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The Data-fication of Openness - The Practices and Policies of Open Government Data in Los Angeles

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Publication Date

2016

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UNIVERSITY OF CALIFORNIA

Los Angeles

The Data-fication of Openness

The Practices and Policies of Open Government Data in Los Angeles

A dissertation submitted in partial satisfaction of the requirements

for the degree Doctor of Philosophy in Information Studies

by

Morgan Currie

2016

ABSTRACT OF THE DISSERTATION

The Data-fication of Openness

The Practices and Policies of Open Government Data in Los Angeles

by

Morgan Currie

Doctor of Philosophy in Information Studies

University of California, Los Angeles, 2016

Professor Johanna R. Drucker, Chair

This dissertation explores the emergence of open government data in the City of Los Angeles

and its implications for governance and citizen involvement. Open government data began in Los

Angeles in 2013 with the launch of an open data portal publishing City financial data; later that

year the City's Mayor, Eric Garcetti, mandated that each city department publish at least one

publically relevant dataset on a new city-wide site to be available the following year. The policy

later expanded with the addition of sites that publish department performance metrics and

geographical data. Concurrent with the growth of open data policies is a burgeoning "civic

hacker" movement that seeks to put government data to civic use.

This dissertation investigates the material, practical work required to turn a city record

into open data; it also shows how open data's ideological role enables new administrative models

and inspires new modes of civic involvement. This dissertation is concerned, ultimately, with the

political, creative, and day-to-day work of government and civic data, and how these emerging

practices and their cultural dimensions interact with the public rhetoric of open data. To both capture and confront the discourse of open data, this research seeks specificity in the implementation of open data in city offices and at public events. I use interviews and fieldwork to understand how public records migrate from internal infrastructures to the public portal, and from there to public sites where the datasets are reused by civic participants and the private sector. I situate open data within sociotechnical systems that surround its production, processing, storing, sharing, analysis and reuse. This research also asks how citizens use data to challenge or augment dominant statistical representations.

Drawing on critical data studies, science and technology studies, and political theory, I analyze the present and future impact of these information infrastructures on modes of administration, citizen involvement, and the relationship between government and governed. My work provides evidence that data consists of material and ideological systems that can modify and extend relations of power. Specifically, policies of government transparency transformed from an antagonistic dynamic pitting citizens versus governments and private industry, into one of mutual collaboration. My dissertation argues that open data does not transparently reveal government transactions and processes; rather this work subtly reshapes modes of administration through a data-centric lens that appeals to industry and civic participants alike. To make this case I examine open data policy in practice and also in relation to historical and contemporary examples of political activism that undertake oppositional, social justice approaches both to government transparency and data production.

The dissertation by Morgan Currie is approved.

Jean-Françoise Blanchette

Christopher M. Kelty

Dana Cuff

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University of California, Los Angeles

2016

This dissertation is dedicated to my mother, Barbara Miller Currie,

and to my daughter, Rowan Simone Danbury.

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Acknowledgements

I would like to thank the individuals who shaped this research and made this dissertation possible. In particular, my committee, Johanna Drucker, Jean-François Blanchette, Christopher Kelty, and Dana Cuff – your comments on my proposal and on specific chapters helped sharpen my arguments and the project's overall focus immensely.

Thanks especially to Johanna Drucker, my advisor, whose mentorship throughout was essential to keeping me on track, mindful, and confident in the quality of the work.

Many of my peers have helped inform this project as well. Stephanie Derrick made invaluable suggestions about the structure of my argument in most chapters. Andrew Schrock was my compatriot at the several civic hacking events I attended and was always generous with sharing literature and inside information from City Hall. The case study in chapter four on the Police Officer-Involved Homicide data would not have been possible without my enjoyable collaboration with Britney Paris, Irene Pasquetto, and Jennifer Pierre. I also benefitted from the Part.Lab, generously led by Christopher Kelty throughout my years at UCLA, and other students involved who read early drafts of chapter three, namely Seth Erickson, Hemy Ramiel, and Roderic Crooks. A special thanks to Wendy Hsu, both for providing helpful critical insight and resources on the topic.

Thank you to my father, Ned Currie, who has always been a big champion of my academic pursuits over the years.

I'm grateful to the city staff and civic organizers who gave me a significant amount of their busy time to answer my questions.

An enormous thanks to Thomas Danbury – I'm not sure how I would have gotten through these final months of writing without you.

Some materials in this dissertation have been modified from other publications. Chapter four's section on Police Officer-Involved Homicide Data involves content also published in a co-authored article by myself and Britney Paris, Irene Pasquetto, and Jennifer Pierre. Chapter three is a modified version of a chapter to be published in a forthcoming book:

Currie, Morgan et al. "The Conundrum of Police Officer-Involved Homicides: Counter-Data in Los Angeles County." *Big Data & Society* 3.2 (2016): 2053951716663566. *bds.sagepub.com*. Web.

Currie, Morgan. "Hacking the Administrative." *Making Our World: Hacker and Maker Movements in Context.* Ed. Andrew Schrock and Jeremy Hunsinger. New York: Peter Lang, forthcoming 2017.

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2011-2013	Chancellors Prize, University of California, Los Angeles.

Introduction: Tracing Open Data in Los Angeles

In 2005, Bibiana McHugh, an IT manager of Geographic Information Services (GIS) at TriMet, Portland, Oregon's public transit agency, approached Google with an idea. McHugh had noted with some frustration that popular online public mapping services, such as Mapquest and Google Maps, offered trip-planning information for private car navigation but had no details about public transit routes or arrival times. Working with a Google software engineer, TriMet handed over its GIS data using a CSV format that served as the prototype of the General Transit Feed Specification (GTFS). GTFS became the first example of a "civic data standard" – a standard specified for a data type (in this case, GIS data for public transit routes) used by municipalities worldwide that would allow data to travel from internal databases or documents to an external party. Using GTFS, cities had the ability to format their transit data for developers to use in web or phone applications (apps), whether map software or transit-tracking phone apps (McHugh 2013). With GTFS, citizens could access information services for transit across an array of platforms made by government agencies, private companies, and individual programmers.

As a student and commuter in Los Angeles who relied on public transit almost daily, I became fascinated with the idea that government data could be used in such a way to help me plan my route to school. Los Angeles's Metropolitan Transit Agency, popularly known as Metro, was a GTFS partner, so each morning I accessed real-time bus schedules on my phone to plot my trip to campus. That was in 2012. By then, many cities around the country had designed open data portal portals to publish city datasets, including San Francisco, New York, Chicago, and Seattle. The concept that cities should open and standardize their data had gained wide currency five years earlier after a meeting of thirty transparency advocates and technology enthusiasts in

Sebastapol, California, in December 2007. Participants there met to define the Eight Principles of

Open Government Data, cementing fundamentals that defined data as "open" both with respect

to legal availability, accessibility, and completeness, as well as in its technical format.[1]

Attendants included copyright lawyer Lawrence Lessig, tech publisher Tim O'Reilly, and the

young transparency activist Aaron Swartz. Yahoo and Google sponsored the event, as did the

Sunlight Foundation, a nonprofit focused on transparency around public information and

campaign finance. Two years later, the recently elected Obama administration would draw from

the eight principles to craft the Open Government Directive, a policy that required all executive

agencies to publish machine-readable, downloadable datasets on a new website, Data.gov.

Two years into my graduate program, more than 100 countries, including China, Russia,

Rwanda, and Mexico, had also started open data programs; initiatives likewise ranged from

community-led projects to World Bank-sponsored programs in Kenya and the World Wide Web

Foundation's support of open data in Ghana.[2] Los Angeles, however, had no open data policies

or websites. That situation changed in October 2013, when the office of Los Angeles's newly

elected Controller, Ron Galperin, started an open data portal called Control Panel LA, a database

of information on city salaries, revenue, and expenses. Two months later, the city's self-

proclaimed "tech-savvy" mayor, Eric Garcetti, used his third directive in office to mandate an

open data portal (Karlamanga 2014). His open data initiative was one dimension of a larger plan

to bring city government more in line with the technology industries that had begun to dominate

twenty-first century economies. Begun the same year as the portal, the Mayor's Innovation Fund,

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[1] The principles state that data must be complete, primary, timely, accessible, machine processable, non-discriminatory, non-proprietary, and license-free.

[2] For an actively updated list, see http://datacatalogs.org.

for instance, awarded departments that came up with ideas for renovating their antiquated

information systems. Its first award supported the Sanitation Department's vehicles' upgrade

from printed Thomas Guides to GIS smartphone apps (Ibid).

Six months earlier, a community of technology enthusiasts hosted the city's first Hack for

LA day, which coincided with the Obama administration's second National Day of Civic

Hacking. Around 500 people showed up to form teams and design phone apps and websites over

the course of a two-day competition. The event was supported by a mix of nonprofit sponsors,

including the civic-tech incubator Code for America and Innovation Endeavors, a for-profit

venture fund established by Google's former CEO Eric Schimdt. The mayor's open data website

launched hand in hand with a public poised to explore it.

The Rhetoric of Open Data

My research began that same year – 2013 – when I attended civic hacking events and started

speaking to public officials involved in establishing the city's open data initiative. I was

interested in the assumptions that they made about the role that data can play in shaping the city

and its public institutions. Open government data broadly reflects changing cultural

understandings of data, particularly assumptions about how "big data" technologies can act as

solutions to urban ills and government ineptitude. Data "are multifunctional tools, a Swiss Army

knife of sorts, with functionality in an assortment of sectors, scenarios, and situations," according

to Aneesh Chopra, Obama's first chief technology officer (CTO) (2014, 120). MIT urban

planning scholar Michael Joroff writes, "Big data will inform strategy on a macro scale. We will

better know about conditions and consequences of policies and actions. Ignorance will no longer

be a condition or an excuse" (Chopra 2014, 306). Narratives and discourse around open data

emphasize the benefits and economic surpluses that government data can generate once it becomes widely available. Such sentiments are also pervasive in Los Angeles. At a Hack for LA event in 2014, Brian Ford, the successor to Aneesh Chopra, told an audience:

> Data alone can't help, but you can use data to find a safer route around the city. By opening data, you can improve the economy. Think of companies using Zilla, Trulio, Foursquare – thousands are using it. You can make the roads safer. Product recall data can be used to make sure products are safe. Weather data was used to help farmers. The McKinsey report says that open government data across the world will create three trillion dollars a year. This will help grow the economy in Los Angeles.[3]

In particular, the rhetoric of open data asks us to rethink assumptions about the nature of the relationship between citizens, government, and the private sector in twenty-first century democracies. First, open data reconfigures ideas about government transparency. As I will argue, in the twentieth century, the concept of "open government" encouraged mechanisms of accountability to citizens. The enactment of open government policy often entailed antagonistic relations; citizens would use transparency laws to wrest information from departments that did not voluntarily concede it. To many activists and journalists at the time, transparency laws redressed power imbalances between citizens and government or between citizens and private corporations that resisted government oversight even as they harmed populations' health in the pursuit of profit. Transparency ideals, however, are slightly reconfigured in the context of open government data with its accompanying managerial and market-based discourse promising private innovation, service delivery, and efficient public services. In place of the per-case basis of openness that characterized Freedom of Information Act (FOIA) procedures, open data is

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[3] Heard at a panel held at the #TechLA event in Los Angeles, May 31, 2014.

open by default. The rhetoric of open data describes a benign form of transparency that neatly aligns the interests of citizens, governments, and the private sector.

Second, the rhetoric of open government data records promises to create more direct interaction between citizens and government administrations through open data flows. Governments traditionally maintained and consolidated municipal records to manage civilian populations, whether through law enforcement or the delivery of public utilities and health services. With open data, citizens and the private sector are given access to data surrogates of such records and encouraged to participate with government in its oversight, service delivery, and urban planning. The government extends its auditing functions to citizens, in the process supposedly flattening the traditional hierarchy between bureaucratic expert and layperson.

One aim of my research is to examine closely the claims that open data delivers a less antagonistic form of government transparency and more direct citizen involvement. Analyzing rhetoric is useful for assessing not only what popular sentiments reveal about a subject, but also how much such language obscures or distorts. The rhetoric of open data plays a hand in driving policies and governance practices in Los Angeles. STS scholar Steve Woolgar calls this work of discourse about a technology *configuring the user* (1990). When the dominant discourse proscribes design activities and use-cases, these scenarios play a hand in guiding users of the technology. By configuring the user, technological practice reproduces and mediates certain subjectivities and social orders – in this case, a set of relations between citizen and government as well as staff.

Yet a technology's definition will be under constant negotiation in a non-deterministic set of relations always in play (Oudshoorn and Pinch 2003; Grint and Woolgar 1997, 2013; von Hippel 2005). Rather than accepting essentialist claims about technological determinism, one can

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watch how technologies' roles remain interpretive, flexible, and contested, especially as the

dominant version of what a technology *should* do will sometimes be at odd with its actual use.

By listening to the rhetoric of open data, one can analyze the social forces and economic contexts

that make open data appear as an appealing and natural investment for a city government to

make.

The Practices of Open Data

The enthusiastic rhetoric of open data proponents can often offer a simple straw man much too

easy to poke into and there find naïve exaggeration and sloganeering for technological change.

For that reason, my research also examines the material practices of open data in Los Angeles in

an effort to expose the interpretive and political aspects of data production and reuse. By tracing

the work of open data, I challenge the popular belief that data is a transcendent, rational

authority, operating outside of influence peddling. Data, rather, acts as a surrogate, several steps

removed from the phenomena it represents. Data points are also rhetorical phenomena that can

operate – and be operated upon – in ways distinct from the phenomena in the world that they

claim to represent (Porter 1994). Data produce paradoxical tradeoffs: reducing specificity and

multiplicity into abstractions, data gain the qualities of manipulability, comparability and

legibility. It can endow a degree of impersonal rationality to decision-making, which plays out

well in both science and policymaking (Latour 1987). Statistics, which move beyond the chaos

of the singular to find stability in probability distributions and averages, offer a powerful method

for objectification.

This dissertation situates its findings theoretically within a body of literature that

examines the social and political constructedness of data. Scholars in the fields of science and

technology studies (STS), infrastructure studies, and critical data studies all address the cultural dimensions of data practices (Hacking 1990, Agre 1994, Bowker and Starr 2000, Gitelman 2011, Kitchin and Lauriault 2014). In this body of research, data are not mechanical and fixed reflections of the world, but a contingent set of relations and material practices that change over time, mutually influencing institutional arrangements, concepts, and legal and economic reforms. Research on the sociotechnical life of data must not take data as given but rather investigate the interpretive and ideological dimensions that impact its construction and use. This literature turns the issue of ontology on its head: Rather than question whether data reflect reality with objectivity, these thinkers claim that reality is the product of established conventions that have been widely invested in through material recordings of equivalence, such that the real is what matches this logic of measurement. As sociologist and historian of science Alain Desrosiere points out, the real is also at the same time a construct (2002).

In the context of government records, datasets are enormously powerful objects, since they can operate both as a kind of description and basis for state action inscribed in stable systems. State records, for example, operate as evidence of a transaction, geographic boundary, or census point, but they may also be analyzed in aggregate to guide decisions, make predictions, or construct visual arguments in the form of graphs and maps. The materialized consistency of measurements, definitions, and actions provides a basis for their value as agreed-upon objects. Government records are material recordings of "thousands of occurrences" that "can be looked at synoptically" and thus form a basis for wide circulation and objectivity (Latour 1986, 26). My research explores open data as a by-product of such state recordkeeping and archival systems; thus, as part of systems that require vast labor and political resources to be created and managed over time.

When used internally by departments, individuals, and private companies, open data most often operates to bolster, versus question or dismantle, the infrastructures of government records. Whether building phone apps to visualize data or using data to make policy decisions, these practices are often based on the myth of data's identity as a neutral statement of "what is." Reusing government data provides tacit support for these governmental "centers of calculation" (Latour 1987). Yet open data does not transparently reveal the transactions of the state but changes it in the course of producing new statistical objects. Through the production of open data, as I will discuss, staff come to view city records as a new source capital that can circulate in the civic and private sectors and support more data-driven management and city planning goals. With this data-fication of records, if you will, comes private sector models of governance that, for example, parse complex urban troubles as post-political, instrumental problems that technology can solve. By framing open data in the context of state recordkeeping and archival systems, I argue that government data is never apolitical.

My research also turns to a body of democratic theory on participation and administration to understand the relationship between publics and government data. I use political theory to articulate distinctions between types of data practices emerging in the civic arena. At stake is how the reuse of government data shapes practitioners' relationship to the state. Open data reuse offers a new mode of public engagement through hands-on making but one that, in most observed cases, serves to reproduce or extend administrative aims rather than criticize or reimagine them, unless doing so means crafting those goals in the image of Silicon Valley.

Antagonistic, grassroots data practices can also be used as explicitly political tools. This dissertation concludes by theorizing case studies of activist work in Los Angeles through a discussion of two different models of democratic participation. I discuss activist work that

augments and challenges the parameterization, production, and ownership of official state data, as groups take on the task of producing their own metrics and statistical representations. Drawing on STS and political theorists, I look at the role of agonistic publics – constituents whose irreducible claims and political antagonisms keep debate ongoing (Mouffe 2000) – and how settled political matters can be contested by statistical representations (Marres 2012). I also look at how individuals and nonprofits use data to provide a layer of authoritativeness to speak to officials and wider publics.

This study, then, describes Los Angeles's early experiments with open government data at a time when city staff are adding to the open data portal and have recent memory of the work and decision-making involved in the process. Los Angeles has also provided a site to explore the relationship between the city and civic hackers in their efforts to instrumentalize government data in websites and apps, as well as the work of public transit and social justice activists who use data to challenge or expand state statistical representations.

To investigate these various aspects of government data, this study asks three research questions:

1. What cultural and material work is needed to turn a government record into open data?

2. What new kinds of political participation come into being through open data initiatives in Los Angeles?

3. How do citizens use data in an oppositional manner to challenge dominant statistical representations?

Methodology

There is a small body of literature on open data that appraises it based on its reuse by citizens and companies, project outcomes, or financial profitability (Zuiderwijk and Janssen 2014, Davies 2010). Open data, according to some sympathetic authors, may also reduce the need for government regulation; as more government data is made available, the knowledge and technological capacities of informed, self-reliant citizens reduces the need for government to regulate citizens and private markets. Instead, citizens take on the role of monitoring themselves and the private sector through networked information exchange about energy use, products and environmental hazards (Janssen and Estevaz 2013, Mayo and Steinberg 2007, Goldstein and Dyson 2013). This optimistic viewpoint, often buoyed by the potential role that "big data" can play in society, has also loomed large in many of the press releases and sound bites offered by government officials in charge of open data programs.

Against this literature is a larger body of research that is highly critical of the premises of open data. Enthusiasts, according to critics, do not take into account the ambivalent values found in open data, particularly the gains to the private tech sector as it profits off of transparency efforts. Open data is too often guided by a depoliticized and technical understanding of openness, one deriving from ideas espoused by Silicon Valley advisors, such as those at the Sebastopol meeting who influenced the early policy development guiding Obama's open government legislation and data.gov (Yu and Robinson 2012, Bates 2012, Tkacz 2013, Kitchin 2013). Scholars express concern as well about the technological sophistication and government literacy necessary to use open data sites, pointing out that participation in open data more often than not requires technical knowledge to repurpose the data usefully and creatively. The interpretive work

essential to using open data effectively – to contextualize it and give it meaning – often requires financial resources, expertise, and training to analyze and report the data to advance certain claims (Gurstein 2011, Jaeger and Bertot 2010). However, these critiques, outlined throughout this dissertation, are often general and not grounded in empirical observation. When they are specific, the observations are often based on one-time events or short case studies.

This study, in contrast, confronts the discourse of openness by seeking specificity in the implementation of open data in Los Angeles from 2013 to 2016. During that time, I participated in social events that promoted open data and were central to its visibility in the civic sphere. I attended civic hackathons, toured city departments, interviewed city staff at work, participated in civic technology-themed conferences, and went to related after-hour events at restaurants and corporate campuses. My fieldwork also included attending open data-related meetups, touring offices that held records that could be accessed by the public, talking with civic hacker enthusiasts, and interning at two departments: The Department of Building and Safety (from September to November 2014) and the Department of Cultural Affairs (from May to October 2016), to understand the labor required to produce and maintain their electronic records. I also followed many of the listservs that connected civic hackers with one another.

Over the course of three years, I conducted in-depth, semi-structured interviews with city staff in nine departments to understand the foundation on which their open data was built; I also spoke with systems analysts within departments. By asking how records migrate from internal infrastructures to the public portal, I was able to see differences between them that revealed the unequal labor costs across departments involved in making public data transparent. I interviewed participants and organizers at civic hackathons and Hack for LA nights, and talked to the architects of the open data portal in the mayor's office and Information Technology Agency. I

also followed and carefully read press releases, City documents, and general interest news about open data to track the rhetoric used about open data in the popular media and within government. For historical material, I gathered and interpreted a variety of primary documents including monographs, legal statutes, Congressional hearings, letters, and institutional reports.

This study followed general ethical guidelines. All interviewees reviewed a Study Information Sheet with a description of the research and contact information (Appendix A). The identities of all participants are concealed in this study, per human subjects approval (IRB#14-000624).

Chapter Layout

This dissertation is structured as a collection of essays that tackle a common topic, each approaching it from different aspects but building on general themes around data, openness, governance, and democratic participation. Each chapter can also function independently of the rest. I begin by providing an historical framework for open data, then proceed by examining the work required to produce open data, along with the cultural shifts caused in the wake of transparency work, before describing some of its reuse in the public sphere of civic hacking. I end with case studies of civic data practices that challenge the statistical representations created by state institutions.

Chapter one visits the origins of much of the current cultural expectations around the role that data can play in city governance. The majority of literature on open data so far traces its influences back to the FOIA and open source software cultures integral to the formations of open data policy in the United States. Left out of much of the literature is the influence of electronic government records legislation and norms that developed during the eighties and nineties. In

particular, the concept of "value-added" from the financial sector reconfigured government records as "raw data" that could be enhanced and made operable through software interfaces. The Reagan administration and commercial vendors viewed value-added software as a proprietary venture that used strict licenses and copyright to wrench profit from electronic government records while closing them off to wide public access. Open data, in contrast, reconciles government transparency with private sector expansion through open licenses and formats.

Chapter two traces the creation of the open data initiative in Los Angeles within nine city departments. This chapter shows how the open data initiative reflects certain values and goals of the city, namely innovation and entrepreneurship and the desire for more scientific, politically neutral approaches to problem solving. To serve these aims, records and information are valued more for their ability to circulate and be operated upon rather than their indexical value as evidence. Records are seen as "raw" resources that can serve as the foundation for collective, iterative problem-solving.

To circulate records, they must be brought into orders of equivalence – that is, different types of data must be brought onto one website in similar formats. This chapter details some of the work of creating these spaces of equivalence. Hand in hand with this work are new governance policies enacted since the initiative began, including predictive analytics, performance metrics, and private sector partnerships. To study the infrastructure of open data specifically, one must consider how wider cultural and economic forces interact with new material instantiations of data.

Chapter three turns to open data in the public sphere, particularly at civic hackathons, where participants confront urban problems by using data analytics, application programming,

and interface design. This chapter draws on political theories of administration and participation to analyze the continuum of approaches to government data reuse. I argue that most civic work around open data entails instrumental participation in the administrative branches of government. This mode of participation blurs the distinctions between public and private, citizen and contractor, in ways that create new relationships between the city and individual.

I also argue that civic participation using open data can take place along a range of types of democratic participation. On one end, civic hackers operationalize government data to improve the design of government or civic information services, such as websites with information on food stamps or bike trails. In these instances, civic hacking collaborates with administrative policy, sometimes even at the government's behest. This instrumental use of government data is prevalent in Los Angeles's civic hacking scene, where government officials often make specific appeals to programmers to improve public information services, a design activity normally closed to citizen involvement. Such an approach appears to blur the distinction between lay citizen and expert, though the results of programmers' attempts to improve public services largely remain speculative. On the other end of the spectrum, government data is used as part of a broader campaign of political struggle and reform. On this end, government data becomes a tactical tool deployed alongside more traditional forms of advocacy and resistance, such as marches, testifying at public hearings, and flyering. Examples of this type of data use, however, are largely absent at civic hacking events or from examples of best practices of open data reuse, which typically point to apps for pothole repair or saving water as models of civic tech.

Chapter four asks: How do citizens use data to challenge or augment dominant statistical representations? It focuses on citizen-collected data and new forms of activism based around

data practices. Unlike efforts that draw from government sources, civic data amplifies and sharpens a community's narrative with data it gathers, processes, and visualizes itself. Civic data practices can also provide literacy on the contingency of statistical tools by showing that there are different ways of representing an issue. This chapter examines four civic groups in Los Angeles, the Los Angeles County Bike Coalition, Stop LAPD Spying, the Bus Riders Union, and the Data Justice Project, to make its argument.

Limitations of Studying an Emerging Phenomena

When I began this project, because Los Angeles did not have an open data policy in place, my intention was to conduct comparative research in other cities, perhaps in places where open data was already robust, such as New York, Chicago, Washington D.C., and Amsterdam. Los Angeles's belated but committed embrace of open data simplified my approach to the project considerably.

Even so, this work has been complicated and limited by efforts to pin down a relatively new and ever evolving phenomenon. Conclusions drawn in this study may prove unfounded in a few years' time, and often the final argument of any chapter remains the result of observations of an up-close, constantly mutating subject. Only by the end of 2016, for instance, did anyone in Los Angeles produce a working civic app using the City's data. Many city staff who I interviewed early in the project have moved on or else changed positions. My hope is that these insights, despite these limitations, prove valuable enough as a foundation for further inquiry and provocations on the matter of data's role in governance, politics, and civic life.

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Chapter One: A Dual Valuation of Open Government

The rhetoric of open government data articulates a depoliticized vision of openness in government that departs radically from twentieth-century understandings of it. Take, for example, the words written in 1970 by the consumer rights activist Ralph Nader. Nader published a strident article denouncing the weakness of a four-year old amendment to the Administrative Procedure Act, known colloquially to all as the Freedom of Information Act (FOIA). Nader's article linked information explicitly to political authority and control: "A well informed citizenry is the lifeblood of democracy; and in all arenas of government, information, particularly timely information, is the currency of power" (1). Just a year before Nader had founded the Center for the Study of Responsive Law, an organization that recruited law students to create detailed, muckraking reports exposing the extent of federal regulatory agencies' collusion with industry. Much of the Center's work relied on the aggressive use of FOIA to ground its claims of agency incompetence and corruption. Nader's article argued that lawful access to information was crucial to citizen empowerment. Open government policies such as FOIA would need to be strengthened to enable citizen oversight of an increasingly secretive and bloated bureaucracy too often beholden to corporate interests.

Four decades later, in 2013, President Barack Obama issued an Executive Order titled "Making Open and Machine Readable the New Default for Government Information," which began:

> Openness in government strengthens our democracy, promotes the delivery of efficient and effective services to the public, and contributes to economic growth. As one vital benefit of open government, making information resources easy to find, accessible, and usable can fuel entrepreneurship, innovation, and scientific discovery that improves

American's lives and contributes significantly to job creation (The White House, Office

of the Press Secretary).

The open data directive offers several points of departure from Nader's vision of open

government. As illustrated by Nader's article, open government in the mid-twentieth century

often entailed an adversarial use of transparency laws, wielded in instances in which citizens,

organizations, historians, and the press used the law to expose or gain influence over covert or

incompetent government activities. Open data, in contrast, cultivates a model of open

government that emphasizes mutual collaboration between citizens and government through data

sharing and reuse. The format of the information can no longer be assumed or trivialized: The

directive states that records are to be published in consumer-friendly, machine-readable, and

downloadable formats. For this reason, access to agency data is not to entail any struggle

between citizens and the government, since departments were to preemptively publish their

information on websites. Most importantly, one finds in Obama's statement a wide list of values:

information for democracy, just as Nader argued, but also for better government services,

scientific advancement, and economic gains. While Nader's mid-twentieth century concept of

openness in government positioned official records in light of asymmetrical power struggles, the

Obama Directive views government information as an asset for "entrepreneurs" and as an engine

of innovation and job growth.

The primary aim of this chapter is to argue that the rhetoric of open government data

conflates its civic value as a mechanism of government disclosure with its market value as

companies gain efficient access to government data. Many scholars of open data have made a

similar observation (Tkacz 2013, Birchall 2015, Bates 2012, Kitchin 2013), yet this chapter

grounds this argument in a specific historical trajectory. I trace events in the United States to a

point in the 1990s when proponents of government disclosure came to see their cause aligned with technology companies that also saw openness in their interest. Up until this time, open government efforts generally involved a struggle between citizens and government agencies. The rhetoric changed once transparency proponents could make the case that both citizens and businesses would profit from greater transparency infrastructure. As I will show, the legacy of open data owes as much to proponents of disclosure laws as to champions of open electronic networks and open information markets, particularly in the financial sector, that have in turn influenced contemporary understandings of open government.

This work contributes to other recent archaeologies of the term "open" by research that has examined Wikipedia, open source software, and open standards (Russell 2015, Tkacz 2014, Coleman 2012). Like these works, this research is interested in the way that concepts and ideals of openness are configured into policy and legal reforms, cultural practices, and material infrastructure. This chapter, however, focuses specifically on openness as it is defined with regards to access to government records; it therefore expands on the small body of literature that has traced the rise of open government data.

Most research on open government data begins with its formalization at the 2007 Sebastopol meeting, followed soon after by Obama's open government policies, the concurrent growth of the civic hacker movement, and the launch of U.S. and UK open data portals (Bates 2012, 2014; Davies and Bawa 2012; Johnson 2014; Longo 2011; McClean 2011; Peixoto 2013; Tkacz 2013). Few scholars have excavated deeper roots. Jonathan Gray's genealogy of the term "open data" commences slightly earlier, with the popularity of the concept of public sector information in Europe in the 1990s, when opening government databases to the private sector promised "wealth creating possibilities" (2014). Joshua Tauberer's "History of the Movement"

tracks open data's origins to FOIA and early electronic government databases but does not detail

the struggles over the privatization of these databases, which I begin to outline here (2014).

Andrew Schrock's essay on civic hacker politics traces open data back to the conflicting concept

of "publicity" – a term that was used in the early twentieth century to support greater

transparency around financial information but later became affiliated with mass media and the

propaganda deployed by the U.S. government during the first and second World Wars. Schrock

leads the reader next through FOIA's implementation in 1966, then to technology activists

Lawrence Lessig and Carl Malamud's influence in the 1990s, thinkers who helped craft the

policy behind Obama's first directive on open data in 2013 (2016). This work does not engage

with the debates on electronic records that took place during the Reagan, Bush, and Clinton

administrations and that influenced the open data movement two decades later.

This chapter traces several historical touch points that have not yet been used to

contextualize and theorize open data. In the next two sections, I provide context for the passage

of the FOIA and the rise of a watchdog group, the Center for the Study of Responsive Law,

which found in FOIA a powerful mechanism to challenge executive branch secrecy. For

transparency activists in the sixties and seventies, the concept of open government entailed

passing legal mechanisms that allowed persistent, combative monitoring of federal

administration, in particular to expose its ties to the private industries it was supposed to

regulate. In the eighties, as I detail in later sections, the concept of open government then

mutated with the introductions of new policies and technological obstacles to FOIA that favored

privatizing government information. Open government advocacy remained an antagonistic

project during this time, but one that turned its focus to policies of computerized databases. In

the final sections, I describe an important precedent for open data that occurred in the 1990s with

Carl Malamud's widely heralded hijacking of the SEC's EDGAR database; during this event, transparency activists began to make the novel case that open government *aligned* with private sector interests. These events are by no means definitive in understanding the history of open data, but they offer a perspective on the depoliticizing of transparency work that began before open government data and continues to define it today.

Open Government as a Citizen's Right

In 1953, a book called *The People's Right to Know* offered the first survey of the irregular set of state and federal laws regarding access to public records. While congressional proceedings had been publicly available since 1873, the book demonstrated that the public had no legal grounds for demanding *executive* department records. On the contrary, agencies had wide legal grounds to reject such requests. The Federal Register Act of 1935 only required agencies to publicize their rule making, while the Administrative Procedures Act (APA) of 1946 gave executive branch staff wide latitude to reject requests for documents on the vaguely worded premise that such information will be released unless it requires "secrecy in the public interest" or is "required for good cause to be held confidential." The APA also became a tool of evasion through its several qualifications for disclosure, including allowing only those "properly and directly concerned" to access agency records. "The dismaying, bewildering fact," wrote the book's author, Harold Cross, "is that in the absence of a general or specific act of Congress creating a clear right to inspect – and such acts are not numerous – there is no enforceable legal right in public or press to inspect any federal non-judicial record" (197).

Writing on behalf of the American Society of Newspapers Editors (ASNE), Cross made the case in great detail that citizens and the press lacked legal enforcements to guarantee their

first amendment right to access to government information. Living in a heady setting of nuclear

science, space discovery, communism, and the Cold War, Cross and his colleagues noted that the

usual, scattered tug-and-pull between journalists and public officials had developed into a

"broad-scale offensive" of resistance to release information across agencies (xv). Agencies, for

instance, found a way to deny records to the press that could harm private industry, including the

smelting and oil industries, as well as companies with naval contracts (206). Making matters

worse, a series of presidential executive orders by Roosevelt and Truman allowed the military,

agencies and departments to classify documents as a matter of national security. These

information laws put the requester at the mercy of "official grace or indulgence," creating a

chilling effect that suppressed inquiry into government doings (198).

Cross argued that classic democratic theory was on his side. An informed electorate is

essential to a properly functioning democracy; Cross cited James Madison and Patrick Henry,

among other early statesmen and legal authors, to make his case.[1] Cross also claimed the laws

suffered from "cultural lag": Information access laws reflected an older time period when the

government was smaller and had less control over the acts of individuals (6). By the mid-

twentieth century, government administration reflected the bureaucratic changes wrought by war

and New Deal policy. New regulatory commissions had formed, such as the Securities and

Exchange Commission and the Federal Communications Commission, that were unaccountable

to the electorate. The metastasizing government departments (of which there were, at that point,

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[1] Madison's quote is the most well-known: "Knowledge will forever govern ignorance. And a people who mean to be their own governors, must arm themselves with the power knowledge gives. A popular government without popular information or the means of acquiring it, is but a prologue to a farce or tragedy, or perhaps both." Madison wrote this in 1822 to advocate for public schooling ("a general system of education") in Kentucky, not to encourage government to share information to citizens (Madison 1910, 103).

more than sixty) took advantage of the law's straggling pace (Parks 1957). Meanwhile, agencies classified more documents in the name of domestic security during wartime.

The concept of the citizen's right to know soon became taken up by a congressional campaign to pass a new federal open records law that would guarantee a citizen's legal right to disclosure. The cause became of particular interest to congressional Democrats eager to control the Republican executive. In a report on the "open-government principle," Wallace Parks, a Democratic consultant, argued that a more "open government" required stronger legislation guaranteeing the people's right to know. Parks joined Congressman John Moss from California and the American Bar Association, another organization that had long advocated for disclosure procedures, to lead an investigation into the extent of the "paper curtain" of government secrecy by the executive branch (Parks 1957, 6). Moss oversaw the investigation, while Harold Cross became its legal adviser.

What began as an effort by a Democratic Congress to assert authority over the Republican-held executive branch continued even after the Kennedy and Johnson administrations came to power.[2] The Moss Committee's investigation found that requests denied appeared politically motivated: Departments would withhold employee titles and salaries or refused to disclose the voting records of its regulatory boards, particularly when rulings were controversial. Agencies denied historians' requests for dated documents of historical importance, including a soldier's Civil War memoir. Both the Office of Civil and Defense Mobilization and the National Science Foundation would not release information on dubious contracts, while NASA refused to release documents recording six failures with $18 million moon probe spacecrafts (Halstuk and Chamblerlin 2006). Agencies flouted basic, lawful requirements to

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[2] During its first four years, from 1955 to April 1959, the committee held 173 hearings and fourteen volumes of reports documenting the extent of non-disclosure.

make public their rules, functions, and methods of operation. Departments colored their obfuscations with an inconsistent lexicon of twenty-four different terms, from the frequent "Official Use Only" to the more obscure "Individual Company Data" and "Limitation on Availability of Equipment Files for Public Reference" (Cross 1953).

Throughout the proceedings, all executive agencies and the Department of Justice opposed the changes, claiming any alteration in law would bring undue cost and burden upon staff, "endless controversy," and an "intolerable situation" (United States, 1959). Some legislators joined the dissent, opposing on the grounds that a hypothetical, libelous press might purposefully misconstrue administrative records (United States, 1956).

In 1965, a decade after the committee began its work, reports on twin bills in the House and Senate called for Congress to address the lack of legal clarity provided by the APA with a new open record law. The bills gave citizens recourse to the district courts if an agency didn't comply; in essence, replacing agencies' control over records with judicial procedures and congressional oversight. The bills also required agencies to make their indexing and accessing requirements clear so that citizens could make reasonable requests.[3] Furthermore, requesters no longer needed to justify their purposes. The bills also clarified nine specific exemptions for disclosure, giving agencies some latitude to deny requests (S. Rep. No. 89-813, 1965; H. Rep No. 89-1497, 1965).[4] Like Cross's book, the bills argued a constitutionally grounded correspondence between self-government, freedom of the mind, and free-flowing information: "A democratic society requires an informed, intelligent electorate, and the intelligence of the

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[3] FOIA specifically applies to cabinet departments, federal agencies, military departments, government corporations, and independent regulatory agencies.

[4] Currently nine exemptions: national security information, internal personnel rules and practices, information exempt under other laws, confidential business information, inter or intra agency communication that is subject to a deliberative process, litigation and other privileges, personal privacy, law enforcement records of specific concerns, financial institutions, geological information.

electorate varies as the quantity and quality of its information varies." (S. Rep. No. 89-813, 1965, 33). The House bill even cited Cross's book, published over a decade before (ibid.). Though reluctant, on July 4, 1966, Johnson signed the new open records bill into law a year after the Congressional bills passed (Moyers 2005).[56]

FOIA also benefited from a turning tide in public sentiment, a general belief that disclosure offered a virtuous redress of power by ordinary citizens. This "cultural right to know," as Michael Schudson has termed it, advanced other new norms that today seem incontrovertible, such as medical disclosure between doctor and patient, informed consent for medical research, campaign finance disclosure, and environmental hazards assessments (Ibid, 1).[7] Schudson finds that the connection between self-government and information disclosure or transparency was not in fact self-evident or grounded in the constitution (despite claims that carry on into twenty-first century literature on FOIA (Florini, 2007, 7)). That is, it was only in the mid-twentieth century that a right to know was framed as a constitutional right, that disclosure was linked tightly to democratic participation and citizenship, and that openness in administration was touted as a civic virtue.

Rather than undergirding a familiar, well-worn right indigenous to American politics, FOIA institutionalized a new form of civic knowledge and engagement that was specific to its

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[5] Pub. L. 89–487, 80 Stat. 250 (1966). The law was never called the Freedom of Information Act. This term was actually an informal name derived from the *Times* report on the new "freedom of information bill." When Johnson signed the law, he considered it a revision of the APA (Schudson 2015).

[6] Bill Moyers, then White House press secretary, says, "I knew that LBJ had to be dragged kicking and screaming to the signing ceremony. He hated the very idea of the Freedom of Information Act; hated the thought of journalists rummaging in government closets and opening government files; hated them challenging the official view of reality. He dug in his heels and even threatened to pocket veto the bill after it reached the White House. And he might have followed through if Moss and Wiggins and other editors hadn't barraged him with pleas and petitions. He relented and signed 'the damned thing,' as he called it (I'm paraphrasing what he actually said in case C-Span is here.) He signed it, and then went out to claim credit for it" (Moyers 2005).

[7] Campaign finance disclosure became law with the Federal Elections Campaign Acts of 1971 and 1974.

time period – a new "monitory democracy" as scholars have called it (Keane 2009, Schudson 2015). The monitorial society created novel forms of representation – such as civil society groups that monitor governments, litigation, and the National Environmental Protection Act – beyond elections (Schudson 2015). The monitory society was not necessarily a progressive movement but rather a making-evident tool by bringing information into the public sphere. However, the rhetoric and civic action that resulted in the name of monitory politics and open government was often couched in terms of gross power asymmetries, particularly between governments and citizens and between private industry and consumers. In the next section, I discuss an example of a new type of monitorial action enabled by FOIA, one that uses the laws of open government to advocate for consumer safety and environmental health. I will later hold up this form of activism for comparison to open data projects that took place in the decades that followed.

FOIA Becomes an Activist Tool

All of these developments in effect expanded the potential for citizen political involvement beyond episodic election cycles to include continuous forms of public monitoring (Schudson 2015). FOIA specifically gave way to a type of radical, confrontational civic action: locating government documents in order to hold officials accountable at various stages of closed-door decision-making. The brashest manifestation of this framework for public interest activism – indeed, the template for it – was a civic watchdog group that began one year after FOIA was put into law. Ralph Nader and his Center for the Study of Responsive Law used FOIA as a tool of exposure and shaming. Nader enlisted teams of Ivy League-educated law students he called "task forces" to hound departments with interview and records requests, penetrating the sanctums of

agencies unaccustomed to citizen monitoring. If denied access to documents, the Center

threatened to sue under the FOIA (McCarry 1972).

The results were damning reports that received wide media coverage. For instance, the

first such report, published in 1970, took aim at the Federal Trade Commission; it found an

agency "fat with cronyism" and commercial influence (Cox, 12). According to William Grieder,

the reporter who dubbed the student teams "Nader's Raiders" in the *Washington Post*, the FTC

report "was the first act in what became a popular theatrical – plain citizens assailing the

government for its failures, demanding access to the decision-making, holding up a bright torch

for something they called 'public-interest'" (1980). The report pried open a window into what

the Raiders considered irresponsible and, at times, corrupt administrative processes. The report

garnered headlines in major newspapers, sparking public awareness and pressuring the Nixon

administration to reorganize the FTC. The administration responded, first hiring a new chairman,

then forming consumer protection committees around the country. The FTC soon began

targeting companies, bringing charges against McDonalds, Coca-Cola, Standard Oil, Mattel, and

many others for deceptive and false advertising. Other companies became subject to anti-trust

suits, and, for the first time, the agency required the cigarette industry to print cigarette cartridge

warning labels (McCarry 1972).

The Center continued to publish reports throughout the late sixties and seventies on water

and air pollution, mine safety, nutrition, nursing homes, auto safety, banking, and land use. In

"The Chemical Feast," a grim 1970 report by the Ralph Nader Student Project on Food

Protection and the Food and Drug Administration, the authors detail how the students found

"shocking disarray and appalling failure" within the FDA in matters related to food safety

(Turner 1970, 2). To obtain these insights, student researchers examined more than ten thousand

documents from the FDA, in conjunction with in-depth interviews of agency staff. Interviewees often contradicted the account of their actions documented in official records; the documents provided evidence that administration policy routinely relaxed consumer labeling and ignored studies demonstrating harmful food products and chemical additives by companies such as Coca Cola and Gerber and within the poultry industry.

The Center's work relied on FOIA in the process of its investigations. Nader expressed the Center's reliance on FOIA in a 1970 essay about the law's ongoing flaws. In the piece, Nader castigates the "corporate favoritism" evidenced in the biased way regulatory agencies stonewalled information requested by students while offering the same information to the industries and trade associations that they were charged with regulating (12). Government documents found their way to public view only months or years after they had already circulated among industry insiders. FOIA should have helped citizens counteract this favoritism, but by 1970, FOIA still wasn't working. Citing FOIA's exemptions, agencies would "convert these congressional limitations into administrative loopholes" (Turner 1970). In his exasperated report, Nader lists the ongoing denials sent to 100 students he organized to make requests on a range of documents on matters concerning environmental and human health, consumer safety, and civil rights. The Labor Department appeared to protect industry by stonewalling evidence of violations of safety standards; the Department of Agriculture would not release records from its advisory groups that could illustrate the extent that food safety policy is shaped by private members. The National Safety Bureau denied the existence of documents it had already circulated to General Motors. Meanwhile, individual citizens, he pointed out, often do not have the financial means to fight this resistance in courts (Nader 1970).

Other Center reports published years later demonstrate that the problems continued. In the Center's 1974 "Citizens Manual on Nuclear Energy," the authors explain that the Atomic Energy Commission frequently withheld documents regarding public safety information, citing the FOIA exemption barring trade secrets and internal memoranda from disclosure (Ignatius and Claybrook, 104). In *Working on the System*, a manual developed to describe how citizens can directly participate in the administrative branch of government, the authors write that the act's "exemptions are so vague that almost anything can be placed within them" (Michael 1974, 16).

The Center's research efforts contributed evidence to Congress that FOIA needed amending. In 1972, Congress held hearings with representatives about their frustrations after repeatedly being denied information by executive departments on matters of foreign relations and budgets (United States Congress 1972). In 1974, with the Watergate investigations as backdrop, a set of amendments easily passed in Congress over a veto by President Gerald Ford.[8] The amendments addressed ongoing inaction by agencies, requiring them to reply within ten days and made copying fees uniform. The Senate also relaxed provisions of FOIA regarding trade secrets and internal memoranda and allowed judicial review of purportedly classified information, placing the arbitration of classification in the hands of the judiciary, not the agencies themselves (Ignatius and Claybrook 1974).[9]

FOIA would be amended by Congress five more times before Obama's 2013 Directive on machine-readable data; the law would also fall subject to the political winds of presidential administrations as they alternately restricted and liberalized records releases through various

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[8] Antonin Scalia, then a young professor at the University of Chicago, characterized FOIA negatively as "the Taj Mahal of the Doctrine of Unanticipated Consequences, the Sistine Chapel of Cost-Benefit Analysis Ignored" (Talbot 2005).

[9] The latter change was prompted in part when the EPA denied congressional requests to view documents on underground nuclear tests at Amchitka Island off Alaska's coast (*EPA v. Mink*, 410 U.S. 73, 1973).

executive directives. What is important here is that a policy change around government information access reflected the country's shifting political and cultural understandings of what open government entailed. FOIA also created new repertoires of democratic participation and resistance, exemplified by the Center for Responsive Law. This type of citizen participation was often adversarial – it was led by citizen "watch dogs," the press, and advocacy groups that saw their role as a check on unscrupulous power by government, the military, and industry. The language used by FOIA's supporters in the press, civil society, and Congress consistently reflected a progressive atmosphere that championed the public interest over vested power. Although FOIA was also an instrument of the private sector, it neither originated from nor strengthened business interests alone. FOIA addressed the asymmetry of power between citizen overseers and the functionaries who carry out government responsibilities, allowing citizens a means to intervene in complicated administrative activities concerning chemicals, dams, streets, food safety, and air quality.

With computerization in the eighties, the concept of open government evolved again to confront new policies around electronic databases. To demonstrate these transformations, I turn next to the years of the Reagan administration, which saw the first law pertaining to electronic records, the Paperwork Reduction Act (PRA), along with the first, public, electronic-only government database, the Toxic Release Inventory (TRI) of 1986. While the TRI is an example of changing norms of openness in the face of technological transformations and new environmental risks, it nonetheless falls in line with the monitorial, confrontational understanding of openness embodied in the work of Nader's Raiders. The PRA, in contrast, introduced an understanding of open government that pitted it against the *economic* valuation of

government information. During this decade, at least, the rhetoric of open government assumes its incompatibility with private enterprise.

The Economic Value of Government Information

During the 1908s, government documentation practices and bureaucratic transactions swiftly computerized, transforming an agency's means of gathering and processing information, as well as the public's access to records. State and federal courts began to link up databases. In many cases government efforts outpaced the private market; the National Institute of Health, for example, launched the Medical Literature Analysis and Retrieval System (MEDLAR) in 1964, creating "the first large-scale, computer-based retrospective search service available to the public" (U.S. National Library of Medicine). Consumer habits were changing as well; by 1984, more than 16 million homes had computers (United States Congress 1985).

Technological change was not an inexorable transformation; rather, it was spurred in part by policy. The Reagan administration's 1980 Paperwork Reduction Act mandated that agencies reduce the burden of paperwork through electronic records systems that would minimize the burden and costs of collecting paperwork on citizens and businesses. Agencies were to use electronic processing to improve services, increase productivity, and make internal management more streamlined. The act, however, said little about how executive agencies should disseminate electronic information to the public (Sprehe 1987). Indeed, according to information access advocates, the Reagan administration did not see information delivery to the public as a core mission of agencies. As Jamie Love, director of the Taxpayer Assets Project, put it, "the Reagan/Bush administrations, often without much opposition from a compliant Congress, vastly restricted the ability of federal agencies to provide the types of services that would exploit

modern computer technologies for the benefit of citizens," thanks to a "rigid ideological faith in private markets" (1993, 245–246). McDermott, a public access scholar, argues that the act was less attuned to the public than it was to government efficiency and productivity; as a result, the act reflected "a political, economic, and social philosophy that considered information an economic resource, rather than a public good" (36).

Instead, the APA reinforced the Reagan administration's faith in a new information industry based on structured information. Beginning in the 1970s, statistical data became an independent commodity to be bought and sold (Starr and Corson 1986). These assets included online bibliographic systems important for scientific and technological research; statistics based on surveys, censuses, mailing lists, and credit information; and television ratings. Computerization, for instance, made possible the rise of statistical forecasting and profiles of entire sectors' financial health, derived from the electronic storage of credit information that had formerly been analyzed in written reports. One of the largest private registers at the time, Donnelly Marketing, had names and addresses of 87 percent of Americans (ibid.).

Indeed, a 1985 set of guidelines for the act, the Circular A-l 30 called "The Management of Federal Information Resources," made explicit the economic importance of government information to commercial information vendors. The circular encouraged agencies to privatize their information services and to use caution when considering whether to disseminate information proactively to the public, particularly if it competed with the private sector. The circular mandated that "maximum feasible reliance" be placed on the private sector to disseminate public information and suggested those costs be recovered through user fees.

According to Love, the PRA was a victory for the Information Industry Association (IIA), which had lobbied Congress to privatize public information dissemination since 1975

(1992). Said a representative from the IIA in 1985:

> A number of IIA member companies meet market needs for government information by
> repackaging or otherwise enhancing raw government information. The result is a
> diversity and specificity of information sources to meet the needs of many different users
> which could only arise through marketplace give-and-take between suppliers and users.
> This so-called value-added function has been especially useful in meeting the needs of
> the financial and securities industry (United States Congress 1985, 70).

To be clear, value-added services for government information had had a place in the private
marketplace well before computerization. NOAA began releasing weather data in the 1970s,
allowing a commercial weather forecasting sector to emerge. The financial sector had long taken
advantage of SEC information thanks to free market-oriented disclosure policies; most
importantly, the Securities Act of 1933 that Congress put in effect after the Great Depression. As
a consequence, the financial industry used this public information to design commercial services,
including those sold by financial institutions such as Dow Jones and Standard and Poor.[10] For the
financial industry, therefore, open government entailed non-restrictive information policies that
allowed companies to add value to public information and then make it widely available –
openness was the lack of a government monopoly on information services. *Electronic*
government records, however, would be revolutionary, according to a document put forward by
the IIA at a hearing of the U.S. Congress in 1985,

> Like the Renaissance period, which documented what had been achieved up to that time
> and thus spurred an outpouring of new achievement, today's information technologies

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[10] Another example: The Federal Statistical Directory, which cost $5, stopped being printed by the Government
Printing Office and became available only through a private contractor who made the text available for $14.95. (p.
127).

have given us the means to capture and manipulate the vastness and complexity of

information resources to lead us to a renaissance-like outpouring of new human

capabilities. The information technologies not only give us the ability to record and store

vast quantities of information equivalents but also enable us to manipulate these and to

test our plans and forecasts in the process. (Zurkowski 1985, 92)

The new information policy by the Reagan administration took this position as well. The OMB

Circular, for instance, specifically suggested that agencies encourage "value-added" resellers of

its information. The concept of "value-added information" gave rise to the understanding of

electronic government records as "electronic raw data" that, when delivered in bulk, could

accrue value if enhanced through additional layers of software by individuals or businesses (U.

S. Congress 1985, 82). Electronic records could be enhanced through indexes, abstracts, retrieval

or search software, full-text search, images, and reformatting in ways that permit new types of

information to be created. According to the 1985 hearing, "In an electronic environment, the

extent of the deliverables is far from finite; information in electronic form can be formatted and

reformatted in countless ways to meet needs never conceptualized at the inauguration of the

system" (ibid., 84). In electronic form, government information would provide value-added

services that the government might never foresee.

This understanding as a consequence gave rise to several federal contracts with private

sector software companies. For example, the Department of Justice's (DOJ) JURIS system, an

electronic database of federal legal information, remained unavailable to the public due to a

contract that licensed case law and other legal information in digital formats to West Publishing.

The contract prohibited the DOJ itself from providing public access to this data; hence, the

department denied FOIA requests to the entire JURIS database. Similarly, the Federal Maritime

Commission's Automated Tariff Filing and Information System, an electronic records system

that began to be developed in 1983, denied the public remote Internet access to its files

throughout the decade, requiring them to pay for electronic retrieval through a commercial

company owned by Knight Ridder. To find the Bureau of Labor Statistics' employment statistics

on the Internet, a person needed to open a monthly $100 account with one of two commercial

vendors. To access government LANDSAT images, the public had to pay a General

Motors/General Electric subsidiary (Love 1992). Furthermore, many agencies, including the

USDA, FDA, CFTC, and Department of State, relied on high-priced commercial Bulletin Board

Services to disseminate their information to the public rather than publish the information in-

house (Ibid). A 1986 law, the Federal Technology Transfer Act, helped the private sector further

by allowing the government to transfer commercial rights of federally funded research to private

firms. Once vendors gained exclusive access to federal government information, they could

claim copyright based on their unique compilation or arrangement of the data, grammatical

corrections, or the copyright of page numbers, a tactic used by West Publishing (Love 1995).

Agencies, in essence, often suboptimized their electronic records systems to promote a

private sector industry based around value-added services for public information. Agencies also

no longer felt beholden to deposit electronic records at the Depository Library Program,

traditionally the public's resource for government information products. As one alarmed

congressman described the program's waning in a 1990 hearing:

> This historic shift from a policy of pricing information at reproduction costs to the pricing
>
> of information according to willingness to pay, and the weakening of the Depository
>
> Library Program, has disastrous consequences for society. It represents a rejection of the
>
> principle of universal access to federal information and it will lead to inefficient

dissemination of information that has important social, economic, and scientific value

(United States Congress 1991).

Significantly during this decade, policymakers considered "wholesale" government data – that is, data in bulk without value-added resources – outside the public's interest. The methods for offering in bulk at that time were in the formats of tapes, optical disk, and expensive dial-up or in public reference rooms around the country. In fact, policymakers saw the release of information wholesale as *counter* to FOIA, because it increased "the frequency with which agencies decline access altogether, by forcing requesters to take data in gross in forms usable only by the technologically sophisticated" (Perritt 1989, 290). Adding value to public information was not seen as something a private citizen would undertake. The debate at the time rested instead on whether government agencies should undergo sophisticated statistical analyses or database schemes to retrieve information for the public themselves, as information access advocates argued for *or* whether a free market model should prevail.

Writing in 1989, Henry Perritt, a law professor who crafted administrative policy on electronic records, claimed that some agencies were not equipped to make their information accessible in user-friendly formats. Until every citizen has "a microcomputer and modem," Perritt wrote pragmatically, "transitional arrangements will be necessary to ensure that electronic transition and release do not prejudice major segments of the population." (261) In general, he believed agencies were not expected to act as monopoly publishers of their internal records if the private sector could deliver the information more cost effectively. The parties that obtain government information wholesale are always, in his words, "private contractors" and "competitors" (306). Because capital costs at that point were so high, thus requiring user fees to recoup investments, Perritt never considered an alternative option in which civic *and* market

interests might be met by agencies making wholesale information freely available.

Finally, during this time period, some policymakers understood the role of format standards to make information available to the wider audience at little cost. In an article written as the eighties ended, Perrit calls on agencies to "release raw electronic information in whatever formats they maintain it, with formats selectable by the requester," as well as the source code of their database management systems and search tools (1990, 328). Perritt urged agencies not to deny the source code to citizens simply because it would disturb the private market for typographic features and indexes. Perritt also called for standards that maximize information exchange, citing the American National Standards Institute standards on Electronic Business Data Interchange and the International Standards Organization's Standard Generalized Markup Language (SGML) (ibid.). While the author foresaw the importance of format in determining how widely electronic information could circulate, he did not yet see the central, political importance it would accrue in the open data movement.

The eighties came to a close, then, with the struggle for open government repositioned away from the *legality* of the public's right to access to records, to questioning the artificial scarcity driven by copyright incentives and monopolistic contracts. The assumption remained in place that the government's release of electronic public records, while having clear civic value, was not always economically feasible and remained incompatible with the economic interests of the private sector. Early open data projects would emerge as critiques of this position and proofs of concept to the contrary. Opening government databases online would be championed as serving both public and private sector parties that saw the market value in openness.

One project from the eighties departs from these policy debates. The decade saw the first public electronic-only government database founded for the primary purpose of providing public

transparency around environmental hazards. This database – the TRI – provides a case study for a new type of civil sector action that foreshadows the open data movement: value-adding government information for *civic* rather than economic ends. The TRI is likely the earliest example of an electronic government database devoted to the goals of a monitory public.

The Toxic Release Inventory

On the night of December 2, 1984, a backflow of water leaked into a tank in a Union Carbide pesticide factory in Bhopal, India, and released a plume of toxic methyl isocyanate. The gas cloud dispersed, traveling down to the nearby shantytowns and instantly killing and maiming thousands of residents (Sarokin and Schulkin 1991). In the days that followed, local food sources diminished, the government declared fishing in nearby rivers prohibited, trees dropped their leaves, and overwhelmed hospitals saw their supplies dwindle. Citizens had to bury the thousands of animal carcasses scattered around streets and fields, as well as tend to the increasing toll of human dead. Throughout the crisis, the government of India refused to make information about the disaster public (Eckerman 2005).

In the United States, this atrocity became linked to a series of local hazardous waste incidents that took place from 1980 to 1985, including a gas leak of noxious chemicals by another Union Carbide plant in West Virginia in 1985. Some 7,000 total accidents occurred, and 140 people died over this period. In response to these catastrophes, David Sarokin and Warren Muir, both of whom worked for the environmental organization Inform, Inc., published an op-ed in the *Gainesville Sun* called "Too Little Toxic Waste Data" (1985). They called for a "nation-wide survey identifying chemical uses and discharges" so that the government "could set realistic priorities for controlling and reducing these wastes" (1985). The authors pointed out that

the federal government had never, up to that point, collected useful information on harmful

chemical toxins released by industry, depriving the country of any accounting measures for the

nation's toxic emissions. The article became a mouthpiece for the vocal Right to Know

movement that rose to protest the lack of political oversight of the chemical industry.

The Right to Know movement should be situated within a decades-long struggle to bring

transparency to corporate practices affecting the environment. The movement first took root in

the sixties around the same time that consumer safety advocates called for disclosure laws on

food packaging as a form of industry regulation. During this decade, the environment took hold

conceptually as a distinct phenomenon embroiled in mutual, potentially disastrous effect with

humans.[11] Rachel Carson warned in 1962 that there was "still very limited awareness of the

nature of the threat" of chemicals "in an era dominated by industry" and concluded the second

chapter of *Silent Spring* with a quote from French biologist Jean Rostand: "The obligation to

endure gives us a right to know" (1962, 2002, 13).

A series of reforms throughout the sixties set the stage for more corporate accountability,

including the Clean Water Act of 1960, the Clean Air amendments three years later, and the

Solid Waste Disposal Act of 1965. Civil society responded to growing public awareness by

founding the World Wildlife Fund in 1961, the Environmental Defense Fund in 1967, the

Natural Resources Defense Council (NRDC) in 1969. The first Earth Day took place in 1970 to

enormous success, the same year that Nixon founded the Environmental Protection Agency.

That the public should be actively involved in environmental regulatory matters – and not

just benefit from them – was first clearly articulated in 1969 with the passage of the National

Environmental Policy Act. NEPA required agencies to disclose the potential results of any action

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[11] Lynton Caldwell was among the first to put a name to this phenomenon in his essay, "Environment: A New Focus for Public Policy," published in 1963.

it took through Environmental Impact Statements (Schudson 211). EIS opened evaluations of the effects of agency actions on the environment to public comment and review, and this mechanism became the primary means to enforce federal responsibility to the environment. NEPA also gave citizens the tools to sue the government for infractions and guaranteed the release of " timely public information" and public hearings (Executive Order 11514).[12] These disclosure policies, in turn, gave rise to new forms of civic action by environmental groups that leveraged them in court (Thompson 2000).

The Toxic Substances Control Act of 1976 was the first law to mandate that the government collect toxic substances data, though its inventory was not standardized in any fashion. Companies reporting were not required to distinguish toxic from non-toxic chemicals, hazards were reported in vague terms, and chemicals were lumped into incongruous, arbitrary categories, making the data of little value (Sarokin and Muir 1985). The Sarokin and Muir piece called attention to the EPA's haphazard monitoring of chemical manufacturers and argued for a better accounting mechanism.

In response to the rising public outcry, Congress passed the Emergency Planning and Community Right-to-Know Act of 1986. The Act provisioned an innovative disclosure tool: the TRI, the first public-facing online government database:

> The Administrator shall establish and maintain in a computer database a national toxic
> chemical inventory based on data submitted to the Administrator under this Section. The
> Administrator shall make these data accessible by computer telecommunication and by
> other means to any person on a cost reimbursable basis (100 Stat. 1613).

From the start, the TRI was envisioned as a way for communities to inject their concerns – either

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[12] Schudson finds evidence to attribute the NEPA language that makes EISs public to Senator Gaylord Nelson, who was also one of the primary instigators of the first Earth Day (2015, 215).

by mindful consumption or pressure on state-level standards-setting – into policies normally created in an opaque fashion by the government and private industries (a state of affairs that Nader's Raiders documented in a running log. Many also saw the TRI, just as they saw the EPA generally, as an offset for the failures of the market, which gave private industry little incentive to disclose information on environmental pollution (Goldman 1990). As Perritt puts it, "The TRI's approach is unique. It reflects a disclosure-oriented regulatory strategy, as opposed to a command and control strategy" (1990, 216). TRI disclosure in this way brought a market orientation to regulation; that is, the information allowed people to put consumer pressure versus further government regulation on private industry.

The National Library of Medicine (NLM) created and administered the TRI database. When the TRI was released, few people had home computers, and there was little demand for electronic information beyond that from private business, lawyers, and interest groups (Perrit 1990). Early users from the environmental community immediately complained about how difficult it was to use, as well as its per hour connect fee and the requirement that users have a modem and NLM account. In 1989, Congressional witnesses, including the Association of Research Libraries (ARL) and American Library Association, expressed alarm that barriers to understanding the TRI data were too high and would thwart the agency's mission to broadly disseminate the information. Many in the librarian community were concerned that the repository required too much expertise to be used to any effect. In response, the EPA made the data available on microfiche to regional and local libraries and on magnetic tape to advocacy groups and the press. The General Accounting Office conducted a study that year to assess if the EPA's policies or practices prevented the public – most of whom didn't have PCs at the time – from accessing the online database. Though the GAO found no negative impact to support the

complaints, it noted that TOXNET was not very user-friendly for the average person. The study also uncovered that, at least in New York, there were no public requests to view the data at all (DeSanti 1991).

The TRI exemplifies the monitory culture enabled by a government statistical tool. How effective this form of disclosure may be, however, is a source of some controversy. Comparatively, the TRI is an indirect form of regulation. That is, unlike governmental oversight, which can be controversial, difficult, and time-consuming, consumer awareness regulates industry in a "least objectionable" method (Schudson 2015, 93; Khanna, et. al 1998).

Alternatively, proponents of TRI claim it enabled collective oversight and promised more direct involvement in setting policies. Sarokin and Schulkin argue that, while the TRI doesn't specify what should be done about pollution, it spotlights corporate malfeasance, thus potentially swaying public opinion and becoming a lever for greater citizen accountability (1991). When the data was first released, for instance, the NRDC, an agent in the environmental movement since 1970, published a report listing the corporate owners of facilities making the largest air emissions of carcinogenic materials (Hamilton 1995). The TRI had repercussions on the corporations' economic activity, as their stock returns took a statistically significant dip when news articles reported on it, affecting investor expectations (Hamilton 1991). Another study found that TRI reports induced firms to reduce release of on-site chemicals, raising the number of off-site transfers (Gamper-Rabindran 2006). Whether the TRI data is a "real" reflection of chemical toxin output, due to the subjective nature of its reporting instrument, it still has a durability to it that can impact the industry it sets out to monitor – that is, the TRI formalization as an official statistic had a real effect on the world (Desroseries 2002).

Importantly, the TRI provides an example of how openness is redefined in light of

technological developments: It was open in terms of government transparency but also with

regards to technological access and its ability to circulate and be recontextualized. Importantly,

the TRI enabled a type of civic engagement through data analysis and reuse. Charles Elkins, then

director of the Office of Toxic Substances, describes the TRI's impact on how the EPA thought

about data:

> Title III represents a shift from how we used to operate. In the old days, EPA analysts
>
> would collect data and analyze it. When they had something to say about it, they would
>
> make the data available to the public in some aggregate form, and tell the public what the
>
> government was going to do as a result of the data . . . Title III really turns this process
>
> upside down. Under Sec. 313, EPA collects the data, puts it up on the computer and
>
> people can analyze it any way they want to (Jobe 1999).

TRI supporters also realized that wholesale government information had little utility unless it

could be enhanced with digestible formatting and contextualization. Writing in 1992, Benjamin

Goldman, an environmental activist, argued that data alone offers little to the public. He

critiqued the government TOXNET database's lack of mapping tools, its text-only search, and

lack of any contextualization to the data, such as permit and standards information or other

databases. By offering some qualitative explanation for the data, Goldman believed users could

better understand why the index was shaped the way it was, such as its use of pounds as the only

measurement rather than levels of toxicity. Data alone "shifts costs to users" by requiring them to

use their own computers and costly statistical and mapping software (320, 1992). Goldman

recommended that the database include a feature to solicit feedback from users, harnessing their

collective ability to report more errors and suggest fixes. In Goldman's estimation, the

contextualization of data and its format is intimately tied to a person's ability to turn the TRI data

into knowledge and action.

As a result, civic groups took on the role of providing user-friendly interfaces for TRI data. When users demanded the EPA create a menu as an information aid to the unstructured data, the EPA refused to pay the $25,000 price. To help provide this service, the nonprofit group OMB Watch, with EPA support, started the RTK Net (Right-to-Know Network), a free bulletin board that provided access to TRI that began operating in 1989. The group also began an email service and bulletin board for community concerns. Through its standardized formats, TRK Net could be linked to other databases through geographic coordinates, industrial classification SIC codes, census data, and EPA region centroids; in this way the TRI data linked to the EPA's Permit Compliance System and the New Jersey Health Fact Sheet to show a chemical's relation to health effects (Presti and O'Brien 1997). A year later, a CD-ROM version of TRI became available, and in 1991, it went live on the web (Jobe 1999).[13] In the case of the TRI, we find a very early example of a public government database supplying content for nongovernment institutions to contextualize through their own interfaces, making way for a civic activity that became common practice within the open data movement.

While the TRI demonstrated that civic groups could enhance wholesale government data, the debate over the FOIA and the private sector's role in adding value to government information continued into the nineties. Among the loudest advocates for greater transparency and access were government librarians at the GPO depository libraries, the American Library Association, and the Taxpayer Asset Project, all of whom pressured Congress to legislate in favor of broad online access to electronic records (Love 1993b, McDermott 2008). The SEC's EDGAR database provides a case study for the contours of this controversy as it played out in the early

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[13] In its current state on the EPA's TRI page, the data now come with several tools created by government agencies for access and analysis, including the TRI Explorer, a data element search tool, and the NLM's TOXMAP.

nineties, one whose unfolding had direct effect on the open data movement more than a decade later.

Open Government Meets Open Systems

The Taxpayer's Assets Project (TAP), a subcommittee for Nader's Center, focused on issues related to the management and sale of government assets (Love 1994). TAP was also among the few civil society groups to monitor government information policy as it became increasingly technical and esoteric. The complexity seemed deliberate; to TAP's director, Jamie Love, the government's highly fragmented, decentralized information systems appeared to be a response to lobbying by the Industry Information Association, which did not want the government to compete with its members by organizing information into one easily accessible database (1995). In response, Love began working with the Government Printing Office to craft legislation to create a "one-stop shopping for federal data-bases," a centralized location for the public to access core federal information that would charge no more than the cost of dissemination, per the FOIA (Love 1994, 6).[14]

Love became a particularly outspoken opponent of the SEC's electronic database, called EDGAR (Electronic Data Gathering, Analysis, and Retrieval). The SEC first began piloting EDGAR in 1983 in an attempt to reduce the paper load of company filings – 9,500 companies were submitting at that time, amounting to over six million pages of paper each year (United States Congress 1985). These documents included hundreds of public reports filed by private corporations, brokers, investment advisors, and other entities and provided the names and salaries of corporate officers and board members, as well as other matters such as trading by

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[14] Love himself had a technical background: Before joining the Center, he worked as an economist who developed database services for financial investors.

corporate insiders, pending civil or criminal actions, and company balance sheet and income statements. The system could respond to requests for information more efficiently by producing microfiche rather than paper copies, and businesses could file using specific formats and data tagging as well as pay fees to the same system. The changes to the financial industry itself were expected to be "revolutionary," allowing "around the clock trading" and investment decisions built on almost instant access to daily stock fluctuations (United States Congress 1985, 40). However, the project came with a hefty economic price tag estimated at more than $50 million.

To launch the database, the SEC first contracted with a private company to design a pilot of the system. After paying for this pilot stage, SEC kept the rights to the database but planned to hand off the high capital costs of implementing the operational program to a contractor that would then recoup its investment by charging user fees for basic access and any value-added services.[15] There was initial controversy as critics warned that the contract would privatize public information and create inequitable access among interested publics by placing the data in the hands of a single vendor. (United States Congress 1985)

In 1989, the SEC moved into the implementation phase with its new contractor, Mead Data Central, Inc. While the SEC itself handled receipt and review of companies' electronic filings, Mead took charge of their storage and dissemination and created a search-and-retrieval system for the public. In this manner, the public SEC data existed on a private server in Dayton, Ohio, controlled and owned by Mead. The SEC itself only maintained official microfiche copies of these electronic records, depriving it of possessing machine-readable copies. The resulting project created a tiered system of access: Citizen requests for EDGAR information received a paper copy from the official microfiche, itself a copy of the electronic filings; this could take

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[15] Such contracting was not new. For seventeen years before EDGAR, the SEC contracted with a private company to provide microfiche and paper copies of FEC documents (U.S. Congress, 1985).

days or weeks to receive, with recipients charged per page ($20–$30 per filing). Meanwhile, financial companies could subscribe for $150,000 a year to a bulk sales program that would allow them online access to the electronic files. Or, for $75,000 a year, subscribers would receive magnetic tapes through the mail. Subscribers thus had quicker access than did nonsubscribers. (Love 1993, Kambil and Ginsberg 1998)

Love took issue with how the government encouraged a private market out of its public documents and research. As mentioned, this private market was not new; the SEC had to make all filings by businesses in the United States available upon public request. Yet clearly the arrangement between the SEC and its contractor was not in the public interest – without electronic copies of its own information, the SEC could not respond to the FOIA requests for information in that format; it meanwhile denied the public copies of the electronic database so that the contractor could continue to profit from sales. The contract also stipulated that the contractor only sell electronic tapes for the day's filings. If someone wanted SEC information in electronic form, he or she was effectively blocked from receiving it as a cumulative database, discouraging competition by preventing the person from entering the online market for SEC filings. In sum, as Love puts it,

> U.S. taxpayers will spend more than $68 million over eight years to establish and operate a computer information system to which few Americans will have access. The public is being asked to invest in a system that will primarily benefit large database vendors and large financial institutions. The electronic records of the EDGAR system will be controlled by a private company that has a stake in limiting public access, and the SEC has taken extraordinary steps to frustrate the Freedom of Information Act (1993, 70).

In 1993, EDGAR found another critic in a Washington-based technology author, "computer

whiz" and public domain advocate, Carl Malamud (Browning 2002, 38). In the years prior, his nonprofit, Internet Multicasting Services (now called Public.Resources.Org), had been engrossed in a campaign to dismantle copyright around the documentation of Internet standards. Writing in 1990, Malamud argued that documentation of Internet protocols belonged in the public domain, as was the case with TCP/IP, but not the Open Systems Interconnection or OSI. Because TCP/IP documentation was available to the public, students and businesses were able to familiarize themselves with the standard and develop better software and hardware dependent on it, further establishing its success. OSI, in contrast, required payment to the American National Standards Institute, the copyright owner; it made standards documentation available only in paper form, with their reproduction prohibited. Malamud exposed the deep irony that standards for an international open system could be copyrighted and kept offline. "Standards about networks should be accessible on networks" both for research purposes and for professionals wanting to code (Malamud 1991). In 1991, he worked with the International Telecommunication Union to place its standards-setting documents online for a free two-month period. (They were not available online again until 2007).

Malamud turned his energy to EDGAR soon after these lobbying experiments – not because of an early interest in uncovering government information but because of a technical challenge raised at a congressional hearing. In 1993, Malamud delivered a speech about the Internet to the U.S. House of Representatives. Chairman Edward J. Markey explained the subcommittee also oversaw the Securities and Exchange Commission and that Jamie Love had asked why SEC filings were not online. The SEC had responded that posting EDGAR's filings online was not technically possible and that the filings wouldn't find an audience beyond Wall Street (or "fatcats," as Malamud put it). To Malamud, such conditions – the SEC's contract with

a commercial firm – created another hurdle to putting information in the public domain. According to to Public.Resources.Org's website, "the SEC had drunk the value-added koolaid popular among beltway bandits of the era" (ibid.).

Both Love's and Malamud's language at the time is important for our understanding of how the rhetoric around opening government information changed. In the eighties, making records available to the public entailed either extensive government capital or exclusive licenses with private companies that foreclosed free or easy access. In discussions about EDGAR, in contrast, disclosure became linked with unforeseen market opportunities. First, though Malamud's values were rooted in Internet culture and Love's in a government watchdog group, both spoke of the potential for private sector innovation using government data in electronic form. Speaking at the SEC's EDGAR Technology Conference in August of 1995, Love points out that the firms that could create the most useful interfaces for government data were not given consideration in the original conception of the EDGAR system:

> I can say from our experience in the legal market that the important value added sector
> that is left out when you have poor government management on records are the most
> innovative companies. The companies that cannot enter, for example, the legal market are
> the companies that provide artificial intelligence front ends, that provide novel new ways
> of searching documents and combining information. (Malamud 1995)

That wholesale government databases on the Internet would help the business sector was also a selling point by Malamud to the SEC at its EDGAR Conference: "There is a tremendous market for extracting value out of this information, and I believe by putting the base data out there we are going to encourage a retail information industry" (Malamud 1995). That same year, computer companies also began to see the value in open government information, including America

Online and Knowledge Systems, whose representatives spoke to the Markey commission in the House to advocate for free online access to EDGAR – these new companies were also interested in an open market of wholesale government information on the Internet (Browning 2002).

Second, providing information in bulk, according to Malamud, offered an important civic tool, a viewpoint that countered Perritt's argument that it would hamper citizen access. Malamud argued for the principle of openness on behalf of other potential users, whether citizen action groups, universities, or the press, who take on the role of innovating on or interpreting arcana found in government documents in a way useable to a wider public. As an article in the library-focused journal *Against the Grain*, put it, "Malamud's over-arching goal is to release government information into the open so that others can build more advanced interfaces and facilitate better access to the workings of our governments" (Cornwall and Jacobs 2009, 43). The users could be anyone, as Malamud made clear in a letter he wrote to Al Gore complaining of his ongoing entreaties to the U.S. patent office to put patents online:

> free on-line access does not compete with the retail information providers. Rather, it reaches out to new groups of users, including college students, senior citizens, and young researchers. By assuring equal access to all for the basic data, we showed that a college student can take the Edgar [sic] data, figure out a new way to add value to the data, and set up shop and as a small business on the information highway. Previously, when the raw data cost $150,000 per year, the artificially high barriers to entry made this kind of rapid innovation impossible (1998).

Love agreed that "grassroots data users" should be involved in government information decisions during initial policy discussions and that software developers, librarians, and small tech businesses would have more creative ideas than interest groups (Love 1995).

After his conversation with Markey, Malamud worked with NYU's Stern Business School under the auspices of a $600,000 grant from the National Science Foundation. The team piloted a cost-effective online version of EDGAR, complete with public domain network-based tools that added searching, an anonymous FTP, and email. The website went live to the public in the fall of 1993 and immediately generated interest, with an average of 16,700 hits a day. NYU and Malamud oversaw the project for two years, then asked to hand it over to the SEC (*New York Times* 1995). After much handwringing over the potential costs and after rejecting several more offers from private companies to take over the effort, the SEC began operating EDGAR itself in 1995.

That same year, the Clinton administration passed a revision of the Paperwork Reduction Act that mentions data explicitly: Agencies that offer "public information maintained in electronic format" are to provide "timely and equitable access to the underlying data (in whole or in part)," effectively ending what Patrice McDermott calls "sweetheart deals" with private sector companies that had been given exclusive access during the Reagan and Bush administrations (2008, 41). (Also that year, the Government Information Locator Services tried to establish standards that all government agencies could use to publish their electronic documents and data for interagency sharing and public access. "The outcome should have been an electronic and interoperable system of uniformly classifying and cataloging agency information, so that building efficient and effective search engines for government information could become more than a pipe dream" (2008, 44). The policy failed, but it anticipated data.gov by eleven years.)

Malamud's interpretation of openness reflects his technical background. He reinterpreted openness in light of his practice with open systems (which also influenced Public.Resources.Org's slogan: "open source America's operating system"). Malamud argued

that the Internet developed and thrived due to a standard that remained in the public domain. When standards were closed – as was the case with the ultimately failed OSI – participation, and consequently innovation in software and services, wilted. The analogy could be grafted onto government documents: Keeping them unnecessarily locked behind paywalls by secondary private contractors prevented a wider audience from accessing the records and building knowledge upon them; it stifled creativity that could contribute value to the data.

For both Love and Malamud, the openness of government documents no longer concerned the legality of disclosure. With FOIA, the primary struggle in defining how open government information was – and remains – the lawfulness of a document's release and whether any of the nine exemptions apply to a request for documents. With the increase of information in electronic form, openness now *also* described technical accessibility and formatting, adequate documentation, and software. Citizen access to government information became equally a legal issue and a matter of format standardization, low costs, and easy points of online access. Technical openness allowed an entrepreneurial culture to thrive alongside a monitory culture. These two motives – openness as government disclosure and openness as open systems enabling unforeseen "value-added services" through entrepreneurship – both became strongly embedded in the concepts driving open data policies and the open data movement. Schrock calls this "the computational shift of open government data": the preemptive "move from governments fulfilling information requests to automatically releasing data to fulfill a range of more speculative uses" (2016, 589).

While work done by Internet Multicasting Services was not called, at the time, open data, the release of EDGAR is cited as an important precedent for open data efforts (Tauberer 2010, Robinson et al. 2009). Other prototypes for open data followed a formula: They were often

designed by programmers or civic groups interested in marrying ideals of open systems and open source software – specifically open licenses, documentation, and formats – with access to public records. EDGAR became a precedent for additional efforts by Malamud to liberate government information from private contractors or sluggish agencies; these included a database of U.S. patents in 1998 and, more notoriously, the PACER (Public Access to Court Electronic Records) database of government law in 2008. Malamud objected to PACER for charging fees for each document on its online database and enlisted other supporters to download the records from terminals at public library that had free PACER trials. Aaron Swartz, an open Internet activist, wound up downloading twenty percent of the database and giving it back to Public.Resources.Org to distribute.

Some early open data project carried on the work of monitory publics, putting transparency at the service of spotlighting consumer safety, corporate accountability, or government corruption. For example, OpenSecrets, created by the Center for Responsive Politics, cleans and publishes campaign contribution data from the Federal Election Commission to enable journalists and the public to track financial interests during elections. GovTrack.us, built in 2004 by Joshua Tauberer, operates as one of the most widely used daily calendars of U.S. congressional activities. In 2009, the Sunlight Foundation built a searchable database of federal filings of foreign agents who lobby Congress members in the United States. These projects created transparency around government data through visualizations, searchable interfaces, and APIs.

Yet also underlying these efforts is the iterative logic of open source software culture: Public documents that are open by law should be available using the open protocols of the Internet, making the records open in a technical sense as well (Kelty 2010). Indeed, the interface

that makes these documents available should also make its source code open, allowing others to further refine its services. Extending that logic, documentation of the construction of the project, as well as its costs and personnel, should also be available. The influence of open source became solidified in the "eight principles of open data" written by the Open Government Working Group in 2007, which, as mentioned, has now become enshrined in federal and local policies. The principles stipulate that data must be in open, structured, machine-processable formats with non-discriminatory licenses. Implicit in the open source spirit, as critics have pointed out, is a free market ethos that encourages private services built on top of public data (analogous to open source code that underlies private software) (Slee 2012; Tkacz 2013; Bates 2012). Value-added services are no longer monopolistic parasites of public goods; they complement the goals of openness.

Malamud himself became directly involved in the civic effort to define and advocate for open data policies. This effort was a marriage of transparency activists, open source advocates and Silicon Valley notables, all worlds that Malamud straddled. He ran a weekly, Internet-based radio program, Internet Talk Radio,[16] sponsored by O'Reilly & Associates, a publisher of books on Internet technology and software and a champion of private sector open data innovation, and Sun Microsystems, an early Silicon Valley company that sold computer hardware and software and developed the Unix operating system and Java programming language (and where Eric Schmidt worked before steering Google). When Malamud gave his presentation of the Internet to the U.S. House of Representatives, he did so on behalf of Sun Microsystems (Malamud, n.d.). He ultimately joined forces with other technologists from Silicon Valley to craft the widely used policies around open data as part of the Open Government Working Group.

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[16] He was also a contributor to the Network Working Group and co-authored a Request for Comments proposing a subdomain for remote printing gateways (Malamud & Rose, 1993).

Because proponents of open government now tout its civic and commercial functions, it is no surprise that other early open data projects entailed collaborations between city governments and private companies that embraced the democratization of data as a corporate strategy. Google has been the most successful at this approach. Indeed, as mentioned in the introduction, the first release of city data in a customized open format resulted from collaboration between Google and the City of Portland, Oregon. Open APIs by companies such as Facebook and Amazon encourage developers to "enrich the customer experience" for these companies' users, while the products industry has embraced "open innovation" by inviting customers to become "prosumers" and contribute to product development (Chopra 2014). Concurrently, as open data policies have spread, the adversarial, monitory nature of government information disclosure has transformed into relationships of collaboration and mutual support between private companies, open data advocates, and governments. As these projects unfold, the inequitable distribution of power that Nader and Right to Know advocates articulated is often no longer the primary concern. The focus lies as much on transparency as innovation and economic growth.

Conclusion: A More Benign Open Government

Open data's vision of open government, in effect, deemphasizes the function of transparency policy to expose structures of power. With the rise of the monitory culture, open government policies sought to redress power imbalances that became increasingly apparent during and after the Cold War, as citizens confronted burgeoning government administrations. Twentieth-century disclosure laws, including FOIA and the Emergency Planning and Community Right to Know Act, enabled citizen groups and watchdog organizations to provide checks on private industry

and executive agencies through avenues outside of electoral politics. The monitorial use of transparency laws continues in the twenty-first century, wielded in instances in which citizens, organizations, historians, and the press seek to expose or gain influence over covert, unlawful, or incompetent government and commercial activities.

In the rhetoric of open data, monitory struggles against monopolistic electronic information technologies that took place in the eighties today align with the free market values of innovation and entrepreneurship touted by Silicon Valley. Less a "monitory culture" in which citizens continue to pit themselves against secretive, monolithic bureaucracies and exploitative private industries, open data proponents seek mutual collaboration between citizens, companies, and governments. The conflation of these interests is clear in this blog post on Google's website:

> Open will win. It will win on the internet and will then cascade across many walks of life: the future of government is transparency. The future of commerce is information symmetry. The future of culture is freedom. The future of science and medicine is collaboration. The future of entertainment is participation. Each of these futures depends on an open internet ("The Meaning of Open" 2009).

This chapter has also attempted a more complex lineage of open data than other genealogies of the concept have put forward. Jamie Love's work for the Center of Responsive Law, as I have shown, is a thread running between the Center's inventive, monitory use of FOIA in the sixties and seventies and the benign, industry-friendly rhetoric that later came to ground open government data in the nineties. Likewise, one of the earliest prototypes for open government data, the TRI, had never been substantively situated in literature on open data. Many other facets of this history have also been left out, such as the influence of the concept of "smart cities" on

open data, particularly as it fueled the interest in releases government databases at the municipal level.

One of the goals in the following chapters is to show that the rhetoric of reconciliation between civic and private sector interests, grounded in part in the debates over EDGAR in the eighties and nineties and now prominent in open data discourse, serves to mask underlying contradictions carried over from these earlier debates. In the following chapters, I attempt to expose some of these contradictions as they have played out in the City of Los Angeles, first by examining in detail how open data is produced by city departments, then in chapter three, through open data's diffusion into the public sphere.

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Chapter Two: Transparency Work in the City of Los Angeles

> *Postmodern power includes the generation, control, collection, and storage of*
> *information and its virtually instantaneous transmission.*
>
> - Sheldon S. Wolin (1960, 2004)

In 2014, Waze, the Google-owned mobile phone navigation service, began a program called Connected Citizens that established data-sharing partnerships with several urban areas. In exchange for the app company's real-time traffic data drawn from users' mobile phones, municipalities provide Waze with public data on road conditions such as highway construction, road blocks for public events, and street maintenance. In some cases, Waze data is being integrated into its partners' city planning efforts. Rio de Janeiro, for example, uses the data to configure the deployment of traffic personnel, garbage truck routes, and the placement of traffic cameras, while Washington, D.C. deploys Waze data to track citizen-reported potholes (Bradley 2015).

The City of Los Angeles is not far behind. In April 2015, during his second annual State of the City address, Mayor Garcetti announced that his office had made a data-sharing agreement with Waze that would affect the company's 1.3 million local users. As a result, Los Angeles Waze users now receive data from the California Highway Patrol and the City of Los Angeles' Department of Public Works that identifies road closures, film shoots, accidents, hit-and-run incidents, and AMBER alerts (Office of Los Angeles Mayor Eric Garcetti 2015).

The data that provides Waze users with timely pop-ups on construction projects and road closures derives from records created by the Bureau of Engineering (BoE), a large, well-funded unit within the Department of Public Works. BoE is responsible for approving and managing

construction permits within the public right of way; to process these requests, the agency uses a web-based electronic submissions system. To become part of Waze's private interface, accessed by thousands of commuters in real-time, these City records must be formatted so that they can circulate outside of BoE's internal permit database. For city records to become tools that shape the traffic landscape, that is, they must become formatted as data. In his announcement, the mayor even tied the Waze partnership to the City's open data initiative: "This is exactly what our open data initiative is all about – going beyond information sharing to provide opportunities for our data to transform into tools to make people's lives safer and easier in very tangible ways" (ibid, n.p.).

The primary argument of this chapter is that the production of open data from city records constitutes, as much as it reveals, the public institutions that create it, and it does this namely by introducing private sector models of governance. Open data does not transparently reveal the transactions of the state, such as the Engineering permits just mentioned, but changes them in the course of yielding new statistical objects. Through the production of open data, staff come to view city records as a cheap, abundant source of economic and institutional capital that can both circulate into private sector infrastructures and support more data-driven management and city planning goals.

As discussed in the last chapter, the root of such a vision predated the Obama administration's new federal transparency initiatives around open data. Open government activists and open systems advocates emphasized the alignment of government transparency and private sector innovation as early as the 1990s; by 2009 there appeared to be no conflict between the two. As technology companies found market value in open source software and information flows unhampered by commercial licenses, so governments became proactive in offering their

data to the public in the hope of driving citizen involvement and sparking entrepreneurship. These initiatives took shape primarily through web portals that allowed users to freely download datasets. Waze partnerships with municipalities around the world can be seen as another outcome of open data initiatives, driven by claims that transparency, civic improvement, and private sector innovation can be intertwined, each aiding the success of the other.

However, concurrent with these initiatives, emerging scholarship has turned a critical eye towards the equivocal values embedded in the policies and technical design of open data initiatives. I am not the first to point out that open data appears to enable government accountability and monitory oversight as much as new instances of corporate subsidy and commercialized capture, particularly for Silicon Valley companies, in a manner that blurs public, private, and civic services (Bates 2012; Janssen, Charalabidis, and Zuiderwijk 2012). Open data proponents appear agnostic towards its use, shifting the emphasis away from the oversight function of transparency laws towards data-driven government efficiency and private sector or citizen involvement in the delivery of public services. Bhuvaneswari Raman, a researcher at the French Institute in Pondicherry, India, is more pointedly critical of the rhetoric of transparency that cloaks open data projects in India, writing that "the unquestioned celebration of OGD [open government data] and the transparency paradigm may serve as a vehicle to reduce political claims into techno-managerial issues, and thereby realize an 'anti-politics' agenda . . . to counter contestations over urban territories" (2012, n.p.). While the semantic merger of different ideals of openness could have positive benefits, these authors warn that governments might also claim to be transparent simply by implementing an open data portal and by publishing innocuous datasets (openness of artifacts) but never engaging in any serious or uncomfortable public accountability (openness of processes) (Davies and Bawa 2012).

Yet this previous scholarship on open government data rarely entails sustained, close scrutiny of how open data projects play out in specific cases nor does it usually direct our attention to the political and economic dimensions of data at different stages of production and consumption. Little of this research on open government data has put data production, processing, and use at distinct sites under scrutiny.[1] Government records are not transformed in an obvious, one-to-one manner when they are published on an open data website; rather, this process involves a series of selections and interpretive work. Records created for specific departmental databases or spreadsheets must be reproduced and organized as new statistical representations – they must "be imaged as data to exist and function as such" (Gitelman and Jackson 2012). When government data is spoken of as a "raw resource" or as a neutral, apolitical tool, this language obscures the contingencies of decisions involved in their production. Furthermore, open data work creates entirely new statistical phenomena to represent government records. While they might maintain signs of their provenance through metadata, open datasets are abstracted from the context of their creation, and their changing material supports bring new data mediators, publics, and practices into being. The creation of the data should not be swept aside but must be examined for these sociotechnical ramifications, which I detail below.

One of these ramifications, scarcely studied in the academic or popular literature on the subject, is how open data constitutes the departments that produce it in a relational fashion that shapes roles and institutional practices. In Los Angeles, producing open data entails a cultural shift in how departments understand their records and those from other departments; as I explore in case studies below, this transformation affects day-to-day routines, restructure management roles, and influences the design of city services. As departments create open data, they conceive

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[1] One exception is the work of Denis and Goëta (2014), who examine the production of open data in French administrations from an STS perspective.

of their records as assets that can be capitalized upon, a viewpoint apparent in new city policies requiring data to be harnessed for predictive analytics, data-driven assessments, and data brokering with private companies. The open data initiative should be situated as part of data-driven initiatives to shape government work, an approach that is highly favored by Los Angeles's current mayor and mirrors efforts in other cities worldwide.

To understand these changes, I conducted fieldwork and interviews with staff from nine city departments from November 2013 to August 2016. I spoke with them about the largely invisible clerical and technical work that goes into maintaining Los Angeles's government datasets: how each department prepares internal data for public consumption and reuse on the open data portal and the datasets' departmental history. I paid special attention to the tension between staff's perception of data as a representation or record of internal or institutional history versus data as machine-readable instructions for public and commercial use. I asked about the cleaning, technical encoding, and maintenance required to create new datasets from existing electronic record infrastructures. The departments I spoke to include the Office of the Mayor, the Information Technology Agency, the Bureau of Engineering, the Department of Cultural Affairs, the Bureau of Building and Safety, the Department of Transportation, the Controller's Office, the Department of Planning, and the Department of Sanitation. This research was also informed by fieldwork at open data events hosted by the City and by a six-month internship for the Department of Cultural Affairs, where I worked from May through October 2016 with the organization's digital strategist to create and clean open datasets and research a growing interest in art data by municipalities around the world.

To proceed, I first situate government records as a particular type of information infrastructure not traditionally dedicated to exposing records-keeping processes to any public

outside the context of its creation. I then provide background on the implementation of open data in Los Angeles and the tactics that its advocates used to persuade departments to participate in the initiative. Afterwards, I offer examples from three different departments to highlight some of the tensions or frictions found in the production of open data. In the final section, I look at the broader consequences of open data projects in Los Angeles, especially how they have engendered new metaphors for governance, data-driven management initiatives, and predictive analytics to address social issues.

The Infrastructure of Government Records

To examine the production of open government data is to observe the unmooring of the traces of government work from the context of their original purpose. Open data requires new infrastructures to stabilize representations of records that in most cases were not originally intended for public circulation. As a worker at Information and Technology Agency (ITA) put it,

> By definition, data is captured in such a way for a purpose, so each application is purpose-built . . . so when you're making data open, you're now identifying a new purpose. You brought a Rottweiler for home defense, and now you want an inside dog and need a transition to make everything work out okay.[2]

Open government data often derives from departmental databases that describe actions taking place within that department, such as permitting or financial transactions. Thus, when city staff generate a record, its creator often has no concept of it having an external audience outside of occasional open records requests. Open data infrastructure, then, must do the work of translating these localized records for a broader audience.

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[2] Interview conducted July 21, 2015.

In this regard, governments are catching up to other commercial industries that have long found economic and social value in public records by creating secondary statistical objects. As mentioned in the previous chapter, statistical industries from the 1970s revealed the commercial value of aggregating and analyzing electronic records of existing activities, as was the case with commercial bibliographic systems based on journal-article publications or the credit industry's use of consumer-credit transactions. That there are also wide scholarly, as well as social, benefits to data sharing has been well argued by practitioners in the sciences, with the establishment by the 1950s of open data repositories and, a few decades later, electronic databases dedicated to the sharing of scientific data. Similar to these "big data" systems in science and industry, open government datasets are also, generally, secondary statistical objects based on accounts of actions taken: cases filed and completed, permits approved, financial transactions made, even stray animals processed.

Similar to public conceptions of these large scientific and commercial data as neutral, at-hand tools, so open government datasets appeal to their proponents as sources of objectivity, a derivative of bureaucratic systems divorced from subjective insights under the sway of political motivations, conscious or not. That open data be neutral is particularly appealing to government staff hoping to rationalize government policy so that it is less polluted by political motivations. Such a perspective was very common among staff I spoke with. According to an employee in the mayor's office, open data creates a neutral ground for consensus formation with the public: "A lot of times political problems can be challenged and questioned... If we do data-driven decision-making, we can take the politics out of decision-making and be more responsive to the public good and public demands versus if we don't."[3]

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[3] Interview conducted February 8, 2016.

This position is widespread among open data advocates speaking in public arenas, such as a speech given by Jay Nath, the chief innovation officer for San Francisco and a leader in the open data movement, who claimed at a conference hosted by UCLA's Luskin Center that city data itself is cleansed of any political influence, while it is "people [who] will take data and editorialize it."[4] A representative from open data software company Socrata likewise told me, "The [Los Angeles] government is changing from gut-driven decision-making to data-driven" through the work of analyzing its open data.[5]

The rhetoric of data neutrality, as many scholars of open data have pointed out, threatens to turn open city data into a positivist decision-making tool that evokes public involvement but ultimately overrides discussion and debate in the civil sphere. Research in the field of science and technology studies (STS) has produced much work to show, as well, how such language obscures that open data are *representations*, not transparent presentations, of state records, which are themselves abstracted surrogates of a phenomena or action. Producing data is the work of making categories out of the singularity of phenomena, a process that always entails "the situated, partial, and constitutive character of knowledge production" (Drucker 2011, 2). STS research has done much to denaturalize these processes, particularly within scientific work. Scholars have traced, for instance, the enormous labor that goes into turning scientific data into "matters of fact" that can circulate and form the basis of scientific consensus (Shapin 1984; Bowker and Starr 2000). Scientific data requires "translation" to move from laboratory observations into statistical charts, then to publishable research (Star and Griesemer 1989). Geoffrey Bowker calls for foregrounding these knowledge systems through "infrastructural

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[4] Who Owns the Digital City? April 24, 2014.

[5] Interview conducted August 1, 2014.

inversion," by which humans are deemphasized as agents of change so that information artifacts can take a more central role in the analysis (1994, 10). Geographers Rob Kitchin and Tracey Lauriault's term "data assemblage" is another concept for understanding these interrelations: The interlocking systems of support that give data durability as representations that can circulate beyond their original context (2014). Data assemblages *produce* data's durability, because a dataset does not exist independently of the material supports that structure and contextualize it.

All of these approaches provide an epistemological orientation that resists the widely held view of data as pre-factual, non-ideological, apolitical givens existing prior to interpretation and analysis. Rather, how data are conceived, collected, stored, formatted, organized, and encoded matter (Gitelman and Jackson, 2013). The political dimensions sometimes embedded in these systems are often opaque and require excavation, yet by tracing sets of relations between these factors, one can come to understand how data assemblages take part in shaping the world and, at the same time, legitimate data as a form of knowledge and power.

In order to trace the production of open government data, such assemblages must be understood on their own terms, distinct from data derived from scientific or commercial contexts. As Jerome Denis and Samuel Goëta point out, scientific work entails the production of "raw" data *first* to support claims that can become widely accepted by the wider community of practitioners (2014). Open government data, in contrast, must be extracted and "rawified" from a bedrock of practices already durable within stable state records systems (n. p.). Alain Desrosieres provides a compelling history of how government records find solidity as inscriptions in durable systems created to resist critique or dispute (2002). In the 19th century modern democracies used records to carry out services to the population, increasingly parsing social and economic issues, such as poverty and health, "as distinct from passion and polemical arguments, objectifying them

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by means of statistics generated by administrative or private sources" (Desrosieres 2012, 133).

Bureaucratic processes such as paperwork trails, signatures, database entry, and classification

consistency all work powerfully to establish the objectivity of records. By virtue, in part, of their

stable material qualities, government records operate autonomously and forcefully, as Matthew

Hull found with paperwork in Pakistan: "It was precisely the materiality of graphic signs that

made them useful as a palpable sedimentation of the real" (2012, 8). State records, consequently,

are often sources for agreement that operate as effective technologies of control and domination.

The literature on the sociology of statistics and records draw a clear relationship between the

production of records and "the discovery of society" as an object that can be scientifically

studied, described, and, consequently, designed. (Scott 1998, 91; Hacking 1990, 105). Much of

the infrastructure of open government data relies on this rationalized "documentary intelligence"

of the state or city – on an apparatus of official recordkeeping that aims to make a population or

the functions of a city intelligible and hence manageable (Scott 1998, 39).

Open government data also differs from scientific work, it should be pointed out, in that

the production of scientific evidence and its synthesis and communication in journal articles are

generally intended for other practitioners, *not* for non-experts. Open government data must do

the heavy lifting of translating closed-door bureaucratic practices to a wide, anonymous public.

To understand the degrees of translation performed by open data work, then, one needs to

examine both the bedrock of state recordings as well as the abstraction of these records into new

statistical surrogates that take public forms.

These statistical surrogates require standardization, or what Desrosières calls "spaces of

equivalence," to encode the practices of several departments for the same interface (2002, 10).

Spaces of equivalences, most obviously, require technical standardization conducive to

producing actions such as machine processing and statistical comparison. To this end, staff must extract their records from databases, spreadsheets, and documents and make them compatible with other departments' records, work that requires standards specifications and a common interface for all departmental contributions. Said an employee in the mayor's office, "There's a bunch of systems outdated and decentralized, and we have work to get them streamlined and uploaded and sharing." Yet the work of open data is also highly social and political. In this case, the work of open data entails new relations of power between city departments, the mayor's office, and the ITA, as well as an ongoing cultural shift within departments that are asked to conceive of their records systems in a new light, as the source of extractable, exploitable resources.

The next two sections examine how the City of Los Angeles created open government data from city department databases and documents. This work entailed technological and legal standards that all departments were to follow, as well as new roles among city staff tasked with coordinating the effort. This task required convincing departments to view their internal records as assets that would create work efficiencies and technical capital for overburdened staff. I then offer case studies of open data work in three departments to demonstrate the interpretive and technical work required to produce open data. These case studies also show how information infrastructures mutually shape the people who use them, reorganizing institutional norms and practices in the process.

Creating "Spaces of Equivalences"

Beginnings and New Positions

The work of open data has already configured Los Angeles government through new roles and arrangements in city department and with commercial vendors. To begin the work of coordinating open data, the mayor hired a chief innovation officer (CIO), a new position filled by Peter Marx. Marx came from the private sector, leaving a position in business development at Qualcomm Labs, Inc., a company that commercializes emerging technologies (Hanson 2014). As CIO, Marx worked with staff in the ITA to launch the open data website by May 2014; he also brokered the deal with Waze to use Los Angeles's Department of Public Works data on street closures (Perry 2015). Later, in August 2014, after the first iteration of the website went live, the mayor hired Abhi Nemani as the City's first chief data officer (CDO). Nemani's role as CDO involved working with departments to identify additional datasets to publish on the open data website, as well as auditing and updating existing datasets and editing the portal's homepage. According to one interviewee, Nemani was primarily hired in order to demonstrate open data's public utility by wrangling free labor from "civic hackers," the term given to volunteer citizens who use technologies to community and civic ends. Nemani's background as one of the original staff of Code for America, a nonprofit organization that pairs software programmers with city governments, gave the mayor hope that Nemani could bring Code for America sponsorship into Los Angeles and, with it, the funds to support two in-house software programmers on a fellowship.[6] Nemani quit the position after thirteen months, and the assistant CDO, Lillian Coral, stepped in.

In July 2016, Marx left his position as CIO, and Garcetti hired Jeanne Holm, a former chief knowledge architect at NASA/JPL and open data consultant for the World Bank, as assistant general manager of ITA and the new deputy CIO. (She is also senior tech advisor to the

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[6] Instead the City set up a Code for America brigade, primarily entailing in-kind sponsorship from CfA. Interview conducted February 22, 2016.

mayor). Unlike the CIO and CDO positions, which are mayoral staff, as part of the ITA department, Holm's position will remain in place after Garcetti's departure from office, giving the open data program some institutional scaffolding during the transition to the next administration. Additionally, the mayor's directive required each city department to designate a staff member as a "data coordinator" responsible for contributing datasets to the new website. The new responsibility did not translate into more pay; instead, coordinators invested additional time to the project.

Open data work also entailed new contracts with private technology companies. The largest contract is with the open data software company Socrata via a license that costs the City $400,000 a year (Mendelson 2015). In October 2013, the company began to host the controller's open data website, Control Panel LA, which showcases department budgets and staff salaries. Then, in May 2014, Socrata won the contract to host the City-wide open data sites, including the open data portal data.lacity.org and the mayor's dashboard, a collection of city service delivery metrics. According to staff in the mayor's office and ITA, the City chose Socrata because the company was the standard open data software provider in the United States, hosting Obama's Data.gov as well as the city portals for Chicago, New York, and Boston.[7] In January 2016, the City of Los Angeles began a second contract with the GIS company ESRI for an open data website called Geohub. Geohub is a collection of maps that draw from departments' geospatial data, the vast majority of which are also on the Socrata site.

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[7] Interview conducted July 10, 2014.
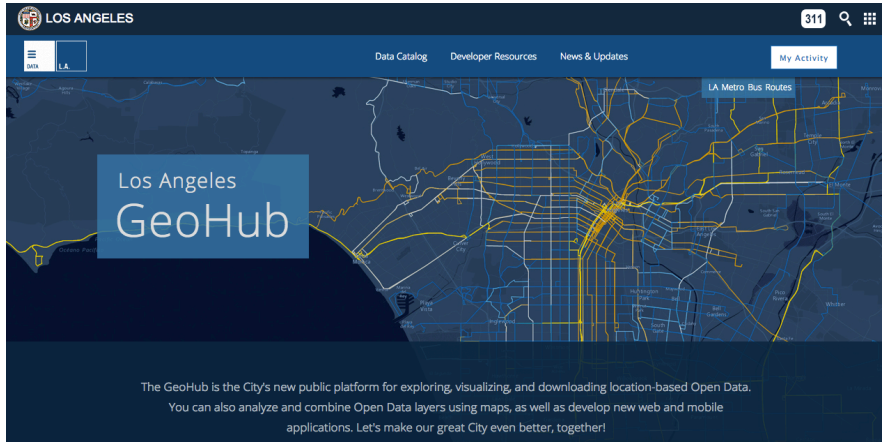
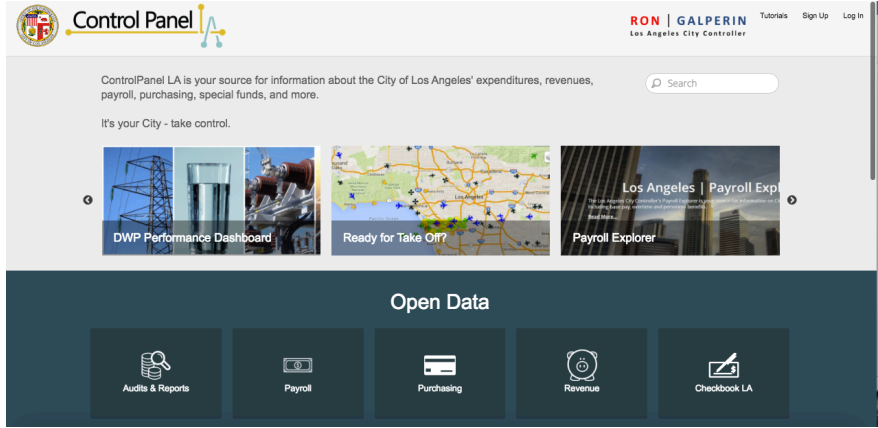Figure 1- the Los Angeles Geohub Homepage.

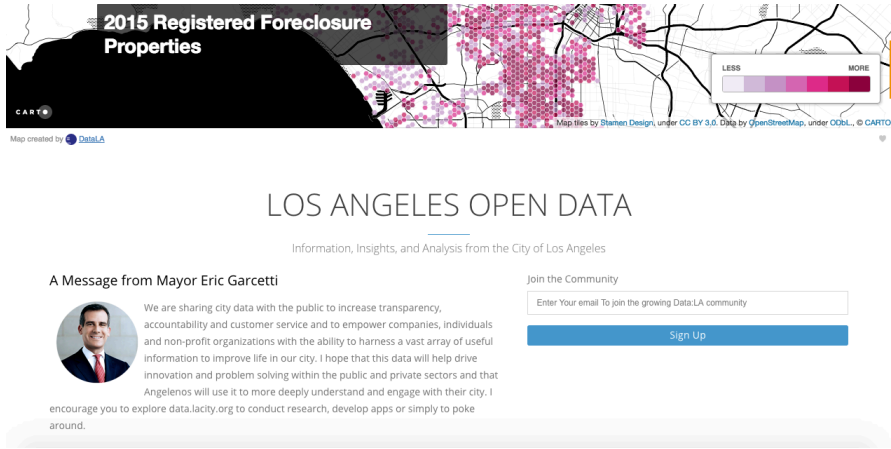Figure 2 - the Control Panel's homepage.

Figure 3 - the City of Los Angeles' open data portal homepage.

In the wake of the mayor's open data directive, a week before Christmas in 2013, the ITA drafted its first open data policy strategy, called the "Open Data Policy and Guide." The guide, according to an ITA employee, "set the rules of engagement" for implementing the site.[8] The strategy provided guidelines on how to identify datasets of value to the public and how to upload these datasets to the site; it instructed departments to ensure that each dataset was complete, reliable, and regularly refreshed. A few weeks later at the start of the new year, staff from the mayor's office, including Marx, approached each department one by one to generate support for the portal. According to the coordinator for the Department of Cultural Affairs, "[Marx] hunted down anybody who had anything to do with data to put stuff up . . . 'You know something about data? What could we put on that portal that your department is ready to share?'"[9]

In a first sweep, the mayor's office asked each department to give a list of their datasets that staff thought could be easily loaded onto the portal, resulting in an initial master list of 160 datasets. Mayoral staff then specifically sought out datasets that they believed would be valuable to the public, including crime and traffic collision data from the LAPD, data on services by Recreation and Parks, Sanitation's data on infrastructure work, water use by zip code from Water and Power, data related to neighborhood development from Building and Safety and Planning, and GIS data from Engineering. The mayor's office next looked at what might be missing; for instance, the Department of Transportation had not submitted any datasets, which was "glaring," according to an employee.[10] The final list of datasets was cleared by the City Attorney General, whose task was to ensure that they didn't violate privacy laws. Departments were to have the

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[8] Interview conducted July 21, 2015.

[9] Interview conducted February 22, 2016.

[10] Interview conducted July 9, 2014.

data uploaded before the website's public launch on the day of a public tech fair held in City Hall on May 31, 2014.

Making the Case for Open Data

Much of the discussions between the mayor's office and ITA with department coordinators entailed instilling in staff a literacy in open data – in the value of creating phenomena that could circulate outside of departments' information infrastructures. The mayor's office and ITA staff held meetings with department data coordinators to convince them of the usefulness of open data, both of the internal value of creating statistical equivalences of their records systems and of the importance of a broad public panopticon viewing the data published on the portal.

Data coordinators were not initially enthusiastic about the extra work. Said a staffer from the mayor's office:

> We really did have to work it through with them. It's almost like the five stages of grieving: The initial response is, 'Why do we do that?' A key example or highlight is Water and Power. In our first initial meetings, they sat in the policy chairing committee and subsequent workshops, and they asked, 'Why would we do this, how does this help us?' as well. At the end of the process, they bought in and had a more robust dataset available, so they went from contrarian to convert relatively quickly. That's always good. Some of the others we're still working to get to that point.[11]

To make their case, the mayor's staff presented open data as a key to modernizing government infrastructure in the post-recession context. The City had suffered extensive personnel cuts during the 2008 recession; the ITA department alone cut 40 percent of staff, totaling around 300

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[11] Ibid.

individuals. An employee in the mayor's office explained to me that these cuts hampered the City's technological capacities: "While tech golden age happened and could have revolutionize how the City shared, the City was cutting back on what it was doing."[12] Compounding the cutbacks, 46 percent of the City's 45,000 employees are now expected to retire by 2018. Staff looked to open data to create efficiencies and generate cheap, informational capital through data sharing. Said an employee in the Mayor's Office of Budget Analysis,

> It's a time of less resources. We're never going to get pre-2008, pre-bubble staffing levels, so now it's finding out how to do things better and easier, but the old ways and old silos of structures of government that had been built in LA [are] cumbersome . . . so we're hoping this can unlock ideas between general managers and how the City runs.[13]

An employee in the Mayor's Office for Budget and Administration (OBA) told me, "This is going to be transformative in this city because we can see what we're doing collectively . . . In terms of delivery of services, rather than an assembly line approach, we have a bigger picture in mind." Another ITA employee told me she became interested in open data prior to the Garcetti administration when she worked with the Emergency Management Department, the operations center for citywide emergencies. The department had no access to real time bus routes for planned events or in anticipation of emergencies, such as "a terrorism type event." The employee told me an open data repository would save the time of calling another department for a document, then waiting as they sent it over. Data sharing could become a common platform across the City's historically fractured departments – a way to overcome the typical silos and fiefdoms of bureaucracy.

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[12] Interview conducted February 8, 2016.

[13] Interview conducted February 27, 2014.

ITA and mayor's office staff also told departments that open data could potentially save time spent responding to open records to requests. A systems analyst at the Planning department was hopeful this would be the case. Planning dedicates a full-time staff member to servicing its daily public records request, and the analyst told me open data would relieve his coworkers from individually servicing each request: "Especially in our department, we're short-staffed, so our staff doesn't have to go and do these custom datasets for the public."

Implicit in this new orientation is an emphasis away from the indexical, evidentiary function of the record towards its reuse for other purposes, whether that's staff productivity or to spur new administrative models of efficient data sharing. The indexicality or provenance of a record – reflecting its social context as part of past government activities – becomes less a matter of concern than creating secondary data with operational functions that ease its circulation into other contexts. The traces of past actions in this manner are treated as material for future actions, furthering the self-reinforcing durability of the data. With open data, the distinction between active and inactive records dissolves. According to an employee in the mayor's office, a record's lifecycle within government is usually too short; instead of viewed a disposable commodity, it should be treated as asset that could find new value:

> It's a lifecycle to the data itself, in terms of it's something that's highly valuable, then tapers down after use . . . to a plain old toothbrush toothpaste commodity instead of something that produces increased efficiency. Something to figure out is: What's the highest value in-house to look at?

The focus on operation and circulation versus index and archive is even immanent in the design of the Socrata portals' software. The company's model as "software as service" means that Socrata never owns nor manages any content but provides an interface to the data, with features

such as maps, visualizations, sorting and filters, and operates as host with support staff. The original design, however, never intended to host government information but to help users monetize dormant data and share it, along with other datasets, on a common platform. Originally called Blist, the company hosted a site for users to monetize data that they ordinarily kept "locked away" on hard drives or private servers. The company turned its focus solely to open data for the public sector after the Obama campaign used it to make its campaign donation information public in 2012. Designers of Socrata software conceive of this interface less of an archive – a storage mechanism recording state doings and the record's original context – than as a public commons for sharing data with civic and commercial value.

While all departments were to supply data, not all data was universally pushed. The Open Data Guide specifies that data selected should be the kind that "increases public knowledge about department operations, furthers the mission of the department, creates economic opportunity, or responds to a need for public information." Coordinators were to consider commonly requested datasets under the California Public Records Act or look to see if visitors scraped their websites for records. Yet, under the Health Insurance Privacy and Accountability Act, the data needed to comply with federal privacy laws around health records and, under the Family Educational and Privacy Act, around education records. Open data also should not reveal information associated with a public utility, such as police radio stations. To work around privacy laws, the Guide instructed data coordinators to aggregate data beyond the individual level, yet doing so entailed ensuring such data remained "meaningful." In other word, the emphasis on data publication and circulation might encounter friction with the values of privacy and security.

Other frictions – tensions invisible at the level of abstracted data – became apparent as I traced the work of open data within departments. Because government records are constructed without a broad public audience in mind, the details of their definitions and codes, their processes of recording and tabulating, often remain tacit institutional knowledge. Said a systems analyst at Building and Safety, "We're a very technical organization, so most of the time that data has been formatted so that our engineers and inspectors could use it. I mean, you try to translate that to something that the public would understand; there's a gap." To use a metaphor, the open data portal only reveals the upper crust of the geological depths of city record keeping, but this exposed topology is very much reified when people begin to use the portal for analysis or to make apps that begin to shape our behaviors or conclusions. Through translations, open data loses the detail of localized knowledge.

In the following section, I describe three case studies of how departments undertook the work of open data and how new data literacies affected some of the administrative practices in these departments. I also attempt to excavate some of the local knowledge about departments' data. These case studies show that in some cases "frictions" occur between the actual work of creating open data and visions about open data as articulated in the values of producing spaces of equivalences (Edwards et al. 2011). Yet more importantly, these cases demonstrate that open data work causes cultural shifts within departments as staff come to see their records as potential reserves for generating secondary data for broader uses.

New Cultures of Open Data

Department of Transportation

Prior to the open data initiative, the public primarily accessed DoT data through open records requests. To that end, the department dedicates a full-time employee who answers public information queries. Selecting what became open data was not a simple matter of mechanical conversion of these records but a charged process guided by economic, technical, and liability concerns. Notably, DoT manages two state-of-the-art systems, both of which generate highly sought-after data: its traffic synchronization data and real-time parking data. Yet these datasets are entangled in complex assemblages that entail security and economic concerns preventing them from becoming "open."

DoT's largest dataset, the traffic-light synchronization data, derives from a system created during the 1984 Los Angeles Olympics as a traffic abatement experiment. At the time, the City used live security cameras feeds to observe and control signals near the Los Angeles Memorial Coliseum, and engineers found that the efforts curbed local traffic significantly. By 2013, with grants from the state and federal governments, the City had synchronized all of its 4,400-plus traffic lights, completing one of the largest undertakings of its kind in the world. The data from this effort, the Automated Traffic Surveillance and Control System, derives from security cameras as well as more than 25,000 embedded sensors that pick up information about the vehicles passing above them. Some of these sensors activate lights; others track the number of cars, traffic speeds, and congestion levels. All of this data links via a network of underground fiber-optic cables to an underground room of engineers and computers in DoT's downtown headquarters.

DoT sees potential safety and security risks in publishing such data. The department's data coordinator, an information systems manager who heads DoT's IT team, told me that building phone apps on such data could create a safety liability for the City:

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It could be the fact that somebody is relying on an app where by . . . It can tell which

lights are gonna turn red at a certain time, and because of that, the app causes an accident

. . . That system relies on the loop sensors that are embedded in the road, and there are

occasions where those break for whatever reason, and then we have gaps. And so, if an

app isn't developed in a way to take account for those things, then it could be a problem.

So, somebody might wanna turn around and look for deep pockets to sue because they

killed somebody in an accident . . . [14]

Even so, the datasets are potentially marketable, as the department well understands, given

private sector interest. The data coordinator mentioned that the department might work with an

outside partner to make the data public, so long as that company takes on the liability.

DoT's highly requested parking meter data is also compromised as open data, this time

by an existing partnership with the company Xerox. Using in-ground sensors along with payment

and violation data, Xerox creates a proprietary payment algorithm to determine the minute-by-

minute cost of the City's "smart" parking meters installed in and around Los Angeles's

downtown periphery. The project, which began in 2013, generates real-time occupancy data that

the City claims curbs parking congestion. Xerox owns and maintains the inventory of parking

and citation data and runs a call center that responds if someone has a problem with a parking

meter. Yet due to this private contract, DoT only makes the meter citation data available on the

open data portal, as part of DoT's larger parking citation dataset. Rather, Xerox provides its real-

time meter data to two commercial parking apps, ParkMe and Parker. On a brochure for the

program, the company claims that this agreement with the two apps shows "its commitment to

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[14] Interview conducted August 20, 2014.

open data" (Xerox Corporation 2013). Open data, in this context, is conflated with government

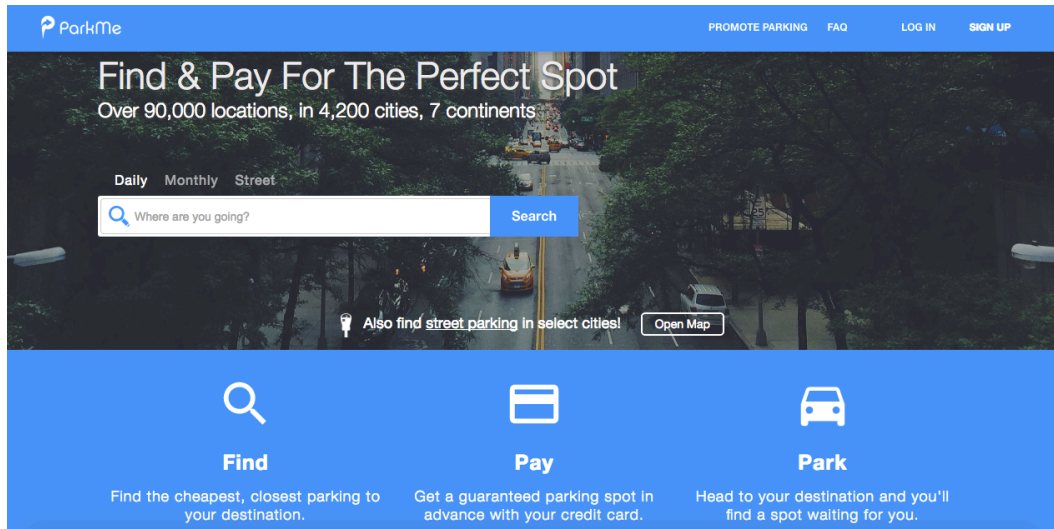data-sharing agreements between two private companies.

Figure 4 - the Parkme website's homepage.

Open data is consistently linked to a vision of an efficient, networked government and

citizens responding to data in real time, as Garcetti articulated in his press announcement of the

partnership of Waze. The parking citation data – an enormous tabular dataset of all parking

tickets given around the city, including location, date, violation description, and car make – is the

closest that DoT gets to this image, though its latest entry dates back five months prior to the

time of this writing. Otherwise, open transportation data as it stands is a far cry from the fantasy

of the city as a living organism accessible through an API and interconnected in real time. My

contact at DoT told me he ultimately picked datasets for the open data portal that "wouldn't

require much refreshing" at all, including the largely static with parking-meter zones (parking

meter infrastructure changes infrequently) and preferential parking districts, both published in

GIS shape files. What DoT records became open data was largely a matter of departmental

resources, not efficiency, perceived public interest, or utility:

> The datasets that are on the open data website now are some of the datasets that don't
>
> change very often. And so, the impact to our organization in maintaining the currency of
>
> that data's product is pretty low. Unfortunately, conversely, those datasets might be of
>
> limited value to some people.[15]

DoT's biggest open dataset, the traffic summary count, is not based on real time information but

rather historic data compiled in a spreadsheet. DoT engineers have produced traffic counts since

1985, when the department began in its current incarnation. The counts are not at regular

intervals but are conducted only when commissioned through internal requests by other

departments, such as Engineering, or due to commercial development activity. The counts

include a mix of automated data based on in-ground sensors and manual data gathered by DoT

staff who stand for a set period of time at an intersection and tally cars with a traffic counter

device. A traffic-counting software package obtains the data from the counting device and

converts the data to PDF documents, which DoT makes available to the public on the Bureau of

Engineering's NavigateLA site. These PDFs are then converted to a summary spreadsheet

available via DoT's website.

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[15] Ibid.

Figure 5 - automated traffic count summary conducted July 24, 2007 and manual traffic count summary conducted November 9, 2011. Both conducted at the intersection of 4th street and Main Street.

On the open data portal, the user will find the summary spreadsheet data of traffic counts from 2011 to 2013. Preparing this already-public data for upload was not time consuming, the coordinator told me. To cleanse the data of anomalies, such as columns that had both numeric and alpha-numeric mixed together, the coordinator simply used Excel's "find and replace" function. There was no need to reformat the summary traffic data, since it was in an Excel document, a format already accepted by Socrata. Once cleansed, the coordinator logged in with his user account and uploaded the Excel file directly to Socrata.

On the portal, the data and metadata for the traffic count are minimal, as is commonly the case for data on the website: columns include the primary and cross streets where the count took place, the date of the count, counts per direction of traffic, a total for the count, and three columns titled "Dir," "Type," and "Dis" that have no metadata to explain their rows of codes

(e.g., abbreviations such as "at," "aut," and "aw"). The coordinator's only frustration with the portal was that he was unable to work with the Socrata API to make changes at a web endpoint after the data was uploaded. Rather, users load the data through an automatic batch load, making changes to the published batch arduous.

Figure 6 - Department of Transportation's Traffic Count Summary as open data.

As of this writing, DoT does not have the resources to create more records as open data. DoT's information-sharing practices remain "very old, antiquated," according to its coordinator. Data that the department would like to contribute, such as street sign history information and work orders for maintenance and installation activity on traffic signs, curb zones, striping, and traffic signals, are still paper-based. The problem remains a lack of resources coupled with legacy systems that don't easily yield to producing records as data.

The process of producing open data at DoT reoriented how the staff involved evaluated their department's records keeping systems. Paper-based systems that operate adequately on a day-to-day basis in the context of internal processes suddenly appear inadequate based on the

pragmatic values of open data: to create efficiencies out of real-time information that circulate

widely as machine-readable phenomena for external use. Furthermore, the DoT's experience

exposes how designating open data is not just an obvious matter of deciding which datasets are

best for the public or even for internal use. Designating what is open data is complicated by

relationships with private commercial vendors who commonly make information scarcity a key

aspect of their business strategy. What records become data is also a matter of the current state of

legacy records infrastructure and on the degrees of translation already in place to circulate

records to a broader public, factors that vary from department to department and are often based

on that department's budgetary resources, including the size of its IT staff.

Department of Cultural Affairs

The Department of Cultural Affairs (DCA) maintains a wealth of records on its three

programmatic areas: its grants division, its 1% for arts public art program, and community art

centers throughout the city that deliver arts education, classes, and exhibitions. Yet very little of

this data is organized electronically. The department is small relative to others in the city and has

no dedicated IT staff. Said the DCA coordinator:

> We don't even have time to digitize our data. Everything we have is in paper form. We
>
> don't know what to do. Some of us don't even know what structure the filing cabinets
>
> and digital file directories on the intranet are designed to store our records. There's no
>
> time to get back into our filing cabinets. We're just pulling records as needed.[16]

In response to the mayor's directive, DCA turned to one existing source of electronic

information: their festival and events dataset, a collection of 500–600 events with date, location,

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[16] Interview conducted February 22, 2016.

and description. For the past several years, DCA events information has been distributed in the

format of a book published by a private vendor (the marketing team once did this work but was

let go five years ago). Staff collect the information by calling festival organizers and trawling

submissions by festival promoters, then compile these details in a Word document that is sent to

the city's print shop for publication. In addition to the printable book, DCA also releases the

information to the public through a website built in Wordpress by a contractor. To that end, the

contractor converted the Word information into data entries in a Google spreadsheet, which,

through a plug-in, feeds into the Wordpress site.

Figure 7 - the front cover and a page out of the DCA's festival guide, 2016.

As the coordinator described it, the workflow for creating open data from the Google spreadsheet of events information "is very 1990s." The data coordinator hoped that a simple export to Excel would suffice but found it was "a nightmare" cleaning the description for each event. With the help of a programmer friend, the coordinator also had to extract web addresses from within the descriptions, cutting and pasting the URL from the href in the html code and putting these in a new column. The coordinator then had to make all event addresses geocodable per Socrata formats.
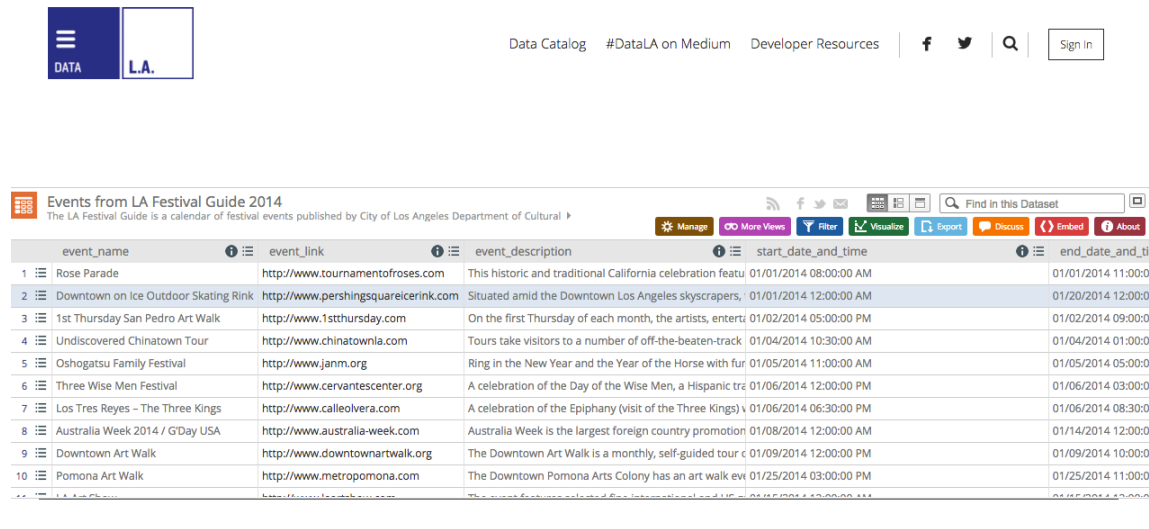
Figure 8 - the LA Festival Guide as open data.

The other open dataset on the department's site, aside from its performance metrics (which I discuss in greater detail below), derives from a Google spreadsheet of location, contact, and parking information of all twenty-two cultural centers, theaters, historic sites, and galleries managed by the Community Arts Division. The coordinator hopes that students and others interested in art resources will create maps or other useful information products from the data. Though this information existed on various pages of the DCA's website, the aggregate dataset is

not based on formatted records that predated the open data portal but was created in response to it. In this sense, this data demonstrates how open data work does not passively present department information but actively configures data-centric modes of department transparency.

Figure 9 - locations and contacts of Los Angeles cultural centers on the Socrata portal.

While the DCA has offered only a small amount of data to the portal, open data work has prompted the department to rethink of its services in terms of statistical measurements and outputs. How can cultural events and artifacts – so often valued for qualitative effects such as art appreciation and public beautification – be measured? DCA's data coordinator pointed out that the department is not accustomed to thinking about its work in terms of quantitative measurement. Yet quantifying art impact, including the economic effects of cultural support and so-called "creative classes," is growing in the cultural sector. Since 2007, the "Otis Report on the Creative Economy of the Los Angeles Region" has formulated metrics to measure the impact of the arts on the region's economy.[17] The company DataArts formed in 2004 with the mission to

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[17] http://www.otis.edu/otis-report-creative-economy

"bring the language and leverage of data to the business of culture" by collecting longitudinal metrics on nonprofit cultural organizations in cities in the United States.[18] DataArts regularly collects data on the Los Angeles region.

In 2014, the mayor's office asked that all departments establish and report performance metrics related to their service goals and to publish these metrics on the open data portal soon after the website's launch. The DCA's indices include the number of audience members at DCA Community Arts programs as well as audience goals and the amount of grants and corporate donations raised. Since that time, the DCA's data coordinator has worked to establish a much broader and detailed metric model with the input of each of the department's various division heads, such that the data has their "buy-in" and is informed by their understanding of their division's goals. Similar to the experience at DoT, the exercise demonstrates the absence of electronic systems currently cataloging DCA's programmatic efforts – for instance, electronic records its past artist grantees – as well as the enormous effort of tracking down and centralizing these metrics. Open data has therefore played a role in causing DCA not only to reevaluate its records-keeping processes, but also the impact of its services to the public, now articulated in terms of statistical outcomes and goals. The work of open data, in this case, reconfigures, rather than reflects, records-keeping and accounting practices.

Bureau of Engineering

Compared to DoT and Cultural Affairs, the Bureau of Engineering (BoE) is a large, resource-rich, technocratic haven where dense, customized electronic systems for internal and public systems are the standard. Because open data work requires "piggybacking" on existing legacy

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[18] http://www.culturaldata.org/

practices around data and robust systems already in place, the Socrata portal was a small burden for BoE, which already had staff devoted to maintaining and circulating electronic records internally and to the public. The staff I spoke with, for instance, were enthusiastic about open data – the department's principal civil engineer told me, "I was supportive of [open data], because we've always had that general mindset anyway."[19] Data sharing was already a default mode of the department, which had begun building customized web software for public access back in the mid-90s.

The Bureau of Engineering is the design and construction arm for the Department of Public Works; other bureaus take care of operations and maintenance for City infrastructure. BoE has two core functions: (1) designing and managing the construction of public improvements, such as those for streets, sewers, cemeteries, parks, bridges, City buildings, fire stations, and police stations; and (2) issuing permits to private individuals and developers whose developments affect the public right-of-way. To those ends, BoE is responsible for providing an accurate record of all the land activities and transactions that occur within the city. These records provide the legal basis for the formation of boundaries and locations of both public and private properties within the city. BoE engineers call these records its "land-based system": geocoordinates of the public right-of-way and easements throughout the city, of every address in the city, all official street names, all public infrastructure, and political boundaries, such as council district boundaries, broken up into 2,000 cadastral maps. BoE, by virtue of these records, has enormous power to shape the land it records.

There are many cases in which the public or other government departments might want records related to the public right-of-way. According to a civil engineer I spoke with, LAPD

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[19] Interview conducted August 15, 2014.

precincts refer often to BoE's land base records to determine if an incident occurred within their jurisdiction. Any City construction project, whether fixing a street or posting a sign, must be determined to be within the public right-of-way, just as private developers need to consult BoE records to ensure their property meets all conditions required by the public arena. BoE's own permitting staff uses the system daily to issue permits.[20]

Originally, cartographers and surveyors maintained the land-based data on paper maps. In the 1970s, BoE staff began drafting with electronic software, called Computer Vision, that enabled drawing and annotating but had no database to contain the attribute information. Yet by the mid-80s, BoE had adopted an Oracle-based ESRI desktop database for engineers to enter data in daily. This data was not public, however. To obtain public records at this time, requesters would visit a still-existing public counter space, wait in line, fill out a piece of paper, and hand it to staff who would pull paper records and make copies for a small fee. In 1995, the bureau began scanning and uploading these records in electronic form to make them searchable and accessible on the website NavigateLA. Today the public can access BoE's land-based data on this website, a dynamic map of 527 layers of data not all of which comes from Engineering. The website is based on a JavaScript application that BoE developed in-house; production engineers maintain the data each work day, and every night, staff export the GIS data in an ESRI file format, a file geodatabase, to the public site. According to one staffperson I spoke to, the "team here actually preempted open data" by creating NavigateLA, since it makes all of BoE's core data accessible to public view.[21] In addition to NavigateLA, the department also maintains an electronic vault of all past permits and an electronic permit filing system.

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[20] Ibid.

[21] Ibid.
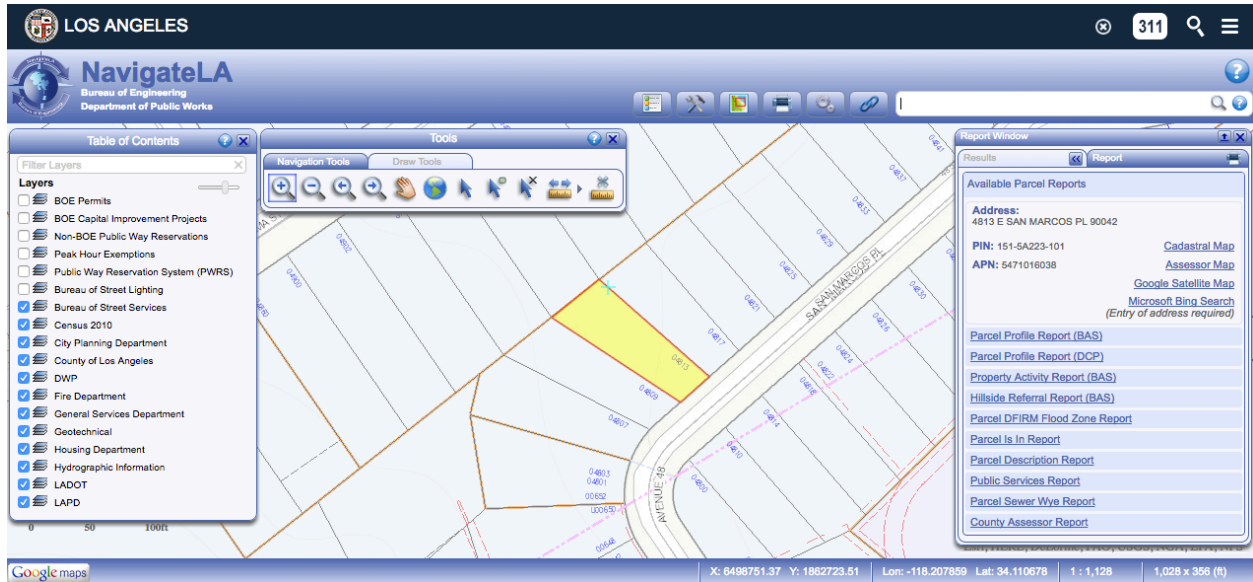
Figure 10 - NavigateLA. The Table of Contents contains 527 layers of data. The Report Window allows users to access PDF documents on flood zone information, property activity, and county assessor records, among others.

Unlike the DCA's and DoT's data, which derived primarily from spreadsheets, BoE's open data production entailed extracting structured data from its ESRI database. BoE published its core data on the Socrata website, corresponding with that found on NavigateLA. These datasets include parcel data, street names, the street centerline, storm-drain systems, city boundaries, council district and neighborhood council boundaries, and the sewer system. Yet on the Socrata portal, the data are no longer overlaid but exist as discreet sets. The site functions more as a place to access the data for personal use. BoE's data coordinator described a scenario in which NavigateLA's users (primarily private developers, engineers, surveyors, and architects) visit the site and ask, "How much easier would it be for me to do my design if I just had this information in my computer?" While before the department assigned a person to respond to requests to get a copy of BoE's data, such as coordinates of sewer systems, land parcels, or storm drain locations, "Now we can say, 'Sure, the open data portal? There's this link right here.'"

Decoupled from the database, the information loses context but gains in machine-functionality and circulation.

Because the data was already public-ready, it required no cleaning. A GIS supervisor who sidelines as the department's data coordinator sums up the process for extracting the ESRI GIS data:

> All of our data is kind of already being replicated nicely for NavigateLA . . . Basically, I
> have my own map-outs and programming, so I just link the data. The Socrata software
> needs it in a specific GIS format for right now, and it needs it in a zip files for the GIS
> data, so I just have a process that can extract the data that was already replicated daily,
> creates another zip file of it, and then we upload it.[22]

The GIS data requires uploading once a month and involves a manual activity that consists of simply replacing a zip file. To upload tabular data, such as street addresses, BoE's data coordinator uses the Socrata automated task scheduler DataSync once a week by FTP. According to the coordinator, the portal has eased the department's work associated with requests for copies of BoE data.

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[22] Ibid.
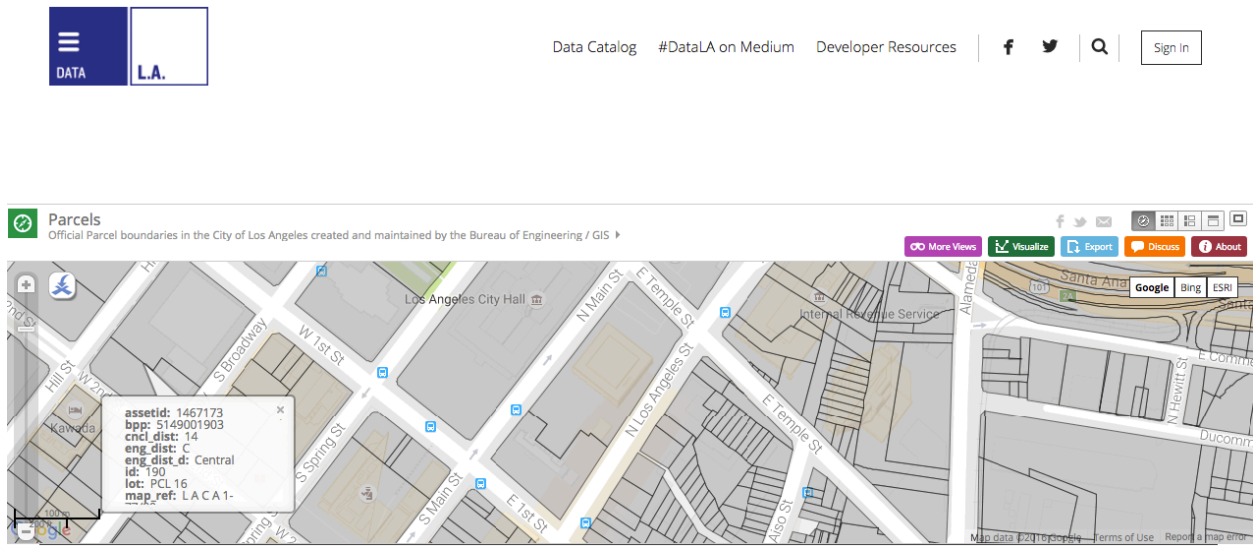
Figure 11 - Bureau of Engineering's open parcel data. By clicking within the parcel lines a user can pull up identifying and geographic metadata for each parcel.
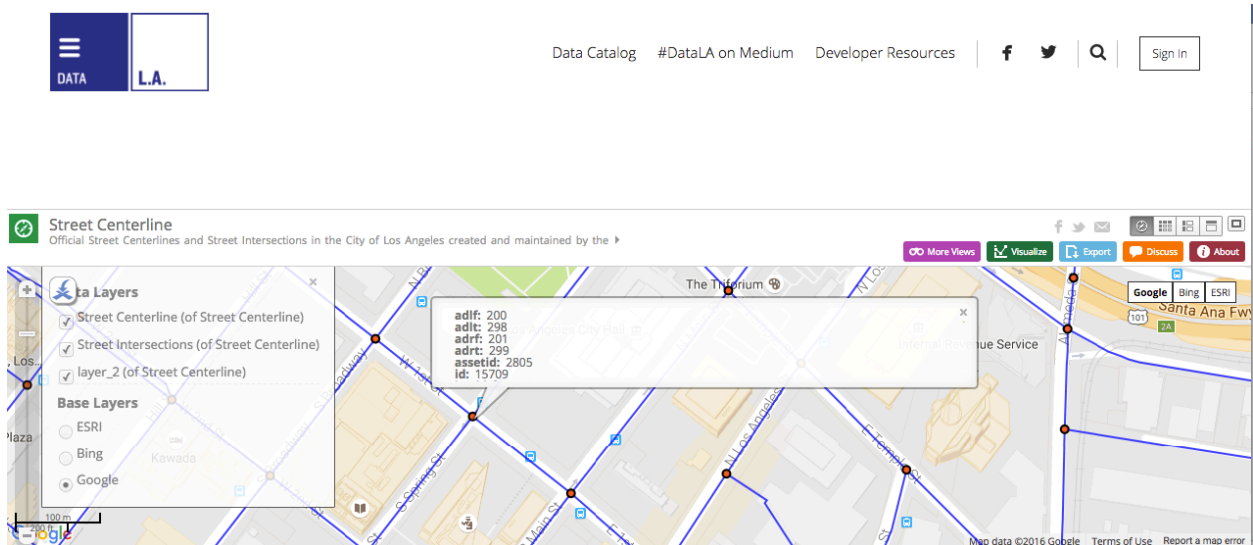
Figure 12 - Bureau of Engineering's open street centerline data. By clicking on an intersection or street centerline a user pulls up identifying and geographic metadata.

BoE's view of its open data exemplifies the shift from indexicality towards circulation and reuse. NavigateLA is primarily indexical: Users go to it to see data in the context of hundreds of other GIS datasets from departments around the city, as well as to download archival records in the form of PDF files about land use, construction, and permits. Furthermore, the data

is not posted to circulate, though it can be extracted by a person who understands the fundamentals of the site's REST software.

In contrast, the emphasis of BoE's open data is not on indexicality but on circulation. The engineering datasets are stripped of any contexts in relation to other City GIS data, yet they gain in functionalities once a user downloads the data for his or her own purposes. One engineer I spoke to speculated on how the open data's release might inspire the public to build applications with BoE data:

> Now by putting it out there in an open format, sure, we're inviting other people to look at that same data differently, present it differently, create new tools. I mean, who knows? There may be supplements to NavigateLA that they can say, 'Hey, we've developed this cool module for you, and we'll give it to you guys free to make NavigateLA that much better.' We don't know."[23]

The case of BoE also illustrates to what degree open data production relies on an existing bedrock of information infrastructures: not only robust electronic records systems but also systems for rapid, public data-sharing. As a lucrative division that brings in money to the City through permit fees, the department has the means to build customizable databases and websites, and it retains ownership of all of its data. As a result, BoE encountered few frictions in creating open data. The spaces of equivalences necessary to produce open data hide these stark differences in departmental resources for doing transparency work, yet they fundamentally inform what records are constructed as open data at all.

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[23] Ibid.

Broader Consequences of Open Data Production

As these examples have shown, infrastructures, once they are in place, may be silent and hidden, but they are never passive. They always condition and structure both knowledge production and cultures of bureaucratic work. In this final section, I briefly highlight some of the broader implications of creating spaces of equivalence for City records that have had an impact on government operations citywide. These include touting characteristics affiliated with data technologies as new metaphors for public administration, a growing use of performance metrics, and plans for predictive analytics in city planning.

Metaphors of Open Data

Open data work has inspired new technological metaphors of city governance. In the first example, staff I spoke to in the mayor's office and in some departments saw open data as foreshadowing a cultural shift in government that drew from the "iterative" quality of open source software, a technical metaphor drawn from open source software: Open data is depicted as a constant process of refinement based on evaluations of past actions. To mollify department concerns that the work would be too painstaking, ITA and the mayor's office stressed the adaptable quality of the website to improve based on past input. As an employee in the mayor's office explained, "We start the iterative process of continual improvement, rather than see it as a static thing. That lowered apprehension or the tension level . . . That malleability we had to convey repeatedly."[24]

In theory, then, the website would improve over time as people use it and make suggestions or point out flaws in the data or request other datasets currently not public. Some

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[24] Interview conducted July 9, 2014.

departments were happy to see the process in this way, because it promised to save labor by involving the public in improvements. Said a director of systems at the Department of Building and Safety,

> Let's get our data out there. If there's anything wrong or missing, we would rather know than be in the dark. Then we could improve whatever information that we have and work in tandem with the public. One of the beauties of this program that they have is that the City doesn't have a lot of resources. By trying to tap into the private sector, it's like you're multiplying your workforce.[25]

So far, such visions have proven inflated and even naïve; in all my discussions, I found no instances of citizens having any hand in altering a department's data. Yet this metaphor also grafts onto a new way of conceiving of administration more generally. Another of the mayor's staff extrapolated this iterative way of working as a future possibility for data-driven government work, one that no longer rests on sluggish bureaucratic protocols but responds quickly to the changing urban environment:

> We wanna send 50,000 more cops out to this part of LA. How about we start with fifty, and test it and learn from the data, and then realize, "Oh, that's a good idea." And then scale it up to 50,000. It's a big shift in terms of the way we think about policy-making. It's data-driven policy . . . Given our limited resources, given our big challenges you have deal with, it strikes me as the kind of thing that we have to do.[26]

Another related metaphor supplied by open data, and perhaps the most obvious and powerful, is that of industrial extraction. Proponents of open data in Los Angeles speak of data as "raw

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[25] Interview conducted August 29, 2014.

[26] Interview conducted October 6, 2014.

resource" or as an at-hand asset from which new value can be extracted at little cost. A sales director at Socrata used the industrial metaphor of raw assets and extraction to describe a shift in how governments understood their records within an information economy:

> Government itself, if you look at trends in our economy, are [sic] shifting away from earth-based raw materials, timber, oil, metals that we extract from ground and use to drive industry and moving to a digital economy. All innovation is happening at that level. The raw material there is data. All major innovative companies today – Facebook, Google, Amazon – they're all driven by data. If you compare organizations to who own the most data, those companies pale in comparison to government. It's the single largest owner of data in the world . . . The process of opening up data, communicating with it, using it, will fundamentally change government and drive the digital economy.[27]

According to this industrial metaphor, once extracted, open data circulates within an ecosystem of reuse and profit, ready to be transformed by citizen innovators and private markets. A general manager at the ITA described this process in a statement that conflates the private sector and civic value of passive resources:

> The private sector could be delivering to the public what we choose not to do or can't . . . This is a different way of looking at government. It's modern; it's web 2.0. This isn't our data; this is the citizens' data. So long as not inappropriate, the citizens and vendors know what to do with it more than we could. It's very free market.[28]

Staff I spoke to viewed open data as bait in particular for young, tech-savvy talent that could infuse new life into the City's aging government staff and create avenues for public involvement

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[27] Interview conducted August 1, 2014.

[28] Interview conducted July 21, 2015.

in administration. Said an employee in the mayor's office:

> I think the biggest thing that we didn't expect was the ecosystem play. The fact that there was gonna be a lot of startups and volunteers who wanna work with government to make that different vision happen . . . And so now, there's this huge ecosystem of companies, of volunteers that are all working with government in this new way.[29]

An employee in ITA said he supported open data because he saw it as a personnel opportunity to draw in young professionals with sought-after technology skills who were also "starving to help the city they love and live in." The City could leverage the civic tech community "to do analytics or make apps that we haven't been able to, to analyze data and come up with new ways to do city government."[30]

Such a concern for generating "raw" statistical capital that can circulate efficiently had consequences on the portal itself, where many datasets refer to traces of bureaucratic transactions rather than to the content of the documents or work referred to. The Department of Planning, for example, publishes a dataset called "Cases Filed 2014" that lists the case number, location of the filing, and date started and completed, but no information about the substance of the case. Similarly, the Department of Building and Safety lists its inspections for 2013, providing the location, date, and result of the inspection, but nothing about the type of construction being inspected. An abundance of data on the portal provide no link to the records referred to but stand in as quantitative abstractions for government work.

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[29] Interview conducted October 6, 2015.

[30] February 14, 2014.

Figure 13 - Department of City Planning's Cases Filed 2013.

The emphasis on extraction and circulation also bears out in the many datasets that lack a clear description of what each data column means. One ITA staffer told me that the portal's often messy or incomplete data made her realize the need for more support in the form of a dedicated data analytics unit that works with departments to improve data quality and encourages more performance-based budgeting. What is missing is "institutionalizing how you can make sure the data is useful and clean."[31] This dearth of contextual metadata can certainly be attributed to the lack of support that data coordinators had in their uploads, but that this continues to be the case at the time of this writing also signals a de-emphasis on the indexical aspect of the datasets. The emphasis on equivalences, operations, and transmission over indexing and archiving implies that the original context is not of importance and that the data's provenance should not bear on or hamper any subsequent use.

Finally, the rhetoric of industrial extraction overshadows calls for new modes of public monitoring and government accountability. One interviewee, an organizer of civic tech events who advised Garcetti on his open data initiative, described how the concept of open government

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[31] Interview conducted February 29, 2016.

data could operate instead as a lever to bring accountability to bureaucratic culture; she used the example of the application process for creating a public mural:

> Other places you make a request, and it goes into a black hole . . . .you should be able to look at who's applying for a mural in my neighborhood, and you should be able to give input and look at the other end and see there's all these murals, and I should be able to export that and make an incredible guide to murals. You see the disconnection of a stand-alone open data platform which is dominant form of that now, how that serves the technical need for open data, but not the potential utility as well as it could. That's the long-term goal: to not just make things technically open but to make them open in a way that serves the goal of increasing accountability, efficiency, and transparency on the practical level for people interacting with governments.[32]

While openness for the sake of public involvement is still a primary value that many open data advocates mention, open data rhetoric more often conflates the often progressive agendas of monitory cultures, as described in chapter one, with management theories modeled on "big data" economics. If open data is successful, this is most likely due to the ambivalence of its many touted values, whether expressed by transparency activists and dissidents or City staff who want to model their governance practices on Google.

Data-Driven Auditing

Since the launch of the portal, open data in Los Angeles has gone hand in hand with new auditing tools to track performance and set goals. Staff I spoke to saw this as objective information that should support departments' requests for funding or budget items. An ITA

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[32] Interview conducted June 23, 2016.

employee also encouraged departments to see open data as part of a virtuous circle in which

departments use the data-tracking performance and budgets to drive future decisions:

> We're trying to move from just deploying technology to deploying technology and
>
> insights in a way that gets better outcomes for citizens, whether that's innovation,
>
> collaboration, analytics, machine learning, how all these things are driven by data. Then
>
> gather it, unbias it, and implement it in a way that measurably improves life. And we're
>
> able to be a more efficient city too. I think we're seeing a change from, 'Oh, we just need
>
> a big system to handle financials,' to how will the data in the system drive decisions and
>
> alert people of the data we need.[33]

As illustrated by the case of the DCA, the Mayor's office has requested all city departments to

create performance metrics to track their "progress towards key priorities" (Office of Los

Angeles Mayor Eric Garcetti 2013) This data then funnels to the Socrata portal. To that end,

open data puts a new spin on the management crusade made popular in the 1992 bestseller

Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector by

Ted Gaebler, a city manager, and David Osborne, a journalist (1993). The book popularized

performance management systems and performance-based budgeting as a way of tying outcomes

to budgets. Performance-based systems departed from the standard public administration model

that relied on pre-set regulations without considering goals and outcomes. Departments were to

set these metrics themselves to establish a routine of indirect control by upper management. The

book also suggested that government turn to the private sector to understand how to be flexible

and less risk-adverse. One wide-spread result of these concepts are phone-based reporting

hotlines – in Los Angeles, the 311 system – that emphasized customer-centered government

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[33] Interview conducted August 9, 2016

service (Gordon and Baldwin-Philippi 2013). Open data, however, assumes a two-way

relationship with the public who will also be interested in these metrics, producing "data publics"

who become analysts and auditors of departments (Ruppert 2015). As an employee from the

mayor's office put it, cities are in competition to attract businesses and residents, and to do this,

they must offer good customer experience.[34] Open data appears to encourage better service by,

for instance, shortening lag times for open records requests.

However, to many departments, the notion that the department would soon become data-

driven, basing decisions off of metrics set by past performance, seemed very far off. Said my

DoT contact:

> They don't offer any resources or any budgetary support to buy equipment, or software,
>
> or consulting hours, or whatever it would take to do these things . . . We don't even have
>
> enough people, and we don't, we're not able to fill our vacancies, so unfortunately, we're
>
> not in a good position to improve some of these things.[35]

The data coordinator at the DCA felt similarly. Performance metrics created a very specific

representation of department work in response to the mayor's request, but the department did not

feel it had the financial or personnel support to change its service goal based on these numbers.

Predictive Analytics and "Big Data" Methods

The mayor's desire for more data-centered processes in the City departments continues, and open

data serves as an organizing fulcrum or civic-minded polish for these policies. An ITA employee

told me that one of her current goals is to use predictive analytics to solve such acute problems as

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[34] Interview conducted February 22, 2014.

[35] Interview conducted August 20, 2014.

homelessness, safety for fire fighters, and better educational outcomes for the Los Angeles

Unified School District (LAUSD).

> When we're in a space of having 20,000 homeless people sleeping on the streets of the
> city, we want to target open data so that it measurably impacts people's lives. We have an
> effort focused on permanent housing and stemming that flow to homelessness. If we can
> identify that, when people first come in to touch city services that they are at risk . . .
> when they come to a county facility because they have health issues or need
> unemployment to get a job . . . . if this is a person who needs to restructure debt, let me
> get you a financial advisor. Or this is a family with health issues, let us get you to
> MediCal and Medicare. By trying to pull services already paid for in earlier, we may be
> able to use predictive analytics help people never get to a point of homelessness.[36]

This employee saw predictive analytics as only part of a more complex solution: "Predictive

analytics is not going to solve homelessness. That's ridiculous. If it can find people at risk early

on and help them avoid homelessness, that family becomes stronger for generations ahead.

Whether we are 10 percent or 5 percent successful, any success is amazing." However, the ITA

is now asking departments to consider their goals in light of algorithmic problem-solving. In a

recent survey called the Technology Vision Survey that the agency sent to all departments, one

question asked departments to explain a mission-related challenge that they would like data

scientists to explore through visualizations and analysis. ITA then asked ten higher academic

institutions in the Los Angeles area to use data analytics to "solve" these specific problems. The

survey also asked how much each department shares data on the portal and whether it would be

expanding the use of data and predictive analytics in its operations.

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[36] Interview conducted August 9, 2016.

To that end, the City also led the City of Los Angeles Angels Lab, co-sponsored by Google and based on the company's innovation lab method. The lab lasted six weeks over the summer of 2016 and invited fifty people (most were City staff) to divide into five teams that would each tackle a problem (civic engagement, homelessness, City hiring, emergency management, and economic development) using "quick prototyping" and "failing fast," two buzzy methods imported from start-up culture. One resulting idea was a game based on Pokemon Go, as described by the ITA employee:

> They came up with a Pokemon Go game built off the MyLA 311 app and used data from cultural affairs to do art walks, and they get points, they get rewards, like Dodger tickets. The idea is to change concepts around civic engagement. You show up at a city council meeting or ask a question there and get points. It's to encourage and gamify the idea of being an Angeleno and what it means to you.

Staff I spoke to view data as one key way to breaking complex city problems into granular size. Said the ITA employee: "When we look at issues like homelessness, economic growth, civic engagement, where people have failed over and over again, it's a scientific problem, and you break it down into components. There are people who are affected. You say, how do we solve the pieces of this?"

The perspective that data-driven technologies can fix the city's grimmest problems often benefits the largest private tech companies, such as Waze's parent company Google, which offers some of the most widely used interfaces of open data accessed by everyday users. The first open data format, the General Transit Feed Specification, which allows users to access public transit routes and schedules, arose from a partnership between Portland, OR, and Google. Yelp, in another instance, worked with the City of San Francisco to create a format for accessing

public restaurant health scores.

Yet some departments have resisted requests by companies to use public data. The DCA has rebuffed requests by the Google Cultural Institute for data on exhibition collection objects or public art objects in the built environment. Said a DCA employee, "What are you going to do with our public art data anyway? . . . Are you just going to see . . . which free artist has the most credibility in the streets? And then, what, are you going to hire them? Or sell it that information to the public or other marketers who will sell that information to the public? . . . It works so well for the private sector. Nothing for the public."[37] As transparency scholar Clare Birchall points out, open data's wide usage too often relies on private companies to deliver data in user-friendly forms such that government "accountability is thus limited by the conditions of profitability" (2015, 191). Problematically, the interoperabilities created by profitable data flows between public and private entities blur the distinction between citizens and consumers of commercial services.

This technocratic view of city problems as discreet, measurable, and therefore tractable ignores the political nature of both data construction *and* civic problem-solving – the need in a democracy to gain societal trust and motivate collective political will. Such a view sweeps aside the thicket of citizens' opposing viewpoints, changing social mores on what is considered "rational," and the powerful sway of special interests and the media on public opinion. This view also ignores the mulishness and persistence of certain problems – climate change and rampant social inequality, for instance – that, due to their structural complexity, cannot be packaged and resolved in any instrumental way (Wolin 2016).

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[37] Interview conducted February 22, 2016.

Conclusion: Bureaucratic Cultures of Open Data

Open data does not straightforwardly reveal government processes and records; rather, in the process of producing new statistical representations for the public, open data work transforms administrative culture and mediates new relationships with the public and private sector. Transparency work is not an apolitical process but one that re-orients departments to consider their records as civic and commercial assets. This new understanding in turn promotes data-centric management strategies and a mechanistic understanding of how to solve city problems, as well as strengthens the market-share of private companies that monetize the products of open government.

As officials see it, the alternative is to remain steeped in a risk-averse, sluggish bureaucratic culture that responds too slowly to public exigencies. With open data, as many I spoke to claimed, government can better respond to city needs, and departments can allocate resources so that they meet their public missions on leaner budgets. Meanwhile, giving data to citizens undoubtedly levels an uneven playing field. I see nothing wrong in replacing paper maps with GPS systems, nor in giving departments the tools for easier data sharing with other departments and the public. On the other hand, open data often benefits large tech companies by encouraging private sector economies that are based on the monetization of consumer data to work even more efficiently. Furthermore, assuming that data can resolve city problems instrumentalizes highly complicated forces as identifiable, calculable dangers requiring more technology to solve. Such a management approach is not necessarily new – it has characterized the bureaucratic risk society throughout the history of the welfare state, as Ulrich Beck details (1992). What is of concern here is that the work of transparency, paradoxically, can take forms that close off matters of concern to public debate. That is, even if crowd-sourced predictive

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analytics yield mathematically accurate outcomes, they are too often couched in a discourse of objectivity and reliability, making them a powerful technology that could further remove issues from the public arena. Posing homelessness as a problem that data can mitigate, for instance, could divert attention from larger structural factors that perpetuate resource inequities. The work of openness leads again to closure.

One contribution of this study is to provide a close examination the infrastructures and labor entailed in open data production, to support the argument that data is not self-evident. Staff encounter new frictions largely invisible to the public while doing open data work: paper-based systems, contracts with private companies, liability concerns, and lack of personnel. In the City of Los Angeles, the production of open data is never straightforward but rather shaped by these complications. Each department's legacy systems inform the work of open data, and these vary widely depending on whether the data exist in databases that are accessible to a wide number of employees and the public, as is the case for BoE's GIS land-based system, or reside in years of Excel spreadsheets on certain staff's desktops.

The work of open data transforms how City staff see their department's records: no longer only indexical archives of government processes, but also as a font of new public resources. Staff in turn reevaluate their information systems in terms of the capacity to produce citywide "spaces of equivalence." As a result, some employees see City records as a source of easy capital, whether cost-saving efficiencies internally or innovation by the community and private sector. Others even see City information infrastructures as a solution for managing outsized, complex City problems. Open data, in this way, simultaneously answers Los Angeles' need for new capital resources in a post-recession context and addresses a self-conscious concern about the lagging technological modernization of public institutions.

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Chapter Three: Hacking Administration

Open City Hall

On May 31, 2014, the Los Angeles Mayor's Office opened the doors of Los Angeles City Hall,

the iconic downtown 1928 building, for a technology and innovation conference called

#TechLA. Children and parents, college students, and casually dressed men and women milled

between the marbled columns of the third floor, where Internet companies and government

agencies had set up tables to hawk buttons and flyers. At one table, attendants could scan the

datasets on two flat screen displays exhibiting the new open data website, data.lacity.org, posted

by city departments for the public. Food trucks parked outside on Spring Street served breakfast

and lunch. Participants filled the pews of the City Council Chambers and the Board of Public

Works rooms to hear speakers at panel discussions such as "Civic Innovation and Engagement,"

"Digital Divides," and "Big Data, Open Data, and Visualization." Panelists came from

technology-based nonprofits and private companies such as IBM, Oracle, and Motorola or

represented public offices or agencies, including councilmembers, the Controller, and the Los

Angeles Police Department. Upstairs, in a more cloistered area of office suites, more than

seventy-five people clustered into twenty teams for a two-day civic hackathon, a competition of

phone and computer application prototypes created with the civic good in mind.

   #TechLA was the first public occasion to invite a general audience into the government

building. That morning, the then-chief innovation technology officer, Peter Marx,[57] welcomed a

packed audience to the City Council Chambers for the unprecedented event, taking place, as he

pointed out, in the city that gave birth to the Internet. Speaking next, Mayor Garcetti described

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[57] Marx would leave the post in July 2016.

his vision of two bridges: one that led to a better, more equitable economy and another to a nimbler government that was currently in bad need of innovation:

> There's an opportunity to look at technology in Los Angeles as the cutting edge of what technology can bring. Can an app or an algorithm help traffic move more quickly, for instance, through traffic light sensors? Can we revitalize Hollywood through an innovative app that will help people find a way to park through a mesh network of real-time parking information?

Figure 14 - Mayor Garcetti speaking to a full room on the first morning of the two-day #TechLA event, May 31, 2014. The new open data website is on the flatscreens behind him.

Building these bridges wouldn't require much hard infrastructure, according to Garcetti, but the rather softer intervention of citizens at events such as civic hackathons, where participants examine municipal goals through software and code. At the civic hackathon's conclusion the following day, for instance, teams presented ideas for apps that would help Angelenos find jobs, locate Little League coaches at local parks, or index housing safety and affordability. One water waste tracking app would send information on water hogs directly to the Department of Water and Power. The winning team proposed an app to connect shelters with restaurants, nonprofits, and volunteer groups.

In earlier chapters, I traced genealogies of open data and examined their infrastructures and construction up close. This chapter tracks open data as it moves out into the world of practice to events such as #TechLA, where citizens take part in civic hacking, a term that describes a type of civic engagement through software programming and design typically in the form of phone apps and websites. Here I analyze civic hacking in the context of the City of Los Angeles. I make the case that civic hacking in this setting offers new models of participation that entail technical making and that engage primarily at the administrative level. The rhetoric about civic hacking blurs citizens with experts, imagines a more direct and collaborative participation, often emphasizes technological practice over debate, and is often engaged with designing civic and city services rather than policy or law. To analyze this kind of participation in practice, I examine civic hacking through political theories about participation in the administrative realm of government. This analysis allows me to make distinctions between types of civic hacking projects that are too often glossed over in the academic literature on the topic. To make these arguments, this chapter presents material from a three-year participant observation study of

events that occurred between 2013 and 2016, as well as from interviews conducted with citizens, city staff, event organizers, participants, and sponsors.

As with the federal open data portal, public participation is an explicit function of Los Angeles's Open Data Initiative, as spelled out in Garcetti's third Executive Directive released in December 2013:

> This Executive Directive empowers Angelenos to participate in their government with greater understanding and impact and promotes a culture of data sharing and cooperation among City departments. I look forward to launching LA's Open Data portal in early 2014 to promote transparency in government and give Angelenos a new way to help us solve our toughest challenges.[58]

Civic hacking is the most visible form of participation using open data, one that the City has taken active interest in since the first civic hackathon in 2013.

This chapter begins by defining civic hacking and then examines literature that has been critical of it. I argue that many of these analyses fall short; civic hacking is an emerging phenomenon that continues to evolve and defy the claims made about it. Finally, I offer a theoretical analysis based on fifteen civic hackathons I attended over a three-year period in Los Angeles to make distinctions among civic hacking goals and aims. I draw from political theories about participation in the administrative wing of government to make the case for more monitory and combative forms of civic hacking that are aware of the values of the technologies being used.

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[58] Speech made at #TechLA, May 31, 2014.

Defining Civic Hacking

Officials from the City of Los Angeles began an alliance with a burgeoning civic hack scene in 2012. In this context, the term "civic hacking" remains the umbrella moniker for a series of informal meet-ups and weekend-long events organized around software demos, conversations, and PowerPoint presentations that all pose technology as a balm for civic and administrative problems. More broadly in the United States, civic hacking has prospered in several cities since Obama took office and oversaw the launch of Data.gov, a website where federal agencies publish datasets for free reuse by the public.

Yet both the term and the form draw from several older, broader traditions: early geek culture, for which hackers were deft manipulators of computer software and hardware; open source software culture, with its dedication to clever code, free speech, and open licenses; and Silicon Valley, where frenzied, time-limited, overnight hackathons became a cheap means to both rapid prototyping and recruiting young talent. *Civic* hacking – drawing more from these traditions than negative, shadowy depictions of hackers rooting out security breaches – captures a trend to harness the craft, ingenuity, and aesthetics of these variably outsider or industry traditions by fiscally and design-challenged governments. Says a "civic designer" in a blog post for the nonprofit Code for America's website, "What began as a niche theory about the potential to improve government using technology has quickly expanded to focus more on changing the culture of government to work more effectively and creatively with its citizens." (Levitas 2013)

Civic hacking encourages participation specifically through hands-on making, usually by forming groups to create websites or phone apps. This kind of "material participation" takes a form not remarked upon in most classic political theories of democracy that prioritize a rational, speaking subject (Marres 2012). Theorists of deliberative democracy, for instance, focus on the

free exchange of information and rational discussion among individuals as the key feature of democratic reform. Such an assumption has lent itself to metaphors of networked technology as a new online "public sphere" that amplifies the everyday voices of citizens (Dahlberg 2010). Enthusiasts of chat rooms, blogs, and social media – , the so-called Web 2.0 technologies – championed these media for bringing publicity to inactive or traditionally suppressed voices, particularly as the technologies became organizing tools for political agitators and political campaigns (Shirky 2009; Bruns 2008; Mossberger, Tolbert, and McNeal 2008).

Such rhetoric has also influenced policy. In a decision striking down parts of the Communications Decency Act of 1996, the U.S. Supreme Court described the Internet as an electronic equivalent to a public square but one with radical scale:

> Any person or organization with a computer connected to the Internet can 'publish' information. . . Through the use of chat rooms, any person with a phone line can become a town crier with a voice that resonates farther than it could from any soapbox. Through the use of Web pages, mail exploders, and newsgroups, the same individual can become a pamphleteer. (Supreme Court of the United States, n.p.)

Civic hacking, in contrast, aspires to drive political or civic change through new digital products and user-friendly design. For example, the first White House Open Data Day Hackathon in 2013 asked participants to build web software for a new White House petition system; at the National Day of Civic Hacking that same year, the EPA asked for participants to make data visualizations on watershed pollution. The Open Knowledge Foundation, a nonprofit dedicated to information sharing, makes the claim that civic hacking, in this regard, allows citizens to participate in creating the tools of government: "This is more than transparency: it's about making a full 'read/write' society, not just about knowing what is happening in the process of governance but

being able to contribute to it." (Open Knowledge Foundation, n.d.) Yet while civic hackathons are oriented around tangible, technical products, they also create spaces of communal making that reflect the production and performance of civic desires and critiques. This aspirational place-making is one key outcome of these events.

Civic hacking, it should also be clarified, is a structural mechanism for engaging with government and civic services, and it will not necessarily be used for utopian or idealistic ends. Similar to the equivocal functions of social media, civic hacking projects have been used for anti-progressive purposes (Morozov 2012). Civic hacking projects can reproduce societal inequities; take, for example, real-time crime tracking applications that combine open data from police departments with geographic data to categorize certain neighborhoods as "sketchy" and dangerous. Here, the use of supposedly neutral government data compounds the discrimination already plaguing lower income neighborhoods by way of underfunded schools and the housing market. While such examples are relatively rare – civic hackers can also be aware of the values perpetuated by their technologies – they serve to clarify the distinction between the structure of civic hacking and the content for what it can be applied.

It is important to point out that open data initiatives have gone hand in hand with civic hacking from its inception. Hackathons are obvious publicity efforts for governments' open data; they offer public spaces where federal or local open data efforts are showcased and tested on an interested audience. Controller Ron Galperin told participants at a Code for LA meetup that open data is the "connection between your world and our government."[59] As Abhi Nemani told me at the Immigration Hackathon in July 2014, when he was still the City's chief data officer (Nemani left his post in September 2015), "Hackathons and open data are one and the same. We deeply

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[59] Code for LA Meetup January 29, 2014.

prioritize engagement with the community to build on data." Civic hackathons, Nemani

explained, also help "inculcate a culture" of open data among staff who might otherwise resist

the policy. The public's use of data demonstrates to government officials that their efforts have

pragmatic value thanks to an audience of users who take advantage of it.
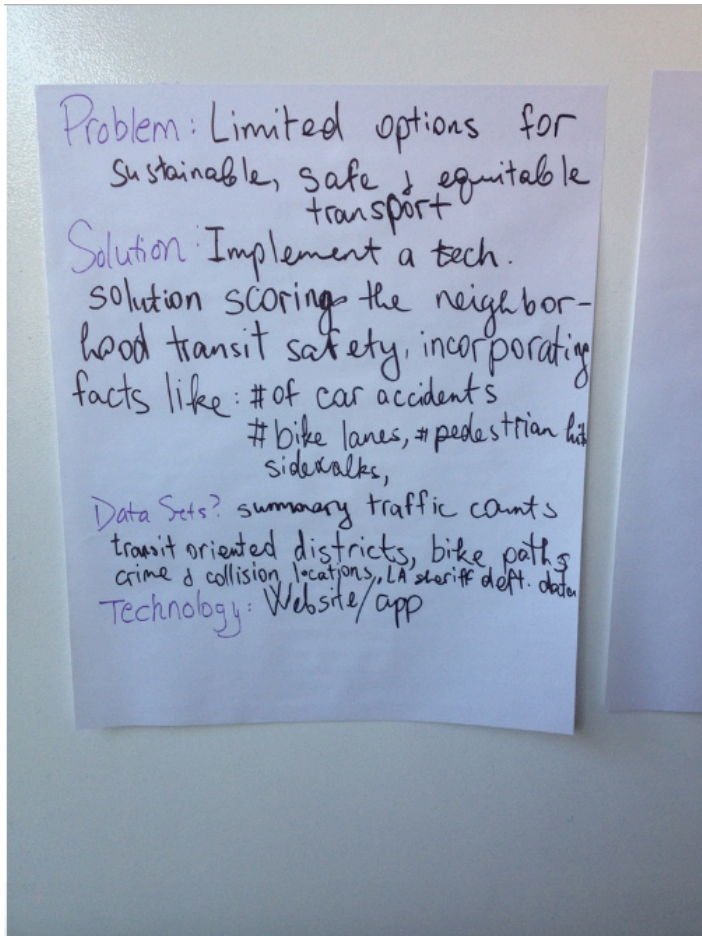
Figure 15 - Solving city problems using technology and open data at the Civic Innovation Lab, October 12, 2014.

By offering open data to citizens, the City also offers, at least symbolically, one of the

means of production it uses to guide service delivery and agency procedures. Data has long been

integral to urban planners who have used it to guide city policies and the distribution of services

(Scott 1998; Porter 1996). Through data collection and computerized databases, midcentury

experts tried to make more accurate assessments and predictions about urban life using indicators such as housing conditions, mental health, and sanitation to guide budgets and policies (Light 2005). These early "smart city" projects reflected a midcentury faith that technology combined with top-down, command-and-control style planning could help solve intricate problems of urban life. (Vallianatos 2015)

Open data appears to collapse the hierarchical distinction between bureaucrat experts and citizens. Open government data discourse in this way borrows from two traditions that historically have been distinct, if not oppositional: the rationalized management of the bureaucratic state or city, and monitory reforms that make these government processes transparent to its citizens. Not only is data open, through licenses and legal tools, but the city also invites citizens to extend and use these tools to have a voice in policy and the designs of service delivery. In this manner, open government data mounts a critique of the limitations of centralized state planning; it offers a more stochastic and pragmatic approach of prototyping and trial by experiment to suit the open-ended complexity of urban settings. These efforts mirror similar trends in the sciences that that demand active participation by citizens in understanding the risks and rewards of technological society (Barry 2001). As we will see, the rhetoric around civic hacking promotes these public events as spaces where this supposed flattening of expert involvement in city services is carried out in practice.

Civic Hacking in Los Angeles

In Los Angeles, civic hacking began as large-scale events that attracted hundreds of people and culminated in a prize competition. These large-scale events, which continue to this day, usually coincide with a National Day of Civic Hacking organized by the White House. Such was the

case for Los Angeles's first civic hackathon in 2013, a grassroots affair that attracted around 500 people. From the start, the City has played a role at these events, hosting Hack for LA at the #TechLA in 2014 and at the Department of Water and Power building in 2015, while helping with publicity and offering personnel support at smaller meetups.

These large-scale events typically take the form of competitions, the format that has characterized civic hacking most vividly in literature and the press. To illustrate, the second annual Hack for LA event took over a bright gym in the Boyle Heights neighborhood of Los Angeles in December 2013. The gym belonged to the Variety Boys and Girls club, a sixty-year-old community center founded by Hollywood philanthropists. Kids who were there for normal activities appeared from time to time on a second-floor balcony, pointing and peering down at the hackathon attendants below. Beneath track lights and basketball hoops, 150-odd participants sat in folding chairs arranged around tables, staring at their laptops or grazing at booths with free bagels and fruit. Attendants appeared to be mostly in their twenties and thirties, with a higher number of of males and a mix of ethnicities.

The morning of the first of two days, the organizers of Hack for LA called for attendants' attention as they made formal announcements and introduced the hackathon's rules: one "demo" – or working prototype – per team and the demo had to use "fresh" code that originated during the event and that had to be up and functional during the final presentations. Judges were to base their decisions on originality, a clear and focused concept, and the quality of the technology in use. The rules placed an emphasis on speed; as one organizer put it, "The hack process itself helps people to quickly problem-solve." Results would need to contend with the technical constraints of designing working demos within two days' time.

Speaking next, commercial dot com sponsors announced cash prizes amounting to $17,500 for apps that served certain civic aims. Tapdn, a Santa Monica software company that markets to college students, offered a prize for a "social enterprise app that makes the most social impact." Google called for an app that would draw from its new Civic Information application programming interface (API), a standard that displayed information on a user's elected officials. Livestrong, a health and fitness website, offered a prize for the best health app, while Sprint announced an award for an app that would benefit the surrounding Boyle Heights neighborhood. A representative from one of the event's primary underwriters, the i.am.angel Foundation, a nonprofit founded by the singer will.i.am from the Black Eyed Peas, described how a youth hackathon held the day before was an inspiration and branding opportunity for the local community: Kids in the neighborhood, which is predominantly Latino and working class, are "underserved and underprivileged," but they could become empowered by learning how to code. The hackathon "changes what people say about us. Boyle Heights can create the next best app, like Facebook and Twitter." Children "can rise to the expectations about what they can do" because "hackathons take them seriously."

Officials from the City of Los Angeles also made an appearance. While industry representatives enticed participants towards certain civic themes, public officials prevailed on attendants to draw on city data in their designs. Wearing a suit in a room full of T-shirts and hoodies, Galperin introduced Control Panel LA, a new open data website with datasets on revenues and expenditures for all City departments. Civic hackers could work with this data, he said, and "mash it up and find a use for it that is creative and different." Rick Cole, then the deputy mayor for budget and innovation, next announced that Garcetti would soon roll out a broader open data website with datasets from departments across the city. Looking at an

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audience largely composed of computer programmers and web designers, Cole said the website would "change the way government works." In the meantime, the beta site, currently under construction with 115 datasets, was available for attendants that weekend.

After the announcements and rallying speeches, attendants formed teams and clustered around tables, where they designed and coded for the remainder of the day and into the afternoon of the next. Prizes were announced just before sunset on the second day. The sponsored format of the hackathon clearly drove many of the projects; several groups designed their entries around the prizes offered by the private sponsors. One winning app, for example, combined Livestrong data with Los Angeles park data to encourage fitness and urban exploration. Other teams' designs' incorporated the available government data. The website "Transparent LA" displayed colorful but static pie charts and graphs of government staff salaries and expenditures pulled from the Control Panel's API. The website "Pocketwatch LA" combined Control Panel data with the Google Civic API to track local government expenditures.
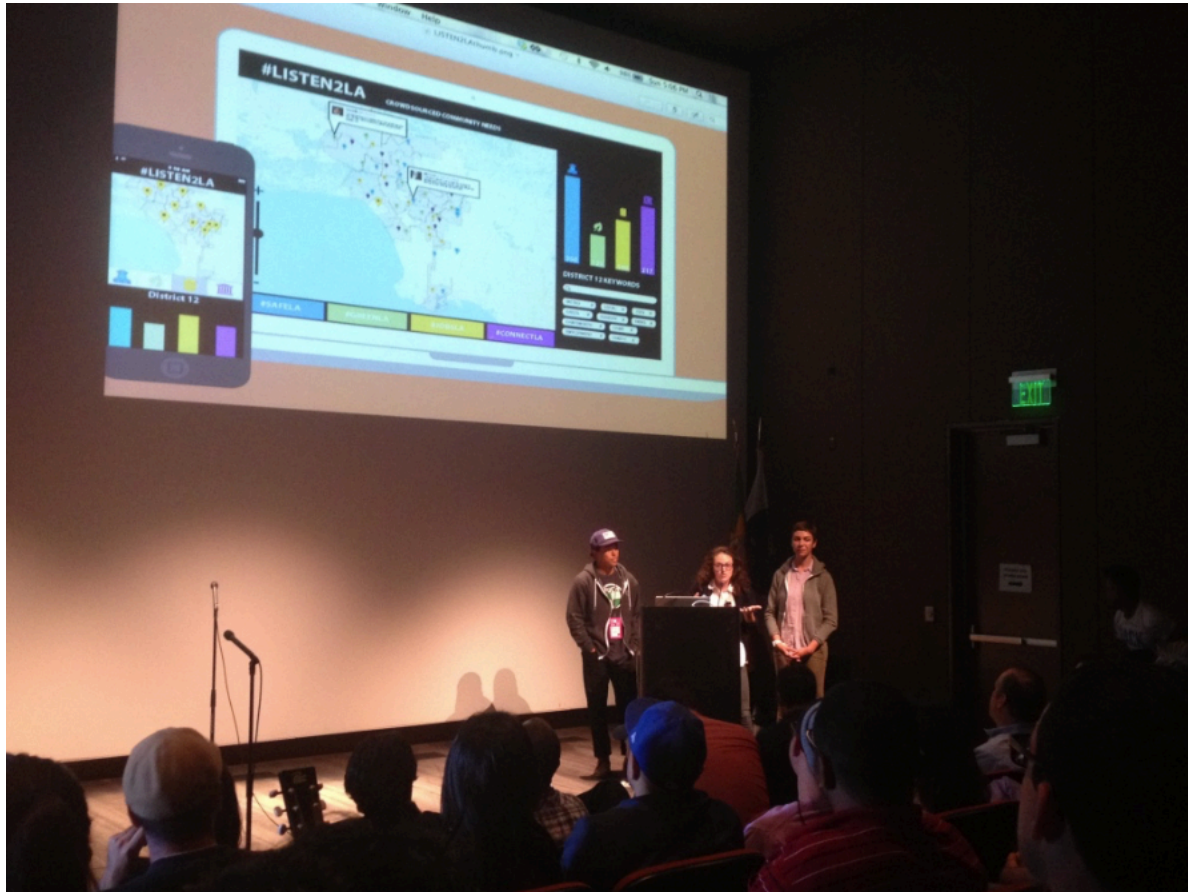
Figure 16 - presenting working app prototypes on the 2nd day of #TechLA, June 1, 2014.

However, civic hacking in Los Angeles has taken other forms beyond the competitive, two-day spectacle. Civic hacking events can also be one-off affairs that tend to focus on particular issues. In 2015, for example, the City coordinated weekend hackathons held throughout the year that urged participants to design projects on the themes of water, transportation, and community. At one of these events, the July 2015 #ImmigrationHack held at the downtown Central Library, there were no corporate sponsors, no prizes, no winners, only suggestions, "ideations," and prototypes. Nonprofits and government officials talked there about the very real material challenges of helping non-citizens find the correct online forms to fill out or the right desk to visit if they want to start on a path towards citizenship. The prototypes ranged

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from a user-friendly website where the undocumented could find essential government forms to social media websites that connect recent immigrants with the settled population.

Finally, the city's broader civic hacker scene encompasses more frequent meetups – ad hoc gatherings of programmers, data scientists, and interested citizens. In 2015, civic hack nights took the shape of monthly Hack for LA gatherings organized by volunteers and the two-person staff from Compiler LA, a benefit corporation (or "B-corp") that designs web apps for governments and non-profits.[60] On its Meetup page, Hack for LA defines itself more specifically as the Los Angeles "Code for America Brigade," meaning that it enjoys minimal administrative and fiscal support from the San Francisco-based civic tech nonprofit Code for LA. The 2015 meetups focused less on actual making and more on brainstorming how technology might address a specific issue, such as homelessness and mental health. After a hiatus, beginning in June 2016, the coordinators of the monthly Hack for LA nights began weekly meet-ups at a space donated by the hard drive company LACI. These weekly gatherings have abandoned the social, discussion-based format of the year before and focus solely on sustainable projects that can develop over the course of months or years. Participants arrive to work in teams on app and website designs during each week's three-hour meeting. Current projects focus on homelessness and affordable food.

The phenomenon of civic hacking remains emergent, given its shifting forms over the past three years in Los Angeles alone, making it difficult to theorize or make claims about, though many have. In the next section, I go over three important critiques that have been made about civic hackathons. But as insightful as these critiques may be, they too often gloss over distinctions among projects, the hackathon form, and how participants engage in these spaces. In

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[60] A B-corporation is a for-profit corporate entity that includes positive impact on society and the environment as one of its defined goals, along with profit.

the final sections, I move beyond these critiques to a normative analysis of civic hacking that makes finer distinctions among civic hacking projects' values and goals.

Four Critiques of Civic Hacking

Neoliberalism and the Influence of Silicon Valley

One critique of civic hacking is Silicon Valley's influence on it, often visible in the hackathons' form and tactics, the rhetoric deployed, and the companies explicitly involved as sponsors. According to some critics, civic hackathons are problematic because they borrow from a format exported from start-up culture in an attempt to reproduce in public administration some values and practices from private enterprise. This formal and conceptual transfer has been widely commented on in literature on civic hacking (Dyson 2013, Irani 2015, Schrock n.d., Tkacz 2013) and by civic hackers themselves. One participant I spoke to described how the city endorses a form borrowed from private industry in order to "catch up" with it: "The city is . . . taking advantage of the buzz. I would say the zeitgeist." Civic hackathons in this way produce particular subjects, creating "entrepreneurial" or 'algorithmic citizens' that value efficiency and rapid-fire innovation (Irani 2015, Schrock 2016). Civic hackathons therefore encourage forms of participation, such as reporting potholes, that are bereft of much impact to addresses broader relations of power (Morozov 2013). The resulting institutional collaboration puts civic hackers at odds with the traditional view of hackers as criminals, dissidents or activists (Coleman 2013).

Because projects often incorporate commercial software, critics have expressed concern that civic hackathons will shift the onus of service delivery from the public to the private sector, providing a "backdoor" to more government contracts (Johnson and Robinson, 2014). Such partnerships with Silicon Valley – or Silicon Beach, the name donned by a cluster of tech

companies in the coastal Los Angeles area – thus appear to signal another example of neoliberalism as governments attempt to hand over the design and oversight of public information services to participants and private companies. Civic hacking therefore harnesses the efficiencies of the private sector by way of citizens who represent the skillset of nimble technology firms. Civic involvement, as a result, becomes uncomfortably tied with corporate aims. For example, one of the sponsors of the 2015 Hack for LA event, a beacon company called Gimbal, began a pilot program with the city to put Bluetooth devices at bus stops, parking meters, and in Union Station (Nelson 2015). I spoke to one of the company's representatives who explained that they were making their source code open to developers at the hackathon, since "Gimbal could help communities improve city service" through combinations with the City's open data.[61]

As we have seen, the influence of start-up culture goes beyond rhetoric to incorporate public-private partnerships into the economic structure of events, particularly in the form of sponsorships by companies that collect and monetize user data. Sponsors also benefit by exploring the City's data. As one participant I spoke to at the 2013 Hack for LA event, the sponsors are part of "a system" in which corporations have sophisticated technology to manipulate data, while the City provides a trove of data to be manipulated. Many projects inevitably draw from these platforms, and the companies, in return, obtain visibility and a platform to recruit potential employees. Meanwhile, sponsors offer access to their products' API, this attendant claimed, acclimating programmers to their product. This attendant, a programmer from Santa Monica, described it further:

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[61] Hack for LA, May 26, 2015.

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Corporations are competing for the mindshare among the attendees. They need

programmers. If a large company hires from a recruiting agency, it costs a lot. This is a

cheap way to recruit and get good publicity. They spend two to three thousand dollars on

refreshments and prizes. That can save them $20,000 of specialized advertising.

Sponsorship appears, at least in Los Angeles, endemic to civic hacking spaces. The weekly Hack

for LA continues to be sponsored by a consortium of government departments, nonprofits and

private companies, including ESRI, Deutsch, and Gimbal.

Figure 17- sponsors on the poster for #TechLA, May 31, 2014.

Finally, civic hackathons unfold simultaneously as both virtuous civic participation and

as the production of a free labor pool, with free job interviews and free talent search among

private companies and government. Among the participants I spoke to, some came to civic

hacking events with a feeling of civic duty as much as a desire to network and to look for jobs.

Indeed, the discursive and design influences from corporate Internet culture are, as mentioned,

highly visible at these spaces. Their presence takes the form of software used – provided by

Google, ESRI, Intel, etc. – sponsorships, prize money, and booths where representatives hawk

their products. The notion that open data can be a platform for private sector innovation is one of

its core purposes, spelled out in both federal and local Open Data Directives. At #TechLA, a

representative from Socrata, the software company that designed the portal, enthused that a

"third-party ecosystem" of commercial apps can draw from the City portal's APIs; he cited

transit apps such as City Mapper as "a city service no longer delivered by the government, but by

third parties that wrap the data." In these spaces, the civic hacker is cast at once as a civic

participant, a consumer, a potential employee, and an unpaid laborer. Any analysis of these

spaces must contend that the civic hacker has other potential gains beyond civic skills and that

this possibly weakens the civic motive. The emphasis on the neutrality of data and these

technical tools only means that deliberation and debate about the role of the private sector in

these civic spaces are often kept at bay.

Cyberlibertarianism

There is also clear evidence that tropes from Silicon Valley and the related open source software

movement are driving the shift from a discourse that valorizes centralized expertise to today's

direct, crowd-sourced problem solving. Both dotcom and open source cultures view greater

openness – in free enterprise as well as the production of social services – as the route to smarter

and more efficient systems. In this discourse, software features provide metaphors for governance; technologies of the "free and open" become, at least for thinkers such as technologist and publisher Tim O'Reilly, a catch-all solution to collectivize social problems at large – education, publishing, architecture, and now government (Kelty 2008). Scholars including Turner, Barbrook, and Cameron have branded such language as part of the cyberlibertarian creed: the belief that clever coders and programmers can negate the need for government services (Turner 2010, Barbrook and Cameron 2001). As one researcher commented about civic hackathons specifically, "civic hacking projects don't encourage their participants to reflect on how government functions or what government is supposed to be." (Golumbia 2013)

Public figures often evoke these cyberlibertarian influences when they adopt O'Reilly's slogans of "gov 2.0" and "government as platform," a phrase that describes the utility of government APIs that programmers can build software upon. Government officials themselves acknowledge the need for greater openness: organizers and advocates ubiquitously evoke the values of open-source software – participation, collaboration, transparency, and crowd-sourcing – in these settings. O'Reilly's ideas are repeated at Los Angeles events, as when, at a Hack for LA event, Mayor Garcetti cited O'Reilly to explain the government's role now that it offers open data: "We are the platform; you innovate and build on us." The rhetoric of civic hacking, as mentioned, describes a direct, collaborative form of participation in government administration that collapses or inverts the distinction between citizens and experts: Now it is citizen entrepreneurs who will improve policy or city bureaucracy, through technological innovation and user-friendly design.

As documented, Los Angeles City staff repeatedly critique the failures and weaknesses of centralized power structures to predict outcomes in complex settings and instead seek direct help

from a more diffused civil sector of the technically skilled. Opening City Hall to the public on the day the portal was launched was a gesture meant to mirror the portal's promise to break barriers between government and citizen. #TechLA's intersection of city staff, tech companies, and private citizens all rubbing shoulders in City Hall complemented the vision of a more collaborative, transparent, and technologically advanced city. The then-deputy mayor of budget and innovation, Rick Cole, told audiences that #TechLA, by opening the doors of City Hall to the public, is a model for making government "permeable and boundariless [sic]," blurring the distinction between citizen and city bureaucrat. Speakers positioned the event as a direct line between citizens and local government, just as the City's open data portal provided the technical infrastructure that citizens could use to initiate this direct collaboration with their government. By offering open data to citizens, the City blurs not only who controls data but also who does the work of analyzing it. Here, the City opens one of the means of production it uses to guide policymaking and agency procedures – government data – to citizen access, use, and involvement. As critics point out, this rhetoric appears to delegate the work of government to citizens themselves.

Languishing in the Speculative

Another critique is the ephemeral nature of many hackathon projects. Rather than full-fledged Deweyian publics that work together to bring political issues into focus, Lodato and DiSalvo (2016) view civic hackers as contingent "proto-publics" that simply disband after an event. Their material labor produces prototypes of imagined, better futures, but it ultimately remains speculative, with no sustained presence over time. Indeed, lack of sustainability has been a problem for civic hacking in Los Angeles. So far, civic hacking is better seen as a broad

diagnostic of civic concerns and frustrations that are worked out through demos of possible

solutions. These demos languish with no financial or institutional support beyond a few days'

hustle of coding and design. Prize awards at civic hackathons do not seem to induce people to

continue their projects once the lights are turned off and doors are closed.

In 2015, the City shifted tactics to contend with the ephemeral results of open data

events. First, Los Angeles hosted a series of themed, issue-oriented hackathons (Lodato and

Disalvo 2016) based on concerns dictated by the mayor's office: the drought in California, Los

Angeles's ongoing transportation woes, and community engagement, with a particular focus on

immigration. At Hack for LA 2015, held in the City's architecturally sublime Water and Power

Building, organizers announced datasets specific to those city challenges, including data on

parking tickets and water use by zip code. Programmers brainstormed prototypes in the main

event space, where a mural of Mulholland towered over participants who were tasked, at this

particular event, with "hacking the drought" currently unsettling California. The City encouraged

participants to put their ideas into workable form through an app challenge that was to begin in

September 2015, called Challenge:LA. The Challenge promised funds and support to shepherd

projects to fruition. However, nothing came of Challenge:LA. According to staff from the

Mayor's office, the funding never materialized, and the hackathons simply did not yield results

that could move beyond prototypes; the City already had contracted with a private company to

design water-saving information services, making the crowd-sourced approach redundant:

> From the water hackathons [hack the drought], what was interesting is people came up
>
> with ways to meter water and for individuals to get information on water use. But the

Department of Water and Power had set up relationships to do that already. There was

not an opportunity to use these ideas.[62]

According to this interviewee, the City plans to partner with the University of Southern

California's entrepreneurial center to incubate a project called the Mayor's Cup, though details

remain vague. With the launch of a new open data website based around GIS data, called

GeoHub, the City also plans to launch projects using this data with an as-yet-undecided

"independent entity." Participants will receive $2,500 in prizes for their efforts; at the date of this

writing, such a project has not yet been announced.

Figure 18 - Hack for LA 2015, June 7, 2015.

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[62] Interview conducted February 8, 2016.

Is participation through civic hacking ultimately better left in the speculative realm, such that the rhetoric of direct participation or collaboration with the government should be corrected and toned down? This shift in rhetoric does seem to be occurring on the City's end. While the 2014 #TechLA event promised to break down barriers between citizens and the government, Coral conceded at an event in April 2016 that the City would spend less time reaching out to citizens and instead redirect their efforts towards more open data sharing across City departments and with private companies such as Google, since these use cases have proved more successful.

Confined by Solutionism

Perhaps the most consistent critique of these spaces centers on the civic hackathon's vision of governance, specifically its proposal that technological expertise is a way to resolve complex political problems. Lilly Irani (2015) argues that the politics of civic hackathons reside in its form more than the issues addressed: making and experimenting are privileged over debating and planning, and proponents imagine that social change can happen through small technical acts occurring "outside social movements or formal politics" (p. 17). The politics of civic hacking, therefore, are not in the various issues that projects take up, since in any case the hackathon can absorb any issue. Rather, the politics reside in an epistemological assumption about how civic concerns should be addressed. Civic hackathons, under this critique, rely on technological "solutionism," a term coined by Morozov to describe the shallow tendency to define problems narrowly through technological solutions (2013).

Lodato and Disalvo also analyze civic hackathons in relation to literature on the role that technology and design plays in politics, drawing from John Dewey's theories on publics and issue-making and from Noortje Marres's concept of "material participation" (2012). For Dewey,

an "issue" is a condition of concern with immediate consequences; "publics" come into being as they cohere around and articulate an issue in the face of ongoing, collective distress. Marres refines these concepts to argue that issue formation is never a settled affair but rather always under political negotiation. Furthermore, Marres argues that material devices can play an important role in mediating and structuring publics and their issues; as mentioned, material practice offers another mode of engagement in issue-formation beyond that of discursive deliberation and debate assumed by classic political theory.

Civic hackathons, for Lodato and DiSalvo, present an example of material participation; they are sites where attendees give form to the conditions of political issues through tinkering and prototyping. In the authors' final analysis, however, civic hackathons reduce political issues into tractable problems that can be resolved through technical or design solutions. Complex issues, such as affordable housing or pollution, masquerade as technical problems that can be solved by phone apps and websites; as such, they hide the underlying, ongoing political controversies that come to comprise them. The authors believe this mode of participation forecloses inquiry and suppresses alternate explanations of an issue. Since these events encourage a specific form of civic engagement, the outcomes are portrayed as a naïve view of "politics as the mechanics of government" by reducing political issues into what can be solved with technical skills alone (DiSalvo and Gregg 2013).

According to Clare Birchall, in a trenchant analysis of open data that applies to this civic hacking literature, "data-driven transparency" presents itself as a pre-political, pre-interpretive offering of neutral information, above the politics that comes with communicating a message – as "data in lieu of politics." (2015, 187) Furthermore, says Birchall, participation turns citizens into entrepreneurs who can help government as much as they can explore the wider data

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economy – open data operates equally to promote transparency and potential economic growth. By participating through open data, civic hackers are not encouraged to be antagonists but to be entrepreneurs who take up the work of the state, reproducing it in the process. The democratic contract that asks for citizens to participate as a result submits to a market logic. Birchall further accuses open data of the unfair "responsibilization" of citizens – because the data is available in unprocessed forms, it becomes the citizen's responsibility to notice anomalies and to process the data for use (192). Birchall's concern is like that of many others: that participation through open data ultimately allows only a limited form of engagement between government and citizen.

The Problem of Writing About an Emerging Topic

These four critiques of civic hacking are, like any analysis of a contemporary phenomenon, based on a selection of outcomes so far, even as civic hacking remains an emerging topic that continues to evolve and belie some of the claims made about it. Several critiques, including DiSalvo et al's and Irani's, are based on empirical observations of civic hackathon that took the form of a one- or two-day app contest. Yet, in Los Angeles, civic hack events are sometimes not based around prizes or product prototyping at all. Not all civic hacking events I attended were contests or had corporate sponsors – the Immigration Hack, for instance, was sponsored by the City and a handful of nonprofits. Several civic hacking events have instead provided forums for discussion among participants, nonprofit representatives, and city officials, taking the form of a more traditional public sphere. Civic hack events have offered a space where citizens can gain a better understanding of the technological infrastructures required for governance and community building – the material needs of governance and civil society crucial for public services, such as water conservation, immigration reform, bullying, and bike sharing. In this way, civic hacking

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can offer what Carol Pateman (1970) calls the "educative dividend" of participation by helping citizens better understand how their city works.

Also, contrary to Lodato and DiSalvo, civic hacking in Los Angeles has generated a small but sustained public, since the organization of events under the banner of civic hacking has continued three years after it started. In this instance, a secondary cause – defined by a set of tools and practices to further various primary civic goals, such as addressing homelessness – becomes, in itself, the primary form bringing together those involved. The current weekly, incubation-oriented Hack for LA meetups appear to be the first time that groups have met for more than one event to realize a project that might sustain beyond the prototype phase; indeed, in October 2016, Hack for LA announced the first working project to come out of its group meetings, called Food Oasis LA. The website steers users to local farmer's markets, food pantries, community gardens, and grocery stores and was made in collaboration with the Los Angeles Food Policy Council.[63]
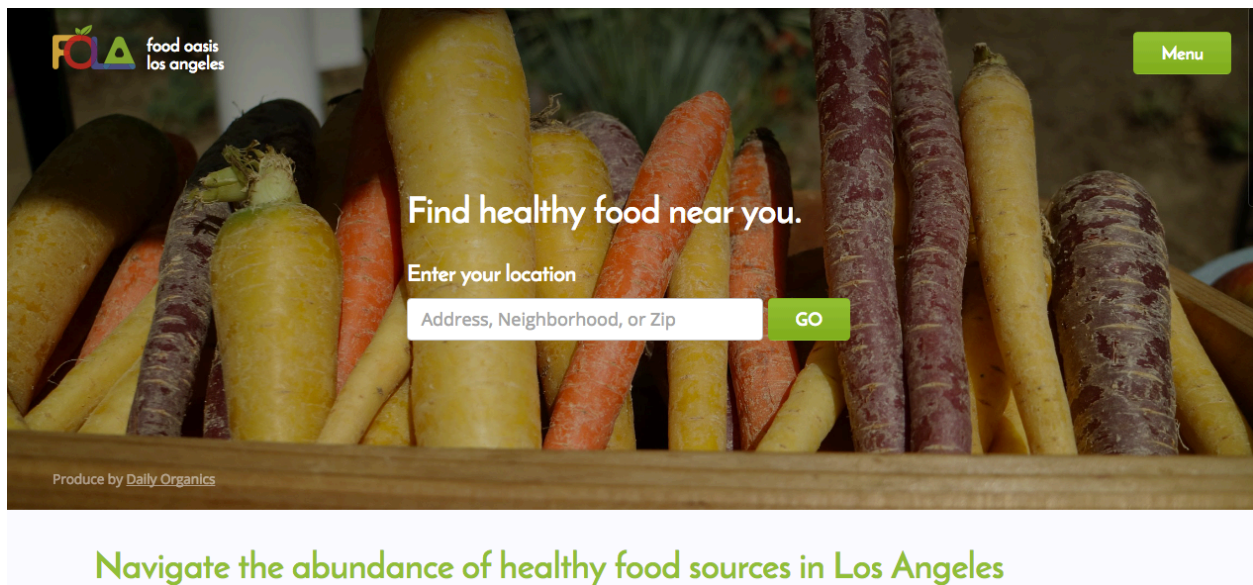
Figure 19 - the homepage for Food Oasis Los Angeles.

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[63] https://foodoasis.la/

Civic hacking in Los Angeles should be viewed as a piece of a larger cultural change. One advocate I spoke to mentioned that a handful of people have been able to create livelihoods based on the City's support of civic hacking or civic technology – one example she supplied is Compiler, mentioned above, which has garnered contracts with the City, County, and local nonprofits. Other participants I spoke to told me that another effect of civic hacking isn't simply new tools – realized or unrealized – but a change in government culture towards greater transparency and data literacy. Said an organizer of Hack for LA, "A lot of times in these environments we can build something that solves a problem, but even if we create a proof of concept to help officials think critically about opening data or engaging in [a] transparent and participatory way with communities, that's a victory. We're trying to win on both of those fronts."[64]

Refining the Analysis: The Citizen Experts

Finally, these accusations often elide over key distinctions between civic hacking projects. In my fieldwork, I have also found that civic hacking projects were often narrowly constrained by their focus on technological, rather than discursive, solutions. Yet I would like to modify the critique somewhat. Rather than trying to solve complex political problems, as other critiques would have it, civic hackers in Los Angeles more often try to imagine better information services that governments and civic organizations might want to use – in short, the critiques have glossed over the odd new partnership imagined between government and citizen. Many apps and prototypes respond to city officials' or nonprofits' request for better information infrastructure for service delivery, whether by prototyping designs for communicating a person's needs to an organization

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[64] Interview conducted June 22, 2016.

or department or by helping the organization cater to these needs. These demos suggest the

inevitable and hidden role of information infrastructure to civic organizations and government:

the banal aspects of governing or organizing that are not usually open to public input or scrutiny

but which happen through internal IT work.

Figure 20 - civic hacking event sponsored by the Controller's office, April 5, 2014. The slide reads, "Civic hacking. People working together quickly and creatively to help improve government."

For example, demos at the 2013 Boyle Heights Hack for LA event showcased a map

meant to help people find retailers that take food stamps in Boyle Heights, offered data on the

Los Angeles river and park information, and drew from city data on water usage so that citizens

could report broken sprinklers or pipes. At the 2014 Hack for LA weekend, as mentioned, the winning app modeled a platform for homeless shelters to report their needs to restaurants and volunteer groups; another app paired business owners with mural artists. Many of these examples are pragmatic devices aiding or supplementing existing civic or government services: finding food-stamp vendors; locating public parks, jobs, and shelters; encouraging public transit and bike ridership; and reporting water leaks to the city.

In other words, the projects at civic hacking events primarily engage with the mundane, ailing nuts and bolts of administrative information services. Garcetti stated the need for technologists to help with government services in his introductory speech to 2015 Hack for LA:

One thing I've always said is that government has the best market share out there. […] But we generally have pretty lousy products. On the flip side, we have people with great products and ideas that have no market share. So if we just kind of get married to each other, we can take the innovation that is out there and take the platform that we have, the reach that we have, to get to everybody, and we can improve the quality of life for everybody.

In contrast, examples of complicated political or civic concerns packaged as problems to be solved through design prototyping were more exceptional. At the July 2015 #ImmigrationHack event held at the Central library, one female participant wanted to tackle the issues of gentrification. Myself, along with this participant and an evolving team of four or five others, sat and brainstormed an interactive game that would use a point system to encourage citizens to become more involved in their immediate neighborhoods, either through small gestures such as

bringing food to neighbors or more intensive projects such as organizing a community block party. An app, envisioned over the course of a few hours, became the means to solve a problem – lack of empathy for immigrants – and to fend off very complicated issues of xenophobia and gentrification that disrupt people's daily lives. The group broke down and ultimately disbanded, however, as it became clear that the woman who originated the concept envisioned a simulated game with fictional characters, while the rest of the group wanted interaction with live players in the users' vicinity.

The ease of prototyping information service products explains why participants are often distinct from Dewey's (2012) publics, as Lodato and DiSalvo rightly argued. Civic hackers are often not an affected community reacting to a singular problem beyond any one individual's control; rather civic hackathon participants often arrive to the table with technical solutions and a repertoire of skills in search of administrative problems to solve. This distinctive kind of participation is, as Chris Kelty (forthcoming) puts it, neither participation in electoral politics nor by the traditional public sphere, but rather participation in "the administration of the government's practical affairs." These technocratic efforts are often about making administration run more smoothly and confronting an "old mentality of hierarchy, bureaucratic complexity, and over-engineered, inflexible design." (Kelty, forthcoming) In a post-recession context, city officials view civic hackathons as sites where participants co-design services in resource-depleted cities. Code for America, following this model, embeds Fellows in cities to design public information services. Fellows have built apps to help citizens in the Bay area be better

serviced by SNAPs (food stamps) by using text messages rather than letters or long phone calls.[65] In Rhode Island, Fellows created an online registration for a school lottery process.[66]

This kind of participation also helps explain why the rhetoric surrounding civic hacking confounds the traditional hierarchy between governing body and governed or between experts and citizens, since it invites citizens to partner in service delivery. In this rhetoric, citizens are the experts while the government trails behind in technical innovation. According to one of the Mayor's staff:

> The most common thing you hear is that the government is the obstacle rather than a solution. Before government was a solution in the thirties to the sixties, then later on government became the obstacle. Then now with all the cuts and everything and different kinds of needs, government is now the partner. We can't do the transactional 'I give you this money, you give me this service you want.' It's more how do we collaborate and figure out big issues like poverty and jobs.

At 2014's Hack for LA weekend, Mike Bonin, representing the 11th district on the City Council – an area that is informally considered "Silicon Beach" – told the audience how his district's fire station used cracked, old maps and binders. Then, after engaging with the volunteer tech community, "instead of radioing down, [fire fighters] now send a photo on an iPad in real time." Citizens can also build supplements to existing city services. On a panel devoted to civic innovation that same day, Catherine Bracy of Code for America, imagined a neighborhood using an app to prompt city responses to 311 calls. "Neighbors could also build a solution with government . . . Does the City have data on that? Could we build something to understand how

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[65] The app is called Promptly: http://www.codeforamerica.org/peer-network-training/06-03-2014/.

[66] The website is called Golden Ticket: https://github.com/codeforamerica/golden-ticket-console.

long it takes [for the City] to pick something up? That's moving from being someone on the

service side to being in collaboration with government." These sentiments have been echoed at

other civic hacking events. At the December 2013 Hack for LA weekend, Ron Galperin, the City

Controller, mentioned that parking reservations at his office building downtown still used the

ancient tool of a fax machine – maybe hackers could come up with a better workflow? He

suggested that hackers design apps for government to track payments, such as dog licensing fees.

In this construction, government is abysmal at services and needs citizen-experts to

improve them. Nemani expressed a similar perspective when he told me that the government is

looking to citizens to use open data to solve its technological problems specifically:

> So, a government has all these technology problems, all these problems, and they want
>
> new solutions to solve it, right? It's really hard for them to say, "Hey, citizen, come here
>
> and help me solve our prison overcrowding problem." It's hard to get them involved in
>
> the bureaucracy of the prison system or the criminal justice system to actually solve that.
>
> But if you open up the data around it, you can then start getting people involved in
>
> building technology, and making visualizations, and building tools with it, right? And so,
>
> that's why open data is so important.[67]

If such services became implemented, civic hackers would become a cheap source devising more

efficient and cost-effective services for governments. These citizen experts will pick up the slack

during difficult economic times. According to Rick Cole, at the 2013 Hack for LA,

> The city is going to be organized so entrepreneurs can drive better outcome . . .We don't
>
> have enough money or time. We need to harness people's imagination. We need to open

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[67] September 6, 2014.

doors to bits of data that you can turn into information: the data inside the black box of government.

A traffic surveyor at the City's Department of Transportation told me that open data would help hackers design services during a resource-depleted time: "We don't have a lot of staff, and the city is challenged in getting back a strong work force. Obviously, the Mayor's office's solution is to reach out and get people involved."

That civic hacking is a relatively new method for participating in government is also how civic hackers view themselves. Claims a liaison for the Hack for LA brigade, hackers short-circuit electoral politics entirely: "There's technical stuff that hacking implies, but the basis is that we're seeking and making change outside typical channels, like voting and getting legislation passed. Hacking is making change with government, but not in the ways of the last 100 years."[68] Another participant I spoke to also emphasized civic hacking as a novel mode of participation:

> It's a new form of public interest volunteering, just people [who] have skills that didn't exist before. There's always going to be a percentage of people who want to do something good for the world with the talents they have. These talents are in demand in the marketplace, but they can deploy them for something else, full-time as a job or as a side thing. Figuring out how to integrate those skill sets into this paradigm of volunteering is interesting.[69]

Of course, as mentioned, the civic hacker as a collaborator who will curtail government spending remains largely speculative. Yet if a civic hacking project actually does move beyond a

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[68] Interview conducted July 9, 2015.

[69] Interview June 22, 2016.

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prototype into the successful implementation of administrative services for city government, a very odd subject is created, one in limbo between the citizen, the unelected bureaucrat expert, and the (financially compensated) government contractor. Arguably, this subject is an example of precarious labor that goes unrewarded, a back door to the "sharing economy" – yet another export from Silicon Valley that erodes the public sphere. This argument, however, could operate as a critique of any example of skilled volunteership. (Are people building homes for Habitat for Humanity exploited workers? Well, no).

A more interesting problem with these "citizen experts," as we could call them, is that they have outsized influence and visibility to the government as volunteer representatives of the tech industry. To one city staff I spoke to, the claim that "Governments know jack shit" is convenient, because it sets up a binary that

> the government is the public sector, and then the people in the hacker community are
>
> private citizens. Well, these are citizens acting as if they are contractors where they are
>
> going to pitch an idea, and then that idea gets sold sometimes, and then some investors
>
> will get into it because government need [sic] that help, and that is seen as a solution . . .
>
> it's weirdly democratic *and* not. Private citizens but representing a public on the
>
> receiving end of this service delivery. [sic] That fits the logic of user-centered design. It
>
> is a design based on market needs. It's a particular segment of the market, a technically
>
> proficient sector of the market representing the entire market.

A more significant critique is that participation in public information services is a very constrained view of civic activity, since it has no choice but to be collaborative with government. In the characterization of the civic hacker as citizen expert, civic hacking does not challenge or dispute government policy, but instead aids the government in carrying out its existing priorities.

Most of the solicitations by government staff at these events understand civic hacking as a form of collusion with a government interested in technological improvement. Civic hackathons, with their appeal to network technologies and metaphors of decentralization, are not actually critical of power structure, but rather instrumental and positivist in the application of technology for service delivery. We find a parallel here to the "professionalization of activism" formulated by Guilhot, who describes how historical forms of aid provided by progressive collective action and anti-imperialist campaigns led by grassroots social movements that *opposed* the state gave way to relief work provided by dominant state institutions such as the U.S. State Department and World Bank (2012).

In the next section, I offer a normative, rather than purely critical, approach to civic hacking, turning to literature on administrative participation. The most important distinction that the literature has not made is the difference between two types of participation: participating in administration by designing information services on behalf of the government, as the bulk of these projects are, and participating in a public sphere to influence policy or representative politics, by provoking discussion and criticism. In the next and last sections, I point out how civic hacking can be understood in terms of theories about administrative participation, before using these theories to call for more projects that move beyond collaboration towards dialogue and even critique.

Theories of Participation in Administration

A long-standing debate in political theory asks: How much direct influence should citizens have on government in any area? Should we participate through more direct, deliberative forms, or should elected representatives or bureaucrat scientists speak for us? In a weaker form of

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democracy, as espoused by political theorists such as Joseph Schumpeter and Lippman, human nature doesn't necessarily allow individuals to know what is in their best interest, much less sort through all the available information on an issue (1954,)1922. Often citizen input is not valued because the public is perceived as not having enough knowledge, and today's problems are too complex for them to understand (Walters, Aydelotte, and Miller 2000). The aggregate of crowd decisions are instead best represented through elected officials or experts. The founding fathers agreed; after thinking through the distinction between direct and representative models of democracy, they settled on the latter after reasoned argument and discussion.

Pushing back against this "elitist" view, some theorists propose the opposite order of cause and effect: It is first through direct participation that an individual accrues the critical skills needed for democratic involvement, while at the same time gaining an equal say in debates about an issue (Pateman 1970, Kaufman 1960, MacPherson 1980). Stronger forms of participation offer more control over the process of governance than the less direct forms of voting, speaking out at public hearings, writing representatives, or offering input on an administrative decision already made. Political theorist Carol Pateman argues that citizens who are directly engaged in decision-making in one aspect of life, such as laborers organizing in an industrial shop, receive what she calls an "educative dividend" of direct participation: Individuals cultivate a "civic virtue" that teaches the skills needed to participate in democratic society at large. Direct or proactive participation in governance is, according to some, a radical and preferable alternative to traditional representative politics. Other contemporary thinkers, such as Richard Box, also take the Deweyian perspective that community residents should determine what services they deserve, and then decide how public servants should deliver these goods (2015).

Focusing this debate still further, political theorists have also examined the role of administration in a democracy: Should democratic participation play any role specifically in the administrative branch of government? On one side of this debate are those who believe government experts should be left alone to decide and enact government policy. Technocracy and scientific management are characterized in this classic literature on administration as anti-participatory aids against "the tyranny of the masses." One of the reasons expertise is needed in the first place, according to thinkers going back to de Toqueville, is for those instances when mass participation is an ill-advised idea. Woodrow Wilson wrote that, while laws are to be settled democratically, the enactment of laws should be left to competent bureaucrats: "public administration is detailed and systematic execution of public law . . . but the general laws . . . are obviously outside of and above administration. The broad plans of governmental action are not administrative; the detailed execution of such plans is administrative." (Shafritz and Hyde 2016, 42) To Wilson and other thinkers such as Goodnow, freeing administration from politics would be the best way to attract and reward competency (1900).

On the other hand, public servants are not elected into office and so are not directly accountable to an electorate, making them a problematically anti-democratic aspect of governance. Mosher, a foundational scholar of modern administration theory, asks "How can we be assured that a highly differentiated body of public employees will act in the interest of all the people, will be an instrument of all the people?" (1982, 5). Traditional literature in the field of public administration characterizes administrative systems as top-down, rational, and authoritative, traits that purportedly conflict with expensive and inefficient values of equitable representation. (Kweit and Kweit 1981, Rosenbloom, Kravchuk, and Clerkin 2009, Thompson 1983) At the same time, public service is crucial for distributing public goods, and public

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institutions are accountable to an electorate that have some means to make demands on its formal structure through elected office.

In twentieth-century political theory, the debate over how power should be delegated between government experts and citizen participants is famously represented by John Dewey's response to Walter Lippman's *Public Opinion* (1922), a treatise that calls for the need for expertise in government. According to Lippman, experts require a place in democratic society due to the internal failings of humans who have not cultivated the habits nurtured over time by expertise, notably those of self-questioning, skepticism, and scientific inquiry. Lippman accordingly believed both policy and its enactment should derive from experts. To give citizens a greater role requires too utopian a vision of the non-expert citizenry. Dewey, in *The Public and Its Problems*, argues for a more limited role for experts, who are unelected and unaccountable to citizens. For Dewey, experts should only devise the means to enact policies and laws set by elected officials. Expertise still has an important role to play in politics, and Dewey advocated for scientific methods in policy setting. Yet experts should be the guides towards ends set by more democratic means.

These debates have influenced policy. Beginning in the 60s, as described in chapter one, in a response to a wildly ballooning federal administration, the United States began to allow more citizen participation in the area of administrative policy-making through transparency laws such as the FOIA; environmental oversight laws, such as the National Environmental Policy Act; judicial litigation; public hearings; and whistleblowing (Schudson 2015). These examples of participation are largely adversarial; that is, these policies were designed to expand the public sphere of deliberation by giving citizens access to information on which to form sound opinions and check the power of administration. Nader's Raiders (of Ralph Nader's Center for the Study

of Responsive Law) made formidable use of these new participation mechanisms to check corruption and incompetency in the Federal Trade Commission, the NEA, and the Food and Drug Administration.

An experiment of another form of participatory administration is the Model Cities program, which unfolded in the United States as an element of Johnson's Great Society and War on Poverty. During its implementation from 1966 to 1974, Model Cities brought people to city halls to talk about what they wanted in their neighborhoods, deputizing citizens as stewards or bureaucrats of a particular area. This experiment envisioned citizen participation as a mechanism to redistribute power to the inner-city poor "by which the have-nots join in determining how information is shared, goals and policies are set, tax resources are allocated, programs are operated, and benefits like contracts and patronage are parceled out" (Arnstein 1969, 216). Taking part in administration allowed citizens to confront the domination of city bureaucrats who were unable to quell rioting inner cities and growing urban poverty and blight at the time. In some cases, as in Philadelphia's, Model Cities aimed for a radical, structural redistribution of power. Rather than monitory participation, Model Cities aimed to blur the distinction of the citizen and bureaucrat.

Complicating this issue of administrative participation is the turn in administrative theory since the 1990s towards favoring private sector principles of efficiency and financial accountability (Kamensky 1996). Sometimes called "New Public Management," administrative reforms during the Clinton years characterized citizens as customers or consumers with needs that public agencies respond to (King and Stivers 1998; Gaebler and Osborne 1992). To address citizen demand, according to this perspective, departments should use performance metrics to reduce the cost of service provision and work alongside private industry as competitors in the

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marketplace, streamlining services through outsourcing or privatization. (Heinrich 2002). Yet for many scholars of administrative theory, this model offers too narrow a vision of government's role. Critics find this new market-based understanding of administration troublesome, particularly when it upholds the values of efficiency and entrepreneurship at the expense of other democratic values such as equity, citizen well-being, and environmental health. Societal issues, critics argue, are individualized by this model rather than treated as systemic problems of economic and social inequity (Box et al. 2001; Denhardt and Denhardt 2000). This management approach also misunderstands the differences between public and private sector spending patterns, their impacts, and their roles. Hence the broad misunderstanding of what "balancing" a budget means in these two domains, which are governed by radically different models of fiscal accountability and policy.

Various theorists have made inroads into the question of whether and how an administration driven by market values of efficiency and cost-saving can square with ideals of democracy. The reconciliation, according to some, comes about by the practices and attitudes of public administrators themselves. Administrators should adopt a professional ethic as guardians of the public good who are responsible for citizens' basic rights (Waldo 1948, 2007; Frederickson 1996; Denhardt and Denhardt 2000). In this perspective, the remedy to an unaccountable administrative is civil servants themselves. Yet the means for citizens to inject themselves into policy debates remain in place at the federal and local levels through, for instance, open record laws, city council hearings, and the judicial system.

In the final section, I apply some of the theories about participation in administration to civic hacking in an attempt to distinguish weak versus strong forms – those that use making and

analytics not towards instrumental ends but rather as the starting point for critical engagement in an issue.

Hacking Administrative Services

Using these theories, we can begin to make a more nuanced analysis of civic hacking projects. On one end, many projects, as we have seen, aim to contribute to information service provisions that complement or supplement government policies. The rhetoric of civic hacking focuses on designing service infrastructure, a type of government participation that is not part of democratic theory and is not codified in law, unlike other types of administrative participation, such as protesting or public hearings. Civic hacking becomes a way to democratize the instrumental step of administration that both Dewey and Lippman considered the province of experts: designing the infrastructures and technologies of service delivery. This type of intervention is *necessarily* collaborative, rather than combative (unless it disguises malicious intentions); it takes a form of technical participation that seeks to reproduce administrative aims by designing services per policies already set. In these projects, citizens and administrators often begin at the same starting point: government and citizen are in alignment, whether on the need to save water, service immigrants, establish more efficient fire services, or encourage biking. In this sense, and just as critics have argued, this kind of material practice does not start from a place of deliberation about societal problems but at the point of their status as settled matters, i.e., at the point of policy enactment, not policy making. For instance, at the Immigration Hackathon held in July 2014, the assumption that the undocumented should receive public services was never in question; rather, it was a matter of designing the most user-friendly websites and apps to access these services. This form of participation is certainly not radical; it rarely engages in protest or structural

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critique – any rhetoric about its revolutionary potential as direct participation should largely be considered marketing. Nor is this kind of participation new, despite its absence in political theory literature. City planners have historically sought out the voluntary help or advice of experts, such as architects and historic preservationists, who assist public employees with civic projects.

Drilling deeper, even as civic hacking deploys the wisdom of the crowds, it still appeals to a longstanding view held since the New Deal that administrative policy should be based on neutral technical expertise and a "professional spirit" rather than through ideology and special interests (Seidenfeld 1992, 1519). Many civic hacking projects evoke the rationalized management of a bureaucratic state operating through statistics and records collection, while also inviting citizens to access and analyze the data themselves. Civic hackers, paradoxically, engage in political participation at a stage of the process that many theorists argue are beyond politics. According to a Hack for LA liaison, civic hackers design information infrastructures that are necessary *prior* to addressing more political issues:

> Our goal and mission is about access to housing, transportation, and air quality, not technology. Technology is a toolset; it's the quickest way to get to those kinds of changes. That's why civic hacking is important. It's the fastest way to rebuild community and find other humans who want to do this stuff and make changes through data. To help other people build systems and get that out of the way.[70]

This mode also often follows the goals of New Public Management – efficiency and cost-saving – but combined with Silicon Valley proclivities for iterative prototyping and user-centered design. Noortje Marres characterizes this mode as drawn from the "liberal idea of scientific democracy, which models democracy on objective knowledge practices as a way of defending

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[70] Interview conducted July 9, 2015.

democracy against the corrupting influences of power and ideology, or as the critical analysis has it, in a misguided attempt to expel the political from politics" (2012, 29).

Finally, as Langdon Winner argues, working with technology can reveal the politics and choices that comprise it and so opening data or the design of information services to public participation could politicize it and make such choices a collective endeavor (2010). Civic hacking projects on the weak, instrumental end of the spectrum at least have the opportunity to explore the micro-politics of technologies in the event that they expose the decision-making processes and ethical choices behind designs. Yet civic hacking projects typically continue to rely on interfaces provided by the private sector, such as Google Maps, or build apps that mimic social networks and Pokemon-like games. In this manner these projects too often reproduce the values of Silicon Valley in their civic projects.

While this type of civic hacking project predominates, there *are* and can be civic hacking projects that engage in monitory and antagonistic forms of participation within and beyond the administrative realm, either by calling for greater transparency or by criticizing policy and administrative goals. The best examples of this do not use technology or government data to prototype an information service provision, but to make an argument or provoke debate on an issue; at the other end of the spectrum, they are part of a larger campaign for systemic change.

The weakest form of this type are simple transparency projects. Govtrack.us, one of the earliest civic hacking projects to consider itself as such, publishes data on federal legislation as well as information about Congressional representatives. This type of civic hacking was also on modest display at a small hackathon hosted by the City Controller's Officer in April 2014, six months after the site went public. The hackathon took place in downtown Los Angeles in a new, shared workspace located on the fourth floor of a renovated building on Broadway, embedded

within a Yahoo-sponsored job fair targeted at "tech creatives." The hackathon was announced at the last minute, and on short notice it attracted eight people, all males except for a woman, a self-taught web programmer who represented Code for LA. Also among the group was an IBM employee, a developer in the process of starting a parking app company, a graphic designer for LA County Metro, and a Los Angeles City urban planner. One app devised a program to validate parking at City Hall's parking garage to replace the current system that operated via a fax machine – an example of designing an administrative service product. The other projects, however, prototyped simple transparency tools. One worked with the Controller's Control Panel open data to create pie-chart visualizations that revealed city expenditures and salaries. The third project designed a Google questionnaire that citizens could use to submit suggestions or complaints about city finances – a platform to solicit citizen feedback. These projects typically went no further than the hackathon. More importantly, transparency alone, as others have argued (Gray 2013), is not automatically tied to the safeguard of public well-being and human rights but can also be used to support technical innovation, government efficiency, and economic growth, such as lucrative open data contracts for ESRI and Socrata.

More successful examples go beyond transparency to publicize a controversy. Chicago's Chi Hack Night, for instance, produced a text message alert system that sends a text when wind blows 15 miles per hour or more in Chicago, with the words "Wind Alert! Avoid petcoke exposure by limiting outdoor activity," and a link to learn more. Petcoke, short for "petroleum coke," are air contaminates known to be released by area facilities owned by Koch industries. The alert was part of a wider campaign to tighten government regulations on these facilities (Lyderson 2015). In another example, Chicago's Million Dollar Blocks project drew from the work done by Laura Kurgan's Spatial Information Lab at Columbia to design a map of the costs

of incarceration by zip code across the city. In these examples, software and data visualizations do not only offer a service but also prompt questions and raise awareness about pressing issues of concern.[71]
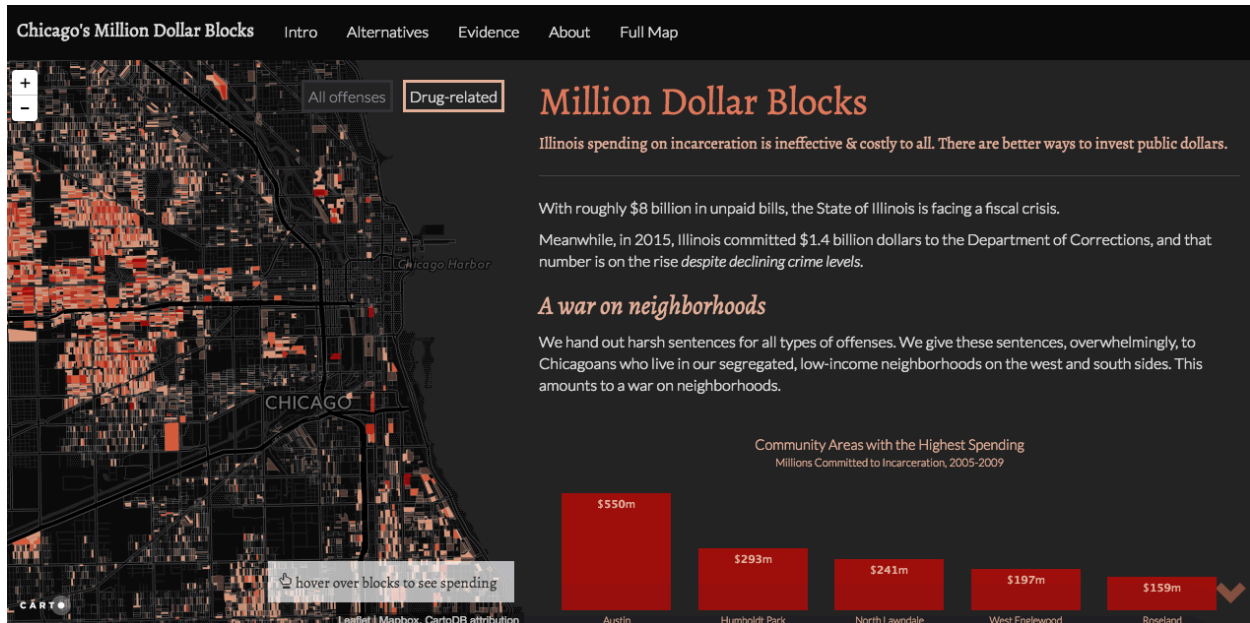
Figure 21 - Chicago's Million Dollar Blocks website homepage.

In addition to the distinction between civic hack projects that produce services versus transparency and issue publicizing, projects must be analyzed by how much they engage with the values embedded in the technologies they use. The petcoke alerts and the Million Dollar Blocks projects, for instance, make their code available under free licenses. Million Dollar Blocks relies on open source software using Open Street maps data rather than Google Maps. These projects avoid commercial software that engages in data-collection and convert the citizen-user into a consumer. Some of the civic hackers I spoke to in Los Angeles are aware of the stakes involved and that values in these designs are important. Said one organizer,

I like to think of the process of taking private sector innovation and moving it into the

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[71] http://chicagosmilliondollarblocks.com/

civic sphere as a 'swords into ploughshares' project, that biblical idiom. You take

weapons and bang them out and make something nurturing. That's what we're going for.

But yes, these can still be used as weapons and have the same ideas and values of the

private sector that are still baked into the methodologies we're still making. To what

extent can we take data analysis from the private sector and make them privacy and

human rights respecting? Do we need to do differential privacy? Do we need to work

harder to make sure that our government web products are going to cater to every

resident in the County of Los Angeles, not just the most active users? It's a fundamental

part of the planning process, is to say, Ok, yes, we're taking these technological

methodologies, but that's not enough. What else do we do to make them jive with the

values of government and civil society and communities? Because it's really the single

most poisonous thing you could do is plug in a commercial technology and think that's

going to solve the problem.[72]

To conclude this analysis, imagine a quadrant. On one axis, you have a scale moving from

instrumental/collusive on one end, where individuals are divorced from wider social movements,

and monitory/antagonistic on the other, where the built device is a part of a broader collective

argument that can contribute to administrative policy *and* play a role in the public sphere.

Transparency projects are somewhere in the middle of this scale, as their use can veer from one

end to the other. With the other axis, you consider value-awareness on a scale of no awareness to

fully aware, such that all technologies used exhibit some consideration of their relationship to the

user.

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[72] Interview conducted on August 1, 2016.

Beyond Civic Hacking

In this chapter, I've attempted to make distinctions among civic hacking projects, distinctions that can serve as well as a normative guide for broadening the impact of civic hacking beyond instrumental ends. Civic hacking projects that incorporate technological design into monitory campaigns can steer or drive a discussion of an issue rather than seal it from debate under the reductive rhetoric of problem-solving.

Perhaps civic hacking as a term has too much baggage, and we need other language to understand how people can use their technical skills to contribute to the political and civic sphere. The Million Dollar Blocks Project, for instance, does not advertise itself a civic hacking project, and it derived primarily from an academic setting. To one of my interviewees at a Los Angeles civic hack night, Million Dollar Projects counts as an important example of civic hacking. But perhaps we need new terms for these projects that use data and software towards humanistic and antagonistic – not only instrumental – ends.

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Chapter Four: Agonistic Data in Los Angeles

In 2005, Los Angeles's Metro Transit Agency (Metro) installed automatic passenger counter systems in its bus fleet. Before this adjustment, Metro sent out workers once a year to count riders manually at each bus line, a painstaking method that might skew figures if the count occurred on a stormy day or during an accident at any major intersection. The automated counters, in contrast, generate daily logs of highly precise ridership numbers. Metro relies on these numbers to set policy around bus schedules, decide which routes to add or cut, or determine how many buses run per given route.[73] The passenger trackers offer a fine metric of real-time behavior that is then treated as coincident with future transit demand, in turn affecting the mobility of thousands of LA commuters.

What could be controversial about load factor measurements based on automated data gathered from Metro's "smart" buses? This seemingly straightforward metric has in fact become a contested object in a campaign led by a grassroots organization in Los Angeles called the Bus Riders Union (BRU). Metro uses its passenger count to set a load standard metric – the number of passengers allowed in a bus before more vehicles must be bought. The load standard metric in turn affects how passenger capacity is calculated across its three public transit modes: bus, light rail, and heavy rail. The BRU argues for using an *alternate* load standard, one that decreases the numbers of commuters who must stand in a bus. As I detail in a case study below, the BRU's preferred metric widens the disparity between the number of rail commuters versus the number of bus commuters – a difference that has a social justice dimension once the socioeconomic backgrounds of these different commuters are taken into account.

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[73] These details are based on an interview conducted with staff from the Department of Transportation on August 9, 2012.

Defining Civic Data

While the prior chapter entailed analysis of the production, consumption, and reuse of

government information, whether to create provocative visualizations or to design new app

services, in this chapter, I shift the lens to look at how grassroots, civic methods of creating and

presenting data provide an opportunity for alternate metrics that are not grounded in "official"

data. Civic data entails the creation of data from the ground up; it resists the instrumental or

political appropriation of official data. Government data circulates from powerful "centers of

calculation" that provide grounds for reality claims, yet these numbers can be contested (Latour

1987, 215). Civic data provides another case for demonstrating the crucial point that data are

never neutral in either method of production nor in their initial representations to the public.

      Civic data also calls our attention to what communications scholar Sandra Braman calls

the "informational state." Braman describes:

> It is the state that operates the statistical technologies, those that in term determine
>
> citizenship rights, status categories, and the constraints of daily behavior. The
>
> technologies that produce the data, the form (information architectures) that data takes,
>
> and the mutual effect of data on our social and political lives all determine the degrees of
>
> freedom in which we can act (2009, 166-167).

In this situation, our ability to build our own autonomous identities is on decline, and the unique

individual is replaced by statistical probabilities. The reliance on statistics in policymaking only

reinforces what Braman labels "the dissolution of the individual into a probability" (142). Data-

matching by linking databases with metadata, for example, allows law enforcement to build

profiles based on statistical calculations. "Big data" and predictive analytics, whether used for

targeted healthcare or policing, raise important questions about the role of individual decision-making by distributing agency among machine-human hybrids. Furthermore, a *lack* of statistical representation has equal repercussion, rendering certain populations invisible and therefore unable to make claims, such as the need of social service provisions.

Critical intervention into the production and presentation of government data (or other big datasets), then, becomes a tool for achieving some control over data's possible representations, while simultaneously exposing the politics behind its production and interpretations. Contesting government data can be used as a foundation on which to build counter-representations to state profiles or to create new ontologies that were formerly invisible. The urgency of data activism becomes especially crucial as government policy and city planning takes an increasingly quantitative, data-driven approach, as chapter two demonstrated is happening in Los Angeles.

In this chapter, I begin by outlining current literature on the phenomenon of citizen-produced data and the role that data can play as a tool of political activism. I next offer some conceptual distinctions between types of data activism, drawing again on political theories of democracy and liberalism. Finally, I illustrate these distinctions further by describing examples of data activism that have taken place in Los Angeles and are embedded within meaningful community projects. This chapter ultimately sets out to show that intervening in the production and representation of data through counter-representations is an increasingly important mode of political intervention.

Activism Takes a Statistical Turn

The political role of civic data production is increasingly the focus of scholarly attention.

Scholars of science and technology studies (STS), in particular, have offered rich case studies revealing the role the public can play in using data collection to politicize issues typically left to the purview of experts. Citizens have successfully contested chemical weapons disposal in the United States (Futrell 2003), mapped the exposure to toxins and pollutants in buildings (Murphy 2006), and tallied the number of the deceased at the hands of police officers. In these examples, activists incorporate civic data as another repertoire of action that can further progressive social and environmental movements (Tilly and Tarrow 2015).

In this literature, the focus has often been on the asymmetry between scientists and laypeople and what this unevenness reveals about the equivocal divide between science and politics in settling scientific debates (Irwin 2001). Scientists have at their disposal highly technical "inscription devices" that make their objects of study stable, authoritative sources of information. Such devices, including the microscope and other standardized laboratory instruments, as well as the peer-reviewed research paper, produce and solidify claims of expertise (Shapin and Schaffer 1985, 2011). These inscriptions can circulate widely; they are what Bruno Latour calls "immutable mobiles" – able to be reproduced, recombined, and displaced from their original context (1986, 7). Through circulation, "insignificant people working only with papers and signs become the most powerful of all" (32) since "the cost of dissenting increases with each new collection, each new labelling, each new redrawing" (18). The general public, in contrast, often has very few and highly unreliable devices with which to make claims (Priest 2014).

As STS scholars have shown, lay publics can play a large role in scientific debates and policy formation. Yet to take a productive role in controversies, lay practitioners must consider how to present their claims as legitimate knowledge and provide a layer of authoritativeness to

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appeal to officials and wider publics. To this end, civic technoscience is a tactic that deliberately

involves non-experts and community-based groups in robust scientific questioning and data

production (Wylie et. al. 2014). "Bucket brigades," for example, emerged out of a practical

necessity to confront the lack of quality tools that could allow nonscientists – especially those

affected by pollution – to participate in air monitoring. The Louisiana Bucket Brigade, organized

around the 2010 Gulf of Mexico oil spill, equipped citizens with the means to collect air samples

and create effective, grassroots maps of polluted areas. A lab analyzed the bucket samples, and

the community collectively interpreted and contextualized the data to build a strong case against

industry that harm was being done to their health and local environment (Ottinger 2010).

The political role of civic data collection and operationalization is certainly not new to

contemporary contexts. Historians of statistical data have described how it has played a part in

political activism in the civic sphere in nineteenth-century France and Prussia when social

reformers and labor activists worked with civil servants to gather statistics on the conditions of

labor to improve workers' living conditions, unemployment, and hygiene. In nineteenth-century

Germany, reformers used population statistics to introduce social protections such as disability

insurance (Desrosières and Naish 2002; Hacking 1990).[74] However, contemporary STS literature

on civic data emphasizes the contingency of statistical tools, such as those used for popular

epidemiology in areas affected by environmental contamination (Brown 1992). Through such

civic actions, the political dimension of established scientific standards become visible again

through controversy or as a product of active resistance. Civic data provides an example of what

STS scholar Sheila Jasanoff describes as "civic epistemologies," localized knowledge that

activists use to confront the "discursive constraints" of government policy (2011). These lay

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[74] To specify, the civic sphere constitutes those areas of public life that operate outside of direct state control and include domestic, economic, cultural, and political arenas (Keane 1988).

practices reveal that expertise, knowledge-making, and trust are all culturally grounded and contextual.

While STS has traditionally looked at a range of tactics to address asymmetries of political and scientific expertise, more recent scholarship reaches for new terms to describe how data practices, in particular, can ignite forms of activism and resistance. The rise of civic data action has come about as statistical devices such as GIS, online survey tools, and other platforms for crowd-sourced data collection are now relatively affordable and widely available. Importantly, these newer forms of political activism differ from historical examples in which groups compete to provide an accurate window onto reality. Rather, these contemporary data practices set out to expose "the double role of statistics" in modeling as well as shaping and criticizing the world (Desrosières and Naish 2002). These scholars, and in many cases the activists they describe, understand data as both a kind of description *and* a basis for action. In the process, data can be revealed to shape reality as much as it reflects consensus about its fundamental assumptions.

Critical geographers Dalton and Thatcher, for example, call acts of resistance to politically dominant datasets "counter data action" (Dalton and Thatcher 2014). This notion draws from their work in critical GIS (geographic information systems), an approach that diverges from the conventional view of geographic maps as a model of the world to one that views maps as political and legal claims on reality. Based on this framework, purveyors of Public Participatory GIS engage in "counter mapping" as a method of emancipatory action, generally by a community such as indigenous peoples looking to reclaim or denounce external dominance of their resources. Counter-data practitioners must be aware of their own perspectives and privileges, as well as the possible outcomes of their work. While the authors raise the notion

without examples or deep exposition, they pose that counter-data can offer possibilities for political liberation or aesthetic expression that actively confronts or redresses the power asymmetries found in technologies of surveillance or capitalist accumulation. Another theoretical understanding of this work is through de Certeau's concept of tactics: weapons deployed by those traditionally lacking in power or without the financial or social capacity to form long-term strategies (de Certeau 1984). Just as counter-mapping sought to repurpose tools of empire to express the perspectives of the indigenous, so counter data actions can create spaces of community knowledge-making and repurpose technologies to counter mainstream science and industry.

In a similar vein, "statactivism" is a term used to describe "emerging forms of collective actions that use numbers, measurements, and indicators as a means of denunciation and criticism" (Bruno, Didier, and Vitale 2014). Such forms acknowledge "the double role of statistics in representing as well as critiquing reality" (200). Statactivism deploys acts of appropriation and intervention by either decrying certain authoritative metrics or devising new ones. The authors present several examples of this kind of collective action. Groups might collect and deploy their own data to make a cause more visible, such as AIDS activists in the 1980s — particularly those involved in Project Inform — who conducted their own clinical trials and epidemiological risk assessment studies (Epstein 1996). Statactivists might also invent new categories of subjects through which to seek representation and emancipation. In other cases, statactivists might use original data collection to resist or reject official state indicators and benchmarks. By presenting data collected through alternative methods or from different sources, all which presume to shed light on the same phenomena, the contingent and negotiated aspects of

data come to the fore. Local statistical practices in this way offer another aggregate reality that diverges from or augments the official version.

However it is termed, this form of activism embraces a type of knowledge production that has also been critiqued as a tool of power and rationalization by the bureaucratic state. Critics of statistics have dismissed data practices full stop as oppressive tools of positivist accounting that perpetuate classism, racism, and sexism. Scholars, for example, have called algorithms "inherently fascistic" because they masquerade as a neutral alternative to human decision-making, a black box that settles human affairs through automation (Marche 2012, n.p.). "The very demand for statistical proof is otherizing," writes another scholar who makes the provocative argument that statistical claims are ultimately racist, since it demands proof beyond personal, lived experience of non-elite (white) "others", whether people of color, the indigenous, or the poor (Lanius 2015, n.p.). Yet to criticize, on principle, the rationalizing logic of accounting and statistical assessment would "allow a monopoly of these instruments to the powerful" (Bruno, Didier, and Vitale 2014, 202). Furthermore, as Dalton and Thatcher point out, statistical work can form the basis for more than positivist assessments of phenomena, giving way to humanistic and aesthetic expression, interdisciplinary encounters, and even humor (2014).

In the next section, I explore how data activism can take place along a continuum of approaches to democratic reform that reflect two very different epistemological theories. The way that civic data interacts with official data can be theorized within political theories of governance. In particular, the approach that civic data epistemologies take can be situated within two frameworks: deliberative or agonistic approaches to democratic involvement. Such distinctions have not yet been made in the literature on data activism, and they can yield insight

into the role of epistemological choices determining how data can be used in the civic sphere, particularly in matters related to social justice.

Deliberative Data

Deliberative democracy is a liberal democratic tradition that proposes to adjudicate social conflict through open dialogue in the ultimate pursuit of social cohesion (Stears 2010). Deliberative democracy is often posted as a response to the constrictions of representative democracy; it sets out to widen democratic participation by giving citizens a broader role in decision-making on political matters. The tradeoffs of this political form, however, are inefficiencies that arise as conversations take place among individuals with varying levels of experience and backgrounds. Proponents of deliberative democracy must therefore describe or theorize mechanisms that allow effective dialogue between citizens, representatives, and bureaucratic policymakers (Ibid.).

Twentieth-century advocates of deliberative democracy include Jurgen Habermas, who was interested in understanding legitimate – by which he meant constitutionally sanctioned – avenues for rational public discussion. He advocated for a greater role for the public in policy decisions already officially made, though he refrained from suggesting the public expand its role in *designing* policy (1976, 2015). Another famous twentieth-century scholar attributed with developing a theoretical foundation for deliberative democracy, John Dewey, suggested a wider role for the public than Habermas allowed. Public participation, for Dewey, was to be a way of life that involved all stakeholders: those designing policy as well as those affected by it (1927, 2012). Dewey saw in the public the possibility for "a great community" of individuals who were no longer alienated by industrial forces "too vast to understand or master" but who shared an

understanding of their dependence on each other and the state (Ibid., 115). Citizens required mutual sympathy, rather than capitalist-fueled competition, to achieve greater social stability.

Dewey's fight was often against American liberalism, the commonly accepted notion that individual freedom, liberty, and the pursuit of happiness are the primary fulfillment of democracy. Dewey countered that democracy reaches its full realization when individuals come together in community formations: "democracy is not an alternative to other principles of associated life. It is the idea of community life itself" (Ibid. 148). Furthermore, communal life would be more equitable as citizens consider the consequences of collective versus individual actions. In *Liberalism and Social Action*, he described how these democratic impulses would derive from deep-seated and shared values found in America's mythos, particularly a democratic heritage that could ultimately overcome individualism and sectionalism (1963).

Dewey's Great Community involved fraternal associations that could be achieved through communication via debate, assembly, an ethical press, increased education, and greater conversation between scientists and lay publics. Through communication, different communities – scientists, policymakers, workers, consumers – could better understand the distributed, shared, and increasingly abstract consequences of industrial capitalism; future action could be guided in light of this distributed knowledge. That state was to foster these exchanges and provide more social welfare and education services than were presently available (Dewey 1920).

Crucial for this discussion, Dewey argued that knowledge is intersubjective and the result of culture, as well as powerful institutions. Agreeing with his sometimes antagonist, Walter Lippman, Dewey believed that the notion of the rational, "omnicompetent" individual who uses reason to make decisions was effectively an illusion. Rather, citizens come to informed, collective decisions by sharing knowledge. Scientists, for this reason, must break down their

specialization as "pure" disciplines and provide a relief for the burdens of ordinary life and increasingly dangerous labor conditions. In this way, he argued, "the ever-expanding and intricately ramifying consequences of associated activities shall be known in the full sense of that word, so that an organized, articulate Public comes into being" (1927, 2012, 184).

As Richard Rorty points out, Dewey saw "objectivity" as a function of collective discussion; it was

> a matter of intersubjective consensus among human beings, not of accurate representation of something nonhuman. Insofar as human beings do not share the same needs, they may disagree about what is objectively the case. But the resolution of such disagreement cannot be an appeal to the way reality, apart from any human need, really is. The resolution can only be political: one must use democratic institutions and procedures to conciliate these various needs, and thereby widen the range of consensus about how things are (1999, 34).

Widening consensus – one important result hoped for by advocates of deliberative democracy – is also the goal of many civic activists described in STS literature. Callon and Lascoumes, for instance, have documented what they call hybrid forums, open spaces where heterogeneous groups come together to discuss technical options involving collective ramifications. According to these scholars, "Hybrid forums take part in a challenge, a partial challenge at least, to the two great typical divisions in our Western societies: the division that separates specialists and laypersons and the division that distances ordinary citizens from their institutional representatives" (2009, 35). Hybrid forums are spaces where legitimacy is adjudicated. The result of such deliberation, according to scholars who study these forms of participation, is more transparent policymaking and thus greater public trust in and consensus around official decisions

(Futrell 2003). According to STS scholar Wiebe Bijker, when deliberative democracy is strong, citizens play a role in shaping policy not because they may have the expertise to design chemical waste facilities or pollution controls in vehicles, for example, but because "more is involved in designing large projects . . . than is described in the engineer's handbook" (2012, 31). These civic epistemologies bring values and insights to the process that technocrats alone cannot.

While political theories of deliberative democracy have traditionally emphasized dialogue and the discursive realm of debate and conversation, contributions made with data analysis, mapping, and visualizations are also discursive mechanisms by which authorities and citizens aim to produce consensus politics. This understanding informs how open data proponents, for example, perceive data as ground for lay citizens to join with government to shed light on a phenomenon through improved analysis. Much open data advocacy, in fact, draws on some of the core assumptions of deliberative democracy. Openness – of government processes as well as databases – allows deliberation among equals whereby reasonable citizens agree upon political results. Such deliberation is directly tied to the legitimacy of political institutions; otherwise, laws and policies are the illegitimate result of dominating interests. Indeed, the link between widespread public deliberation and government legitimacy has been an important foundational claim of many deliberative democracy theorists (Rawls 2009, Manin 1987). Data becomes a means to unite claims, a medium of intersubjectivity between governors and governed.

One open data advocate I spoke to, for instance, discussed data as inevitably flawed but always open to refinement through public involvement:

All data is flawed of course. Is it better to use flawed data than no data? . . . How can I dig in and see what doesn't exist, and is there political will to create it? . . . I was a social

worker, a public health person. I have a master's and did public health research for

years. All that data's flawed. Are you asking all the right questions of course, but it

doesn't mean that . . . it's an iterative process. It's never perfect. Do you believe in the

scientific method? If so, you believe it gets better over time.[75]

Civic data practices can serve a deliberative function when they are deployed to widen the voice

of those affected – the political communities that come together around a public issue – in order

to enter in dialogue with authorities. In this manner, civic data augments government data to

increase the number of voices represented. The goal is to allow more sources to contribute to

what is widely accepted as authoritative metrics. One example of this kind of data activism are

the tactics of the Gowanus Canal Conservancy, a group that has balloon-mapped the canal

seasonally to examine the health of bioswales, landscape elements planted by members that

absorb pollutants and runoff and aid the remediation of the superfund site. The bioswales

revealed areas of melted ice and unmarked inflows entering the canal. Some of these inflows

were not mapped by the U.S. EPA, and the balloon maps served to augment official records. In

this case, citizens worked with authorities to create statistical records that interested publics

could accept as more legitimate because they were more comprehensive (Wyle et. al. 2014).

Another example of deliberative civic data is Conroy and Scassa's discussion of a data

collection model developed in Philadelphia for reporting sexual assaults (2015). Sexual assault

data, as the authors detail, can be widely unreliable. They proposed a model that involved

extensive collaboration between the Philadelphia Police Department and local women's

advocacy groups to attempt a more proper handling of sexual assault reporting. As part of this

model, the scholars suggested that the women's groups could help assess incidents of

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[75] Interview conducted June 23, 2016.

mishandling by conducting annual reviews of sexual assault reports that were deemed unfounded. This model allowed the public to redress flaws in government accountability through the involvement of the community.

In these examples, community data ultimately aims to reconcile with official data, expanding the voices of those who contribute to authoritative metrics on a phenomenon. Just as hybrid forums try to unite the perspectives of specialists and laypersons through productive dialogue, so deliberative data becomes a way to redress the imbalance between government or scientific metrics and those produced by grassroots efforts.

Agonistic Data

Deliberative democracy, however, has its critics. Historically, more cynical thinkers have denied the possibility of consensus on the common good. Sectional interests are more likely to prevail, they claim. A divergent political theory called agonistic pluralism argues that the diversity of interests in the public arena precludes any possibility of fair dialogue and that consensus politics merely masks how power is rooted in society (Stears 2010). Conflict and irreconcilability is endemic to the democratic process, and the terms of any dialogue always begin from inequitable contexts. Even if pluralists and deliberative democracy advocates want the same ends – a more democratic, equitable distribution of resources – the means to achieve this, according to agonists, is not through greater dialogue and consensus, but rather through an ongoing clash of power. Historically, pluralists pushed aside voting, op-eds, and town meetings in favor of strikes, sit-downs, and protests (Ibid.).

Twentieth-century pluralists such as Reinhold Niebuhr called for a politics of power, rather than the rational exchange of viewpoints, to prevent injustice through struggle. According

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to Niebuhr, deliberative democrats "did not see that the limitations of the human imagination, the easy subservience of reason to prejudice and passion, and the consequent persistence of irrational egoism particularly in group behavior, make social conflict an inevitability in human history, probably to its end" (1932, 2013, xxxiv). The "egoism of a class" must be taken as a given, and no appeal to higher morality would abolish it (141). Only coercive tactics by those divested of power would lead to social justice.

Chantal Mouffe, a contemporary theorist of agonism, argues that political stabilization comes about not through widening consensus by means of dialogue and empathy but through hegemony (2000). For Mouffe, writing at the turn of the twentieth century, middle-of-the-road consensus is but another way of naturalizing the current inalienable rights of property and free markets at the expense of progressives' longtime struggle for social and economic equality. Indeed, consensus is never possible because liberal democracy is founded on a paradox of two competing traditions, one that emphasizes political equality and another that stresses individual liberty. This tension, between individual freedoms and rights, versus the exercise of popular sovereignty and participation, "can only be temporarily stabilized through pragmatic negotiations between political forces which always establish the hegemony of one of them" (Ibid. 5).[76] In the present day, Mouffe argues, the liberal logic of individualism subsumes the democratic project of equality.

We can distinguish agonism from consensus models in Mouffe's insistence, first, that dialogue will never give way to equality. "No amount of dialogue and moral preaching will ever convince the ruling class to give up its power" (Ibid. 15). Mouffe also argues that pluralism will never lead to an objective state in which differences are bracketed out. She describes consensus

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[76] "The point of confluence between objectivity and power is what we have called 'hegemony'" (p. 21).

democracy as an illusory aim in which supposed rational consensus "disguises the necessary

frontiers and forms of exclusion behind pretenses of neutrality" (22). With consensus politics,

irrationality, violence, and power have been bracketed.

Agonism, in contrast, takes difference as a given and a positive feature of liberal

democracy, one that is always shifting the terms of exclusion. Writes Mouffe, "The main

question of democratic politics becomes then not how to eliminate power, but how to constitute

forms of power which are compatible with democratic values" (22). She doesn't believe that

liberal democracy is inherently doomed; instead, she wants to harness this paradox and the

agonism it engenders in a productive manner. Paradox is productive, not destructive, and keeps

hegemony from stasis over the long term.

The aim for Mouffe is a collective politics that does not resort to antagonisms, to us

versus them, but to "agonism," to "friendly enemies, that is persons, who are friends because

they share a common symbolic space but also enemies because they want to organize this

common symbolic space in a different way" (Ibid. 13). Her criticism of an intersubjective

rationality, a socially constructed objectivity, mirrors the critique that data can also achieve a

degree of consensus or ground truth that ever rids itself of the politics embedded in subjective

conditions of creation and knowledge modeling.

Agonistic data practices do not seek reconciliation with official data but offer a parallel

and distinct understanding of an issue. This form of data activism addresses informational

asymmetry by using data in a conflictual manner to challenge dominant statistical

representations. Agonistic data can be a way to amplify and sharpen a community's narrative

with data they gather, process, and visualize themselves and that does not neatly reconcile with

authoritative sources. Such work rejects the translation of a phenomenon into commensurable

abstractions; instead, it provides literacy on the contingency of data by showing that there are different ways of representing an issue – and in the process the contingency of data remains in play. Agonistic data practices reveal that data should be viewed as built upon an already-interpreted edifice, one that exists within a complex assemblage of vying interests that at times may conflict. Similar to the role of controversies in STS, agonistic data practices are apparatuses for exploring and learning about possible worlds.

An example of agonistic data practitioners includes the Superstorm Research Group, a part of the grassroots Occupy Sandy collective. The organization set its activities apart from the City of New York's own efforts to gather information on citizens affected by "superstorm" or Hurricane Sandy in 2012. According to Max Liboiron and Daniel Cohen, two of the group's organizers, the City saw the disaster as a discrete infrastructural event, and its data collection tended to focus on categories of home ownership, the success of evacuation orders, and other metrics that matter for FEMA and government agencies (2014). The Superstorm Research Group also collected data on Hurricane Sandy victims, primarily through canvassing with questionnaires. Yet the canvassers saw Sandy as one event in a longer, chronic disaster characterized by climate change and wealth inequity resulting in poverty and inadequate housing. As a result, they posed questions related to residents' socioeconomic situation and preexisting crises that had been exacerbated by the weather event. Occupy Sandy canvassers asked residents, for instance about their health and legal needs before, during, and after the storm. The group also continued to work with residents for over a year after the event to present the storm data as a longer timeframe of infrastructural damage that resulted not just from weather but also from inadequate city services.

The information collected by both the City and the Superstorm Research Group resulted in two very different types of information pertaining to the same phenomenon (Ibid.). The data gathered differed in focus, granularity, and duration. This disparity allowed the Superstorm Research Lab to show how the data collection groups identified different vulnerable populations, timelines for aid, and recovery options. Liboiron and Cohen conclude that these two datasets are both parameterized and thus political.

The distinction between deliberative and agonistic data, to be clear, is not ontological. A dataset can be both, depending on the context of its creation and use. Civic data may first contradict official data but ultimately come to shape it. This distinction rather serves to define the epistemological intentions of those who create or encounter the data. Is the data meant to reconcile viewpoints, to allow more voices to contribute to what is considered authoritative metrics? Or is the data intended to produce alternative representations of phenomena, to pluralize how a thing is understood in a manner that diverges from the official narrative such that the "centers of calculation" never reconcile it with their own?

Civic data practices are non-partisan and can be used just as well by organizations on the left and the right. Two examples of civic data used by conservative and hard-right groups are climate change skeptics, who spend time disputing scientific data by creating alternative metrics on climate change, and the Stormfront white nationalist groups that use racial testing to produce "proof" of an individual's racial lineage. Yet I argue that civic data can become a distinctly progressive project once it explores data through the lens of social justice, in a manner that investigates the historic role that data has played as a tool of oppression and control.

In the following section, I describe four civic data projects taking place in the City of Los Angeles at the time of this writing, three of which I have taken some part in. I explore these

examples through the framework of deliberative versus agonistic data, with a focus on civic data devoted to social justice issues. I show as well how each case exemplifies particular tactics among an array that community groups can deploy. In the final two examples, civic data practitioners use their work specifically to highlight the contingencies and biases that can be found in government data collection, exposing how official data is often a tool of power and even oppression.

Making Phenomena Visible: The Los Angeles Bike Coalition

The ontological representations that result from data production can be an important prerequisite both for making and justifying political claims. A Harvard study from the mid-eighties, for instance, found that the federal Office of Management and Budget denied agencies the ability to collect racial and ethnic data that could monitor discrimination in housing, employment, or mental health treatment; as a consequence, any congressional mandates for equal employment and opportunity would have been nearly impossible to implement. The inclusion of racial categories in the census has also proven controversial, and some immigration advocates have questioned whether locality of birth or native language should be a part of the census at all (Braman 2009).

Civic data collection can likewise reveal the political dimensions that determine which phenomena are statistically visible. A civic group in Los Angeles that has had an enormous success in producing visibility through data is the Los Angeles County Bike Coalition (LACBC). In 2009, the LACBC, through its first biannual bike count, created statistical representations of cyclists and pedestrians. Over the course of two weekdays and a Saturday, 100-plus volunteers stood on more than fifty street corners and manually counted the cyclists and pedestrians passing

by. In total, volunteers clocked more than 1,000 hours on the project, capturing 14,222 cyclists and 62,275 pedestrians. The tally resulted in the "2009 City of Los Angeles Bicycle and Pedestrian Count," the first-ever report on cycling activity in Los Angles and the first to use local data to make policy recommendations on the bicycle and pedestrian improvements that are considered most needed (Los Angeles County Bike Coalition 2009).

The Coalition relies on the cycling data to argue for greater cycling infrastructure in city and county budgeting and to make suggestions for where bike infrastructure improvements are most needed; subsequent years' counts have also been able to demonstrate that the number of cyclists continues to rise (Los Angeles County Bike Coalition 2011). LACBC also documents the safety impacts of biking infrastructure in part of a region – Southern California – that has accounted for up to 30 percent of all bicycle-related collisions in California (Southern California Association of Governments 2008).[77] The LACBC's counting method follows national standards set by the National Bicycle and Pedestrian Documentation Project, which keeps an ongoing record of bicycling and walking activities throughout the country. An example of deliberative data, the coalition's bike count has been successful in persuading policymakers to revise transit budgets.

As a volunteer in the 2015 count, I attended a standing room-only meeting on the first floor of a building in downtown Los Angeles a week before the count. Using a PowerPoint presentation, LACBC staff guided us through the counting process and the count form. The document, passed out to everyone there, was several pages long – a page for each thirty minutes of counting over the two hours of each volunteer session. During my session, from 7–9am both days on 4th street in downtown LA, I carried the document on a clipboard received at the

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[77] Data comes from the Fatality Analysis Reporting System maintained by the National Highway Traffic and Safety Administration.

meeting.

The count deploys screenlines to track activity. Screenlines rely on volunteers to position themselves in one spot on the sidewalk while facing the opposite side of the street. Volunteers' line of sight becomes an invisible line stretching across a roadway or sidewalk so that they tally just the number of vehicles, bicyclists, and pedestrians who pass over that line. Screenline counts are a common tool of transit agencies and are used to collect data on the number of motor vehicles on a street, though these counts often happen as well through automated means via pneumatic tubes, inductive loop detectors, or video, among other technologies (Southern California Association of Governments, 2013).

The form collected several details beside cyclist and pedestrian tallies. Volunteers were to indicate the direction in which each cyclist and pedestrian crossed their screenlines and to note if the cyclist was on the street versus the sidewalk or if the cyclist was riding the wrong way. Volunteers were also instructed to capture the cyclist's gender and whether he or she was wearing a helmet. The count included people in wheelchairs, children, and people on skateboards, scooters, or skates who passed volunteers' screenlines, in addition to including them in the pedestrian count. Joggers and people walking their bikes also counted as pedestrians, though children in strollers or their parents' arms were not.

Figure 22 - the LACBC bicycling screenline count form.

Before the count, the cyclist as a type of commuter simply didn't factor in any substantive way into Metro's planning policies and budgets. Since 2009, LACBC has made inroads with both Metro and the LA Department of Transportation. The approved City of Los Angeles's 2010 Bike Plan mandated an annual citywide bike count along existing or proposed bike routes, generating data on the need for infrastructure for city developers. This policy change led to the second-ever count of LA cyclists in 2011; results found that cycling went up 32 percent between 2009 and 2011, with the highest numbers on streets with bicycle infrastructure (Los Angeles County Bike Coalition, 2011). One of the organization's future goals is to integrate cycling into multi-modal transit planning so that people find it convenient and safe to bike to

other transit options, such indoor bike parking at the subway.

Yet counting cyclists remains an ongoing and confounding project, given a lack of reliable bike counting technologies. While cities have refined accurate metrics for car counts through remote sensing by satellites, no standards exist for bikes. Currently, the Census's American Community Survey (ACS) and the National Household Travel Survey (NHTS) provide the only national data on cycling and pedestrian use, but this data is limited on two fronts. First, the ACS only tallies work commutes, leaving out everyday trips to school, the store, social visits, and transit stops. Secondly, both counts do not provide information at the city or county level, leaving municipalities to generate these figures themselves. To augment these national surveys, the LACBC and the National Bicycle and Pedestrian Documentation Project is currently exploring technologies that will produce more statistically accurate measurements of bicycling and walking activities throughout the country. LACBC is still seeking a remedy to this situation, especially since, as absolute rates, the bike counts conducted to date don't scale.

The LACBC's tactics for promoting sustainability continue to influence regional policy and shape ideas of possible city futures – this, even as the area's traffic conditions worsen; Los Angeles commuters spent 81 hours idling on freeways in 2015, the worst record of any metropolitan area in the country (Nelson 2016). What needs to be looked at more closely, however, is how data intervention combines with an organization's political capital to affect policies that shape urban life. One hope is that by showing how official data occludes certain constituencies, civic organizations or individuals might use data collection to inform authoritative metrics as part of their organizing strategies.

The distinction between general forms of data activism and projects that squarely address implicit power biases found in authoritative data practices is too rarely made in the literature on

data and activism. In the projects that follow, agonistic data are used for purposes of social justice, either to produce new ontologies on behalf of socially vulnerable populations or to contest or resist authoritative representations of these groups.

The Bus Riders Union: Augmenting Official Data with a Social Justice Perspective

In 1995, the Bus Riders Union (BRU) successfully sued Metro for civil rights violations under the Title VI Civil Rights Act. Fueling their dispute were the disproportionate subsidies Metro afforded light rail commuters – 71 percent of Metro's budget went to rail, while its bus system took only 29 percent. At the same time, bus average passenger load was 43 percent higher than rail (Elkind 2014). BRU argued that the policy discriminated against LA's primarily low-income and minority commuters who did not live near rail lines. The suit resulted in a ten-year consent decree that required Metro to increase its bus fleet, keep bus fares low, and convert its vehicles to electric power.

In 2011, five years after the decree expired, Metro voted to eliminate what it considered "excessive service [that] has led to regular budget deficits" (Bloomekatz 2011). Metro approved the elimination of nine bus lines, reductions in service on eleven more, and reduced 4 percent of its bus service hours (Ibid.) In an article on Metro's blog, Metro CEO Art Leahy explained that the cuts were due to too many bus lines as a result of an "artificially high level of service because of the consent decree" (Hymon 2011). Bus lines with low ridership or that replicated other transit options available were to be eliminated and fused with rail service and municipal transit buses, dropping Metro's peak fleet to about 1,900 buses or 400 fewer than operated during the decree. The cuts also allowed more passengers per bus. All of these measures seemed even further justified because bus ridership continued to decline after peaking in 1985 (Ibid.).

As mentioned in the introduction, the BRU responded to these changes by mounting a campaign against Metro. On behalf of thirty-five community organizations, BRU published a report called "Transit Civil Rights and Economic Survival in Los Angeles: A Case for Federal Intervention in LA Metro" (2001). The report used both surveys and data visualizations to dispute the data Metro used to justify its cuts. For its metrics, the document drew from a constellation of federal-level statistics and Metro datasets, including budget plans, aggregate ridership statistics, and routes and schedules.

The document takes issue with two of Metro's claims, countering them with an alternate interpretation of government metrics to produce a much different picture of LA transit. First the report tackles Metro's claim that ridership was on a steep downward trend in the ten-year period between 1985 and 1995. The BRU's analysis revealed a more complex picture: Bus ridership has ebbed and flowed based on bus affordability and availability. For instance, ridership was high after LA county's Prop A, a one-half cent local sales tax measure that kept bus fare at 50 cents for five years starting in 1980 and ending at an all-time peak of LA bus ridership in 1985. In a second boost, during the ten-year consent decree between 1996 and 2007, ridership picked back up, increasing bus use by 12 million until it almost matched the peak in 1985. Ridership started to deteriorate again by 10 percent after the decree ended in 1997, seemingly in response to fare hikes and service cuts. The picture appears to shows that demand responds to service cuts and enhancements, not the other way around: Make transit more affordable and efficient, and passengers will come. Implicit in this picture is that current need alone should not determine routes and scheduling and that Metro should take more proactive measures in its service provisions.

The BRU's second disagreement over the figures supports its ongoing complaint that rail

still consumes a disproportionate amount of Metro's budget. In this case, part of the dispute is over a metric: how to measure a bus or railcar's "maximum capacity." During the consent decree, BRU successfully argued for setting the buses' load factor at 1.2, meaning that a forty-seat bus should carry a maximum of forty-eight passengers. More than that, and Metro must supply more buses for that route (Li and Wachs 2000). In 2011, Metro's approved cuts increased bus's maximum capacity up to 1.3 or 53 passengers per bus.

Under current loading standards, bus runs almost 14 percent higher than light rail but almost 3 percent lower than heavy rail. However, by using the BRU's preferred 1.2 standard, bus claims more ridership than both light or heavy rail in fiscal year 2010 – 23 percent more than light and 5 percent more than heavy rail. The BRU uses the consent decree standard to strengthen its argument that subsidies flow away from need: Metro subsidizes light rail passengers, who are more often higher income whites, almost twice as much as it does bus riders.

Crucially, the BRU combines its load-factor statistics with demographic data on ridership collected by Metro. These demographics form the crux of their civil rights claim that, since bus ridership is 90 percent people of color, to take funds from bus and put them into rail violates these commuters' civil rights. Ridership data alone, which counts each person as an equal unit of one, does not take into account the disparities in socioeconomic background among Metro's riders.

FIGURE 10: Metro Light Rail riders more often white, more highly subsidized than Metro Bus[42]
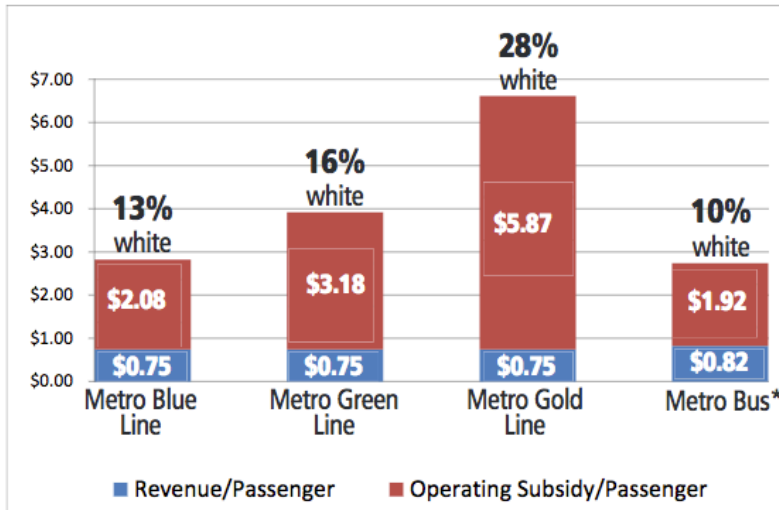
Figure 23 - visualization of data produced by the BRU, augmenting fiscal data with demographic data.

Similar to the Occupy Sandy tactics, the Bus Riders Union augments data on public transit ridership by combining it with other factors – such as racial demographics and the rising cost of bus tickets – that lend a social justice perspective to the official numbers. Also like Occupy Sandy's work, BRU's ridership data remains agonistic, as they are repeatedly rejected or ignored by government accounting practices. Indeed, in 2012, the Federal Transit Administration again found Metro non-compliant with federal civil rights requirements due to extensive service cuts. Federal officials said the review's results were partly motivated by the Bus Riders Union's complaints (Bloomenkatz 2012).

Police Officer-Involved Homicide Data: Irreconcilable Metrics on the Dead

Despite the enormous apparatuses our government invests in other types of data collection, there currently exists no downloadable national database of data on Police Officer-Involved

Homicides (POIH). While Obama's Police Data Initiative is a recent step towards remedying this situation, official information on such killings remains fragmentary and difficult to find (Smith and Austin 2015). The ellipses in these datasets is confounding given that large organizations such as the FBI would ostensibly have the resources and labor power to oversee efficient data production.

As a result, activist groups and newspapers collect some of the most comprehensive statistics on national POIH. Two of the largest, KilledByPolice.net and Fatal Encounters, are crowdsourced civilian efforts. Operation Ghetto Storm, published by the Malcolm X grassroots committee, released a 2012 report using statistical information from local police departments on police killings of African Americans in the United States. The Center for Policing Equity at UCLA similarly collects and analyzes information on police-civilian encounters, studying racial profiling as one of four primary areas of concern. Both *The Guardian* and *The Washington Post* have also established their own national counts on POIH in the United States.[78]

The data on homicides collected by law enforcement and civic groups underscores the cultural and political dimensions of such statistics, since the counts often differ depending on the collecting organization. Disparities in data collection became apparent at an event I helped organize, along with three other students from UCLA's Department of Information Studies, called the Hackathon on Police Brutality. We held the hackathon over the course of four hours on February 14, 2015 at UCLA. We advertised the event widely and drew nearly fifty individuals, who ranged from students and professors to members of police watchdog groups (Currie et. al. 2016).

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[78] See the websites http://www.theguardian.com/us-news/ng-interactive/2015/jun/01/the-counted-police-killings-us-database and https://www.washingtonpost.com/pb/policeshootings/.

In preparation for the event, the other organizers and I gathered and organized four

datasets on Los Angeles County POIH and made these available in a public Google spreadsheet.

The first dataset came from the FBI's Supplementary Homicide Report, the most frequently cited

among the federal POIH datasets. The SHR provides granular details on the homicide victims'

relation to offenders (Sherman and Langworthy 1979, Federal Bureau of Investigation 2015).

These details are manually recorded by local law enforcement agencies on a voluntary form; how

the form is completed might vary, and filling out data fields are optional. Once completed, the

form is then compiled and coded either by the FBI or state-reporting agencies to produce the

statistical data for all U.S. counties that report it. By recording information into the form's

column labeled "circumstances," the SHR allows agencies to report data on justifiable homicides

by law enforcement – coded as "Felon Killed by Police Officer" (code 81). The FBI offers no

evidence as to whether it provides additional oversight over the forms' accuracy.

The SHR is a very limited metric of POIH. In the first place, the SHR only includes

POIH deemed justified; POIH determined to be unlawful fall out of the dataset entirely.

Secondly, the report is not legally mandated. As a result, many states decline to participate. In

data released on the SHR in 2003, eighteen states had opted out from reporting on this

classification during certain years; Florida has opted out of the program entirely ("Bureau Of

Justice Statistics UCR and NIBRS Participation," n.d.). Even when forms are submitted, data

entry is often incomplete – law enforcement reporting a homicide will not always include

demographic data, for instance. According to the Guardian, "In 2011, 31% of supplementary

homicide reports omitted the offender's sex, age and race. When the victim was a black male,

basic identifying data on the offender was omitted more often, 39.9% of the time" (McCarthy

2015). Additionally, the SHR provides only information based on the initial police investigation, not on subsequent decisions about cause of death made by prosecutors or courts.

Incident	Situation*	Victim**				Offender**				Data Code	Weapon Used (Handgun, Rifle, Shotgun, Club, Poison, etc.)	Relationship of Victim to Offender (Husband, Wife, Son, Father, Acquaintance, Neighbor, Stranger, etc.)	Circumstances (Victim shot by robber, robbery victim shot robber, killed by patron during barroom brawl, etc.)
		Age	Sex	Race	Ethnicity	Age	Sex	Race	Ethnicity	Do Not Write In These Spaces			

*
** - See reverse side for explanation

DO NOT WRITE HERE	
Recorded	
Edited	
Entered	
Verified	
Adjusted	

_____ Month and Year _____ Agency Identifier _____ Prepared by / E-mail address _____ Title

_____ Agency _____ State _____ Sheriff, Chief, Superintendent, Commanding Officer

FBI/DOJ

Figure 24 - form for the Supplementary Homicide Report.

Our second dataset, the National Vital Statistics System (NVSS), is based on death certificates by a coroner or medical examiner, as required by law in thirty-six states (Federal Bureau of Investigation 2015, Enten 2012). In contrast to the voluntary SHR, the NVSS is mandatory. To be classified as a POIH, this form must certify manner-of-death as a homicide, then provide additional detail in an open text field that asks the coroner to "describe how the injury occurred." Only if an officer is listed as a perpetrator in this description is the death coded,

through the International Classification of Disease-10 codes, as "Death by legal intervention." However, the instructions for completing the form do not explicitly indicate that police involvement be mentioned at all, and coroners may not even know if the deceased was involved in an attempted arrest at the time of death (Loftin et al. 2003). Studies have shown the inadequacy of this data, with underreporting as high as 51 percent in some cases (Sherman and Langworthy 1979). Furthermore, unlike the SHR, the NVSS only provides aggregate data at the county level, obscuring demographic data at the level of each incident (Quinn 2014).

The third dataset used at the hackathon was the *LA Times*' (LAT) comprehensive Homicide Report, which gathers statistics and analysis on all deaths within Los Angeles County. The report is a part of the LA Times' Data Desk; it uses police reports corroborated with the coroner's reports, and it sometimes supplements these with investigative reporting on cases. The data for each homicide is displayed publicly online on a dynamic map, as well as in individual posts with a description about each death. Each post is organized through statistical data capturing the neighborhood in which the death occurred, along with gender, age, race and ethnicity, cause of death, and whether an officer was involved. The LAT's data is browsable but not downloadable on its website; individuals can request the statistical data, which the LAT provides in the form of an Excel spreadsheet.

The Youth Justice Coalition (YJC), a community organization devoted to issues around incarceration, youth, and race, collected our fourth dataset, a report of the deceased. It used coroner's reports corroborated with police reports, along with data gathered from interviews with the family of the deceased, as well as eyewitnesses and community members in the area where the victim was killed. The report collected information on shootings between January 2007 to August 2014; it included demographic data (age, gender, race), data on the neighborhood and

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address where the homicide occurred, and date of death. Some profiles include a photograph of the deceased and a short description for each incident of police homicide; one included, "Called to mental health facility; officers claimed they shot because Saucedo approached with 'sharp object.'" The YJC's website is not as widely known as the LAT Homicide Report nor does the group incorporate any sort of interactive elements into the display of their information, but they do make available for download the PDF with their findings.

Of the data collected by the YJC, the most important was the information gathered in talks with community members. One incident includes this intimate description:

> Davis' mother moved to Moreno Valley to get James away from the violence in LA. He was visiting his family in Watts, and was shot once in the back while 'running away.' Several witnesses say that when he stopped by police [sic], he dropped a gun and surrendered. The crowd that formed after the shooting was called an 'angry mob' by the police, and they issued a tactical alert in response. But the crowds according to the YJC and several community intervention groups at the scene was upset, but peaceful.
> Johnathan Cuevas (photo left) 20 Male Latino 10/10/10 Long Beach Blvd

Figure 25 - the Hackathon on Police Brutality was held February 14, 2015, at UCLA.

The hackathon focused on understanding the disparities found in POIH data by comparing the datasets. One hackathon team performed an intensive analysis of the inconsistencies between the *LA Times* data and SHR dataset during 2012. For example, the LAT Homicide Report data indicated five more POIH than the thirty-three reported in SHR for the same year and in the same geographical area. In the SHR, the group found that there were eleven reported homicides that did not find any matches in the LAT Homicide Report based on age, gender, and date. In the LAT Homicide Report as well, there were eighteen incidents that could not be accounted for in the SHR based on age, date and location. Only twenty-three POIH were entirely consistent across the two datasets. The group found that five were very close matches but were a year off in age or reported the death in an adjoining neighborhood. Overall, the

information contained in the two datasets was widely inconsistent; discrepancies existed not only in the count of the deceased but also in the details of each account.

Each of the four datasets also revealed the interpretive dimensions of the data, such as decisions about what should be visible and invisible within a schema. These variances bounded the analysis at the hackathon, because the level of detail determined comparability across datasets. This constraint became a source of discussion. All schemas capture race, gender, and age; otherwise, categories varied. Only the locally produced data (those collected by LAT and YJC) included the incident address and names of deceased. LAT and YJC incident accounts also had information on whether victims were intoxicated, whether domestic abuse was involved, and whether witnesses disputed the account, but such information is not categorized and counted as data. The federal datasets have no categories for purportedly non-lethal actions, such as tasing, that may lead to death. Furthermore, all datasets failed to capture certain information, such as statistics about the number of officers who fired, number of bullets fired, or number of bullets hit – all details that could shed light on "on differential 'kill ratios'" of certain police agencies compared to others (Klinger 2012).

Articulating the inconsistencies present in the databases analyzed was a significant outcome of the hackathon. The various accounts of POIH demonstrate how such data remains highly contested and that local data collected on POIH sometimes produces a picture at odds with federal accounts. Local POIH data offers agonistic accounts of civilian deaths in this case and are more comprehensive than government-produced statistics that aim to capture such a critical matter.

Our Data Bodies: Data Literacy for the Poor

The final case study is the Our Data Bodies project, a research project begun by Virginia Eubanks of the University of Albany and Seeta Peña Gangadharan of the London School of Economics. The project is funded, appropriately enough, by the Digital Trust Foundation, a grant program created after Facebook lost a class action lawsuit against Beacon, a targeted advertising program that illegally drew data on members' activities from third-party sites. The Our Data Bodies project involved grassroots organizations from three cities, including the Center for Community Transitions in Charlotte, North Carolina; the Community Technology Project in Detroit, Michigan; and Los Angeles's Stop LAPD Spying Coalition. This case study focuses on the Los Angeles wing of the project.

In Los Angeles, Our Data Bodies is allied with the Stop LAPD Spying Coalition, an organization whose goal is "to dismantle government-sanctioned spying and intelligence gathering in all its multiple forms."[79] The Coalition is purely volunteer run.[80] According to one of its founding members, the organization began in 2008 in response to the LAPD's Special order 11, which allows anonymous citizens to file Suspicious Activity Reports (SARs) to the LAPD in the event they observe a person engaging in any of eighteen pre-defined, out of place, or odd behaviors, including photographing a building or buying unusual amounts of fuel. Many of the campaign's organizers at the time worked with immigrant and undocumented populations, and they became concerned that their constituents would be targeted by the SARs program. Since its inception, the Coalition's campaigns have expanded to target the legitimacy of body cameras, drones, and intelligence-gathering guidelines.[81]

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[79] From the Stop LAPD Spying Coalition website: https://stoplapdspying.org/.
[80] Though the coalition receives umbrella status from Los Angeles Community Action Network, a nonprofit dedicated to ending homelessness and poverty.
[81] Interview conducted September 14, 2016.

The Our Data Bodies project examines the scope of data collection that affects poor and homeless individuals in Los Angeles. According to one of its organizers, "We're looking at how data is used and shared across systems and how it impacts our access to needs."[82] Such data entails LAPD crime data, including SARs and gang databases, as well as data collected on the poor in the course of obtaining services – be they food stamps, healthcare, or housing – from City agencies. A major concern of the project responds to research showing that poor people, in particular, surrender many basic rights in exchange for common needs such as food, housing, and healthcare, and that this data collection is becoming more and more normalized. Eubanks has documented, for example, the extent that food stamp debit cards track food purchases. Such information is collected not only by state agencies and the USDA but also private companies, including J.P. Morgan Chase and Xerox, that profit from EBT contracts with public agencies (2014).

To better understand the web of data collected on individuals, specifically the poor, the project organizes information sessions and one-on-one interviews with individuals from low-income communities about their personal experiences. In addition, the organizers hold monthly community meetings open to anyone interested in participating and discuss the project at monthly Stop LAPD Spying meetings. To date, the organizers have met for several weeks with Skid Row residents and residents of the Watts neighborhood, brainstorming about data collection systems with which participants commonly interact. Participants regularly mention the LAPD as well as housing subsidies, the Department of Child and Family Services, the Obama phone (a federal phone subsidy program that distributes cell phones to low-income individuals), EBT or food stamps, and the medical system, including the mental health department and emergency

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[82] Ibid.

room. An ambulance, it became clear during meetings, was often folks' only entry point to city medical systems. Many participants explained that they feel as if they have to remain impoverished just to access these systems. The project also examines how public benefit systems might correlate information with the police and vice versa, producing the "criminalization of poverty, the policing of bodies and our lives, and a culture of policing," as the organizer put it. One participant spoke of how the Los Angeles Department of Water and Power tracks every time a light is turned on and off in an abandoned building and shares this data on energy consumption with law enforcement. The project has even begun to involve social workers who engage in sensitive information collection through the course of their work.

Through greater literacy about these programs, Our Data Bodies ultimately hopes to help members of poor communities reclaim their personal story. The project's in-depth interviews and workshops will inform curricula on data awareness, including a "popular education tool" to engage people in a topic that can often seem abstract. The project title itself aims to ground this abstraction in embodiment. The organizer explained that the title

> came from the process of understanding our bodies as sources of information. And there's a process of humanizing ourselves. We're more than data, but 'Our Data Bodies' shows how our bodies are made to just be data. So a little punch in that name, commenting at the systems making our bodies just to be data. They're saying OUR data bodies, they're our bodies, they carry stories, emotions, they carry more than just numbers or parts. We're not just fingerprints or irises or the different biometrics they're building our body into.

Our Data Bodies aims to give under-resourced people more agency over the data collected on them in the course of their daily lives. The project doesn't set out to create counter-data or to

produce alternative metrics, but it does hope to educate people about the extent that their activities can be counted and measured. A better understanding of the extent of state data collection systems can then integrate into Stop LAPD Spying's larger campaign to counteract surveillance of minorities and the poor.

Conclusion: Tracing the Rise of Grassroots Data

This chapter documents instances of civic data action occurring in the City of Los Angeles. Civic data practices are distinct from open data efforts; they are grassroots projects that engage citizens in their own data collection either to augment government data or to challenge it with new metrics that offer an alternate representation of a phenomenon. I have argued that civic data practices can be better understood by framing them through two different theories of democracy: first, a deliberative framework that aims to bring more voices to the discussion so that rational consensus, bolstered by popular legitimacy, can shape an issue. In terms of data practices, such an approach would aim to reconcile citizen-produced data with institutional or scientific data so that the data reflects broader perspectives than that of an elite group. On the other hand, an agonistic pluralist approach to data collection views power struggles as inevitable in a democracy and has little hope that rational consensus can ever be reached without hegemonic means. For civic data practitioners, an agonistic approach would not try to find resolution with official datasets but would present a new perspective entirely on an issue.

As the four case studies have shown, civic data practices can take a variety of approaches. Data collection can produce a statistical phenomenon, such as bike ridership, that had formerly been unaccounted for in policy, and so create representations that achieve legitimacy so long as the collection methods are accepted by authoritative institutions. Data

practices can also focus specifically on issues of social justice; in these cases, supposedly neutral datasets or statistics are exposed as laden with values that impact minorities or certain socioeconomic classes in particular. Such projects can also set out to redress power struggles by helping constituents take greater agency over their statistical representations.

This research is preliminary in its efforts to understand, document, and theorize grassroots data efforts, particularly as more and more citizens use abundant data collection and visualization tools to make their political claims. Each of these case studies allow for a deeper understanding of the asymmetries found at the intersection of technological change, governance, and community participation. Continued research into civic data can offer a finer level of analysis of how the data collected by public institutions impacts the lived experience of citizens, as well as how such regulatory work can be made visible and hence a cause for political action.

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Conclusion: Challenging the Depoliticizing Claims of Open Data

Implications of this Study

This dissertation explores the emergence of open government data in the City of Los Angeles and its implications for governance structures and citizen engagement. To be sure, most aspects of open data that I have examined in this research are not new. Government data, as chapter one demonstrates, has been used as a commercial asset at least since post-Depression-era disclosure laws concerning the FEC's financial records. Electronic records began circulating to the public during the eighties when federal departments made their databases available by dial-up or disk. Citizens have added civic value to electronic records since the TRI at least. Data-driven auditing and administrative models based on private sector practices became popular in the nineties through widespread literature espousing New Public Management; open data performance measures only offer a new face to these decades-old models. But as open data becomes widespread on multiple state scales – the County of Los Angeles launched its own open data portal in May, 2015, for instance – its policies introduce new dynamics. This dissertation has characterized some of these changes both within city departments and as citizens engage in new forms of civic participation through open data. The story of policies and practices that convert government records into data also tell us about the broader cultural and political role that data plays in administrative and civic life.

While my research has sought to pin down an emerging and shifting phenomenon, I believe there are a few generalizable implications that can service further research on the topic. One thread throughout this dissertation is that the rhetoric of open data too often leaves out the political aspects of its production and reuse – specifically, the dimensions of power intrinsic to

data coming from state institutions and its ready cooptation as an economic asset. The rhetoric of neutrality can serve to propagate social inequities; only a month before the time of this writing, I encountered an article that argued that online housing databases such as Zillow and Redfin perpetuate redlining by posting public school ratings for listed properties. Representatives for these sites routinely claim that government school ratings are neutral and therefore have no discriminatory effect of steering buyers away from certain neighborhoods (Zub 2016). The rhetoric of open data rhetoric presents itself as above the fray of politics

This dissertation has presented two approaches to challenge the assumptions of data as post-political. First, I consider the production of open data as a sociotechnical process. What records become open data, for instance, are determined in part by the document's economic value: records from Engineering produce revenue for the city and hence already exist in sophisticated electronic infrastructures designed for broad circulation; those from Cultural Affairs and Transportation do not. These latter departments' open data selection are based less on a consideration for public benefit than on the limitations of existing technological infrastructure. Furthermore, the work of open data itself reinforces institutional logics that reduce social ills to computational problems, closing off political work that might reimagine the problem outside of the data parameters already given. Finally, open data work, as I found, imports the rhetoric of Silicon Valley in a manner that both profits some of the most powerful companies in the world and also seeks to transform government in their image. This discourse, however, often only remains hype: the frictions of open data production – the labor and expense, as well as contractual obligations to private companies – belie the fantasy of government as a dynamic interface that citizens can access in real-time through an API.

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In a second move, I draw from political theories of democracy to analyze emerging forms of data use that create distinctive modes of public involvement. Citizen-produced phone apps that augment city information services introduce a new form of civic participation that is not codified in law nor discussed in political theory. These material practices, evident at civic hacking events, present a benign form of participation that reproduces, rather than challenges, state aims. Civic data practices, in contrast, explicitly put forward the limitations of authoritative data as a reason for public involvement. Civic data practices use data production to challenge state recordings and provide a voice for those that are underrepresented in policy and law. In some cases, this work strives to challenge the current distribution of resources, such as public transit funds; in another instance this civic data activism struggles to limit the extent of state data collection of marginalized groups.

This dissertation is concerned, ultimately, with the political, creative, and day-to-day work of government and civic data, and how these emerging practices and their cultural dimensions interact with the public rhetoric of this often hyped-phenomenon. My research makes the case that it is increasingly crucial to investigate empirically how open data's ideological role enables new administrative models and inspires new modes of civic involvement, while at the same time assessing how open data is deployed in actual practice.

Contributions to the Fields of Critical Data Studies and Information Studies
This dissertation captures the policies and practices of open data as it unfolds in the City of Los Angeles and asks what its emergence entails for city governance and civic participation.

Chapter one argues that the rhetoric of open government became depoliticized once it conflated the benefits of open information markets with government accountability. This chapter

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adds to the current literature on open data by depicting the struggles during the eighties and nineties over electronic records infrastructures. Through these struggles, the policies of government transparency transformed from an antagonistic dynamic pitting citizens versus governments and private industry, into one of mutual collaboration. Open government, in the rhetoric of open data, benefits the public sector, individual citizens, and the private sector alike through information flows that are now agnostic to how government data is ultimately reused.

Chapter two is one of the very few accounts of open data that ground the topic within empirical research on the work of its production by city staff. I apply thick descriptions of data work along with images of city records and their statistical byproducts on the Los Angeles open data portal. The description of this labor provides evidence of the interpretive dimensions of data work and supports my argument that open data is grounded in the sociotechnical context of its production. I also show how open data work provides new models for administration, with political and economic repercussions.

Chapter three contributes to the existing literature on civic hacking by arguing that it is a particular type of participation in the administrative branch of government. I situate civic hacking within literature on administration theory to more finely understand why civic hacking encourages civic involvement that is collaborative with, rather than antagonistic to, public institutions. I also provide a space for civic hackers to examine the micro-politics of the infrastructure of government service delivery – how the difficulty of accessing a public document, for instance, can crucially affect the experience of the immigrant or of those seeking affordable housing. However, too often the political and commercial dimensions of civic technologies go unexamined at these events.

Finally, in chapter four I contribute to literature on critical data studies by providing a theoretical lens with which to analyze types of civic data practices. I draw a distinction between deliberative data practices, those that attempt to augment authoritative data on a phenomenon, and agonistic data practices, which provide alternative representations of an issue and do not attempt to reconcile with official numbers. Through case studies I also present different types of civic data actions: collecting data on a phenomenon neglected by the state, disputing the state's parameterization of an issue, creating alternate metrics that account differently for a phenomenon, and resisting state data collection altogether.

All of my research draws from and contributes to critical data studies, a field that understand data as situated in sociotechnical systems that surround its production, processing, storing, sharing, analysis and reuse. My work provides evidence that data consists of material and discursive systems that reify certain assumptions about the world, as well as involve and extend regimes of power. My research is also of relevance to the broader discipline of Information Studies, a field that has long been concerned with the political and ethical dimensions of records and communication infrastructure. I offer a critical framework to understand practical applications in which individuals might actively interrogate data and their relation to it, as well as improve data literacy in communities that have particular stakes in certain data sets.

Future Directions for Research

Richard Rorty writes, "such a country [as the United States] cannot contain castes or classes, because the kind of self-respect which is needed for free participation in democratic deliberation is incompatible with social division." (1999, 30) In a similar vein, Sheldon Wolin argues

pessimistically, "Science, technology, and corporate capital are essentially impenetrable to, and unincorporable with, democracy." (1960, 2004; 518) Wolin maintains that any science or technical work claiming to be democratic is merely "feckless." Rather, "The incorporation of democracy into the complex of science, technology, capitalism, and state would mean that the political element represented by democracy would become embedded in, and adapted to, a complex of totalizing powers." (Ibid) In these authors' estimation, both of which draw on the work of John Dewey, democratic involvement is curtailed by the current inequities of the capitalist state and perpetuated by technological consumption.

I have purposefully avoided using terms in this dissertation such as 'neoliberal', 'info-capitalist' and 'hegemony,' words are so often overloaded in academic literature. But I have concluded through this research that the policies and practices of open data support the perspective that democracy is neatly compatible with capitalism, and in particular with the expansion of data as capital and of an individualist viewpoint that promotes entrepreneurship. My future research into open data will need to position it, much more competently, within intricate and long-standing theories about political economy.

Through this lens of the political economics of open data one can give a finer account, for instance, of the relationship between openness and environmental risk. In particular, future research should investigate the data practices of environmental activists and position their battles within struggles over corporate and government control of information. This theoretical perspective can also refine ideas outlined in chapter four on the relationship between data, activism, and social justice; for example, one could better understand how infrastructures of government surveillance, such as predictive policing, are increasingly of public concern. A discussion of the political economic dimensions of openness and open government will tell us a

great deal about present and future impact of these information infrastructures on modes of

governance, citizen involvement, and creative alternatives to the relationship between

government and governed.

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