Article

The Noise of Silent Machines: A Case Study of LinkNYC

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Abstract

In early 2016, the city of New York and the Google-backed consortium CityBridge launched LinkNYC, a communication network that enables residents and visitors to access Wi-Fi, charge their phones, and make domestic calls—all for free. The ten-foot tall kiosks scattered around the city are also equipped with screens, cameras, a tablet, speakers, and a microphone. Almost immediately after its launch, many raised concerns about LinkNYC: noise complaints concerning users listening to loud music, homeless people gathering around the kiosks, outrage regarding users watching pornography, as well as the potential threat to privacy the kiosks present. In this paper, I argue that LinkNYC functions as a neoliberal apparatus of listening and silencing in the public sphere through data collection and restrictions of usage of the kiosk in the name of accessibility. As Google's first attempt at occupying the public space, LinkNYC reveals the aspirations for the neoliberal city. Through an ethnographic socio-technological study of LinkNYC, I engage sound studies in current discussions about surveillance. I theorize the modalities of listening in the neoliberal city and discuss competing notions of the public space in smart/responsive cities. I investigate the ideological difference between the smart city and the responsive city and trace the movement from a listening entity to a responsive one, analyzing the implications for privacy. I theorize unsilencing and its politics, discussing examples of re-appropriation of the kiosks. I conducted fieldwork by observing interactions with the kiosks and by doing interviews with citizens, homeless advocacy groups, CityBridge employees, and experts. In addition, I analyze the discourses of CityBridge, local politicians, activists, journalists, and citizens surrounding LinkNYC. This paper is at the theoretical intersection of sound studies, urban studies, science and technology studies, and surveillance studies. Through this case study, I open a theorization of the listening practices of surveillance to look at how power circulates through sound.

Introduction

LinkNYC kiosks are a co-initiative from the administration of Mayor Bill De Blasio and the Google-backed consortium CityBridge, meant to replace New York's outdated payphones. A total of 7,500 LinkNYC kiosks are projected to be installed throughout the five boroughs in the next few years, and 1,800 have been installed since 2016. LinkNYC provides the following services: free Wi-Fi, free phone calls, calling 911 with an emergency button, the charging of portable devices with a power-only USB port, and access to 311 city services and Google Maps. The kiosks were also originally intended to provide a free web-browsing option, which I discuss below. The kiosks are equipped with three LCD screens—two large advertising screens on each side and one small tablet for users. LinkNYC is projected to generate more than half a billion dollars in ad revenue for the city in the next decade, at no cost to taxpayers. The kiosks are also equipped with three cameras, one on top of each screen, speakers and a microphone, and sensors (CityBridge 2017).¹ This raised

¹ Even though the sensors are referred to in the privacy policy, CityBridge notes they were only part of a pilot version for the kiosks and have since been removed (Colvin 2021, video interview).

privacy concerns for many observers, particularly concerning the capacity of the kiosks to gather personal data in the public space.

I first encountered LinkNYC kiosks when I arrived in New York City to start graduate school. Walking around the Morningside Heights neighborhood, I found myself standing in front of a tower that immediately made me think of a panopticon. I later noticed eleven LinkNYC kiosks installed within a ten-block radius of my apartment. I also noticed, especially in the evening, small groups and individuals, often homeless people, interacting with the kiosk: listening to music on YouTube, bringing couches and chairs to set up around the kiosks, re-appropriating the public space by gathering and enjoying the warm summer nights. My immediate impression changed completely, and I started to feel like this could have a positive impact on citizens, possibly reflecting a community-building cultural policy of the city. Yet, on September 14, 2016, city officials and CityBridge decided to shut off the web-browsing platform. This decision came after residents complained about public disturbances that this component created: users listening to music, watching pornography, loitering near the kiosks, and monopolizing them for hours. Although it is still possible to connect to Wi-Fi, only users with a smartphone or a tablet can use this feature. As such, part of the population is intentionally excluded, and the altruistic element of the initiative is undermined. The consequences of terminating web-browsing were immediate, as the visible usage of the kiosks fell dramatically. The kiosks were largely ignored and unused. Now silent, the towers started to resemble the panopticon once again.

In this article, I theorize LinkNYC through the sonic frameworks of noise, listening, and silencing to reveal the surveillance aspirations of the neoliberal city. If contemporary surveillance is both sonic and visual, I use sound as both a metaphor and a medium for surveillance. Through an ethnographic socio-technological study of LinkNYC, I contribute to the aural study of surveillance. I conducted fieldwork by observing interactions with the kiosks and by doing interviews with citizens, homeless advocacy groups, CityBridge employees, and cybersecurity and legal experts. In addition, I analyze the discourses of CityBridge, local politicians, activists, journalists, and citizens surrounding LinkNYC.

Sound and surveillance is a small field of inquiry that deserves further attention. Central contributions to the topic emerge within historical sound studies analysis, such as post-structural analysis of the genesis and evolution of eavesdropping in Western history and art (Szendy 2017); theorizations of Dionysus's Ear as a tool for tracking political dissent (Bull and Back 2016; Szendy 2017); studies of how the "listening ear" constructs and disciplines racialized subjects throughout American history (Stoeveer 2016); works on the listening modalities of the Stasi (Bijsterveld 2014), on twentieth-century noise ordinances and subsequent tracking and policing of noise-makers (Bijsterveld 2008; Radovac 2015), and on the construction of sensory privacy in cars (Bijsterveld 2010); as well as literary approaches to sound studies through conceptions of listening that detail how listening can be harmful (Connor 2014), conceptions of the "panopticon ear" as an authoritative modality of listening resting on whiteness, which functions to reinforce normative listening practices in musical institutions (Eidsheim 2020), thus countering the notion that listening is a passive, caring activity (Sterne 2003). Considering surveillance as a fundamental strategy of colonization (Ogasawara 2019; Zureik 2015) renders central to the literature on sound and surveillance the various decolonial repatriation projects that resist colonial surveillance practices that resulted in the displacement of sound recordings into institutional archives (Fox 2013; Gunderson, Lancefield, and Woods 2019) as well as historical projects that engage with the listening practices of colonizers, such as the theorization of the "confessional-state" in nineteenth-century Colombia (Ochoa Gautier 2014) and the investigation of "hungry" listening modalities and its resulting affective relationship between listener and listened to in settler colonialism (Robinson 2020).

Research on contemporary surveillance uses listening as a metaphor to understand participation and attention on social media platforms (Crawford 2009), investigates the iPhone as a technology of listening in which the user is both a listener and listened to (Crawford 2012), borrows from the concept of the "acousmatic" (sound heard without seeing its source) to describe the surveillance practices of the NSA (James 2014), and examines neoliberal aurality through voice assistants (Amsellem, forthcoming).

Significant contributions also stem from interdisciplinary projects such as the collective and multimedia curriculum on “machine listening,” which aims to bring to light the social and political implications of machines that listen in our contemporary world (Dockray, Parker, and Stern 2020). Within surveillance studies, most research is focused on the visual aspect of surveillance. Among notable exceptions are works focused on sonic surveillance tools such as Andrew Merrill’s (2017) study of acoustic gunshot detection systems and their relationship to police brutality and structural racism, and Stephen Neville’s (2020) work on “eavesmining” in smart homes. Works on music consumption and circulation provide a significant contribution to sound and surveillance through the concept of “piracy surveillance,” the surveillance practices of the music industry to stop piracy (Katyal 2005; Ardit 2012), as well as on the ways music is used as a tool of surveillance in streaming services (Drott 2018; Prey 2015). There is a growing literature on surveillance in creative practices such as in song lyrics (Nielson 2010; Marx 2018), films (Burton 2018; Copenhafer 2018), novels (Gaylin 2002), and in the visual arts (McGinley 2006).

This paper participates in building sound and surveillance as a site of inquiry by contributing to the theorization of the aurality of neoliberal modes of governance. I show how sound can be understood as both a metaphor for surveillance modalities and as a physical, sensory phenomenon and action that deserves its own focus in surveillance studies. I analyze both the physical sounds and silences that emanate from the kiosks as well as their surveillance capacity framed through aural metaphors of noise, silencing, listening, and voice.

I conceptualize LinkNYC as an object located between uses of the internet, public and cultural policy, urbanism, the law, and politics of inclusion and exclusion. LinkNYC is the product of a consortium of corporations, financed by Google but in service of the city. I argue that LinkNYC reflects Google’s monopolizing ideology and ambition to be virtually (and now physically) present in all possible facets of life. Listening to LinkNYC reveals the aspirations of private entities for the neoliberal city.

This paper is framed in three parts: noise, listening, and voice. In part one, I borrow from sound studies literature to argue that qualifying public sonic practices as “noise” requires a specific modality of listening that enforces class boundaries under claims of protecting sonic privacy. I describe how tools of the smart/responsive city provide the ability to enforce these classed modalities of listening. I also discuss competing notions of public space in smart/responsive cities. In part two, I investigate the ideological and technological differences between the smart city and the responsive city and trace the movement from a listening entity to a responsive one, investigating the implications for privacy. I also analyze the discrepancy between the “interaction” tech companies promote and their listening practices. Through the framework of listening, we can both question the kind of interactions stakeholders want and investigate the surveillance aspirations of the neoliberal city. In part three, I deploy the metaphor of “having a voice” to investigate various forms of resistance to the kiosks. I theorize unsilencing and its politics, discussing examples of re-appropriation of the kiosks.

Noise

Following the launch of LinkNYC in 2016, numerous residents complained about the use of the web-browsing feature by homeless people, considering it a misuse of the technology (Aiello 2016; Kanno-Youngs 2016; Weaver 2016). As one New Yorker observed; “I’ve been noticing homeless people hang out dancing in groups—dancing in front of it. It’s weird, and I don’t think it’s used for the right way” (qtd. in Aiello 2016). Another resident reported one homeless man who had spent six hours plugged into a kiosk: “It is very unpleasant; it actually seems like it pulls these people to the units themselves” (qtd. in Aiello 2016). These reactions reflect a form of unease towards celebratory behaviors, such as dancing or listening to music, coming from homeless people.

The new sounds that populated the city were heard by some residents as a disruptive invasion of the public space. This response to the sonic presence of homeless people invokes what Jennifer Lynn Stoeber (2016: 15) theorized as the “listening ear,” a modality of listening historically rooted in white supremacy, which

functions as attempts to “[s]uppress and reduce an individual’s myriad, fine-grained embodied listening experiences by shunting them into narrow, conditioned, and ‘correct’ responses that are politically, culturally, economically, legally, and socially advantageous to whites.” The listening ear, Stoevers (2016: 16) notes, is collective and prescriptive, claiming “to be how any ‘reasonable person’ should listen.” Complaining residents, equipped with their surveilling “listening ear,” deemed the sonic presence of the homeless as invasive and threatening to public order.

The music emanating from the kiosks was considered as a public disturbance, as noise. To ethnomusicologist David Novak (2015: 126), noise “is not really a kind of sound but a metadiscourse of sound and its social interpretation.” Borrowing from this notion, I am not interested in what kind of sounds emanated from the kiosks but rather why these sounds were considered as noise rather than as music. This is also reminiscent of the place of music in the public space in the 1970s, most notably through “ghetto blasting” and the subsequent banning of boomboxes on public transportation. Boomboxes became representative of the perceived threat that young men of color presented to the white middle class lifestyle and became associated with crime and juvenile delinquency (Radovac 2015). The loudness of boomboxes and the kind of music emanating from them (mostly hip hop) was interpreted as a form of public disturbance while it simultaneously functioned to signify presence and belonging to the public space.

The history of boomboxes highlights the perceived link between noise and criminal activity, where noise functions as inducing fear for the preservation of public order by members of the powerful class (Radovac 2015). Similarly, in their study of the use of sound as a means to control access to the public space, Jonathan Sterne (2005: 4) notes that sonic deterrents are not used to fight crime but the threat of crime: “Class and race are slippery slopes toward crime here.” With public sonic expressive practices such as playing music on boomboxes or on LinkNYC, the sounds emanating from the machines were deemed noise and a nuisance because of the identity of the user. Sterne (2005: 5) refers to sonic deterrents as efforts to “reduce the chances of cross-class encounters,” creating a “comfort zone for a certain set of middle-class visitors to a space.” Thus, sonic practices in the public space threaten the boundary between members of different classes and the singular, often imagined and idealized, identity of the public space.

Drawing on the work of Douglas Kahn, Novak (2015) observes that noises are too significant to be just noises. As Novak (2015: 126, 130) notes, “Noise is an essentially relational concept” that “stands for subjectivities of difference that break from normative social contexts.” The process of differentiation through qualifying music as noise is revealing: the usage of the technology by homeless people rendered both audible and visible the pervasiveness of homelessness in the city. To limit this exposure and what it reveals about the city, the music emanating from the kiosks was deemed a nuisance. Noise is thus simultaneously a marker of difference, which “interpellates marginal subjects into circulation” (Novak 2015: 130); a means to justify exclusion; an expressive practice; and a modality for tracking and for punishment.

With LinkNYC, it was the technological capacity of amplification embedded in the device that brought groups of homeless people together around the kiosks. Unlike with boomboxes, where noise ordinances regulated amplification, using the technological capacity of the kiosks was not a crime: they were simply using technology made available to the public. After the launch, CityBridge employees responded positively to the re-appropriation of the public space through the kiosks. Brenden Beu (2021, video interview), a former employee of Intersection (one of the companies that make up the CityBridge consortium), enthusiastically recalls people on the street referring to the kiosks as “on-street jukeboxes” and describes his own experience of the kiosks saying: “I [once] saw a very outspoken member of the LGBTQ+ community standing in front of a LinkNYC kiosk having a one-person dance party, and it was amazing. It was the most beautiful picture of what public spaces in New York can be.” Beu (2021, video interview) also noted some of the more practical public benefits the web-browsing provided, such as the instance of a homeless person who applied for a job on the kiosks and got it.

Following the first complaints, CityBridge limited the volume of the speakers and used a website filter, such as the ones used by libraries to block pornographic sites. Complaints continued and, in September 2016, the city and CityBridge made the radical decision to shut down the web-browsing option completely. In that process, homeless people were silenced from and through technology. This form of silencing functions as an isolating force and is telling of neoliberalism. Ethnomusicologist Ana María Ochoa Gautier (2015: 187) argues that, in the neoliberal context, “[t]he acoustic overtones of silencing include... the denial of expressive practices and needs in institutional forms of clinicalization and criminalization of populations that involve radical isolation.” Through limiting the capability of the device, CityBridge is limiting the appearance of transient people in favor of an ideal community made of local residents. This type of silencing poses questions about the goals, aspirations, and utility of the kiosks: Who are the kiosks meant to serve? What types of sound is CityBridge listening for?

The attention and data of homeless people are not commercially viable for an advertising-based platform such as LinkNYC. The noise-making practices surrounding LinkNYC kiosks were quickly and unequivocally shut down in a much more efficient manner than boomboxes could ever be. The portability and commercial availability of boomboxes made the noise ordinance more complicated to enforce, whereas the fixity and centralized ownership of the kiosks allowed for an efficient and almost instantaneous shutdown. The qualification of noise as a means to control and silence marginalized populations is not new (see Bijsterveld 2008); what is novel here are the implications of the means of sonic production being controlled by regulatory powers. This reveals the concentration of power that is characteristic of neoliberal governance. The consequences of this concentration of power are the efficiency with which targeted populations can be silenced and the difficulty for individuals to create contested spaces. The control of the means of communication and of the output prevents tinkering or the appropriation of public utilities by citizens. CityBridge was able to efficiently sort through the noise, revealing the discrepancy between the discourse of the company, its positioning as a public service, and its aspirations.

With this decision, the kiosks moved from a loud to a silent machine, from an inclusive medium to an exclusive one. This shift was accompanied by a shift in discourse from CityBridge. Prior to the removal of the web-browsing option, the company presented LinkNYC on Twitter as a tool that is “all about connecting the unconnected” (LinkNYC 2016d), used to “bridge the digital divide” (LinkNYC 2016a, 2016b, 2016c), prevent homelessness, connect the “homeless and LGBT NYers” (O’Donnell 2016; LinkNYC 2016e), and build “just and inclusive cities” (LinkNYC 2016f). This typifies the utopian discourses of tech companies, which often forego the complexities of co-existence.

Once the web-browsing option was shut down, CityBridge justified the decision saying: “Links are not meant for long-term use, so we’re making changes to make Links more accessible” (LinkNYC Support 2016). The use of the term “accessible” is ironic: to CityBridge, by cutting access to the people who have the least access to technology, they are making it more accessible to the people who might need the services less. It is also directly contradicting their previous assertions. Sam Miller (2016, phone interview), communications director at the New York based non-profit “Picture the Homeless,” told me in an interview that beneficiaries of his organization met the news of the installation of LinkNYC with excitement, and that he believes the initiative benefits the homeless with regards to access to technology. However, to Miller, the city is not tackling the underlying issue, which is the issue of housing inequality: “People wouldn’t need charging stations for their phone if they had a home where they could charge their phone.” The decision to remove the web-browsing option, to Miller, shows that: “The City is more interested in media response than they are in actually helping out the homeless.” The silencing of homeless usage of the kiosk puts into question the kiosk’s positioning as a public good.

Yet, CityBridge maintains that LinkNYC is chiefly a public service (Colvin 2021, video interview). The kiosks can be used to call 911, get access to city services, make free phone calls, or charge a phone. The kiosks provide free, high-speed Wi-Fi with a wide range. COO of CityBridge Nick Colvin (2021, video interview) notes that people who have limited access to broadband greatly profit from the kiosks. In a survey of users done post-pandemic, CityBridge found that 30 percent of all respondents, and 40 percent of those

in the Bronx, had no other access to broadband. Colvin (2021, video interview) points out that there are tens of thousands of calls to 311 and the EBT SNAP benefits line per year and that social services directory links are accessed hundreds of thousands of times a year. In addition, the kiosks provide public messaging on its advertising screens (Colvin 2021, video interview). As such, LinkNYC is a public service both in that it is a provider of free Wi-Fi (for those in its range) and in that it facilitates access to governmental agencies and information.

However, the map of LinkNYC kiosks shows that they are not equally distributed within the city. Areas of the city with less access to broadband such as Staten Island or the Bronx have the smallest number of kiosks. Manhattan's wealthy neighborhoods are the best served by the device. The highest concentration of kiosks is in Times Square, a logical set-up since it is a busy neighborhood principally populated by tourists. In Brooklyn, the area with the highest concentration of kiosks is Bedford Stuyvesant, on Fulton Street between Utica Avenue and Eastern Parkway. This part of Bed Stuy is not gentrified, and the majority of the population is black and Hispanic. The area is quiet and mostly residential, mainly made up of housing projects and several community spaces, such as churches and community centers. In my time there, there was dormant police activity in the neighborhood: an empty police car was parked on a street corner, an empty police booth stood on the corner of Fulton and Malcolm X Boulevard, and there was a sign for an NYPD security camera between Fulton and Rochester, although I couldn't find a trace of such camera. This prompted me to wonder whether the high density of kiosks in the area was because they could be used as a replacement for police presence and/or if the kiosks were implemented there because the population has insufficient access to Wi-Fi.

LinkNYC represents a constant ambiguity between a tool designed for the public good and one designed for surveillance. As Benjamin Dean (2016, video interview), an expert in cybersecurity, argued in an interview I conducted with him, it is possible to give free Wi-Fi to every New Yorker in their homes for a fraction of the cost and infrastructure of the kiosks. The need for a physical kiosk implies its necessity as a space for interaction with citizens while also allowing for the potential of physical capabilities of surveillance through cameras, microphones, and sensors. Yet, the extent to which LinkNYC is an interactive object is disputable.

The kiosks are purposefully unaccommodating and are designed for short-term usage. Interaction with the machine is strictly goal-oriented. The space is not designed to be a comfortable place for people to interact: there is no place to sit, and it feels awkward to stand in front of it, as there is no specific space to stand. People might feel as if they are in the way, especially within a city that seems to keep its people constantly moving forward in the streets and in which stopping suddenly is a mark of rudeness. In many ways, the kiosks feel out of place in this city.

As Dean (2016, video interview) notes: "This is not a public/private partnership. This is a commercial endeavor." To him, the De Blasio administration does not have much regulatory power or involvement in the project: "The City does not have a seat at the table" (Dean 2016, video interview; see also Dean 2016). This absence is also embedded in the technology. In their article investigating the security apparatus of emergency communication on the kiosks, security specialist Nathaniel O'Grady (2020: 10) shows how automation creates a "reconfiguration of authority" in which private companies take over public governance through discretionary decisions. As O'Grady (2020: 9) notes: "By leveraging APIs, CityBridge not only improves its access to, and oversight of, data circulating concerning events occurring across the city... the API also affords CityBridge an enhanced role, over and above that of local authorities, in analysing data and thus evaluating the emergency landscape." By generating and having control of the data, CityBridge can make decisions on behalf of the city. As O'Grady (2020: 12) notes, this is partly allowed by neoliberal politics, in which public powers operate on reduced funding while private tech companies have endless resources, precisely because of their data-gathering practices.

The tension between the company and the city became clear as the project evolved. CityBridge has fallen short of its revenue projections by millions of dollars and stopped installing kiosks in the Fall of 2018.

Jessica Tisch (2020), New York's commissioner of the Department of Information Technology and Telecommunications (DoITT), told the City Council at a preliminary Budget Hearing in March 2020: "New Yorkers who'd benefit most from this service are not getting it... because CityBridge is delinquent." Tisch (2020) further noted that "CityBridge owes the city tens of millions of dollars going back to FY19. All of this, is against the backdrop of millions of dollars in advertising revenue that CityBridge has reported they received over the same period." Tisch (2020) pointed out that CityBridge reported \$105 millions in revenue, with only a small portion of it trickling down to the city. Tisch (2020) insisted that the city "bent backwards" to help the kiosks thrive.

CityBridge responded by blaming the city's bureaucracies (McDonough 2020). This is a common trope in tech companies' discourse: contrasting the fast-paced creative environment of tech with the stuffy and inefficient nature of government and displaying how innovation is stopped by bureaucracy. Dan Doctoroff, CEO of the Google project Sidewalk Labs (an investor in CityBridge), has also taken a clear stance on what they envision as the city of the future. Doctoroff has presented Sidewalk Labs' data-driven innovations as: "Only the latest in a string of world-historical technological revolutions — the steam engine, the electrical grid, the automobile — that have transformed the metropolis, forever disrupting the old order. Cities are hard — you have people who have vested interests... You had to overcome big obstacles. But the technology ultimately cannot be stopped. And we think we're at that position now" (qtd. in Pinto 2016). Doctoroff positions smart cities as participating in the never-ending project of technological progress that is characteristic of Western modernization. In this context, bureaucracy is an obstacle to the natural progression of things, but resistance is pointless because the power of innovation is too big. This discourse of conquest positions skeptics as reactionary and antiquated.

LinkNYC is a private object in the public sphere, marketed as a public good. The composition, selection process, and privacy policy of LinkNYC reveal the threat that a private object within the public sphere can present.

Listening

By the end of the twentieth century, most payphones were unused and replaced by the widespread use of cell phones. This prompted governments of major cities to rethink the function of these outdated machines. Thus, in December 2012, the Bloomberg Administration launched the Reinvent Payphones Design Challenge to create prototypes that imagined the future of New York City's public payphones (IBO 2013). In March 2013, the city announced the six pre-selected finalists from the payphone challenge.² Among the finalists was NYC/IO, a project led by Control Group and Titan. Control Group, founded in 2001, is a technology and design consultancy firm. Titan, also founded in 2001, is an out-of-home advertising firm.

The goal of NYC/IO, their promo video claims, is to "Not just reinvent the payphones, but reinvent New York City," turning New York into a "Responsive City," a city that listens to its citizens and responds back by adapting to their needs. Colin O'Donnell, then a partner at Control Group (and, later, CIO at Intersection), describes the technical features of the kiosks:

We've designed this payphone booth with an array of sensors that are modular in nature and can be upgraded over time, including GPS sensors who identify your locations, sensors to modify the display to meet the environment, as well as a host of others sensors like accelerometers and gyroscopes to provide alternate input by creating a network of sensors throughout the city that is inherently open to the public for analysis and research. It allows the citizens control of the data. (Qtd. in Control Group and Titan 2013)

Aurelia Moser, at the time an analyst at Control Group, further argues in the video:

² For a detailed description of the selection process, see Shapiro (2018).

One of the biggest problems with data collections and using data for visualization or software building is that consistency is an issue. We don't really have even distribution of data points all the time across an entire landscape, and that's kind of what the phone booths provide, they collect this information at regular intervals and in very standard formats so that anyone could understand a lot better how they should build an application to respond to the city because they will have these regular data points. (Qtd. in Control Group and Titan 2013)

These two claims show the original ambition of the kiosks: data gathering. Furthermore, as Moser points out, the kiosks would allow Control Group to gather datapoints throughout a landscape as the kiosks are close enough to each other to provide this continuous stream of data (Control Group and Titan 2013). These data, as per the video, would be used to benefit citizens, and would be under their control. Chas Mastin, then director of Control Group, argues: "The opportunity here really has to do with the evolution of the city as a living thing, and we are a new organ for the city. To have this is a way for the citizens of the city to talk to the city and also hear the city speak back to them, and to that end, I think building an open structure is crucial" (qtd. in Control Group and Titan 2013). NYC/IO will get you "more connected to where you live," and allow for you to be "plugged in to the DNA of the city and have this kind of living, breathing organisms telling me what is happening in the city" (Mastin qtd. in Control Group and Titan 2013). The discourse surrounding the responsive city positions it as a sensory communion between the city and its residents.

The competition resulted in the installation of LinkNYC. Yet, although NYC/IO bears resemblance to LinkNYC, is developed by Titan and Control Group, and many of the people involved in the project ended up working for LinkNYC, the kiosks seem to be a hybrid between NYC/IO and the competing project NYFi, designed by the architecture firm Sage and Coombe. The design of the NYFi resembles the current LinkNYC, with its tall vertical structure and two screens on each side, but LinkNYC has the data-driven technology and infrastructure of NYC/IO. Both initial projects were much more of a communication network than LinkNYC ended up being, and NYC/IO had interaction between the city and its residents as its core value.

In 2014, the De Blasio administration announced the winner of the competition, and in 2015, Titan and Control Group merged to become Intersection, now financed by Sidewalk Labs, which is owned by Alphabet. LinkNYC was Sidewalk Labs' first project, and their first move as a company was to make a major investment in Intersection to fund the kiosks (Ingraham 2015; Nevill-Manning 2016). Sidewalk Labs' CEO Dan Doctoroff was the former Deputy Mayor during the Bloomberg administration, and is the current Chairman of Intersection (see Figure 1 for the ownership structure of LinkNYC).

Following the installation of the kiosks, numerous newspapers articles (Pinto 2016, McGeehan 2016) described the potential threat to privacy LinkNYC presents. Both Google's investment in CityBridge and the technical abilities of the kiosks have spiked concern of unethical data-gathering practices and threats to privacy. Furthermore, prior to its involvement with LinkNYC, Titan was involved in a major privacy scandal. In 2014, journalists revealed that the company was using beacons on the city's phonebooth advertising displays, which could be used to track people's movement through their smartphones and push for ads. The beacons were manufactured by a subsidiary of Qualcomm, another member of the CityBridge consortium. After publication of the report, the city asked Titan to remove the beacons (Bernstein, Ryley, and Singer-Vine 2014).

Figure 1: Structure of LinkNYC.

In March 2016, the NYCLU expressed concerns with four areas of the privacy policy: on the kiosks' ability to gather information on personal devices, such as browsing activities and personally identifiable information; to share these data to governmental agencies; to record with the cameras; and to share data from sensors (Mariko and Miller 2016). However, the NYCLU did not raise any concerns with the kiosks' ability to record using the microphone. The microphone inside the kiosk is considerably less of a concern than the three (visible) cameras, even though the law recognizes the importance of the protection of audio information over visual information.

In March 2017, a year after the NYCLU letter, CityBridge updated the privacy policy (see CityBridge 2017). The NYCLU responded positively to the new change: to them, the policy is largely improved because it clarifies that browsing history will not be stored, reduces the retention period of users' data, is more transparent about disclosing information to law enforcement,³ and limits camera use (NYCLU 2017). Some ambiguity nevertheless remains. As per CityBridge, "The privacy policy was changed to clarify our day-to-day practices and provide more information to users about how data is used. There have been no changes to our practices" (CityBridge Employee 2017, email interview). The new privacy policy is, as per CityBridge, not a new privacy policy but a clarified one. However, the previous privacy policy did state that CityBridge could share user data with third parties (CityBridge 2014) while the current privacy policy states that

³ CityBridge issues yearly transparency reports with the number of requests from law enforcement agencies and other governmental officials. As per these reports, from 2016 until 2019, sixty-one data requests were received, eighteen of which resulted in disclosures (CityBridge 2021).

CityBridge “[w]ill not share any information that is not anonymized with any third parties for their own use” (CityBridge 2017). When I asked if CityBridge could guarantee anonymity, they responded: “CityBridge uses hashing methods to anonymize information.... We also encrypt all Personally Identifiable Information” (CityBridge Employee 2017, email interview). This is an improvement, but it puts into question the meaning of anonymity for privacy.

Following the change of privacy policy, I spoke with lawyer and historian Eben Moglen. To Moglen (2017, phone interview), information is retained forever, as long as one keeps using the service. The NYCLU had brought up that concern but did not follow up on it. According to Moglen (2017, phone interview), digital anonymity is not achievable because the technical reality is that data are always linkable. When different sets of data get pooled together, as recent efforts within data gathering have done, “data de-anonymizes itself” (Moglen 2017, phone interview). This is a particular concern with LinkNYC because of its affiliation with Google, which has access to multiple pools of data such that correlation between pools would be technically possible. Moglen (2017, phone interview) expressed his skepticism towards the new privacy policy, considering it as not being an improvement on privacy but on the writing of a successful privacy policy. Moglen (2017, phone interview) further argued that the words “for their own use,” really means “for our own use,” because Google uses “data mining contracts, outsourcing this work because it’s a little dirty.” If Intersection is Sidewalk Lab’s portfolio company (Doctoroff 2016), and the companies share leadership and have neighboring offices in Hudson Yards, Colvin (2021, video interview) argues that Sidewalk Labs is “not involved in anyways in the operation of LinkNYC” and that “Alphabet, Google and Sidewalk Labs are all third parties to CityBridge.”

Data gathering, Colvin (2021, video interview) assures, is not the main goal of the kiosks, and CityBridge only receives “aggregate reporting and anonymized data from that usage data, meaning device identifiers are all removed so it’s just usage volumes. And that’s it. The data is not stored either. There is no persistent storing of MAC addresses, there is no persistent storing of any device identifiers of any kind. We are only allowed to use the data to provide and maintain the services, and that’s all we do.”

According to Benjamin Dean’s calculations, CityBridge will lose \$50 million on the project. As such, Dean argued that there must be another revenue stream, such as target advertising or other forms of usage of gathered data (Dean 2021, video interview). However, the new privacy policy removes the possibility to do targeted advertising on individual users. Targeted advertising is still possible using information gathered from a group at an imprecise location (CityBridge 2017). The cost and the ambition for the project does not match the current privacy policy. In 2016, Doctoroff claimed that “By having access to the browsing activity of people using the Wi-Fi—all anonymized and aggregated—we can actually then target ads to people in proximity and then obviously over time track them through lots of different things, like beacons and location services, as well as their browsing activity. So in effect what we’re doing is replicating the digital experience in physical space” (qtd. in Pinto 2016; emphasis added). Then it was clear that the kiosks had beacons and that CityBridge had access to the browsing activities of its users. Sidewalk Labs’ vision for the city of the future as a network of data-gathering devices has been documented in the press through the company’s other projects such as (the now defunct) Quayside project in Toronto or the implementation of the cloud-based software “Flow” and the kiosks in Columbus, Ohio (Harris 2016; McCormick 2016; Singer-Vine 2016). Following public backlash, the data-gathering abilities of the various projects have been significantly downplayed. However, LinkNYC was originally conceived as a listening tool, and Doctoroff’s ambitions are revealed in the technological capacities embedded within the device.

In May 2019, college student Charles Meyers came across folders in LinkNYC’s public library on GitHub showing the codes that would allow the collection of users’ precise location, browser type, operating system, device type, device identifiers, and full URL clickstreams, and would give the ability to aggregate all of this information into a single database. These practices would apparently be in direct contradiction with the updated privacy policy. Intersection responded arguing that the codes were not in use on the kiosks and that they were “prototyping and testing some ideas internally, using employee data only, and mistakenly made source code public on GitHub” (Mitchell qtd. in Kofman 2018). Because there is no third-party oversight,

LinkNYC's data collection is not constrained by any auditing mechanisms, as Daniel Schwarz, a technology fellow at the NYCLU, explained: "Without transparency and external auditing of the source code, as well as what data is collected, for what purpose, and how it is being monetized by the company, there is no way to verify whether the privacy policy is working to protect users' data" (qtd. in Kofman 2018). After releasing the code to *The Intercept*, GitHub was subsequently met with a takedown notice from CityBridge and the threat of legal action on copyright grounds (Intersection 2018).

This story reveals another instance in which the privacy policy is at odds with the ambition and technical capacity of LinkNYC. Citizens' participation in altering the function of the kiosks have all been met with shutdowns through technological or legal means. Yet public participation was meant to be central to the project and is a central characteristic of the responsive city. CityBridge installed kiosks throughout the city on the pretense of interaction but has silenced citizens' attempts to interact.

If smart cities have been largely theorized and critiqued for their ubiquitous listening and recording (Murakami Wood 2015), the responsive city presents itself as its ethical counterpart. The concept was developed by lawyer Susan Crawford and politician Stephen Goldsmith (2014) and was then picked up by technologists working in urban development, such as the employees of Control Group. As Beu (2021, video interview) describes it, the responsive city responds to the needs of the various communities that form the city. It gathers data to be more efficient with the deployment of resources (see also Beu 2020). While the smart city is a connected city with a top-down model, the responsive city is dynamic, flexible, and malleable. Similarly, to Crawford (2016), the responsive city is a public entity whose role is to benefit citizens and create a more efficient city. As such, it is mindful of "digital justice" and "data stewardship" (Crawford 2016). Within this conception, data collection is not used to profit private companies but instead as a means to "empower citizens," making them contributors to the wellbeing of the city (Crawford and Goldsmith 2014). Thus, building the responsive city is a collaborative and transparent process. Both smart cities and responsive cities gather vast amounts of data from their citizens. However, while smart cities are listening entities, responsive cities have interaction at their core. The kind of interaction the responsive city offers depends on its stakeholder. While Crawford (2016) insists that the responsive city should be a public entity, there is growing interest from the private sector to invest in the responsive city. As O'Donnell (2017) argues, the responsive city would be focused on "manipulating infrastructure or *influencing behavior* to dynamically optimize the city for any number of outcomes; safety, convenience, efficiency – but also discovery, joy, community" (emphasis added). O'Donnell (2017) also notes that, while online technology has been focused on targeted content for individuals, the responsive city could obtain data on how communities respond: "City experiences are inherently one-to-many. 50 people look up at a sign, and they experience it together, with 50 different backgrounds and maybe as many individual objectives. This opens up an interesting field of study: understanding groups of people and how they respond to real-time changes in their environment." Anthropologist Shannon Mattern (2017) asks: what is the identity of a city where technologies such as LinkNYC exist? They note that "a city is not a computer" and that conceptions of the city as an information-processing machine "appeals because it frames the messiness of urban life as programmable and subject to rational order" (Mattern 2017). O'Donnell's (2017) vision is that of an automated city that can gather, analyze, predict, and influence behavior. Although O'Donnell (2017) has efficiency and public benefit in mind, the same tools can easily be used in service of "surveillance capitalism" (Zuboff 2019), as part of a dystopic private takeover of the public space.

LinkNYC has the potential to be a tool at the service of surveillance capitalism through the technical capacities of the kiosks and its large network spread across the city. According to CityBridge, the kiosks gather minimal data, while to many observers their practices lack transparency and oversight (Colvin 2021, video interview). LinkNYC remains a malleable tool on which various already existing capabilities could be activated and new ones added. Multiple experts have warned against the risks of companies such as Sidewalk Labs entering the public space by financing urban revisions (Crawford 2018; Schanzenbach and Shoked 2018), yet local public powers in need of investments have obvious temptations to enter into these types of projects.

Here, we can see competing notions of the city of the future: private entities are interested in treating the city as they have constructed digital space, a vast communication network that provides means to understand and influence behavior, while others hope to use digital technologies to empower citizens. Central to the difference between the two conceptions are their definitions of “interaction.” Framing interaction in terms of listening is a useful way to conceptualize why, on its own, “interaction” is not a sufficient word to define the city of the future. I argue that the kind of interaction between the city and its citizens is dependent on the modalities of listening that are practiced and encouraged. Further analysis of modalities of interaction is needed to offer a comprehensive analysis of the listening practices of surveillance capitalism, which are the subject of a larger project. Here, I provide one example of how listening intentions are central to framing interaction.

The identity of the listener, and why they listen, is central to both affect and effect in an interaction. This is all too familiar to musicians. A musician’s playing is affected by the reason they are being listened to: is it to be judged at a competition, to be evaluated at an audition, or to be experienced at a performance? The pleasure that can be derived from musical performance is dependent upon the function of the listener. Similarly, in conversation, there is a particular violence associated with a silent listener, whose level of attention is hard to evaluate and is thus suspicious because the function of their listening cannot be determined. This kind of listening removes the joy of being heard because there is no pleasure of interaction and connection.

In surveillance capitalism, listening is hungry and silent, visible yet ambiguous. Both the smart city and the publicly sponsored responsive city record, but they don’t record with the same purpose. Being listened to in order to be helped, empathized with, enjoyed, or experienced is opposed to being listened to in order to be sold to, to be a product, to be manipulated, or to be policed. The civil responses to the kiosks reveal what happens when tools such as LinkNYC are confronted with the complex cultural processes of the city and when citizens take charge of the interaction.

Voice

If the surveillance capabilities of LinkNYC remain a concern, the kiosks do not have a unidirectional impact on people. Rather, I conceptualize LinkNYC as Jonathan Sterne (2015: 65) conceptualizes hearing: “a medium for sound, a body with ears to hear, a frame of mind to do the same, and a dynamic relation between hearer and heard that allows for the possibility of mutual effects.”

As described above, numerous organizations, citizens, observers, public officials, and experts have voiced their concerns over the kiosks. In addition, activist groups such as Rethink Link have vehemently contested their existence (see Rethink Link 2020). I have also noticed several efforts to challenge the existence of LinkNYC throughout my fieldwork. In November 2016, duct tape started to appear on several kiosks’ cameras (see Figure 2). The tape will usually stay up for a couple of days, be taken off, and be put back up again. The taping occupies a dual function, simultaneously signifying to CityBridge “stop watching us” and to citizens “you should be concerned.” Several kiosks have been the subject of artistic vandalism (see Figure 3) and re-appropriation through “tactical urbanism” (GSAPP Students 2017; see Figure 4).

Figure 2: Tape on LinkNYC cameras. (Photo credit: Audrey Amsellem)

The kiosks have also been used for sonic performances. In early 2018, a slowed-down version of Mr. Softee's ice cream truck theme song started to play from the kiosks. The perpetrator, Mark Thomas, used the calling feature to dial a conference call number he had previously set up, turned up the volume all the way, switched back to the home screen, and walked away. After several attempts, Thomas made the recording start with a minute of silence. This "magic minute," as he calls it, helped him move away undetected and allowed him to program several kiosks at once, creating an echo among close by kiosks (Offenhartz 2018).

Of all of his performances, it was Mr. Softee's theme that drew particular attention. The high-pitch theme, set in a tinkling music box timbre, is distorted by being stretched out into an uncannily slow tempo. Listeners easily associated the music's disturbing affect with that of the imposing kiosks from which it was played. Thomas explained the motive behind his action saying, "I consider the kiosks themselves to be unwanted, unasked for irritants, and to express that sentiment I turned the kiosks themselves into irritants" (qtd. in Offenhartz 2018). However, Thomas noted that he doesn't think of his work as protest against surveillance. Rather, Thomas conceives of his intervention as a performance, a kind of "street theater... an ephemeral kind of performance art that subverts a repugnant piece of street furniture" (qtd. in Offenhartz 2018). Thomas describes the pleasure he derives from his performance: "For as long as I can remember, I have wanted to feel invisible yet present, and this is as close as I think I've come to reaching that goal" (qtd. in Offenhartz 2018). Through his performances, Thomas has a voice without being listened to and repopulates the city with unexpected noises.

Figure 3: Artwork on LinkNYC, creating a private space for interaction. (Photo credit: Audrey Amsellem)

Figure 4: "Hacking the Urban Experience" students in their project to make the kiosks a "more useful and accommodating space" (GSAPP Students 2017, personal interview). (Photo credit: Audrey Amsellem)

Conclusion

In this article, I showed how listening to the tools of our digital lives can contribute to surveillance studies. I have shown that LinkNYC is a tool designed with listening rather than interaction in mind, and I analyzed the consequences of this vision when confronted with the complexities of urban life. I showed the effectiveness of modalities of silencing in neoliberal life and their radical consequences of exclusion and isolation. What constitutes “misuse” of the technology reveals the aspirations for the neoliberal city: silent and regulated in order to quietly turn urban life into data. LinkNYC is an object of contention: it represents the threat of the neoliberal privatized takeover of the public space. In building the neoliberal city of the future, citizens get constantly pulled between anxiety over invasion of their privacy and the utopic discourse surrounding technologies that provide meaningful public benefits.

The ten feet high totem-like kiosks stand tall and imposing on the streets, resembling the skyscrapers that populate the city’s skyline. Once loud, the kiosks are now silently attending, invoking a haunting presence, representing the dangers and fear of the unknown. The new listening practices of the neoliberal privatized public are silencing to more effectively sort through the noises of its citizens.

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