MA THESIS

Walking in the datafied city:
Exploring strategies and tactics that shape the agency of ordinary citizens in public space

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2. ABSTRACT

Data-driven activities impact walkers in public space. Ordinary citizens who are an organic part of the city cannot be expected to inform themselves about novel data-driven processes that shape where and how their data is collected while they walk. They are inert to the activities that companies or municipalities execute regarding their data, but to change this, they should have access to information about the processes that impact them in the city, such as where their data is collected or how it is utilized. The analysis considers this through the framework of Michel de Certeau on "strategies and tactics"; how strategies impose on public space and walking, and what tools ordinary citizens need to strengthen their agency regarding these developments, in the form of tactics. The analysis includes data collected at data walks organized at the Utrecht Data School, and an investigation of technologies in public space that impact walking, such as urban dashboards and Google Maps AR. It concludes that strategies impose on walking both for purposes of regulation, but also commercial mapping applications that collect location data. As a solution, visibility is key to inform citizens about where their data is collected and to utilize technologies that function to inform citizens about processes that impact their agency in public space. Regarding tactics as tools that citizens can utilize, walking in the form of data walking is a useful one, because it makes participants critical and aware of data-driven developments in public space.

3. INTRODUCTION

In 2018, several articles appeared online that tackled the collection of user data in public space where citizens live and work. The New York Times analysed the location history recorded on users' mobile phones, stating that even if the tracking is anonymous, location history can reveal a lot about a person's preferences.[1] The Guardian also reported on the location tracking of Google, which might track location even when the recording of location history is turned off.[2] Personal mobile phones are increasingly used not only for marketing purposes, but also to improve services that companies provide for users. For example in the Netherlands, public transport provider NS, together with ProRail, analyse real-time data of passenger flows by tracking their wi-fi and Bluetooth signals.[3] In order to protect the privacy of the millions of citizens that travel every day through the main central stations of the Netherlands such as Amsterdam, Leiden or Utrecht, strict laws exist that prohibit personal data collection and the storing of this information for longer periods of time.[4] While laws prohibit these companies to utilize personal data, the data of preferences, routes and habits of citizens that are anonymized are still collected. The European Union GDPR data protection law Article 13 ensures that data subjects are informed about their data that is being collected, and they also have "the right to be forgotten".[5] They aim to regulate companies that retrieve a person's activities and preferences.[6] While regulations exist, and people often consent to provide their data by agreeing to the terms of conditions, the activity of ordinary citizens are tracked. In public space, this indicates that walkers are tracked through the mobile phones that they carry, but also through the surveillance cameras that record them, and they are not always informed about the collection of their data or how it is utilized.

These examples highlight that walking in the city is directly shaped by datafication. Walking is an activity that is available to most of us in society, but due to its everyday character it is not often discussed. Walking has shaped human history since the very beginning, ensuring activities such as travelling and work.[7] It played an important role in the development of cities and in the creation of citizenship.[8] In return, the expansion of cities also influenced walking. It has been impacted by the projects that shaped modern cities, and by the technological innovations that emerged after. Ordinary citizens who are an organic part of the city cannot be expected to inform themselves about data-driven developments, where and how their data is collected while they walk. Because of the number and scale of projects in public space, it is impossible to keep track of sensors, cameras and applications that collect data. As a consequence, citizens are inert to the activities that companies or municipalities execute regarding their data, and while they are not expected to know everything, they should have access to information about the processes that impact their agency in the city, such as where and how their data is utilized.

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[1] Jennifer Valentino-DeVries et al., "Your Apps Know Where You Were Last Night, and They're Not Keeping It Secret," *The New York Times*, last modified December 10, 2018, https://www.nytimes.com/interactive/2018/12/10/business/location-dataprivacy-apps.html.

[2] "Google Records Your Location Even When You Tell It Not to," The Guardian, accessed 5 July, 2019, https://www.theguardian.com/technology/2018/aug/13/google-location-tracking-android-iphone-mobile.

[3] "Meten is weten: realtime reizigers tellen op zes drukke stations," Nieuws, NS, accessed 5 July, 2019, https://nieuws.ns.nl/meten-is-weten-realtime-reizigers-tellen-op-zes-drukke-stations/.

[4] "Wifi tracking", Radar, accessed 5 July, 2019, https://radar.avrotros.nl/uitzendingen/gemist/item/wifi-tracking/.

[5] "Rights of the Data Subject," General Data Protection Regulation GDPR, accessed 9 August, 2019, https://gdpr-info.eu/chapter-3/.

[6] For more on GDPR and the regulation of tech companies see Paul Nemitz, "Constitutional Democracy and Technology in the Age of Artificial Intelligence," *Phil. Trans. R. Soc. A* 376, no. 2133 (November 28, 2018).

[7] Joseph Amato, *On Foot: A History of Walking* (New York: New York University Press, 2004), 19.

[8] Rebecca Solnit, *Wanderlust: A History of Walking* (London: Penguin Books, 2001), 292.

My claim is that these complex developments in the city put walking citizens under unequal conditions regarding their agency. By agency of citizens I mean (1) the access to services and information about processes that concern them in the city, where and how their data is collected (2) their ability to act or react, express their opinion in a way that reaches those that impose such strategies on walking. In this context, being powerless or disadvantaged exist in relation to either the institutions that impose strategies, or companies that utilize location data to gain more information for purposes such as advertising. Walkers are impacted by more types of data, but two areas are especially dominant, and also relevant for this thesis: the regulation of citizens by public institutions to manage and protect citizens, and the collection of data through mobile phones by commercial companies that walkers carry with them. They utilize data but for different purposes, which will become evident later.

To inquire into how citizens that walk in public space fall under these unequal conditions as a direct result of data-driven technologies and how they affect them, I ask the following research question:
1. How do strategies impact walking in datafied public space?

While this question focuses on the act of walking and strategies that impose on it, we need to ask where the initiatives should come from that contribute to the agency of ordinary citizens that walk the city every day. Should the citizens demand their rights in a bottom-up way, or should institutions and companies also make an effort to bring more transparency? The other research question considers ways that citizens can create more equal relations when it comes to their knowledge about processes that impact their agency in the city, where and how their data is collected:
2. What kind of political tools and efforts do we need strengthen the agency of ordinary citizens that walk in the datafied city?

4. THEORETICAL FRAMEWORK & ACADEMIC RELEVANCE

Relevant theories frame the analysis that concern (1) the strategies that impact walking in datafied public space and (2) the political tools and efforts for ordinary citizens to strengthen their agency while walking in this space. In order to tackle this, the theory of "strategies and tactics" offers an overarching framework to inquire into power relations in public space. The idea of "the right to the city" is utilized to highlight the agency of ordinary citizens in relation to a lack of power. Additionally, I apply theories that concern the effect of new media and datafication on public space and walking.

4.1. MICHEL DE CERTEAU'S MODEL: STRATEGIES AND TACTICS

Michel de Certeau's theory on "strategies and tactics" was published in his book "The practice of everyday life" in 1984, in which he explores the power relations between powerful and powerless, in the frame of a cultural analysis.[9] He emphasises the practices of everyday life, such as walking or language.[10] For him, these are what ordinary citizens have in their toolset in order to fight strategies that are imposed on them.

His analysis emphasises the space and tools that institutions and companies strategically hold and exercise. It questions the relations between authorities and citizens, and where the line is drawn in their capacity to participate in the civic sphere. According to de Certeau, strategy refers to a subject that is isolated, and it possesses a place from where it can operate and manage targets and threats.[11] This is a "triumph of place over time, a mastery of places through sight and a certain power is a precondition of this knowledge and not merely its effect."[12] Strategical power occupies material place that serves for a basis of operation, where strategies are envisioned and imposed. It requires expertise, planning and infrastructure. Today, this generally accounts for our institutions that utilize data-driven management, police that uses predictive analytics or companies that sell and implement their products and services. They have the tools to operate from a central space, where they can make predictions, plan and intervene in the lives of citizens.

In contrast, tactic is the practice of the powerless and weak, operating in the space of the other, consisting of smaller, spontaneous and isolated actions.[13] It points to a lack of place that strategic power possesses, and actions that do not require thorough planning. They stem from individual or collective actions that take place due to a lack of agency or discontent. Tactics appear as part of more everyday practices: in the context of datafication, tactics are small acts when citizens do not use the public wi-fi to provide their data, or citizen sensing projects created to involve ordinary citizens in the process of environmental data collection.[14] These acts demonstrate that tactics are spontaneous reactions to strategies and smaller in scale.

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[9] Michel de Certeau and Steven F. Rendall, *The Practice of Everyday Life* (Berkeley: University of California Press, 2011).

[10] See the concept of "strategies and tactics" in chapter III "Making do: Uses and Tactics" on pages 29-43 in Michel de Certeau and Steven F. Rendall, *The Practice of Everyday Life* (Berkeley: University of California Press, 2011).

[11] de Certeau, *The Practice of Everyday Life*, 36.

[12] Ibid.

[13] Ibid, 36-38.

[14] Qijun Jiang, Frank Kresin, Arnold K. Bregt, Lammert Kooistra, Emma Pareschi, Edith van Putten, Hester Volten and Joost Wesseling, "Citizen Sensing for Improved Urban Environmental Monitoring," Journal of Sensors (2016): 1-10.

The theory impacts the thesis in two ways: firstly, it sets a framework for the analysis, since it uses the concepts of "strategies and tactics" to highlight current power relations in the datafied city. Strategies represent the activity of companies or institutions that utilize data in public space, for reasons such as security or profit oriented means. It uses the concept of tactics to find ways where ordinary citizens can step forward and fight against these strategies that are imposed on them. Secondly, the framework is used to consider the activity of walking that serves as strategy or as tactic. Later it becomes evident that there is no clear division between strategies and tactics. Media and communication scholar Brian Morris illuminates this as a critique of de Certeau: while acknowledging the model's potential, he states its limitations in the example of street protests, where the actions against establishment actors are mediated by plenty of civic institutions that have different relationships to hegemonic culture.[15] Walking can function as both: while it can act as a strategy in the form of army marches, it can also act as a tactic where the crowd protests against a problem in the space of the other. The distinction is useful to highlight existing power relations in public space and invent solutions for more balanced ones.

4.2. PUBLIC SPACE AS A SITE OF CHANGE

The aim of considering theories of public space is to situate the analysis in the context of cities, which is a space of equal access for all citizens.[16] Theories show why and how public space is a complex site of competing interests, where strategies and tactics both influence the lives of citizens.

4.2.1. WALKING IN PUBLIC SPACE

From a philosophical perspective, philosopher Hanna Arendt in her book "The human condition" investigated the notion of public in a political context.[17] She argues that our feeling for reality depends upon appearance.[18] Public space used to provide the most available alternative for things that rely on appearance to come into public. Since her book was published in 1958, media has further served to complicate these processes. Before new modes of communication, streets had a greater significance in the lives of citizens, since appearance was more tied to physical presence and walking was necessary to receive information. Considering the state of contemporary cities, the notion of public as a space of representation and appearance is more an ideal than reality. Today, citizens can access all information in their private space, without having to leave the house, walk and collect the newspaper or start a conversation. Similarly, in a philosophical context but with a focus on walking, writer Rebecca Solnit wrote about the importance of public space in the city. She argues that the word citizen is related to the word city, since the ideal city is built around the idea of participation in public life.[19] We become public and visible through walking in public space.

Contrary to the ideal of public space, historian Joseph Amato in his book "On Foot: A History of Walking" explains by way of a thorough analysis on walking, how public space became a regulated assemblage of actors and infrastructure.[20] Especially important for this analysis is his account on the regulation of walkers and streets, in reaction to the growth of cities and their population. These

[15] Brian Morris, "What We Talk about When We Talk about 'Walking in the City'1'," *Cultural Studies* 18, no. 5 (September 2004): 679.
[16] Katharine S Willis, *Netspaces: Space and Place in a Networked World* (Farnham: Routledge, 2017), 83.
[17] Hannah Arendt, *The Human Condition* (Chicago: The University of Chicago Press, 1958).
[18] Ibid, 50.
[19] Solnit, *Wanderlust: A History of Walking*, 293.
[20] See chapter 6 "City Walking" in Joseph Amato, *On Foot: A History of Walking* (New York: New York University Press, 2004).

processes among other were results of industrialization and efforts aimed at the elimination of diseases.[21] While walking lost its character as an essential part of human life, we still rely on our feet to walk from A to B in public space. The purpose is twofold: to unpack how walking is impacted by these regulations in datafied public space, and to question how public space can serve as a site to strengthen the agency of ordinary citizens. It is useful to investigate the state of walking in public space, because the implementation of strategic surveillance and control point to public space as less of a site of equal access and participation. Framing the analysis, I consider public space as a site where citizens should have the power to participate and strengthen their agency.

4.2.2. PUBLIC SPACE AND WALKING INFLUENCED BY NEW MEDIA

In the fields of media and communication, contemporary scholars have investigated how new media impact public space and the lives of citizens. Like the aforementioned philosophers, design and architecture scholar Katherine S. Willis argues that public space is an effective medium of communication because it is equally accessible to all.[22] Due to their accessible character, cities should strive for communication that reaches ordinary citizens. In the context of effective communication, media and anthropology scholar Shannon Mattern also investigated urban dashboards and their effectiveness in informing citizens about changes in the city.[23]

Other media researchers focused on the transformation of social/public space as a result of emerging technologies. Sociologist Richard Sennett in his book "Building and Dwelling" considers how new media that are present in public space (eg. mobile phones) impact creativity and sociability, due to their built-in logics such as efficiency.[24] Communication and access to information is also important in the field of mapping contemporary cities. Theories that consider modern map making become relevant for the second case study and the analysis of Google Maps Augmented Reality (AR). Digital maps affect walking in the city and the agency of citizens. Generally, maps have been instruments of city planning for centuries and according to J.B. Harley, they became signifying systems through which social order is communicated, reproduced and experienced.[25] Gordon and de Souza e Silva say that mapping changed from something that can "spatialize social information to something that can socialize spatial information."[26] With the advent of geographic information systems, social information is organized around the structure of geographical systems. Communication scholar Scott McQuire explores this through an analysis of Google Street View and argues that Google transformed map-making: below the surface of pictures, they collect our routes and preferences that reveal an economy that strives on data collection.[27] This influences walkers and the way they use public space.

Besides changes in map-making, our devices also changed in the past decades. The use of mobile phones proliferated in the past years for purposes of orientation- amongst other things. They affect the way we walk; we carry them everywhere and they store much personal data. There are

[21] Ibid.
[22] Katharine S Willis, *Netspaces: Space and Place in a Networked World* (Farnham: Routledge, 2017), 83.
[23] Shannon Mattern, "Interfacing Urban Intelligence," *Places Journal*, 28 April, 2014.
[24] For the exploration of technology that impacts creativity and sociability, see chapter 6 "Tocqueville in Technopolis" on pages 144-170 in Richard Sennett, *Building and Dwelling: Ethics for the City* (New York: Farrar, Straus and Giroux, 2018).
[25] J. B. Harley, David Woodward and Mark S. Monmonier, *The History of Cartography* (Chicago: University of Chicago Press, 1987).
[26] Eric Gordon and Adriana de Souza e Silva, *Net Locality: Why Location Matters in a Networked World* (Hoboken: John Wiley & Sons, Incorporated, 2011), 28.
[27] Scott McQuire, *Geomedia, Networked Cities and the Politics of Urban Space: Networked Cities and the Future of Public Space* (Chicester, UK: Polity Press, 2016), 64.

obvious benefits to mobile phones, observing the amount of information that one can access about the city, but there are also arguments against them in the context of being public and social interactions. Gordon and de Souza e Silva coined the term 'net locality' that shows the complexity of the situation.[28] They analyse the effect of mobile technologies on sociability and argue for a more fluid space where the web is present in public space and the physical space is brought into the web.[29] Information does not only reach people from the street, but also from screens, the music one listens to or the people that one talks to on the phone.

Overall, these theories explain how public space changes as a result of new media technologies, which also alters the way we walk. The extent to which citizens access information in public space becomes relevant for both research questions: how walking is affected in the datafied city and the tools we need to strengthen the agency of ordinary citizens.

4.3. THE AGENCY OF CITIZENS IN PUBLIC SPACE

Cities are spaces of struggle: according to a 2018 United Nations Department of Economic and Social Affairs statistic, 68% of the world's population is projected to live in cities by 2050.[30] A growing population living in cities means that they will face incredibly complex challenges, among them the management of infrastructure and citizens, which is increasingly data-driven. The ability to respond to strategies that are imposed on citizens contributes to their agency, which only works if citizens have access to information about processes that impact them in the city, such as where and how their data is collected. To situate this in an ideological debate, I will utilize the concept "right to the city", which was popularised by philosopher and sociologist Henri Lefebvre in 1968, in the midst of student and worker protests in Paris. Lefebvre's idea of the "right to the city" rightfully captures cities as places of struggle and where changes can be achieved. Although the concept is not entirely clarified, he describes it as

"the right to information, the rights to the use of multiple services, the right of users to make known their ideas on the space and time of their activities in urban areas; it would also cover the right to use the center."[31]

It is a claim, but also provocation against forces that control and by people that lost power or never had it, both in terms of basic living conditions and access to information. Urban planning professor Peter Marcuse analysed the "right to the city" in terms of whose right it is, what rights and what city it means.[32] I believe he captured brilliantly whose right it means today: the demand is of those that lack basic material conditions, and the cry is of the alienated that do not find their place from a creative and intellectual point.[33] How can citizens re-appropriate these rights in order to gain a more egalitarian

[28] Eric Gordon and Adriana de Souza e Silva, *Net Locality,* 28.
[29] Ibid, 86.
[30] "68% of the World Population Projected to Live in Urban Areas by 2050, Says UN," United Nations Department of Economic and Social Affairs, last modified 16 May, 2018, https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html.
[31] Henri Lefebvre, "The Right to the City" in *Writings on Cities* ed. Eleonore Kofman and Elizabeth Lebas (Cambridge: Blackwell Publishers Ltd., 1996), 34.
[32] Peter Marcuse, "From Critical Urban Theory to the Right to the City," *City* 13, no. 2–3 (June 2009): 185-197.
[33] Ibid, 191.

society? Marxist geographer David Harvey states that the concept refers to a claim to a shaping power over the changes in urban space and democratic control over the production and use of surplus.[34]

Building on Harvey's argument, to acquire control, citizens need resources and knowledge about the processes that influence their agency in the city. I want to highlight that in today's datafied societies, the way cities are shaped are increasingly mediated through data-driven processes that require the harnessing of great amounts of data. Internet researchers Shaw and Graham point to these shifts through Lefebvre's concept "the right to information" and they argue that material space is reproduced through abstract spatial projects such as real-time data visualizations and path-finding algorithms.[35] Besides the appropriation of material resources and the development of physical infrastructures, the trade of information also shapes the city. This ranges from real-time data usage for the management of cities and the datafication of surveillance (wi-fi tracking, cameras) to companies that utilize user data for advertisement or the developments of their services (applications like Google Maps, Facebook, Nike running and shops like Albert Heijn that categorize consumers for marketing purposes).[36] The agency of ordinary citizens is shaped by these processes, thus in the context of this thesis, the "right to the city" means the right to be informed about processes that concern citizens' agency in public space. This includes where and how their data is used, and also to be able to answer to these strategies. The task is to identify strategies that impose on these rights while walking and analyse the tools and efforts ordinary citizens need to answer to them.

4.3.1. CRITICAL DATA STUDIES: THE SMART CITY AND DATA WALKS

While the city is increasingly shaped through data, researchers that I include in this section study data and its impact on cities and question if data-driven developments are indeed effective in answering social problems. Smart city is an umbrella term and I employ Kitchin's definition to clarify its meaning:

"pervasive and ubiquitous computing and digitally instrumented devices built into the very fabric of urban environments that are used to monitor, manage and regulate city flows and processes, often in real-time, and mobile computing (e.g., smart phones) used by many urban citizens to engage with and navigate the city which themselves produce data about their users (such as location and activity)."[37]

One can observe these developments in the products of corporations such as Cisco's "Kinetic for Cities".[38] Their data-driven technology offers solutions for as many areas as lighting, traffic, parking, waste management and wi-fi deployments around the city by drawing data from sensors such as smart LED streetlights.[39] Rabari and Storper in their paper the "Digital skin of cities" critique data-driven developments and the ideology that rational planning will give answer to economic and social problems

[34] David Harvey, *Rebel Cities: From the Right to the City to the Urban Revolution* (London: Verso, 2012), 5 and 23.
[35] Joe Shaw and Mark Graham, "An Informational Right to the City? Code, Content, Control, and the Urbanization of Information," *Antipode* 49, no. 4 (2017): 908-910.
[36] For more on the categorization of users online for marketing purposes see John Cheney-Lippold, "A new algorithmic identity: Soft biopolitics and the modulation of control," *Theory, Culture & Society* 28.6 (2011): 164-181.
[37] Rob Kitchin, "The Real-Time City? Big Data and Smart Urbanism," GeoJournal 79, no. 1 (February 2014): 2.
[38] "Cisco Kinetic for Cities," Cisco, accessed 17 July, 2019, https://www.cisco.com/c/en/us/solutions/industries/smart-connected-communities/kinetic-for-cities.html#~stickynav=2.
[39] Ibid.

in cities.[40] Among other issues, technology giants that lead innovation in the field promise that smart technologies will allow more communication between those that manage the city and ordinary citizens. Contrary to this, Ratti and Townsend in their article on smart cities claim that preordained smart city solutions often ignore the needs of inhabitants and do not reflect their culture.[41] These researchers critique contemporary beliefs that try to solve social problems through the measurement of activities and rendering them data. They are sceptical about the rhetoric that technologies will cater to the needs of citizens by engaging them. Others such as Shoshana Zuboff in her book on surveillance capitalism go even further, viewing this as a way of governing citizens in a top-down manner, enhancing surveillance and diminishing privacy.[42]

Optimistic beliefs and accounts are also what scholars try to counter that take an ethnographic approach to datafication in the form of data walks. Communication researcher Allison Powell calls data walking a radically bottom-up approach, connecting it to previous ethnographic explorations with a focus on space and the production of knowledge.[43] She sets out to produce different kind of knowledges than what Kitchin called "technocratic view", in order to "to learn about how people with different expertise understood and defined data."[44] The aim is to counter the belief that data is objective, by experiencing data as something that is generated in a particular context. Walking is one way to do it, because as opposed to data collection and measurement, it is a subjective, everyday experience that immerses people in public space to reflect on the specificities of data collection and how it concerns citizens. These theories are relevant, because the analysis adds to those studies that critique smart city developments and the extent to which they engage citizens.

Data-driven activities impact walkers in public space and the analysis will unpack how they do that, together with the consideration of how citizens can strengthen their agency when it comes to walking in public space. Until now, both the activity of walking and the impact of data on citizens were explored. While data walks combine these issues, they have not yet been used to explore how "strategies and tactics" shape walking in the light of datafied developments in the form of a cultural analysis. We do not yet understand how data-driven strategies influence the activity of walking, and if walking can operate as a tactic to strengthen the agency of citizens. This thesis adds to previous studies in the following ways: (1) explores data walking as a method to point out strategies that utilize data in public space and uses the method of data walk to investigate the activity of walking as a tactic and (2) analyses how datafication influences public space and walking, regarding the information that ordinary citizens can access that impacts their agency, how and where their data is utilized. The next section will present how I am going to explore this.

[40] Chirag Rabari and Michael Storper, "The Digital Skin of Cities: Urban Theory and Research in the Age of the Sensored and Metered City, Ubiquitous Computing and Big Data," *Cambridge Journal of Regions, Economy and Society* 8, no. 1 (March 2015): 27-42.
[41] Carlo Ratti and Anthony Townsend, "The social nexus," *Scientific American* 305.3 (2011): 45.
[42] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for the Future at the New Frontier of Power* (London: Profile Books, 2019).
[43] Alison Powell, "The data walkshop and radical bottom-up data knowledge," in *Ethnography for a Data-Saturated World* ed. Hannah Knox and Dawn Nafus (Manchester: Manchester University Press, 2018), 213.
[44] Ibid, 218.

5. METHODOLOGY

5.1. STRUCTURE

This thesis consists of a description of strategical sites that are imposed on walking in the datafied city. I employ these insights to find answers to the research question how strategies impact walking in datafied public space. Describing these strategical sites means that during the research process I found and described examples of media objects in public space that affect walking and contribute to the agency of citizens that walk in public space. I describe the strategies imposed on walking through two case studies: one that deals with strategies that impose on walking for purposes of security, and another that tackles strategies of companies that utilize data collected from mobile phones that citizens carry while walking, with a particular focus on Google Maps AR. Besides pinpointing the strategies and their impact, the thesis also identifies tactics to analyse how ordinary citizens can react to these strategies. This part of the analysis operates to find answers to the research question what kind of political tools and efforts we need to strengthen the agency of ordinary citizens.

In addition to a description and analysis of technologies in public space, I analyse these questions by utilizing the method of data walking. In the first case study, I utilize data walking to give insights into the strategies that are present in datafied public space with a particular emphasis on the city of Utrecht. In addition, it consists of a description of strategies and tactics to strengthen the agency of citizens while walking. In the second case study, I utilize data walking to explore how walking can act as a tactic, in relation to strategies that render walking profitable for companies.

5.2. DATA WALKS

Data walking is an empirically informed, exploratory ethnographic method that embeds participants in the local environment and invites them to ask questions about how processes of datafication concern citizens' agency. The method is especially useful to bring observations to my research questions, since it is a bottom-up approach that considers the perspective of citizens and how datafication affects them and their access to information. Generally, it contributes to the sharing of knowledge between citizens and it helps to create data-literacies. It has been practiced by scholars such as Adam Greenfield and Kim Nurri who wrote a guide to data walking called 'Systems/Layers'.[45] They advise participants to search for data in the environment that is collected, displayed or where networked information is acted upon.[46] Media scholar Alison Powell started the data walking as an educational tool and wrote about data walking as bottom-up approach to destabilize dominant views about data practices in the city.[47] Juliane Jarke from the field of media, communication and information studies is particularly interested in the relationship between government and citizens, and investigates data walking as a method that engages elderly citizens in the creation of digital public services.[48] We can see from the examples that data walks are used for different purposes but they share the objectives of immersing participants in a specific environment, that is a special characteristic of walking in general.

[45] Adam Greenfield and Kim Nurri, "Systems/Layers: How to run a walkshop on networked urbanism," last modified 21 March, 2011, http://diffusion.org.uk/?p=2364.
[46] Ibid, 9.
[47] Powell, "The data walkshop and radical bottom-up data knowledge."
[48] Juliane Jarke, "Open Government for All? Co-Creating Digital Public Services for Older Adults through Data Walks," *Online Information Review* (2019).

5.3. DATA COLLECTION: DATA WALKS AT THE UTRECHT DATA SCHOOL

To analyse these strategies that impose on walking, I use the insights from data walks that I have conducted in Utrecht as part of my research internship at the Utrecht Data School (UDS).[49] I created a Data Walking booklet, which was inspired by Powell's method of splitting participants into groups, and by Greenfield's approach of searching for points of data in the city.[50] UDS' approach is that of a fieldtrip where participants collect data in several ways: with the help of mobile phones they take pictures, record the route, check wi-fi signals, and in the format of fieldnotes they record what signs of datafication they see and the discussions they had during the walks.[51]

In the first case study, I analyse the discussions and data collected at two particular data walks: one that I took with students under the theme "inclusion/exclusion" and another called "ownership" with participants with diverse backgrounds. Inclusion/exclusion considered processes of datafication that exclude or include certain citizens from processes that happen in the city, while "ownership" questioned who owns the data of citizens, where they are stored and for what purpose. Here we also questioned to what extent citizens are informed about these processes. Besides the discussions, their task was to observe objects and phenomena that manifest datafication (sensors, displays), but also data that are not necessarily visible. I created a list of examples to ease the process and to find hubs of datafication.[52] Participants created a presentation at the end of the walk where they discussed their findings. I include insights from these discussions, which show how strategies such as surveillance cameras or wi-fi tracking impact walking in the city.

In the second case study, I employ my insights of researching the history of walking and data walks, organizing data walks and writing a Data Walking Booklet.[53] For this purpose, I needed to consider the potential of data walks, their objectives, the themes that should be considered and the roles that participants should take. This experience helped me to explore how walking itself can act as a tactic in datafied cities, which I explore in the thesis by analysing how data walks are organized, the tools that are handed to participants during the walks and how they utilize them to be more critical observers.

[49] Presented the method of Data Walk for the exploration of more-than-human worlds in digital cities at symposium Digital Cities #11 Communities and Technologies Conference Vienna, 2019.
[50] See 'Data Walking Booklet' in Appendix.
[51] See the fieldnotes included at the end of the booklet on page 35-41 in 'Data Walking Booklet' in Appendix.
[52] See the examples of datafication in the section "What to look for?" on pages 13-18 in 'Data Walking Booklet' in Appendix.
[53] See 'Data Walking Booklet' in Appendix.

6. ANALYSIS

6.1. CASE STUDY 1: DATAFIED PUBLIC SPACE AS A SITE OF STRATEGIC REGULATION

The analysis concerns public datafied spaces as strategic sites and questions how ordinary citizens can react to these strategies through tactics. Firstly, it tackles strategies that shaped the modern city and walking from a security perspective. It utilizes data walking to argue that practices need to be more visible and create dialogue between strategies and tactics by bringing access to information through technologies such as urban dashboards. For case study 1, the task is not to evaluate the state of surveillance, but to focus on how data-driven developments impact walkers and how technologies can strengthen their agency.

6.1.1. PUBLIC SPACE AS A STRATEGIC SITE

Solnit claims that the ideal city is built around participation, but modern cities developed along different values.[54] Scholars often analyse Paris of the 19th century as a city in the forefront of development utilizing rational and systematic planning.[55] Authorities' primary aim has been to clean cities and stop epidemics that were ever present in cities and had no proper water or sewage system.[56] Walking before was a part of everyday life and a necessity; people were reliant on their feet to do any kind of activity, work or leisure. A pedestrian based localism only ceased to exist with the emergence of mass transportation in the 20th century.[57] Amato states that

"authority insisted on control. It would, as best as it could, supress vagrancy, unlicensed itinerancy, illegal assembly, rebellious marching, strikes, and other forms of threatening pedestrian behaviour, which they identified with the dark and dangerous classes. A crowd going on foot was potentially subversive."[58]

Considering these developments under the framework of "strategies and tactics", it is clear that the description of public space as a site of control points to strategies that require a central space to operate from, to make predictions for the future and to intervene in present processes. Control and regulation are not only beneficial but also necessary in densely populated cities. Walking on foot often ensured that people could gather and express their opinion, but it became highly regulated and controlled for stability and security. As a consequence, walkers got into a position from which they could react in relation to these strategies. I argue that forms of walking, marches and revolutions belong to tactics, because they do not operate from a central command, but assemble as a reaction to strategies. Bodies on the streets become public, visible, perhaps violent and threatening, but most importantly have the power to demand from a place that is in de Certeau's words the "place of the other".[59] These instances present that while walking became highly regulated in public space, it was also used as a tactic in reaction.

[54] Solnit, *Wanderlust: A History of Walking*, 293.
[55] Amato, *On Foot: A History of Walking*.
Solnit, *Wanderlust: A History of Walking.*
Sennett, *Building and Dwelling.*
[56] Amato, *On Foot: A History of Walking*, 160.
[57] Ibid, 156.
[58] Ibid, 180.
[59] See explanation of the "place of the other" in the theoretical framework on "strategies and tactics" on page 7.

Regulations mentioned here impact not only walking, but the agency of walking citizens. They were imposed on them, but they did not always access information about changes in the city; in response they could not react to them. This situation points to the unequal power relations that I argued for, between authorities and ordinary citizens.

6.1.2. INVESTIGATING STRATEGIES THROUGH DATA WALKS

Regulation imposed on walking does not end, in fact it intensifies with the emergence of datafication. Discussions with participants at the data walk "inclusion/exclusion" highlighted how data collection shapes access to public space. Walking is highly determined by the places one is granted access to, which are increasingly regulated by data-driven developments. Even though the streets are meant to provide equal access to everyone, data practices ensure that even places that were earlier public are only accessible to people that have the means to. As an example, the central train station in Utrecht operates gates that grant access only to people that provide their data through having a personal OV-chipcard, or that possess a ticket. (Figure 1) This renders the place a private, regulated site, not one of equal access that the public can use. All this is ensured by the gates and chip card technology that are automatically trackable and log data of passengers' travel history each day.[60] Walkers can still cross the station, but they are not allowed to go into the space to access the trains.

Besides regulating walking in public space through data, during the data walk "ownership" participants observed that a large part of datafication takes place for purposes of surveillance to ensure security. Surveillance data are generated through various means: "CCTV, photographs, fingerprints or iris scans; spatial video, LiDAR, thermal or other kinds of electromagnetic scans of environments that enable mobile and real-time 2D and 3D mapping."[61] Walking through the streets, the most visible and obvious signs of data collection are always the tremendous amount of surveillance cameras that operate in cities. (Figure 2) Data walks showed that people do not often remark the number of surveillance cameras that operate on the streets. The main concern here is the uncertainty of citizens about where their data is collected, stored, for how long and by whom. Even though this analysis regards cameras as parts of strategic surveillance in public space, they are often privately operated by shop owners or citizens. While private surveillance camera owners regularly inform citizens about surveillance (Figure 3), in many cases there is no mention where data is collected, and in most cases citizens do not know who owns the data and how it is used. Public surveillance is more transparent, since people know who collects data and there is a number that they can dial for further information. (Figure 4) As to the perspective of ordinary citizens, they might have strikingly different views on the state of surveillance and privacy. Still, as a majority of participants remarked, citizens are not informed about where their data is collected and how it is utilized. Ultimately, walkers are observed by surveillance cameras and they have no way to opt-out.

These developments reveal a lot about the state of strategic sites that impose on walking. According to optimistic accounts, smart city developments enable higher involvement in public decision making, the informing of citizens and participation.[62] Services that require the collection of data are believed to solve problems in public space, such as access to basic utilities or decreasing the number of crimes. According to Kitchin, automated forms of surveillance, IoT and sensor networks are especially popular in government management.[63] He says the city is imagined "as instruments that are connected through multiple networks which provide continuous data regarding the movements of people and

[60] See the news on switching to the current technology on "Trans Link: Veiliger OV-chip niet meer van NXP", Webwereld, accessed on 23 July, 2019, https://webwereld.nl/security/56013-trans-link-veiliger-ov-chip-niet-meer-van-nxp.
[61] Kitchin, "The Real-Time City? Big Data and Smart Urbanism," 4.
[62] Rabari and Storper, "The Digital Skin of Cities," 6.
[63] Kitchin, "The Real-Time City? Big Data and Smart Urbanism," 4.

materials.''[64] In the case of interconnected networks of surveillance, citizens do not know who has access to their data at any given moment. I stated earlier that the agency of citizens depends on how much information they receive about where and how their data is used, but the present findings show particularly in the city of Utrecht that signs fail to inform them. This is not only in case of surveillance cameras, but also spaces that are regulated through data. This analysis shows that citizens often fall under unequal conditions when it comes to public or private services that exist to regulate them in public space. Their data is taken, and they have no way of seeing where and how it is handled.

6.1.3. CONNECTING STRATEGIES WITH TACTICS: STRENGTHENING THE AGENCY OF CITIZENS

As I quoted Lefebvre earlier, the "right to the city" captures the idea of maintaining an equal society where citizens have access to public space and to information that influences their agency. How can citizens strengthen their agency against these regulatory mechanisms that use data? For contemporary cities, art projects such as Zach Blas' "Facial Weaponization Suite" form tactics by wearing masks to hide walkers' faces from surveillance cameras.[65] (Figure 5) Design projects like this show the potential to act from the space of the other and enter into resistance, but do they really gain power through such tactics? They intervened in the ability of cameras to perceive them, but they only limited their own freedom by wearing masks that cover their faces, instead of entering into dialogue with entities that impose surveillance. After participants remarked the level of surveillance but the lack of information about the use of data, they highlighted that even if they are implemented, more transparency is necessary regarding their operation. Signs could inform citizens about the nature of data collection and what happens to their data. As an example, signs that inform walkers about wi-fi tracking should be rendered more visible, since participants remarked that due to their placement or size, they are easily overseen by walkers. (Figure 6)

In the following, I argue that in order to strengthen the agency of ordinary citizens in public space, it is necessary to create dialogue where strategies ensure the informing of public. I also argue that technologies-when used in that way- can contribute to the agency of citizens. The objects and phenomena that participants found demonstrated that information can be utilized in many ways to inform citizens. This can vary from the public displays that show public transport times to displays that show the number of spots left in a parking house. (Figure 7) More creative utilization of data concern public displays that inform citizens about what happens in nature on a given day. (Figure 8) The data walks that I have conducted in Utrecht pointed out that besides these projects, there are currently no smart technologies that inform walkers about processes that impact and also strengthen their agency in the city (with an exception of the sign of wi-fi tracking and simple signs that inform about camera surveillance.) There are ways that ICTs are utilized, such as the Utrecht Municipality mobile app that helps report any disturbances in public space in an easily accessible manner.[66] There is communication between municipalities and citizens, but we have not found examples that facilitate dialogue in public space. To ensure this, I argue that these technologies need to be visible to facilitate access to information, so that walkers can interact with them.

Scholars have investigated the impact of technologies on social interactions in public space. Willis proposes that while technologies such as AR might create private bubbles, public screens facilitate a kind of collective gathering and greater sociability.[67] Public space is key in the context of citizens'

[64] Ibid.
[65] "Facial Weaponization Suite," Zach Blas, accessed 10 June, 2019, http://www.zachblas.info/works/facial-weaponization-suite/.
[66] "Melding, Klacht, Bezwaar," Gemeente Utrecht, accessed 9 June, 2019, https://www.utrecht.nl/contact/melding-klacht-bezwaar/.
[67] Willis, *Netspaces,* 96-98.

participation, because it is a place of encounters.[68] Urban dashboards could facilitate engagement while citizens walk, because they are visible, and they allow two-way interaction. Adam Greenfield's Urbanflow is a design project created 8 years ago by design agencies Nordkapp and Urbanscale .[69] The designers argue that current urban dashboards are underutilized, providing no return on the investment of installing them.[70] Current dashboards allow citizens and tourists to interact with information through the touchpad, but it is simply an interactive way of presenting information about the city. There is no two-way communication, no platform to indicate opinions or levels of satisfaction with certain infrastructure or services. In contrast, Urbanflow's first point of interaction is a map, which would tell people where they are and provide information for navigation. (Figure 9) Another layer consists of ambient data, with the objective of creating awareness of real-time data in the city. Designers state that "the citizens are enabled not only to access data, but also to contribute their knowledge and experience about the city, by reporting issues such as potholes, broken streetlights or dangerous crossing."[71] (Figure 10) It is built to enhance accessibility, situatedness and enhancing pedestrian experience, which encourages being present in the environment instead of a private experience on the phone. When two-way communication is built into the technology, citizens and tourist could advise local council on traffic, environment or leave other comments. Mattern pointed to the complexity of urban interfaces, stating that they are mediators between humans and computers and that "computer systems are commonly modelled as a "stack" of protocols of varying degrees of concreteness or abstraction."[72] Creating real-time visualizations of the city requires technological expertise, design skills and experts that translate activities that take place in the city. The concept of "stack" points to this complexity, because in order to present a clean and easily understandable dataset, decisions need to be made about excluding data in the different layers. The secret to create two-way interactions lies in the subtle modalities of these systems. There are plenty of layers: physical processes, sensors, data, its collection, its organization, decisions about the visualization and questions about their accessibility that all need to be considered. Alison Powell's data walks emphasise such complexities: data are determined by social decisions and context; they should not only be regarded as simple and efficient mechanisms that solve social problems in the city.[73]

By efficiency I mean the aspect of solving problems in the city quickly, earning the most profit. It is crucial, but it does not suffice in solving social problems, like transparency and dialogue between ordinary citizens and public institutions. Sole focus on efficiency neglects fundamental civic goals like democracy, rule of law, social cohesion and quality of life.[74] We need technologies that involve citizens that walk in public space, and not just for purposes of entertainment that public screens offer, but those that allow citizens to engage with city management. It is an engagement of strategies and tactics: if citizens are better informed, they can answer to strategies that are imposed on them in public space more directly. The analysis established that visibility is one answer to this: citizens need to be informed through signs about where and how their data is collected in public space, and through visible technology that shares changes that impact their agency.

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[68] Sennett, *Building and Dwelling,* 81.
[69] "Urbanflow." Urbanflow Helsinki, accessed 10 June, 2019, http://helsinki.urbanflow.io/.
[70] Ibid.
[71] Ibid.
[72] Shannon Mattern, "Interfacing Urban Intelligence," *Places Journal*, 28 April 2014.
[73] Ibid.
[74] Ratti and Townsend, "The social nexus," 45.

6.2. CASE STUDY 2: DATAFIED PUBLIC SPACE AS A SITE OF COMMERICAL STRATEGIES

After exploring walking from the perspective of security and how strategies increase dialogue through technology, the purpose of this section is to explore walking in the context of mobile media in public space. How do commercial maps and mobile applications affect walking? I analyse Google Maps AR as a strategic application that nevertheless utilizes user data and ask how ordinary citizens can apply tactics in reaction to these projects in public space- also through walking.

6.2.1. GOOGLE MAPS AR'S IMPACT ON THE SOCIABILITY AND CREATIVITY OF WALKERS

Google Maps AR is a new product of Google that a number of people tested and wrote reviews about.[75] It is a service added to Google Maps, which utilizes the camera so that users can find directions by pointing the device at the street. Through the screen they see the street and to make navigation easier, the developers superimposed signs, arrows and the measurement of distance on the screen in the form of augmented reality. (Figure 11) Developers can use all imagery collected through Google Street View and take the visual features to precompute a map, learn these coordinates and orient the device in the real world.[76] This shows the technical side, which relies on an immense amount of data extracted from visual imagery. A developer explained at a Google conference that with the help of the camera, users instantly know which direction to go, instead of looking down the blue dot and being clueless about where to start walking.[77] A Statista survey from 2018 shows that Google Maps is the second most used application in the Netherlands after Facebook's messaging application Whatsapp.[78] Even though their services are useful for walkers and citizens, I argue they impose on walking and put citizens under unequal conditions regarding their agency in public space. It can be argued that Google has a different purpose than to empower its users, since it is a commercial application that provides different services. Still, I argue for unequal power relations because they impose on the experience of people (sociability, creativity) in public space and they take the location data of citizens that walk the city, which they use for the development of their commercial services. In a strategic way, they hold incredible amounts of data of our habits and preferences and they work from a locatable source to provide services to their customers. In the following, I explore how these developments impact walking in the city and how ordinary people can react to these strategies.

As Willis argued, AR applications can create private bubbles in public space where people rather pay attention to their device than to the streets or other walkers.[79] Sociability has diminished not only as a result of smart technologies, but also as a result of modern city development. In Solnit's words, "in the country, one's solitude is geographical…in the city, one is alone because the world is made up of strangers."[80] Instead of asking a pedestrian if they know the way, citizens tend to look at their phones

[75]See reviews "Google Maps AR Review: Changing the way we get around," Eftm, accessed 30 July, 2019, https://eftm.com/2019/06/google-maps-ar-review-changing-the-way-we-get-around-61462;
"It's impossible to get lost with this experimental Google Maps feature, which puts arrows over images of the real world," CNBC, accessed 30 July, 2019, https://www.cnbc.com/2019/03/15/google-maps-ar-first-look-at-augmented-reality-directions.html.

[76] "Developing the First AR Experience for Google Maps," Google Developers, filmed May 2019 at Google I/O, video, 9:19, https://www.youtube.com/watch?v=14wedZy90Tw&t=559s.

[77] "Google I/O 2018 keynote in 14 minutes," The Verge, filmed May 2018, video, 9:42, https://youtu.be/BRUvbiWLwFI?t=581.

[78] "Netherlands: Top 20 Used Smartphone Apps 2018," Statista, accessed 10 June, 2019, https://www.statista.com/statistics/947829/most-used-smartphone-apps-in-the-netherlands/.

[79] Willis, *Netspaces,* 96-98.

[80] Solnit, *Wanderlust: A History of Walking*, 309.

and search for information there. For safety reasons, Google advices their AR users not to hold up their phone during walking. For the time that they do, the application might offer the help of a guide, such as a fox. (Figure 12) This is creation of a net locality that Gordon and de Souza e Silva argued for, because the web is brought into public space and the public space is brought into our phones.[81] Citizens walk, but the phone is in their hand, distracted by the fox, the recommendations and services that Google offers. (Figure 13) Augmented reality and helpful guides on the screen distract them even more from public space and real-life interaction. These complexities are inevitable consequences of the emergence of new media, but the problem I want to illuminate is that these mapping applications impose on walking. Walking becomes an experience where people are guided by algorithms and increasingly glued to their phones instead of using and developing their skills of navigation and being immersed in real place. Sociologist Richard Sennett calls such a place a "closed smart city" that does not involve accidental encounters or illuminating exchanges, the sort of city that Jane Jacobs praised in her book "The Death and Rise of Great American Cities".[82]

Besides decreasing attention to public space and other citizens, Google Maps AR also imposes on human creativity. This is not only an impact of Google, but a systemic feature of user-friendly technologies. In the context of the smart city and its effect on people, sociologist Richard Sennett emphasises two concepts. One is "individualism", which he took from French diplomat and political scientist de Toqueville, meaning that the crowd results in the phenomenon of mass individuals, that are "comfort-driven and inward looking."[83] The other concept is "equality of condition", which does not point to equality of opportunities, but that people will want the same kind of things.[84] Sennett explains that in the context of communication, smartphones are individualizing machines and the standardized programs that run on these devices create an equality of condition.[85] Reflecting on the impact that Google Maps AR will have on walkers in the city, one can notice what he meant by the individualizing machine. The essential objective of the product is to make navigation easier. While walkers do not know the direction and use their devices for help, navigation becomes a convenient experience. They do not use experience and spatial memory in order to find places in the city, and they do need to come up with creative solutions. On the other hand, it also creates an equality of condition, since most people that use the application will be guided by algorithms. These will offer personalized suggestions, searching for the most time-saving and efficient way to get from A to B. Walking this way becomes a systematic experience guided by a commercial application, and instead of taking a street because it offers a more pleasant experience aesthetically, users rely on their phones to guide them. The nature of walking is deeply influenced by such data usage and technology, where algorithms calculate the most efficient route and recommendation algorithms offer suggestions for places to visit. These are all processes that slowly make citizens less active and critical of the public space. While this might not be the primary aim of Google developers, their technology can render walkers that passively follow predetermined routes, as a result of commercial services and comfort-driven thinking.

[81] Gordon and de Souza e Silva, *Net Locality, 86.*

[82] Jane Jacobs went against city planning that went on solving problems in neighbourhoods by clearing up streets, leaving no traces of street life and communal places. See Richard Sennett, *Building and Dwelling: Ethics for the City* (New York: Farrar, Straus and Giroux, 2018), 157.

[83] Ibid, 145.

[84] Ibid, 146.

[85] Ibid.

6.2.2. IMPOSING ON WALKING THROUGH LOCATION DATA COLLECTION

According to Google's "Privacy & Terms", it tracks location data determined by GPS, IP address, sensor data from device, from things near the devices or from trusted marketing partners.[86] While walkers use their smartphones to access information that they need in order to navigate, their locations, clicks and preferences become valuable source of information that Google can utilize to create more efficient services, and to provide personalized services. [87] Professor Shoshana Zuboff explores datafication's role in these processes and in the context of behavioural data, she calls the processes of datafication 'rendition', which means that human experience is claimed as data for capitalist pursuits.[88] She says "your body is reimagined as behaving object to be tracked and calculated for index and search."[89] I would like to build on these statements, because citizens that walk function as customers that consume and provide data, so that companies can create more robust services feeding on the excess of user data. Location data is valuable to them, but walking makes it possible to track the habits of citizens. Through smartphones, walking has been transformed into a tool for commercial companies.

Google Maps AR could not have been developed without Google Street View's popularity and the users that provide their data on a day-to-day basis. Shaw and Graham call the operation of Google Maps bottom-up navigation instead of a locatable top-down source, due to the collection of user data.[90] I disagree with the use of the word bottom-up to describe this process, because bottom-up projects are celebrated for the way they are organized and utilize democratic ways to harvest human creativity and potential. While it is true that users contribute their data in a bottom-up manner, it is not in Google's interest to empower citizens, to inform them about developments that impact their agency so that they can act and use their power for change (such as the case with Urbanflow). This is an issue of the ownership of data. When bottom-up data is collected by a company that clearly wants to raise its profits and views citizens as a market of customers, the motivation for the project shifts from a service created for the public good to one for the pursuit of commercial profit. Even though ordinary citizens benefit from these applications and knowingly/unknowingly provide their data, those that consume these applications while walking fall under unequal conditions from the perspective of data ownership. The power gained from appropriating information of streets, habits, preferences, location data of users is concentrated in the hands of Alphabet with the fourth biggest tech company market value in the world according to Forbes magazine in 2019.[91] Instead of engaging them with processes in the city that impact their agency, they strip away creativity and take potentially sensitive location data. They impose on walking in a strategical way, take walkers' data that merely empower the company. In regards to the "right to the city" and the agency of ordinary citizens, they do not help those that lack basic material conditions, and those that are alienated from an intellectual point.[92] How can ordinary citizens still act up against these commercial strategies and regain their agency in public space? What will make them more aware and critical about operations that utilize their data?

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[86] "Privacy & Terms", Google, last modified 22 January, 2019, https://policies.google.com/privacy?hl=en-US#infocollect.
[87] Ibid.
[88] Zuboff, *The Age of Surveillance Capitalism*, 234.
[89] Ibid, 242.
[90] Shaw and Graham, "An Informational Right to the City?", 917.
[91] "The Largest Technology Companies In 2019: Apple Reigns As Smartphones Slip and Cloud Services Thrive," Forbes, last modified 15 May, 2019, https://www.forbes.com/sites/jonathanponciano/2019/05/15/worlds-largest-tech-companies-2019/.
[92] Marcuse, "From Critical Urban Theory to the Right to the City," 191.

6.2.3. WALKING AS A TACTIC IN PUBLIC SPACE

What kind of tools and efforts do citizens need to regain their agency in the context of commercial data collection? Using walking as a tactic, is there a way for them to act up against commercial applications such as Google Maps AR? In de Certeau's model, in order to form tactics, ordinary citizens act in the place of the other to cause small changes to these practices.[93] Graham and Shaw claim that the informational "right to the city" also demand a dissent, or a refusal to act as "informational commodity prosumers." [94] I agree, since instead of producing and consuming information that Google provides, citizens should critically think about the consequences of such practices and live with their rights to opt-out. Choosing to opt-out and use applications that utilize data for non-commercial gains is a powerful tactic. Open Street Maps is a good example that is created voluntarily by people, while the data is open to everyone.[95] The result of this act depends on the scale- how many people decide to opt-out. Nevertheless, it is not the only option or tactic to advocate for fundamentally different values and to strengthen the agency of walkers in public space.

For this purpose, I use data walking to analyse how walking can operate as a tactic. Instead of imposing on walking for commercial gains, data walks utilize walking in order to empower participants with critical thinking and to gain knowledge about their insights of the datafication of public space. It is a bottom-up practice, going against the discourse that renders the view on data and algorithms impartial, capable of solving complex social problems.[96] The data walks of UDS resemble the purpose of the data walks of Centre for BOLD Cities, since they developed them to create social and civic uses of big data instead of a commercial and entrepreneurial mindset that others operate with.[97] These approaches are a systematic consequence of a shift of cultural (and data) studies to the everyday; professor of digital society Helen Kennedy states that in order to see what just data arrangement would look like we need to consider the standpoint on non-experts.[98] Because the data walks follow this, I argue that they do act as tactics: small, dispersed actions that operate in the space of the other and critique it. Their tool is the observation of datafication, reflection and the sharing of knowledge.

Regarding the use of smart devices, data walks provide a contrasting experience to navigation with Google Maps AR, since they invite participants to be fully present in public space. They focus on spontaneous discussion and data collection inspired by the local urban environment. The Data Walking Booklet I created advises participants to use mobile phones to collect data and take pictures.[99] Participants looked at wi-fi signals to search for access points, who provides them and to question what kind of data they collect. (Figure 14) Fieldnotes help participants remember the discussion and have a proactive attitude towards such research.[100] There is no commercial gain and the aim is to observe traces in the environment. Discussions remarked that it is helpful to see data in the physical environment instead of looking at datasets through laptops or phones. It confirms that data affects people in public space during walking, and walking is a helpful way to see that data is created in

[93] De Certeau, *The Practice of Everyday Life*, 36.
[94] Shaw and Graham, "An Informational Right to the City?", 917.
[95] "About," OpenStreetMap, accessed 30 July, 2019, https://www.openstreetmap.org/about.
[96] See Gillespie's argument about the view on algorithms and what makes them seen objective and impartial: Tarleton Gillespie, "The Relevance of Algorithms," in *Media Technologies : Essays on Communication, Materiality, and Society* ed. Tarleton Gillespie, Pablo J Boczkowski, and Kirsten A Foot (Cambridge, Massachusetts: MIT Press, 2014), 171.
[97] Liesbet van Zoonen, "Seeing More than You Think: A Data Walk in the Smart City," last modified 26 May, 2017.
[98] Maranke Wieringa and Karin van Es, "Working Paper- Walking as method in data studies," last modified August 17, 2018, https://datafiedsociety.nl/working-paper-walking-as-method-in-data-studies/.
[99] See the section "Tools and Equipment" on pages 7-8 in 'Data Walking Booklet' in Appendix.
[100] See the fieldnotes included at the end of the booklet on page 35-41 in 'Data Walking Booklet' in Appendix.

particular social contexts. Instead of accepting our passive consumerism, walking in the form of data walking creates awareness of such invisible ways of data collection, thus also contributes to the agency of citizens.

As an act of resistance that involves walking, it is closest to the practice of flaneur, a type of walker that observed cities. The flaneur is a romantic idea of the 19th century walker that takes the role of a distant observer that studies a foreign environment and the people within. It is an observer that is seduced by shops that offer new and exciting possibilities for a new kind of lifestyle, but still keeps his distance.[101] The idea of the flaneur was born at a time when cities became more complex, creating the possibility to walk, look at commerce and trade that shaped the city. The arcades provided a perfect setting for this and as Amato argues, "the arcades in Paris revealed society's evolution from one based on mutual concern to one based on commodities and material well-being."[102] This historical example highlights that the idea of the reflective walker was born at a time when commercial purposes were central to the shaping of the city. They shaped walkers, just as Google Maps AR shapes walkers today. This type of walker however does not act from a completely powerless position. It rather describes a person that is in the words of Marcuse alienated from an intellectual, creative point of view.[103] Those who go on a data walk are not completely powerless, but processes hinder their abilities to use the public space to its full potential. In certain cases, citizens that take the walk have even more power to shape processes in the city, where researchers take civil servants on walks.[104] From this perspective, data walks do not operate as tactics for all strategies in cities, because walking cannot serve as a solution to the problems of people that lack basic material conditions.

To conclude, walking in the form of data walks serves as a tool to immerse participants in a local environment. They take the role of the observer as ordinary citizens and question where they stand in relation to data practices in public space. Where is their data used, for how long is it stored and who can access it? Is there a way to cause change? As I experienced at the "ownership" data walk, walking offers a helpful setting to create awareness and share knowledge. People attended this workshop that work at technology companies or municipalities together with ordinary citizens. They all had relevant insights about the issues that we discussed from various angles. Walking in the form of data walks is a representative of tactics: it arises from a source of discontent and unequal conditions in public space. It does not set out to cause systematic change: creating awareness is a slower procedure that changes the way people think about smart city developments. It does not impose a product or a solution to a problem that affect citizens on a grand scale, such as surveillance cameras in cities or Google Maps AR. Instead, walking in the format of data walks provides citizens with agency for the time of the walk. They make an effort to empower and create more equal relations regarding their agency. Through utilizing the capacity of public space as a site of equal access and walking, they inform themselves about where and how their data is used through observation and discussion.

[101] Solnit, *Wanderlust,* 292.
[102] Amato, *On Foot: A History of Walking*, 174.
[103] Marcuse, "From Critical Urban Theory to the Right to the City," 191.
[104] "Data Walks," Centre for BOLD Cities, accessed 10 June, 2019.

7. CONCLUSION

Considering the scale and limitations of data walking for research purposes, it is an exploratory method, restricted to the sensory and subjective experience of the observer. The data collection was also exploratory, guided by the observations of participants and my own findings. Because it is exploratory and focuses on a specific environment, further research was required on the particularities of data collection in cities. To do this, the analysis considered the impact of technologies such as urban dashboards and Google Maps AR. I did not set out to find definite answers, instead the aim was to explore the method to analyse the state of datafication in public space and its impact on walkers. On the whole, data walking operates well to discuss the research question how walking is impacted in public space, because it places the observer in the position of the ordinary citizen to see how the person is impacted by developments. It also works well with the framework of "strategies and tactics" because in other instances (such as Alison Powell's practice) it is employed as a bottom-up approach that considers how citizens are impacted by top-down practices. It points out the complexities of public space as a site of walking by reflecting on the experience of walkers. It is an especially useful method to point out the unequal power relations that walkers fall under while walking in datafied public space- and offer solutions, such as more visibility in public space. To complement this study, further research could be conducted on the public values that citizens find important when it comes to their data in public space and to further explore solutions to the informing of citizens beyond *visibility*- perhaps through the method of data walking.

The main questions that this thesis aims to answer are (1) how do strategies impact walking in datafied public space and (2) what kind of political tools and efforts do we need strengthen the agency of ordinary citizens that walk in the datafied city? I claim that citizens fall under unequal conditions in datafied public space regarding their agency, which I analysed through two case studies. Regarding the first question, the first case study shows that public sites are strategically regulated through data collection, such as gates that grant access to spaces or the surveillance cameras that collect data. This impacts walking: data walks show that walkers' agency decreases, because they are not well informed about where and who collects data about them. As for the second case study, it shows that maps such as Google Maps AR impose on sociability by shifting walkers' attention away from public space. They render walking a systematic experience guided by algorithms created by a commercial application, which also makes them less critical, impacting their creativity. They also fall under unequal power relations regarding their location data, which is collected by the company in a strategic way.

Regarding the second question, in the first case study I argue for the engagement of strategies and tactics. Visibility is a key tool here, both in terms of informing citizens about where their data is collected and in terms of visible technologies, that can function to inform citizens about processes that impact their agency in the city. In the second case study, I argue that opting-out of using technologies that take data for commercial purposes can be a powerful effort and tactic. Walking in the form of data walks is also a tactic, because it is a result of many smaller actions, it is a slow process and it empowers only a certain group of citizens while operating in the space of the other. It is not a definite solution, but an effort of citizen to raise awareness and be more critical regarding their agency in public space.

Focusing on the everyday activity of walking, the outcomes present questions that capture the attention of many researchers and citizens today. Whose responsibility is it to ensure transparency, dialogue and fair data practices? Who is responsible for our cities and that they are liveable, utilizing technologies for efficiency but also respecting the agency of ordinary citizens? This thesis contributes to previous studies in two main areas. Firstly to data walks, because besides previous studies that used data walks to create data-literacies in a bottom-up way and to create digital services, it proves that it

can serve as a method in research.[105] It utilized data walking to explore data-driven developments in a particular context and its impact on ordinary citizens. It also adds to studies of cities as datafied spaces, from the perspective of citizens, by critiquing smart city developments and the extent to which they involve ordinary citizens.[106] In this context, it builds on the theory Lefebvre on "the right to the city", because it considers the agency of ordinary citizens and how they can be strengthened in datafied public space.[107] The agency of walkers in datafied public space is a central issue in this thesis that has not yet received the attention it deserves. In addition, the method of data walking allowed it to acquire a special focus. Besides critiquing technological developments that impose on ordinary citizens, it tried to offer solutions through finding the problems that concern them in public space.

[105] Powell, "The data walkshop and radical bottom-up data knowledge."
van Zoonen, "Seeing More than You Think: A Data Walk in the Smart City."
Jarke, "Open Government for All?"
Greenfield and Nurri, "Systems/Layers."
[106] Shaw and Mark Graham, "An Informational Right to the City?
Kitchin, "The Real-Time City?
Rabari and Storper, "The Digital Skin of Cities."
[107]Lefebvre, "The Right to the City."

8. IMAGES

FIGURE 1. GATES AT CENTRAL STATION IN UTRECHT. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

FIGURE 2. SURVEILLANCE CAMERA. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

FIGURE 3. SIGN INFORMING CITIZENS ABOUT CAMERA SURVEILLANCE. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

FIGURE 4. SIGN INFORMING ABOUT SURVEILLANCE CAMERA, IMPLEMENTED BY THE MUNICIPALITY OF UTRECHT. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

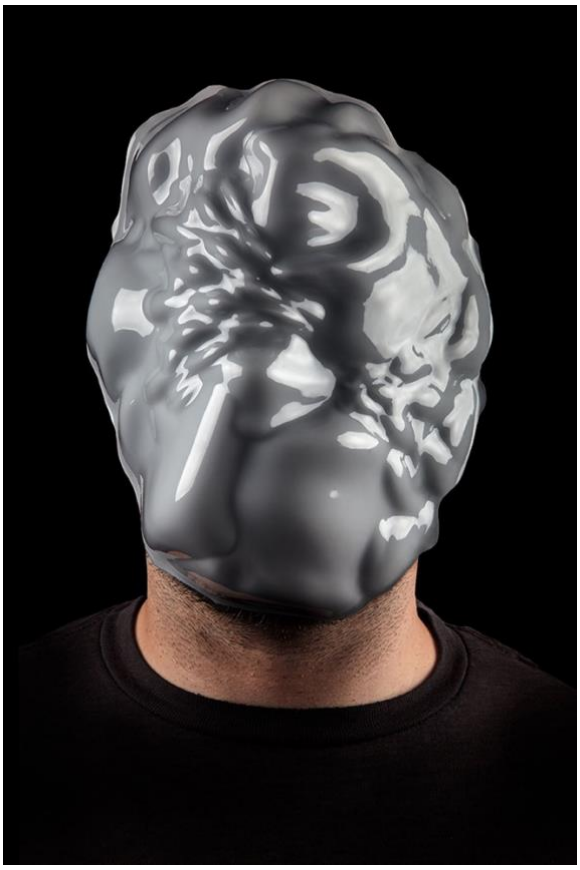

FIGURE 5. ZACH BLAS. FACIAL WEAPONIZATION SUITE. SOURCE: HTTP://WWW.ZACHBLAS.INFO/WORKS/FACIAL-WEAPONIZATION-SUITE/.

FIGURE 6. SIGN INFORMING ABOUT WI-FI TRACKING AT UTRECHT CENTRAL STATION. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

FIGURE 7. DISPLAY INDICATING BICYCLE STORAGE SPACES. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

FIGURE 8. DISPLAY SHOWING WHAT IS HAPPENING IN NATURE. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

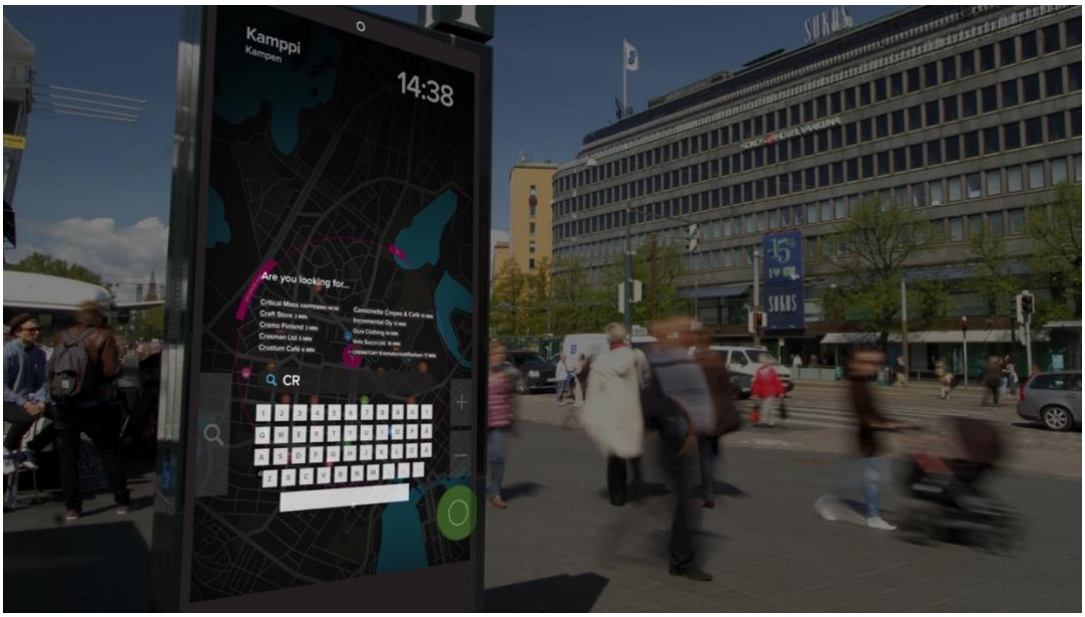

FIGURE 9. URBANFLOW. URBAN DASHBOARD SHOWING MAP OF THE CITY. SOURCE: HTTP://URBANSCALE.ORG/PROJECTS/URBANFLOW/.

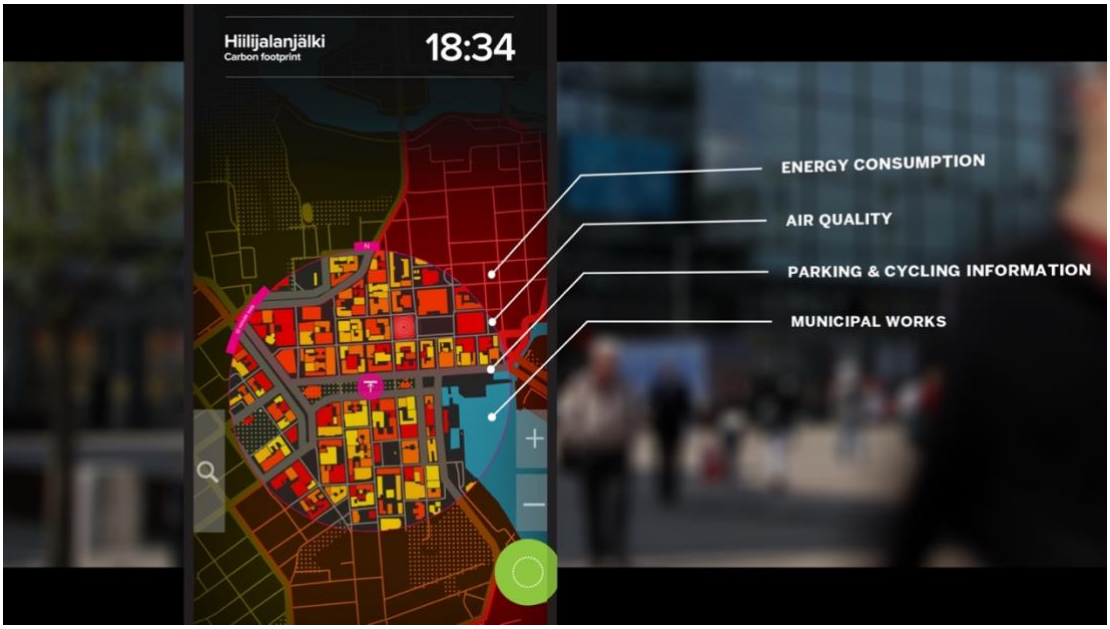

FIGURE 10. URBANFLOW. URBAN DASHBOARD DESIGN SHOWING INFORMATION OF THE CITY. SOURCE: HTTP://URBANSCALE.ORG/PROJECTS/URBANFLOW/.

FIGURE 11. GOOGLE MAPS AR NAVIGATION. SOURCE: HTTPS://WWW.SMARTDROID.DE/GOOGLE-MAPS-AR-NAVIGATION-MUSS-NOCH-OHNE-FUCHS-AUSKOMMEN-DER-ERST-INTELLIGENTER-WERDEN-SOLL/.

FIGURE 12. GOOGLE MAPS AR WITH A FOX GUIDING THE USER. SOURCE: HTTPS://WWW.DIGITALBODIES.NET/AUGMENTED-REALITY/GOOGLE-AR-AND-VR-AUGMENTED-REALITY-IS-HERE/.

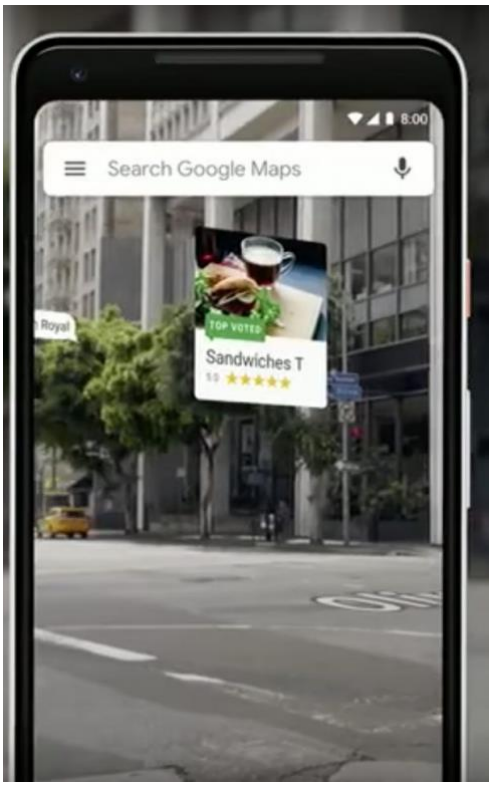

FIGURE 13. GOOGLE RECOMMENDATIONS IN THE FORM OF AUGMENTED REALITY. SOURCE : HTTPS://KEY.DIGITAL/GOOGLE-UPDATES-MAPS-WITH-AUGMENTED-REALITY-DIRECTIONS/.

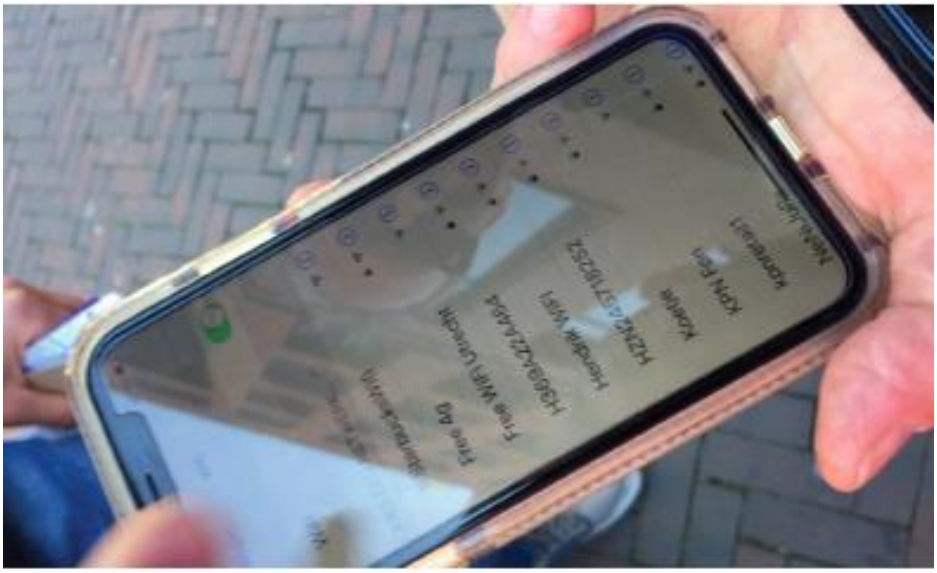

FIGURE 14. CHECKING WI-FI SIGNALS IN PUBLIC SPACE USING MOBILE PHONES. SOURCE: IMAGE TAKEN AT UTRECHT DATA SCHOOL DATA WALK.

9.BIBLIOGRAPHY

Amato, Joseph. *On Foot: A History of Walking*. New York: New York University Press, 2004. http://ebookcentral.proquest.com/lib/uunl/detail.action?docID=2081686.

Arendt, Hannah. *The Human Condition*. Chicago: The University of Chicago Press, 1958.

Blas, Zach. "Facial Weaponization Suite." Accessed 10 June, 2019. http://www.zachblas.info/works/facial-weaponization-suite/.

Centre for BOLD Cities. "Data Walks." Accessed 10 June, 2019. https://www.centre-for-bold-cities.nl/projects/data-walks.

Certeau, Michel de, and Steven F. Rendall. *The Practice of Everyday Life*. Berkeley: University of California Press, 2011. http://ebookcentral.proquest.com/lib/uunl/detail.action?docID=922939.

Cheney-Lippold, John. "A new algorithmic identity: Soft biopolitics and the modulation of control." *Theory, Culture & Society* 28.6 (2011): 164-181.

Cisco. "Cisco Kinetic for Cities." Accessed 17 July, 2019. https://www.cisco.com/c/en/us/solutions/industries/smart-connected-communities/kinetic-for-cities.html#~stickynav=2.

CNBC. "It's impossible to get lost with this experimental Google Maps feature, which puts arrows over images of the real world." Accessed 30 July, 2019. https://www.cnbc.com/2019/03/15/google-maps-ar-first-look-at-augmented-reality-directions.html.

Eftm. "Google Maps AR Review: Changing the way we get around." Accessed 30 July, 2019. https://eftm.com/2019/06/google-maps-ar-review-changing-the-way-we-get-around-61462.

Forbes. "The Largest Technology Companies In 2019: Apple Reigns As Smartphones Slip and Cloud Services Thrive." Last modified 15 May, 2019. https://www.forbes.com/sites/jonathanponciano/2019/05/15/worlds-largest-tech-companies-2019/.

Gemeente Utrecht. "Melding, Klacht, Bezwaar." Accessed 9 June, 2019. https://www.utrecht.nl/contact/melding-klacht-bezwaar/.

General Data Protection Regulation GDPR. “Rights of the Data Subject.“ Accessed 9 August, 2019. https://gdpr-info.eu/chapter-3/.

Gillespie, Tarleton. “The Relevance of Algorithms.” In *Media Technologies : Essays on Communication, Materiality, and Society.* Edited by Tarleton Gillespie, Pablo J Boczkowski, and Kirsten A Foot, 167-194. Cambridge, Massachusetts: MIT Press, 2014.

Google Developers. “Developing the First AR Experience for Google Maps.” Filmed May 2019 at Google I/O, video, 9:19. https://www.youtube.com/watch?v=14wedZy90Tw&t=559s.

Google. “Privacy & Terms.” Last modified 22 January, 2019. https://policies.google.com/privacy?hl=en-US#infocollect.

Gordon, Eric, and Adriana de Souza e Silva. *Net Locality: Why Location Matters in a Networked World*. Hoboken: John Wiley & Sons, Incorporated, 2011. http://ebookcentral.proquest.com/lib/uunl/detail.action?docID=693780.

Greenfield, Adam, and Kim Nurri. “Systems/Layers: How to run a walkshop on networked urbanism.” Last modified 21 March, 2011. http://diffusion.org.uk/?p=2364.

Harley, J. B., David Woodward, and Mark S. Monmonier. *The History of Cartography*.

Harvey, David. *Rebel Cities: From the Right to the City to the Urban Revolution*. London: Verso, 2012. http://www.geography.wisc.edu/histcart/v1toc.html.

Jarke, Juliane. “Open Government for All? Co-Creating Digital Public Services for Older Adults through Data Walks.” *Online Information Review* (2019). https://doi.org/10.1108/OIR-02-2018-0059.

Jiang, Qijun, Frank Kresin, Arnold K. Bregt, Lammert Kooistra, Emma Pareschi, Edith van Putten, Hester Volten, and Joost Wesseling. “Citizen Sensing for Improved Urban Environmental Monitoring.” Journal of Sensors (2016): 1-10. https://doi.org/10.1155/2016/5656245.

Kitchin, Rob. “The Real-Time City? Big Data and Smart Urbanism.” GeoJournal 79, no. 1 (February 2014): 1–14.

Lefebvre, Henri. “The Right to the City.” In *Writings on Cities*. Edited by Eleonore Kofman and Elizabeth Lebas, 147–59. Cambridge: Blackwell Publishers Ltd., 1996.

Marcuse, Peter. “From Critical Urban Theory to the Right to the City.” *City* 13, no. 2–3 (June 2009): 185–97. https://doi.org/10.1080/13604810902982177.

Mattern, Shannon. “Interfacing Urban Intelligence.” *Places Journal*, 28 April, 2014. https://doi.org/10.22269/140428.

McQuire, Scott. *Geomedia, Networked Cities and the Politics of Urban Space: Networked Cities and the Future of Public Space*. Chicester, UK: Polity Press, 2016.

Morris, Brian. “What We Talk about When We Talk about ‘Walking in the City’1’.” *Cultural Studies* 18, no. 5 (September 2004): 675–97. https://doi.org/10.1080/0950238042000260351.

Nemitz, Paul. “Constitutional Democracy and Technology in the Age of Artificial Intelligence.” Phil. Trans. R. Soc. A 376, no. 2133 (November 28, 2018): 20180089.

Nieuws, NS. “Meten is weten: realtime reizigers tellen op zes drukke stations.” Accessed 5 July, 2019. https://nieuws.ns.nl/meten-is-weten-realtime-reizigers-tellen-op-zes-drukke-stations/.

OpenStreetMap. “About.” Accessed 30 July, 2019. https://www.openstreetmap.org/about.

Powell, Alison. The data walkshop and radical bottom-up data knowledge. In *Ethnography for a Data-Saturated World*. Edited by Hannah Knox and Dawn Nafus, 212-232. Manchester: Manchester University Press, 2018. http://ebookcentral.proquest.com/lib/uunl/detail.action?docID=5557378.

Rabari, Chirag, and Michael Storper. “The Digital Skin of Cities: Urban Theory and Research in the Age of the Sensored and Metered City, Ubiquitous Computing and Big Data.” *Cambridge Journal of Regions, Economy and Society* 8, no. 1 (March 2015): 27–42. https://doi.org/10.1093/cjres/rsu021.

Radar. “Wifi tracking.” Accessed 5 July, 2019. https://radar.avrotros.nl/uitzendingen/gemist/item/wifi-tracking/.

Ratti, Carlo, and Anthony Townsend. "The social nexus." *Scientific American* 305.3 (2011): 42-49.

Sennett, Richard. *Building and Dwelling: Ethics for the City*. New York: Farrar, Straus and Giroux, 2018.

Shaw, Joe, and Mark Graham. “An Informational Right to the City? Code, Content, Control, and the Urbanization of Information.” *Antipode* 49, no. 4 (2017): 907–27. https://doi.org/10.1111/anti.12312.

Solnit, Rebecca. *Wanderlust: A History of Walking*. London, UK: Penguin Books, 2001.

Statista. “Netherlands: Top 20 Used Smartphone Apps 2018.” Accessed 10 June, 2019. https://www.statista.com/statistics/947829/most-used-smartphone-apps-in-the-netherlands/.

The Guardian. “Google Records Your Location Even When You Tell It Not to.” Accessed 5 July, 2019. https://www.theguardian.com/technology/2018/aug/13/google-location-tracking-android-iphone-mobile.

The Verge. “Google I/O 2018 keynote in 14 minutes.” Filmed May 2018, video, 9:42. https://youtu.be/BRUvbiWLwFI?t=581.

United Nations Department of Economic and Social Affairs. “68% of the World Population Projected to Live in Urban Areas by 2050, Says UN.” Last modified 16 May, 2018. https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html.

Urbanflow Helsinki. “Urbanflow.” Accessed 10 June, 2019. http://helsinki.urbanflow.io/.

Valentino-DeVries, Jennifer, Natasha Singer, Michael H. Keller, and Aaron Krolik. “Your Apps Know Where You Were Last Night, and They’re Not Keeping It Secret.” The New York Times, December 10, 2018. https://www.nytimes.com/interactive/2018/12/10/business/location-dataprivacy-apps.html.

Webwereld. “Trans Link: Veiliger OV-chip niet meer van NXP.” Accessed on 23 July, 2019. https://webwereld.nl/security/56013-trans-link-veiliger-ov-chip-niet-meer-van-nxp.

Wieringa, Maranke, and Karin van Es. “Working Paper- Walking as method in data studies.” Last modified August 17, 2018. https://datafiedsociety.nl/working-paper-walking-as-method-in-data-studies/.

Willis, Katharine S. *Netspaces: Space and Place in a Networked World*. Farnham: Routledge, 2017. http://ebookcentral.proquest.com/lib/uunl/detail.action?docID=4338080.

Zoonen, Liesbet van. “Seeing More than You Think: A Data Walk in the Smart City.” Last modified 26 May, 2017.

Zuboff, Shoshana. *The Age of Surveillance Capitalism: The Fight for the Future at the New Frontier of Power*. London: Profile Books, 2019.