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Governing cities as more-than-human entities

From the population of databases to the legibility of urban populations

Morgan Mouton  and Melanie Rock 

The field of urban studies has scrutinised digital technologies and their proliferation, but rather little attention has been paid to databases. Furthermore, contributions to date have focused almost exclusively on how digital technologies interface with human populations in cities. By contrast, we draw attention to databases maintained by city governments that contain identifying information about pet dogs and their legal owners in cities. Methodologically, our study merges database ethnography with multi-species ethnography. Conceptually, we contend that “dog data” contribute to orderly conduct in urban space. This orientation to urban governance illustrates “trans-biopolitics,” in the sense of socially-situated and technologically-mediated power relations that operate through multi-species entanglements. As such, this article extends the literature on (neoliberal) urban policing by providing a fine-grained analysis of how emergent forms of social control become palpable. In general terms, the adoption and use of digital technologies by city governments has increased their capacity to enforce rules and regulations. Overall, we find that the more legible dogs and their legal owners become in databases, the more governable both dogs and people become in urban life.

Keywords **Canada, digital ethnography, neoliberal governance, more-than-human geography, smart cities, urban ecology**

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“Certain forms of knowledge and control require a narrowing of vision”

James C. Scott, *Seeing like a State*. Yale University, 1998, 11.

Introduction

Scholars have lamented the messy character of cities for decades (Rose 2000, 95), but this observation takes on new meaning as the field of urban studies expands to acknowledge the more-than-human character of urban life (Braun 2005; Hinchliffe and Whatmore 2006). City governments routinely fall short of regulating human behaviour and bodies (Le Galès and Vitale 2013), so how can city officials possibly exert control over non-human animals? That question underpins this article.

In recent years, the massive deployment of digital technologies in cities has prompted scholars to consider the possibility of increased control over urban life. As the “digitalisation” of urban life continues to evolve, we become more exposed to new forms of surveillance and control (Sadowski 2019; Jefferson 2020; Mouton and Burns 2021). So too, do non-human animals. According to Moss, Voigt, and Becker (2021), “non-human living organisms are peripheral to the smart city discourse” (3), yet non-human life is not immune to digitalisation processes. With this article, we respond to their call for digitalisation scholarship to expand beyond human life in cities. In doing so, we follow Amin and Thrift (2017, 9) in viewing cities as a “mangle of machines, infrastructures, humans, nonhumans, institutions, networks, metabolisms, matter and nature.”

Increasingly, city governments rely on digital technologies to carry out their mandates (Bernardin and Jeannot 2019; Courmont 2019), including interactions amongst and with their constituents (Levenda et al. 2020). In the process, city governments have transformed their organisations from within, and more generally, the ways in which they govern (Jeannot and Maghin 2019). To be sure, public authorities have not waited for the advent of the “smart city” to collect and use data, including data supplied by citizens themselves – as evidenced by scholars who have studied the history of the urban census and the rise of statistics (Desrosières 1998; Hacking 2016). We contend, however, that widespread adoption of digital technologies has led to changes in urban policing, and more specifically, how city governments address disturbances within their jurisdictional and spatial limits.

To advance debates about digitalisation and urban policing, we studied the collection, sorting and deployment of data by city governments’ *animal-control* services. As formalised in Aronson’s (2010) handbook, animal-control services seek to manage people’s interactions with non-human animals, especially with dogs (*Canis lupus familiaris*). Indeed, urban dog-owners have been legally obliged to supply information about their dogs to local authorities for more than a century and a half, initially as a rabies-control measure (Pemberton and Worboys 2007). Whenever urban dwellers keep and care for dogs (for example, by feeding and sheltering them), these people qualify as legal owners in the Western legal tradition, even if they may object to defining dogs as private property. In addition, urbanites who keep dogs are usually supposed to pay a

fee each year (“dog license” or “dog registration”), which we regard as a property tax. Neglecting to pay this fee and supplying inaccurate information to local authorities (e.g. breed type, sterilisation status) comprise fineable offences. Hence, dogs have become increasingly subject to rules and regulations, to be sure, but ultimately these rules and regulations apply to people. In these regards, legal accountability for dogs in cities exemplifies the use of monetary instruments in governance (O'Malley 2009). In this article, we concern ourselves mainly with city governments' legal mandate to discipline and punish people vis-à-vis aggressive behaviour exhibited by dogs.

With this objective in mind, we pay attention to the practicalities of animal-control *enforcement* through documentation and analysis of the *technologies of government* (Foucault 1994, 2004). As such, we pay attention to the legal framework that subtends animal-control units, as well as how officers carry out investigations and enforce animal-control legislation. In doing so, we pay particular attention to how, and the extent to which, local authorities can count, identify, and track canine populations in urban environments. We are concerned, therefore, with the extent to which local authorities can render urban-dwelling dogs and their legal owners into *legible* entities (Scott 1998).

Below, we begin by reflecting on the place of dogs in urban policing with reference to previous research in socio-legal and urban studies, and then we present our methodological approach and our analytical framework. Next, we offer an historical overview to help illuminate contemporary practices in the Canadian cities of Calgary and Edmonton. Finally, we mobilise the concept of *trans-biopolitics* to explore how dogs and “dog data” currently contribute to urban policing.

Policing *through* pets?

In legal terms, a city's mandate to govern always revolves around things, as opposed to persons, according to Valverde (2012, 2011). More specifically, city governments are supposed to regulate the arrangement of things in ways that enhance people's lives. Consequently, dogs may contribute to disorder in urban space, but at the same time, their legal status as “living things” can provide city governments with policy leverage. Therefore, even as animal-control services may seem mundane, the disciplining of dogs and their legal owners can contribute substantively to urban life.

Our interest in dogs goes beyond a mere inclination for more-than-human geography, for we view canines as characters in urban policing. This focus on dogs situates us within recent developments of scholarship on urban policing and socio-spatial justice, whereby attention has been placed on practices of “sanitation” with respect to public space. While the marginalisation and removal of the poorest has been well-documented (Wacquant 2008; Fassin 2013), and its structural causes explained (Brenner 2011), more diffuse practices targeting wider populations remain under-theorised (Reigner 2015). In a recent issue of *City*, this line of thought prompted Clarke (2019) to consider how the Australian city of Brisbane resorted to a neoliberal rationality in handling so-called nuisances. Clarke (2019, 526), in paraphrasing Valverde (2012, 2011),

explained that “nuisance is a relational phenomenon that emerges when one or more parties are disturbed or bothered by the conduct or property of another.” And as Valverde (2012, 2011) has argued, nuisances remain understudied and under-theorised in urban studies.

In this article, we take up the call to examine how city governments go about regulating bothersome behaviour and disturbances. Our study, however, focused on efforts to prevent and to redress dog-bite injuries. Whereas the presence of a dog’s excrement in public spaces represents a nuisance and a fineable offense for dog-owners in many cities (Rock 2013), aggressive behaviour exhibited by dogs is another matter, with immediate implications for human health. In fact, the persistent transmission of rabies via dog-bite injuries, notably amongst children, is a serious problem for cities throughout the global South, and dog-bite injuries remain a leading reason for families dwelling within Western cities to seek emergency treatment for their children (Mills and Westgarth 2017). As discussed below, by focusing our study on animal-control services, we came to appreciate the general relevance for urban governance of databases that city governments may create, curate, and deploy for administrative purposes.

“Dog data” in urban governance: study sites and analytic approach

The present paper concerns how “dog data” interface with rules to minimise dog-bite injuries in urban areas. In doing so, we take up “digital ethnography” (Burns and Wark 2019) as a valuable approach for the analysis of policies and governmental rationalities. Digital ethnography’s premise is rooted in science and technology studies (STS): it views technology as imbricated onto human values and epistemologies (Star 1999). By studying technological systems such as databases, we seek to produce new insights into social processes (Corman and Barron 2017; Burns and Wark 2019). In addition, we adapted our ethnographic approach to capture multi-species entanglements (Rock 2016; Hamilton and Taylor 2017), thus combining two emerging ethnographic traditions to encompass both databases and dogs. We did so to explore the implications for urban life when governments maintain databases about dog populations in cities, and when front-line officers use such databases in investigating dog-bite complaints.

Most of the fieldwork took place in Calgary, Alberta, Canada. This setting has broad relevance for policies on dog-bite prevention (Rock, Rault, and Degeling 2017). Indeed, animal-welfare advocates, animal-control professionals, and dog-bite researchers often refer to “the Calgary model” (Parliament of Victoria 2016; Mills and Westgarth 2017; Mouton and Rock *In Press*). That is because the City of Calgary has reported reductions in dog-bite incidence and severity without recourse to breed-specific legislation (Rock 2013), or “BSL.” Whereas this type of policy has taken many forms, breed-specific legislation always involves restricting the ownership of dogs and their freedom of movement based on their ancestry and appearance. In contrast, Calgary’s animal-control policy has revolved around the principle of “deed, not breed.” The City of Calgary classifies dog-bite incidents based on severity, and may impose restrictions on dogs with

a documented history of biting, such as exclusions from off-leash parks and mandatory muzzling in public (Rock, Rault, and Degeling 2017). Registration (known locally as “licensing”) is obligatory for all dogs in Calgary, but owners must pay more to license dogs with a documented history of biting. Hence “dog data” are central to “the Calgary model” for dog-bite prevention. On the one hand, the City of Calgary emphasises licensing compliance, and on the other hand, the administration documents dog-aggression incidents. Databases held by the City keep track of licensing compliance and dog-aggression incidents, respectively.

To complement and extend our fieldwork in Calgary, we chose to study Edmonton’s “dog data” and dog-bite policies. Calgary and Edmonton are the two largest cities in the Canadian province of Alberta. Approximately 1.4 million people live in Calgary’s metropolitan area, while 1.3 million live in Edmonton’s metropolitan area (Statistics Canada 2016). Notwithstanding their similarities, Calgary and Edmonton have had different dog-bite policies. The City of Edmonton rescinded its version of breed-specific legislation in 2012, and “the Calgary model” directly influenced this change in policy. In addition, Calgary’s “dog data” is more complete. In Calgary, eight or nine of every ten dogs have been licensed (Rock, Rault, and Degeling 2017), whereas perhaps two-thirds of dogs in Edmonton have been licensed (Lye 2014). Furthermore, dog-related injuries have accounted for more “visits” per capita to emergency departments in the Edmonton area than in the Calgary area: 90 per 100,000 inhabitants in the Edmonton area, as opposed to 64 per 100,000 in Calgary (Jelinski et al. 2016).

Consistent with our Foucauldian line of investigation, we carefully considered public discourse. To this end, we collected and analysed documents in the public domain, including municipal and provincial legislation, related policy statements, material directed specifically at dog-owners, and material directed at human residents more generally (Rock, Rault, and Degeling 2017; Rault et al. 2018; Mouton et al. 2019). Our sources of information included the websites for the City of Calgary and the City of Edmonton, respectively; newsletters; media reports; and brochures. We were also able to consider the history of animal control by studying archival material from an exhibit that the City of Calgary presented in 2006 (City of Calgary 2006; Rock 2013). In short, we considered “discourse” in its broad sense, not just speech but also statistical categories, texts, and tools, especially database-management software.

Previous research in our team (Rault and Rock 2017; Rock, Rault, and Degeling 2017; Rault et al. 2018; Caffrey et al. 2019) had allowed us to establish rapport with animal-control professionals in Calgary and, albeit to a lesser degree, in Edmonton. As a complement to fieldwork and interviews, team members have attended multiple conferences alongside animal-control officers and managers. One such conference featured a presentation of results from a previous segment of this study (Mouton et al. 2019). In addition, members of our team have presented at several conferences oriented towards health professionals, including nurses, epidemiologists, paramedics, physicians, social workers, and veterinarians. These conferences enhanced our understanding of animal-control services and dog-bite injuries, especially through informal interactions.

Immersion in a community or setting is vital for any ethnographic project. That said, immersion may need to take new forms when ethnographers

study databases, interactions between members of different species, or both. Participant-observation research for the present study took the form of “ride-alongs” with officers who enforce dog-related rules. These “ride-alongs” allowed us to listen and learn while animal-control officers carried out their duties, as “street level bureaucrats” (Lipsky 2010). In particular, we observed first-hand how the officers used the tools at their disposal, including dog-licensing databases. Hence, we carefully considered the format and structure of these databases. For instance, we noticed whether information had to be entered by way of a drop-down list, and whether the software allowed users to enter textual information as comments or notes. To delve deeper into animal-control databases and their deployment, we interviewed animal-control officers and their managers, both in Calgary and in Edmonton (3 and 6 participants, respectively, for an hour or more each). For the sake of confidentiality, we have assigned pseudonyms to all participants.

As for the analysis, we quickly realised that Scott’s (1998) notion of *legibility* would be a key concept for us. We observed that entering information about dogs and their owners into a database was instrumental to the capacity of city governments to follow up on dog-related complaints. Databases, we came to appreciate, contribute to making rules actionable for city governments. Even as we focused our comparative case study on city governments’ animal-control services, this line of inquiry prompted us to pay attention to how authorities can manage and mobilise databases in the interest of social control.

Bodies and populations need not be human in nature to have political relevance, not least in urban areas. The more tightly coupled individual dogs and people become in law and in urban space, the more that public authorities may gain leverage over both dogs and people (Srinivasan 2013, 2016, 2019). Whereas Srinivasan has drawn upon and extended Foucault’s concept of biopolitics (Foucault 1972, 1991), we turned to a related concept, that of *trans-biopolitics* (Blue and Rock 2011). Biopolitics applies to intersections between human bodies and populations, whereas trans-biopolitics explicitly includes the classification and evaluation of non-human life, beginning with “non-human” as a descriptor. Furthermore, trans-biopolitics concerns the melding of technologies with individual bodies and with populations, for example, through statistics. In these regards, trans-biopolitics reflects Foucault’s conceptualisation of governmentality, along with his conceptualisation of biopolitics. The concept of trans-biopolitics helped us to recognise how digital infrastructures can contribute to the entanglement of human and canine lives, in conjunction with the ordering of conduct within cities, under the auspices of civility and safety.

Canines in the city: a matter of public health and public order ...

To place our ethnographic inquiry into a global context, we must consider the history of animal-control policies. Otherwise, we would fail to consider how city governments came to develop such powers and, to varying degrees, the administrative capacity to co-manage canine and human populations. Pemberton and Worboys (2007) offer insights through their historical investigation of

rabies in England. In particular, they highlight how the “scientisation” of public health, combined with public fear of rabies, prompted authorities to include dogs in the scope of their prerogatives. For instance, city governments have long stipulated that urban dogs kept as pets must wear a collar with a license tag, as this requirement began as a rabies control measure. Some cities, including Calgary, have required “dog tags” for more than a century (Pemberton and Worboys 2007; Rock 2013). At the same time, the targeting of dogs under the auspices of rabies control reflects an emphasis in urban areas on governing humans via non-humans, in keeping with city governments’ jurisdiction over things (Valverde 2009).

We note, however, that disease prevention was not the sole reason for a perceived need to police canine populations in urban areas. As Valverde (2011) argues, nuisance is central, historically and yet today, in “seeing like a city”. Indeed, canines constitute a key source of nuisance in contemporary cities (Instone and Sweeney 2014; Clarke 2019), and have for decades, even centuries. For example, as early as the year 1900, public authorities in Calgary were receiving complaints regarding the disorder caused by ranchers bringing in packs of “coyote hounds” when visiting Calgary and “letting them lie about the streets, sometimes for a week at a time, to the annoyance of pedestrians especially of ladies” (City of Calgary 2006).

The history of dog-walking highlights that dogs themselves and dog-related policies can influence how and whether people enter public space. Over the past fifteen years, a series of studies have shown that dog-owners are more likely to walk or run outdoors than people without dogs of their own, even as environmental features such as housing type and “dog parks” influence dog-walking (Christian et al. 2018). That said, the presence of dogs sometimes deters other urbanites from venturing outdoors, especially if dogs are unsupervised and perceived as intimidating (Toohey and Rock 2011; McCormack et al. 2016). Dogs’ presence in the urban fabric can also, notoriously, be registered visibly and olfactorily by the faeces they leave behind, which can deter people from visiting parks (Derges et al. 2012; Instone and Sweeney 2014; Rock 2017; Pearson 2019). Overall, dogs can reflect, as well as contribute materially to overt conflicts and simmering tensions in cities (Tissot 2011; Urbanik and Morgan 2013; Instone and Sweeney 2014; Holmberg 2015; Rock 2017; Power 2018). In what follows, we explore how “dog data” contribute to the investigation of dog-related complaints.

Trans-biopolitics and canine bodies

12:30 pm: After an uneventful morning (one patrol in an off-leash area, and no calls), Officer Ludgate sees a new task on her on-board computer. Someone has reported a dog bite. She retrieves the complainant’s phone number and proceeds to call using a mobile phone. It appears that a third-party witnessed a dog, possibly a Rottweiler, bite a middle-aged man as he was trying to break-off a fight between his own dog and the Rottweiler. The caller adds that the Rottweiler’s owner is an older lady (probably in her 60’s), and that she frequently brings her dog to this off-leash area. She calls her dog “Stella”. And Stella has been involved in dog-on-dog aggression before.

1:00 pm: Shortly after the phone call, another complaint appears on Officer Ludgate's screen: a dog bite with the same location as earlier. Upon calling the complainant, Officer Ludgate confirms that she is speaking with the victim of the dog bite. We head for the victim's home address to obtain a written statement. The victim invites us into her home and confirms the account provided by the earlier caller, as well as the type of dog (that is, Rottweiler in appearance). Officer Ludgate documents the open wounds on the victim's arm by taking photographs. Upon leaving the premises and re-entering her City-supplied vehicle, she logs in using her on-board computer and searches the database of licensed dogs in Calgary. First, she lists all the Rottweilers that are registered in Calgary under the name "Stella". She finds 17 of them. From this list, she removes the dogs who are presumably too old to still be alive (i.e. dogs who are over 15 years-old, and whose license has not been renewed for several years). Then, she looks at the owners' ages, and targets those who are over 50 years-old. Finally, she also consults the owners' home addresses and selects those who live in the vicinity of the off-leash area, thus formulating the hypothesis that Stella's frequent visits to the park reflect proximity to her owner's home. Officer Ludgate eventually selects five names that meet some or all the criteria (name, breed, location and owner's age), and copies their phone numbers. She plans to call them later tonight in hopes of identifying the problem dog.

The next day, when I enquire about her investigation, Officer Ludgate tells me that she located Stella. She issued a ticket to the owner, and advised the owner to refrain from letting her dog run off-leash, even in parks where off-leash dogs are allowed.

These vignettes are based on a ride-along with an animal-control officer employed by the City of Calgary. The case of "Stella the Rottweiler" illustrates the extent to which a city government may monitor both human and non-human populations. Using a City-issued laptop within a City-owned vehicle to access a confidential database, the officer was able to identify and locate a single dog – and owner – from amongst 135,070 licensed dogs (City of Calgary 2006, 50). The officer simply set up a query with two parameters (the dog's breed type and name) and then applied three additional filters (location of the alleged dog-bite incident, the dog's approximate age, and the owner's approximate age) [Figure 1](#).

In ethnographic terms, the successful tracking of this dog named Stella and her owner represents this article's point of departure. The fact that such a tracking is even possible may come as a surprise. In fact, animal-related issues suffer from lack of visibility, even from the standpoint of officials in city government and professionals in public health (Reese and Remer 2017; Rock, Rault, and Degeling 2017). As illustrated by the case of "Stella the Rottweiler," dog-licensing databases can become salient in the day-to-day activities of animal-control officers. Following Castagnino (2016; 2017, 349), and acknowledging that databases are "information infrastructure" requiring work and maintenance (Bowker et al. 2009), we will highlight three stages in the "social life" (Appadurai 1988) of dog-licensing databases: *collection*, *sorting* and *deployment* of data. In doing so, we assert that the "social lives" of licensed dogs encompasses their inclusion in such databases (Rock and Degeling 2013).

(Dog) licence and registration, please

In urban areas, databases increasingly determine the capacity of animal-control officers to identify dogs "at large," to locate and contact their owners, and to track



Figure 1: Picture of a bylaw officer's vehicle. Digital equipment (on-board computer, radio, smartphone) sits alongside “analogue” technologies (catch pole, gloves, leash, ticketing stubs). Photo: Morgan Mouton.

down the protagonists involved in a dog-related complaints. In our fieldwork, city governments maintained two databases with information from different sources: (1) the licensing of dogs by their owners; and (2) incident reports produced by animal-control officers. Compliance with dog-licensing rules is therefore crucial for animal-control services to be effective and efficient. Here, not all cities are equal. As noted previously, we set out to compare animal-control investigations in the City of Calgary with the City of Edmonton because we wanted to understand what differences in licensing compliance mean, in practical terms, for dog-bite investigations. Of note, dog licensing has financial repercussions, since people typically pay a fee to license their dogs. Hence the higher the compliance with pet licensing, the more funding city governments obtain. In Calgary, for instance, licensing fees have sustained human-animal services ranging from outreach in schools about dog-bite prevention, to sheltering lost pets and returning them to their legal owners, to supporting volunteers to monitor off-leash parks (Rock 2013).

Increasing compliance for dog-registration can be resource-intensive. If we take the City of Edmonton's recent efforts in this area, the Animal Care and Control unit dedicated a team of four officers whose main task was to call dog-owners whose licence had expired, and prompt them to renew it when appropriate.¹ Meanwhile, their colleagues were encouraged to pursue the same objective when activity levels lowered during the day, and to visit targeted households in person to ascertain the presence of dogs on the premises. To do

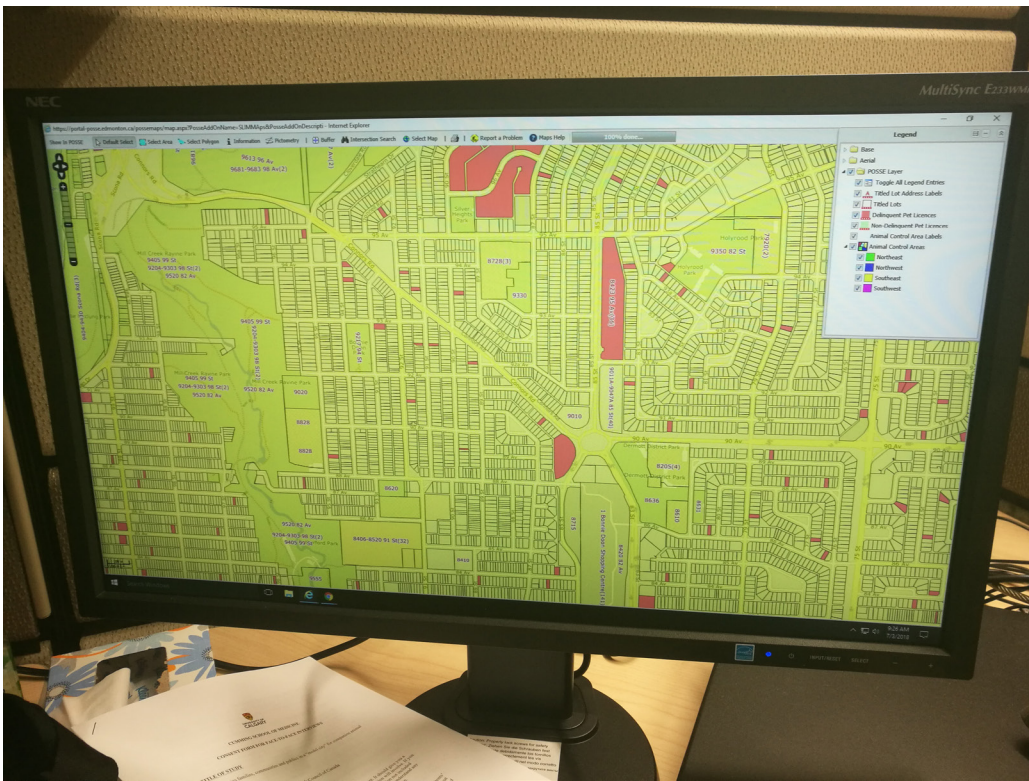


Figure 2: Picture of a bylaw officer's computer screen, where outdated pet licences are marked in red on a map of the City of Edmonton. Photo: Morgan Mouton.

so, the officers used software to map the locations of every household with an expired licence, anywhere in the city (see [Figure 2](#)). Of note, the manager for this unit eventually dismissed the “licensing team,” so that the officers could resume their regular activities. That decision reflected the view that “chasing after” unlicensed dogs was inefficient.² More generally, in both cities where fieldwork was conducted, officers usually enquired about the licensing status of the dogs they encountered, and they visually verified that these dogs were wearing a collar bearing a city-issued tag with the animal's license number.³

Throughout the rest of the paper, we want to operationalise our methodological stance and demonstrate the value of database ethnography in understanding how public authorities conceptualise the cohabitation of urban space and the management of more-than-human cities. More specifically, we will explore how the architecture of the animal-control database offers insight into rationalities that contribute to urban governance, and along the way, we will characterise these rationalities with reference to the concept of trans-biopolitics.

Making dogs legible in urban areas

In transforming dogs into database entries, local authorities must select a finite number of characteristics as variables. But first and foremost, the mere action of entering a dog in an administrative database has consequences for the status of that dog, and for the status of people who reside with that dog. Whereas the legal status of “feral” dogs in urban areas, as *domesticated* or *wild*

animals, can be confusing and contested (Nowicki 2014), all dogs in licensing databases legally belong to someone, as private property. As regards due process, a city government should not arrange for licensed dogs to be killed or rehomed without attempting to contact their legal owners (Rock and Degeling 2013). And as a corollary, each licensed dog is associated with and “related to” a human being. Such an imperative is a consequence of dogs’ legal status. Dogs are sentient beings, but they can still be private property in Western law. And, consequently, urban dogs must be *someone’s* property within a Western legal framework (Srinivasan 2013). The singular is important: not only do canines have to be owned, in Western urban settings, but in legal terms, they belong to a single individual. As such, local authorities’ licensing systems dispel the possibility of what Srinivasan (2019) calls “free-living dogs” in Indian cities, and which she conceptualises as constituting an “unintentional nature”. Put another way, amongst the diversity of relationships that humans and dogs can entertain, authorities can only recognise one type in Western cities: that of ownership. And through this simplification of a complex reality, city governments can gain a form of knowledge that translates into social control.

In *Seeing like a State*, James C. Scott (1998) introduced the concept of *legibility* to capture the importance of simplification processes for statecraft. Modern states, he argues, need to have specific forms of knowledge that enable the supervision and control of human societies. And this quest for legibility extends beyond human populations: in fact, Scott opens his book with the example of European and North American scientific forestry, whose ultimate objectives were to redesign woods and obtain uniform, rationalised environments that could be surveyed, managed and harvested “according to centralised, long-range plans” (Scott 1998, 18). It is no surprise, then, that dogs do not have any immunity with respect to authorities’ efforts to enhance legibility. And especially so in urban areas: Scott discusses extensively how urban planning is an epitome of states’ modernist ethos (Scott 1998, 103–46).

Governing canine and human bodies: from biopolitics to trans-biopolitics

Ultimately, local governments seek to increase the legibility of their canine population to better handle dog-related issues, which can range from everyday nuisances to threatening behaviour to bodily harm. A nuisance occurs when someone’s conduct and use of property negatively affects one or several parties. Despite their variety, nuisances of all types are relational phenomena (Valverde 2011; Clarke 2019), in that nuisances involve several parties, but also in that a nuisance “is contingent upon the ostensible norms, values and expectations of a particular ‘community’ or neighbourhood to which the relevant parties belong” (Clarke 2019, 3). For dogs, the nuisance concept translates into such questions as: How loud, where, and for how long, can a dog “reasonably” bark? And where might dogs move freely, without a leash, with how much human supervision? We note, however, that the answers to such questions pertain to the potential for dogs to intimidate and to bite.

At this juncture, we must consider how Foucault’s work applies to urban areas as more-than-human formations. More specifically, we are interested in his conceptualisation of *biopower*, which brings together two distinct, yet interrelated processes (Foucault 1976, 81–91). On the one hand, Foucault documents the

exertion of power over human bodies: their training, their increased docility, the capture of their strength, and so on. This aspect of biopower aligns well with this paper's concerns. That is because we studied city-level policies that, in the final analysis, enunciate social norms that apply to the bodies of dogs (e.g. where they go, how they move, what they do, how much noise they make) *through* the bodies of their legal owners (i.e. whatever a dog does, under animal-control legislation, reflects what their owners have allowed to happen). On the other hand, biopower also affects bodies at the population level, by which we mean the cumulative effects of biological processes that include births and deaths, injuries and illnesses, and so on. Again, canine bodies and populations offer fertile ground for building on Foucault's work on biopower. Most notably, for our purposes, Srinivasan (2013) has mobilised the concept of biopolitics to analyse dog-related policies in England and India, respectively. Subtle differences in wording lend support for systematic sterilisation of "street dogs" in some Indian cities, as compared with systematic euthanasia of "homeless" dogs in English cities. The breeding of dogs, their neutering, and their killing exemplify biopolitical interventions that target non-human beings. Along the same lines, Youatt (2008, 394) argues that the "categorising, naming, counting, and labelling of nonhuman species" involved in carrying out a biodiversity census reflects a will to "manage life."

In the same article, Youatt raises an important point, about the applicability of biopower to non-human populations. Recall that Foucault put forward the notion of humans as self-governing subjects who may internalise the forms of biopower to which they are subjected. Conceptually, we have a problem here, in that self-governance is far from obvious for non-human animals as political subjects. To accommodate non-human populations, Youatt (2008) offers a "mutated" concept of biopower that emphasises forms of resistance that are "constitutional" rather than "intentional." For instance, non-human animals cannot internalise discourses in the ways that (most) people can, but through their behaviour, these creatures can still challenge individual people and political will. Meanwhile, Srinivasan (2013, 114–6) proceeds to demonstrate that subjectivation *on the part of dogs* is not an absolute prerequisite for biopower to be a relevant concept for animal-qua-social control.

For similar reasons, and to emphasise the fact that there is "more mobility in the creation and exercise of power than that designated by biopolitics" (Blue and Rock 2011, 354), our study evoked the concept of *trans-biopolitics*. In other words, we want to draw attention to power relations that are exerted across species: "animal-human connections, but also animal-to-animal relations mediated by human actions and by inequalities within and between human populations" (Blue and Rock 2011, 355). The concept of trans-biopolitics assisted us in understanding how social positions and species classifications are both important in determining the forms of power that may run through urban populations – human *and* canine. Next, we will illustrate this argument by focusing on how animal-control professionals seek to "educate" dog-owners, and how their efforts may have differential effects, for dogs and people.

Disciplinary entanglements: normalising canine and human conducts

In his study of nuisance governance, Clarke (2019, 3) identifies a form of neoliberal rationality that promotes the "interweaving of punishment with

practices promoting self-governance and reflexivity on the part of nuisance perpetrators”. Reigner (2015) similarly highlights the notion of “responsibility” in her study of policies regarding urban transportation. Meanwhile, our study of animal-control investigations yielded comparable findings. In fact, the City of Calgary’s main animal-control policy has been known as the “Responsible Pet Ownership Bylaw” since 2006 (Rock 2013). This discourse translates, in the everyday work of animal-control officers, into interactions with the public that are not limited to repression (e.g. issuing fines, assigning court dates). Instead, animal-control officers repeatedly told us that the main service that they provide to dog-owners consists of *education*. Several times during our ride-alongs, animal-control officers gave advice to owners on handling their dogs. For example, they explained how to tie a leash to prevent bigger dogs from pulling too hard, and they provided guidance on what kind (and duration) of daily exercise different types of dogs need. Advice of this nature could, therefore, have very concrete impacts on a dog’s body and life, with implications for the legal owner as well.

Departing from a purely punitive approach to enforcement allows animal-control officers to exercise discretion in their interactions with dog-owners. For example, during a ride-along, an officer spotted a man walking alongside his dog without a leash. The man and his dog were walking along a street leading to the off-leash area, but not yet in the park, thereby contravening rules outlined in the city’s animal-control legislation. The officer decided to warn the offender but not to issue a ticket. After this encounter, he told me that he might have reacted differently if the dog had not been licensed (something he checked, by looking for the dog’s city-issued tag number), or if the owner had not demonstrated understanding and contrition during their interaction.

In addition, environmental characteristics and considerations may influence how animal-control officers handle the cases to which they are assigned. For instance, neighbours may complain to the city because they want to stop what they consider to be excessive barking, or because a neighbour’s dogs have been at large. By way of illustration, during a ride-along, a complainant became aggressive towards an animal-control officer. Allegedly, a neighbour’s dogs routinely escaped and roamed loose in the neighbourhood. This complainant felt that the officer was not being harsh enough in responding to damage caused by these dogs to a fence on his property. With respect to this display of verbal abuse, we should note the position of animal-control officers in the law-enforcement hierarchy. Even as our research with animal-control officers has pointed towards a certain degree of overlap and porosity in law enforcement, animal-control officers appear to be on the less-intimidating and less-respected side of the spectrum of law enforcement. These officers usually lack access to protective equipment such as bulletproof vests; they cannot carry a sidearm; they often work alone; and they sometimes encounter difficulty in obtaining police backup (Rock, Rault, and Degeling 2017; Rault et al. 2018). Furthermore, animal-control officers do not have access to police databases, which document, for instance, previous convictions (Rault et al. 2018).

In addition, urban environments influence animal-control investigations, not least due to differences in people’s ability to mobilise cultural, political, and economic resources. On several occasions, for instance, animal-control officers

expressed frustration at political interference in their work, for instance, when a city councillor would ask their manager to prioritise certain types of offenses or certain areas of their district. (similar observations were made by Valverde 2012) Dogs are therefore thoroughly entangled in power relations, whereby their status as non-human animals, along with their relationships with “their” humans, and “their” humans’ social status and situation, conditions their lives.

In addition to such “human” factors, canine behaviour is also deemed critical by animal-control officers when contemplating punitive actions such as imposing a fine or impounding a dog. Hence the prominence of “dog data” in our conversations with animal-control officers and their managers. On several occasions, animal-control officers told us that the most gratifying aspect of their job was helping dog owners understand their pets better and avoid future problems – such as dog-bite injuries. The idea was that “smaller problems” (e.g. excessive barking, or dog-on-dog aggression) can reveal issues in a dog’s behavioural tendencies, or in the quality of care provided by the owner and other human members of the family unit, or both. And these issues could lead to further complaints, explained the animal-control officers, or even to serious dog-bite injuries if not addressed pro-actively. This idea was clearly expressed by an official involved in the restructuring of the pet-licensing database in Calgary. He explained that the aim was to have a more searchable and comprehensive database, by linking the pet-licensing database with data generated from “3-1-1”⁴ calls from the public. As he talked about the need to have more and better data on dog-related incidents, he said:

Getting [dog-related incidents] information out is why we need to report it, and it's important that we know these things. Let us know, so we can act on them. Hopefully we can address and stop this behaviour. So it doesn't happen again. You know we had one, two weeks ago, in-house bite. On the face of a kid. Investigation turns around that says, 'yeah, two weeks before, the week before, exact same thing, just not as severe.' Exact same circumstances, not as severe. Nobody knows about it. And there's, and yet, the parents and the guardians allowed the exact same set up. You know, and so we're there and we're like, "Really?"⁵

As illustrated above, front-line officers – never mind managers – may envision “dog data” as a mechanism for transforming something as contingent and seemingly unpredictable as a dog-bite injury into an event associated with probable recurrence, to some degree. Here, the database opens a pathway for dog-related incidents to become statistics, and therefore allows humans to have more knowledge – and a sense of control – over dog-bite injuries. “Dog data,” to paraphrase Ian Hacking (1990), hold out the promise of *taming* a city’s canine population, as well as specific dogs in a canine population, by exerting influence on the legal owners of these dogs in the first instance. Hacking has documented how the enthusiasm for statistics, which launched what he called an “avalanche of printed numbers,” was a key element in the rise of biopower (Hacking 2016); similarly, the documentation of dog populations and dog-related infractions in purpose-built databases currently plays directly into the practices and the rationalities associated with trans-biopolitics. As regards the taming of dogs for the sake of urban governance, the notion that people can and should be held responsible for their own dogs’ behaviour is key. From this perspective, owners’

understanding of canine behaviour is critical, and education can enhance the capacity for exerting “humane” forms of control over dogs.

Conclusion

Policing is a “condition of existence for urbanity” (Foucault 2004, 374), and non-human animals are hardly exempt. In studying the policing of canine populations as a form of social control, we have paid attention to digital technology, notably databases. With few exceptions (Yigitcanlar, Foth, and Kamruzzaman 2019; Moss, Voigt, and Becker 2021), little has been written on digitally-mediated attempts to manage the coexistence of multiple species in cities. Hence our inquiry into animal-control databases remains novel in urban studies. Even so, “dog data” have been hiding in plain sight. That is because in cities throughout the global North, dog licensing tends to be mandatory. Our study suggests that the higher the compliance with dog licensing, the more powerful the resulting database when investigating dog-bite injuries and when seeking to prevent dog-bite injuries from occurring.

Even as animal-control databases contain an inventory of dogs and a record of canine behaviour, ultimately, these databases concern people. More specifically, animal-control databases concern people’s obligations towards dogs, but also towards the people around them. As such, animal-control services enhance the legibility of canine populations to tame the dogs. The taming of urban dogs takes place statistically and corporally, by disciplining the dogs themselves as well as people, as regards responsible complaints and ownership. Licensing helps with investigating complaints, and such investigations may prompt dog-owners to exercise more direct control over their pets, for the sake of civility and to avoid paying fines, rehoming of their dogs, or killing of their dogs. Repressive capacity accompanies discourses that strongly emphasise individual responsibility for *normalising* canine and human conduct.

Accordingly, we have argued that *trans-biopolitics* flows through animal-control databases and investigations. To prevent dog-bite injuries, animal-control officers may investigate as soon as “disorderly” conduct comes to their attention (e.g. “excessive” barking, dogs “at large”). Hence officers may become implicated in the training of dogs, by offering educational advice and referrals, not just enforcement in the strictest sense by fining dog-owners. As city governments build more (actionable) databases, dog-bite education has become more feasible.

Disciplinary education as a preferred alternative to punitive enforcement applies generally in urban governance (Valverde 2012; Clarke 2019), yet takes on a particular character with canine–human combinations. Of note, local authorities may gain leverage over human behaviour by focusing on canine behaviour. Keeping in mind that the jurisdiction of local authorities revolves around non-human “things” as opposed to human persons, a dual status for dogs as private property and as veritable members of multi-species families permits local authorities to regulate human–canine interactions in public places as well as in the privacy of homes. Hence the social status of dogs facilitates forms of urban policing that are more pervasive than the outright removal of “undesirable” populations (Wacquant 2008; Fauveaud 2014).

Overall, we have sought to advance discussions about how and the extent to which digital infrastructures are transforming urban governance. Given the relevance of multi-species dynamics for urban life (Braun 2005; Hinchliffe and Whatmore 2006; Whatmore 2006; Steele, Wiesel, and Maller 2019), databases that inventory non-human populations merit further investigation. For several reasons, we believe that demographers, ethnographers, historians, and instructors who specialise in urban studies should pay more attention to animal-control databases, policies, and professionals. First, city governments' animal-control services carry implications for all human inhabitants, not just the most marginalised, due to diffuse forms of discipline that scholars in urban studies might otherwise overlook. Second, animal-control services have immediate relevance to domestic animals. A city's entire canine population, for instance, is typically subject to animal-control legislation, even as administrative capacity and policy directions may vary considerably from city to city, and over time within the same city. One-third or more of all households in Western cities include dogs, not to mention a growing proportion of households in non-Western cities. By extension, animal-control services – or a lack thereof – already have direct relevance for upwards of one in three urban households in Western cities, and the potential for such services to exert influence continues to evolve and grow around the globe. Third, even when a city's animal-control legislation does not directly address wildlife, animal-control services still implicate urban wildlife. Issues range from infections that urban wildlife may contract from dogs, and vice versa (with potential consequences for human health, as illustrated by rabies), to the subjugation of wildlife species arising from bites, chases, harassment, and killing by dogs (as well as cats). Animal-control services, therefore, provide a point of entry for further exploration of urban ecologies and politics.

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Notes

- 1 Interviews with the manager of the animal-control division and head of the "licensing team" in Edmonton, June 2018.
- 2 Ibid.
- 3 Multiple ride-alongs carried out with animal-control officers in Calgary and Edmonton, between October 2017 and July 2019.
- 4 In Canada and in the US, 3-1-1 is a special telephone number – a counterpart to 9-1-1 for non-emergency city services. By extension, "3-1-1" also designates complaints that are lodged via mobile

applications (in use in both Calgary and Edmonton).

- 5 Interview with an official from the City of Calgary's "Community Standards" division, February 2018.

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