# Smart City or How to Go to City Hall through the Cloud

Marianne Côté

A Thesis

In

The Department

Of

Communication Studies

Presented in Partial Fulfillment of the Requirement for the Degree of Master of Arts (Media Studies)

Concordia University

Montréal, Québec, Canada

September 2017

**CONCORDIA UNIVERSITY**
School of Graduate Studies

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By: Marianne Côté

Entitled: Smart City or How to Go to City Hall through the Cloud

and submitted in partial fulfillment of the requirements for the degree of

Master of Arts (Media Studies)

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Signed by the final examining committee:

Maurice Charland Chair

Martin French Examiner

William J. Buxton Examiner

Fenwick McKelvey Supervisor

Approved by _____
Chair of Department or Graduate Program Director

_____
Dean of Faculty

Date September 5, 2017

## ABSTRACT

**Smart City or How to Go to City Hall through the Cloud**

On the campaign trail in 2013, then-mayoral candidate Denis Coderre promised to transform Montréal into a smart city. Since then, the city released a strategy and action plan, established the Smart and Digital City Office and introduced several projects as 'smart' initiatives. Still, what is a smart city and what does it mean to be smart? First, this thesis demonstrates that even if the smart city concept is often seen as 'new', it includes many central elements found in the early days of computing technology. Second, this research draws some parallels between the past and the present when it comes to justifying a new urban paradigm. Then, using critical discourse analysis and interviews with two key actors in the Montréal city apparatus, this thesis will reveal how the model was put in place, as well as some of the challenges that the administration faced in the process. By focusing on the regional development of Montréal, Québec, Canada as a smart city, this thesis hopes to make a meaningful contribution to the discussion about the relationship between technology, politics and the future of cities.



**Marianne Côté**

**Concordia University, 2017**

## ACKNOWLEDGEMENTS

Je voudrais dédier ce mémoire à mes parents, Louise et Marc-André, qui m'ont toujours soutenu dans mes projets. C'est grâce à vous que j'ai pu me rendre aussi loin. Sophie, Caroline and François - ma chère fratrie. Je vous aime.

I want to thank my supervisor, Fenwick McKelvey, for providing me with advice and guidance throughout my entire research process. Thank you for giving me the space to develop my own ideas, to discover new topics, to pursue new goals. Thank you for always treating me like an equal. It was a true privilege to work with you.

À mon cher Salim, mon partenaire, mon meilleur ami, mon cœur. Merci de ton incroyable patience à travers ce processus parsemé de stress, de syndrome de la page blanche et de doutes. Tu n'as jamais cessé de croire en moi, même dans les moments les plus difficiles. J'ai hâte d'entamer un nouveau chapitre de ma vie avec toi, peu importe la forme qu'il prendra. Je t'aime.

Merci à mes ami.e.s qui m'ont donné leur écoute et leur solidarité en cours de route. Je voudrais particulièrement remercier mon ami Eddy Pérez pour son soutien constant au cours de ces dernières années. Ta persévérance, ton dévouement pour les causes qui te tiennent à cœur ont toujours été un exemple à suivre pour moi. Un énorme merci également à mon ami Zachary Rosentzveig, Expert au cœur tendre, qui a accepté de réviser mon mémoire avant son dépôt final. J'attends avec impatience nos discussions sur le futur de la technologie et l'éventuelle domination du monde par les robots. Merci aussi à Jérémy Boulanger-Bonnelly d'avoir assisté à ma défense de mémoire. Ta présence m'a aidé à garder une attitude positive et à répondre aux questions qui m'étaient posées avec confiance.

Finally, thank you to my MA cohort (especially to Taghrid, Alicia and Lori), to the Communication Studies department, my professors and the staff at Concordia University for making me feel part of a community. I will always be grateful for this wonderful learning experience.

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# INTRODUCTION

"To create a smart city is not a fad. A smart city is more than a connected city. It's not the solution to all problems, but it's an excellent way to reach and empower citizens and to shape a greener, richer and more efficient city." This is a quote from Denis Coderre, translated from French. He was speaking at a conference on new technologies when he was running for mayor of Montréal (Marchal, 2013). His promise to turn the city smart became a central part of his campaign. It was listed among his seven top priorities when he made his candidacy official on May 16, 2013 (Bourgault-Côté, 2013). He reiterated this priority repeatedly over the course of the campaign, including during his opening statement at the Webcom conference the following month (Fortier, 2013). He was later elected mayor of Montréal on November 3, 2013.

It was not the first time that I heard the term, but I was curious to see how the newly elected municipal government would carry out his promise. As time passed, I noticed that the city would tag several projects and initiatives as 'smart,' and began to wonder why. As a citizen of Montréal, I wanted to know how living in a smart city would affect my everyday life and how it would impact my governing institutions. What is a smart city, and what does it mean to be 'smart'?

My thesis studies the underlying myths behind the smart city through a discourse analysis of a key document and elite interviews. By 'myth,' I draw on the work of seminal political economist Vincent Mosco, whose book *The Digital Sublime* tracked those behind "The Age of the Computer" (Mosco, 2004, p.2). He defines 'myth' as "seductive tales containing promises unfulfilled or even unfulfillable" (Mosco, 2004, p.22). He mostly develops on this idea of the technological sublime or the digital sublime when talking about the myth of cyberspace. The sublime "achieves transcendence through astonishment, awe, terror, and psychic distance" (Mosco, 2004, p.23). He argued that it is imperative for us not to simply see myths as "falsehood" and to dismiss them, but rather that we should try to decipher their importance for our culture. I was particularly interested in his method. He looked at various declarations and statements attached to the radio, to electricity, and to television, among other media, to reveal how history seems to repeat itself when it comes to describing the potential of new computing technology. Most of these historical accounts were overwhelmingly positive: nearly all speakers would declare that the technology they were describing would dramatically transform their ways

of life. To the people that were becoming familiar with this technology, it belonged to the realm of the sublime. Like Mosco, I could not help but notice a similar tendency nowadays when it comes to the perceived capacity of ICTs to revolutionize our world. Therefore, in my first chapter, I attempt to demonstrate that there is a "historical amnesia about technology" (Mosco, 2004, p.117) when it comes to using technology as mainframe for governmental policymaking. I intend to do so by looking deeper into the historical cases mentioned by Townsend, as well as others, to suggest that the smart city is a version of the technological sublime brought to the urban world.

In less than 50 years, 66% of the world population will live in urban areas (United Nations, 2014). The cities of the future will be bigger and more complex. Therefore, how governments choose to tackle this challenge will determine our collective future. If the smart city is the narrative that will guide this future, we must come to a better understanding of its possible effects.

**Understanding the Concept**

Montréal is not the first smart city in the world. There are several examples of smart city initiatives globally. The Dutch city of Eindhoven uses its LED system to control lighting based on whether or not pedestrians or cars are actually using them (Braw, 2014). In terms of traffic management, a major urban issue, many cities designed an intricate surveillance system composed of cameras and sensors in order to control the flow of vehicles, and to ensure that emergency services may respond to accidents in an effective manner. An example of a traffic management project is Manila where, thanks to a partnership between the World Bank and three ridesharing companies, the city was able to open its traffic data to the public (The World Bank, 2016). Closer to home, the city of Vancouver reported that over 35,000 people worldwide contributed to the making of their "Vancouver Greenest City 2020 Action Plan," either online through social media or in face-to-face meetings (City of Vancouver, 2012, p.6), a clear example of collaboration between administration and citizens. Of course, a textbook case of a smart city would be SongDo, South Korea. SongDo International Business District is a city that was entirely built from scratch with sensors, ubiquitous computing and cutting-edge technology (Townsend, 2013, p.23-31).

The smart city could revolutionize the city as we know it today. Antoine Picon, professor at the Graduate School of Design at Harvard University, went as far as to compare it to the Industrial Revolution of the 19th century (Picon, 2015, p.154). In his book titled *Smart Cities: A Spatialised Intelligence,* he argued that the city itself would become a cyborg construction: "the entire city could be considered intelligent in a new way, founded on the interaction and composition of the perceptions and deliberations of multiple entities: human, non-human and often a mixture of the two" (Picon, 2015, p.11). In the meantime, the smart city could offer new opportunities for citizen engagement. If an administration could harness technology in order to get feedback on its projects, it could lead to better results. If it could develop new smartphone applications or websites to tackle a targeted issue, it would better answer the needs of citizens. If the smart city could answer the growing demand for a more open government, it would strengthen municipal democracy; the smart city would clearly have a positive impact. Some would say that the vision of the "public agora" that technology could help create is desperately missing from the "utopian imaginaries of the smart city" (Vanolo, 2016, p.35). Giovannella, Dascalu and Scaccia (2014) argued for citizen empowerment to become the defining feature of an intelligent city, a place "where the human capital, (and more in general each individual/citizen) owns not only a high level of skills (possibly innovative ones), but is also strongly motivated by continuous and adequate challenges, while her/his needs are reasonably satisfied" (p.85). In other words, many authors understand a "smart city" as having "smart citizens" rather than just "smart technology." In this future city, citizens feel fulfilled. One can see that the smart city model carries within itself the hopes that it will create a more sustainable, democratic and prosperous future for all.

However, there are also many potentially problematic aspects to the concept. Robert G. Hollands, published in 2008, wrote one of the key articles on the smart city. The article commented on the general confusion surrounding the concept and offered some guiding principles for future smart cities. First, Hollands pointed out the lack of definition for the concept, but he also argued against using other related terms — such as cyber city, wired city, or knowledge-based city — as synonyms rather than differentiate them as clearly separate concepts (Hollands, 2008, p.306). He also critiqued the self-congratulatory tendency that surrounded the 'smart' label, meaning that some administrations preferred to simply market themselves as such without implementing concrete changes (Hollands, 2008, 305). Moreover, he pointed out that

there are numerous assumptions about the smart city, especially when it comes to the potential of ICTs: it is taken for granted that using more technology is inherently a good thing. For example, he is concerned that many tend to value the smart city as a sustainable model, but then ignore the amount of waste produced both when manufacturing computers and when discarding technology to make room for an upgrade (Hollands, 2008, p.313). Furthermore, he pondered whether the smart city discourse could potentially encourage inequality, as information technology tends "to deepen social divisions in cities" (Hollands, 2008, p.314). Smart cities' administrations are eager to develop their business sector, attracting workers that tend to be educated, middle-class, technology-savvy experts. While doing so, they have to be careful not to promote social exclusion and urban gentrification (Hollands, 2008, p.312). Hollands mentioned the example of the city of Leeds, in the UK, which saw its entertainment and leisure scene drastically change after its urban economy went from a "manufacturing city to a service-based urban form" (Hollands, 2008, p.312). What can this new model offer to the poorest portion of the population if it caters to the knowledge-based middle class? Thus, he made the argument that future smart administrations must not assume that having the right technological tools would automatically create the right conditions for dialogue with its citizens. Rather, he argued that they should use them "in ways that empower and educate people, and get them involved in a political debate about their own lives and the urban environment that they inhabit" (Hollands, 2008, p.315). In brief, technology alone will not suffice in bringing politicians and citizens closer. The decision to become smart must be coupled with concrete actions.

Many other authors from different disciplines also provide valuable critiques. In another article about the smart city, Vanolo introduced the concept of 'smartmentality,' a discipline mechanism that coerces cities into compliance, moulding them into the new model of the technologically advanced, sustainable and economically driven city (Vanolo, 2014, p.891). He is worried that the desire to be 'smarter' will force cities into a uniform model to attract investments, rather than encouraging them to strive for original projects. In that sense, the smart city would curb any critiques by becoming a "neutral" discourse, devoid of any "politics" (Vanolo, 2014, p.891; Kitchin, 2015, p.132). Evgeny Morozov also shared that fear with the readers of *The Guardian*, in an article published in July 2014. He called governance that relies on data and technology to predict behaviour "algorithmic regulation" and wondered about the consequences that this ideology could have on our democracy:

> Everybody agrees that education, health, and security are all "desired outcomes", but how do we achieve them? In the past, when we faced the stark political choice of delivering them through the market or the state, the lines of the ideological debate were clear. Today, when the presumed choice is between the digital and the analog or between the dynamic feedback and the static law, that ideological clarity is gone — as if the very choice of how to achieve those "desired outcomes" was apolitical and didn't force us to choose between different and often incompatible visions of communal living. (Morozov, 2014)

If politicians and governments are pushed out of the discussion, then who will determine the future of cities? As mentioned before, Vanolo feared that private companies would transform governments into disciplined receptacles for their products, thereby restraining critical discussions about urban issues. Adam Greenfield, author of a pamphlet entitled "Against the smart city," described a similar concern, recognizing neoliberal undertones in the discourse surrounding this model (2013, Section 10).

The potential for surveillance and control given by smart technology is also a matter of interest for researchers. Professor Liesbet Van Zoonen, who specializes in popular culture, politics and new media, wrote an article in which she used a quadrant with personal/impersonal data on one axis and service/surveillance on the other to indicate some boundaries, and help determine where public policy and data collection might fall into a controlling tendency (2016, p.475). She argued that as cities request more data and share them with their constituents, they would have to prove that they could be trusted with sensitive information. Furthermore, she pointed out that based on previous research, the risk perception for citizens giving up their personal information matters as much as the actual safeguards that are put in place to protect their data (Van Zoonen, 2016, p.474). Finally, another important aspect in the discussion about the smart city will be security. Indeed, as cities become hackable, developing effective emergency response to cyber-attacks should be considered a priority (Townsend, 2013).

To these questions about the smart city, my thesis asks: where does the smart city come from, and how does it concretely influence municipal governments? Why did Montréal adopt this model, and what impact will it have? How does the administration justify this model to the public?

**Methods**

To understand these myths, I analyze a key text that communicates Montréal's smart city initiative. I chose the *Montréal Smart and Digital City: 2014–2017 Montréal Strategy* as the main basis of analysis (City of Montréal, 2014). The text is easily accessible through multiple sources, and downloadable. I chose this document as opposed to others because it contained enough written text to justify an elaborate textual analysis. Apart from the strategy document, another important milestone in the process to become a smart city was the *Action Plan 2015–2017*, which described the 70 projects that were selected by the Smart and Digital City Office as well as their deadlines for execution in the following years (City of Montréal, 2015a). In fact, the two documents are linked: the strategy document presented the research process and the consultations that ultimately gave birth to the different projects outlined in the action plan. However, I was more interested in understanding the vision that was driving the city to become smarter than by the actual projects chosen by the administration. Furthermore, I wanted to examine the discursive tactics that governmental institutions used in order to justify policy decisions to their constituents. Therefore, a strategy document dedicated to Montréal's citizens — as explicitly self-described on page 4 — was the perfect subject to examine the particular discourses used to support the smart city myth. It was a superior means to achieve that research objective. The 50-page document allowed for an interesting analysis, even if it represents only a portion of the material created to justify the smart initiatives in the city.

I studied the document using a critical discourse analysis approach, mainly based on the work of Norman Fairclough and his book *Analysing Discourse*. I chose Fairclough because of his orientation to social research themes and the social effects of text, as well as his critical approach. *Analysing Discourse* does not provide the reader with step-by-step instructions on what to look for in a text to then offer a rigid interpretation for given words or sentences. Rather, the author suggested that texts have causal effects, which can be sought through an analysis of both the linguistic form of the text, but also through its larger social and political context. He argued that discourse analysis is "oscillating" between a focus on a selected corpus of texts and "the order of discourse" (Fairclough, 2003, p.3). Hence, a researcher who conducts a textual analysis must keep one eye on the linguistic components of the text and the other on how the text might sustain or challenge certain ideologies. I incorporate this double focus in my own research.

When conducting my discourse analysis, I first sought to understand the origins of the text and its purpose: Who wrote it? What was the targeted audience? What objectives did the creators of this text pursue? This would help me to couch my analysis within the document's social and political context. Then, I turned my attention to the relations of power illustrated throughout the text: Which social actors are included or excluded? Are they passive or active? Social actors are those who infuse meaning into the text and structure the argument. Therefore, it is noteworthy to consider the representation of those voices in strategic documentation. Another aspect to consider were the assumptions made by the author (or authors) of the text, which could support certain ideologies. Furthermore, I annotated the text to highlight repeated clauses, sentences or expressions that would suggest the desire to convey a key message to the reader. Finally, I chose to focus my analysis on certain elements of the text (and not others) in order to retain a manageable project. For example, all footnotes, figures, as well as the glossary and bibliography section of the document were not referenced unless they added further proof to existing elements of analysis. Of course, as Fairclough himself recognized, no analysis of a text is ever complete or definite (2003, p.14). Therefore, I present my findings as merely one interpretation of the *Montréal Smart and Digital City, 2014–2017 Montréal Strategy*, keeping in mind that another researcher could have highlighted other elements of this particular text.

Data for this research also includes two semi-structured interviews: one with Harout Chitilian, the councillor responsible for smart city initiatives, and one with a source working at the city of Montréal who wished to remain anonymous. I wanted to interview people that were closely involved in building a smarter Montréal to get a regional perspective on the topic. It also helped me to situate the strategy document into its context and understand the larger circumstances that were influencing the city's initiative. As the main political spokesperson for the smart city, Harout Chitilian was an essential contact. In order to design the interview questions, I used the book by Anne Galetta and William E. Cross, *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication* (2013). As I had never done interviews for research before, I appreciated that this volume could explain each step in a way that was clear and comprehensive. Galetta and Cross suggested drafting the interview in three segments: first with open-ended questions on the participant's experience; then to investigate the nuances in their testimony; and, finally, to return to earlier points or to directly connect their experiences with theory (2013, p.45-72). They explained that the questions should

escalate in terms of difficulty and level of engagement with the researcher. I designed my interviews according to this general method.

The two participants agreed to be recorded during the interviews and I made a transcript based on those recordings. When they signed the consent form prior to the interview, they had to decide if they agreed to have their name and information appear in my research or not. Then, I sent the transcript to my participants and asked them to review it. They could email me within a week after receiving the transcript to confirm the level of confidentiality. One participant asked me not to reveal their name in this research, so I picked a pseudonym to refer to them. In addition, I tried not to attach any particular statement to them that could directly relate to their job description. Finally, I chose not to reveal the date of our meeting in this thesis.

I used grounded theory as an approach to analyze the data produced by those meetings. Even if that approach does not seem very popular in media studies, I thought it was the most appropriate to use given the situation. Grounded theory is particularly useful for researchers who can keep an open mind and who do not necessarily hold preconceived ideas about the research topic (Charmaz, 2006, p.48). I knew very little about how the administration was concretely developing the smart city in its daily activities. I did not even know if the concept itself was tangible, because the literature on the subject was very divided. My main reference for learning about grounded theory was a book written by Kathy Charmaz in 2006, *Constructing Grounded Theory*. The book offers a detailed, updated version of the original "rules" of grounded theory established by Glaser and Strauss in 1967.

I divided my coding process into two main phases, as suggested by Charmaz: during the first phase, I read my transcripts line by line, identified and named every segment of data, and then I organized those segments into larger categories (Charmaz, 2006, p.46). I discarded certain codes when they appeared less often in the transcripts compared to others. I ended up with two main categories that I called "What makes a city smart?" and "Building By and For Citizens," linking them back to my research questions. To these two categories, several sub-groups emerged from the data. "What makes a city smart?", a category which contains all the data relating to the nature of the smart city, included two subsections: "capabilities" and "resources vs desires." The former is meant to reflect several instances in the data where my participants talked about what the city could and could not achieve. The latter group contains every instance where my

interviewees identified Montréal's strong points or aspirations for the city's future. I considered the two sub-groups to be linked, as resources might affect the city's capacity to achieve their objectives. My other main category, "Building By and For Citizens," did not have any sub-groups, but included many different aspects that were linked to the strategy document discussed in my second chapter: "transparency," "citizen engagement," and "what is seen/unseen," among others.

In this thesis, I use the concept of 'myth' based on Mosco's understanding of the term. I think that there are several myths that surround the smart city concept, and that the smart city itself could be considered as a myth of its own. In the introduction to *The Digital Sublime*, Mosco wrote about how people kept many Internet companies alive despite common sense because they thought that "cyberspace was opening a new world by transcending what we once knew about time, space, and economics" (Mosco, 2003, p.4). In the same manner, my literature review and my research suggest that the smart city was at some point envisioned as a game-changing model for urban planning and politics. However, Mosco also believes that it is when technologies lose their utopian qualities – when they are no longer sublime – that their impact on society truly comes through (Mosco, 2003, p.6). I would argue that the smart city is on the verge of becoming a 'banal' concept; of being presented as the natural evolution of municipal governance. Through this thesis, I illustrate the origins of the smart city myth as well as the implications of its shift from the sublime to the commonplace.

**Chapter Breakdown and Research Questions**

The smart city continues to provoke debates on its potential, on its very nature and on the possible consequences of the model on future cities. By focusing on a specific city and its own process to become smarter, this thesis hopes to contribute to the academic discussions on the topic. My first chapter elaborates on some of the history of smart cities; a history that is rooted in governance, communication and urban planning. The chapter asks: How does the smart city model compare to, and differ from, previous examples of technology-driven politics? Then, in the next two chapters, I narrow my focus to the city of Montréal. Through discourse analysis, Chapter 2 examines the strategies used by the administration to communicate the smart city plan to its population: How does it describe and justify this initiative? Finally, the third chapter details

the development of Montréal as a smart city, thanks to interviews with two city officials. The objective was to learn how this model was actually integrated into governmental practice, as well as the possible challenges that this administration faced while building a smarter Montréal. The city is now at a crossroads. I see a shift in the way that the administration describes the smart city strategically compared to how its officials discussed the concept in my interviews. The smart city is no longer part of the technological sublime, as both city officials and academic authors increasingly see it as the one and only model for cities to follow. This will certainly have an impact on the dialogue between citizens, entrepreneurs, city workers and politicians on the future of cities.

# CHAPTER 1: ICT AND GOVERNANCE

In this chapter, I investigate the possible origins of the smart city and some early examples. I demonstrate that many aspects of this recent urban model are actually rooted in a history of cybernetics, statistical data analysis and computer simulations. Looking at the past uncovers what might be 'new' about the smart city as a concept and, in contrast, what can be considered a continuation of existing human-technology governance.

I found out through the stories recounted by Flood, Light and Medina that there are several assumptions made about new technology. First, when it is introduced into the political realm, it is seen as 'neutral,' and therefore thought to be easily transferrable from one environment to another without consequences. Second, a common belief is that technological tools will always be an improvement on the status quo, which in turn tends to silence any critique against its usage. Finally, there are interesting similarities between the narrative established by military organizations post-World War II and the one supported by ICT companies to sell their products to cities in the last decade.

## Definitions of a Smart City

Anthony M. Townsend (2013), author of *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia* defines the smart city as "places where information technology is combined with infrastructure, architecture, everyday objects, and even our bodies to address social, economic, and environmental problems" (p. 15). Townsend makes two general claims about the smart city: technology is a powerful agent for change, and an important tool that can be used to solve targeted urban problems.

Information technology is one of the key components of the smart city. Decision-makers expect that the integration and usage of these powerful technological tools in management practices will improve the city's future. Townsend understands that a smart city is one where technology meets infrastructure, architecture, and "everyday objects," referencing the global trend of "The Internet of Things". But he goes further, adding our own bodies as a meeting place with technology, alluding to the possibility of using humans as sensors that could collect data, for example. Data is at the heart of the smart city concept. Aribilosho & Usoro from the School of

Engineering and Science of University of the West of Scotland state that "smart" is originally an acronym for "Self-Monitoring Analysis and Reporting Technology." They elaborate: "what this really means is object embedded *[sic]* with the ability to record data, analyze them, and make a decision based on either a programmed response, or the most preferably used options from its database of actions" (2016, p.22). Of course, this in turn opens up many potential debates on surveillance, control, and privacy in urban environments.

Townsend also argues that smarts cities rely on this information technology to solve "social, economic, and environmental problems" (2012, p.15). Indeed, many cities choose to focus on a particular issue or objective in their efforts to become smarter: some wish to strengthen their democracy and encourage their citizens to become more involved in their community; some strive to be more efficient in their operations and service delivery in order to save money; others choose to address climate change by using technology to reduce their greenhouse gas emissions.

For the last two decades, major information technology vendors have been pushing the smart cities discourse into the mainstream. Indeed, many authors attribute the development of the 'smart' discourse to computing companies such as IBM, Cisco and Siemens (Townsend 2013, Söderström, Paasche & Klauser, 2014; Vanolo, 2016; Paroutis, Bennett, & Heracleaous, 2012). To this day, a major part of their business includes technological tools tailored for cities. Cisco offers to "digitize your city to make it smarter" through its "Smart+Connected Communities" campaign (Cisco); and Microsoft promotes its "IoT solutions" to render cities more efficient (Microsoft).

An applied sense of the smart city can be found in Vienna, Ljubljana and Delft (Giffinger, Fertner, Kramar, Kalasek, Pichler-Milanović & Meijers, 2007). Rather than defining a smart city, they exhibit six applications of smartness. The first, "smart economy," refers to a city's "innovative spirit" and "ability to transform" (Giffinger et al., 2007, p.12). Then comes "smart people," a category that includes several defining factors of a population, such as its education level, tolerance, creativity, and diversity (*Ibid*). The third factor, "smart governance," evaluates an administration's services (*Ibid*). "Smart mobility" focuses on the quality of transportation, a key city responsibility (*Ibid*). The last two characteristics are "smart environment" and "smart living," with the former indicating how clean and sustainable a city is, whereas the latter

evaluates the quality of life of its residents (*Ibid*). The report has inspired many organizations, academics, and politicians to use the six characteristics in an attempt to measure 'smartness' (Vanolo, 2014; Gil-Garcia, Pardo & Nam, 2015; Gianovella, Dascalu & Scaccia, 2014).

While a useful introduction to the contemporary literature, Townsend's definition encourages an investigation of the history of the smart city. Boyd Cohen (2015), an urban and climate strategist, suggests that the concept is not fixed, but rather has evolved over time such that there are, in fact, three generations of smart cities. He explains that the first generation of smart cities is the one that is technologically driven, built by the administration that got hooked into the concept by ICT companies ten years ago; the second generation is driven by "city administrators increasingly focus[ing] on technology solutions as enablers to improve quality of life"; and the most recent model, smart city 3.0, is the "citizen co-creation" model, in which citizens are active participants in project development and implementation (Cohen, 2015). This would explain in part why there seem to be many different ideas and projects that could all be related to the process of building a smart city. Technology remains at the centre of the concept, but the main social actors are changing: first ICTs companies, then governments and, most recently, citizens.

We could go back even further. Even though the smart city has been framed as a new model of the political sphere, its main elements may also be found in the early days of computing technology, back in the 1960s and 1970s. Townsend himself recognizes a renaissance of system analysis and cybernetics in the smart city concept, scientific principles and beliefs that were proliferated in public administration post-World War II. At that time, governments were already considering computer models and simulations as possible tools that would radically change the political landscape. Some even predicted that world leaders would someday consider computers as aides, consulting them when developing warfare strategies or seeking advice on how to better manage the economy (Flood, 2010, p.121). This prediction turned out to be not so far from the truth.

**Seeing Like a Smart City**

Smart cities alter the gaze of municipal administration, making the city more intelligible. They give the (false) impression that, with technology, any city could be turned into a machine, transforming complex interactions into a simple formula for perfect governance. This relates to the concept of simplification discussed by James C. Scott in his book *Seeing Like a State* (1998). He considered this process to be one of the main features of the modern state (Scott, 1998, p.11). Simplification is the process of rendering local knowledge legible in order to better control a given population (1998, p.11). The state would engage in simplification by dismembering a complex situation into one single element, the one considered the most valuable. The author demonstrated this concept using the scientific forestry practiced in late 18$^{th}$ century Prussia and Saxony as an example. This particular forest, human-designed, consisted of even rows of trees, arranged to render the process of cutting them down easier and more efficient. However, its artificial design completely ignored the delicate ecology of the wild forest and narrowed down this habitat to a single use: as a source of timber for state revenues. This "narrowing of vision," as Scott calls it, allowed the state to exert its control over the otherwise unruly state of nature (Scott, 1998, p.11). This simplification process is also visible in our examples of early smart cities.

Scott also discusses the ideology that he calls "high modernism." He defines it as a set of beliefs driven by trust in modern scientific and technical linear progress in "every aspect of human activity" (Scott, 1998, p.89). This ideology advocates for building the present on a completely blank slate, as opposed to building upon the past to develop new ideas (Scott, 1998, p.115). An individual could have "high modernism faith," which would mean that his or her viewpoints follow the main components of this ideology. For example, Scott dedicates a large portion of a chapter in *Seeing Like a State* to Le Corbusier and his influence on modern urban planning. Le Corbusier was one of the most famous urban planners of the 20th century. Scott considered his vision of the perfect city, made up of straight lines with clearly defined areas dedicated to each human activity, as "a textbook case" of high modernist thought (Scott, 1998, p.116). The author associated this ideology with authoritarian regimes, because in his view that would be the only political system in which it could be pushed to its limits (Scott, 1998, p.89). I would argue that the high modernist faith does appear at certain points in the smart city narrative, making it a useful analytical concept to review this history.

I focus on three main reflective early illustrations of the smart city. The first is a cautionary tale set in the New York of the 1960s and 1970s. *The Fires*, by Joe Flood, provide an interesting case of the potential disastrous consequences of technocratic decision-making. The book discusses the causes of devastating fires that burned down several neighborhoods in New York City from 1968 to 1978, a decade that is now known as "The War Years." There were certainly fires before, but Flood argues that their number greatly increased after Mayor John Lindsay announced a partnership with a military think tank, the RAND Corporation, in 1968 (Flood, 2010, p.116). Based on their advice, the city closed down the busiest fire stations in the most fire-prone areas, with catastrophic consequences. The fires killed and injured thousands of citizens, and more than half a million people lost their homes (Flood, 2010, p.18). In addition, the fires contributed to the spreading of disease and the rise of child mortality (2010, p.18). In this case, I am particularly interested in the relationship between the city administration and RAND, as it has not only contributed to the proliferation of the fires, according to Flood, but also helped set the future of cities.

My second case does not focus on cities *per se*, but offers an interesting perspective on human-technology interaction in politics. *Cybernetics Revolutionaries*, by Eden Medina (2011), discusses an ambitious technological project designed, yet never completed, in the Chile of the 1970s: Project Cybersyn. "Cybersyn" is a porte-manteau of cybernetics and synergy — in Spanish, "SYNCO," which stands for "Sistema de Información y Control" or System of Information and Control — and was meant to revolutionize the country (Medina, 2011, p.88). Using cybernetics principles, the team at Project Cybersyn surveyed the state of Chile's economy in order to facilitate the nationalization and centralization of the country's production according to socialist principles. Through an intricate system composed of statistical analysis software, a network of telex machines, and an economic simulator, a group of selected experts would have been able to access real-time data on the state of the industry in order to manage the country's economy from the main control room. Cybersyn was supposed to integrate principles of democratic socialism within its economic simulator and help to make a smooth transition away from capitalism. After the military coup that led to Chilean President Allende's death, all work related to the project was destroyed or abandoned. However, Medina's account of the project provides a compelling case study of how governments considered using technology as an agent

of political change in society. Furthermore, the author's account of the project is generally positive and therefore stands in sharp contrast to *The Fires*.

Finally, in her book *From Warfare to Welfare*, Jennifer S. Light (2003) exposes how technology and practices originally designed for warfare — such as aerial photography and satellite reconnaissance data — were repurposed for governments during the Cold War. It traces the history of that transition, its consequences on city planning and on urban research. Arguably, Canada was not as heavily shaped by warfare as American society. Still, her argument encourages us to consider the origins of certain technologies, as well as the economic and political interests that guided their introduction into new contexts. Light also traces the transition from cybernetics to system analysis, and how the two visions were instrumental in bringing warfare technology into the political realm.

One of the most influential figures in this transition was Robert McNamara. McNamara was a young accounting professor at Harvard when he struck an alliance with an Air Force Colonel to improve the number of successful airstrikes over enemy territory during World War II (Flood, 2010, p.81). After the war, the Ford Motor Company was in terrible financial shape. McNamara and eight other colleagues, a group that later became known as the "Whiz Kids," succeeded in saving the company from the brink of collapse, enough to settle their reputation and change the face of business management. McNamara was named president of Ford in the winter of 1960, a position he held for only a few weeks before being appointed to head the US Department of Defense (Flood, 2010, p.85; Light, 2003, p.41). He contracted with RAND analysts several times during his mandate, including for the development of the "Planning, Programming, Budgeting System (PPBS)," essentially a technique to analyze the cost-benefit of a given governmental program or decision (Light, 2003, p.41). President Johnson later made PPBS mandatory, even if its benefits had never been demonstrated (Light, 2003, p.52). Then, during the Vietnam War, McNamara relied on body counts to calculate the progress of American troops on the ground (Mayer-Schönberger & Cukier, 2013, p.165). However, relying on that data point was proven to be an unreliable method for understanding what was happening in the field. Many generals later admitted that their numbers were "grossly exaggerated" and "often blatant lies" as "junior officers sometimes gave their superior impressive numbers to keep their commands or boost their careers" (Mayer-Schönberger & Cukier, 2013, p.165). Due to McNamara's influence

during the presidencies of John F. Kennedy and Lyndon B. Johnson, system analysis and computer simulations became a central part not only of military strategy, but of American bureaucracy.

Throughout this short history of cybernetics and operations research, there are two overarching points that link the narrative of our 'early smart cities' together. The first is the blind trust in the effectiveness of rational thought and obscure scientific knowledge. For example, Project Cybersyn was developed according to cybernetics, a transdisciplinary science that was based on how both animate and inanimate systems work (Medina, 2011, p.20). Cybernetics is about the science of 'systems' and analyzes organizations as if they were a living organism. In 1971, an engineer that worked for the newly elected President Allende sent out a letter to British cybernetician Stanford Beer. He had a managerial view of cybernetics, defining it as the "science of effective communication" (Medina, 2011, p.20). The engineer asked the already renowned academic to work in Chile and develop his ideas on a national scale (Medina, 2011, p.15). Beer accepted the proposal and took a primary role in the development of Project Cybersyn.

When he first met with Allende to introduce his plan, he was allegedly surprised to see the president nodding along to his explanations of the basic cybernetic principles, the theoretical framework behind the whole project (Medina, 2011, p.75). This anecdote could show that certain elites pressured politicians to model the political apparatus according to standards that they were not expected to fully understand. Similarly, in his book, Flood reported that New York mayor John Lindsay was hypnotized by the opaque methods of the RAND Corporation: "Lindsay really believed they were supermen, one budget aide said of RAND. Their use of statistics and charts just dazzled him. The statistics made him feel like the city was controllable with expertise" (Flood, 2010, p.207). It is certainly understandable that the opportunity to use seemingly irrefutable tools for policy design in order to avoid making the hard decisions would be tempting to a politician.

Nevertheless, this fascination with the figure of "The Expert" could have potentially harmful consequences on the political process. First, the apparent impenetrable logic of technical jargon makes it almost impossible to critique or oppose it. For example, the model proposed by RAND to decide which fire stations needed to be closed down had many flaws: it was based on a really small sample composed of stations situated in 2–3 targeted areas of the city (Flood, 2010,

p.220); the simulation model ended up being too complex for computers from that period to handle, therefore they had to simplify their original model to an extreme (Flood, 2010, p.222); firemen were suspicious of RAND and so reported erroneous response time when it could play in their favour (Flood, 2010, p.221), to name only a few. Consequently, when the people at the RAND Corporation ran their models and had to determine which stations could be closed without affecting the overall response time, their results were deeply flawed. They advised shutting down among the busiest fire stations in the city, many of them in the poorest areas of New York, with a majority of black and Puerto Rican residents (South Bronx, the Lower East Side, Harlem, and Brooklyn). A team of experts and a complex mathematical formula supported a policy that would appear contrary to basic logic and still, decision-makers apparently did not question the resulting policy before it was enforced.

Moreover, the figure of "The Expert" is not entirely devoid of bias. Let us look back at Cybersyn, a project that relied heavily on scientific principles. Both Allende and Beer wanted the project to be shaped according to Chilean socialism. It was important for the President that the workers have their say in the development of the economy. Sadly, this ended up not being the case. When touring the factories in order to assess the multiple factors that could affect their production and convince managers to get on board with the project, the team of engineers went against those instructions and refused to deal with worker committees (Medina, 2011, p.131). They thought that it would be easier to make it more technical than ideological, and so ended up dealing far more with management rather than with the originally targeted population (Medina, 2011, p.131). The choice to engage in technocratic discourse effectively shut down participation. Another example of this trend appeared in *The Fires.* When the cuts proposed by the RAND Corporation took effect, the firefighter unions, who opposed the cuts, sued the city, bringing forward the argument that the cuts were racially motivated. Judge John M. Cannella rejected the plea, considering that the decision "was premised solely upon the neutral, non-racial, scientific, and empirical data available" (Flood, 2010, p.246). A political decision backed by scientific jargon was more likely to be considered impartial.

A common myth binds these examples. The overarching element between the three accounts is that technology simply exists. It is dismembered from a specific context, separate from social and political influences. This in turn feeds into the assumption that it can safely be

transferred from one environment to another without any consequences. We see countless quotes from various political leaders, researchers and social actors in *From Warfare to Welfare* who perceive transition of technological tools from the military to the political realm not only as convenient, but also as entirely normal.

The events told by Flood are one example of the failure to transfer military techniques into the urban world. As mentioned earlier, the RAND Corporation had become famous for its use of statistical analysis and computer models at the service of the military during World War II before collaborating with the fire department. They proposed an innovative management model, one based on what they called system analysis, otherwise known as operations research. This approach was using mathematics and computing technology to pinpoint the most effective way to perform certain operations. After the war ended, the people from RAND were looking for new opportunities. They were convinced that their practices could find some use in the political realm, which could lead to more effective decision-making. They were apparently aware that designing policy would be harder than managing weapons, but they saw this as a problem to overcome rather than a potential deficiency in their method (Flood, 2010, p.122). Their logic was that the same techniques that were so successful in managing weaponry could be applied to housing, healthcare and education … with just a few tweaks. Their beliefs were quickly tested by Mayor Lindsay and then chief of the Fire department John O'Hagan, with the results that we know.

To be fair, the practices and models established by the RAND Corporation contributed to major savings and updated strategies during the world conflict. The people who worked for the organization were considered the most brilliant minds of the century, graduates from Ivy League universities. Moreover, the ability to predict fire rates through computer models and statistical analysis would have been a game changer not only for the city of New York, but for all governments. Instead of always reacting to problems, decision-making bodies could act on them before they even appeared by looking at past patterns and predictions (Flood, 2010, p.111), arguably the long-term objective of a smart city. Furthermore, O'Hagan was not an incompetent chief; he greatly improved the New York City Fire Department (NYFD). During his mandate, he encouraged firefighters to submit their inventions to the department, which led to the adoption of the first version of the jaws of life, among other innovative tools (Flood, 2010, p.72). His work in the adoption of the Local Law 5 in 1972 led to new aggressive fire regulations for high-rise

buildings that potentially saved thousands of lives (Flood, 2010, p.207). Nevertheless, the people at RAND fed into O'Hagan's strong desire for innovative, rapid change and merely confirmed his beliefs rather than providing true insight: "RAND was pushing O'Hagan's favoured root approach for tackling problems: compartmentalize an issue, analyze it with comprehensive statistics, and charge ahead with a bold new solution" (Flood, 2010, p.196). It could be argued that O'Hagan was also prone to high modernist faith, as he preferred to consider only audacious solutions backed by technical jargon rather than considering incremental solutions based on his own local knowledge. Even if other factors contributed to the increasing numbers of fires, the relationship between O'Hagan and the RAND Corporation as well as their blind faith in the positive outcome of system analysis certainly had an influence on the tragic situation.

This example supports the myth of what I call 'technology as positive force.' The introduction of a new technical tool in a given environment is foreseen to be beneficial by default, even if there is no proof of its value. Flood reported a massive investment in operations research management initiatives under Kennedy, then Johnson (2010, p.97). Light also talked about the case of NYC and RAND in *From Warfare to Welfare* and came to the same conclusion: "More than $100 million annually had been spent on consultants whose work produced results that could be read about but not often seen" (2003, p.74). I observed the same trend when talking about the power of ICTs to respond to urban challenges. This tendency is discussed in detail in the next section.

Light attributed the success of warfare technocrats to their ability to adapt their discourses to other audiences. The industry needed to demonstrate the value of their technology, and needed to do so in a political context that was unfavourable to them. Indeed, to talk about their tech as a potential game changer in the "national security crisis" made the transition from warfare to governmental usage normal, even casual. Nowadays, I would say that there seems to be a generalized discourse about the necessity of certain technological tools that is particularly striking when we talk about smart cities. Indeed, the term 'smart' city is one that highlights the need for a symbiotic relationship between governments and technology, as opposed to a 'dumb' city which does not. However, in this case the ones pushing this myth are ICT companies, not the defense industry. The following pages take a closer look at the possible parallels between past

and the present discourses regarding technology and politics, specifically when talking about the smart city model.

**Cities of the Future Past**

With those historical examples in mind, let us examine what might be 'new' about the smart city myth. It is interesting to note similarities between the accounts about the origins of the smart cities and Light's *From Warfare to Welfare*. Whereas the military lobby helped dictate urban management during the Cold War, ICT firms are the ones who shaped present innovations in our cities.

First, we can compare the justifications of the new urban management paradigm offered by both actors. Flood mentioned that the New York of the 1960s was imagined as a "city in crisis," a narrative fuelled by the media based on the false assumption that NYC was on the verge of a precipice (2010, p.122). In fact, Light mentioned the moral panic that surrounded the city when she discussed how military institutions forged the "national security crisis" discourse. City planners understood that major reform was needed to 'save' the cities from downfall. She reported a speech addressed to the New York Planning Commission symposium in 1964 by Barbara Ward, "an economist and environmentalist," who declared: "the problem facing cities may become more lethal than the bomb" (Light, 2003, p.62). Military tech was seen as the only solution to those problems.

Söderstrom and al. (2014) saw the same type of negative portrayal of the city related by IBM, a narrative that they call the "sick city," which is one "permeated by a series of pathologies" (p.315). In their article entitled "Smart cities as corporate storytelling," Söderström and his colleagues called the worldwide initiative known as "Smarter Cities" "the most developed attempt by a private company to define a smart model of urban management" (2014, p.307). As was the case for the aerospace and defense companies after the Second World War, ICT firms had to tailor their tools for new markets at a time when business was tough. In an article published in 2012, Paroutis, Bennett and Heracleous stated that IBM's "Smarter Cities" program was a strategic reaction to the recession of 2008, crediting the initiative, at least in part, with the company's constant financial performance during that time (2012, p.263). IBM even acquired the name: the trademark "Smarter Cities" officially belongs to the company as of 2011 (Söderström

and al, 2014, p.311). They were using the smart city discourse as a framework to sell their products as the ultimate solution for urban problems. Our present-day cities suffer from a corruption syndrome, crippling bureaucracy, and participation deficiency – and ICT firms possess the cure.

Furthermore, cybernetics and system analysis morphed into the smart city discourse later adopted by IBM and other ICT firms. Townsend argued that the trend of "system dynamics" — or "system analysis" as I have been calling it — was essentially dormant until it reached the ears of Justin Cook, an IBM strategist:

> On a website used to interact with the model, diagrams reminiscent of those in *Urban Dynamics* dissected the city into a spaghetti-like tangle of interacting variables. It was as if someone sauntered into an IBM lab, dropped off a copy of the moldering book, and said, "Give me one of these." (Townsend, 2013, p.82)

It is also not a coincidence that we see a revival of some of the key elements from cybernetics management in the new smart cities. One of the most iconic elements of Project Cybersyn was its operations room, with chairs that looked like they were stolen from Star Trek's *Enterprise*, surrounded by several computer screens projecting graphics, statistics, and other information to the team. The same type of design, albeit more modern, reappears in several smart cities such as Rio de Janeiro, where IBM's "Intelligent Operations Center" regulates and monitors the city's activities (Söderström and al., 2014, p.312; Picon, 2015, p.19). Picon sees such Operations Centres as pertaining to the neocybernetics form of the smart city.

Moreover, the desire to control urban life through simulation is not an idea that has been abandoned. Many companies are providing governments with such tools in order to improve their response rate in different scenarios. A company called Simudyne, for example, sells software powered by an AI that is able to test different scenarios in 3D environments. A governmental institution might use this tool to measure its response rate in case of a catastrophic event. I discussed how statistical data analysis and computer modelling made people envision a world in which computers would help decision-makers to govern. In an article that describes this simulator, the founder of Simudyne adopts the same discourse when he states that "simulation science will transform how humans make decisions for the next 100 years" adding that it is a mistake "to place trust — an inherently human characteristic — in other humans" (Clark, 2013).

This fuels the imagined ideal of an entirely automated city in which politicians are obsolete. It also brings back the same possibility for debate as when the RAND Corporation used their model to manage the rate of fires in New York City. As was also mentioned in the introduction, we must also wonder about the potential security concerns of a city that relies entirely on electric circuits, sensors, and computer systems to provide for public safety.

Technocratic tools for policy-making do not always work. Sometimes, the fact that a technological tool proved effective in a certain environment does not mean that it is easily transferrable to another. Light recognized that the military industry played a primary role in the development of urban planning in the US; she did not necessarily see this impact as negative. However, she did provide a compelling argument as to why the tools used in the military were not always appropriate for public management:

> This notion of the clash of cultures between computer and humans points to a final explanation for the limited successes of technology transfer: fundamental distinctions between the organizational culture of military versus urban decision making. Military organizations have a hierarchy of command and control; hence, orders from the top are implemented with only rare disagreements or feedback. By contrast, authority in complex city governments is far more dispersed; city agencies rarely march in lockstep. Many defense intellectuals (…) assumed that a master plan, carried out with more centralized coordination, could improve the plight of American cities. But as urban administrators recognized early on, cities are far more complex organizations than the military, and master planning can be a controversial exercise. While most Americans could agree that the United States was worth defending, the goals of specific social programs, by contrast, were not so easily universally approved. (Light, 2003, p.88)

Many authors reported that the RAND Corporation's models were not adequate for the city, because they had to be overly simplified in order to be useful. This, in turn, brings us back to the concept of simplification introduced early on in this chapter. To be sure, the city is still a complex organism, and the urge to plan everything from the top-down is an idea that citizens usually resist, at least in the case of Montréal. City governments could fall into the trap of simplification and choose to reject incremental change in favour of simple, short-term, and incomplete solutions to urban problems.

We talked earlier about how inserting a new technology into the political realm is usually an assumed positive fact, even if there is no concrete proof of its value. Hollands noted the same problem when it comes to the smart city narrative: "In addition to assuming there is an automatically positive impact of IT on the urban form, the smart city label can also be said to assume a rather harmonious high-tech future" (2008, p.314). The idea of integrating ICTs into the urban environment in order to 'upgrade' the city seems to be automatically accepted and encouraged. For example, one article from CNBC reported that "cities around the world could spend as much as 41 trillion on smart tech over the next 20 years" (Pattani, 2016). However, the same article stated that even if governments are hoping to save more money than they invest in these tools, there are actually very few reports that can back that claim (Pattani, 2016). History seems to repeat itself: the blind faith in a model favoured by designated experts — in this case ICT companies — leads cities to put their money and trust into a system that has yet to prove its worth.

City administrators must become aware of the potential influence that the expert figure has within the smart city model. Viktor Mayer-Schönberger and Kenneth Cukier, respectively professor at the Oxford Internet Institute and data editor for the *Economist*, wrote a book on the transition between a word of "small data" and manageable datasets to the world of so-called Big Data. They argued that this change might mean the end of the "subject-area expert":

> We tend to think that people with deep specialization are worth more than generalists — that fortune favors depth. Yet expertise is like exactitude: appropriate for a small-data world where one never has enough information, or the right information, and thus has to rely on intuition and experience to guide one's way. In such a world, experience plays a critical role, since it is the long accumulation of latent knowledge — knowledge that one can't transmit easily or learn from a book, or perhaps even be consciously aware of — that enables one to make smarter decisions. (Mayer-Schönberger & Cukier, 2013, p.142)

Big Data protects, in theory, against the types of mistakes made by the RAND Corporation. Because researchers at the military think tank had so little data to work with, they had no choice but to simplify their models and to accept that it would create flaws. It reduces the problem to a lack of exactitude. The authors went on to say that an organization — such as a city — that wants

to use data for development should still be wary of potential risks, including what they call "the dictatorship of data," a "very old problem." Their example to expand on the concept is McNamara and his body count method (Mayer-Schönberger&Cukier, 2013, p.163). The "small data world" problem does not disappear with the arrival of Big Data. Even if it is true that governments now have more data to work with, I submit that it is not impossible for them to carry out the same mistakes from the past. Like McNamara, governments could still focus on the wrong factors to guide their policies.

Rather than replace the Expert, Big Data augments the Expert. The Expert becomes the person who can analyze Big Data. In the case of a smart city who seeks efficiency above all else, the politicians are left at the mercy of those who are able to crunch the numbers for them. In a world driven by data, the capacity to interpret numbers becomes invaluable and so mathematicians, statisticians, and computer scientists are viewed as 'experts' in every given circumstance. In the most extreme cases, it could get in the way of a rich, healthy exchange of information between the public and the political class. As was the case with Cybersyn engineers and factory workers, how to better consult populations when dealing with a seemingly complicated project is still an issue in contemporary politics. The need for better public consultation is increasingly seen as an antidote for the rising cynicism that is affecting political life. The ideal city – the smart city – is one in which the administration has a symbiotic relationship with new information and communication technology for the benefit of its population. As such, when looking at Montréal's own process to become 'smart,' it will be useful to observe how the administration conducted those public consultations. Moreover, the fact that data will have a significant impact on smart policy development is undeniable and deserves further research.

Furthermore, even if computers have the ability to consider multiple factors when dealing with a problem, they are still unable to grasp the complexities of cities. Jane Jacobs, famous for her unique critique of rational city planning, used to celebrate the unorganized, chaotic mesh that is the urban environment. If there is one thing to take away from those examples, it is that it seems inevitable to put aside multiple aspects of a given social problem – in other words, to adopt tunnel vision – in order to make the issue suitable for a machine to process. This was one of the promises of system analysis as devised by the RAND Corporation: "Just as it had done with

warfare, RAND's system analysis would reduce the myriad complications of the bureaucracy into easily defined variables" (Flood, 2010, p.121). In the end, smart cities may indeed succeed in solving certain municipal problems, but risk falling into the trend of simplification in order to do so.

The smart city restates the high modernism initially critiqued by James C. Scott. The gaze might now include Big Data, but the underlying myth remains largely consistent. Adam Greenfield, a writer for the Guardian, makes a similar point. He links the concept of the smart city with high modernism, and argues that "it replicates in tone, tenor, form and substance most if not all the blunders we associate with the discredited high-modernist urban planning techniques of the twentieth-century" (Section 13, first par). Like Scott, he described the work of Le Corbusier and argued that the same desire to ignore or dispel the existing city characteristics and to promote "overspecification" is present in current smart city projects. He mentioned SongDo as an example of this replication of the tropes from high modernist thought. According to Townsend, the city is "the largest private real estate project in history at some $35 billion" (2013, p.25), and still, its buildings are mostly empty (Townsend, 2013, p.27). What was supposed to be "cutting-edge technology" was quickly outdated (Townsend, 2013, p.28); and its promise to be one of the greenest cities on earth was compromised as massive amounts of land were destroyed or transformed into landfills, displacing rare wildlife in order to make rooms for apartments and office spaces (Townsend, 2013, p.29). Even if I would agree with Greenfield that the high modernist discourse appears in many conversations about the smart city, and that it seemed that history would repeat itself when politicians first tackled the model, I would not dismiss the concept altogether – especially since more and more authors, activists, and city officials are pointing out the failure that is SongDo. In my own research, Elsa Dupuis[1], who is closely involved in the development of the smart city strategy, mentioned SongDo as an example of the kind of smart city that Montréal did not want to become and asserted that it would mean to give up the "soul" of the city. Hopefully, this would be a small proof that even if mistakes were made, maybe there is still hope that the future of cities will not be tainted by high modernist thought.

[1] This participant wished to remain anonymous. I used a pseudonym throughout this thesis.

## Conclusion

I began this chapter with a definition of smart cities based on the work of Townsend. At the core of his conception is the belief that technology could be a powerful tool for problem-solving in modern-day cities. However, the desire to turn the city into a well-oiled machine is not recent. Computing technology, system analysis, and cybernetics all had a role in the origin of the smart city. Through the stories relayed by Flood, Medina, and Light, we are able to grasp several myths about technology that could influence their introduction into public administration. I also fleshed out the pattern that would lead to the adoption of military tech for urban planning after the Cold War, then to the integration of ICT into city governance in the 21st century. The 'city in crisis' described by the media in the 1960s and 1970s gave way to the 'sick city' of today.

Of course, we must be careful not to take these examples as fateful prophesies. It would be fallacious to assume that because the relationship between humans and technology was not always successful that it will never be. Other than the RAND Corporation and system analysis, many other factors caused half the city of New York to burn during the War Years. Moreover, to think that technological tools are infused with an original intent that forever guides the manner by which they are used would fall into the discourse of technological determinism. Many technologies could have been repurposed to become indispensable tools, even if they were not specifically designed to aid policy makers. However, looking at past mistakes can inform our present and prevent us from repeating mistakes in the future. In that sense, the events recounted by Medina, Light, and Flood should encourage us to consider discussions of technologically based policy making from a critical stance. Their historical accounts help us to better comprehend some elements of the smart city narrative. In the next chapter, I focus my attention on Montréal and its own process to become smart.

## CHAPTER 2: MONTRÉAL, SMART AND DIGITAL CITY

Then-mayoral candidate Denis Coderre promised to turn Montréal into a smart city as part of his successful campaign in late 2013. Once elected, he moved swiftly on his project. First, the new mayor established the Smart and Digital City Office in March 2014. He appointed Stéphane Goyette as Chief Digital Officer. Goyette was previously a mentor at FounderFuel, a start-up accelerator, and vice-president of Astral Media from 2010 to 2013. His new office had a mandate to provide "a framework for the kind of transformational projects that affect every aspect of life here, whether they involve government, infrastructure, public services or social issues" (City of Montréal, Smart City: About). A very large mandate given to a selected team: according to their website, ten people, including Mr. Goyette, form the Smart and Digital City Office (City of Montréal, Smart City: Our Team). The Office drafted the strategy, the document discussed in this chapter, which made good on this promise of transformational change. Then, Goyette announced a more detailed plan, entitled the *Montréal, Smart and Digital City 2015–2017 Action Plan*, in May 2015. It introduced 70 smart projects selected by the city along with a timeline for their completion.

In this chapter, I examine an important document that laid down the foundation of Montréal's plan to become a smart city: *Montréal Smart and Digital City: 2014–2017 Montréal Strategy*. This document details the administration's main guidelines, and Harout Chitilian first presented it at a press conference on January 29th, 2015. Using critical discourse analysis, the goal of this chapter is to unearth the discursive strategies used by the administration in order to justify this promise to the population. How does Montréal describe and explain this initiative? What tactics does the administration use to support the smart city concept?

The strategy maintains a positive tone. It also uses the phrase "By and For Citizens" throughout, which would translate the vision that the city hopes to establish. It seems the objective is to construct their initiative based on an effective dialogue between the administration and citizens. Indeed, some projects and decisions taken since the election of Denis Coderre would prove the desire to encourage public participation. However, the document contains very few indications of a significant dialogue taking place past the consultation phase. I also found out that the administration used the strategy document to convey another key objective: it wants to be known around the world as a smart city.

**The Text**

First, let us look at the general organization of the text. It outlines the main sectors of intervention for the smart city projects, the research and consultation process that were conducted by the Smart and Digital City Office, as well as the general vision for Montréal as a smart city. The document begins with a word from the mayor, Denis Coderre, followed by one from the Vice Chair of the Executive Committee and councillor responsible for the smart city, Harout Chitilian. Then, the document opens with a summary of its content as well as an index. Following this comes the bulk of the document, which is divided into four main sections: "The Smart City" (Section 3) explains the smart city concept and explores Montréal's own context as it dives into this process; "Montréal's Initiative" (Section 4) informs the reader about the main steps of the Montréal strategy and how it was crafted; "Policy Guidelines" (Section 5) identifies five focus areas, with structural components that will support them; and Section 6, "Action Plan," discusses the document that will expose how the projects will be developed. Finally, Section 7 includes a short conclusion. I did not scrutinize the rest of the document, meaning the bibliography, glossary and a summary of the various tables and figures.

Familiar with the organization of the text, we can take a look at its content. The text conveys the particular objectives that the city pursues in its process of becoming a smart city. I pinpoint two main goals in the document that deserve further discussion: first, the administration wants the smart city to build "by and for citizens"; second, it aims to be internationally recognized as a role model in this field. However, it is also logical to wonder what is not successfully conveyed to the audience. In this case, the purpose of the smart city, meaning an understanding of the concept that would sustain the administration throughout this process, is lacking from this strategy document.

**What is a Smart City According to Montréal?**

There are two aspects to consider when looking at this question. The first is to investigate how the administration defines a smart city in the document, and how it attempts to persuade Montréalers of the merits of this model based on their understanding of the term. The second aspect is how they use the definition to draft their vision for the future. In order to unpack those

two separate – yet related – questions, this section focuses on two particular sections of the text: Section 3, "The Smart City," and Section 4, "Montréal's Initiative."

First, the document is missing a clear definition of the concept that is driving Montréal's vision and initiatives. The first page of Section 3, "The Smart City," states that worldwide initiatives related to the smart city concept are meant to overcome numerous challenges faced by municipal administrations, including the fact that "confidence in institutions is down" and that cities have multiple important services to deliver, including transportation and managing pollution and waste (City of Montréal, 2014, p.8). This rather gloom portrait of the municipal context seems to bring us back to the "city in crisis" discourse post-World War II and IBM's "sick city" from the previous chapter. Then, the author argues, "the scale of the challenges is forcing cities to rethink their strategies and to innovate in order to maintain service levels" (City of Montréal, 2014, p.8). This is not a surprising turn of phrase for a policy document. When it comes to justifying the smart city concept, the socio-economic context is presented as an inextricable force that reduces the possibilities for action. The municipal government *has* to act in that field, otherwise something bad will happen.

Even though the document does provide definitions of the smart city to the reader, it fails to communicate which one, if any, is in line with Montréal's own vision. The last page of Section 3 contains three definitions in quotation marks. The first is the "IT-based model," the second introduces the concept as "built around the use of big data," and the last talks about the smart city as "an organic factor incorporating different aspects of city living" (City of Montréal, 2014, p.10). The document presents these definitions as "conflicting," but never explains why that might be. The latter is referenced as "the one most common today" (City of Montréal, 2014, p.10). Still, the most common does not mean the best or the one that the author prefers. By simply incorporating these definitions in the strategy document without further explanation, the administration does not effectively clarify the concept of the smart city and fails to demonstrate why it might be desirable for Montréal to adopt. Perhaps it means to communicate that the city's vision is a combination of the three, but this is never explicitly stated. This seems even more bizarre when the definition section begins with the assertion that "the concept is often misunderstood" (City of Montréal, 2014, p.8). As the introduction of this thesis has proven, it is true that defining what constitutes a smart city is no easy task. Why then not take the time to

properly introduce the concept to your citizens and explain how it might adapt to your local context? By not doing so, the document might end up raising more questions than it answers.

Moreover, Montréal's argument for being a smart city seems tautological: we want to be a smart city because we are a smart city. On page 9 of the document, the reader finds the following statement: "As we recently saw, Montréal ranks among the world's top 21 smart cities. Figure 1 illustrates numerous resources in this field" (City of Montréal, 2014, p.9). One must take note of the fact that Montréal was able to be a part of these top 21 cities back in 2013, even before Denis Coderre was elected and before the administration developed its strategy and action plan. It could provide evidence to the argument made by Hollands and others that the smart city is such a murky concept that one could qualify as 'smart' without actively pursuing that goal. When looking at Figure 1, one sees a cluster of numbers: "5,120 Self-service bicycles," "11 Academic institutions," "171,000 University students," "92,000 IT jobs," "10 business accelerators," "750 Free Wi-Fi hotspots," etc. (City of Montréal, 2014, p.9). All of those numbers are presented to the reader as "resources," and are expected to be considered as necessary and valuable assets for becoming smarter. However, the reasons why these items should be viewed as valuable are unknown. In fact, some of them could be associated with "conflicting definitions" of the smart city concept that are referenced earlier in the strategy document. For example, the number of academic institutions and number of students would belong to a literal definition of 'smartness,' whereas the 750 free Wi-Fi hotspots and IT jobs would relate to the "IT-based model," the first definition on page 10. To be clear, this is not to say that the number of IT firms, students, or self-service bicycles (Bixis) in Montréal has nothing to do with being a smart city. The problem is that those numbers are associated with a definition of the smart city that is neither clearly expressed nor developed.

The lack of definition of the smart city could relate to one of the myths identified earlier: technology as a positive force. The strategy does not have to justify its approach to building a smart and digital city because the definition section sets the table for the reader to accept this choice as necessary. In its own words, the administration says that it is "forced" to make those changes. Then, using Figure 1, the strategy demonstrates that the model is also convenient for Montréal to adopt because it already has many "resources" to develop it. Even if the text does not convey a particular explanation as to why the city would want to be smart, it does transmit two

important goals to the reader: the administration wants to build a smart city "for citizens, by citizens" and intends to become an international model for other cities. These two objectives are further discussed in the following pages.

**For Citizens, By Citizens**

Consider the first goal that the city identified in its strategy: that the smart city be built "for citizens, by citizens." Indeed, the emphasis on dialogue with the population is made clear throughout the document and might arguably be the vision we were looking for earlier. A sub-title written in bold capital letters precedes the message from the mayor: "A smart and digital city built by citizens, for citizens" (City of Montréal, 2014, p.2). The same words also conclude his address. The author uses the phrase again as a title for Figure 2, on page 11. They appear again, although with a slight change of words, in introduction to the section on policy guidelines: "Apply collaborative innovation, state of the art technology, and Montréalers' trademark creativity in imagining and developing an exceptional quality of life and prosperous economy, *with and for citizens*" (emphasis added) (City of Montréal, 2014, p.32). The phrase is also cited in the summary section (City of Montréal, 2014, p.4). This sentence reads like a slogan for the smart city of Montréal. In addition to this statement, several elements of the text would point to a desire for dialogue, exchange, and co-operation between the city administration and its citizens.

In his book *Analysing Discourse,* Fairclough addressed the question of dialogue and the public sphere when it comes to the analysis of contemporary political texts. He noted the increased discussions about the need for "deliberation" and "consultation," acknowledging that it raises questions about what constitutes effective dialogue between citizens and governments (Fairclough, 2003, p.79-80). It follows that when presented with a policy document that alludes to a dialogue between government and citizens, one must pay attention to how this conversation is framed. Because the consultations, surveys, and other opportunities for discussion surrounding the drafting of this particular document were already part of the past when I started writing this thesis, it was impossible for me to assess the quality of the dialogue based on personal experience. However, I could examine how the document recounts those events, to look at the 'voices' that can be heard through the text. In other words, to examine which social actors are

present in the narrative and those who are absent from it. In addition, we can evaluate how they are portrayed, taking particular notice at how citizens' input is situated throughout the document.

The drafting of the strategy is presented as a collective effort in the conclusion, mentioning that "civil society, university, businesses — and in particular young entrepreneurs — representatives of other cities and levels of governments have all made major contributions to producing the 2014-17 Montréal Strategy" (City of Montréal, 2014, p.41). The fourth section, "Montréal's Initiative," describes the numerous tools that the Smart and Digital City Office used "to find out what municipal stakeholders want" (City of Montréal, 2014, p.13). The list is certainly impressive. The Smart and Digital City Office conducted four surveys, along with a study of Montréalers' requests through the 311 service — a free number that residents can use to report urban problems or to get information on the city's activities — along with town hall meetings and a 'suggestion box' on a website (City of Montréal, 2014, p.13). The Office used different media to contact citizens, including phone, Internet, and face-to-face meetings. A lot of information on those consultation events is either included in the documentation or available online. For example, the precise date and place of town hall meetings are listed on page 28 of the strategy document, with a summary of the discussions cited in the footnotes. The summary is published on the smart city portal online in PDF format (City of Montréal, Smart City: Documentation). Indeed, many documents concerning the smart city are available online, including the strategy. This certainly shows an intent of transparency from the administration. It is also positive that the Smart and Digital City Office gave citizens many opportunities to get involved in the consultation process.

However, a few elements of the document raise concerns about the quality of dialogue between administration and citizens. The author suggested that the administration wants an "ongoing dialogue with citizens" when defining orientations and following up on the action plan (City of Montréal, 2014, p.11). However, the vision for a smarter Montréal established in Section 4 contains no feedback element from citizens. The administration's priorities, or "focus areas," are listed as four C's: Collection, "transparent management and open government"; Communication, "information access and distribution systems"; Coordination, "digital public services"; and Collaboration, "supporting industry, to stimulate innovation and creativity" (City of Montréal, 2014, p.12). Underneath each focus area, two or three short sentences provide more

details about the specific objectives attached to it. None of those statements include a feedback process between the city and its population. We can read that data will be released so that "users can display and use such information" and that other tools will be developed "for distributing information to citizens in real-time" (City of Montréal, 2014, p.12). However, they fall short of sharing with the reader how they or other citizens might get further involved in the process of building their smart city. In short, the administration has put in place an important consultation process early on and that is undeniably a positive endeavour. Nevertheless, the strategy document does not reveal how the administration will keep an ongoing dialogue past that first consultation phase.

Details about the methodology that guided the consultation process before the action plan is quite vague. It is described right after the focus areas under the headline "Listening." The document mentions that "several phone and Web surveys" took place between 2012 and 2014 to query citizens' needs. However, the reader does not know the format of those surveys: What questions were asked during each exchange? Was there an opportunity for respondents to add their own suggestions or provide feedback after the survey? Were the categories exhaustive or were they selected for that document based on the number of responses? The only exception appears to be the subsection describing the town hall meetings. Here the statements are provided, sometimes with a percentage of support, even if the number of participants is not divulged (City of Montréal, 2014, p.30). The details of the selection process for the 'suggestion box' set up by the city are also unknown. In section 4.2.6, the document states: "357 suggestions were received online and at the co-design workshop, of which 232 were selected for further study" (City of Montréal, 2014, p.29). Again, the reader does not know who carried out this selection and the criteria according to which those particular ideas were picked. The fact that those details are not known makes it difficult to assess if those surveys were true attempts at dialogue or if they were merely aimed at selecting already favoured opinions. It also makes it difficult for citizens to participate if the format and rules of the discussion are unknown. Since then, the city has conducted other surveys about the quality of services in Montréal, and has put the results, survey questions, and structure on its open data portal.

Another aspect of the strategy that is worth noting is that "citizens' opinions" are never attributed to actual individuals. Intertextuality refers to the quality of a text to reference and

include other texts into its fabric (Fairclough, 2003, p.47). Which voices are selected, how they are framed, or their contextualization in terms of other elements of the text can reveal certain attitudes or assumptions about those actors (Fairclough, 2003, p.11). In this document, the administration always mediates the opinions expressed by citizens. In the section about the town hall meetings, it reads: "In some cases, participants were asked to vote on certain statements to indicate their preferences" (City of Montréal, 2014, p.30). Underneath that sentence, the statements in questions are listed, for example, but not actual quotes that came out of the meetings. In fact, throughout the document, not a single citizen is mentioned by name or attributed a quote. Montréalers' input is always translated into figures or percentages of support linked with statements that are not theirs. Even though the will to have a dialogue with citizens appears genuine, there seems to be a desire to filter what is being said, and how it is communicated – at least in this particular document.

This 'translation' of citizens' voices into figures and tables could only be an attempt to render those opinions legible to a casual reader. Still, the impact of this framing is most striking when compared to countries, cities, or other governmental institutions that are present in the text. Section 4, "Montréal's initiative," is the largest section of the strategy document. Of the 21 pages included in this chapter, 12 are dedicated to "a review of worldwide initiatives" (City of Montréal, 2014, p.15). A short description atop a screenshot presents those initiatives (11 in this section). Those screenshots come directly from the website for the targeted project. The images are incredibly large, taking three quarters of the available space on the page in most cases (City of Montréal, 2014, p.16-27). In this case, the author means the screenshots to be truthful visual representations of a given initiative. They are used as both sources of information for the reader and as visual aid for the short description. In this particular context, the screenshot could be viewed as the equivalent of a quote. However, this enlargement of governmental institutions' voices does not only happen in this particular section. They are also disproportionately represented in discussions over terminology. In Section 3, "The Smart City," three definitions of the smart city concept are presented to the reader, with four different quotes. Two of those quotes come from research papers written by companies, the other two are from governmental sources. The author makes the sources for governmental quotes more visible by incorporating them in the body of the text, while citing the other two as footnotes. Overall, the Montréal strategy document tends to enlarge the voices of public institutions and private companies, or at least to present their

contributions “as is,” contrary to the voices of citizens, which are translated into figures and percentages of support.

The work of classification of social actors also textures the document in interesting ways. Categories are used in a text to differentiate, but also to impose divisions that constructs a particular vision (Fairclough, 2003, p.138). In many instances in the text, the ‘citizen’ group is separated from the ‘expert’ group (City of Montréal, 2014, see p.28, 39 & p.40). This distinction could appear normal at first; this is a policy document, influenced by the genre of governance. This genre is characterized by a vision of governing as managing, which would place emphasis on the character of the Expert as a powerful figure. However, the context becomes relevant in our discussion about effective dialogue. In all three instances, the author differentiates experts and citizens when talking about public consultation, such as the one on page 39: “Naturally, project definitions will be enhanced through consultation with citizens and experts” (City of Montréal, 2014). This statement could point to the implication that citizens are not experts and experts are not ‘regular’ citizens, which would set up a certain hierarchy between the two categories.

There is, however, some positive proof that the city is willing to consider citizens’ voices while developing its smart strategy. An evident example would be the evolution of “Je vois Mtl” into “Faire Montréal,” presented as a collaborative platform that would allow citizens to follow up on projects and initiatives from “Je fais Mtl” and the action plan (City of Montréal, 2015b). “Je vois Mtl” was an event held in November 2014 that assembled 1500 people at Place des Arts (Radio-Canada, 2014). Organized by Michel Leblanc, from the Chambre de Commerce du Montréal métropolitain, and Jacques Ménard, from BMO Groupe financier du Québec, “Je vois Mtl” led to the adoption of 180 projects sponsored by organizations, companies, or individuals (Radio-Canada, 2014). The strategy document mentions the movement as one of the sources for the projects to be included in the Montréal action plan (City of Montréal, 2014, p.37). Several months later, Je vois Mtl turned into Je fais Mtl, then “Faire Montréal” was launched in June 2015 (City of Montréal, 2015b). Nevertheless, it is interesting to note that the city has linked this movement with the smart city label, even if the organizers and the citizens who participated did not seem to describe their initiative as such. Earlier, I questioned the lack of details divulged on the parameters of the consultation process. In Section 6, the strategy document includes the matrix that the Smart and Digital Office used to select the projects for the Action plan, a matrix

"validated by citizens at the November 23, 2014 Convergence Workshop" (City of Montréal, 2014, p.38). Another example occurred more recently. On July 5th, the City of Montréal Facebook page shared a link to a page titled "SimpliCity." The site links to a platform that allows participants to submit a design for the new website by sorting topics into categories, ultimately shaping scroll-down menus (City of Montréal, 2017). The participant may also move the categories across the screen and create new ones.

The assessment of the consultation process exposed by the Montréal strategy document should not be interpreted as an attempt to comprehend the individual experience of participants, nor as an effort to analyze reception. Those concerns are well outside the scope of this thesis. Rather, I want to look at different claims made by the document, as one of my goals is to understand the discursive strategies used by city governments in order to justify 'smart' policies. Subsequently, the strategic use of the phrase "by citizens, for citizens" deserved further inquiry. My analysis reveals that the voices of citizens tend to be diluted into numbers, while statements from governments or businesses occupy most of the space in the document. Furthermore, even if there is proof of the administration's intention to share information with the public, many details are left out, which leaves us with an incomplete picture of the consultation process.

**International Recognition**

The second goal established by the *Montréal Smart and Digital City, 2014–2017 Montréal Strategy* document is for the city to be internationally known as a smart city. Again, the administration immediately reveals this objective in the "Message from the mayor." The first sentence states that Montréal created the Smart and Digital City Office "to become a world leader among smart and digital cities" (City of Montréal, 2014, p.2). This objective appears again on page 9, where it says that the city intends "to become a model in the field" (City of Montréal, 2014). This type of statement is repeated on pages 11, 36, 38, and 41. It is evident that gaining recognition is supporting Denis Coderre's promise to turn Montréal into a smart city.

As part of the process to fulfill that goal, the Smart and Digital City Office studied what the strategy calls "worldwide initiatives" in order to develop its own approach. In discourse analysis, participants in a text can be "social actors." They are typically those who perform actions. Furthermore, how the author represents those actors in a given text can give clues about

the social significance attributed to them (Fairclough, 2003, p.222). I have examined above how cities or countries were portrayed in terms of space dedicated to them. I now take a closer look at which countries are included or excluded from the narrative, as well as how their initiatives are introduced to the reader.

The smart and digital city strategy uses many examples from around the world in order to support its own vision or to inform the reader on the particular cases that have inspired Montréal's projects. However, when one pays closer attention to the countries and cities included in the document, the category "worldwide" is actually more restrictive than its name would suggest. All the examples featured are from European countries or cities in the United States. Throughout the 50 pages of the strategy document, the author mentions only one other Canadian city, Toronto, and only one country in South America (The Mueve TT Innovation Challenge from Chile) on page 34. No countries or cities from Africa or Asia are in the document, despite the fact that one of the most famous examples of a smart city is SongDo, in South Korea, a city entirely conceived and built around ubiquitous computing technology (Townsend 2014, p.26). Furthermore, research conducted in 2013 by the Nikkei BP Cleantech Institute reported that China had almost twice as many smart city construction projects as North America (Tokoro, 2016, p.2). As mentioned earlier, classification helps to construct a particular vision. In this case, the fact that those particular cases were selected as representative of "worldwide initiatives" (City of Montréal, 2014, p.15) builds an ethnocentric vision of the smart city, in which "relevant examples" (City of Montréal, 2014, p.32) and "best practices" (p.13) are only found in the global North.

**Impact of the Smart City Initiative**

The city has begun to implement many of the projects listed in the report. The administration opened several "Fab Labs" on the island, including in the borough of Côte-des-Neiges-Notre-Dame-de-Grâces during the summer of 2016 (City of Montréal, 2016a). A Fab Lab — a contraction of the words "fabrication" and "laboratory" — is an open creative space. It is situated in a public library and is equipped with a 3D printer and various open source software packages that can be used by the public. In terms of public transit, a key municipal responsibility, the city has announced the introduction of iBus, a new system that would allow users to track

buses on their route, learning of delays because of traffic or construction, for example (City of Montréal, Faire Montréal: iBus). The city also has an open data portal that was already in place before the election of the current administration. However, it has released new datasets, including crime data sets, for instance (Rocha, 2016). Finally, the city of Montréal also wanted to use smart city initiatives to increase activity in the private sector. It created InnoCité Mtl, a 'start-up accelerator,' in June 2015. InnoCité Mtl supports start-up firms whose projects, apps, or business ideas could help fulfill the goals outlined by the Montréal Action Plan 2015–2017 (Mathys, 2016). The administration also announced in that same summer the creation of Capital Intelligent Mtl, a group of 23 enterprises who donate resources and money to develop start-ups for the smart city. The companies in this group gathered a $100 million private capital fund for projects that work towards a digital and smart Montréal (La Presse canadienne, 2016). These are just a sample of the various projects that the administration has presented to the public as part of his efforts to become smarter.

The local investments and projects have attracted some coverage and recognition outside of the city. For example, Montréal won the 2016 "Intelligent Community of the Year Award" from the Intelligent Community Forum (ICF) (Owen, 2016). The ICF is a global research think tank that gives the award annually based on "a year-long evaluation that included a quantitative analysis of extensive data, site inspections by the Intelligent Community Forum, and votes from an international jury made up of experts from around the world" (Owen, 2016). Montréal had its eyes on the prize for a long time; it was included in the strategy document as an objective for the administration (City of Montréal, 2014, p.4).

On the other hand, there were also false starts and mishaps. Montréal tried to host a Smart City Expo in 2014, which aimed at providing a meeting place for entrepreneurs, academics and politicians interested in the development of smart cities (Smart City expo Montréal). Originally scheduled for December 2014, it had to be postponed due to the low number of registrations for the event (Bruemmer, 2015). The press also critiqued one of the first smart projects, the INFO-Neige Mtl app, last year. An article in La Presse pointed out that the smartphone app does not have a lot of active users, around 23 000 in 2016 (Normandin, 2016). Another article mentioned that even if the app did provide the city with more data about snow removal operations, it did not effectively reduce the number of cars towed in most districts (Normandin & Desautels, 2016). At

the time of submission, the city has announced that half of the projects scheduled for delivery by the end of the year will not be completed, and many others will probably have to be abandoned (Houde-Roy, 2017).

The technical capabilities of Montréal as a potential smart city are also a source of concern. Although many documents issued by the city argue that becoming a smart city is not only about technology, many of the projects prioritized by the administration do rely on a strong technological infrastructure in order to become reality. For instance, one of the main projects is to deploy a larger free Wi-Fi network across the island (City of Montréal, 2014, p.12). However, a 2014 report by the Montréal's auditor general confirmed that the city maturity level when it comes to IT is desperately low. The office conducted several studies over the years to evaluate IT management and assess whether they could achieve objectives or if, on the other hand, new strategies needed to be developed. The information technology department is one that seems to be in a continued state of crisis and struggle. Indeed, the first study carried out in 2004 found several operational problems that were still present in 2006, then only worsened with the departure of the manager "following allegations of overbilling and collusion" (Vérificateur général, 2014, p.127). The audit that led to the 2014 report was conducted between February and November of 2014, after the city announced its plan to become a smart and digital city. The auditor general conducted interviews with the city's IT department as well as in-depth analysis of different documents related to the state of information technology in the city. The report concluded that their investigation did "confirm that the organizational structure and management processes in place do not ensure a sufficiently effective and efficient IT contribution to the city's mission, strategies and objectives" (Vérificateur général, 2014, p.128).

Although the report admitted that the city had taken some important steps in order to improve, it proposed a number of recommendations, including that the administration ratify a master plan for IT governance in consultation with the department. Moreover, it identified possible shortcomings in the administration's current governance framework, for instance that the city might have to rely more and more on outside firms, or that IT maintenance expenses will drain investments that could have been made in more productive activities (Vérificateur général, 2014, p.131). Since then, the city announced that more than 100 new positions in IT would be opened, meaning that 20% of their workforce would be renewed starting in October 2016

(Blanchet, 2016). Nevertheless, it is unclear what steps the city has taken since the recommendations from the auditor general to raise the IT maturity level. My participants mentioned the IT department several times during the interviews; I discuss their take on this issue in Chapter 3.

The desire to become a smart city seems to be an important goal for the current administration, with several projects already in place. The city created a number of new organizations, including the Smart and Digital Office, in order to tackle the many challenges that the transformation entails. Even if the *Montréal Smart and Digital City: 2014–2017 Montréal Strategy* is only one document among many, it is central to the city's development process. The administration shares its two main objectives with the reader: to build a smart city that is "by citizens, for citizens," and to be internationally recognized for its projects. The strategy reports an extensive consultation process that helped build the action plan, but fails to mention how the discussion will carry on through the years. In addition, the author seems to erase the voices of citizens from the document, while enhancing those of private companies and public institutions. Finally, it is curious to note that the inspiration for Montréal's projects appear to come exclusively from other developed countries, despite the fact that many countries in Asia have developed impressive smart projects. However, in order to get a complete picture of the regional situation, I cannot rely exclusively on documentation. The next chapter investigates the lived realities of the smart city.

## CHAPTER 3: BUILDING A SMART CITY

Two of my research questions concern the very nature of the smart city: “What is a smart city?”; “What is ‘new’ or ‘different’ about it?” To answer these questions, I collected data from face-to-face interviews with two major actors involved in the development of Montréal as a smart city. One of them is Harout Chitilian, the councillor responsible for smart city initiatives; the other, Elsa Dupuis. These meetings aimed at understanding how Montréal defined its own initiatives, in addition to what was driving the administration to pursue its goals. In contrast, I also wanted to know what might limit the city’s capacity to grow smarter: are they facing any particular obstacles? What are some of the essential resources? What influenced the administration to pursue or abandon projects along the way? I also asked what differentiates Montréal from other smart cities worldwide, in order to understand its regional specificity, an aspect that is missing from research on the topic, according to Kitchin (2014, p.134). The interviews aim to give insight into what it is like to build a smart city.

My research demonstrates that building a smart city requires much more than integrating technology into daily practice. In the case of Montréal, it requires an important cultural change that will not happen overnight. The administration was able to complete several interesting projects so far. However, it needs to do a massive amount of work over the long term to include citizens in municipal decision-making. In addition, I sense a shift between the smart city established by the strategy document compared to the one relayed to me by my participants. It seems that the concept has moved from being a valuable model to an inevitable solution. This shift could eventually affect debates around the projects, initiatives, and actions taken to construct a smarter city.

I divide this chapter into four sections. “What makes a City Smart” is dedicated to the main category that derived from my analysis of the interview data. The second section summarizes my findings associated with the two subsections in that same category: “capabilities” and “resources vs. desires.” Because there were several links between the two subsections, I grouped all of my conclusions into one section. The third section, “Building by and for Citizens,” is named after the second main category that emerged from my data analysis. It compares what I learned in my interviews with my analysis of the strategy document. Finally, “Plans for the

Future" refers to a discussion with Harout Chitilian at the end of our meeting about the long-term plan of the administration for the smart and digital city of Montréal.

**What Makes a City Smart?**

This question was one of the main codes that derived from my transcript. To find out the definition of the smart city that inspired Montréal's initiatives, I asked both my participants the question: "What is a smart city and what does it mean to be smart?" Both acknowledged the complexity of the term itself before submitting their definition. Dupuis gave a definition that resembled the one given by Townsend, linking it with problem solving. Indeed, as previously explained in the introduction, Townsend considered that using technology in order to solve modern day problems was at the heart of the smart city. In the same manner, Dupuis understood it as follows: "it means to systematically use technologies in order to resolve or participate in the resolution of the city's problems or organizational issues. It means to put aside the case-by-case analysis of these issues and ask ourselves: what can we achieve today with technology?" (E. Dupuis, personal communication). In comparison, Harout Chitilian first talked about the human aspect of the smart city, characterizing it as "fundamental" to the concept. He defined it as a "strategy, it's a program that's driven by humans for humans" (H. Chitilian, personal communication, November 15, 2016), a turn of phrase that one might recognize from the slogan used in the strategy document and discussed in chapter 2. He also linked the idea of 'smartness' to the introduction of technology into the day-to-day city administration, while maintaining "technology is a means to an end but it's not the end" (H. Chitilian, personal communication, November 15, 2016). Elsa Dupuis and I also talked in the very first minutes of our meeting of the "smart community" as being part of Montréal's vision for the smart city (E. Dupuis, personal communication). In short, both put forward technology as a strategic tool for problem-solving and better management.

Furthermore, both interviewees used the term "ecosystem" throughout our meetings to describe the desired environment for development, one that the city of Montréal already possesses, according to my participants. Chitilian described this environment as something that sets his city apart from others: "We had this great wealth that I would like to call a collective and know-how, knowledge and creativity that we were sitting on. It was this huge wealth that we had.

So, no other city… because a lot of cities also used the smart city program to build this ecosystem. But we had the ecosystem" (H. Chitilian, personal communication, November 15, 2016). In other words, instead of having to build a smarter city from the ground up, Chitilian felt that Montréal only had to harness the existing resources to become smarter. My other participant also talked about the ecosystem to insist that the development of a smart city does not only affect the administration: "there is this vision to make the ecosystem work and to work with the local ecosystem to make this city smart, not only from an administrative point of view, but also in general" (E. Dupuis, personal communication). Therefore, Dupuis also understood that a smart collective was fundamental even if she did not immediately talk about the human aspect of the smart city when asked to define it. Both seem to understand this ecosystem as the local businesses, civic organizations and universities that could be mobilized in order to drive strategic initiatives.

Many of the cases for the smart city that appear in mainstream media are about how the city would save money, resources, or energy by building an app, opening up its data, or modernizing its digital infrastructure. However, there could be many different reasons why a city government might want to become 'smarter,' and being a better manager might not always be the main objective. I asked Elsa Dupuis if the initial objective of the INFO-Neige application, for example, was efficiency. The INFO-Neige Mtl application was one of the first 'smart' projects that Montréal presented to the public. It is a smartphone app that allows users to register the location of their car on the street and receive a notification when snow removal operations are scheduled for that street. The interactive, colour-coded map gives information about planned and ongoing snow removal operations, as well as the location of free parking spots. The logical explanation for this project would be faster snow operations and fewer cars towed every year. However, Dupuis did not support this theory at first. According to her, the main objective was not to be more efficient. Nevertheless, when I insisted, she said: "the main focus was helping citizens with little things rather than on efficiency. But, actually, when we talk about transportation among other issues, improving citizens' lives is about being more efficient" (E. Dupuis, personal communication). However, Chitilian did mention that a team was dedicated to cost saving and efficiency. He called it "the performance measurement and operation excellence team" (H. Chitilian, personal communication, November 15, 2016). He told me that this team examined the massive amount of data collected by the city and suggested changes that

represented 2 million dollars' worth of savings (H. Chitilian, personal communication, November 15, 2016). Therefore, it seems that efficiency and cost-saving are part of the process to become smarter, but not every single project is designed to fulfill that objective.

When I discussed the city's strategy in Chapter 2, being an internationally recognized smart city was a key objective for the administration. This part of the myth holds, given my interviews. Harout Chitilian explained to me that building strong relationships with other cities was one of the key pieces of their strategy. He even suggested that knowing about different projects gave them an advantage: "being late in the game we had the privilege to not go down dead ends. We had the privilege to know where to hit the nail on the head" (H. Chitilian, personal communication, November 15, 2016). He also listed certain prizes or recognition that Montréal had earned thanks to its smart city initiatives; the Intelligent Community of the Year 2016 award, for example. The administration values its growing influence on the international front not only to showcase their success, but also to inspire future initiatives. Building relationships with international allies, according to Chitilian, gave the city an opportunity to learn and grow. In contrast, the strategy document does not make that objective particularly clear. Even if some statements under the images of international projects did provide more details about why they might inspire Montréal's projects, most were only descriptive. The interviews were useful in shedding light on this perspective.

On her part, Elsa Dupuis used projects or initiatives introduced in other jurisdictions as tools to compare or contrast Montréal's own projects. However, when speculating on the future challenges of the city as a political entity, she brought forward a competitive element:

> Countries and provinces are not the only ones in competition with one another, the cities also compete to gather funds, to recruit talents, and this means that, in addition to the cities' historical prerogative to maintain infrastructures, to offer services to their citizens such as collecting garbage, etc., new prerogatives pile up more and more. (E. Dupuis, personal communication)

This adds another layer to Chitilian's interview, as comparing Montréal to others becomes as much about competition as collaboration. As mentioned, a growing proportion of the population now lives in urban areas. City administrations will not only be expected to maintain current

service delivery to citizens, but also to offer new ones as demand increases. Those better equipped to do so will thrive, and city officials seem to be aware of that impending challenge.

To sum up, my research demonstrates that decision-makers had several key characteristics in mind whilst building a 'smarter' Montréal. They knew that technology would be playing an essential role in this transformation and open up new possibilities for the administration. However, smartphones and apps alone would not change the city for the better: 'smart' humans and a smart ecosystem have to drive that change. Academia, start-ups, businesses and concerned citizens would all have to contribute. The city also seems to be interested in hearing success stories from elsewhere in order to pick its own projects. In the end, saving money or becoming more efficient is definitely one of the goals of becoming 'smarter,' but the city expects other positive outcomes to come of smart initiatives.

However, it appears that the Montréal narrative driving the smart city ideal is becoming less and less a matter of will and more about following the one and only road to the future. It has become path-dependent. As Elsa Dupuis put it rather bluntly in our interview, "I think it is inevitable one way or another" (personal communication). My interviews confirm that the narrative of the smart city has evolved from a potential solution to growing urban problems into an inevitable result. As Dupuis explained, the smart city poses the question of how technology may resolve some problems and ensure that the administration is able to "do more with less," because "the reality is we don't have a choice" (E. Dupuis, personal communication). This statement is consistent with a lot of the literature on the phenomenon. More and more, the smart city model is pursued to the point of inevitability.

Even in cases where authors encourage policymakers to act with caution when it comes to integrating technology in the city infrastructure, they are doing so with a sense of helplessness. In a chapter written for the book *Smart cities as Democratic Ecologies*, Wadhwa argues that stakeholders will have to pass legislation on privacy and security as the phenomena of the Internet of Things keeps growing:

> Many of the problems that cities face, from traffic to air pollution, are the same, and if a method is truly an improvement, you can expect it to spread widely. The question isn't whether cities will become smart; it's which technologies and approaches actually create value for all stakeholders. Those that are truly "smart" will no longer be known as that;

> they will follow the path of other successful technologies and just become the default expectation. (Wadhwa, 2015, p.127)

In other words, even when somebody holds a pessimistic view of the smart city, we can see that it is already accepted as the next evolutionary phase of urban life. The administrations can inspire one another and share their tools with other smart cities because many are fighting the same problems. That is why it is frequent to observe multiple cities using the same technological tools, especially when the general solution appears quite versatile. As I demonstrated in the introduction, there are many different subtypes of smart cities, depending on their main objective. Still, there may be specific challenges that would affect the development of a smart city, as I discuss in the following sections.

**Capabilities and Resources vs. Desires**

Even if my two participants saw multiple resources that their city could tap into, they also acknowledged that they faced numerous challenges similar to my observations at the end of Chapter 2. Some of them are linked to the very nature of the city, while others are specific to Montréal. The potential obstacles were extremely important for my research because they reveal information that was not visible in the strategy document. Indeed, the text focuses on resources and plans for the next few years. The tone remains overwhelmingly positive throughout. It evades all questions of capability in order to focus on possibility. By contrast, Montréal officials recognize several obstacles that could hinder that strategy. This section expands on the two subsections that I consider linked with the category "What Makes a City Smart."

As mentioned in the previous chapter, the desire to make Montréal a smart city started in 2013. The Coderre administration was elected without any organization already in place to help make that wish a reality. During our meeting, Chitilian confirmed that when he was appointed to this office, he "started with a blank sheet" (H. Chitilian, personal communication, November 15, 2016). He had no existing strategy, proposal, staff, or department. He added that the IT department "was a challenge on its own" (H. Chitilian, personal communication, November 15, 2016), a point to which I will return. Considering those conditions, it is impressive what the city was able to accomplish in such a short period. Still, Chitilian recognized that Montréal is "late

into the game" in terms of smart initiatives (H. Chitilian, personal communication, November 15, 2016). Even if he argued that it could be viewed it as an advantage, it does mean that the city is years behind when it comes to modernizing its digital infrastructure.

One of the main obstacles to building a smart city – referred to several times by both my participants – is (ironically) the fact that the city is a public entity. The nature of the city as a public administration delays projects, limits the potential of the city to develop its technological tools, and pressures workers to pursue certain initiatives but not others. I am not referring here to the particular situation of the city within our Canadian federal system. After I asked him if the support of provincial or federal governments had an influence on smart city initiatives in Montréal, Harout Chitilian replied that it did not have a meaningful impact on his work (H. Chitilian, personal communication, November 15, 2016). Rather, it is the organization of the city, its communication and information practices as a public administration that shapes the capabilities and resources. Furthermore, they often compared the potential of the public to the private sector, with the latter being superior or more *capable* in every scenario that was brought up.

This became clear on several occasions during both interviews. When asked to define the smart city, Chitilian stated that there are three major stakeholders in the development of this concept: private companies, the public sector, and scholars. The comparison between the public and the private appeared here for the first time:

> You basically had policy makers who already at the beginning of the year 2000 wanted to bring the digital revolution into the public realm, because the private sector went through the digital revolution and now it's even further. We're, you know, not even at 2.0, we're at 3.0, 4.0 in the private sector and in citizen driven initiatives. (H. Chitilian, personal communication, November 15, 2016)

On one hand, the literature would support Chitilian's statement, as private companies, such as Cisco and IBM, initiated the smart city model by suggesting partnerships in order to help cities implement technological projects. On the other hand, this statement infers that the private sector as a whole is far more advanced in terms of citizen driven initiatives than the public sector. Even if it were true, it may not be a fair comparison to make. Just as Light points out in *From Welfare to Warfare*, cities are more complex organizations than the military; I would argue that they are

also more intricate than private companies. Additionally, as Kitchin pointed out in "Making sense of smart cities: addressing present shortcomings," ICT companies most likely use the citizen empowerment discourse in search of profits, not necessarily to fulfil population needs (2014, p.132). The question should not be who has the most technological tools, but instead focus on their proper usage.

Chitilian himself exposed an important difference between the challenges faced by governments and companies when considering a reform process: "But the public sector (…) is considered a business but it's not … But they're in the business of delivering services. And when you're delivering services you don't have the privilege to call a timeout" (H. Chitilian, personal communication, November 15, 2016). He is mentioning this at a part of the interview where he talked about what is in his view the third pillar of the smart city, innovation. He is making the point that it is difficult to innovate when it is nearly impossible to take a break and assess the situation. Governments constantly have to evolve. He did add that smart data, smart citizens, and technology make it "more accessible to the public sector," while "innovation in the private sector, it's normal" (H. Chitilian, personal communication, November 15, 2016). As we can see, the private sector is revered and seen as the ideal to which the public sector must be compared.

Even if the private sector is less glorified in my interview with Elsa Dupuis, the comparison with the public realm is still present in several instances. One of the most extensive ones is between Facebook and the city. I was asking my interviewee how the city was concretely building the vision exposed in the strategy through the phrase "By Citizens, For Citizens." She first talked about several projects that were in the works in order to get feedback from the people of Montréal and to incorporate an interactive approach to the city's initiatives. Then, she said:

> it is important to understand that the Facebooks of this world, for example, have <u>one</u> website, and that most people only see <u>one</u> page. We, the city, have between 500 and 600 different systems to manage, from trees to public security, from snow removal to sports platforms. (E. Dupuis, personal communication)

She is seeking understanding: the process towards change is more time-consuming than in a private company because there are many more elements to manage. As such, it adds to the narrative previously established by the councillor responsible for smart city initiatives. The

normal pace of the city appears to be slow, the normal pace of the private sector faster; but there are factors that can explain their distinct path to technological development.

Of course, the inner functioning of the city is not the focus of my research. It is therefore beyond the scope of this thesis to assess if the comparisons, stories, and statements on the public administration are accurate or fair. However, it is interesting to notice how both participants used them. They draw a portrait of the city as living in inertia, trapped in its old, outdated ways. Its technological systems are stuck in limbo, while the businesses are developing the latest tools and using them for their own benefit. In Montréal, the answer to this lack of capacity comes in the form of private-public partnerships. Robert Hollands was already noticing a shift in urban governance back in 2008 when looking at the development of smart cities. He mentions in his article "Will the real smart city please stand up?" that the private sector had a growing influence in urban governance. For example, he notices that self-designating smart cities chose first to promote their capacity to attract corporations and private capital on their website, as the smart city discourse grew to favour city administrations who were "business-friendly" (Hollands, 2008, p.308). He argues that governments should be careful of the potentially conflicting implications of public-private partnerships: "While the Canadian government has pored some C$6.4 billion into the Technology Partnerships Canada program (effectively loans to multinational companies), it is expected that only about a third of that money will have been repaid by 2020" (Hollands, 2008, p.314).

The strategy document suggests using partnerships to drive projects or to fund them as part of Montréal's vision (City of Montréal, 2014, p.12). Early on in our interview, Elsa Dupuis talked about a deal struck between the city, Montréal en Lumières, and the Palais des Congrès in order to further develop Wi-Fi on the island, which is one of the objectives included in the strategy (E. Dupuis, personal communication). Later on, we discussed a partnership with Waze, an application that monitors the flow of traffic based on its users' data. The city's Urban Mobility Management Centre sends its data to Waze in exchange for the data collected through the application's pool of Montréal users (CBC News, 2016). Dupuis explained that the city installed hundreds of cameras at the main intersections and employed operators to watch the footage (E. Dupuis, personal communication). However, due to the cameras' placement pattern and the fact that it would be nearly impossible for operators to watch all the intersections at the same time,

they could still miss important problems or incidents. My interviewee presented this deal as mutually beneficial: everybody gets more data. Not only that, but the partnership was the only viable option, because the city was not interested in developing its own app to report on traffic flows and Waze had "a capacity to collect information that we can never have […]. As a city, we don't have the means to have the … to get this reach, to reach that many people" (E. Dupuis, personal communication). Dupuis did acknowledge that the city realized this partnership gave "leverage" to the business. Still, the city frames this deal as the only means to accomplish its goals.

Then, we have the elephant in the room: IT. The relationship between the city and its Information Technology department appears complicated. As discussed in Chapter 2, that department was the object of a corruption scandal around 2007–2008. In addition to his other portfolios, Harout Chitilian is also the councillor in charge of IT. As soon as he mentioned it in our meeting, he acknowledged the particular challenges that it entailed. "You had to completely redefine the whole optics of how this department was working at the city of Montréal (…) because it was an organization that had underwent a lot of rapid transformations but that were not very well thought out" (H. Chitilian, personal communication, November 15, 2016). He also added that the city suffered from "massive underinvestment in technology" (H. Chitilian, personal communication, November 15, 2016). The 2014 auditor general's report confirms this statement. It reveals, as discussed in Chapter 2, that Montréal had a very low maturity level in terms of information technology. The IT department was also one of the main challenges brought forward by Elsa Dupuis. Unfortunately, a strong digital infrastructure is critical for the model that the administration says it aspires to build: a city made smarter by its citizens' input into the administration, one that is more open and accessible to all.

The core of the matter is how digital systems were built in the first place: in-house and now outdated; or someone else designed them and now the city depends on third parties for upgrades. Moreover, it is still difficult to find a system that allows for both data entry and extraction on the market, which is a problem when you want a project to be as interactive as possible. When you manage an entity that has over 500 technological systems, it could certainly be hard to change even a small number of them in as little as four years. Still, when Montréal has an IT department that has suffered a corruption scandal; was underfunded, understaffed, and

overbooked with demands from different services; it is not surprising that the changes come at an ever-slower pace. It will be interesting to see if the major employment surge from the fall of 2016 will accelerate the reform of the technological culture that administration officials desire.

These discussions are relevant to my analysis because they stand in sharp contrast with the narrative established by the strategy document. Indeed, it did not highlight these issues at all. This might be because the author wanted the strategy to establish a positive vision. Other reasons for this might include the fact that the city was starting with a blank sheet and therefore could not predict the potential obstacles that it would face. The administration may have been optimistic about its plan, and its capacity to realize it.

**Building By and For Citizens**

The second code that derived from my transcript analysis was "Building By and For Citizens." This code grouped together several statements from both participants about establishing their relationship with the population as the smart city developed. Some sub-codes included "communication," "citizen engagement," and "transparency"; I discuss each of these themes in this section.

Evidently, it is hard to get feedback when a good portion of your work is invisible to your targeted audience. In the case of Montréal, Elsa Dupuis recognized that the city may have some trouble sharing its accomplishments with the public, but also mentioned that it intends to get better. She told me that she spent a significant amount of time on communications, but that this often does not translate into more recognition from the general public (E. Dupuis, personal communication). Moreover, when asked how the city was turning the slogan from its strategy into concrete actions, she started by explaining that the city consulted its citizens at the beginning of the process, but acknowledged that it now "has a tendency to do it insufficiently" (E. Dupuis, personal communication).

During our meeting, Dupuis mentioned that the administration was planning to introduce new projects in the upcoming months in order to get more feedback from Montréalers. My participant mentioned a project called "citoyen-testeur" — an expression that could roughly be translated as "citizen-tester" — which would allow volunteers to test new apps, provide feedback

on a given service, or be consulted on a project under development (City of Montréal, Faire Montréal: Citoyens testeurs). She also said that the city wants to give a completely new look to its official website, along with a mechanism for people to comment on its design as it is being built (E. Dupuis, personal communication). In July, the city launched a testing tool to allow any citizens to suggest a design for the categories on the website. As Elsa Dupuis rightly pointed out in our meeting, it is certainly a fresh take on the more 'traditional' process of government-led project development (personal communication). However, she also explained that establishing an effective feedback mechanism is complicated. Despite the city's desire to get feedback from citizens, that process requires a structure and lengthy planning in order for all the departments and services implicated to get on board with the project (E. Dupuis, personal communication). Therefore, she added, it is not that the administration has given up on its objective to create a smart city that is truly "By and For Citizens," but rather that this takes time to coalesce into habit (E. Dupuis, personal communication). It seems that, at least in this case, the smart city is as much about integrating technology into governance practices as it is about culture change. In order to accomplish its objective of building a city that corresponds to the needs of its citizens, Montréal has no choice but to reform procedures that have been entrenched in its administrative machinery for decades.

When asked to define the smart city and what it means to be 'smart,' Chitilian clearly envisioned data as a core element of the strategy. He described three "founding blocks": the human element, which I mentioned above; transparency; and innovation. He included data in the transparency element and explained that it is not only a tool for the "start-up ecosystem," but also something that is needed to draft policies and manage services, in addition to keeping the administration in check. He mentioned data again when talking about his third "block," innovation: "And every time you look and you drill down and you see that somewhere and somehow data is playing a role, better data and smart citizens and smart employees are playing a role to make that innovation happen" (H. Chitilian, personal communication, November 15, 2016). Dupuis also considered data to be a critical element, "one of the founding pillars of the smart city strategy" (E. Dupuis, personal communication).

Even if the administration and its different services do produce an enormous amount of data, obtaining it and sharing it is easier said than done. I learned during my interviews that

opening data meant more than just making it accessible and available for citizens; most city employees do not have access to data from their own departments. If they do want this data, they have to ask IT and be willing to have any other requests that they previously made be shunted down their list of priorities. The administration is finding that releasing the massive amount of data that each department produces online, in a format that is easily usable and readable for the average user, is a colossal task. This shows the potential difficulties that city governments can encounter when attempting to open up their data.

**Plans for the Future**

Towards the end of the interview, Harout Chitilian talked about the future challenges for his administration. I thought it would be interesting to include them in this chapter; he provides insight into what will be the short- and long-term objectives of the person responsible for smart city initiatives. He talked about accessible digital services — Montréal wants to make it easier to deal with the city and contact them. His three other goals are to attract and retain talent; work together with the provincial and federal government; and celebrate success. Then, we discussed the challenges specific to technological development in the city. He talked about cybersecurity and the need to develop an integrated cybersecurity plan. Not long after my meeting with Chitilian, the administration issued a press release announcing a new partnership between a Montréal firm, PM SCADA Cyber Security, and an Israeli firm, SCADAfence, "to establish a research and development laboratory for cybersecurity" (City of Montréal, 2016b). It shows that there is a desire for the city to work on protecting its infrastructure from hackers as it becomes smarter, a major concern for many scholars (Goh, 2016; Townsend, 2013; Wadhwa, 2015). The other two goals were smart policymaking and the recruitment of smart employees. Future research could assess whether or not the city carries out these objectives in the next few years.

My interviews provided much needed detail on the process of building a smart city. The strategy document was certainly useful to understand the vision of the administration when it began this process, but the interviews really shed light on how the desires expressed by the administration were affected by their resources and capability to implement them. My participants' testimonies also revealed that the smart city is as much about integrating technology into the everyday practice of the administration as it is about implementing a new culture of

governance within the city of Montréal. In order to develop a project that is truly "By Citizens, for Citizens," the city has no choice but to modify practices and habits that have been in place for years. Even if many authors would argue that the smart city is an ideological concept with little real life implications, my research would tend to demonstrate that the desire to become smarter has triggered some incremental, but significant changes in the administrative machinery of the city. However, there seems to be a shift in the discussion. The strategy presented this model as an ambitious project that would modernize infrastructure and effectively create a dialogue between government and citizens. However, the narrative built by my participants rings different. There seems to be no other alternative.

# CONCLUSION

There are many different conclusions that can be drawn from this thesis. The introduction discusses the myth of the smart city and what is meant by 'smart.' Even if it may offer great opportunities for city governments, one must keep a critical stance when assessing the potential of the new urban model. Indeed, some of its central aspects are not new. The desire to transform the city into a well-run machine, to solve complex urban problems as one would solve a mathematical formula, was not born in the last decade. Therefore, the first chapter compares the smart city model to previous examples of technology-driven projects in the 1960s and 1970s. I prove that history seems to repeat itself when it comes to the perceived potential of ICTs to revolutionize policy-making. The stories told by Flood, Medina, and Light suggest that it is inevitable to put aside certain factors when trying to translate the social world into a computer formula. This process of simplification, coupled with high modernist thought, can lead to disastrous consequences, as we have seen with the account of the War Years in New York. There are also similarities between the past and the present when it comes to technology-transfer and the narrative that drives the transition. Whereas the defense industry was pushing its technological tools onto urban planners in the early decades of the Cold War to maintain its influence, multinational ICT companies are now selling the smart city ideal to policy makers for high profits. The "city in crisis" gave way to the "sick city," a discourse that serves to support the integration of Internet of Things solutions, neocybernetic structures, and sensors into our urban environment.

Following this historical perspective, one of the main goals was to understand how a government — in this case, the Coderre administration in Montréal — would integrate the smart city model into its practices. In order to do that, I first looked at the strategy document released by the city after the election. It is a compelling source from which to gather the vision, priorities, and objectives established for a 'smarter' Montréal. For example, it talks about the large consultation process that led to the development of the strategy and action plan. In that sense, the administration's desire to include the population into the process is made evident through the text. The need to fill the gap in terms of technological innovation and to be known internationally as a smart city is also made clear.

Still, it leaves some questions unanswered, even after careful examination. The strategy does not describe how the city would keep the conversation going past the consultation phase. The strategy is missing a clear definition of the smart city, one that would drive Montréal's development. The city's capacity to accomplish these objectives is unclear. Therefore, my interviews help to fill in the blanks and reveal the multiple challenges that the city faces between the abstract of the strategy to everyday practice. The current administration started its smart city development with no existing structure to lean on, outdated systems, and an IT department that was underfunded and understaffed. Even if the administration wants its strategy to rely heavily on open data, it is proving difficult to release that data to the public. Confronted with these challenges, the city chose the path of public-private partnerships in order to pursue its objectives. Moreover, a trend that is noticeable in the strategy document, but made clear during the interviews, was the shift in the perception of the smart city: it evolved from possible urban model to the inevitable solution for growing urban challenges.

**Self-Reflection**

A thesis is always a journey. I wish to provide the reader with a few thoughts about my own journey. First, as it was expected, my thesis changed significantly between my proposal and final submission. I originally wanted to focus on the so-called "smart snow removal system" and the INFO-Neige Mtl application as a case study for analysis. However, the amount of data that I had on the development of the smart city and its many challenges were enough for me to reconsider integrating that aspect into my thesis and I finally chose to put it aside entirely. However, I still believe that the management of our Canadian winters would be the perfect template for future research to investigate the smart city discourse in action.

Second, I feel it is important to mention that it was extremely difficult to obtain information on, or to get in touch with people to interview from, the city of Montréal in order to complete my research. For all the talk of openness, Montréal as a smart city remains opaque to the researcher. Because it is a public organization, any citizen may call the Mayor's office and request an employee's contact information. However, as I should have known, getting an email address or a phone number does not guarantee an interview. I realized this when my multiple calls and emails were often left unanswered. Thankfully, it was not difficult to contact Harout

Chitilian and I had the pleasure of having a very productive meeting with him. Nonetheless, at the end of the year 2016, I only had that one interview out of three or four that I had originally planned. Looking for a new approach, I considered submitting an access to information request to the city of Montréal in order to get documents that would help answer my research questions. It became clear upon visiting the web page on the procedure that I did not have everything that was required to submit an access to information request. It requested extremely precise information: "The document is clearly identified (title, author, subject, date or time period in which the document was produced, city department)" (City of Montréal, Access to information). Needless to say, the format was not ideal for someone conducting research. Therefore, I called the Montréal City Clerk for guidance. Marc Lebel, the person responsible for access to information requests at the time, returned my call within 24 hours. Later, Elsa Dupuis generously offered not only to meet with me, but also to send me some documents. Thankfully, with both interviews, I was able to complete my thesis.

Still, this tedious research process reveals how opaque the apparatus of the city of Montréal can be for the average citizen. There are few resources in place to make the process of gathering information any easier. Even if the email addresses of most of the councillors and administrative employees of the city are publicly available, it is of little help if requests or questions are left unanswered. In the end, I cannot know if the lack of response was out of neglect, lack of interest for my research, lack of time or any other reason. Mr. Lebel told me on the phone that the city was always happy when researchers were looking into their activities. It is true that my experience with the two people who granted me an interview was very pleasant. Nevertheless, it is regrettable that many of my attempts to communicate with the municipal government failed. Given the opportunity to do my research differently, I would have familiarized myself with the city apparatus and its procedures before considering using interviews as a research method.

**Final Thoughts**

Montréal is at a key moment in its evolution. It started its journey on an ambitious plan that would radically change its practices and that would seek to include brand-new tools, in an attempt to present itself in a new image to its population and to the world. However, after

meeting with key actors involved in the transition, I see a shift between the vision established by the strategy and the one carried out by policymakers. The private sector is portrayed as an actor that is more capable and better-equipped to deal with growing challenge than cities are. Montréal sees public-private partnerships as a convenient solution to accomplish its objectives and justify the smart city model. The city seems permeated with a general feeling of helplessness. Its officials frame the smart city model as an inevitable step in the evolution of cities rather than one of many paths for renewed urban governance. In short, the smart city does not seem to belong to the sublime anymore.

This could have several consequences. As Adam Greenfield, Alberto Vanolo and others have suggested, the administration has to keep a critical stance when it comes to the potential influence of the private sector on its development. At least, in the case of Montréal, the business world attached to smart city projects comes in the form of local start-ups and not of multinational companies. Encouraging local entrepreneurs to design solutions tailored to the needs of Montréalers seems like a perfect way to both encourage public participation and local talent. The administration will also have to prove that its intention to build a smarter city "By and For Citizens" still holds when the time comes to write a new strategy. A 'smart' administration, which wants to get closer to its citizens, has to implement tools that relinquish a form of control to the participants. I for one hope that future smart initiatives will not shy away from the complex process of public participation. "Je vois Mtl" was a good example of how citizens might actively translate their ideas into projects supported by the city. It is still possible that the smart city concept will turn out to be a useful vehicle for the city to promote a concrete culture change that would help strengthen our democratic institutions, establish a new relationship with citizens and render the administration more transparent. Even if we have encouraging examples to rely on, it is just too soon to tell if they will crystallize into a durable habit.

The desire to turn the city into machine has not faded, but the modern vehicle for this desire, the smart city, is beginning to fade into banality. If the smart city is no longer sublime, what impact will it have on the future of cities? In the case of Montréal, the model is about to be tested. In this thesis, we talked about the myth of technology as a positive and neutral force. Many authors have warned about the danger of considering the smart city as an "apolitical" project, which would greatly affect the parameters of debate about its implementation. At the

time of submission, Montréal is only a few months away from a municipal election. Whether or not the current administration receives another mandate from citizens could determine the future Montréal, smart and digital city model. Will the next administration frame the smart city as a political project or will it carry on under new leadership?

## REFERENCES


Aribilosho, M., Usoro, A. (2016). A Review on Smart Cities: Impact of Technology and Social Factors. *Computing & Information Systems, 20 (1)*. 21–28.

Blanchet, J-N. (2016, October 24). Un grand ménage informatique à Montréal. *Le Journal de Québec*. Retrieved from http://www.journaldequebec.com/2016/10/24/un-grand-menage-informatique-a-montreal

Bourgault-Côté, G. (2013, May 16). Lancement de campagne mouvementé pour Denis Coderre. *Le Devoir*. Retrieved from http://www.ledevoir.com/politique/montreal/378363/mairie-de-montreal-denis-coderre-plonge

Braw, E. (2014, March 12). Illuminating cities with sustainable smart lighting systems. *The Guardian*. Retrieved from https://www.theguardian.com/sustainable-business/sustainable-smart-lighting-systems-cities

Bruemmer, R. (2015, March 21). Montréal's struggle to be smarter. *Montréal Gazette*. Retrieved from http://montrealgazette.com/news/local-news/montreals-struggle-to-be-smarter

CBC News. (2016, April 24). Montréal 1st Canadian city to exchange traffic data with Waze app. *CBC*. Retrieved from http://www.cbc.ca/news/canada/montreal/montreal-waze-traffic-partnership-1.3550640

Cisco. Smart + Connected Communities. Retrieved from http://www.cisco.com/c/en_ca/solutions/industries/smart-connected-communities.html

City of Montréal. (2014). *Montréal Smart and Digital City 2014–2017 Montréal Strategy.* Montréal, Qc. Retrieved from http://villeintelligente.montreal.ca/en/strategy

City of Montréal. (2015a). *Montréal Ville Intelligente et Numérique Plan d'action 2015-2017*. Montréal, Qc. Retrieved from http://villeintelligente.montreal.ca/plan-action-2015-2017

City of Montréal. (2015b, June 17). *Lancement de la plateforme collaborative « Faire Montréal » : Les Montréalais appelés à participer.* [Press Release]. Retrieved from http://ville.montreal.qc.ca/portal/page?_pageid=5798,42657625&_dad=portal&_schema=PORT

AL&id=25189&ret=http://ville.montreal.qc.ca/pls/portal/url/page/prt_vdm_fr/rep_annonces_ville/rep_communiques/communiques

City of Montréal. (2016a, August 1). *Ouverture du Benny Fab - Premier Fab Lab dans le réseau des bibliothèques de Montréal*. [Press Release]. Retrieved from http://ville.montreal.qc.ca/portal/page?_pageid=7497,81296374&_dad=portal&_schema=PORTAL&id=27257

City of Montréal. (2016b, November 16). *Israel Mission: A total success for PM SCADA Cyber Security*. [Press Release]. Retrieved from http://ville.montreal.qc.ca/portal/page?_pageid=5977,43117560&_dad=portal&_schema=PORTAL&id=27745

City of Montréal. (2017, July 5). How will you browse montreal.ca?. Retrieved from https://simplicite.montreal.ca/en/how-will-you-browse-montrealca

City of Montréal. Access to information. Retrieved from http://ville.montreal.qc.ca/portal/page?_pageid=5977,42203564&_dad=portal&_schema=PORTAL

City of Montréal. Faire Montréal: Citoyens testeurs. Retrieved from https://fairemtl.ca/fr/testeurs-citoyens

City of Montréal. Faire Montréal: iBus. Retrieved from https://fairemtl.ca/fr/ibus

City of Montréal. Smart City: About. Retrieved from http://villeintelligente.montreal.ca/en/about

City of Montréal. Smart city: Documentation. Retrieved from http://villeintelligente.montreal.ca/documentation

City of Montréal. Smart city: Our Team. Retrieved from http://villeintelligente.montreal.ca/en/our-team

City of Vancouver. (2012). *Greenest City: 2020 Action Plan*. Retrieved from http://vancouver.ca/files/cov/Greenest-city-action-plan.pdf

Clark, L. (2013, October 28). Battling insurgency in war-torn nations with immersive 3D sims. *Wired*. Retrieved from http://www.wired.co.uk/article/war-simulations

Cohen, B. (2015, August 10). The 3 Generations of Smart Cities. *Fast Company*. Retrieved from https://www.fastcompany.com/3047795/the-3-generations-of-smart-cities

Fairclough, N. (2003). *Analysing Discourse: Texutal analysis for social research*. New York: Routledge.

Flood, J. (2010). *The Fires: How a Computer Formula, Big Ideas, and the Best of Intentions Burned Down New York City — and Determined the Future of Cities*. New York: Riverhead Books.

Fortier, M. (2013, June 20). Coderre promet une « ville intelligente ». *Le Devoir*. Retrieved from http://www.ledevoir.com/politique/montreal/381245/coderre-promet-une-ville-intelligente

Galetta, A., Cross, W.E. (2013). *Mastering the Semi-Structured Interview and Beyond*. New York: NYU Press.

Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanović, N., & Meijers, E. (2007). *Smart Cities — Ranking of European medium-sized cities*. Edited by the Centre of Reginal Science, Vienna UT. Project home page: www.smart-cities.eu

Gil-Garcia, R.J., Pardo, T.A., & Nam, T. (2015). What makes a city smart? Identifying core components and proposing an integrative and comprehensive conceptualization. *Information Polity, 20*. 61-87.

Giovannella, C., Dascalu, M., & Scaccia, F. (2014). Smart City Analytics : state of the art and future perspectives. *Interaction Design and Architecture(s) Journal, 20,* 72–87*,* http://www.mifav.uniroma2.it/inevent/events/idea2010/doc/20_6.pdf

Goh, B. (2016). Securing the Smart City. *Kennedy School Review 16*, *32–38.*

Greenfield, A. (2013). Against the smart city (The city is here for you to use Book 1). New York: Do Projects.

Hollands, R. G. (2008). Will the real smart city please stand up?. *City, 12 (3)*, 303–320. doi: 10.1080/13604810802479126

Houde-Roy, L. (2017, June 12). Ville intelligente: la moitié des projets attendus sont en retard. *Le Journal de Montréal*. Retrieved from http://www.journaldemontreal.com/2017/06/11/ville-intelligente-la-moitie-des-projets-attendus-sont-en-retard

IBM. Smarter Cities. Retrieved from https://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

Kitchin, R. (2015). Making sense of smart cities: addressing present shortcomings. *Cambridge Journal of Regions, Economy and Society*, *Vol 8 (1). p.131-136*. doi: 10.1093/cjres/rsu027.

La Presse canadienne. (2016, June 10). 100 millions pour Montréal, ville intelligente et numérique. Retrieved from http://ici.radio-canada.ca/nouvelle/786688/capital-intelligent-mtl-montreal-ville-intelligente-numerique

Light, J. S. (2003). *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America*. Baltimore and London: The Johns Hopkins University Press.

Marchal, M. (2013, September 12). Denis Coderre veut rendre Montréal intelligente. *Métro*. Retrieved from http://journalmetro.com/actualites/montreal/331445/denis-coderre-veut-rendre-montreal-intelligente/

Mathys, C. (2016, October 7). Une troisième cohort pour InnoCité MTL. *Radio-Canada*. Retrieved from http://ici.radio-canada.ca/nouvelle/807550/innocitemtl-villeintelligente-startup

Mayer-Schönberger, V., Cukier, K. (2013). *Big Data: A Revolution that will Transform How We Live, Work, and Think.* Boston: Eamon Dolan/Mariner Books.

Medina, E. (2011). *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile*. Cambridge: The MIT Press.

Microsoft. (n.d). Retrieved from https://www.microsoft.com/en-us/internet-of-things/

Morozov, E. (2014, July 20). The rise of data and the death of politics. *The Guardian*. Retrieved from https://www.theguardian.com/technology/2014/jul/20/rise-of-data-death-of-politics-evgeny-morozov-algorithmic-regulation

Mosco, V. (2004). *The Digital Sublime: Myth, Power, and Cyberspace*. Cambridge: The MIT Press.

Normandin, P-A. (2016, May 19). Moins de neige, plus de remorquages. *La Presse*. Retrieved from http://www.lapresse.ca/actualites/montreal/201605/18/01-4983123-moins-de-neige-plus-de-remorquages.php?utm_categorieinterne=trafficdrivers&utm_contenuinterne=cyberpresse_vous_suggere_4951509_article_POS1

Normandin, P-A., Desautels, M-S. (2016, February 17). Des remorquages aussi nombreux malgré Info-Neige. *La Presse*. Retrieved from http://www.lapresse.ca/actualites/montreal/201602/16/01-4951509-des-remorquages-aussi-nombreux-malgre-info-neige.php

Owen, M. (2016, June 16). *Intelligent Community Forum Names Montréal, Québec, Canada as its 2016 Intelligent Community of the Year*. Intelligent Community Forum [Press Release] Retrieved from http://www.intelligentcommunity.org/intelligent_community_forum_names_montreal_quebec_canada_the_2016_intelligent_community_of_the_year

Paroutis, S., Bennett, M., Heracleaous, L. (2012). A strategic view on smart city technology : The case of IBM Smarter Cities during a recession. *Technological Forecasting & Social Change, 89*, 262–272.

Pattani, A. (2016, October 25). Building the city of the future — at a $41 trilion price tag. *CNBC*. Retrieved from http://www.cnbc.com/2016/10/25/spending-on-smart-cities-around-the-world-could-reach-41-trillion.html

Picon, A. (2015). *Smart Cities: A Spatialised Intelligence*. Wiley.

Radio-Canada. (2014, November 17). 180 projets verront le jour grâce à Je vois Montréal. *Radio-Canada.* Retrieved from http://ici.radio-canada.ca/nouvelle/694136/je-vois-montreal-place-des-arts-denis-coderre-philippe-couillard

Rocha, R. (2016, April 27). Montréal police to release more crime data. *CBC*. Retrieved from http://www.cbc.ca/news/canada/montreal/montreal-police-open-data-1.3555343

Scott, J. C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.

Smart City expo Montréal. Smart City Expo Montréal. Retrieved from http://www.smartcityexpomtl.com/

Söderström, O., Paasche, T., & Klauser, F. (2014). Smart cities as corporate storytelling. *City, 18 (3)*, 307–320.

The World Bank. (2016, December 19). Open traffic Data to Revolutionize Transport. *The World Bank*. [Press Release] Retrieved from http://www.worldbank.org/en/news/feature/2016/12/19/open-traffic-data-to-revolutionize-transport

Tokoro, N. (2016). *The Smart City and the Co-creation of Value: A Source of New Competitiveness in a Low-Carbon Society*. Tokyo: Springer.

Townsend, A. M. (2013). *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*. New York/London: W.W. Norton & Company.

United Nations, Department of Economic and Social Affairs, Population Division (2014). *World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER. A/352).*

Van Zoonen, L. (2016). Privacy concerns in smart cities. *Government Information Quarterly, 33*. 472–480.

Vanolo, A. (2014). Smartmentality: The Smart City as Disciplinary Strategy. *Urban Studies, 51 (5)*. 883–898.

Vanolo, A. (2015). Is there anybody out there? The place and role of citizens in tomorrow's smart cities. *Futures, 82,* 26–36. Doi: https://doi.org/10.1016/j.futures.2016.05.010

Vérificateur général de la Ville de Montréal. (2014). *Report of the Auditor General of the Ville de Montréal to the City Council and to the Urban Agglomeration Council for the Year Ended December 31, 2014*. Retrieved from http://www.bvgmtl.ca/en/our-reports/annual-reports/

Wadhwa, T. (2015). Smart Cities: Towards the Surveillance Society?. In D.A. Editor (Eds.), *Smart Cities as Democratic Ecologies (124–141).* Palgrave MacMillan UK.