. How did this city go from being the most dangerous in the world to the *Smartest*[6]? That is the question we want to answer.



FEBRUARY 20TH

INTERVIEW AT MEDELLÍN'S METRO HEADQUARTERS

Aerial metro, urban cable cars... Mobility in Medellín is all about the futuristic experience. It is when seeking to understand how these projects were born that we realize that here, the *Smart City* label says more about a successful collaboration between public authorities, the private sector, and academic institutions, than an innovative use of urban data.

FEBRUARY 27TH

SNOWSTORM IN TORONTO

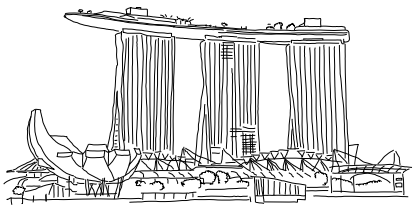
Thermal shock when we arrived in Canada. However, it's not the weather that makes Torontonians shiver, but *Sidewalk Labs*'s project for the *Quayside* neighborhood. The young *Google* sister-company has been working since 2017 with *Waterfront Toronto*, the authority in charge of revitalizing the area. This project has been making headlines, and not always for the best. We're here to check out what is at stake.

APRIL 1ST TO 6TH

SINGAPOREAN FREEDOM

A fortnight later, we regain our freedom, a new question on our minds: how does the Singaporean *Smart Nation* use digital tools to limit the spread of the virus? Our experience of the city-state during the COVID-19 period confirms that this Asian dragon is one step ahead in terms of digitization.

To read our quarantine log, it's this way.



MARCH 15TH TO 17TH

24 HOURS PLANE RIDE... DESTINATION SINGAPORE

As the world closes in on itself, we travel across the globe to Singapore, which at the time seems to be handling the pandemic perfectly. After a 24-hour flight and a stopover in Manila, we discover El Dorado... A brief bubble of life as we used to know it, in the shape of the immense mall at *Changi* Airport, will recharge our energy level before the harsh reality of a mandatory quarantine.

APRIL 7TH

2020 – COVID VS. ACROSS THE BLOCKS... CHECKMATE?

Singapore must finally go on lockdown. Our trip and our study are officially on hold. We return to France a few days later, ruling out Jakarta and Tel Aviv once and for all. For the rest, we remain hopeful. We plan to resume the project as soon as possible to delve into the European cities.

MAY 7TH

EVEN ON LOCKDOWN, THE INVESTIGATION MUST GO ON

As we settle back in France, each confined to our own home, we learn of *Sidewalk Labs'* withdrawal from the *Quayside* project. The official reason is the economic crisis. We reconnect with our contacts around the world... What is the virus's impact on the *Smart City*?

OCTOBER 9TH

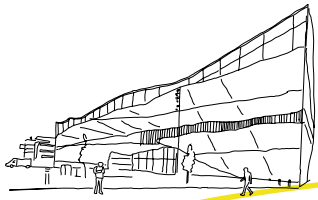
DISCOVERY OF HAMMARBY 2.0

Thanks to our chat with former minister Allan Larsson, we find the best example of a citizen participation project at the local level. In *Hammarby Sjöstad*, residents are directly involved in the transformation of their eco-neighborhood through technology.

OCTOBER 15TH

BALTIC CROSSING

It will take us a whole night of ferry to disembark in Estonia. A short week of isolation is once again required...
But it seems to be worth it. In Tallinn, the epidemic is still under control. We're here to find out what makes *e-Estonia* the most advanced European country in the digitization of public services.



NOVEMBER 29TH

HELSINKI: A LAST ONE FOR THE ROAD

Against all odds, we managed to convince customs officials to let us enter Finland to complete our study. Here we discover a *Smart City* focusing on people and citizen participation. And experimental projects that confirm our views.

NOVEMBER 27TH

THE CREATIVE CITY

The journey is drawing to a close. We start writing this report from our new HQ, the Tallinn's *Creative City*. A final expedition to Helsinki is also in preparation before our return to France. Closed borders are not on our side...

DECEMBER 4TH

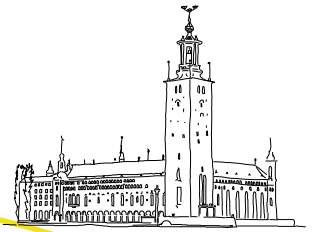
THAT'S ALL FOLKS!

After a short week battling Finland's cold and darkness, it's time to go home. This time for good, to conclude a year of study and travel. Sometimes arduous, always exciting.

MAY, JUNE, JULY 2020

FIRST RETURNS ON EXPERIENCE

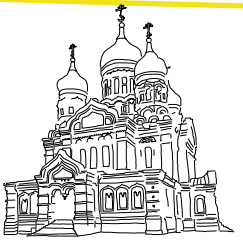
We take advantage of this mandatory pause to share our first analyses with our partners. Together, we identify the questions yet to probe. We note that focusing on the local level and the *living environment* can be fuel to increase citizen involvement.



SEPTEMBER 21ST

SEASON 2: NEW DEPARTURE FOR STOCKHOLM

Awarded *World Best Smart City* in Barcelona in 2019, the Swedish capital is the ideal city to resume our study. This is where all our strongest ideas take shape. Stockholm concedes that it is not yet fully *smart* and stands by an experimental approach to new technologies. One clear goal in mind: to achieve carbon neutrality by 2040.



OCTOBER 28TH

IN TALLINN, THE INVISIBLE SMART CITY

Surprise: in Tallinn there is no *Smart City* strategy. Our meeting with the city's director of innovation allows us to understand that here digital technology must above all aim to facilitate the lives of its residents. Everything is to be done behind closed *back-offices*, asking the population as little as possible.

NOVEMBER 2ND

IN TARTU, ART IS SMART

200 kilometers south of Tallinn, we get to study the project to revitalize the *Smartkovskas*, the former Soviet buildings in Tartu and the cultural capital of Estonia. To make the concept of *Smart City* more tangible for its inhabitants, the municipality is betting on art.

What the sequence of these seven destinations will have shown us is that all cities differ, and each caters to its own stakes. They have different histories, types of governance, populations... and various reasons for positioning themselves as *smart*. While some do so to gain appeal, others seek to innovate, test new solutions and optimize their management and operations. No need to compare and rank these cities. **Back in France, we instead try to understand what their diversity teaches us about the concept of *Smart City*.**

OUR MAIN TAKEAWAY: LEARNING CITIES

Here are our main observations in a few sentences. Something to satisfy the reader pressed for time!

We explained that the concept of *Smart* City was based on two pillars: **a data-driven optimization of city management systems, and an increased participation of residents in the renewal of their cities. From these two standing pillars arise two great fantasies. We call them the *Data City*, the city governed by data. And the *Smart Citizen*, the blissfully digital enthusiastic city resident.**

These fantasies, we wish to call into question. Because today's *Smart Cities*, such as the seven cities we studied, face two limitations. **First limitation: the impact of data on urban services actually remains relatively limited. Second limitation: these cities often suffer from a lack of engagement from city residents to tech. The even sometimes reject it.** Before *Smart Cities*, the reality of these cities is (for now) closer to *Learning Cities*. Cities that test, poke around, learn to capitalize on digital and to engage in fruitful dialogue with their inhabitants.

Highly instructive, this year in the field will have allowed us to debunk the fantasies that many cast upon *Smart Cities*... starting with ourselves. No, there is not yet a full-on *"Data-driven" City*. No, most urbanites are not enthusiastic tech-savvy *Smart Citizens*. **Proud of their successes, aware of the room for improvement, these *Learning Cities* are moving forward one step at a time.**

Follow us as we discover them!

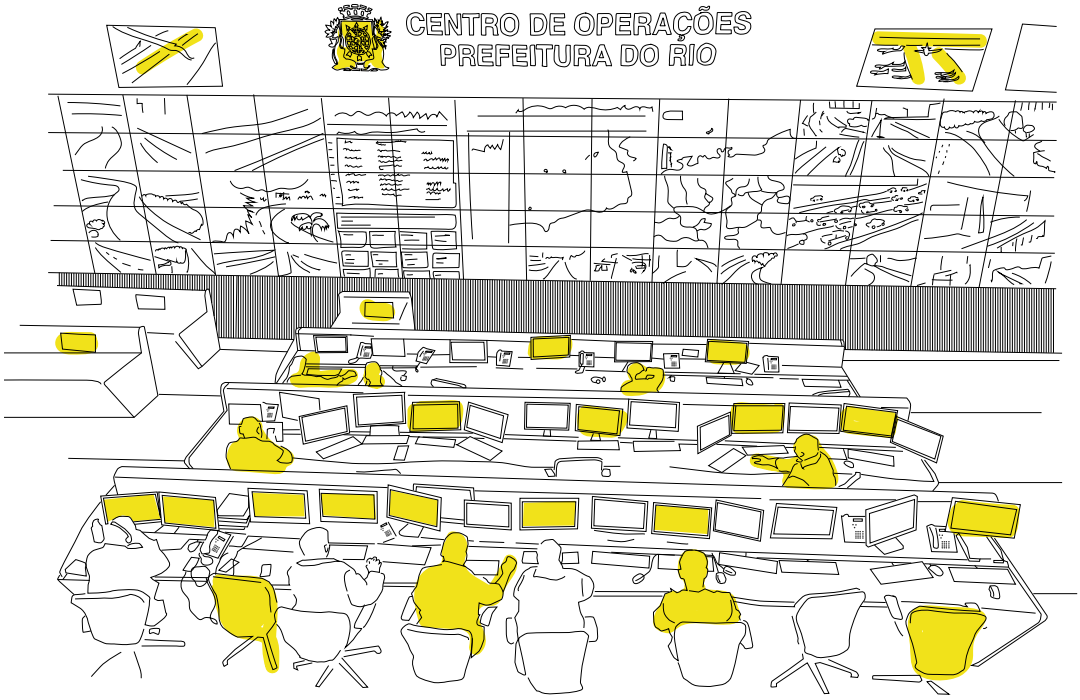
PART 1
DATA CITY

FAR FROM A FANTASIZED DATA-DRIVEN CITY,
A REALITY CLOSER TO DIGITAL PROJECTS IN THEIR TEST PHASE

THE FANTASIZED DATA CITY: A CITY FULLY DRIVEN BY DATA

Before leaving, we dreamed of cities revamped by data. The "*Google City*" of Toronto, the *Rio Operations Center* control tower, the Stockholm *Smart Grids*... We imagined unknown and optimized urban regions, illuminated by millions of connected objects, flowing thanks to massive and constant data sharing. **To this idea we gave a name: *Data City*.** The *Data City* is a city "led" by data, that is to say a city where sensors and algorithms assist (or even replace!) decision-making municipal power, conceding the role to make urban services more efficient.

However, this *Data City* remains a fantasy. In the cities we ventured to, the actual use of data remains relatively straightforward and its impact on urban management systems is limited. Rio, Toronto, and Stockholm are the best examples of that.



FIELD STUDY #1

THE COR (RIO OPERATIONS CENTER) — THE URBAN CONTROL TOWER

To read our detailed analysis of the COR, click here.

Visualizing the city, to better drive it. This is the first promise of the dreamed *Data City*. At the start of our trip in Rio, we thought we had stepped into the dream as we walked through the doors of the famous *Centro de Operaçoes* of the city.

The "COR", as they call it, was even the main reason we chose to study the *Cidade Maravilhosa*. It must be said that, on paper at least, this monitoring platform is impressive. Created in 2011 (originally in partnership with *IBM*), it aims to offer centralized management of more than 200 different types of urban data, to make the city's public services - transportation, emergency response, weather risk management - more efficient, especially in crisis management situations. Unique and ambitious, COR has attracted many international delegations since its creation, and even earned Rio the 2013 *World Best Smart City* title in Barcelona[9].

On site, the reality lived up to our dream: with its hundreds of connected screens in front of which the municipal officers hustle, entering the COR *situation room* plundged us into a real urban control tower. "At COR, we know everything," explained Pedro Martins, Planning Manager of the center. This is the fantasy of a data-driven city. Visualize to control, control to optimize.

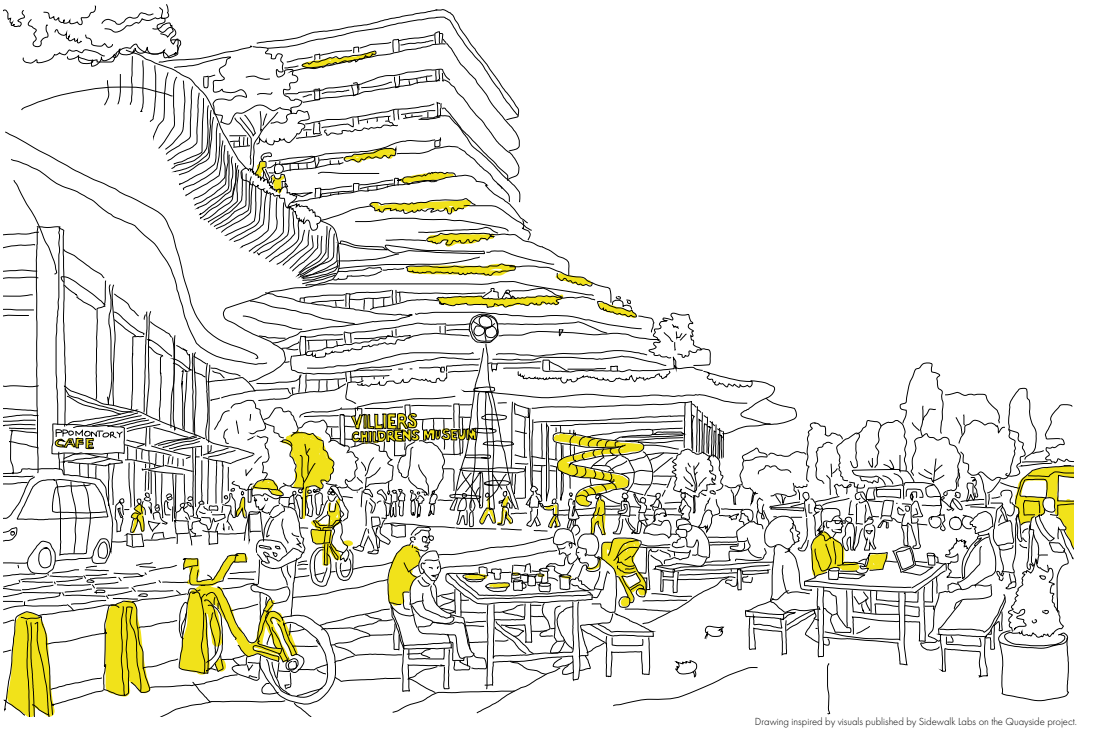
The glitch is that such a centralized model of urban monitoring does not necessarily guarantee efficiency. The COR faces two major limitations, which prevent it from fully delivering on the promise of an optimized city through centralized data collection and visualization.

- The first disillusion resides in the lack of actual use of the data collected. According to Pedro Martins, only 15% of the data collected by COR is used to improve urban services. While the remaining 85% are simply not processed for lack of time, resources, and skills. An example perhaps. True, COR has partnered with NASA to get accurate weather forecast data. However, going from there to creating an algorithm crossing that data with Rio's flooding history to predict future flooding occurrences... is a step that COR has not been able to take. Collecting data is a first milestone but integrating it into effective urban prediction and management models requires *data scientist* skills that COR government officials lack.

- The second disillusion is the question of resistance to change. Qualified as "a crucial issue" by Alexandre Calderman, the COR's Chief of Operations, true cooperation between the 30 agencies the center oversees comes with challenges. For instance, when the COR sends out flood warnings advising a protocol on a specific street, there is no guarantee that the municipal employees will necessarily take it into account or change the way they work. The decision-making process of a government agency is the result of established relationships and habits. That does not change with the simple implementation inaugural of a new sensor.

In the end, while the centralized model of the COR is useful for transmitting information to inhabitants via social networks, especially in the event of a crisis situation (weather forecast, accident, etc.), it remains above all very costly for the city. And fails to radically transform it.

9. See: *Smart City Expo World Congress chooses Rio de Janeiro as the best smart city of 2013*. (2013, November 21). *Fira de Barcelona*.



Drawing inspired by visuals published by Sidewalk Labs on the Quayside project.

FIELD STUDY #2

SIDEWALK LABS' PROJECT AT QUAYSIDE — A LAKESIDE "GOOGLE CITY"

Who hasn't heard of Toronto's "*Google City*"? This project - since abandoned - of a city supposedly administered by *Google* was destined to put to shame all the greatest science fiction novels. A dystopia where everyone's data are continuously collected, where everyone's behaviors are constantly tracked to create 100% personalized services, and above all, to sell this information to third-party companies, eager to pay up. Really? In any case, this is the image that was widely relayed about the *Quayside* neighborhood revitalization project in Toronto[10]. **This small 12-acre wasteland on the shores of Lake Ontario was to become the testing ground for *Sidewalk Labs'*, a subsidiary of *Alphabet*... and therefore sister of *Google*[11].**

When we arrived there, we expected to discover a futuristic "*Google City*": drones and autonomous cars on every street corner, gadgets massively collecting personal data, targeted advertising at bus stops... Reality check? Admittedly, the *Sidewalk* project included installing presence sensors on streetlights, weather monitoring sensors, or "dynamic pavements" incorporating LEDs in the ground. But each of these solutions only collected anonymous and targeted data, linked in most cases to the urban environment (air temperature, pedestrian presence in the street, number of cars on the road, and so on). As we were told many times, *Sidewalk* is not *Google*. The ambition was always to optimize the city's services and not to offer targeted advertising to its users.

Seemingly, rather than a "*Google City*", the intent was above all to design a sustainable neighborhood. Contrary to what one might think, most solutions presented in the latest version of the project were not digital. According to *Waterfront* Toronto, *Sidewalk Labs*'s municipal counterpart, out of the 160 solutions offered by *Sidewalk*, only 59 had a digital component[12].

10. In international press, the project was often referred to as a "*Google City*", worthy of a sci-fi movie. See for example: Georges, B. (2020, May 15). La « Google City » de Toronto ne verra jamais le jour. [*Toronto's "Google City" will never see the light of day.*] Press Les Echos. In our opinion, all precautions were taken not to fall into a bad episode of *Black Mirror*, particularly with regard to the protection of privacy. We clarify this point later, in Field Study #3 of Part 2.

11. That was a big part of the problem. "When we chose *Sidewalk* in 2017, we didn't expect to attract this much attention (...) This was before scandals like *Cambridge Analytica*, the image of GAFAs was very different," admits Kristina Verner, VP Innovation, Sustainability, and Prosperity at *Waterfront Toronto*.

12. To get a good overview of the solutions offered by *Sidewalk Labs* in the latest version of the project, consult the discussion guide established by *Waterfront* for the February 2020 citizen consultation (cf. Bibliography).

Right in the heart of Quayside, *Sidewalk Labs* designed its offices as a resident friendly venue.

The rest? Innovations intended to make *Quayside* a resolutely green and inclusive neighborhood: mass timber constructions, co-living spaces, affordable housing programs... In fact, nothing very "*Google*".

As for the "science fiction" reveal, there really isn't any. The vast majority of solutions suggested by *Sidewalk* were not new. They had already been tested elsewhere. "In terms of innovation, *Sidewalk*'s contribution is ultimately quite modest, because out of the 144[13] solutions approved by *Waterfront*, only a few are true innovations" explained Kristina Verner, innovation manager at *Waterfront Toronto*. More than the solutions themselves, it was their coordinated and simultaneous deployment within the same neighborhood that was innovative.

Was the "*Google City*" just a dream? This is our take on the matter. However, beware, the debate and questions raised by the population are not without merit. It is necessary that citizens take an interest in the projects that affect them. However, when we interviewed some skeptics, like journalist John Lorinc[14], we felt their concerns were more based on the fear of the unknown than on actual contingencies with the solutions pushed by *Sidewalk*. "When *Apple* first came up with the *iPhone*, no one anticipated that we would do so much with a *smartphone*. We cannot predict what might happen and have to be humble with technology," John explained to us. The argument holds its ground in the grand scheme of things but not really in relation to *Sidewalk Labs*'s suggestions. As for us, we don't subscribe to thinking *Big Brother* is hiding behind *smart* pedestrian lights that won't turn red so long as someone is on the road.

Finally, in the midst of a pandemic, *Sidewalk Labs* announced that it was withdrawing from *Quayside*, officially for economic reasons. This decision, taken a few weeks before closure of the 2020 public deliberation, was also possibly influenced by the lack of popular support. **The time of the *"City of Sensors"* is yet to come.**

13. Attentive readers will have noticed that of the 160 solutions proposed by *Sidewalk, Waterfront Toronto* had approved only 144. This is proof that the regulatory authority *(Waterfront)* did its job of supervising the private sector *(Sidewalk)!*

14. John Lorinc is a Canadian journalist specialized in urban issues, business, and culture. He writes for several newspapers including *The Walrus, The Globe and Mail* and the urban planning magazine *Spacing*.

For the full interview with Kristina Verner, click here.

FIELD STUDY #3

THE STOCKHOLM ROYAL SEAPORT — SMART GRIDS TO SAVE THE PLANET

Can tech save the planet? This question remains at the heart of *Smart City* controversies, and its supporters readily answer in the affirmative. They defend a sustainable *Data City*. A city made greener thanks to energy data exchange[15]... As if in the future, the zero-carbon city will have *Smart Grids* alongside trees and green spaces. **We went looking for these energy data exchange systems in Stockholm, in the *Royal Seaport* district... only to find, in the end, solely an already finished research project.**

Located northeast of downtown Stockholm, the *Royal Seaport* is, after *Hammarby*, the new green showcase of the Swedish capital. Intended to house 60,000 inhabitants in 2030, this ambitious sustainable project mobilizes 55 developers and aims to reach a carbon footprint 60% lower than the average of the rest of the city.

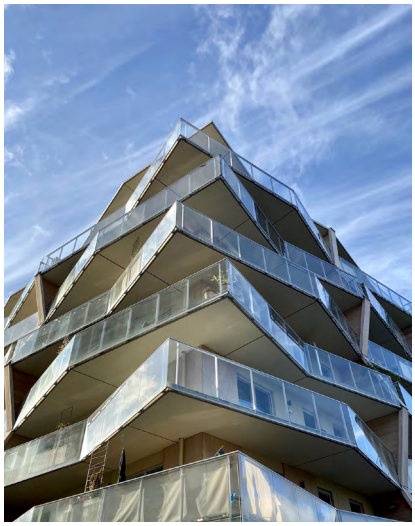
To fulfill this aspiration, the district relied, at least initially, on *Smart Grids*. These local digital tools aim to optimize energy consumption of a specific area through data exchange between the different parts of the network, including the residents. "We look forward to participating and creating the first urban district in the world that is being built with a complete Smart Grid" stated in 2015 Sten Jakobsson, CEO of ABB, a European energy giant[16].

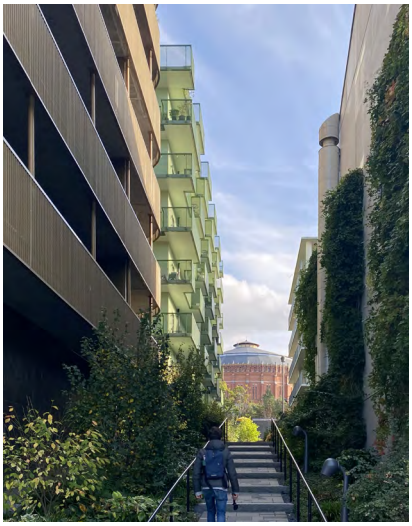
But five years later, these *Smart Grids*, are still nowhere to be found. Admittedly, a partnership of large players (such as *ABB*, *Fortum*, *Ericsson*, etc.) did indeed conduct a *Smart Energy Program* at the *Royal Seaport* in 2017. They equipped certain apartments with digital meters allowing their inhabitants to act on their energy consumption (programing a washing machine at night, for instance). But this was only an experimental research project, not really intended to be scaled up[17].

15. For more information refer to the *Think Smartgrids Association* web report, that states: "Through energy, the Sustainable City and Smart City initiatives, long conducted separately, are now tending to come together." (2015, November 2). Les Smart Cities françaises passent aux Smartgrids. [*French Smart Cities switch to Smartgrids.*] Think SmartGrids FR website.

16. Quote from the *Swedish Energy Agency* website. To learn more about the initial plans for the *Royal Seaport Smart Grids*, see: Juskaite, L. (2014). *Smart grid implementation in Stockholm's Royal Seaport project - S.W.O.T. analysis.* KTH University.

The *Royal Seaport* district is expected to accommodate 60,000 inhabitants in 2030 and aims to reduce its carbon footprint by 60% compared to the rest of the city.





In fact, most tech solutions are not yet mature enough to create "sustainable districts". Instead, the key to creating such a place lies more in establishing an efficient collaboration between the many actors who must get involved. This is what Christina Salmhofer, the *Royal Seaport*'s Sustainability Strategist, explains: "We found that there was a breach between those who design buildings and those who build them, and again between those who build them and those who manage them." The big challenge is therefore to improve coordination between actors, in lieu of moving forward with blinders on throughout the construction process. The goal must be to avoid knowledge voids, narrow views, and less efficient buildings[18]. **Rather than digital, the sustainable city is above all collaborative.**

17. The findings of this research program on behavioral change among residents are particularly interesting. They are discussed in the second part of this report.

18. This notably involves employee training and advocacy programs for developers, organized by the city of Stockholm.

To read about our exploration of *the Stockholm Royal Seaport,* click here.

THE BIG REVEAL: CITIES STILL IN TESTING PHASE TO LEARN HOW TO CAPITALIZE ON THEIR DATA

From Rio to Toronto to Stockholm, these examples reveal how the idea of a *Data City* is the result of the fantasized *city of the future* we've come to expect through Hollywood culture. The reality of how cities use data today is quite different: simpler, more gradual, and less ambitious. **In fact, to capitalize on their data, all are still in the testing phase.** This is our main discovery from the field, which stems from three main observations.

OBSERVATION #1

A QUESTION OF SCALE

To find out more about the CITRA, click here.

As of today, *Smart is Small.* This is a good way to summarize our first observation. Far from the fantasy world *Data City* (where digital technologies fully transform the urban environment), the use that cities make of their data primarily involves projects limited in size, based on well-identified use cases. Whether it involves collecting data using sensors and other connected objects or analyzing them using the notorious monitoring platforms (these urban "control rooms" discussed in the introduction), **most cities maintain (for now) an experimental approach to data management and develop their projects on a small scale.**

Let's backtrack to the monitoring platforms first. In comparison to all those we visited, the centralized mega control tower of Rio's *Centro de Operaçoes* is unique. Realistically, most cities are less ambitious. They prefer to equip themselves with smaller platforms, with sector-based operations, called "hypervisors". Their strength is that they are more selective in the data they collect. They are generally only dedicated to providing one municipal service for a particular area (transportation, waste management, security, etc.). Let's look at different examples: while the COR is supposed to oversee the *Cidade Maravilhosa*'s transportation, weather, and emergency services altogether, most other cities will prefer to rely on separate hypervisors to monitor each service. Medellín has on one side a center specialized in traffic management, the CITRA[19], and on the other a separate platform dedicated to weather risks, the SIATA[20]. One would thus think: one platform per field of intervention... Could it be that easy? Well, within a given municipal agency, several monitoring platforms can also be necessary. In Toronto for example, if you want to have a good overview of the city's transportation management systems, you need the *Traffic Operation Center* (TOC) which (obviously) takes monitors traffic, but also the TTC[21] control center in charge of public transportation, the police control center... and a few other organizations, with more obscure roles and names (TSO, TSM, TSD[22]...).

Such a fragmentation of services clearly exhibits that most monitoring platforms remain sectorized and limited to a given urban service (e.g., waste management), and to a few specific use cases (optimizing rounds for garbage pickup in a given district). Faced with the difficulties of handling too much data (remember COR only analyzes 15% of the data it collects!), cities prefer to keep it simple. To do this, they have set up suitable monitoring platforms with limited scopes of action.

What is true for monitoring platforms is even more true for data collection points, connected objects and other sensors. The "*Google City*" fantasy, that of a "*City of Sensors*" is not yet a reality (except perhaps in beta version in China, or in the minds of megalomaniac philanthropists and large multinationals, from Bill Gates[23] to *Toyota*[24]). In the cities that we have explored, the use of connected objects remains cost restrictive, and their scale of deployment is still limited. When meeting in Rio, the startup *Noah* (which works closely with the municipality on flood control), had only one test sensor placed to detect abnormally high water levels in a strategic zone. In Stockholm, only limited, privileged, targeted zones are seeing innovative connected solutions being deployed (for traffic management, smart lighting, etc.). Specific areas like the Kista district to the north of the city, or Årsta to the south, are the chosen lucky ones. Even in Tallinn, the "largest *Smart City* network in the world"[25] deployed by the startup *Thinnect* remains an experimental project. In fact, its 850 interconnected sensors are still far from covering the whole of the city.

19. CITRA: Centro Integrado de Control de Tráfico y Transporte [*Integrated traffic and transport control center*].

20. SIATA: Sistema de Alerta Temprana de Medellín y el Valle de Aburrá [*Early Warning System of Medellín and the Aburra Valley*].

21. TTC: Toronto Transit Commission.

22. TSO: Traffic System Operations, TSM: Traffic System Maintenance, TSD: Traffic System Delivery.

23. In 2017, Bill Gates announced the acquisition of 100 km2 of land in the middle of the Arizona desert to build Belmont, his Smart City of 160,000 residents. Since then, there has been no real information on this massive project.

24. Three years after Bill Gates, Toyota presented its *Woven City* project just below Mount Fuji in Japan. The small town, which is due to start construction in 2021, will be home to 2,000 people

25. *Taltech and Thinnect are building the world´s largest Smart City sensor network in Tallinn.* (2019). Tallinn.ee.

Why such targeted projects? Quite simply because cities and sensor suppliers are still looking to test their digital solutions and find the right business models. Leading them to use testbeds in order to finalize proof of concept. This test phase takes a long time. And costs quite a bit of money. In Tallinn, *Thinnect*'s founder and CEO, Jurgo Preden, admitted that sensor-based solutions have not yet found their economic equilibrium. "Achieving profitability and identifying the real value of data for cities is very complex. That takes time." The true potential of urban data is not yet known, making it difficult for municipalities to invest in large-scale projects, especially if these require a whole new visualization and data analysis infrastructure, which would force them to change the way they work. To describe the current situation, Jurgo used an original metaphor: the chicken and egg paradox. Eager for economic savings, cities only want to deploy connected objects if they foresee cost reductions. But to prove that their solutions generate savings, startups precisely need... to deploy their solutions!

With technologies that are not yet fully mature, and municipalities that sometimes struggle to adopt them, a testbed approach therefore appears to be a compromise. It allows both digital solutions to improve, and cities to learn fow to use them.

SENSOR SAGAS
— THE FIRST TESTIMONIES OF A SMART CITY IN BETA MODE

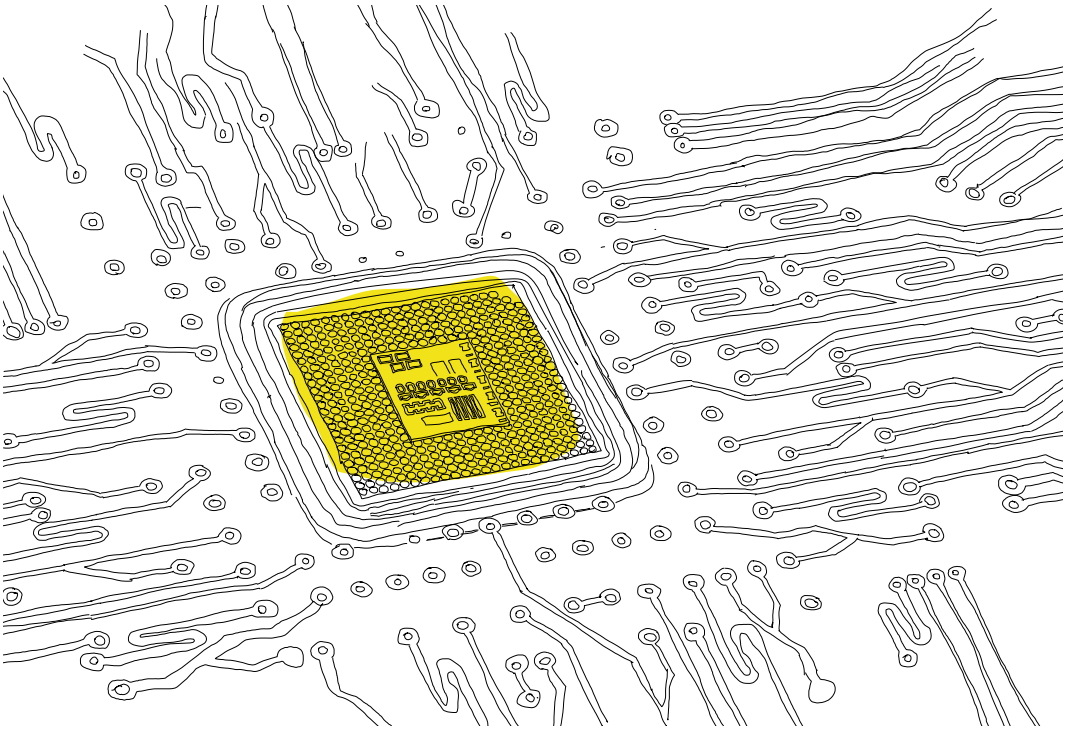
Technical difficulties, illegible data, maintenance issues... During our trip, we met several public officials unsatisfied with the sensors they had just installed. Proof that, in the field, collecting data implies a learning curve.

Rio — Where do data go?
Rodrigo is proud to have installed his sensor, which is supposed to predict flooding and send out warnings. But when it comes to the use of data, that's not his problem. "My job is to produce data (...) It's up to them [the municipality] to see if they use them or not!"

Toronto — Better off without...
Sometimes the technology is too sophisticated. Toronto's Traffic Operations Center learned it the hard way. After installing new sensors to monitor traffic flows, officers were forced to shut off certain features. Because they just did not know how to use them.

Stockholm — It works on its own (as long as you take care of it).
To assess the water quality throughout its archipelago, the city of Stockholm had deployed underwater sensors. They worked... only if they were brought to the surface and maintained every day. Well, one might as well take manual samples!

Singapore — Half the number of sensors... For the same result.
For its ambitious *Punggol Digital District* project, Singapore initially planned to deploy more than 5,000 sensors... before realizing that some data and information could already be collected within the neighborhood. Even after reducing the projected number of sensors by half, they will still be able to achieve the same results.



OBSERVATION #2

WHAT ROLE FOR SENSORS? IN LIEU OF DIRECT OPTMIZATION, THEY KEEP CITIZENS INFORMED

Cities are therefore learning how to make better use of data collection and analysis technologies. But use them for what? What can all these sensors be used for? How can collected data have a tangible impact on urban services such as public transportation or emergency interventions? Throughout this study, we kept asking these questions to our contacts... in English, French, and even sometimes in broken Spanish. Each time we visited a monitoring platform center, we were determined to identify the real impact of this control room on the city's operations. Obviously, we were expecting to find many examples proving the increased efficiency of urban operations and management thanks to these platforms. **But on site, we realized that (for now) data wrangling is only effective to help inform residents in real time.**

At first, this outcome left us feeling cheated. If the goal of these platforms is to make urban services more efficient, shouldn't there be some concrete and palpable successful optimizations? With all of its sensors and big screens, shouldn't Rio's COR (which for instance oversees transportation management) be able to reduce traffic congestion or the number of accidents? During each interview, we insisted on getting hard core numbers. After all, like sensors, we were there to collect data too. It was finally in Medellín that we managed to find what we were looking for, while visiting with Juan Manuel Gomez Sierra, Director of Engineering at the SIMM[26] center. This structure, born in 2011, uses road traffic data to reduce the response time of traffic officers in the event of an accident. In its first year of operation, that time was reduced by more than 40%, from an average of 28 minutes to 16 minutes. These are the stats we were looking for: factual evidence of real and direct optimization of certain urban services (in this case, emergency response).

26. SIMM: Sistema Inteligente de Movilidad de Medellín [*Intelligent Mobility System of Medellín*].

The fact that we found no other similar statistics in other cities has led us to admit that data wrangling - whether related to traffic management, air quality, or noise pollution - does not directly imply optimization of the corresponding urban services. Increasing urban efficiency is not that simple. Just because you position a sensor to monitor traffic on a road doesn't mean that congestion will reduce. This was attested while in Tallinn by Jurgo Preden, founder and CEO of *Thinnect*. Thanks to his startup, he gets a behind the scenes look at the installation of hundreds of sensors throughout the streets of the Estonian capital. When we asked him about their usefulness, he explained with humility that in the long term, his devices (still in the testing stage today) will above all be a tool to assess urban public policies. The sensors are not intended to have a direct impact on traffic (as they coud on *smart* traffic lights, which would adjust in real time according to the number of cars on the road). However, the sensors can evaluate the impact of a new speed limit on congestion, air quality, or noise pollution. It is therefore a question here of assessing public policies rather than directly optimizing city management. In Tallinn as elsewhere, sensors do not make urban services more efficient on the day of their installation.

With more than 13,000 *Tweets* per year, Toronto's TOC primary service to the population is to provide information on traffic conditions.

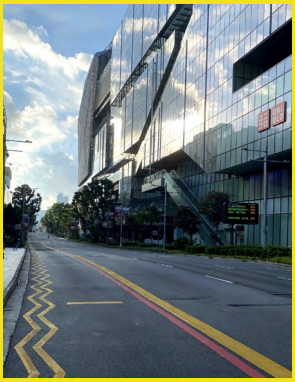
Nonetheless, these monitoring platform centers and all the sensors to which they are connected do have a direct use: that of informing the population. We identified this for the first time as we strolled along *Copacabana*, after a visit to the *Centro de Operaçoes de Rio* and a lively exchange with Pedro Martins, Planning Manager. He opened our eyes to this function as he enthusiastically explained that one of the COR's core functions is to communicate with *Cariocas*. With over a million *Twitter* and *Facebook* followers, the center has become a go-to source of information in the event of an incident. During the heavy rains of 2019, nearly seven million people were logged in! A sign of destiny: later that evening (after our chat with Pedro), as we were enjoying a soccer game at the *Maracanã*, the big screens of the stadium shared information from the COR on the estimated travel time to return home. Proof that *Cariocas* have daily contact with this monitoring platform, sometimes without realizing it! And in all the other cities, we have made the same observation. At Toronto's *Traffic Operations Center (TOC)*, traffic engineer Linda Lee summed up: "The real value of TOC is getting people up to speed quickly in case of an emergency." In Stockholm too, the city uses data platforms to communicate accurate and specific information to its residents, such as air quality through a dedicated monitoring portal. Even when the Swedish capital invests in a *digital twin*[27], its main use is to inform residents regarding the city's future urban transformation projects. **Data collection and visualization are therefore a means to reinforce the transparency of municipalities, providing their inhabitants with the keys to modify their behavior themselves.**

27. A *digital twin* is a digital replica of the city used to execute virtual simulations and projections.

To find out more about the platforms used by Stockholm to communicate with its inhabitants, click here.

LA SMART CITY FIGHTING THE PANDEMIC

Quarantined in Singapore, stuck at home in France[28], or travelling across northern Europe... No matter our location, since the outbreak of COVID-19, we witnessed cities adopting new digital strategies to fight the spread of the virus and communicate accurate data to residents. In this period of uncertainty, *Smart City* tools have revealed ro be simple and effective means to share information with the population. Let's take a quick look at a few examples...



Despite relative control over the epidemic at the start of the first wave of COVID-19, Singapore eventually had to lockdown in April 2020.

In Singapore, we were confronted with the reality of the virus for the first time. This gave us the perfect opportunity for a live experience of *Smart Nation's* "response" to the epidemic. And we were not disappointed. A *contact tracing* app, digital forms and QR codes to enter public places, a quarantine monitoring system... The Singaporean agency *Govtech (*in charge of developing new technologies for the city-state) quickly managed to create many digital services. The vast majority were used to transmit information to residents[29]. For instance, the agency worked on a specialized COVID-19 *chatbot* for government websites, an online registry of clinics offering subsidized respiratory disease treatments, or a list of supermarkets selling masks. The city-state has even gone so far as to develop web portals allowing real-time crowd monitoring in malls and parks! Among all these communication channels, it seemed to us that effectiveness correlated with simplicity. We ourselves became hooked to the official *WhatsApp* loops used to share the daily number of cases, to announce new measures, and even to respond to *fake news*...

However, the city-state is not the only city to have put forth information sharing to deal with the crisis. In Rio, the COR developed a dashboard to track the spread of the virus in real time. The platform was even able to alert residents by text message when cases of COVID-19 were detected near their homes. The same goes for Medellín, which put forward a similar dashboard and launched *Medellín Me Cuida*, an initiative allowing residents and businesses to obtain financial aid in exchange for useful personal data to fight the virus. As for Tallinn, their epidemic monitoring was integrated into the municipal dashboard, an online platform for real-time information on traffic, weather, budget, planning projects and official announcements of the city.

We can say that COVID-19 was a bit of a crash test for cities that are betting on digital technology to become more resilient. Verdict? One role has been established for monitoring platforms: they are especially useful when it comes to sharing information with residents. And in this venture, new types of data have found value. Antoine Courmont, Scientific Director of Sciences Po's "Cities and Digital Technology" Chair took an interest in the subject[30]. He identified three main types of data that have become strategic in a pandemic landscape, which he calls "coronoptics":

- Data that **make the virus visible** (number of cases and health data).
- Data that **reveal contacts and movement** among the population (telephone operators tracking population movement, contact tracing apps).
- Data that **monitor lockdown compliance** (e.g., web portals tracking the number of people gathering in public spaces, such as *Safe Distance @ Parks* in Singapore).

What these "coronoptics" have in common is making the invisible... visible. They provide essential keys to understand such a complex phenomenon: that of the spread of a virus. This circles back to the mission fulfilled by *Smart City* digital tools: providing information to the population. Crisis situations take this mission one step further. Now informed, residents are called upon to modify their behavior depending on the intensity of the epidemic. Now, they can knowingly avoid neighborhoods or venues identified as clusters, choose less crowded modes of transportation, or work from home, etc.

28. In France, the case of the city of Dijon is interesting. Opened in 2019, the new *OnDijon* control center has centralized the management of the COVID crisis and offered residents a reliable 24-hour information platform.

29. For a list of digital services developed in Singapore to combat the virus, see the website of the government agency *Govtech*.

30.Antoine Courmont. (2020, April 10). Coronoptiques: dispositifs de surveillance et gestion de l'épidémie. *[Coronoptics: epidemic monitoring and management systems]* LINC. Digital Innovation Laboratory of the CNIL

To find out more on our experience living in a Singapore fighting the virus, click here.

OBSERVATION #3

ONE MAJOR CHALLENGE FOR CITIES — DATA GOVERNANCE

Still in the early days of their quest for data, cities are faced with a major challenge: that of thinking about their data governance. Once an urban issue has been identified, the technological solutions deployed, and the data collected... Who can access them? And how? Our field observation led us to realize that cities are in the learning zone. Municipal agencies and private companies are still struggling to share data and analyze them together.

Let's first take a look at data exchange between different public departments or municipal agencies. In the virtual world, data don't like silos. Using data on a larger scale calls for enhanced collaboration among municipal agencies. In a perfectly digital city, the police would (for instance) work in a fully integrated way with traffic control to redirect traffic in the event of demonstrations. Likewise, electricity providers would collaborate in real time with meteorologists to predict building energy consumption based on weather predictions. The problem is that such a radical shift requires changing the way municipal agencies work together, with little time to prepare. In the specific area of public transportation, Medellín offers an interesting case. Traffic monitoring is carried out by two separate centers. The first one, the CIOS[31], is public and is responsible for operating traffic lights. The second, the SIMM[32] (mentioned above), is private and supervises traffic officers' interventions. Obviously, with distinct statutes, goals and means, the cooperation between these two legal entities is far from perfect. When we visited the CIOS, the agents did not hesitate to point out that their colleagues at the SIMM do not sufficiently share certain data with them, even though sharing data would allow them to be more efficient. And while the physical and geographic separation of such agencies may not help, bringing all public entities together in one room does not solve all of the issues. At Rio's *Centro de Operaçoes*, the collaboration between the 35 public agencies that work there seems particularly challenging. It is no wonder Alexandre Calderman, the Director, speaks of collaboration as "the crux of the matter", a COR(e) challenge... **From Medellín to Rio, we witnessed public actors who still must learn how to work together, even though they're not always up for it.**

This first impression when visiting these monitoring centers was confirmed by the professionals equipping them with digital solutions. Reached by videoconference while we were still in quarantine in Singapore, Yasser Helmy, at the time Head of *Smart Cities* in Asia Pacific for Cisco, put it simply: "The reality is that most public departments have difficulties collaborating: a city's police force would not cooperate with the waste department, in France the *métropole* would seemingly be unwilling to work with the *département*. With this observation in mind, the trend is now to focus on data platforms dedicated to specific agencies, working for instance on lighting on one side, parking on the other."

For a more in-depth comparison of the transport monitoring platforms we studied, click here.

31. CIOS : Centro de Control de Semaforos de Medellín [*Medellín Traffic Light Control Center*].

32. SIMM: Sistema Inteligente de Movilidad de Medellín [*Intelligent mobility system of Medellín*].

One COVID pandemic wave later and now on the other side of the world, in Stockholm, we heard a similar tune from Hakan Engman, Business Development Director - *Digital Cities*, for Bentley Systems, with a core offering to build "digital twins" for municipalities. According to him, "urban data cannot be aggregated within a single platform because each department in the city would continue to work in silos, refusing to share their data with others." His company prefers to offer a clear-cut portfolio of unambiguous products, tailored for specific services and distinct agencies or departments.

The challenge of data governance also arises vis-à-vis private players. Whether it be a digital platform such as *Uber*, a sensor technician, or an energy producers, they all generate data. How does one work with them? How is it possible to capitalize on their data? Here too, cities are seeking answers and learning. Many questions arise. If digital solutions are deployed in my neighborhood to count the flow of pedestrians passing on the *sidewalk*, who should own the data generated? The city or the company that manages the infrastructure? The debate is far from being settled. This was one of the stickiest questions discussed with regards to *Sidewalk Labs*' project in Toronto. As Kristina Verner explained: "In its initial project, *Sidewalk* had imagined the creation of an *Data Trust* that would have regulated the use of data in the neighborhood. This body would have, to certain extent, deprived the municipality's sovereignty over data in the public space. It was thus ruled to take this idea off the project."

Rome wasn't built in a day, and neither will its *digital twin*: to collaborate with private companies, cities will benefit from thinking long term. Learning to work together takes time. It requires synchronized thinking, but with different people, different types of work culture, and at times different cultures altogether. The first time the city of Tallinn reached out to the *Bolt* platform to share data, the company was not very interested. But now, after seven years of working closely together, *data exchange* seems to be paying off. Recently, by sharing its data on electric scooter tracking in Tallinn, *Bolt* allowed the city to identify the routes most employed by app users. This information turned useful in preparation for future roadwork interventions. Because they work together on a regular basis, *Bolt* and Tallinn have succeeded to generate shared added value to their data. To secure a seamless and open data governance, private companies and municipalities must get to know and trust each other. Sometimes, this trust is more easily obtained through informal and personal exchanges between different players. Toomas Türk, Tallinn's Chief Innovation Officer also praised the merits of the Estonian ecosystem where everyone knows each other personally: "If I have a problem related to data with so and so, I take my car and go see them!" A good (sanitized) handshake, and problem-solved!

OUR RECOMMENDATION: A QUALITY APPROACH TO DATA IN THE CITY

We have shown that cities are still in a testing phase, still learning how to best use their data. But how does one ensure that this testing phase goes smoothly? How can cities capitalize as much as possible on the data they collect? **Our answer can be summed up in just three simple words: do not overdo.**

In the field, we have often observed data collection overloads. Sometimes to the point of not knowing what to do with it. **To overcome this pitfall, we believe it to be necessary to adopt a quality approach to data collection. The principle is simple: rather than seeking to collect a large amount of data, cities should focus on specific targeted, high-quality and valuable data.** Thanks to this more frugal approach, they will move towards an improved use of digital tools and avoid wasting resources. We have identified seven steps to apply this high standard approach to the process of optimizing urban services:

1. Preparation – Identify use cases that validate worthwhile needs.
Before embarking on data collection, cities should determine a framework to meet clearly defined needs. Once the process is initiated, they must identify use cases. These are real life situations where data would be useful to optimize the services relevant to the urban issue the city seeks to tackle.

2. Scoping – Target the right data to achieve a clearly identified goal.
No need to collect too much data. To adopt a quality approach, it is in the best interest of cities to target data directly correlated to the needs identified in their use cases. Often, these data are already collected and accessible (sometimes even without the cities' knowledge!). Otherwise, additional data input may be required.

3. Governance – Foster lasting relationships between stakeholders by moving forward in a progressive approach.
We advocate a progressive approach to governance, where each department or public agency would join monitoring centers step by step, one project at a time. Such a long-term vision would contribute to new work dynamics, where collaboration between stakeholders would be appreciated and continue on even after data are exchanged.

4. Data collection – Purchasing processed data rather than investing in sensors.
As mentioned already, cities have access to a lot of data. Let it be repeated, they don't always need additional sensors. And while data may be needed, buying and installing new sensors also means that cities must uphold their maintenance and manage all the technological hazards that may arise. To avoid some of these expenses (in terms of time or human and financial resources), the purchase of already processed data is a promising solution. The responsibility and maintenance of data collection systems would be delegated to the city suppliers, whether institutional or private. For example, this is what *Thinnect* has been aiming to offer to the City of Tallinn. With the startup's new *Platform as a Service*, the city would not own the sensors, and it would directly access information on a dedicated platform. The strength of this model? Allowing cities to focus on their core business: pushing forward new public policies. Of course, this also requires estimating the price of data over time, and developing a framework guaranteeing cities with the sovereignty over their data.

5. Processing – Provide proper training for agents taking on data analysis.
Even if municipal officials are not *data scientists*, the ongoing digital revolution requires them to acquire new skills. Before offering new data platforms to agents, they must trust the technology. To do so, training programs will allow agents to better understand how these tools work and what is their added value. Otherwise, they will turn their back on them after the first technical glitch.

6. Integration – Getting into a logic of real-life optimization through data.
Data are virtual. This means that, in essence, they cannot have a direct real-world effect, an impact on the present, on life. In order to optimize urban management and achieve set goals, data must therefore be embedded in the administrative processes. Public actors must be ready to make decisions based on the insights generated by data and be willing to review existing processes. For the sake of improvement.

7. Improvement cycles – Use agent feedback to hone the improvement process.
Throughout this optimization sequence of public services, agents will generate ideas. Could we perhaps use even more accurate indicators? Could we maybe enhance the accuracy of the first results with additional data? Building on these feedbacks, the city will gradually make the process more efficient. Ultimately, new use cases may also be identified, leading to a new cycle of optimization.

PART 2
SMART CITIZEN

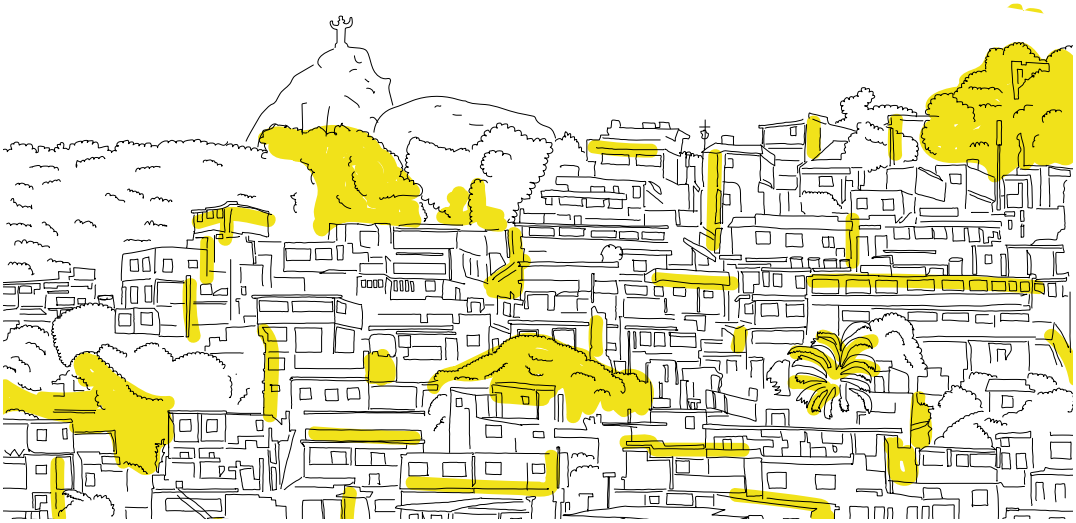
FAR FROM FANTASIZED NAIVE AND ENTHUSIASTIC SMART CITIZENS, CITY DWELLERS REMAIN SKEPTICAL IN RELATION TO DIGITAL TECHNOLOGY IN THEIR CITY.

Drawing inspired by a work signed by illustrator Ruth Gwily. See www.ruthgwily.com

THE FANTASIZED SMART CITIZEN: AN ENGAGED CITY RESIDENT THANKS TO DIGITAL TECHNOLOGY

The fantasy of a *Smart Citizen* is rooted in the idea that thanks to smartphones, *civic technologies* and digital platforms, residents would better participate in the making of their own city. Make no mistake, this does would not imply that citizens were previously *Stupid Residents*. Rather, with this fantasized *Smart Citizen* lies the belief that urban digital transformation would offer the tools to allow everyone to live an augmented urban experience. Forget mass transit, download *Uber*. Goodbye hotels and guesthouses, welcome to *Airbnb*. Ditch municipal polls, make way for citizen participation apps. From municipal *crowdsourcing* solutions to *Smart Homes* technology, the new digital services of the *Smart City* would be an opportunity to reshape the relationship between residents and their city. *Smart Citizens* would consciously and constantly share their data (where they go, their energy consumption levels, what they like to buy, etc.). Even when using a *Bolt* scooter, they would be contributing to the improvement and continuous transformation of the city. **In the perfect *Smart City*, we would therefore leave our passive role of urban consumers to become true actors. We would be willing to generate ideas, get involved, offer time (and data!) to serve a more human and inclusive city. Filled with idealized *Smart Citizens*.**

Throughout this journey, we therefore tested these digital tools urging residents to play a newfound role within their city. But everywhere we ventured, we came across the same field observation. New technologies are simply not miracle solutions to turn citizens into active contributors of urban transformations. Upon our arrival in Rio, we noticed that new digital services are not always welcome. In Medellín we even came upon a ghost citizen participation platform. In Toronto, we witnessed citizens' ambiguous and conflicting attitudes regarding the use of personal data. **Each time, the idea that people would offer their time, share knowingly their data, or simply use the new tools at their disposal was far from reality. Each time, this collaborative *Smart Citizen* proved to be a myth.**



FIELD STUDY #1

FLOOD WARNINGS IN RIO — "GIMMICK OR NOT GIMMICK"?

Empowered with real-time information, the urban citizens of tomorrow will be invincible. They will no longer have to fear weather risks, traffic jams, major events, or rallies... No, the citizens of tomorrow will be resilient thanks to digital technology. They will be able to adapt to the hazards of urban life. This is the promise behind Rio's *Centro de Operaçoes* (COR): that of a *Smart Carioca* feeling safer thanks to the cautiousness of a municipality equipped with sensors to send warnings directly to residents from its large urban control room.

Born at the end of 2010 in response to vast floods and landslides that had caused hundreds of deaths in the city's *favelas*, the COR was built to anticipate meteorological risks (an everyday matter for the tropical city). The *favelados* would then be warned in the event of an incoming landslide. How? Thanks to loudspeakers installed in the heart of the *favelas,* they alert the population in case of heavy rains and invite them to take cover in a secure location. Nothing revolutionary, other than the idea of better equipped neighborhoods and empowered citizens thanks to data sharing and monitoring.

But this was just the theory. In practice, after one, two, three false alarms, most *favelados* simply stopped reacting. Within the wooded grounds of Rio's Pontifical Catholic University, researcher Rafael Soares Gonçalves explained why: "People who live in *favelas* essentially no longer trust the city's public authorities. This is the real problem, which cannot be resolved with *Smart City* technology innovations alone." In Rio, there are no awareness policies addressed to the population. Even though they would allow the deployment of "social technologies"[33] as Rafael Soares calls them. Without those, the idea of a *Smart Citizen* is nothing but a myth. Cristina Mendonça shares this opinion. Formerly in charge of Rio's *C40 Cities* organization projects, she worked extensively on the city's resilience strategy. According to her, citizen awareness must be raised before investing in technological tools. Building on education, residents must be converted into first-rate urban planning participants. They must be aware of their city's challenges (environmental, economic, social) and be mindful of the solutions that exist to face the hurdles. The use of new tools is first and foremost based on trust.

In short, it is a mistake to think that *Smart City* solutions, which aim to share information and create new dialogue tools, can by themselves generate a renewed citizen engagement and lead individuals to change their behaviors. Especially if the civic and social bedrock is not favorable. **However sophisticated it may be, a technological tool will never replace a public policy.**

33. Rafael Soares Gonçalves defines "social technologies" as innovations which are deployed in parallel to educative and awareness-raising policies geared towards the population. They focus on local schools and social structures to promote the appropriation new digital tools by citizens. To find out more about our interview with him, go to the *La Fabrique de La Cité* website. (Interview in French – Google Translate will again be your friend!).

FIELD STUDY #2

MI MEDELLÍN — AN ONLINE PLATFORM... AND THEN NOTHING

"Giving a voice to citizens", "Putting humans at the heart of it all"... Ah! How beautiful are the promises of the *Smart City* for its *Smart Citizens*! After all, what could be better than using new technologies to strengthen citizen participation? The rise of *civic tech*, which relies on digital technology to improve the democratic process, makes it easy to ask residents for their opinions. But for these opinions to have a real impact, they must actually be taken into account. **In Colombia, the citizen participation platform *Mi Medellín* taught us that *civic technology* does not necessarily settle the fight for a fruitful dialogue between a municipality and its residents.**

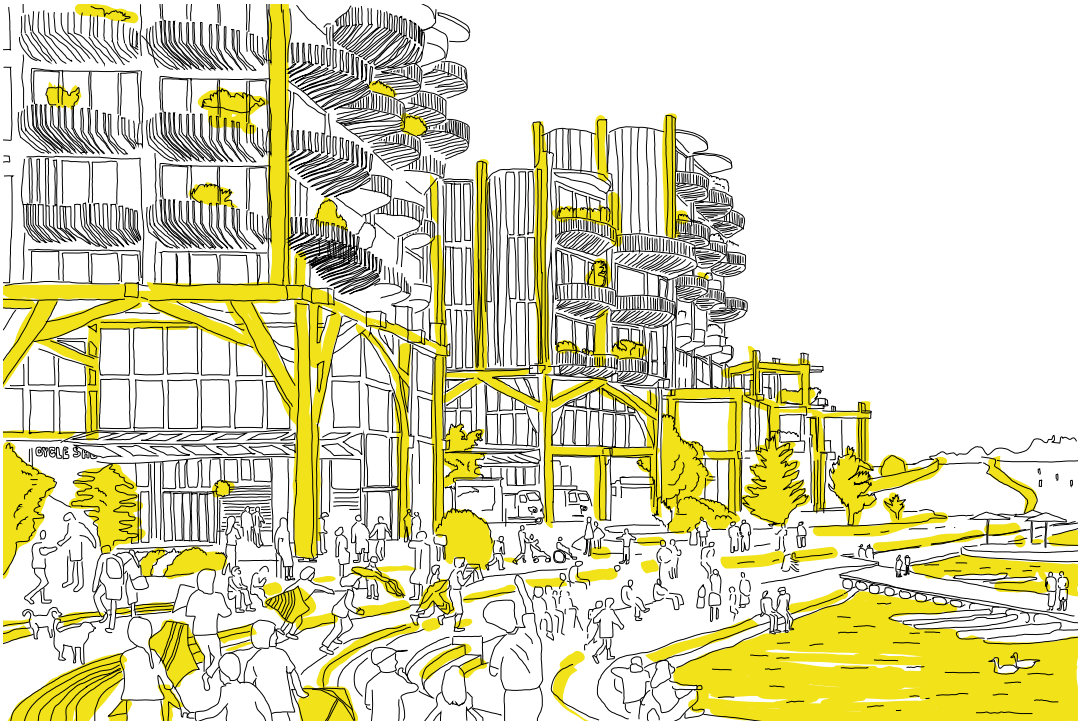
On paper, as often, it works. If Medellín was named "*Smartest City of the World*" by *Newsweek* magazine in 2019, it is notably thanks to the crucial role that city dwellers have played in urban planning since the end of the 90s. To build on this renewed civic engagement, the *Mi Medellín* citizen participation platform popped up. Created in 2014 by the *Ruta N* innovation center, this space for co-construction was intended to allow residents to formulate ideas responding to challenges set by the public authorities. "How do you imagine the future of Medellín?", "What would like to see the Monaco[34] building replaced with?"... For each of these questions, dozens of answers were formulated by committed and creative citizens. This platform seemed to be working perfectly. Had we finally found the real-life embodiment of tomorrow's participatory city?

34. The *Monaco* building is a former residence of Pablo Escobar located in the heart of Medellín. It was taken down in 2019.

Not really. Giving city residents a new outlet to voice their opinions does not necessarily mean that they will be listened to. In fact, just after welcoming us, *Ruta N*'s Marketing Director Santiago Ospina shared with us the news that the *Mi Medellín* platform had been closed in 2019. Why? Although participation rates were satisfactory, the municipality was unable to fully understand the ideas that were emerging. The reasons: the questions addressed to the population were too vague; the platform suffered from a lack of resources; and the urban planners in charge of the city's revitalization were not sufficiently aware of the level of quality of the ideas put forward.

While a new "improved" platform is now under construction, the example of *Mi Medellín* remains striking. **It demonstrates that even when people are inclined to use *civic tech*, there is no guarantee that they will be heard, nor that their virtual ideas will turn out as real-life projects.** Clearly, we can reexamine the naive belief that, in a city populated by so-called *Smart Citizens*, digital solutions would solve all the shortcomings of citizen participation.

Medellín was named *Smartest City* of the Year by Newsweek in 2019



Drawing inspired by visuals published by *Sidewalk Labs* on the *Quayside* project.

FIELD STUDY #3

SIDEWALK LABS TORONTO — *GAFAAALERT*

"I'm sure they're listening to us!" – Who hasn't heard this claim before? We use our *smartphones* for anything and everything. Yet, as soon as we notice targeted advertising online, we get scared. This is the "Internet paradox": the testimony of the ambiguous relationship we have with digital tech, and which can easily be applied to the use of technology in public spaces. **Already studied above, *Sidewalk Labs*' withdrawal from the Quayside project in Toronto is once again a textbook case.**

Let's travel back to February 2020. Fresh upon our arrival in the economic capital of Canada, we got to take part in a public consultation on the revitalization of *Quayside*. At the time, the project was led by *Sidewalk Labs*, an *Alphabet* subsidiary and therefore sister company of *Google*. At the very chic *Westin Harbor Hotel*, we were able to witness a debate where everyone seemed to worry about the eventual collection of their personal data. Just a few seats away from us, we could hear a young woman crying out: "But how do they plan to make money? What are they going to do with our data?! They work with *Google*!"

In a city like Toronto, where the tech industry created more jobs in 2017 than in San Francisco, Seattle and Washington D.C. combined[35], such mistrust towards digital technology is surprising. This mistrust is, nonetheless, very real and shared by a large part of the population. Facing strong opposition from movements like *Block Sidewalk*, the *Sidewalk Labs* initiative eventually surrendered, and withdrew from the project in May 2020.

For more details on our experience of citizen consultation in Toronto, click here.

35. *Toronto adds more tech jobs than Seattle, the Bay Area and Washington D.C.* (2019, 6 May). InvestinOntario.

In Toronto like anywhere else, collecting people's data is really nothing new. "The data train has already left the station" summed up Suzanne Kavanagh, community leader of Quayside's neighboring district. She's right, we accept social networks' privacy policies without really reading them. And in the same vein, we all already share some of our personal data (such as our location) with mobility apps or food delivery platforms on a daily basis. In public spaces, we are also being watched and tracked by various types of sensors, from video cameras to other motion detectors. Most of us prefer acting as if we didn't know.

This time around, with *Quayside*, the use of residents' personal information was deemed unacceptable. How can this unexpected vigilance be explained? First, there were the ties with the giant *Google*, a name tainted with suspicion for many people nowadays. But the project's scope, the ambition to consult all stakeholders, and the strong media attention it aroused also played a major role in leading to such a heated debate. For all of these reasons, the population decided from the very start, and for the first time, to take a close interest in the installation of sensors in their future neighborhood. Yet, the city lacked clear communication to explain what the sensors would relay[36]. And there you go: a Pandora's Box was opened. Many city dwellers, rarely introduced to obscure data protection rules (rarely asked about them either), got scared and let it be known.

Was this mistrust from citizens justified? The debate remains open and must continue on. Without a doubt, *Sidewalk* made mistakes. Too eager, the first version of the famous MIDP[37] had to be scaled back. Fundamental disagreements and "threshold issues" emerged with *Waterfront Toronto*, the local planning authority in charge of overseeing *Sidewalk*'s work[38]. One of these issues (and not the least) was the geographical scale of the future neighborhood, which *Sidewalk* had wanted three times bigger than the initial agreement. In the end, negotiation and shared learning allowed the project to be considerably upgraded, especially on the issue of data. Having examined the 144 solutions approved by *Waterfront* and the protection mechanisms that were to be associated with them[39], we believe that all the ingredients to ensure a fair and transparent use of technology in Quayside were present. This belief was also shared by Kristina Verner, *Waterfront Toronto*'s VP Innovation: "the discussions have evolved in a fascinating way, opening the door for Quayside to become one of the most data protected areas in the world, a lighthouse project in terms of data regulation."

All this does not mean that the discussion was a waste of time. The debate brought clarity to the project. We also met skeptics, whose opinions were perfectly reasonable... so long as they were based on facts, and not on fantasized "*Google Cities*"!

In any case, the debate and the level of emotion generated clearly prove that the reality of a *Smart Citizen* remains a myth. Citizens are far from systematically and enthusiastically consenting to share their data to obtain a more comfortable urban life. Instead, when confronted with the use of data in urban space, they ask questions, challenge, and resist. **Instead of easing a hypothetical residents-municipality dialogue, *Smart City* technologies fuel tensions and misunderstandings.**

36. During the consultation in which we participated, we were asked to read a fifty-page report in a few minutes to get an idea of *Sidewalk*'s 160 innovations... Obviously, no one had time to understand anything.

37. The *Master Innovation and Development Plan* is *Sidewalk*'s first proposal for *Waterfront Toronto*. It is 1,524 pages long... Enjoy reading!

38. Too often, the power struggle between *Sidewalk* and *Waterfront* was seen as an unbalanced relationship: the small municipality versus the giant *Google*... In reality, this was far from the case. *Waterfront Toronto* was always in control.

39. *Waterfront* had started working on *Intelligent Community Guidelines* to be contractually binding for *Sidewalk*, including "*Privacy by Design*" requirements and numerous control measures ("*Privacy Impact Assessments, Threat Risk Assessments, Algorithmic Impact Assessments*"). These guidelines and measures are detailed on page 11 of the *Discussion Guide* of the second public consultation on the project.

THE BIG REVEAL: MOST PEOPLE ARE RATIONAL AND PRAGMATIC CITIZENS RATHER THAN ACTIVISTS. THEY WILL GET INVOLVED LOCALLY, WHERE THEY LIVE

The three field studies mentioned above prove it: these *Smart Citizens* are just a fantasy. Citizens are not always conscious and enthusiastic actors contributing to their city's digital transformation**. The reality is more sublte. Only a minority actually get involved: a minority of "urban activists". The vast majority of city dwellers have an ambiguous relationship with urban technologies. They often find no interest in participating in new transformation projects, that they sometimes distrust. They are rational and pragmatic. As such, urban citizens will be more likely to get involved locally when projects or issues affect their *living environment*, regardless of the presence of technology or not**. This revelation is based on three observations.

OBSERVATION #1

THE PARTICIPATORY SMART CITY IS A MATTER OF "URBAN ACTIVISTS"

40. *The Smart City* often has its local stars, like Medellín's urban planner Alejandro Echeverri, Tallin's researcher Ralf Martin Soe in Tallinn, or Helsinki's Veera Mustonen...

41. *Open data* refers to opening-up public data to citizens.

The *Smart Citizen* has been fantasized. True, but that does not mean we haven't met tech-savvy citizens who want to see their city digitalized. In fact, some were eager to see new urban transformations emerge thanks to new participatory technologies. *Civic tech* can then reinforce the dialogue between these urbanites and their municipality. **In each city, our path crossed a few of these citizen participation *aficionados*. We call them "urban activists".** Not only do they have a strong interest in their city's digital transformations, but they also see these solutions as means to share their opinion, change their habits, and convince others to get involved too.

Beware, these "urban activists" are not devoid of critical thinking. As new actors of their city's digital transformation, they keep an eye on the use of their personal data. Unlike fantasized *Smart Citizens* who would willingly share all their information, they take a more nuanced stance. Their thirst for dialogue drives them to get informed. They understand that digital opportunities also come with risks. They are aware of the challenges of data protection and campaign for a general awakening.

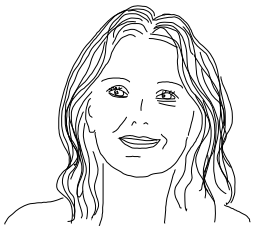
Meet some of these passionate actors from around the globe.

Helsinki's "data activists": fighting for personal data sovereignty
City residents need to have control over their personal data in order to become true urban actors. This is the belief of the Finnish *MyData* movement (which was presented to us by Veera Mustonen, Helsinki's Smart City "wizard"[8]). Born in 2014, it is a community of experts, *geeks*, and citizens. All together, they have been campaigning for profound changes in the way private and public actors could use their personal data. For them, citizens should remain the sole owners of their data and always know who uses them and for what. Their fight is not in vain. Today, these "data activists" play a major role in the development of *Open Data*[9] strategies in Northern European cities.

Suzanne Kavanagh: Toronto's local community leader
The public consultation on the *Sidewalk Labs* project was an opportunity to meet local figures passionate about urban transformations. Suzanne Kavanagh is one of them. As Saint-Lawrence's community leader, a neighborhood located just north of the famous Quayside, she supported the project led by this *Google* sister-company. She saw *Sidewalk's* proposals as an opportunity to make Toronto's *waterfront* a more pleasant and sustainable area. Her take on the debate was enlightening, and often more nuanced than the projects' opponents'.

Allan Larsson: the former Swedish minister behind *Hammarby 2.0*
When this former finance minister moved to the famous *Hammarby Sjöstad* eco-district, he was shocked to find that energy consumption targets were far from achieved. In response, he launched *Hammarby 2.0*. The goal was to make *Hammarby* great (and green!) again. Through a testbed approach, this community of local residents started to use innovative solutions in the neighborhood, like electric cars, solar panels, or other tools to reduce their energy consumption. Thanks to Allan's support, many companies agreed to join and finance this citizens' initiative.

Piedad Patrica: *it's gonna be a good life* with *Medellín Cómo Vamos*



Medellín used to be the most violent city in the world. So today, fostering good living conditions is essential to keeping it safe. With *Medellín Cómo Vamos's* online surveys, Piedad Patricia measures the evolution of living conditions and monitors levels of satisfaction. This independent and private initiative seeks to go further than a traditional polling institute. The idea is to empower citizens, inform them, and involve them locally. Thanks to the data they collect, Piedad and her teams also aspire to influence municipal policies. Even before COVID-19, improving access to health services was their top priority[42].

N.B.: Since our stay in Medellín in February 2020 and the publication of the French edition of this report in March 2021, the situation in Colombia has much evolved over the spring of 2021. Even though inequality issues were already core (and part of the key issues identified by Piedad), the recent social awakening had not sparked yet.

Maju from *Nossas*: the carioca "activism lab"

Thanks to *Nossas,* Maria Julia Wotzik leads mobilization campaigns on Rio's urban policies. *Nossas* means "ours". Who is behind this "our"? A group of people paying attention to local authorities' decisions. Together, they built a digital toolbox to help citizens become more involved in public life. How? Easy, they invite active people to act collectively online. When politicians make decisions they deem unfair, they flood their networks: mailboxes, *Twitter*, *Messenger, WhatsApp*... From a tech point of view, the device is simple. But users are reaping benefits. In total, they have reached 120 "victories" out of 280 campaigns - in 20 different cities, not just Rio! (For instance, they were also behind the Sunday pedestrianization of the famous *Paulista* in São Paulo). In short, *Nossas* proves that tech can leverage activism and mobilize new audiences.

These clear-headed and dynamic *urban activists* show that technology can lead to an enlightened dialogue between citizens and their municipality. The problem is that such a dialogue ultimately includes only a very small part of the population. In a city of several hundred thousand, sometimes millions, there are only a handful of Veeras, Suzannes, Allans, Piedads or Majus.

We can therefore question cities declaring that their *Smart City* strategy is based on the contributions of their residents. Many times, the feedback they have does not really represent the aspirations of the whole population, but only a few part. For example, to develop its *Smart & Connected City* strategy, Stockholm asked its residents to give their opinion on social networks. In total, 3,500 people spoke out. In comparison to Stockholm's 975,000 inhabitants, this is a relatively low response rate... We can then wonder: what is the minimum participation rate cities need to merit the "citizen approved" stamp?

The heart of the problem is that those who formulate ideas using digital tools are already onboard. They are the ones that are interested in *Smart City*. Some cities like Stockholm or Singapore have tried to expand the audience using video games like *Minecraft*. Even then, it's always the same type of people who are willing to participate and collaborate in urban planning projects. They are urban *aficionados*, tech-savvy students, participation addicts... They are few. Yet, they are convinced that they can play an active role in the transformation of their city. In Helsinki, Veera Mustonen came up with the consultation program for the famous *Kalasatama* district, credited as one of the most *human-centric* in the world. According to her, "the people who get involved are the ones who have the time and the means. They already know they can make a difference in their city." **Empowering the rest of the population on data-related issues is not an easy task. It requires finding their prime motivators, and going beyond the illusion that technology will automatically boost their participation.**

42. To dig deeper, check out the *Kit for the construction of the Medellín Development Plan - 2020-2023 of Medellín Cómo Vamos* (and practice your Spanish...).

For the full interview with Maju, click here.

To find out more on the *Minecraft City*, click here.

In Brazil, many streets are pedestrianized on weekends. Here, *Infante Dom Henrique* avenue in Rio.

OBSERVATION #2

THE HOMO ECONOMICUS IS (AND WILL REMAIN) THE TRUE URBAN CITIZEN OF TODAY (AND TOMORROW!)

That's where we stood in May 2020, mid-journey and back in France on lockdown. We were facing a dilemma. On the one hand, *civic tech* innovations seemed to be fertile ground for the rise of *Smart Citizens* eager to participate in urban life and share their data. But on the other hand, our first field experiences had shown us that technology strengthens dialogue only with an urban elite of sorts, a *happy few* online citizens. But what about the others: the difficult to pin down, "silent" urban majority. How could they, be reached?

We had a revelation just before our second departure. We shared our conflicted state of mind with a friend. And he simply asked, "Are you sure the average resident even wants to get involved in urban planning?"

It was a key question. As things stand, we must answer with a negative. **We mentioned above a minority of "urban activists". But the majority of city dwellers remain cost-centric in their use of technology. They are rational, cautious, looking to save time and money... To put it simply, they are the *Economic Man* (or *Homo Economicus*) with regards to their city's services**. The pragmatic experts we met in Stockholm explained this reality to us. We questioned Anders Broberg, *Smart Cities* consultant for the city hall, about his difficulty raising interest within the population. His response was simple: "People want to live their lives. They don't have time to get involved." The message was clear.

In fact, Anders is right. It all comes down to intertemporal trade-offs[43]. We always carry out a cost and benefit ratio between gains and risk. Even when we download an app, register for a new online service, or invest in the community. We look to gain something (in terms of money, environmental impact, self-esteem) and compare that to the possible risks (for our privacy, the environment, our community, etc.). This is the rationale behind any decision to engage in a project. This reading grid helps understand why some digital services might be successes and actually used by people, while others might not. Quite logically, city residents will tend to use services when they find solid short-term gains or when relatively little effort is required. Alternatively, they will turn away from services which do not present immediate gains or require too much effort to be used.

43. This notion is a microeconomics fundamental. Cécile Maisonneuve, President of *La Fabrique de la Cité* [The Urban Factory], applied this idea on the use of new energy services, in an editorial published in late 2020.

During the first wave of COVID-19, the most sophisticated digital tools did not find their audience, while some "good old methods" of information and communication were big successes. *Homo Economicus* allows us to understand why. Indeed, everyone obviously wants to fight the spread of a virus, but who wants to take the time to download a dedicated app which would require them to always make sure they have their *Bluetooth* on? This probably explains the first struggles faced by the *StopCovid* app developed by the French Government. Available since June 2020, it had only been downloaded by four percent of the population in November 2020... We witnessed a similar and interesting example in Singapore. In March 2020, the city-state had already developed its *contact tracing* app, called *Trace Together*. But even in this tech-savvy country (and culturally more open to *tracking*), not enough people were ready to take the leap for the app to be functional. More than a month after its launch, the app had only been downloaded by a fifth of the population. Instead of creating a new app, locals preferred to stick to... *WhatsApp*. Numerous information loops were created on the instant messaging app. These official loops were simple ways to broadcast recommendations and defeat rumors, without having to ask citizens to change their digital habits. When it's simple and useful, ***Homo Economicus*** makes the "smart" choice and says yes!

However, this *Economic Man* feels less confident when it comes to personal data. While citizens are aware that there are privacy risks when using a digital service, they may not fully understand them. These risks are not concrete enough for daily life and short-term mindsets. Who truly knows what is at stake when clicking "OK" to agree for online *cookies*? Who really reads their apps' terms and conditions? We know that some risks exist. But adopting the right behavior to avoid those risks takes time, education, courage, and transparency. These efforts can seem too big when compared to the simple and immediate desire to use a service. This dive into cognition helps explain the successes of digital platforms such as *Uber* or *Airbnb*. Sure, *Uber* will have access to my data. But isn't that a small price to pay to have access to an efficient and fast transit offer? We forsee that *Airbnb* will turn cities into "open-air museums". However, isn't that a marginal problem compared to the flexibility that this service gives us today? In Tallinn, Sandra Särav, *Head of Sustainability* at *Bolt* (one of *Uber*'s main competitors) confirmed our point of view. For her, Bolt's commercial success is due to basic common sense: "Our platform is easy to use and it provides access to inexpensive services."

There remains an important unresolved question**. How do the urban *Homo Economicus* prioritize the gains associated with a service? Which comes first: monetary or time savings? Our self-esteem or positive impact on the environment?** Once again, we found key answers to this query in Stockholm. We mentioned earlier the *Royal Seaport* project. We had hoped to find state of the art *Smart Grids* in this future Swedish sustainable district. In the field we learned that these *Grids* had only been installed temporarily as part of a research project. As it turns out, the research project focused on city resident engagement. It aimed to identify the types of incentives most likely to lead to behavioral change in people's energy consumption habits. Do they prefer above all cost reductions? Or are they more sensitive to the environmental cause? The conclusion of the program is enlightening[44]. "The program found that consumers react both to financial and environmental signals, although the financial signal comes with the largest impact." How could we find a better epitome of ***Homo Economicus***?

44. The report of this study, conducted by ABB and Ericsson (among others) is available online. See: *Smart Energy City - Final Report - Stockholm Royal Seaport.* (2018).

OBSERVATION #3

PEOPLE WILL BE MORE WILLING TO ENGAGE LOCALLY — AT HOME

Having met *Homo Economicus*, new questions came forward. Does this mean that the average city dwellers will always be too selfish and greedy to ever participate in their city's transformation, with or without technology? With this very pessimistic view, the vast majority of citizens would be indifferent to the common good. Without concrete and immediate gains, any initiative to increase participation would then be doomed to failure. However, this assumption ignores another observation. No matter if we are more of an **"urban activist" or a *Homo Economicus*, we all have some connection to our *living environment*. The intensity of this attachment varies for each individual, but it always takes place locally**. It involves the streets that we take every day to get home, the fresh market we get our food from, the parks in which we sunbathe, and the transportation lines that paralyze us when they breakdown. It is also that one area that users know better than urban planners, developers, or politicians. After years of living in a neighborhood, people know it like the back of their hand. They know at what time the traffic jams appear, which shops are the busiest, when the next bus will pass, and which parks are the nicest. This local expertise, acquired through years of experience, is begging to be valued!

We engage more easily locally, around our own *living environment*. This is where and when we feel concerned on specific issues. We can see how we can contribute and which changes must be prioritized. Here, gains are concrete. Claes Johannesson, in charge of Stockholm's *Smart and Connected City* Strategy, brought us this idea: "People don't have time to devote to their city... except when it concerns their own backyard. Look at the NIMBY[45] effect."

From this, we developed the intuition that citizen engagement must be thought about locally. This is **not just because it awakens people's interest. This scale is also the right one for technology to promote local social contact and solidarity.** We saw this for the first time when we arrived in Medellín, as we set camp in *El Poblado*, a temple of North American tourists in the pre-COVID world. We were struggling to find our hostel address and looked for a way to connect our phone to the online world. Finally, in the middle of a public square, we found a way. In Medellín, all public parks have their own *Wi-Fi hotspots*. In a country where a large part of the population does not have access to unlimited internet subscriptions, this is a game-changer. These connection areas have become real spaces to gather and socialize. Rather than staying eyes glued to smartphones (like "*zombies*", some would say), the *Medellínense* that we met were taking advantage of these spaces to talk, debate and socialize. The population used to live behind locked doors during the worst years of the war between drug traffickers and guerrillas. Now, the digital transformation of their city allows them to reclaim public spaces (well, in a world without COVID-19 restrictions, and before the 2021 social uprisings occurring throughout Colombia). A few months later, from our Singapore quarantine hall, we witnessed how digital services can reinforce local solidarity. With the first lockdown, dozens of mutual aid apps between neighbors popped up around the world. In France, the *BlaBlaHelp*[46] initiative showed that city residents can use technology as a civic gesture.

45. *NIMBY*: acronym for *Not in My Backyard*. Change is fine, as long as it's not in my neighborhood!

46. *BlablaHelp*: little sister of carpooling app *BlaBlaCar*, the app allows people at risk to ask their neighbors to go shopping for them.

In Medellín, most parks have their own free Wi-Fi.

Completed in 2010, Hammarby Sjöstad has long been an eco-district model.

The previous example is striking, it shows how engaging with neighbors can contribute to a successful citizen mobilization. If my neighbor is trying the latest innovative energy solution... shouldn't I too? And why not act jointly by equipping our two apartments at the same time? And while we're at it, why not work with the entire condominium to save more energy, in exchange for municipal subsidies? With subsidized funding, we could build shared spaces dedicated to *co-working*, or install electric vehicle chargers in front of the building.

This is how neighborhood social ties can lead to successful urban engagement. They are fertile grounds to make locals adhere to testbed projects, and gradually modify their behavior. Here again, Nordic countries provide good examples. Mentioned above, the *Hammarby 2.0* initiative launched in Stockholm by former minister Allan Larsson, relied on housing associations to make *Hammarby Sjöstad* a sustainable testbed model, with beta projects like carpooling, electric car chargers, solar panels... The community of enthusiastic neighbors joined forces to attract businesses happy to work with willing residents. Across the Baltic Sea, in Helsinki, the *Kalasatama* district offers a similar scenario. There, one third of the 8,000 inhabitants have already participated in a municipal pilot project! What is the secret of such participation rate? Once again it is the sense of community that pervades the neighborhood. Michel Nader, anthropologist in charge of evaluating the *Smart Kalasatama* program, drew our attention to the activity level of the neighborhood *Facebook* group. For him, the 6,000 members (out of 8,000 inhabitants!) and their daily posts on varying topics, from a lost dog to the new waste management system, are proof of a unique sense of belonging.

Last but not least, deploying projects locally also impacts positively data protection. Here, people become aware of the use of personal data. They become more vigilant, better informed, and more alert. If a sensor or a CCTV camera is installed in my garden, I will inevitably be curious to know why, for what purpose, what type of data is used and by whom. Only then will I decide to support the project or go against it. This is what happened with *Sidewalk Labs* in Toronto. Urban routines were being disrupted and citizens found an interest in the solutions deployed. They focused on privacy risks and either decided to support or oppose the proposals. As mentioned above, the tone of the discussions and the accuracy of some arguments can be questionable. Yet, the urban awareness brought by such a debate remains obviously a good thing. In Toronto, we now know better than elsewhere how much personal data must be protected!

To discover the story of our visit of Kalasatama, click here.

OUR RECOMMENDATION: FOR A PRAGMATIC APPROACH TO CITIZEN ENGAGEMENT

Based on these observations, we believe that cities would benefit from a pragmatic approach to citizen engagement. They are now aware that they are inhabited by a minority of committed "urban activists" and a majority of responsive *Homo Economicus*. Cities would benefit from targeting these audiences. They would capitalize on the thriving energy of the former, without forgetting that they only are a minority! At the same time, they would identify the right incentives to mobilize the latter. Above all, this pragmatic approach would provide solutions to deal with the two main negative reactions that may arise regarding digital transformation:

- **The lack of interest:** The majority of city dwellers, like good old *Homo Economicus*, will not give urban projects (digital or not) the time of day, unless they perceive tangible and immediate gains. The lack of interest is thus an issue for citizen engagement.

- **The rejection:** Some urbanites sometimes see urban digital projects as threats to their privacy and personal freedom. Regardless of if they are right or wrong, they distrust and reject the projects. Rejection is a trust-related issue.

47. See: https://support.apple.com/en-us/HT207014

48. We cover this important matter in the conclusive part of this publication, as the third major challenge for *Learning Cities*.

Let's first look at people's lack of interest. The pragmatic approach pleads in favor of two reciprocal requirements:

- **First, ensuring that the efforts required for residents to engage in urban projects are minimized.** This requires developing new features with the right tools. An example is Singapore's use of *WhatsApp* to share official communication during the first wave of COVID-19. Tallinn's Chief of Innovation Toomas Türk underlined the imperative of asking as little as possible from citizens. He even spoke of an "invisible *Smart City*". Instead of developing countless new services, the city must work seamlessly, *behind the scenes*. In turn, this approach will offer an augmented urban experience, without expecting too much from citizens. In order to truly simplify peoples' lives, they need to be asked as little as possible.

- **Second, seeking to maximize the gains perceived by users when they do engage.** These gains can for instance be time, money, or self-esteem. Encouraging people to participate in local neighborhood activities is one way for them to quickly see real impact. Another way is to promote rewards and distinctions to enhance peer recognition. For example, *Apple Watches*, after tracking physical activity information like their daily number of steps, offer to challenge friends in "*7 days - competitions*"[47] to find out who is the most athletic. In the Finnish city of Lahti, the *Personal Carbon Trading* app called *CityCap* allows you to track your travel carbon footprint. If you reduce it and reach set targets, you can then earn specific rewards (like movie tickets, museums passes, free coffees, etc.). To go further, project leader Anna Huttunen who was interviewed via *Zoom* from Helsinki is now working on gamification systems to boost user engagement thanks to competitions between users.

The issue of rejection is trickier to deal with. In fact, it is as much of a problem as it is an opportunity. Sometimes people are opposed to an innovation for the wrong reasons, linked to fallacies or a lack of understanding. But often, they bring forward legitimate concerns such as privacy issues, deprivation of liberty... Technologies come with many potential liabilities. Cities must stay alert to emerging threats. **The challenge is then to raise awareness and empower citizens. They must be sufficiently enlightened on data-related issues in order to form an unbiased opinion[48].** To achieve this, we have seen that deploying technology through a local approach can be a good way to spark interest and promote awareness in a pragmatic way.

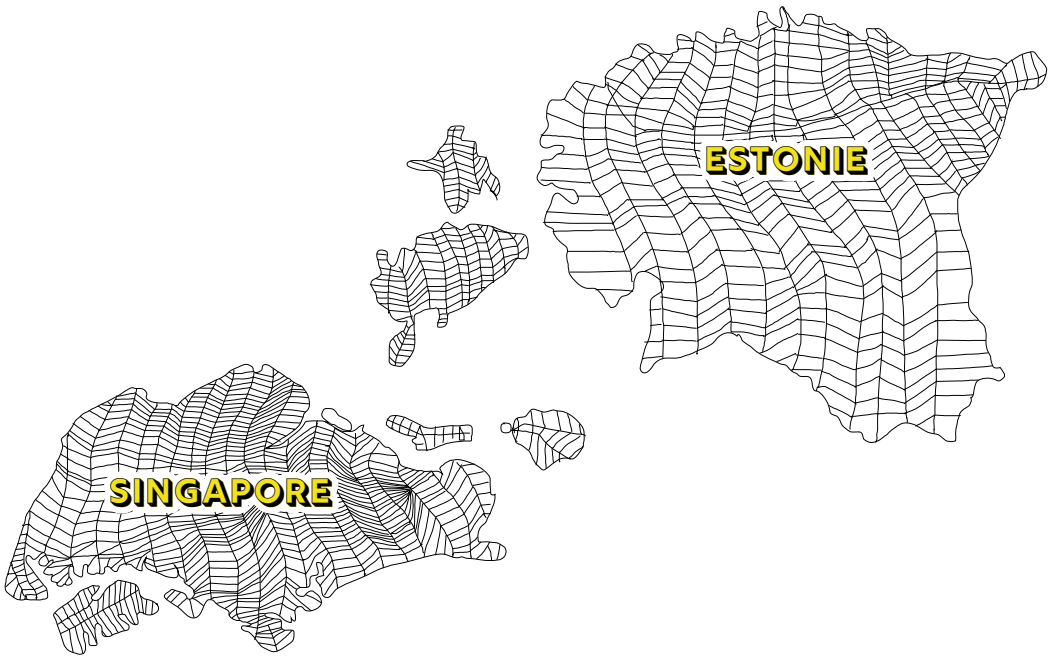
This pragmatic approach applies both in the virtual and the real world. Virtually, it consists of connecting with digital services already well used. In the real world, it implies looking for local citizen engagement opportunities. Ultimately, the essence of this pragmatic way lies in one sentence - to meet city residents on their playing field and follow their habits.

Street art in Tallin's Telliskivi district.

SMART CITY vs. SMART NATION

EXCEPTIONS TO THE RULE

FROM SINGAPORE TO ESTONIA... BEYOND SMART CITIES, DIGITAL NATIONS ONE STEP AHEAD



Of the seven cities we were able to explore, two stand out as exceptions: Singapore and Tallinn. There, we got an up-close look at the almost perfect incarnation of the fantasized *Data City* and *Smart Citizen*, nowhere to be found elsewhere. No doubt, Singapore, and Estonia, two small countries squeezed in between big threatening giants, and long occupied by foreign powers, learned faster.

EXEMPLARY DIGITAL INITIATIVES

When it comes to data processing to optimize public services, and citizen engagement through digital tools, Singapore and Estonia are one step ahead. This head start is the result of a singular culture, history, and geography.

To find out more about X-road, click here.

Let's start with *data*. Compared to the other cities we were able to study, Singapore and Estonia stand out**. In these two countries, the use of data is not limited to mere attempts to optimize "classic" urban services, such as transportation or waste management.** From health to leisure activities, every sector of the economy, every aspect of daily life, benefits from digital technology. It goes beyond operations and is about making the most of an optimized life. In Estonia, the state's data sharing platform *X-Road* is a good example. Operating on a decentralized model, this digital infrastructure guarantees fast, secure, and tracked data transfers between Estonian administrations as well as with private entities. Central state services, police, gyms, libraries, hospitals... In all, more than 1,000 entities continuously exchange data non-stop via *X-Road* to feed more than 2,900 digital services. The aim of these transfers: simplifying the daily life of Estonian citizens in every aspect. Singapore shares this mindset. The *eHealth* services developed by the city-state prove it well. The *Health Hub* portal, operated by the Ministry of Health, offers a variety of health services to Singaporeans, from online appointment booking to specific health programs ("Stay well to Stay Strong", "Eat, Drink, Shop Healthy Challenge"). It's even possible to benefit from discounts in partner stores thanks to *Health-points* that can be earned on the app through these programs! The goal is the same as in Estonia but expressed here in an even louder voice: **to enhance all areas of life through data.**

With its 350 parks and 4 nature reserves, Singapore calls itself the « *City in a Garden* ».

What is true for data is also true for urbanites. **In Singapore and Estonia, we were struck by the natural appropriation of digital services by the population.** Let's take a look at a few examples. In April 2020, Singapore uploaded an additional feature into its crowdsourcing app[49]. Quite unusual (to say the least), this feature allowed people to report social distancing violations with their phone. While this use may be of concern in Europe, it is not for Singaporeans: two days after the app was upgraded, the authorities were already recording 700 notifications per day! Such speed to get acquainted with a new feature – and a noteworthy one! – is impressive. In Tallinn, we witnessed the same attachment to digital service: 96% of Estonians do their tax declarations online, even though it's not compulsory, and 50% of election votes are cast online[50]. Naturally, this "digital culture" within the population did not fall out of the sky. Rather, it is the result of a long-term learning process, of a specific education strategy... Singapore and Estonia's digital head start comes from national public policies, which go beyond the city perspective.

NATIONWIDE STRATEGIES

Long occupied, Estonia has only been independent since 1991.

Tallinn and Singapore share a unique strength. Their digital strategies go beyond the jurisdiction of the city and its area of expertise. Regardless how *smart* these cities might be, what truly matters is how *smart* the nations are. For 20 years, Estonia and the Asian city-state have embarked on the creation of a digital identity at the national level. Two brands were born from this differentiation strategy: Singapore's "*Smart Nation*" initiative, and the "*e-Estonia*" program. Their ambition? To use the country's digitalized services and its simplified day-to-day life as a means to attract investments and talents on the international scene. Abroad, *Smart Nation* and *e-Estonia* represent the two states' singular ways. There, and much more than in most other countries, digital technologies occupy a central role. **Not only are these "digital nations" structured and organized online, but public and private actors, hand in hand with the population, all share a digital culture**.

This moves us away from the *Smart City* concept. In these two countries, the nation collides with the city, which disappears in favor of the state. As a matter of fact, there is no municipal level in Singapore, where every digital project is a state matter. In Tallinn too, the municipality does not have an actual defined *Smart City* strategy, unlike most of the cities we studied. Instead, it capitalizes on its status as the capital of *e-Estonia* to position itself in the realm... And it works, visit the *e-Estonia Briefing* Center, you'll want to invest!

How can we explain the rise of these two "digital nations"? Let's first reset things in their geographical and historical contexts. Notably, these are two relatively small countries. Estonia is roughly ten times smaller than California. Singapore is smaller than the Greater Paris. However, in this case, their size (and small population) is an advantage: implementing policies at the scale of the whole territory requires less time and less investment. On the downside, their small size also means that they can be vulnerable targets. To make things worse, they are both precisely located in strategic geopolitical positions. On one side, Estonia is a real gateway between Scandinavian countries, Russia, and continental Europe, and has long endured the territorial ambitions of its neighbors. Throughout its history, it suffered periods of occupation and regained its independence only with the fall of the USSR in 1991. For its part, Singapore is a required stop for all ships seeking routes linking the Indian and Pacific Oceans. This explains among many other reasons why the British Empire hung on to it as long as possible until 1963. With parallel histories, the two nations sought to be recognized as new independent powers thanks to digital technologies. No need to dive deep into political fiction to understand why Singapore wants to stay one step ahead of Chinese global cities... Nor to understand why Estonia must be able to defend itself against possible Russian attacks, whether through cyber or armed forces. In fact, the small Baltic country was the first nation to face a series of massive cyber-attacks carried out by Russian hackers in 2007. Ten years later, Estonia also became the first country in the world to build a *data embassy* - a digital copy of its *Cloud* and its administrative databases outside its borders, nestled within the walls of its embassy in Luxembourg.

That leaves us with an unanswered question: can we replicate these digital nations elsewhere? Should we be inspired to emulate them? This is a good question. In fact, the geopolitical and historical contexts of these two nations are such that any attempt of exportation will be difficult, if not impossible. Researcher and urban planner at the *Future Cities Laboratory* in Singapore, Fabien Clavier shares this point of view: "We cannot speak of a *Singaporean model*. The Singaporean experience is unique because it is a city state, which makes it very difficult to replicate to other cities." The same reasoning plays out for an *Estonian model*. **While these two countries can be admired for the digital culture they have managed to build and the digital services they have developed, their exemplification must nevertheless be treated with caution. They do not embody the *Smart City* ideals and remain exceptions**. Their virtue is to remind us that when it comes to digital transformation, the city must not act alone. The state also has its role to play.

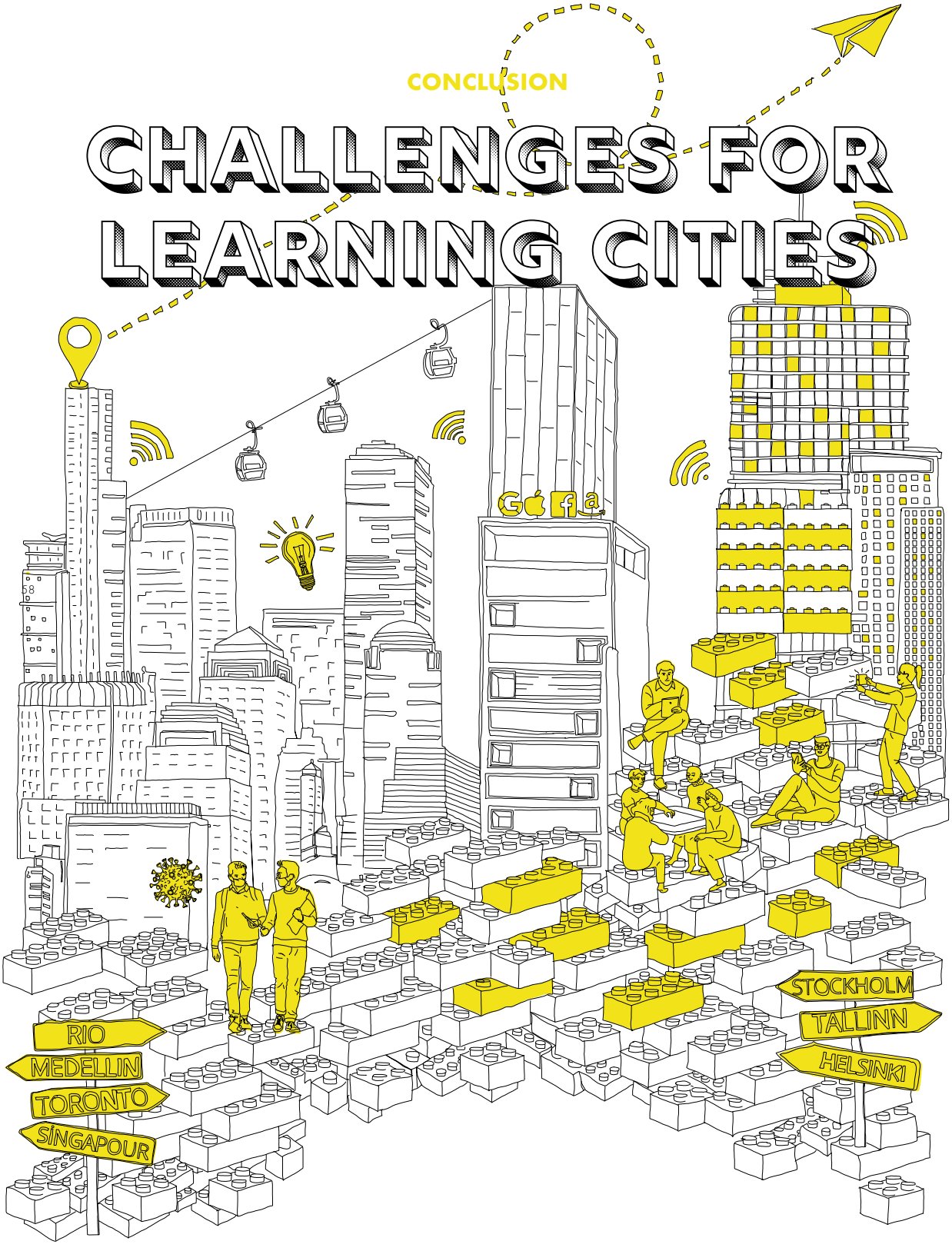
49. The *One Service App* is meant to allow residents to report everyday problems (a waste bin that has not been collected, a streetlight out of order, etc.).

50. As a comparison, 60% of French tax households declared their income online in 2017. Online voting does not yet exist on a national scale in France.

For the full interview with Fabien Clavier, click here.

CONCLUSION

CHALLENGES FOR LEARNING CITIES



Seven very different cities on three continents, hundreds of meetings, and two epidemic waves in the midst... This one-year long journey has taught us a great deal. Before our departure, we had an idealized and fantasized vision of *Smart Cities*. Not anymore. Instead, we have built, meeting after meeting, exploration after exploration, platform after platform (we could go on like this for a long time!), a more nuanced, solid, and concrete understanding of how the real world is unfolding digital technologies in urban environments. **In the field, we did not come across *Smart Cities*, but *Learning Cities*. Cities that fumble, experiment, test, fail and at times succeed. Cities learning how to make better use of new technologies.**

The cities we studied revealed that this learning phase remains essential, because the *Smart City* concept faces two limits. **First, the impact of data use on urban services is still relatively limited.** To compensate their difficulty to change quickly and the shortcomings of immature technologies, cities have adopted an experimental approach to *data*. This takes the form of testbeds or specific research projects, primarily intended to provide proof of concept for technological solutions. **As a second limit to the *Smart City* concept, cities still have to adapt to the inhabitants' lack of engagement, which sometimes turns into distrust when misunderstandings arise.** Faced with pragmatic city dwellers, cities often struggle to find sufficient incentives to encourage citizens to participate in urban renewal, to change their habits or to adopt digital services that are useful to the community. Admittedly, perhaps these two observed limitations are temporary, and in a few years, cities will eventually be "data-driven". Perhaps this will lead to considerable changes in the way we live in those cities. However, from the perspective of the ones we have studied, there is still a bit of time to get ready.

Therefore, rather than referring to them as *Smart Cities*, we prefer *Learning Cities*. Not to replace one buzzword with another, but to better reflect how the cities we studied are acting vis-à-vis digital technology. We are not claiming to create a new abstract concept. We simply looked for a more accurate way of labelling cities across the world that are learning. They are learning to capitalize as much as possible on their data. They are testing new solutions. They are often making mistakes. They are also learning to establish a fruitful and peaceful dialogue with their residents. They are trying and often struggling to raise awareness about personal data protection. Of course, these *Learning Cities* remain very different from one to the other. In fact, they use digital technology with their own agendas, depending on their distinctive histories and their specific contexts. Not to mention, they also differ from a technological point of view, as some are not as advanced as others. **Nevertheless, when tackling the digital transformation and *Smart City* projects they are all on the same learning curve**.

But how can we ensure that this learning yields results? During our study, we identified four challenges for these *Learning Cities*. Going beyond data management or citizen engagement, there are more fundamental *across the board* issues that cities must dig into when engaging in digital technology and innovation in general. In our opinion, **these four challenges are proper prerequisites for the successful digital transition of these *Learning Cities*. If they are satisfied, maybe then will we be able to talk about *Smart Cities*?**

CHALLENGE #1 : ACQUIRING A LONG-TERM VISION IN THE IMPLEMENTATION OF DIGITAL PROJECTS

The first challenge for Learning Cities is considering the long term. Too often we have come across interesting initiatives or services which, after a few years without investments or prospects, became useless. Yet, cities have a direct interest in developing a long-term vision when implementing new digital projects. A sensor, no matter how sophisticated, will always require maintenance, repairs, and updates. Likewise, the people who want to get involved and use these new tools must be taught, trained, and have access to proper support. **All of this takes time and needs to be taken into account by cities when developing their strategies.**

Some cities are already trying with success. Stockholm is a good example. Indeed, the Swedish capital is aiming to be carbon neutral by 2040. To achieve this goal, the city has been developing long-term projects ready to adapt over time thanks to continuous improvement models. For instance, each year the city publishes a *Sustainability Report* on the future *Royal Seaport* eco-district (mentioned above). The idea is to assess the energy performance of new buildings. If the targets are not met, developers must rectify their work, correct their errors, and become more collaborative. Why? To make sure that future buildings meet the criteria and are more efficient. According to the project's Sustainability Strategist, Christina Salmhofer, the long-term collaboration between the city of Stockholm and the 55 developers of the *Royal Seaport* is also an essential condition to its success.

Another crucial issue is that of obsolescence. Even though endorsing and adopting solutions takes time, the technology race does not wait. In fact, by the time sensors can be deployed on a large scale after their test phase, new and more efficient solutions often emerge. A new up to date solution will also in turn require its own test phase. This highlights a legitimate and delicate dilemma for cities: should they focus on today or tomorrow? Indeed, they must get ready to see the solutions they're working on today be overtaken by those of tomorrow. As soon as a solution will prove to be worthwhile, it will become an obsolete antiquity compared to the latest innovations. **A long-term digital strategy, based on regular assessments, adaptability, and dynamic updates of the projects undertaken seems to be the best way to deal with the challenge of obsolescence.**

CHALLENGE #2: LEARN TO FOSTER BETTER COLLABORATION BETWEEN ALL STAKEHOLDERS

To discover Medellín with us, click here.

With the development of digital solutions for the *Smart City*, the roles of many private actors, academics, and citizens have been profoundly revisited. Data collection or the creation of new services requires the involvement of both public authorities and new stakeholders within the urban ecosystem. Cities must therefore learn how to collaborate with these stakeholders as they disrupt the status quo with their new projects. The recent buzz around electric scooter operators colonizing cities is a good example. Just like the rise of private digital platforms such as *Airbnb*, which required the rethinking of laws and regulations. ***Learning Cities* are then challenged to find a balance between promoting innovations and regulating the private players who are providing the solutions.**

To meet this challenge, cities must rethink the way they work with private actors and imagine new partnership models. In this regard, Toronto's *Sidewalk Labs* experience is inspiring. Getting past the debates on the proposed solutions, the real novelty of the project is, in our opinion, the role of *Innovation and Funding Partner* (IFP) given by the City of Toronto to *Google's* sister startup. More than a traditional developer, IFP aimed to become a longer-term "execution and co-creation" partner. Present throughout the district's revitalization process, this new actor would work hand in hand with the municipality to identify needs, imagine solutions, and deploy them. This new approach, geared towards co-construction, rings a bell to the one tested by Stockholm with the developers of the *Royal Seaport*.

In addition to the private sector, cities must also include academics and residents in their innovation process. This has been key to Medellín's transformation success in recent years. Relying on collaborative urban planning, the Colombian economic capital has managed to include the insights of its residents and the recommendations of researchers in various development projects. Thus, the initiative promoted a less unequal and more enjoyable city. In the same way, Tallinn seeks to capitalize on researchers' expertise. Enticing *TalTech University* to test solutions *in situ*, the Estonian capital has started to install sensors on autonomous vehicles capable of monitoring parking across the city[51]. This is proof that a multistakeholder approach is worth the try.

As they create new collaborative frameworks including different stakeholders, *Learning Cities* will be able to break silo effects on their digital projects. Only then will they be able to make the best use of their data.

51. The project is called *Iseauto*. https://iseauto.taltech.ee/en/

CHALLENGE #3 : TURNING CITIZENS INTO VIGILANT AND CLEAR-HEADED AGENTS WHEN IT COMES TO DIGITAL TECHNOLOGY

In the *Learning City* as in any other area, digital technology is often discussed and mistrusted. We were witnesses to this debate in Toronto with the *Sidewalk Labs* project, and then again in France on the thorny issue of 5G. This debate locks cities in a dilemma: when residents' mistrust originates from a lack of comprehensive understanding, should digital solutions be introduced without the population's buy-in? Or should a potentially beneficial innovative product be discredited by taking into account unjustified critics? **To escape from this dilemma, cities must create the conditions for a constructive and amicable discussion on digital technology**. **Make no mistake, rejecting debate is not under consideration. Rather, the question lies on how to ensure a robust conversation in a healthy and productive environment.**

Digital debate and communication are essential in our cities, especially at a time when certain uses of data or technologies can influence behaviors, reduce our free will and liberties, or have harmful effects on our health and the environment. To be successful, this debate requires that everyone understands and masters the subject. Citizen awareness on complex digital issues must therefore be raised. Most importantly, the most vulnerable and those who are the most alienated from the subject cannot be circumvented before engaging in conversation. Obviously, states have a crucial role to play here. Singapore and Estonia, two examples of particularly advanced digital nations, have been deploying numerous education policies. For example, *the Singapore Digital Office* has initiated a *Digital Ambassador* program to entice young Singaporeans to help seniors navigate e-services. In Estonia, dozens of *Smartlabs* have been built to educate young people on new and digital technologies in order to encourage them to move towards these promising sectors.

At the city level, where new digital projects are being rolled out, these awareness programs are opportunities to give voice to citizens. They provide the grassroots for a common and shared vision. This is for instance the mission of the *Connected Communities* initiative. Launched in 2018 by the City of Toronto, it was born after the first hurdles of *Sidewalk Labs*. The idea of this program is to create an evaluation framework for digital urban projects based on principles defined by the citizens themselves. Still under construction, this *Digital Infrastructure Plan* will not be operational until 2022. Nevertheless, it places Toronto at the forefront of discussions on the role digital initiatives can play within the city[52].

Raising awareness among urbanites to make them vigilant and clear-headed agents regarding digital technologies is the third challenge for *Learning Cities*. In Rio, Cristina Mendonça, who led the projects for the *C40 Cities* organization in the Cidade *Maravilhosa*, sums it up elegantly: "A *Smart City* is a municipality populated by conscious people." It's time to awaken urban consciousness, to create the grounds to root informed debate.

52. To learn more on this new approach, take a look at the *Discussion Guide* used during the first public consultation on the future *Digital Infrastructure Plan*, available on the City of Toronto website (Cf. Bibliography).

CHALLENGE #4: FOCUS ON ART AND CREATIVITY AS DRIVERS OF TRANSFORMATION IN THE DIGITAL CITY

To visit Tartu with us, click here.

How can the invisible become visible? In essence, data is virtual. The lines of code and algorithms do their work in the closed cell of the *data center*. Information circulates instantly, without anyone realizing it. To make the *Smart City*'s abstract mechanisms tangible, art can offer real solutions. **This is the latest challenge for *Learning Cities*: to bet on creativity to make digital transformation visible to residents and offer them a new urban experience**. Several initiatives of this type caught our attention**.** On the very the first days of this journey, in Rio, we explored the *Porto Maravilha* district, a "cultural corridor" within the city center. At the heart of this new development, the *Museu do Amanhã* (Museum of Tomorrow) uses digital technology to offer a new museum experience to curious visitors. Later in Singapore, we took advantage of our few days of freedom to stroll around the famous *Super Trees*. With their unique technology, these connected and intelligent trees invite us to rethink our relationship to nature in the city. Right after that walk, the *ArtScience Museum*'s exhibition, titled *2219 Futures Imagined,* propelled us into a futuristic and imaginary Singapore. Months later in Tartu, Estonia's second largest city, we discovered the European *SmartEnCity* initiative. This renovation program focused on technological and energy innovations to give a second life to 18 former Soviet buildings. In order to give more visibility to this transformation, the facades of each building were painted by different artists. Result: the *smart* renovated buildings can be identified at first glance. These experiments combining city, art and digital technology invite us to question our foregone conclusions about urban transformations. As they appeal to our senses, they showcase the visible behind the lines of code.

53. Martel, F. (2018). *Smart: The Digital Century*. HarperCollins.

Pairing nature with technology, the Singapore Super Trees are equipped with water collectors

Beyond art, citizen creativity can also bring out new perspectives of innovation for cities. French journalist Frédéric Martel, who published in 2014 – 2018 for the English version – *Smart: The Digital Century*[53] and who followed us throughout this journey, often told us that it is no coincidence that the great innovations of the end of the twentieth century were born at the heart of countercultures, in the alternative cradles of *Silicon Valley*. For him, creativity and technological innovations are intimately linked and feed off each other: from the *Beat Generation* to *Google,* there is only one step! With this in mind as they rethink their relationship to digital, cities must now reconcile data scientists and artists. This is why Tallinn's *Creative City* (the city's trendy *hipster* mecca) attracts European *digital nomads,* mixing art and tech in a unique atmosphere. Believe it or not, this is also where we based our Estonian HQ, and where this one last line is being written.

MERCI !

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Richard Gomes, Director of *Business France Latin America & Brazil*
Augusto Barros de Figueiredo, Legal Manager – Former Head of Dispute Prevention and Resolution / Infrastructure at Organizing Committee for the *Rio 2016™* Olympic and Paralympic Games
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BIBLIOGRAPHY

01. Courmont, A. (2018, November). *Où est passée la smart city ? Firmes de l'économie numérique et gouvernement urbain* [*Where has the Smart City gone? Digital firms and urban governance*]. [Working Paper Sciences Po Urban School].
Available at: https://spire.sciencespo.fr/hdl:/2441/8u0sebbjd9p3b8jjk48tigd16/resources/wp-02-2018-courmont.pdf

02. Cohen, B. (2014, November 20). *The Smartest Cities In The World*. Fast Company.
Available at: https://www.fastcompany.com/3038765/the-smartest-cities-in-the-world

03. AmCham France. (2019, November). *Human Cities - Pour en finir avec les « smart » cities* [*Human Cities – To put an end to "smart" cities*] [White Paper]
Available at: http://amchamfrance.org/wp-content/uploads/2019/11/Rapport-de-lAmCham-sur-les-smart-cities.pdf

04. Courmont, A. (2016, December). *Politiques des données urbaines. Ce que l'open data fait au gouvernement urbain* [*Urban data policies. What open data does to city council.*]. [Thesis]
Available at: http://www.urbanisme-puca.gouv.fr/IMG/pdf/courmont_antoine_resume.pdf

08. Freedman, D. H. (2019, November 18). *How Medellín, Colombia, Became the World's Smartest City*. [Press Newsweek]
Available at : https://www.newsweek.com/2019/11/22/medellin-colombia-worlds-smartest-city-1471521.html

09. Lecha, F. (2013, November 21). *Smart City Expo World Congress chooses Rio de Janeiro as the best smart city of 2013*. [Fira de Barcelona Press Release]
Available at: https://www.firabarcelona.com/en/press-release/uncategorized/smart-city-expo-world-congress-chooses-rio-de-janeiro- as-the-best-smart-city-of-2013/

10. Georges, B. (2020, May 15). *La « Google City » de Toronto ne verra jamais le jour.* [*Toronto's "Google City" will never see the light of day*]. [Press Les Echos]
Available at: https://www.lesechos.fr/idees-debats/sciences-prospective/la-google-city-de-toronto-ne-verra-jamais-le-jour-1203256

12. *Waterfront* Toronto's MIDP Evaluation Consultation (2019, February). *Quayside Discussion Guide Round 2 Consultation*. [Online publication]
Available at: https://quaysideto.ca/wp-content/uploads/2020/02/Quayside-Discussion-Guide-Round-Two-Consultation-February-18-2020.pdf

15. Think Smartgrids. (2015, November 2). *Les Smart Cities françaises passent aux Smartgrids.* [*French Smart Cities switch to Smartgrids*]. [Online]
Available at: https://www.thinksmartgrids.fr/actualites/ les-smart-cities-francaises-passent-aux-smart-grids

16. Swedish Energy Agency. (2015, March 17). *Smart Grid in The Stockholm Royal Seaport will integrate the entire electricity supply system – from refrigerator to harbour*. [Website]
Available at: https://www.energimyndigheten.se/en/news/2010/smart-grid-in-the-stockholm-royal-seaport-will-integrate-the-entire-electricity-supply-system--from-refrigerator-to-harbour

Juskaite, L. (2014). *Smart grid implementation in Stockholm's Royal Seaport project – S.W.O.T. analysis.* [Degree Project in Regional Planning, KTH University, School of Architecture And the Built Environment.]
Available at: https://www.diva-portal.org/smash/get/diva2:729150/ATTACHMENT01.pdf

23. Les Echos (2017, November 19). *Bill Gates va construire sa « smart city » en plein désert.* [Online Press Les Echos].
Available at: https://www.lesechos.fr/2017/11/bill-gates-va-construire-sa-smart-city-en-plein-desert-187889

24. «Toyota Newsroom. (2020, January 7). " '*Woven City*' *a prototype city where people, buildings, and vehicles are connected through data and sensors.*". [Press Release Toyota]
Available at: https://global.toyota/en/newsroom/corporate/31221914.html

25. O-Mag (2019). *Taltech and Thinnect are building world´s largest smart city sensor network in Tallinn*. [City website Tallinn.ee.]
Available at: https://www.tallinn.ee/eng/tallinnovations/Uudis-Taltech-and-Thinnect-are-building-world-s-largest-smart-city-sensor-network-in-Tallinn

28. Chauvot, M. (2020, April 11). *La smartcity de Dijon passe le test du coronavirus* [*Dijon's smartcity passes the coronavirus test*]. [Press Les Echos].
Available at: https://www.lesechos.fr/industrie-services/immobilier-btp/la-smartcity-de-dijon-passe-le-test-du-coronavirus-1194249

29. Govtech Singapore. (2020). *Responding to COVID-19 With Tech* [Website].
Available at: https://www.tech.gov.sg/products-and-services/responding-to-covid-19-with-tech/

30. Courmont, A. (2020, April 10). *Coronoptiques : dispositifs de surveillance et gestion de l'épidémie* [*Digital Coronoptics: surveillance and management devices in a time of pandemics*]. [Article LINC. The CNIL'S Digital Innovation Lab].
Available at: https://linc.cnil.fr/fr/coronoptiques-14-dispositifs-de-surveillance-et-gestion-de-lepidemie

33. Gufflet, B. & Kremp, D. (2020, June 17). *Technologie, grands événements, résilience : quelles applications locales des modèles urbains globalisés ? Les cas de Rio de Janeiro et Medellín, en Amérique latine.* [*Technology, major events, resilience: what local applications of globalized urban models? The cases of Rio de Janeiro and Medellín, in Latin America.*] [Website] La Fabrique de la Cité.
Available at: https://www.lafabriquedelacite.com/publications/technologie-grands-evenements-resilience-quelles-applications-locales-des-modeles-urbains-globalises-les-cas-de-rio-de-janeiro-et-medellin-en-amerique-latine/

35. InvestinOntario (2019, May 6). *Toronto adds more tech jobs than Seattle, the Bay Area and Washington*. [Website]
Available at: https://www.investinontario.com/spotlights/toronto-adds-more-tech-jobs-seattle-bay-area-and-washington-dc-combined

37. Sidewalk Labs. (2019). *Master Innovation and Development Plan*. [Report]
Available at: https://sidewalk-toronto-ca.storage.googleapis.com/wp-content/uploads/2019/06/23135500/MIDP_Volume0.pdf

39. *Waterfront* Toronto's MIDP Evaluation Consultation. (2019, February). *Quayside Discussion Guide Round 2 Consultation.* [Report]
Available at: https://quaysideto.ca/wp-content/uploads/2020/02/Quayside-Discussion-Guide-Round-Two-Consultation-February-18-2020.pdf

42. Medellín Cómo Vamos. (2020, February 11). Kit para la construcción del Plan de Desarrollo de Medellín, 2020-2023 *[Kit for the construction of the Medellín Development Plan, 2020-2023]* [Website].
Available at: https://www.medellincomovamos.org/download/kit-para-la-construccion-del-plan-de-desarrollo-de-medellin-2020-2023

43. Maisonneuve, C. (2020, October 2). *Numérique et transition énergétique : en finir avec le paradoxe de l'Internet. [Digitalization and energy transition: putting an end to the Internet paradox.].* [Website La Fabrique de la Cité]
Available at: https://www.lafabriquedelacite.com/publications/numerique-et-transition-energetique-en-finir-avec-le-paradoxe-de-linternet

44. Stockholm Royal Seaport. (2018). *Smart Energy City – Final Report – Stockholm Royal Seaport.* [Report]
Available at: https://docplayer.net/124253262-Smart-energy-city-final-report-stockholm-royal-seaport.html

52. City of Toronto. *Connected Community / Smart City TO.* (2021, January 11). [Website]
Available at: https://www.toronto.ca/city-government/accountability-operations-customer-service/long-term-vision-plans-and-strategies/smart- cityto

53. Martel, F. (2018). *Smart: The Digital Century.* [Book] HarperCollins.

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In 2020, we traveled the world.

We, Ben and Dim, are two young graduates from Sciences Po and HEC Paris Business School. For a whole year and with two pandemic waves as a backdrop, we explored and studied seven global cities on three different continents. Our goal? To see if the abstract concept of *Smart City* holds up in the reality of diverse, changing cities, which face ever-increasing risks. How can digital technologies make these cities more efficient? What roles should their inhabitants play in this digital transformation?

By gradually disentangling the great fantasies around *Smart City* – those of a city governed by data and populated by blissful inhabitants in the face of technological innovations – we are drawing the outlines of a more nuanced reality. In 2020, while the digitization of our lives has further accelerated, it is not *Smart Cities* that we have visited, but rather *Learning Cities*: cities that fumble, experiment, often fail, and sometimes succeed. Cities that, step by step, are learning to use digital tools.

Visit these seven cities through this immersive and interactive report. Scan the QR codes as you read, we'll take you with us! (Smart right?)

ACROSS THE BLOCKS
A JOURNEY INTO SMART CITIES

Co-written by
Benoît Gufflet and Dimitri Kremp

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