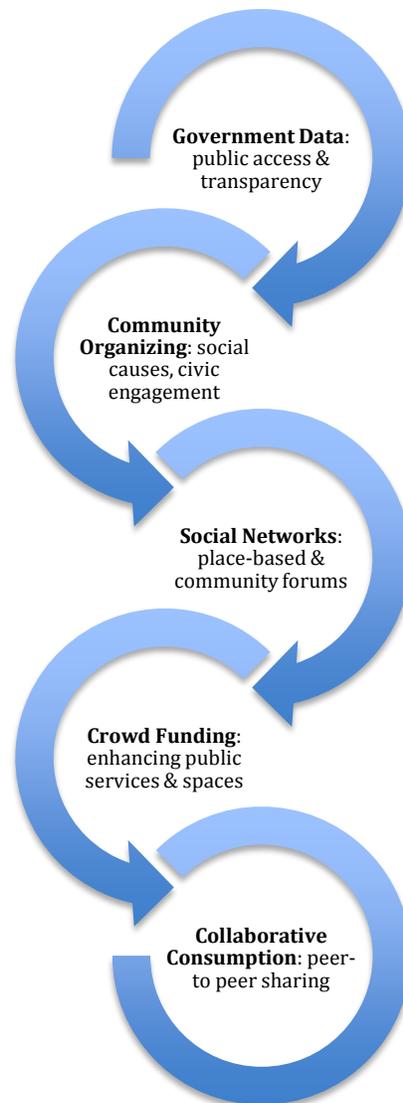


The Civic Technology Landscape: A Field Analysis and Urban Sustainability Directors Network Recommendation



Acknowledgements

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- The Urban Sustainability Directors Network (USDN) is a peer-to-peer network of local government professionals from cities across the United States and Canada dedicated to creating a healthier environment, economic prosperity, and increased social equity.
- The Innovation Network for Communities (INC) is a national non-profit organization whose mission is to develop and spread scalable innovations that transform the performance of community systems.

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Executive Summary

In 2014, a group of local government sustainability directors began exploring the landscape of the Civic Technology (civic tech) field. The intent of this learning project is to discover: 1) what civic tech can do for sustainability directors as they work towards economic, social, and environmental goals, and 2) how the Urban Sustainability Directors Network (USDN) can support members who want to understand and use civic tech to meet their goals. This report captures project findings, and presents a set of recommendations to USDN. The recommendations primarily request continued information gathering around what governments are using which civic tech applications. As use of external information technology (IT) becomes a regular mode of operating in local government, it is becoming increasingly important for sustainability directors to understand how it can best be used to encourage behavior change in their communities.

Civic tech is an emerging field with a blurry definition, even among those who deal with aspects of it on a daily basis. This scan defines it as:

The use of information technology to engage local government and community residents in behaviors that improve the quality and accountability of public services, facilitate resident-driven improvements to local quality of life, and deepen participation in decision-making and public infrastructure maintenance.

In short, civic tech serves as an interface for local government and community members to virtually interact. The interaction can solve something, like using open data to improve communications between state and local business registration offices, or to spot trends in public transit use by district. It can make governments function more like the private sector, offering online access to once hard-copy tasks such as filing construction plans to obtain building permits. It can encourage virtual interaction in public meetings, like surveying online during city council sessions. Or, it can simply be used to communicate and track the mundane of public maintenance, like reporting potholes and noting the repair. Whatever shape it takes, civic tech is differentiated from the term “Smart Cities” by essentially being the softer, community-facing side of technology: a new normal for interaction between citizens and their governing bodies, and a door to big data access and use through local crowdsourcing.

At the beginning of this project, there was limited information available on civic tech, even though it’s been in use in various forms for 10 years or more. Initial assessment indicated that the field was ready for a significant breakthrough. Six months later, a large open government firm called Socrata announced a \$30 million investment in cloud based solutions for local governments.¹ Accela, another private tech company, followed, announcing the largest investment to date (\$143 million) in cloud based government and citizen interaction.² Both GovTech and TechCrunch report as this scan concludes that civic tech is ripe for investment³ and that the civic tech market has grown strong roots, with growth projected to be 14 times faster than traditional government technology spending at both state and local levels – at \$6.4 billion by the end of 2015.⁴

¹ <http://www.socrata.com/newsroom-article/global-open-data-government-cloud-solutions-leader-raises-30-million/>

² <http://www.accela.com/easyblog/entry/accela-closes-largest-investment-in-the-government-tech-market>

³ <http://techcrunch.com/2015/04/29/civic-tech-is-ready-for-investment/#.pmtmvm:ThbY>

⁴ <http://www.govtech.com/budget-finance/6-9-Billion-to-be-Spent-on-Civic-Tech-in-2015-Report-Says.html>

Many of the interviews conducted during this scan with cities and industry players pointed to open data platforms as being a practical and relatively simple first step for cities to enter the civic tech space. Opening data sets can begin a mutually beneficial relationship with the tech community. The Socrata and Accela investments may mean more than growth for the companies: it may indicate that civic tech is emerging from its teenage years as a full fledged field with a lot to offer governments as they reach for sustainability goals.

Originally, the USDN Civic Tech Advisory Board was considering a convening for local government and industry players as a follow-up step to this scan. At the conclusion of this initial effort, the Board determined not to pursue a convening in 2015. Instead, they opted to continue learning around the topic, and created the following recommendations for USDN's consideration.

The primary recommendation the Advisory Board makes to USDN is to enable members to continue to learn together. The Advisory Board would like a sub-network developed to address civic tech needs that can:

- 1.) **Quantify** how USDN members are using local government data currently, and how it can be better used for outreach. **Consider creating a mechanism that can track how USDN members are using open data, to what end, and with what success rate.**
- 2.) **Build** a repository of member data showing who is using what civic tech tool to meet their sustainability goals. Follow how cities are investing and who the early adopters are. **Consider creating a repository of sustainable civic tech tools used by USDN members.**
- 3.) **Provide** a mechanism to identify and respond to USDN member needs that arise; build the infrastructure to allow members to stay up to speed without a lot of investment. Educate USDN members on how to better connect with their IT Departments, and on how they can push the needle on existing technologies that help them reach their sustainability goals. Help members identify and fill the information gaps. **Consider revisiting a Civic Tech User Group in 2016.**
- 4.) **Formally Partner** with Industry Experts. **Consider having industry partner(s) on retainer who can be called upon to help evaluate the merit, feasibility, and budget of proposals that enable a civic tech tool or application - and perhaps partner on proposals, serve on a consortium, or be commissioned to solve a collective member need.**

Local governments often don't know where to begin in the civic tech space. They can realize time and cost savings by learning together how to establish best practices in the planning for and use of civic tech. Specifically, Sustainability Directors can learn together to overcome internal barriers to development and use of civic tech that can help them accelerate and track progress towards local sustainability goals.

Local government's existing internal systems can be modified to allow leverage of the field of civic tech by establishing guidelines for city strategy development. These can be focused on modifying existing IT and Finance processes that prohibit access to civic tech or to opening existing city data, and by establishing partnerships that can repurpose existing applications that generate progress towards city sustainability goals. USDN members in various stages of this process can access the lessons of those who have gone before, and modify their planning and implementation strategies accordingly.

Introduction to the Civic Technology Scan

This document ties together the deliverables from the Urban Sustainability Directors Network (USDN) Innovation Fund Project Civic Technology (civic tech) Scan. Its intent is to summarize the findings from each component of the project: the literature review, interviews and survey, and convening recommendations. The scan reveals aspects of what is currently happening in the civic tech space and what value it provides to urban sustainability efforts. The scan does this by identifying who’s doing what, probing, and identifying notable patterns. Key guiding questions for this exploration into civic tech include:

- Which cities are leading?
- How are cities organizing to support the use of technology?
- How are cities funding these projects?
- What foundations and NGOs support this work as part of their mission?
- What private firms are working in this area?
- Is there information USDN should be gathering from members to stay abreast of this field?
- Is there interest among USDN members to form a User Group or use another mechanism to work together in this practice area?

An Advisory Board that spanned public, private, and non-profit sectors directed this work:

- Matt Naud, Ann Arbor, MI; Jacqui Bauer, Bloomington, IN; Jennifer Green, Burlington, VT; Karen Weigert, Chicago, IL; Doug Melnick, San Antonio, TX; Leslie Ethen, Tucson, AZ; and Brendan Shane, Washington, D.C. served as city advisors.
- Melanie Nutter of Nutter Consulting served as the Smart Cities Advisor, and Pete Plastrik of the Innovation Network for Communities (INC) provided scan oversight.

Purpose of the Analysis

This scan was undertaken to increase city understanding of the civic tech field, examine it as a tool to help cities reach their sustainability goals, and identify any ways that to help the field advance (Table 1).

Table 1. The Urban Sustainability Directors Network Civic Technology Scan Purpose.

Goal Area	Description
Increase Understanding	The purpose of this project is to understand how city governments are currently using and can better use the civic tech phenomenon to advance sustainability—and how the Urban Sustainability Directors Network (USDN), as an aggregation of city governments, can do so.
Achieve Sustainability Goals	This scan of the civic technology space seeks out the most effective ways for USDN and its members to utilize civic technology—an emerging field at the nexus of information technology, civic innovation, open government, and resident engagement—for behavior changes that help cities to achieve sustainability goals.
Accelerate Development	The opportunity it addresses is to help small and large cities overcome the many barriers to accelerated development and use of civic technology.

Definition of the Civic Technology Field

For the purpose of this scan, Civic Technology is defined as the use of information technology to engage local government and community residents in behaviors that:

- Improve the quality and accountability of public services;
- Facilitate resident-driven improvements to local quality of life; and
- Deepen participation in public decision-making and infrastructure maintenance.

The drivers of Civic Technology in communities include technology-business entrepreneurs, civic hacking (which draws on a local tech community’s skills), and local government efforts, such as labs or think tanks. Table 2 provides examples for each of these three definition categories:

Table 2. Civic Technology Definition Categories and Examples.

Definition Category	Definitions and Examples
Improve the quality and accountability of public services	<p>Help city residents more effectively access and track responsiveness of public service delivery, facilitate resident engagement with government around service delivery issues, and streamline resident access to public services.</p> <ul style="list-style-type: none"> • <i>Example: SeeClickFix (seeclickfix.com): allows anyone to report and track non-emergency issues via the internet, empowering citizens to take care of and improve their neighborhoods, provides tracking of repairs, and ultimately contributes to more community involvement.</i>
Facilitate resident-driven improvements to local quality of life	<p>Enlist city residents to provide new data to support or inform government efforts, to organize community-based efforts based on that data, or to participate in the development of strategies and policies to address these issues more effectively.</p> <ul style="list-style-type: none"> • <i>Example: ChicagoBuildings (chicagobuildings.org) is a vacant and abandoned building finder tool that allows anyone to find buildings in Chicago that are not in use and potentially hazardous to the neighborhood around them.</i> • <i>OpportunitySpace is a similar application that re-envision “forgotten” spaces.</i>
Build community through peer-to-peer sharing	<p>Promote peer-to-peer sharing of information to build a sense of community, belonging, and ownership.</p> <ul style="list-style-type: none"> • <i>Example: Our Common Place (ourcommonplace.com) is a civic technology organization that works to revitalize the spirit of local community engagement in towns across the country.</i>
Deepen participation in public decision-making	<p>Develop more effective ways to collect meaningful resident input, especially from low-income residents, and bring them more deeply into public decision-making processes.</p> <ul style="list-style-type: none"> • <i>Example: Changebyus (changeby.us) allows users to create or join a project (such as a community garden), post progress and needs, and be connected to resources.</i>

Civic Technology Field Analysis Process

The civic tech scan was guided by a set of Advisory Board questions (Table 3). These were a product of the scoping process and the first Advisory Board meeting.

Table 3. The Urban Sustainability Directors Network Civic Technology Scan Purpose.

Interest Area	Questions (<i>broadly, what is happening in civic tech, how cities use civic tech, what USDN should/shouldn't promote, and specific civic tech applications - such as energy data</i>)
Funding	<ul style="list-style-type: none"> • Who is funding these efforts? • Should USDN be funding civic technology, or are there partners to work with? • When does USDN invest? If there is interest, does it make sense to pursue if no investors are quickly apparent?
Ownership and Operations	<ul style="list-style-type: none"> • If we work on open source solutions, who will be the developer? • Who will own and operate? • Where does a technology live? • Who maintains it on a long-term basis? • Many platforms are used in concert with each other, so where is there interface, and where can these platforms be linked / crossed?
Engagement	<ul style="list-style-type: none"> • How best to use civic tech to engage around sustainability? • There are roadblocks due to lack of information – how best to engage the tech community and tap community mind resources?
Data Access	<ul style="list-style-type: none"> • How have people been successful at getting utility data – what are the projects that have been successful with crowd sourced data and why? • How can USDN help assess areas where data is needed but not available?
Collaboration	<ul style="list-style-type: none"> • Can we get a sense of which projects are city-driven versus multi-city driven? • How can we cross-city collaborate to avoid replicating effort? • How can we clarify goals with the tech community, so problems are well defined?
Market Evaluation	<ul style="list-style-type: none"> • What are the areas of need where the private sector won't engage on their own? • Where the response is inadequate or non-existent? • Using civic tech for sustainability goals isn't addressed much; should USDN be driving this? • How can USDN vet market interest when a need is identified? • Are areas where the market isn't working USDN's area of investment?

The scan set about answering these questions by designing a process that tapped both local government and industry expertise. First, to understand what currently exists on the market, a database of existing applications and tools was created in Excel by category:

- **Government Data:** public access & transparency
- **Community Organizing:** social causes, civic engagement
- **Social Networks:** place-based & community forums
- **Crowd Funding:** enhancing public services & spaces
- **Collaborative Consumption:** peer-to peer sharing

Civic Technology Applications were classified within this matrix, and 3 key themes emerged:

1.) There appear to be three scales at which Civic Technology operates:

- **Geospatial** - Global, National, Regional, and Local (citywide, neighborhood, and site specific);
- **Urban System** - Transit, Energy, Buildings, Waste, Water, Safety, Health, Education, etc.; and
- **Social Groupings** - Neighbors, Voters, Activists, Service Users, Students, etc.

2.) There appear to be three categories of users:

- **Government Agencies** – functioning in different systems or citywide;
- **Citizens** - in different social groupings and demographics; and
- **Hackers** - technologists that create tools, often using open data sets.

3.) The value being created in the civic tech space is to attempt to ease these processes:

- **Search** - helping people find something (information, a peer, etc.);
- **Report** - provide government and / or peers with information including aggregating information (crowdsourcing) into a map or pattern that wouldn't otherwise be available;
- **Ask** - request government and / or peers for (non-emergency) service, information, and assistance; and
- **Input** - provide government with feedback.

To better understand patterns and trends in the matrix, a picture was created that examined applications, software, data, and hardware. Appendix 1 (Table A-1) puts civic tech tools into each category. Summary observations by component are as follows:

- **Applications and Software Observations:** The line between applications and software blocks is blurry; they are primarily cloud-based tools that appear to involve both components. Much focus is on shared mobility (transportation: commuting, parking) or some version of neighborhood or peer sharing (sustainable consumption). There often isn't a clear role for government in these instances, except to respond to citizens as needed. Focus is also put on turning public data systems into maps or some form of visualization, to inform or alert citizens about concerns like crime, building permits, noise, etc. Crowdfunding tools put government in a very reactive / responsive role, and online voting is reoccurring but weak.
- **Data Observations:** Many data sets are used by hackers and tech developers, but they don't show up as a primary, stand-alone component; they are a vital piece of the final product. This is an important but not highly visible building block, and cities often don't know the best methods to share data in compatible formats.
- **Hardware Observations:** The physical parts and components of a computerized system do not factor much in civic tech. This seems to fall more in the Smart Cities discussions.

Ultimately, this landscape became a problem matrix: a way to start categorizing the problems by solution, who is providing it, and who is using it. The full problem matrix can be found in Appendix 2. Designed around the technology currently available, it asks questions in the categories of City Operations, City Planning, Residential Engagement, Transportation, and Energy, identifies desired

outcomes, and then points to civic tech tools and who is using them. Major problem matrix observations include:

- Transportation is the largest category that deals with directly with sustainability / carbon reduction goals;
- Public service directors and planners are best served by civic tech right now; and
- Energy, water, waste, and carbon are mostly absent from the list, meaning there’s a gap in what civic tech is currently offering and what sustainability directors need.

Civic Technology and Smart Cities

During this scan’s timeframe, the Advisory Board was very aware of Smart Cities research the USDN Innovation Fund is also supporting, and overlap was noted as the conversation evolved throughout the concurrent processes. The starting point of the conversation to differentiate the two is summarized in Table 4.

Table 4. The Urban Sustainability Directors Network Civic Technology and Smart Cities Conversation.

Sample Differences	Sample Components	Sample Products
Smart Cities	Usually involves heavy infrastructure components, as well as hardware, software, and applications	Smart Grid, energy efficient (automated) buildings, and transportation mode synchronization
	Involves long-term economic planning	Fiberoptics, wireless sensor networks, and a mindset that prioritizes sustainable economic development
	Detailed deployment with communications strategies	Smart Meters, Red Light Cameras, and Traffic Signal Management
Civic Technology	Primarily software or application based, can be cloud based and not needing to touch a city server	Parking Applications (ParkMe), land applications (ChicagoBuildings), and community sharing (Peerby)
	Involves operational budget planning in some cases	Web platforms that provide educational information, community challenges / competitions, etc. require ongoing maintenance and support

Since building the original thoughts on the differentiation in Table 4, the USDN Innovation Fund Smart Cities project is discovering that the civic tech and Smart Cities spaces are intersecting more than originally thought – the Smart Cities Advisory Board is now seeing the term “Smart Cities” as a mix of all things technology and community oriented. USDN’s Smart Cities 1.0 focuses on government-run tech dealing with internal infrastructure. USDN’s Smart Cities 2.0 focuses on involving communities in data collected through infrastructure or an application. The Smart Cities 2.0 work will deliver 3 main components: a sustainability toolkit, partnership models, and executive training for decision makers.

The Smart Cities 1.0 report drew several civic tech conclusions: 1) that more cities are turning to crowd-sourcing applications like MindMixer and SeeFixClick to engage citizens in government; 2) that more cities are publishing open data sets to drive government innovation by civic hackers; and 3) as new platforms are rolled out, cities are experiencing unforeseen challenges and even unintended consequences. For example, publishing general open data sets: it takes a lot of time and resources to

create and manage systems that can aggregate crowd-sourced data, while being more targeted about the data sets made available.⁵

Nigel Jacobs (New Urban Mechanics, Boston), sums up the difference between civic tech and Smart Cities by equating the first to government interface with citizens, and the second to government service provision. He notes that Smart Cities technologies are typically big investments in terms of time and money, and that the dollar amount can be small when compared with the time it takes to adopt a technology. Nigel says that the human interface side of technology side is still weak; that unless there is an easy way for citizens to get involved, it has limited outreach capabilities. He thinks of Smart Cities in terms of databases, data aggregation, systems, and data analytics. Vendors that are building Smart Cities and civic tech tools often use the term “Gov Tech” to describe both.

Ultimately, there are different value propositions unique to each. Smart Cities tech centers on centralizing control, top-down systems, and high dollar projects: a big screen view of the city, for example. Civic tech has a different set of values. It represents more bottom-up control, moving government services to where people are. It focuses on usability, interface importance, and can be used to empower people. At the close of this scan, the USDN Civic Tech Advisory Board maintains that civic tech, a tool that is light on revenue generation but heavy on behavior change, is very different from Smart Cities, which represents major civic investments and can at times be removed from community consciousness. While there is undeniable overlap, the metrics are different.

Lay of the Land: Literature Review

Secondary research was conducted to explore the state of the civic tech field. Literature that deals with civic tech is very limited in scope, and information useful to practitioners is largely found from online sources like GovTech, which provides daily updates to subscribers. Information relevant to this scan is summarized in the following section.

Investors Report

Over the last 15 years, the Knight Foundation has done an analysis of civic tech organizations launched each year. In their 2013 report, *The Emergence of Civic Tech: Investments in a Growing Field*, they break Civic Technology behaviors with associated clusters:

1. **Open Government**, which includes tools for data access and transparency, data utility, decision making, resident feedback, mapping and visualization, and voting; and
2. **Community Action**, which includes tools for civic crowd funding, community organizing, information crowdsourcing, neighborhood forums, and peer-to-peer sharing.

Knight Foundation findings show consistent, high growth, measured by the number of organizations in each cluster. From 2008 - 2012, the field grew at an annual rate of 23%. Growth varies across clusters, and the Community Action clusters are growing at a faster rate than those in Open Government. The

⁵ *Strategies and Resources for Advancing Smart and Sustainable Cities*, <http://usdn.org/public/Innovation.html>

fastest growth has been among organizations focused on Peer-to-Peer Sharing, at 36% annually from 2009 to 2012.⁶ Content in Table 5 has been modified from this report.

Table 5. Civic Technology Innovation Clusters and Trends.

Behavior	Clusters	Cluster Description	Top Providers
Open Government	Data Access & Transparency	Promote government data availability, transparency and accountability	Socrata, Placr
	Data Utility	Empower users to analyze government data and leverage data to improve public service delivery	AlertID, mySociety
	Public Decision Making	Encourage resident participation in large-scale deliberative democracy and community planning efforts	Localocracy, Our Say
	Resident Feedback	Provide residents with opportunities to interact with government officials and give feedback about public service delivery	SeeClickFix, Public Stuff
	Visualization & Mapping	Enable users to make sense of and gain actionable insight from civic data sources, specifically through the visualization and mapping of that information	Azavea, Public Engines
	Voting	Support voter participation and fair election processes	TurboVote, Votizen
Community Action	Civic Crowdfunding	Support local projects and organizations that generate a public benefit through peer-to-peer lending and crowdfunding	Neighbor.ly, Citizeninvestor
	Community Organizing	Manage social campaigns and initiatives	Change.org, Bang The Table
	Information Crowdsourcing	Collect data from a large number of individuals to inform and address civic issues	Waze, NoiseTube
	Neighborhood Forums	Power local groups of people to connect, share information and collaborate	Next Door, Front Porch Forum
	Peer-to-Peer Sharing	Promote resident-driven sharing of goods and services	Acts of Sharing, Lyft

Knight Foundation research provides an in-depth analysis of Civic Technology Investments by cluster. It is important to note that the Knight Foundation report only examines investments; the number of users and revenues per application is unknown. According to Knight, over 200 Civic Technology projects were identified according to specific criteria, and almost half received investments from 2011 to 2013.

Knight also examined cluster investments by investment type. From 2011-13, 84% of total supporting capital came from private investments. Open Government clusters are mostly supported through grant funding: Data Utility, Data Access & Transparency, and Resident Feedback. Community Action clusters mostly attracted private capital: Peer-to-Peer Sharing, Neighborhood Forums, Civic Crowdfunding, and Information Crowdsourcing.

Financial investors and individuals (Table 6) tend to support Community Action investments. Foundations account for over half of the number of investments in Open Government. Philanthropic

⁶ *The Emergence of Civic Tech: Investments in a Growing Field*, www.knightfoundation.org/features/civictech

grants outnumber private investments. Private capital is still investing heavily in open government. Venture capital and angel investors frequently co-invest. Foundations are rarely co-investing with other types of investors.

Table 6. Major Civic Technology Investors.

Investors	Investors by Category, High to Low
Foundations	Knight, MacArthur, Hewlett, Rockefeller, Points of Light, Open Society, Code for America, Ford, Kauffman, Gates
Financial Institutions	Omidyar Network ¹ , SV Angel, Start Fund, Y Combinator, Lerer Media Ventures, General Catalyst, Benchmark Capital, Andreessen Horowitz
Corporate Investors	Dell, Google, Zipcar, SXSW, Obvious, Nelnet, Daimler, BMW, Bennett Coleman, Comcast
Individual (angel) Investors	Ashton Kutcher, Sean Parker, Guy Oseary, Esther Dyson, Aviv (Vivi) Nevo, Alexis Ohanian, Peter Thiel, Marissa Mayer, Jeff Bezos

Clusters focused on civic engagement and democratic participation are the youngest and least funded: Public Decision Making, Resident Feedback, and Voting. Foundations may achieve greater impact advancing the growth of peer-to-peer sharing economies by addressing outdated regulations inhibiting growth (instead of sporadic grants) and by co-investing. It is important to note for USDN that city investment isn't factoring as an investor category in the Knight Foundation study.

As this project commenced, aside from the Knight Foundation report, there was limited information available on civic tech - even though it's been in use in various forms for 10 years or more. This assessment indicates that the field is ready for a significant breakthrough, similar to how AirBnB revolutionized traveler lodging or Uber ground transit in cities. Six months into this scan, a large open government firm called Socrata announced a \$30 million investment in cloud based solutions for local governments.⁷ Accela, another private tech company, announced the largest investment to date (\$143 million) in cloud based government and citizen interaction.⁸ Both GovTech and TechCrunch report as this scan concludes that civic tech is ripe for investment⁹ and that the civic tech market has grown strong roots, with growth projected to be 14 times faster than traditional government technology spending at both state and local levels – at \$6.4 billion by the end of 2015.¹⁰

Civic Technology and Sustainability

One challenge this work shares with the Smart Cities work is linking civic technology to city sustainability. The 2014 Verge conference focused on introducing the space of civic tech and smart cities to achieve deep carbon reductions, so the conversation is starting to evolve. But is all civic engagement relevant or of interest to sustainability directors? Most widely adopted civic tech applications have a strong public service link, like SeeClickFix. The few that do have struggled with data access and funding, like USDN's RentRocket. The more clearly linked deal with energy efficiency, like Joulebug, and transportation, like PlugShare.

⁷ <http://www.socrata.com/newsroom-article/global-open-data-government-cloud-solutions-leader-raises-30-million/>

⁸ <http://www.accela.com/easyblog/entry/accela-closes-largest-investment-in-the-government-tech-market>

⁹ <http://techcrunch.com/2015/04/29/civic-tech-is-ready-for-investment/#.pmtvmv:ThbY>

¹⁰ <http://www.govtech.com/budget-finance/6-9-Billion-to-be-Spent-on-Civic-Tech-in-2015-Report-Says.html>

Table 7. Civic Technology and Sustainability.

Sustainability Pillar	Civic Technology Relation
Economics: civic tech as a market-changer	<ul style="list-style-type: none"> Digitized technologies enable globalized local economies Raleigh, NC hosts CityCamp each year, where academic communities work toward next generation solutions for local municipalities.” Prizes are given to the best civic hacking projects
Environment: civic tech as a platform	<ul style="list-style-type: none"> Overall this is not a stand-alone category in civic tech Aps like Noisetube and community forms can provide a platform to discuss local environmental challenges
Equity: The Greatest Challenge ¹¹	<ul style="list-style-type: none"> An estimated 100 M Americans (1/3) lack a home computer / smart phone with Internet access The “digital divide” is acute for low-income urban and rural residents, older industrial workers and low-skilled immigrants <p>Case Studies:</p> <ul style="list-style-type: none"> MA is addressing these imbalances by funding broadband expansion Boston has installed wifi towers in low-income neighborhoods and is providing free wi-fi in public spaces Chicago's LISC’s Smart Communities digital inclusion campaign led to a 15% increase in internet usage in five low-income neighborhoods

Challenges and Opportunities

Compared to the technology industry as a whole, civic tech organizations are young. As with most emerging fields, the activity and noise is confusing. Civic Crowdfunding projects have a median age of 2 years, and the average age of organizations in Knight’s mature clusters is 5 to 7 years (Voting, Public Decision Making, and Visualization & Mapping). Table 8 summarizes the challenges and opportunities:

Table 8. Civic Technology Challenges and Opportunities with Potential City Responses.

Issue Category	Civic Tech Challenge	City Response
Funding & Collaboration	<ul style="list-style-type: none"> Fragmentation Sustainability Risk 	<ul style="list-style-type: none"> Communicate with funders / partners Understand the field, to lower barriers Revise Procurement
Ownership & Operations	<ul style="list-style-type: none"> Data & System Management 	<ul style="list-style-type: none"> Know where you want Open Source Data to help Design to be device-blind for broader use
Market Evaluation	<ul style="list-style-type: none"> Market Development Strategy Alignment 	<ul style="list-style-type: none"> Experimentation will help the field establish itself Collaborate with academic and private partners and hire smart people Designate staff to understand needs and strategize Design data sharing standards

To further explore the challenges and opportunities associated with the categories from Table 8:

¹¹ Gerry Smith. *Huffington Post*, “Without Internet, Urban Poor Fear Being Left Behind In Digital Age”

Funding & Collaboration

- Fragmentation:
 - **Challenge:** Funding mechanisms are fragmented, with no cohesive strategy. Funders are not currently collaborating for widespread adoption.
 - **Opportunity:** Communicate. Talk to funders about collaboration. For example, the Knoxville TN, United Way teamed up with the State of Tennessee to launch CodeTN, a local youth coding competition. The more players, the more funding opportunities.
- Sustainability:
 - **Challenge:** Most tech products and services require long-term funding to get beyond the start-up stage. Where will this investment capital come from? Is there a role for cities to play?
 - **Opportunity:** Understand civic startups. Emerging from incubators (Code for America, for example) startups are starting to scale. While it's difficult for less established companies to sell to government due to the long procurement process and requirements, companies like OpenCounter are gaining momentum by selling to smaller cities with lower barriers.
- Risk:
 - **Challenge:** Investing at the start-up level, requires governments to accept a level of risk. It also requires tech companies, who may be small and lacking excess capital, to bond, insure, and otherwise contract with relatively inflexible local government legal requirements. Negotiating a mutually acceptable contract directly between the two entities can be difficult.
 - **Opportunity:** Procurement Revisions. Some cities are experimenting with alternative procurement strategies (Philadelphia's FastFWD civic startup incubator, for example). Other agencies (like Gov.UK and Consumer Financial Protection Bureau) are hiring technologists inside government to build tech in-house, reducing the need to hire contractors.

Ownership & Operations

- Data and System Management:
 - **Challenge:** Cities vary greatly in data availability and technical capacity. Some governments share data sets regularly and some don't. Some have progressive IT staff and some don't. Those without staff to develop and manage a resource have an operational budget component to outsourcing the project, which cities consider carefully in light of competing priorities.
 - **Opportunity:** Open city data and adjust for various operating systems.
 - Open Source Data: GitHub introduced government to what open source means and how to do it; Philadelphia has used it as a tool to streamline the RFP process; and San Francisco has posted its municipal code for hackers to use.
 - Responsive Design: More than 30 states have embraced this practice to design once for all devices, ensuring that there's no need to build a devoted mobile website or application.

Market Evaluation

- Market Development:
 - **Challenge:** There is difficulty in creating an actual market – with customers, entrepreneurs, investors, and finally, a sustainable funding or profit mechanism. Some

organizations support start-up application development, but the long-term market hasn't been addressed or fully developed yet.

- **Opportunity:** Experiment. *"As more local governments incorporate experimentation into their processes, we'll see initiatives become permanent"*, says Alyssa Black of the New American Foundation. For example, the City of Vallejo, CA was first to approve participatory budgeting citywide, a practice that has since spread globally. Local governments can expand this beyond budgeting. There is less emphasis on crowdsourcing ideas as governments think about how to open up data in meaningful ways. Creating civic data standards is one approach to outlining specifically how the city will use technology to empower people and communities.
- No Clear End Game:
 - **Challenge:** The civic tech world still lacks a long-term horizon. A lot of civic tech projects are here and then gone, creating confusing noise for local governments. Who should they invest in? When? Why? Governments and technology move at vastly different paces, and risk is distasteful to an organization operating with tax dollars.
 - **Opportunity:** Collaboration. The community is growing on all fronts: more startups and investment entering the space, a growing network of innovators inside government, and academia is introducing new research and graduate level programs in the space. In the media, civic hacking has become a mainstream term. All of this indicates that the ecosystem is maturing.
- Alignment:
 - **Challenge:** Projects tend to focus on the innovation at hand, rather than the broader picture: that technology tools can ultimately be used to change the ways problems are addressed. They often fail to address the greatest needs cities face from an economic, environmental, and social perspective. Without the long term big picture in mind – and where the application can help achieve specific city goals - the pitch for a specific innovation can lack context.
 - **Opportunity:** Innovation Offices. This trend is not only programs devoted to spurring innovation internally, but also those that involve others in creating innovation in government. Governments from the San Francisco Mayor's Office to the White House are launching innovation fellowship programs of their own. NYC and Chicago have analytics teams in place.

Civic leaders, organizations, funders and citizens increasingly recognize the power of technology to connect people, improve cities, and make governments more effective. So, how can the field itself become more effective? Here are some observations:

1.) Ripe for a Breakout Success: With large addressable market sizes, small average investment sizes and lack of a dominant market leader in most clusters, entering the field now positions a company well to be that breakout success. The field is still defining itself. It is more than just tech tools, which makes the concept digestible to more people.

"Often, when talking about "civic technologies" -- tools deployed in a variety of government and social contexts -- we attribute any change that results to the tool itself. But tools are only as effective as the people wielding them, the tactics they use, their opportunities for access and participation, and the policies that shape all of these things." – The New America Foundation

2.) Bright Young Minds: This field builds entrepreneurs at a young age, and teaches them how government works. Universities and community colleges are offering more and more courses in civic engagement and coding at the undergrad and graduate levels. They are also teaming up with nearby cities that serve as “labs”. Florida Tech's Civic Engagement Initiative matches community needs with student and employee interests to develop individual and collective actions designed to identify and address issues of public concern. Other educational programs include: MIT and Boston, MA; Georgia Tech and Athens, GA; University of Michigan and the Jackson, MI.

3.) High Optimism: There is an unquestionable mood of growth and momentum among civic technologists. This provides the opportunity to foster more cross-cluster community and collaboration. The Knight Foundation's network map shows that Open Government and Community Action organizations tend to have little overlap. Breaking out of these silos has the obvious benefits of exchanging knowledge, ideas and solutions.

4.) Peer-to-Peer Established: In the peer-to-peer collaboration cluster, Uber and AirBnB are breakout successes, attracting droves of investors and entrepreneurs. The civic tech field is also peer to peer established, and is also attracting a lot of investment. The breakthrough application is simply a matter of time now.

“The average age of civic tech organizations is about 4 years old. That explains why we have yet to see a “breakout success”—a Facebook or a DropBox – of civic technology; we simply need more time. And the challenge here is that without that success story to point to, the potential upside that would attract both entrepreneurs and investors to the space is simply not as obvious.” – Knight Foundation

Talk on the Street: Survey and Interview Analysis

In order to get real-time information on what is happening in the civic tech field in both the public and private sectors, a survey was designed for cities. As that was in the field, interviews and organization profiles were conducted and created. This provided a clear sense of what is currently happening and where civic tech is headed from the public and private sector perspectives. Results of both initiatives are summarized in the following sections, and more detailed information can be found in Appendixes 3 (City Survey), 4 (City Interviews), and 5 (Industry Interviews and Profiles).

City Survey

The survey was offered to the entire USDN membership, but the uptake was too low to provide a well-rounded body of data. Only 10 members responded - mainly from the Advisory Team. The survey went out to Smart Cities team (30+), was posted on USDN’s internal website twice, and went out twice in the USDN weekly news. It serves as a good profile of the USDN Civic Tech Advisory Team, but indicates that the broader membership isn’t focused on this topic yet. Survey results are summarized in the following Table 9, and the most informative answers can be found in Appendix 3.

Table 9. Civic Technology Survey City Responses.

Interest Area	Survey Data Observations
Definition	<ul style="list-style-type: none"> The Definition of Civic Tech is still fluid; even field experts differ on it. Revise to include reporting ability
Leadership and Positioning	<ul style="list-style-type: none"> Management responsibility isn't standardized and is still new in local governments Not many Sustainability Directors hold the reins on civic tech, but some are asked to implement it.
Strategy Development /Plans	<ul style="list-style-type: none"> Very few cities have a civic tech strategy in place Plans are in the beginning stages and will be emerging more frequently as cities mature on this topic
Civic Tech in City Departments	<ul style="list-style-type: none"> As observed in the literature review, the most uptake and success of civic tech applications are in the operations departments
Most Successful Initiates / Helpfulness towards sustainability goals	<ul style="list-style-type: none"> Cities vary in what has worked the best for them. The most successful so far have been in operations categories (transit, safety, etc.) In sustainability categories, civic tech was ranked as helping least with equity, somewhat with sustainable economics, and moderately with environmental issues There was wide difference in opinion on if civic tech can help cities reach their sustainability goals
Procurement Processes	<ul style="list-style-type: none"> City Procurement is being modified on a case by case basis to accommodate civic tech testing, purchasing, and developing. There is no standardization of what those modifications look like
Partnering with External Agencies	<ul style="list-style-type: none"> Advocacy is coming primarily from academia Partnership is coming primarily from the non-profit sector
Challenges to Overcome	<ul style="list-style-type: none"> Budgets and internal processes are standing in the way of advancement of civic tech in cities Maintenance and operations, lack of interest from internal departments, lack of funding, lack of external partners, and lack of leadership around civic tech are all identified as barriers by the Advisory Team
Data	<ul style="list-style-type: none"> There is a focus on transparency and an overall aversion to collecting /sharing sensitive information

Interviews and Profiles

A series of interviews were conducted with 5 cities that volunteered from the Advisory Board or were requested by the Advisory Board. From industry, 6 players were selected based on coverage in the press and influence on the field. Additionally, 4 industry profiles were completed to get a complete span of sectors.

City Views

Five cities were interviewed as part of this analysis. Table 10 summarizes their collective responses by area on interest and inquiry. Appendix 4 contains the full interviews.

1. Ann Arbor, MI: Kevin Eyer, IT Department
2. Bloomington, IN: Jacqui Bauer, Sustainability Director and Rick Dietz, IT Department
3. Chicago, IL: Tom Schenk Jr., IT Department
4. San Francisco, CA: Denise Cheng, Mayors Office of Innovation
5. Tucson, AZ: Leslie Ethen, Sustainability Director and Andrew Greenhill, IT Department

Table 10. Civic Technology City Interview Summary.

Interest Area	Highlights from Interviewed Cities
Primary area of interest in Civic Technology	<ul style="list-style-type: none"> • Varies by level of advancement; cities starting out have no overarching strategy evident, while cities that have been at this awhile align with the top administrative priorities
Most useful application(s) cities called out	<ul style="list-style-type: none"> • Reporting applications are most common, and Open Data appears to have the lowest risk and hurdles to overcome as a gateway into civic tech for cities
Involvement in the Smart City / Civic Tech space	<ul style="list-style-type: none"> • Civic Tech adoption varies by city – SeeClickFix is the most consistently mentioned vendor application • Just as prevalently mentioned are applications / platforms that cities have developed in house
Engaging with the tech community	<ul style="list-style-type: none"> • The consistent message is to participate as a peer, not govern / agenda set for the civic tech community • There is overall agreement that that prescription doesn't work as well as enabling does
Challenges cities are using civic technology to solve	<ul style="list-style-type: none"> • Transparency, access to city services, and operational efficiencies are the top apparent categories • Specific use of applications range widely and vary by city (see Problem Matrix, Literature Review)
Driver: the city or the tech community	<ul style="list-style-type: none"> • Both the city and the tech community can drive the agenda, with the greatest successes being those cities that have an active and ongoing dialogue, peer to peer, with their tech communities
Ownership, open data, and long term funding?	<ul style="list-style-type: none"> • The underlying message is to step in, pilot, test, and figure out how to go from project to program as value is shown. Change the mindset from tech as an extra to tech as essential
Funding sources / models	<ul style="list-style-type: none"> • No silver bullet; the preference seems to be try Code for America if it's affordable, but try anything that works in your community structure. The universities are good advocates and the non-profits can be functioning partners
Use smart / civic tech to meet sustainability goals	<ul style="list-style-type: none"> • Applications designed for sustainability are increasingly emergent, and those cities that see civic tech as an essential part of progress monitoring are using to track progress towards sustainability goals. New example: the

	Marin Sustainability Tracker: http://www.marintracker.org
Data being collected	<ul style="list-style-type: none"> Types of data collected by cities varies in kind and quality. Mostly data is discussed in the Open Data context: cities can be good aggregate data collectors, and then the market can determine the profitable and helpful plays around that data
Could USDN meet needs in this area	<ul style="list-style-type: none"> There is a sense that USDN is already starting to meet needs through research and convenings. The opinions seem to be that USDN can best serve the membership through education on this topic
External partnership opportunities of interest	<ul style="list-style-type: none"> There is concern over alignment, excitement over collaboration in general, and no real sense of who could be a strong USDN partner (though Code for America was mentioned frequently, and they are reciprocally interested)
Interest in partnering with each other	<ul style="list-style-type: none"> As with external partnerships, concern over alignment but excitement over collaboration in general was expressed. There is no real sense of what the partnership could be formed around
Critical areas where the market is not meeting needs	<ul style="list-style-type: none"> Data that is considered sensitive (health, utilities, etc.) is often avoided. There is a suggestion that this shouldn't be the initial concern. To start, the focus should be on structuring a program that allows the market to grow
Success with open data and /or accessing utility data	<ul style="list-style-type: none"> Cities expressed lots of success and enthusiasm around open data. Not as much success with utility data access though both cities and industry seem to be leaning towards utility data work-arounds (crowd sourcing, hacking)

Industry Views

Six industry players were interviewed as part of this analysis. Table 11 summarizes their collective responses by area on interest and inquiry. Appendix 5 contains the full interviews.

1. Code for America: Dan Hon
2. Accela: Mark Headd
3. LocalData: Matt Hampel
4. New Urban Mechanics: Nigel Jacobs
5. Tumml: Clara Brenner
6. U.S. Open Data: Waldo Jaquith

Table 11. Civic Technology Industry Player Interview Summary.

Interest Area	Highlights from Interviewed Players
Advice to cities contemplating investment in civic technology	<ul style="list-style-type: none"> Start small, open data, use existing platforms and applications, don't try too hard with start-ups (go for the more established companies that can weather city timelines)
How best to adapt processes	<ul style="list-style-type: none"> Procurement processes must be tackled, but can be done with good communication with the tech community and on a case by case negotiating basis

Specific challenges the industry is trying to solve	<ul style="list-style-type: none"> Some work with start-ups, others with governments in general, others with open data. They all are working in the adolescent years of civic tech field development, and have yet to realize a “big win”
Defining the problem set	<ul style="list-style-type: none"> Don’t chase civic tech for its own sake, catch it, and then try to figure out where to put it. Start with a set of problems, develop a strategy, and experiment to test that strategy with prototypes and pilots
Funding the work	<ul style="list-style-type: none"> Just like any other city effort to deliver and improve services, Civic Tech isn’t optional but expected of cities, and it requires a budget. It’s time to change the conversation from if to how
How cities can be helpful	<ul style="list-style-type: none"> Cities can facilitate, introduce, be a peer at the table, or test products. Focus on the aspects of civic tech that don’t require nimbleness (relationship building, barrier removal) and listen to the tech community
Strategic moves to nudge the field towards addressing city challenges like equity, environmental quality, and sustainable economic growth	<ul style="list-style-type: none"> Cities can encourage existing venues to go in more sustainable directions. Companies that see the benefit of expanding scopes (more uptake) can be swayed to go in greener directions. Consider quality of life and behavior change when making tech decision, and chose Apps that answer sustainability goals in some capacity, even if at first glance they aren’t designed with that in mind
Data gathering (revenues, users, impacts, uses / findings)	<ul style="list-style-type: none"> Data sets companies gather are as varied as mission statements. However, one of the strongest tool in a city’s kit in starting down the Civic Tech road is to open their own data, put it out there, and see what happens
Ideas on field movement	<ul style="list-style-type: none"> Civic Tech as a advocacy tool really took off in 2009 and has entered the adolescent stage; it’s at a boiling point now and has gone beyond code writing and into the way that city services are being delivered. It’s not soft or hardware, it’s a public good now (<i>Laurenellen McCann (recorded talk) and Mark Headd</i>).
Models cities should consider to advance civic technology	<ul style="list-style-type: none"> It’s OK to start with grant funding, knowing that a some point the city will have to budget, own, maintain, and operate. The important thing isn’t the model, it’s the starting, the committing, and the feedback loop
Thoughts on business models for civic applications that don’t have a clear revenue stream	<ul style="list-style-type: none"> Even if there’s no revenue stream immediately apparent, they can develop over time. Governments have to solve problems that people aren’t willing to pay for some times. There are no clear answers, but the important thing is to put it out there and see what happens
Advice for cities on open data, long term maintenance, etc.	<ul style="list-style-type: none"> Open data means the city is open to civic tech. It’s the signal the tech community looks for. Put it out there with a good contact, and see what happens. Long term maintenance is part of building a programmatic approach
Access to multi-city perspective	<ul style="list-style-type: none"> There is no clear and cohesive message of interest. Some in the industry think it’s a good thing to have (Code for America); others are mildly interested (LocalData), and some doubt it is needed (Tumml, U.S. Open Data)

Industry Profiles

In addition to the interviews, profiles were created for 4 Industry Players. They are intended to round out the interview list, and can be found in full detail in Appendix 5, tables A-5.7 through A-5.10.

1. Funder Profile: Knight Foundation (CFA, Detroit) – chosen because of field building investments.
2. Policy Profile: Open Technology Institute – chosen because of national policy influence.
3. Non-Profit Profile: Smart Chicago Collaborative – chosen as a model / ability to replicate.
4. Company Profile: Socrata – chosen due to scale and reach.

What's Next: Advisory Board Recommendations for USDN

Originally, the USDN Civic Tech Advisory Board was considering a convening as a follow-up step to this scan. At the conclusion of this initial effort, the Board determined not to pursue a convening in 2015. Instead, they opted to continue learning around the topic, and created the following recommendations for USDN's consideration.

Recommendations

The primary recommendation the Advisory Board makes to USDN is to enable members to continue to learn together. The Advisory Board would like a sub-network developed to address civic tech needs that can:

- 5.) **Quantify** how USDN members are using local government data currently, and how it can be better used for outreach. *Consider creating a mechanism that can track how USDN members are using open data, to what end, and with what success rate.*
 - Note: This could be done by adding open data survey questions from this scan's problem matrix, or by creating a website area devoted to sharing this type of data on USDN.org.
- 6.) **Build** a repository of member data showing who is using what civic tech tool to meet their sustainability goals. Follow how cities are investing and who the early adopters are. *Consider creating a repository of sustainable civic tech tools used by USDN members.*
 - Note: Socrata is building a library of civic technology applications, called the Civic App Marketplace. It serves as a business generator for civic application developers, and local governments can search applications by category. It can be accessed online [here](#).
- 7.) **Provide** a mechanism to identify and respond to USDN member needs that arise; build the infrastructure to allow members to stay up to speed without a lot of investment. Educate USDN members on how to better connect with their IT Departments, and on how they can push the needle on existing technologies that help them reach their sustainability goals. Help members identify and fill the information gaps. *Consider revisiting a Civic Tech User Group in 2016.*

8.) **Formally Partner** with Industry Experts. *Consider having industry partner(s) on retainer who can be called upon to help evaluate the merit, feasibility, and budget of proposals that enable a civic tech tool or application - and perhaps partner on proposals, serve on a consortium, or be commissioned to solve a collective member need.*

- Note: USDN Smart Cities advisors could be a starting point: Graham Richard, Advanced Energy Economy; Emma Stewart, Autodesk; Gordon Feller, Cisco; and Peter Torralles, Siemens.

Conclusions

Local governments often don't know where to begin in the civic tech space. They can realize time and cost savings by learning together how to establish best practices in the planning for and use of civic tech. Specifically, Sustainability Directors can learn together to overcome internal barriers to development and use of civic tech that can help them accelerate and track progress towards local sustainability goals.

The civic tech field is old enough now that cities have realized it's time to address it as a new way of operating. Traditional city processes and procedures are not set up to accept this new way of interfacing with citizens. Learning from each other's experiences can be a way for cities to begin to understand how civic tech can be incorporated and used to reach sustainability goals through behavior change.

Local government's existing internal systems can be modified to allow leverage of the field of civic tech by establishing guidelines for city strategy development. In most cases, modifications should be focused on:

- 1.) Modifying existing IT and Finance (budgeting and procurement) processes that prohibit access to civic tech or to opening existing city data and
- 2.) Establishing partnerships that can repurpose existing (or develop new) applications that generate progress towards city sustainability goals.

USDN members in various stages of this process can access the lessons of those who have gone before, and modify their planning and implementation strategies accordingly.

Resources

Reports

- The Emergence of Civic Tech: Investments in a Growing Field. Knight Foundation, 2013. http://www.knightfoundation.org/media/uploads/publication_pdfs/knight-civic-tech.pdf
- Gerry Smith. Huffington Post, “Without Internet, Urban Poor Fear Being Left Behind In Digital Age”. 2014. http://www.huffingtonpost.com/2012/03/01/internet-access-digital-age_n_1285423.html
- Civic Tech Forecast: 2014. Code for America. <http://www.codeforamerica.org/blog/2014/01/27/civic-tech-forecast-2014/>
- Civic Tech Report Helps ID Opportunities in the Field. Knight Foundation Blog. <http://www.knightfoundation.org/blogs/knightblog/2013/12/17/civic-tech-report-helps-id-opportunities-field/>
- Civic Innovation Beyond Civic Technology. New America Foundation. http://oti.newamerica.net/blogposts/2014/civic_innovation_beyond_civic_technology-110511

Case Studies / Supporting Organizations

- The CA Innovation Institute: <http://ccip.newamerica.net>
- Boston Tech Case Study: <http://www.bostonindicators.org/indicators/technology/highlights/accomplishments-and-developments>
- New Urban Mechanics: <http://www.newurbanmechanics.org>
- Code For America: <http://www.codeforamerica.org/>
- Govtech Fund: <http://govtechfund.com/>
- Sunlight Foundation: <http://sunlightfoundation.com/>
- Tumml: <http://www.tumml.org/#mission-1>
- Urban.US: <http://urban.us>

Appendix

Appendix 1 – Civic Technology Matrix by Identifying Technology Block

Table A-1. Civic Technology Matrix by Component

Type		Tool Description		City Role					
Tech Block	#	Name	Description	Paying Customer	Database: GIS, Permits	Information Provider: 311	Responder or Legislator	Incubator or Investor	None
Applications: most of these have a data/software component as well, but they are placed in this category because of the mobile device being primary point of access									
Applications	1	Acts of Sharing / Peerby	Peer-to-peer platforms for collaborative consumption . Focuses on making sharing easy, fun, and social. Believes sharing can be the new shopping to create a sustainable future.				X		X
	2	Carma / Lyft/ Sidecar	Introduces people with similar commutes with a smart phone app. The trip is logged, and reimbursement is automatically transferred from rider to driver.						X
	3	Causes / change.org	Connect people who support a common cause and empower them to take action together. Free service for cities with an Ad supported platform.				X		
	4	CitySourced	Provides a mobile app in order for citizens to identify and report non-emergency civic issues, such as public works, quality of life, and environmental issues .	X			X		
	5	Citizen vestor	A crowdfunding and civic engagement platform for local government projects. Citizens can donate to the projects of their choice. The project is built when fully funded.				X		
	6	Getaround / RelayRides	A community marketplace for underutilized personal vehicles . Rent by the hour, day, or week. Patent-pending Getaround CarKit, iPhone app, and web app enable car sharing.						X
	7	ioby	Connects people and money to site-based projects. Projects are conceived, designed, and run by neighbors , ensuring community buy-in caretakers and daily reminders.						X
	8	mySociety	Invent and popularize digital tools that enable citizens to exert power over decision makers . Projects include FixMyStreet, FixMyTransport, WriteToThem, Populus Components, Pombola, TheyWorkForYou, WhatDoTheyKnow, Alaveteli, SayIt, PopIt, MapIt, Writelt, FixMyTransport. All projects promote open government and community feedback platforms. Services are offered in digital consulting for public organizations.	X			X		
	9	neighbor.ly	Provides opportunity for local governments, civic organizations, and civic ventures to obtain funding for civic-natured projects . Must pay for posting more than one project.	X			X		
	10	ParkMe	A tool to help find the closest, cheapest parking nearby and compare rates to get the best deal. Parking applications like this one claim to reduce emissions by reducing drive times.	X	X				
	11	Public Stuff	A digital communications system for residents to submit real-time requests in their neighborhoods. Residents can use the system to submit issues and track them, such as road maintenance or waste management . Can buy service or just receive requests (free).	X	X		X		
	12	SeeClickFix	A communications platform for citizens to report non-emergency issues , and governments to track, manage, and reply. Focus on transparency, collaboration, and cooperation.	X	X		X		
	13	Textizen	A service to help city officials, community leaders, and local organizations get feedback from the public via SMS to make more data-driven, representative decisions.	X			X		
1	Uber	Connects riders with safe, reliable, convenient transportation				X			

	4		providers at a variety of price-points in cities around the world. Changing the cab industry model.						
	1 5	Voterheads	A service that streamlines websites of local government / organizations for community members. It puts all of the information in one location and shares feedback with officials.				X		
	1 6	waze	Community-based traffic and navigation apps. Drivers share real-time traffic and road info.						X
Data: most of these have both software and application components, but rely on large public data sets									
Data	1	Azavea	Create web and mobile tools to enable the public to access and visualize data. Used for natural resource planning, sustainable economic development, crime analysis, real estate property analysis, redistricting, political advocacy, and cultural resources.	X	X	X		X	
	2	Chicago Buildings	The Vacant and Abandoned Building Finder is a tool for finding buildings in Chicago that are not in use and potentially hazardous to the neighborhood around them. Building data comes from Chicago's 311.		X	X			
	3	Civic Insight	Civic Insight makes official information about buildings and construction projects available to the public in an interface. Also visualizes how a city changes over time.	X	X			X	
Hardware: nothing in the matrix really fits here; Zipcar is included because there's city infrastructure involved, but it's not really "hardware"									
Hardware	1	Zipcar	Zipcar is an online car-sharing company allowing individuals to make car reservations that are billable by the hour or day. Most rental car companies have a similar model.	X	X			X	
Software: almost all of these have applications and data components as well; they are included here because the web appears to be the primary point of access									
Software		AlertID	Delivers critical public safety information from trusted sources to members on an easy to use map and through emergency alerts on their mobile devices, email and online.					X	
		front porch forum / Next Door	A free community-building service. Neighborhood forums are only open to people who live there. Next Door can be more broadly accessed. It's about helping neighbors connect.					X	
		LocalData	Cloud based mapping platform that makes tools to collect and analyze information about urban infrastructure.	X	X				X
		Localocracy	Free service where cities can engage with community members. Platform promoted to journalism outlets.					X	
		MindMixer	Leveraging the power of the Internet and social media, this tool helps organizations connect with community members who might not otherwise get involved.	X				X	X
		Neighbor land	This company offers web-based tech tools and offline resources to connect community members with public officials to create change.	X				X	X
		Public Engines	A tool used to help prevent, reduce, and solve crime with cloud-based solutions that facilitate crime analysis, supply actionable intelligence, and increase engagement.	X				X	
		Socrata	Private cloud software company that helps the public sector improve transparency, citizen service, and data-driven decision-making. Delivers data to governments trying to reduce costs, to citizens who want to understand how their tax dollars are used, and to civic hackers dedicated to creating new apps and improving services.	X	X			X	X
	TurboVote/ Votizen	Tracks elections, local and national. Helps people update or get registered, or request an absentee ballot. Provides needed forms and information.							X

Appendix 2 – Civic Technology Problem Matrix by Category

Table A-2.1 Civic Technology Problem Matrix, City Operations.

Problem, Barriers, Desired Outcome	Matrix Category	Operation Category	Sample Application Providers with User Cities
Citizens expect immediate responses to maintenance issues. How can they report city issues best so the city can deliver good customer service?	Government Data	Maintenance	<ul style="list-style-type: none"> • SeeClickFix: Ann Arbor, MI • CitySourced: Peachtree Corners, GA; Kingston, NY; Wilmington, DE; Weatherford, TX; Sedona, AZ; • Public Stuff: Philadelphia, PA; Palo Alto, CA; Tallahassee, FL; Plano, TX; North Miami Beach, FL (used in 200 cities) • Street Bump: Boston, MA
There are limited resources to maintain public property. What are cities using to allow citizens to become involved in this process, so they can “own” their community?	Government Data	Fire, Water, Trees	<ul style="list-style-type: none"> • Adopt-a-Hydrant: Boston, MA • Adopt-a-Storm-Drain: Oakland, CA • Open Tree Map Cloud: Asheville, NC
City Budgeting is confusing to residents. How can I clarify that process and get feedback on spending priorities so people can understand and be a part of where their taxes go?		Budgeting / Procurement	<ul style="list-style-type: none"> • City Mart: San Francisco, CA
Sometimes people don’t like the decisions the city makes. Is there a way to digitally manage disputes to reduce lawsuits?	Government Data	Disputes	<ul style="list-style-type: none"> • Modria: Athens County, GA
I have a limited equipment budget. How can I access shared materials and borrow from other cities and reduce my overhead?	Government Data	Procurement	<ul style="list-style-type: none"> • MuniRent: Ann Arbor, MI
Crime is an issue in my community. What tools are there to visualize and manage this so my citizens are safer?	Government Data	Crime	<ul style="list-style-type: none"> • CityConnect/ Public Engines: San Jose, CA

<p>I have a limited project budget. What resources are there that can help me not only understand my community's priorities but also raise funds to help them get done?</p>	<p>Crowd Funding</p>	<p>Donations</p>	<ul style="list-style-type: none"> • Citizeninvestor: 170 governments Gainesville, FL; Boson, MA; Alexandria, VA; Eugene, OR • lobby: 100 cities, Pittsburg, VA; Memphis, TN; Miami, FL; New York City, NY • neighbor.ly: Miami, FL; Kansas City, KS; Portland, OR; Raleigh, NC; Detroit, MI; Sacramento, CA
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Table A-2.2 Civic Technology Problem Matrix, City Planning.

<p>Problem, Barriers, Desired Outcome</p>	<p>Matrix Category</p>	<p>Operation Category</p>	<p>Sample Application Providers with User Cities</p>
<p>People want to be engaged and consulted on how their community develops. How can I streamline this process so new and re-development is open and understandable?</p>	<p>Government Data, Social Networks, Community Organizing</p>	<p>Buildings Development Planning</p>	<ul style="list-style-type: none"> • Civic Insight: Palo Alto, CA; New Orleans, LA • ChicagoBuildings: Chicago, IL • LocalData: Pittsburg, PA; Indianapolis, IN, Chicago, IL • MetroQuest: Auburn, AL; Austin, TX; Calgary, AB; Chicago, IL; Cleveland, OH; Henderson, NV; Los Angeles, CA; North Vancouver, BC; Northlake, IL; Ottawa, ON; Toronto, ON • Open Plans/ Shareabouts: Chicago, IL; New York City, NY • Community PlanIt: individuals an use this service anywhere • Our Common Place: available anywhere to community users • Citizen Interaction Design: Jackson, MI • Cityzen: Raleigh, NC • OpenStreetMap: London, UK • Mapbox: Available anywhere
<p>Many people don't want to go to public meetings. How can I engage them in this process anyway, so contributions come from more than just the "faithful 10"?</p>	<p>Government Data, Social Networks, Community Organizing</p>	<p>Public Meetings</p>	<ul style="list-style-type: none"> • Crowd Hall (also a Crowd Map in Beta): city users unknown • Codigital: city users unknown • Textizen: Portland, OR; Oakland, CA; Monrovia, CA; Salt Lake City, UT; Denton, TX; Central Arkansas; Chicago, IL; Flint, MI; Philadelphia, PA; Tampa, FL • MindMixer: available everywhere • Community Remarks: Des Moines, IA; Chicago, IL; Kenosha WI; Buffalo, NY

Table A-2.3 Civic Technology Problem Matrix, Residential Engagement.

Problem, Barriers, Desired Outcome	Matrix Category	Operation Category	Sample Application Providers with User Cities
Residential Engagement in government decision-making is low. What tools should I consider when trying to improve interaction so the discussion is full?	Government Data	Decision Making	<ul style="list-style-type: none"> • Peak Democracy: Ann Arbor, MI • Google Civic Information API: available to residents in any city • Socrata: Tucson, AZ
Citizens have a hard time visualizing their community. What is the best way to allow them to do this, so patterns and trends (everything from crime to development) are easily apparent?	Government Data	Trend Spotting	<ul style="list-style-type: none"> • Azavea: Philadelphia, PA; Toronto, Ontario; Asheville, NC • Citygram: Seattle, WA
People complain about noise levels. How best to empower them so they can gain perspective in their own situation and work with the city towards a solution?	Government Data	Noise	<ul style="list-style-type: none"> • Noisetube: 598 Cities listed, see http://www.noisetube.net/cities
Only 20-30% of my city votes. How can I promote people going to the polls so more people contribute to who and what governs them?	Government Data, Social Networks	Voting	<ul style="list-style-type: none"> • Voterheads: individuals in any city can pay for this application • TurboVote: works with colleges
Many people don't have access to the resources they need. How can I connect them so goods can be borrowed and consumption is reduced?	Collaborative Consumption	Reduce Waste	<ul style="list-style-type: none"> • acts of sharing: Austin, TX; Nashville, TN; Toronto, Ontario • Peerby: Amsterdam, London, Paris
Citizens are often disconnected from each other as well as government. What online tools exist to spur that connection and build stronger communities?	Social Networks	Community Building	<ul style="list-style-type: none"> • AlertID: San Francisco, CA • Civic Commons: Detroit, MI; Cleveland, OH; Pittsburg, PA; Washington, D.C., Philadelphia, PA • EveryBlock: Chicago, IL; Philadelphia, PA; Denver, CO • front porch forum: Argyle, NY; Stewartstown, NH • i-Neighbors: Toronto, Canada • meetup.com: available everywhere • Neighborhow: Philadelphia, PA • Next Door: Jacksboro, TX; Scarborough, ME (43,000)

People talk. How can I - as a government agent - know what they are saying and participate in the conversation so greater collaboration is achieved?	Community Organizing	Participation	<ul style="list-style-type: none"> • All Our Ideas: Calgary, AB • Bang the Table/ EngagementHQ: Sydney, Australia; British Columbia, Canada; Eastern Cheshire, U.K. • Causes: Present in 156 countries • mySociety: London, UK • Neighborland: Memphis, TN; Chicago, IL; San Francisco, CA; Oakland, CA; New Orleans, LA • Localocracy: Boston, MA • Tidepools: New York City, NY; Boston, MA • Zilino: San Jose, CA
Petitions are often required to move city councils one way or the other. How are people organizing these online to persuade government action?	Community Organizing	Petition	<ul style="list-style-type: none"> • change.org: individual users, no city clients
Disasters happen increasingly in the face of climate change. What tools are available for community preparedness or recovery?	Community Organizing	Disaster Preparedness	<ul style="list-style-type: none"> • Recovers: Boston, MA

Table A-2.4 Civic Technology Problem Matrix, Transportation.

Problem, Barriers, Desired Outcome	Matrix Category	Operation Category	Sample Application Providers with User Cities
EV use isn't as high as desired. How do I promote EV's to expand EV drivers from the early adoption phase?	Collaborative Consumption	Electric Vehicles	<ul style="list-style-type: none"> • PlugShare: used by EV owners to find open public or private charging stations anywhere, in any area
People circle downtown looking for parking. How can I reduce their trip time and so reduce their vehicle emissions?	Government Data	Parking	<ul style="list-style-type: none"> • ParkMe: New York, NY; Los Angeles, CA; Washington, D.C.; Austin, TX

<p>I want to reduce single rider car trips. What resources are there to promote ridesharing in my community so carbon emissions from transportation can be reduced?</p>	<p>Collaborative Consumption</p>	<p>Ride Sharing</p>	<ul style="list-style-type: none"> • Carma: can be used in any city • Getaround: San Francisco, Portland, Chicago, Austin, San Diego • Lyft: Washington, DC; Los Angeles, CA; San Francisco, CA; Phoenix, AZ; Tucson, AZ; Lexington, KY; Chicago, IL; Denver, CO; Atlanta, GA; New York, NY; Seattle, WA • Uber: San Francisco, CA, and most major cities • RelayRides: All major cities except NYC • Sidecar: San Francisco, CA; Los Angeles, CA; Long Beach, CA; San Diego, CA; Seattle, WA; Chicago, IL; Charlotte, NC; Boston, MA; Washington, D.C.
<p>My Mayor wants all taxis to be summoned the same way. Who is standardizing this process so tourists and residents have an easier time getting around?</p>	<p>Government Data</p>	<p>Taxi Services</p>	<ul style="list-style-type: none"> • One City One Taxi: Washington, D.C.
<p>Transportation planning is hard in an already built environment. What can I use so people can visualize the realities of the situation and help with realistic solutions?</p>	<p>Government Data</p>	<p>Planning</p>	<ul style="list-style-type: none"> • TransportAPI: London, UK • Waze: used in most major cities by community members • Transmix: Seattle, WA • Transitlabs: GA DOT • Transit Screen: Washington, D.C.; San Francisco, CA • TransitApp: Ann Arbor, MI, Atlanta, GA

Table A-2.5 Civic Technology Problem Matrix, Energy.

<p>Problem, Barriers, Desired Outcome</p>	<p>Matrix Category</p>	<p>Operation Category</p>	<p>Sample Application Providers with User Cities</p>
<p>I want to reduce residential energy consumption. What resources are there to promote this in my community so carbon emissions from residential energy use can be reduced?</p>	<p>Collaborative Consumption</p>	<p>Energy Consumption Reduction</p>	<ul style="list-style-type: none"> • Nest thermostat: Available at Best Buy to any consumer • PowerHouse: Available to any consumer(Sanford developed, DOE funded).
<p>I want to engage rental residents in recycling. What can I do to motivate building owners to offer it?</p>	<p>Collaborative Consumption</p>	<p>Waste Reduction</p>	<ul style="list-style-type: none"> • MyBuildingDoesntRecycle.org: Chicago, IL

Appendix 3 – Civic Technology Survey Information

Table A-3.1. Advisory Board Barriers to Civic Tech.

	Least Difficult	Somewhat Difficult	Moderately Difficult	Most Difficult
Lack of open data standards	20%	40%	20%	20%
Long-term ownership obstacles	0%	25%	25%	50%
Maintenance support / budget questions	0%	0%	40%	60%
Lack of internal IT support	0%	40%	40%	20%
Lack of interest from using departments	40%	0%	60%	0%
Lack of clean or standardized data	0%	20%	40%	40%
Inability to access needed data	0%	40%	40%	20%
Lack of funding	0%	20%	60%	20%
Lack of funding partnerships	0%	40%	60%	0%
Lack of leadership around technology	20%	20%	60%	0%

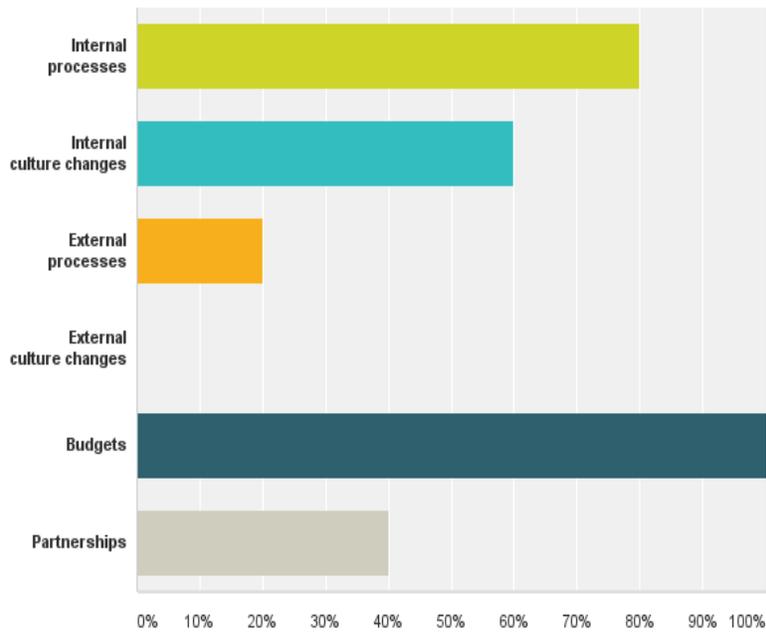


Figure A-3.1. Advisory Board Barriers to Civic Technology

Appendix 4 – Civic Technology City Interview Information

Table A-4.1. City of Ann Arbor, MI Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Primary area of interest in CT</i> • <i>Most useful application(s) in your city</i> 	<ul style="list-style-type: none"> • The City has an innovative culture - that and industry drives the CT interest • A combination of tools are available, chosen to answer city needs • No overall strategy; adoption is needs driven • Most useful Apps are ones that meet the needs of the city directors • More transparency is always good (FOIA site: cut down on requests)
<ul style="list-style-type: none"> • <i>Involvement in the Smart City / CT space</i> • <i>Engaging with tech community</i> 	<ul style="list-style-type: none"> • SeeClick Fix, Volgistics, Crimemapping.com, Petitions Under Review, Peak Democracy, Next Door • Consistent communications and consistent messaging is key • There are a handful of very passionate tech people in the community – not a lot of programming, but a lot of analysis
<ul style="list-style-type: none"> • <i>Challenges</i> • <i>Who defines / drives them</i> • <i>Ownership, open data, and long term funding</i> • <i>Funding sources / models</i> 	<ul style="list-style-type: none"> • Challenge: How the IT director is positioned in the organization: they need a seat at the table to understand challenges being faced by each department (during budget meetings, for example). They are seen as a cost center, not as an innovation tool, so they don't always see the high-level problems and are sometimes an afterthought • Organizational IT maturity is a challenge – to shift from the perception that they are just ticket takers, but business partners. City IT has invested heavily in working closely on the application side of things. They have been good historically at infrastructure / help desks – but big investment done on systems analysis to develop them is needed
<ul style="list-style-type: none"> • <i>Use of smart / civic tech to meet sustainability goals</i> • <i>Data collection</i> 	<ul style="list-style-type: none"> • Economic growth: currently isn't very coordinated; the majority of economic development (SPARK) is in SE MI – does small business incubation, and the city contributes to this program. There are secondary efforts around planning • Environmental (water, air): Ann Arbor is mapping an active dioxide plume weaving around an old industrial site • Social: while the basic needs are put first, there are apps around health and transportation
<ul style="list-style-type: none"> • <i>USDN role</i> 	<ul style="list-style-type: none"> • Cites working together to sort through the issues makes perfect sense. It would be beneficial for all the cities to include their IT staff to be sure that the deliverables are reusable, spreadable
<ul style="list-style-type: none"> • <i>Partnership opportunities</i> 	<ul style="list-style-type: none"> • Anything that uses tax funding could be a collaboration nexus: if partners that spend tax dollars could work together, that would be helpful (example: in the economic downturn they started sharing desk space to do a data center for emergency management. It was an electronic content management system: good collaboration came out of necessity; Ann Arbor collaborated with Washtenaw county to create a shared data center for both organizations) • More collaboration across entities (schools, universities, bus systems); systems run by tax dollars influence economics
<ul style="list-style-type: none"> • <i>Interest in partnering</i> 	<ul style="list-style-type: none"> • Yes, with the goal of advancing sustainability

<ul style="list-style-type: none"> • <i>Critical areas where the market is not meeting needs</i> • <i>Success with open data and /or accessing utility data</i> 	<ul style="list-style-type: none"> • Ann Arbor did data cataloguing in 2009, shortly after Apps Against Democracy – Seattle, San Fran, NYC, wanted to do something, so they put data sets out there (GIS files, permitting, planning, calls for service, etc.) • Ann Arbor also tried Hackathons – the data analysis is the biggest part of that; what does the data tell you? What questions does it answer? All the data overlaps / tells the story. It worked well in Ann Arbor
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Table A-4.2. City of Bloomington, IN Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Primary area of interest in CT</i> • <i>Most useful application(s) in your city</i> 	<ul style="list-style-type: none"> • For the past 4 years, have been engaged with Code for America (leading advocates for the nexus of government and civic tech). They haven't been a CFA city due to cost, but have good connections with them around citizen reporting tools and government data flow (i.e., Open311) • Has open source Apps that collaboratively developed with other governments (the city has stewarded the tools from the beginning). Did Google Summer of Code for 2 years and have had 6 students working on with them on tech solutions to public issues. (Google Summer of Code: open source, defines projects, students pitch to organization projects that dovetail interests) https://developers.google.com/open-source/soc/?csw=1)
<ul style="list-style-type: none"> • <i>Involvement in the Smart City / CT space</i> • <i>Engaging with tech community</i> 	<ul style="list-style-type: none"> • Developed an open platform that any city can adopt (Columbus, OH and Peoria, IL are using it, for example); their view is that it's generic open source, and available on the City's GitHub page: https://github.com/city-of-bloomington. • Good peer relationships between the tech community within the City of Bloomington • The City has sponsored a number of events (The Combine, for example). There are things the City can do to promote civic tech development, but there is mutual public and private leadership, with city policies being driven in part by tech community (esp. the new Certified Tech Park), and then the tech community being informed by the city. Bloomington Tech Partnership: http://bloomingtontech.com
<ul style="list-style-type: none"> • <i>Challenges</i> • <i>Who defines / drives them</i> • <i>Ownership, open data, and long term funding</i> • <i>Funding sources / models</i> 	<ul style="list-style-type: none"> • There is an advisory group that meets on a monthly basis; it's a sharing process. There are areas of broad agreement on challenges everyone wants to see addressed but nothing is formal or ratified. It's a fluid, moving process that evolved organically in some part because of the people that are involved. There is mutual interest / communication • Ownership has come up with the Rent Rocket process; the team wants to get to a point where it's developed, and then deal with the long-term maintenance questions. This is a perennial question with Civic Tech – how do you make a project into a program? The same maintenance issues have happened across dozens of city IT initiatives
<ul style="list-style-type: none"> • <i>Use of smart / civic tech to meet sustainability goals</i> • <i>Data collection</i> 	<ul style="list-style-type: none"> • Civic Tech could be used to meet sustainability goals down the road, but Jacqui doesn't see this as being a regular part of her job. There is a huge challenge from a community-planning standpoint when you have black holes of data (like utility data, for instance) and you don't have the chance to do policy development around it. Is there a way to aggregate information from a community-needs based approach?

<ul style="list-style-type: none"> • <i>USDN role</i> 	<ul style="list-style-type: none"> • ID where the market's not responding, and then use the membership to promote those areas for exploration: see a definite role for USDN here. USDN can help civic tech become more accessible to sustainability directors
<ul style="list-style-type: none"> • <i>Partnership opportunities</i> 	<ul style="list-style-type: none"> • A more formal interaction with a partner like Code for America would be interesting for USDN to explore – the ability for cities as a conglomerate to mobilize the tech sector
<ul style="list-style-type: none"> • <i>Interest in partnering</i> 	<ul style="list-style-type: none"> • Yes, to explore how to make civic hacking and application development sustainable. There is strength in numbers
<ul style="list-style-type: none"> • <i>Critical areas where the market is not meeting needs</i> • <i>Success with open data and /or accessing utility data</i> 	<ul style="list-style-type: none"> • There is a reason why Rent Rocket hasn't been done before. It's hard. There is an ongoing set of challenges – you have to first prove the concept works: trying crowdsourcing as opposed to begging for utility data sets ready made • The topic of data sharing is interesting because we blindly accept it on our phones, but fear the areas where the data came with the precedence of privacy (health, utilities, etc.). RentRocket is trying to overcome this

Table A-4.3. City of Chicago, IL Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Primary area of interest in CT</i> • <i>Most useful application(s) in your city</i> 	<ul style="list-style-type: none"> • 2012 – sustainability was underway but was a nascent community; not the focus. The Civic Tech community sprang from journalists, who wanted transparency through access to city data – so they can tell their own story that's interesting to the community. The tech community grew from that as well as students. The city looked for opportunities around the sustainability initiative to galvanize technology use; the Benchmarking ordinance, for example: the data portal still is shows energy consumption by census block, which is the only one of its kind in the nation
<ul style="list-style-type: none"> • <i>Involvement in the Smart City / CT space</i> • <i>Engaging with tech community</i> 	<ul style="list-style-type: none"> • Chicago Community Trust is based in Chicago and provides grant funding / investment opportunities; Mayor Manual focuses on technology to grow the economy. Smart Chicago Collaborative: http://www.smartchicagocollaborative.org creates an economic development initiative around civic tech. Hack nights and meet ups have been incredibly successful • Be very available, easily reachable, and engaged in the civic tech ideas springing up the community. The Administration set the bar that chief data officers follow: they are to be engaging with the civic tech community - talk with companies about procurement barriers. If someone is offering a unique service, it's not hard to get a city contract
<ul style="list-style-type: none"> • <i>Challenges</i> • <i>Who defines / drives them</i> • <i>Ownership, open data, and long term funding</i> • <i>Funding sources / models</i> 	<ul style="list-style-type: none"> • The city at first just focused on civic tech for economic development and was open to everything. Chicago Buildings is an example of a start up that was just for fun, and then a business model emerged around premium data offerings. MyBuildingDoesn'tRecycle.org is a new one in sustainability. The community is self-directing, not city driven • Companies often solve their own problems in these areas – there are over 60 incubators across the city of Chicago, and they are able to get access to these professional networks, which can help start-ups navigate ownership issues, etc. Incubators, accelerates: look at the Open 500 that use open data.

	According to NYU, IL has the most start-ups
<ul style="list-style-type: none"> • <i>Use of smart / civic tech to meet sustainability goals</i> • <i>Data collection</i> 	<ul style="list-style-type: none"> • There is a community organization that is trying to understand the equity of bike lanes across the city of Chicago, and the city is working with them on this. There is a common bent around sustainability. Northwestern University used a data set as a way to figure out why some neighborhoods had greater consumption patterns than others
<ul style="list-style-type: none"> • <i>USDN role</i> 	<ul style="list-style-type: none"> • Collaboration is key – with partners and the community. It is tightly integrated, reachable, and friendly – without that broad and deep level collaboration, public policy and civic tech will not align
<ul style="list-style-type: none"> • <i>Partnership opportunities</i> 	<ul style="list-style-type: none"> • Do a SWOT-type analysis to before you decide what gaps to fill and how. It's the city's job is to facilitate, but to not dictate. Having the Universities involved helped. Wasn't a strategy focus – but facility driven, so it was organic. Since then, it has been strategic: a Nepal / NW collaboration is focusing on app development and open data use in the curriculums. The University of Chicago started a public policy and computational analysis program. They are producing the next generation of leaders that can think analytically about governing. If you can't capture the information and see it in a database, you can't enforce it well
<ul style="list-style-type: none"> • <i>Interest in partnering</i> 	<ul style="list-style-type: none"> • The City of Chicago would need to see a scope, but in general they are interested in helping facilitate across cities. In the collaborations so far, the goal has been to provide better services in their own city by learning from others
<ul style="list-style-type: none"> • <i>Critical areas where the market is not meeting needs</i> • <i>Success with open data and /or accessing utility data</i> 	<ul style="list-style-type: none"> • There are plenty of areas where the technology market hasn't caught up with the needs of cities • It can be because there's not enough data, not enough economic incentive, not enough interest, or because the problem is too esoteric, etc. Chicago hasn't spurred the development of apps; Code for America does this sometimes

Table A-4.4. City of San Francisco, CA Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Primary area of interest in CT</i> • <i>Most useful application(s) in your city</i> 	<ul style="list-style-type: none"> • The work falls into the open government category, and we are expanding our interest in Smart Cities a la Internet of Things. Chief innovation officer wants to see San Francisco become the IoT capital of the world. The City is interested in IoT along two lines: 1.) drive growth in jobs and 2.) help government be more efficient and responsive (i.e.: public safety, public health, transportation)
<ul style="list-style-type: none"> • <i>Involvement in the Smart City / CT space</i> • <i>Engaging with tech community</i> 	<ul style="list-style-type: none"> • Have facilitated several programs that support the civic tech space and expand IoT thinking into its applications for cities. MOCI incubated the Startup In Residence program (STIR), the first of its kind, where startups from all around the world applied to work with city agencies for a period of 16 weeks. These startups either had a working tool that needed testing or were thinking about government as a new market. Matchmade 6 teams to city agencies. In one partnership with SFO, the airport installed hundreds of iBeacons so that Indoors could explore the usability of a tablet app to help

	<p>the blind and visually impaired navigate the airport</p> <ul style="list-style-type: none"> • A startup within government: moving quickly and making the most of just a few resources. As a mayor’s office, MOCI does not fund programming or buy equipment. They work with city agencies who ultimately feel ownership over projects. They facilitate partnerships between city agencies / the tech community to stimulate new thinking. Leverage from the tech community: brain power and perspective - rather than being a direct customer of goods
<ul style="list-style-type: none"> • <i>Challenges</i> • <i>Who defines / drives them</i> • <i>Ownership, open data, and long term funding</i> • <i>Funding sources / models</i> 	<ul style="list-style-type: none"> • Areas that we work on are affordable housing, women’s empowerment, education, anti-poverty, and transportation. • The Office of the Chief Data Officer maintains an open data portal in the interest of transparency and to promote creativity around government data. OCDO helps departments prep their data sets for publishing and also advises on the frequency of publishing, which is determined by the type and volume of the data set (i.e.: by the second or minute, on a weekly or monthly basis as makes sense). The data released on datasf.org is not always generated by the City, but all datasets on datasf.org are licensed under the public domain dedication and license (PDDL)
<ul style="list-style-type: none"> • <i>Use of smart / civic tech to meet sustainability goals</i> • <i>Data collection</i> 	<ul style="list-style-type: none"> • The City uses smart meters for water and electricity. There is a huge opportunity to share this information with consumers and policy makers
<ul style="list-style-type: none"> • <i>USDN role</i> 	<ul style="list-style-type: none"> • USDN can play a strong role in educating government employees
<ul style="list-style-type: none"> • <i>Partnership opportunities</i> 	<ul style="list-style-type: none"> • The MOCI is a small team with a wide scope. We do not run programming. We incubate an idea with collaborators, work through the prototyping and testing phase, and then encourage full ownership by our City collaborators. • Any external group we collaborate with must see the city agency as an equal part of the collaboration and the ultimate owner of the initiative. Most of our portfolio is about architecting processes / building frameworks rather than creating products. Products sometimes come out of our work, and we are happy to facilitate connecting potential City partners with city agencies that have a matching, acute focus
<ul style="list-style-type: none"> • <i>Interest in partnering</i> 	<ul style="list-style-type: none"> • This can be challenging as priorities are often not aligned
<ul style="list-style-type: none"> • <i>Critical areas</i> • <i>Success with open data and /or accessing utility data</i> 	<ul style="list-style-type: none"> • The market broadly is not meeting the needs of cities as can be seen in the amount of work being done on city specific solutions developed in-house or outsourced. We have had tremendous success with sharing data to the public for development of solutions.

Table A-4.5. City of Tucson, AZ Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Primary area of interest in CT</i> • <i>Most useful application(s) in your</i> 	<ul style="list-style-type: none"> • Tucson is interested in how to use technology to improve community engagement, provide more data, and to meet some administrative openness and transparency goals • We don’t feel like there is a special push towards civic tech in any

<p><i>city</i></p>	<p>particular area: the city has been more opportunistic as a whole, rather than being driven from any special interest of a department or external group</p>
<ul style="list-style-type: none"> • <i>Involvement in the Smart City / CT space</i> • <i>Engaging with tech community</i> 	<ul style="list-style-type: none"> • Tries to release data that is downloadable / machine readable, so it's useful if someone wants to use it • Uses See Click Fix, and have expanded to targeted applications like one used to help control the spread of Buffelgrass • Contract with GPC for graffiti removal (My Tucson), citizens photograph new art straight into the contractor's work order system (same in Long Beach, CA). The city set up the architecture to transport street maintenance data into the form of a work order email; this is an extra step at the preference of the city staff that deal with the work orders • Two efforts are going on: IT has new leadership, reductions in funding. See their job as internal operations focused: they need to make sure the cooling systems are working, so open data isn't falling into their self-image • Creation of Apps is of interest, but the ability to use them internally isn't there yet. The push for open data was lead by an effort external to the city. Open Tucson is a civic group that engaged with the Mayor: for data, GIS shape files, etc. They have lists of data streams they would like to see, so that is driving part of Leslie's work
<ul style="list-style-type: none"> • <i>Challenges</i> • <i>Who defines / drives them</i> • <i>Ownership, open data, and long term funding</i> • <i>Funding sources / models</i> 	<ul style="list-style-type: none"> • Civic tech has gone through many changes: Open Data is reaching adolescence. There was an early excitement that lead to cities hiring chief data officers, but open data is at the point now that an understanding about system penetration limits is surfacing. Think about the value of adopting some aspect of civic tech: transparency, ultimate value to citizens. It's all over the map right now with cities: how far, how fast, how slow • Would like to see more of the strategy to processes to data protocols, from what info is gathered to connecting it to the day to day decision making and operations process. This could advance a more strategic vision and align things internally. Leslie sees staff training down the road, to update or create new protocols • Long term, ownership is a huge concern. For this to be something more than data being posted and sitting there indefinitely, the city needs to figure out internal ownership (likely it will be shared, but that has its own sets of issues). • Tech could be starting at the Mayors level instead of the IT level because it's relatively new. Watch Oakland, CA
<ul style="list-style-type: none"> • <i>Use of smart / civic tech to meet sustainability goals</i> 	<ul style="list-style-type: none"> • No. In large part because of lack of resources, but sees Socrata as an opportunity to amplify the sustainability message and communicate more effectively how Plan Tucson is being implemented
<ul style="list-style-type: none"> • <i>USDN role</i> 	<ul style="list-style-type: none"> • USDN's role is two-fold: help a sustainability director see who is doing what where (Leslie is already connected to Palo Alto, for example). USDN has the capacity to advance member understanding of the topic
<ul style="list-style-type: none"> • <i>Partnership opportunities</i> 	<ul style="list-style-type: none"> • Impressed with Knight Foundation who partnered with Code for America and their work in Detroit • Interested to see if open data can be done in smaller cities (less technical competition / obstacles?)

<ul style="list-style-type: none"> • <i>Interest in partnering</i> 	<ul style="list-style-type: none"> • Yes, to accelerate the adoption of technology and develop some internal talent to carry the effort over time
<ul style="list-style-type: none"> • <i>Critical areas</i> • <i>Success with open data and /or accessing utility data</i> 	<ul style="list-style-type: none"> • Cities shouldn't get too caught up in the market. It's not the market gaps (there's so much out there already) that are the issue, but more that they need to adopt and implement programs. They want to create sustainable operations internally that serves / is served by open government. What can cities do to make it easy to adopt projects internally?

Appendix 5 – Civic Technology Industry Player Interview Information

Table A-5.1. Accela Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Advice to cities contemplating investment in civic technology</i> • <i>How best to adapt processes</i> 	<ul style="list-style-type: none"> • First thing to do is to talk to peer cities. Even if budget is a constraint, there are still lessons to be learned • The beginning stages of fostering a Civic Tech ecosystem involves flexible movement around the technology; a low-cost foot in the door for cities involves releasing the right kind of data with a good point of contact. Signals readiness • The biggest question from the industry in small to mid-sized cities is “who do I talk to in the city?” Open data posted with clear information about who is responsible / who to contact is a great way to start allowing your government to serve as a platform. So, Mark tells technologists to look for data on a city site (GIS layers, permitting data, etc.), and if they find it, to realize that though the city may not have a Boston-sized effort, it's on its way
<ul style="list-style-type: none"> • <i>Specific challenges the organization is trying to solve</i> • <i>Defining the problem set</i> • <i>Funding the work</i> • <i>How cities can be helpful</i> 	<ul style="list-style-type: none"> • The industry role is to help customers understand how they can create systems that produce data, and to help customers understand why they should care about producing data • Mark thinks cities are eager in general to learn this “new” world – there is an awakening, cities are reading about the possibilities and learning what's possible from other cities. Advises cities on how they can use software for service • Data is the starting point. It's a clear signal, an invitation to the field. It's a way to start getting inquiries and getting involved in civic tech without making a traditional big tech investment (i.e., a softer launch than an RFP)
<ul style="list-style-type: none"> • <i>Strategic moves to nudge the field towards addressing city challenges like equity, environmental quality, and sustainable economic growth</i> 	<ul style="list-style-type: none"> • People want to be a part of the solution; you will see some cities starting by saying they know what they want – but, then ask the civic tech community for free services, instead of launching an RFP. They quickly realize it's complicated • If a city signals what they want with bid specifications, they have said, “I'm not open to other thoughts, I'm ready for this particular solution”. If they are not sure what they want (perhaps they generally know they want tools for sustainability), then engaging the community is a better fit than an RFP. This means learning the CT language
<ul style="list-style-type: none"> • <i>Data gathering</i> • <i>Revenues, users,</i> 	<ul style="list-style-type: none"> • The divide between cities and tech is getting worse. Traditional model for cities is to hire people that can give you what you need: job classifications

<ul style="list-style-type: none"> impacts Uses / Findings Ideas on field movement 	<ul style="list-style-type: none"> in specific fields, like teaching, which aren't competing with the private sector In software development, public and private are interchangeable –cities are competing with the private sector in this job market, but without understanding it like the private sector does. City tools aren't bettering at the pace of tech
<ul style="list-style-type: none"> Models cities should consider to advance civic technology 	<ul style="list-style-type: none"> Models are a good way to get city feet wet, and are a good way to experiment safely. Innovation Officers / Chief Data Tech Officers – these can be token appointments or can have real clout. Because the Civic Tech field is accelerating, design skills are becoming much more valuable. The price point for these skills will be pushed up
<ul style="list-style-type: none"> Thoughts on business models for civic applications that don't have a clear revenue stream 	<ul style="list-style-type: none"> No silver bullet– start by surveying the landscape, know what needs to be learned from others, point to field examples Cities ultimately have to reform procurement processes: civic tech responds to the prototype model better than the huge budget grasp of old. Cities need to allow ideas (even those with long term maintenance attached) to start small
<ul style="list-style-type: none"> Advice for cities on open data, long term maintenance, etc. 	<ul style="list-style-type: none"> More and more, government is going to be pushed: so, the question is: how do they do it, not if they should. There are two options for cities here, and neither one is mutually exclusive: 1.) Release the data, become a platform for application development or 2.) Hire or mold government IT operations into a silicon valley-style company At some point, cities need to have an official website / platform for every public service (an official digital service) If you can turn yourself into a really good data platform, you can then be less concerned about the “next big thing”
<ul style="list-style-type: none"> Access to multi-city perspective 	<ul style="list-style-type: none"> There are great models out there (mostly big cities), and the need is for more experience / cross-sector interaction.

Table A-5.2. Code For America Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> Advice to cities contemplating investment in civic technology How best to adapt processes 	<ul style="list-style-type: none"> Cities should research first, to: 1.) understand their own needs, and to 2.) determine what success looks like in meeting them with technology. Have they gone out and validated what's occurring in the community they serve? CFA is seeing massive success in properly identifying user needs ahead of determining a solution. An example of this is the UK Digital Transportation initiative, where they are rapidly iterating on community needs and using a multi-disciplinary team. The team doesn't dictate a form of tech, but looks at the solutions from start to implementation When a city develops detailed RFPs before full research is done, they miss out on the chance to properly adapt the procurement and (other effecting processes) to the technology. CFA strategy is that cities should design only after understanding people's needs. They suggest that the city needs to organize on the front end for back end results

<ul style="list-style-type: none"> • <i>Specific challenges the organization is trying to solve</i> • <i>Defining the problem set</i> • <i>Funding the work</i> • <i>How cities can be helpful</i> 	<ul style="list-style-type: none"> • Code for America defines the problem set because cities often aren't able to clearly specify what the strategies are and what their goals are. It's a new process as well as a new technology: a simple application might not deliver without operations overhauls. Cities can at times enter the CT world with a naive perspective. CFA often they are helping the office built. Cities need to hear things in new ways – someone from an outside perspective. A neutral 3rd party can get away with saying: this is broken and your staff needs new tools. Cities buy the service
<ul style="list-style-type: none"> • <i>Strategic moves to nudge the field towards addressing sustainability</i> 	<ul style="list-style-type: none"> • There is a lot of money on the table. Cities are hamstrung in terms of how they budget and purchase (i.e., procurement problems). Sustainability can be used to deliver public services / utilities in a new way. • Focusing on improving the quality of services instead of trying to force tech into a sustainability box is key
<ul style="list-style-type: none"> • <i>Data gathering</i> • <i>Revenues, users, impacts</i> • <i>Uses / Findings</i> • <i>Ideas on field movement</i> 	<ul style="list-style-type: none"> • Fellowships are very focused on the number of people affected in city hall. The training is so proactive – entirely focused on developing end-to-end services. Breaking down departmental silos is part of the CFA work, so the question now in thinking through new pilots is how much of a can be high touch, and how much in-person training is needed? Would a boot camp session suffice? Can the material / curriculum be standardized, and not very customized?
<ul style="list-style-type: none"> • <i>Models cities should consider to advance civic technology</i> 	<ul style="list-style-type: none"> • Other models for a cash strapped cities: CFA is looking at a range of ways to work with cities to improve impact / scale. They are asking how do we scale across the 30,000 cities in America, and are working to pilot less expensive methods than the ~\$450,000 fellowship. One approach is aimed at practical training / applied learning that can be used across multiple cities. Like an assembly line: one size fits all to compliment the fellowship. This could be a cheaper way of showing cities how to use technology
<ul style="list-style-type: none"> • <i>Thoughts on business models for civic applications that don't have a clear revenue stream</i> 	<ul style="list-style-type: none"> • CFA sees a parallel with the open source movement. CFA sees its role as stimulating the market when the revenue stream isn't at first apparent. CAF tries to show civic reasonability in terms of delivering services. There is not always enough market stimulation, but it can be spurred by developing open source infrastructure
<ul style="list-style-type: none"> • <i>Advice for cities on open data, long term maintenance, etc.</i> 	<ul style="list-style-type: none"> • This is an area where the mindset needs to change. Cities should view the purchase of software as an actual service change to an ongoing offering - instead of thinking of it as a high recurring maintenance costs for a "new" thing • Software / tech isn't ancillary anymore: it is a delivery mechanism for essential city services (same as roads, trash pickup, etc.). To believe that there should be a 1.) high upfront capital costs and b.) no maintenance is wrong
<ul style="list-style-type: none"> • <i>Access to multi-city perspective</i> 	<ul style="list-style-type: none"> • Yes, CFA is interested

Table A-5.3. Local Data Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
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<ul style="list-style-type: none"> • <i>Advice to cities contemplating investment in civic technology</i> • <i>How best to adapt processes</i> 	<ul style="list-style-type: none"> • If you're not thinking about this investment, you may not have realized the value of using tech to solve city problems • Investment should be driven by problems already identified, preferably with metrics and outcomes. There are 2 ways to look at this: 1.) existing technology already addressing the issue, or 2.) new tech to be created • Start small. Prototype grants can help test the idea and get it into the funnel. Because CT is fairly new, there is much investment that needs to be made to make it live and prosper. The question for cities is how much, and when?
<ul style="list-style-type: none"> • <i>Specific challenges the organization is trying to solve</i> • <i>Defining the problem set</i> • <i>Funding the work</i> • <i>How cities can be helpful</i> 	<ul style="list-style-type: none"> • The people that need to make decisions around CT investment often don't have the granularity to see the full picture. There is lots of talk about the tech revolution, but LocalData sees their role as making data fresh, clean, and useful • More recently, LocalData has been working on making the open data world accessible to un-technical decision makers. Specifically, they tackle the built environment (i.e., housing, use, blight) and explore uses for this kind of data • Funding: clients are charged a fee for platform use / access to software/consulting. Started from a seed Knight grant • Needs to be a focus on building relationships, securing funding, and easing towards revenue creation
<ul style="list-style-type: none"> • <i>Strategic moves to nudge the field towards addressing sustainability</i> 	<ul style="list-style-type: none"> • It's hard to know what the specific challenges are, or how Sustainability Directors can move the needle. Other government entities are more visible with their needs and data. For example, HUD + homelessness • Pick an issue (meter reading apps, for example) and explore generalized solutions. The civic tech community might be positioned to propose work-arounds for accessing utility data. Can a hardware hacker pick up the meter reader tech? • Producing generic problems can help trigger curiosity to move towards sustainability goals, as participants will see their efforts having a wider impact. Scaling and spreading can come later. A small, local project might be needed • Local innovation offices are too young to have produced sustained outcomes, but that doesn't mean they can't
<ul style="list-style-type: none"> • <i>Data gathering</i> • <i>Revenues, users, impacts</i> • <i>Uses / Findings</i> • <i>Ideas on field movement</i> 	<ul style="list-style-type: none"> • 90% of the work LocalData does builds off the physical world, like parcel data. Geodata is the most useful to their clients (cities, nonprofits, and universities). Permitting data, crime, and social media data also emerging as useful • They often work directly with the municipality, but recently have been working directly with open data portals • Often data is available but poor quality (thousands of NYC buildings without identifiers). There is a professional role to clean and use (not hackathons, which are a community involvement exercise; good for generating awareness, buy in, etc. but not a large scale mover). Cities shouldn't fear experimentation but they should have clear reasons for it
<ul style="list-style-type: none"> • <i>Models cities should consider to advance civic technology</i> 	<ul style="list-style-type: none"> • The consortium is interesting. A city example: a group of nonprofits that all need performing arts ticketing software got together, pay into the project, and the consortium develops open-source software. Vendor choice is key • A partnership with an existing network could save a city time and money.

	Using an existing neighborhood organizing platform (neighborland) to share utility data would be win-win: company gets more users, city gets existing network
<ul style="list-style-type: none"> Thoughts on business models for civic applications that don't have a clear revenue stream 	<ul style="list-style-type: none"> If the city sees a need that isn't being met, are they sure it's a need? Are we really sure this is how civic tech vendors should be thinking? Are the incentives there for them to care? Both parties should discuss how to fill it in a smart way Concern about equity shouldn't stop progress in civic tech
<ul style="list-style-type: none"> Advice for cities on open data, long term maintenance, etc. 	<ul style="list-style-type: none"> Maintenance one is the most interesting challenges, but at some point you just have to plunge in - there's no straight answer until things are tried. If projects are scoped as pilots, that can be a way to break it in (ex: Detroit Transit pilot)
<ul style="list-style-type: none"> Access to multi-city perspective 	<ul style="list-style-type: none"> It would be really informative to understand city sustainability priorities, depending on discussion topics

Table A-5.4. New Urban Mechanics, Boston Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> Advice to cities contemplating investment in civic technology How best to adapt processes 	<ul style="list-style-type: none"> Cities should consider outcomes and goals and the issues they are targeting. You can find a technology that will do anything; so honing means determining what impact you want to have in your community (i.e., general engagement, Energy Efficiency, etc.) Then think in terms of the challenge statement, and have that drive the tech solutions Too often cities start with the technology and then go to the issue later. That's backwards
<ul style="list-style-type: none"> Specific challenges the organization is trying to solve Defining the problem set Funding the work How cities can be helpful 	<ul style="list-style-type: none"> The public articulates the challenges we face. The primary set of directives comes from the Mayor. They are constantly talking to people and getting feedback. Start with those issues: big urban issues (i.e., economic development, public health, etc.). Then, take cues from public requests (i.e., education, sustainability, resilience) Start by developing a strategy with the Mayor and department heads, and then use budget to tackle the issues There are 1-2 offices like his in the country. They created a flexible team to explore services delivered to the public
<ul style="list-style-type: none"> Strategic moves to nudge the field towards addressing sustainability 	<ul style="list-style-type: none"> The field needs greater specificity in defining the challenges. CT can ensure we are working on problems that directly impact people's lives. This is the only way that CT can differentiate from the older less effective tech of the past In terms of the sustainability issues, you have to articulate the value proposition to the public. Behavior change: groups that build special tech solutions need to understand the needs, so they can determine what to invest in
<ul style="list-style-type: none"> Data gathering Revenues, users, impacts Uses / Findings 	<ul style="list-style-type: none"> Boston gathers data from many sources – the majority is gathered through operations (how well they deliver service) Understanding impacts is less clear. The good data is on the operations side. They try to be clear about what they aren't capturing: one of the values of

<ul style="list-style-type: none"> • <i>Ideas on field movement</i> 	<p>the tools built is that privacy is preserved. Government is scrutinized</p> <ul style="list-style-type: none"> • 2 ways of data thinking: 1.) planning context (i.e., new development, rethinking transit, etc.); and 2.) the data mining side (i.e., looking for trends and patterns in the data). Understanding user satisfaction is less common • How do services that get delivered impact quality of life? Cities don't have a great sense of this. If cities are just looking at the existing data sets, they are only getting a small community picture. They need to broaden the questions. • Cities should use the data to see what we should do instead of what we have been doing
<ul style="list-style-type: none"> • <i>Models cities should consider to advance civic technology</i> 	<ul style="list-style-type: none"> • Models are contextual and have different advantages. One of the more interesting models is the Chicago public private collaboration. On Code for America: what happens after year 1? How do you keep the tools running, or take them to the next level? They are a good (but expensive) gateway if there is a tangible second step. The impact is mixed (50/50) • Bloomberg programs (Innovation Delivery Teams: fund an innovation team in a city that can move from topic to topic)
<ul style="list-style-type: none"> • <i>Thoughts on business models for civic applications that don't have a clear revenue stream</i> 	<ul style="list-style-type: none"> • This area can be a wise investment for cities. A collaboration could demonstrate the market opportunity • Can be thought through in terms of tool building for the public – you have to show that the uptake is there • Combining civic engagement with sustainability is a great route to behavior change. Cities need to think differently on how they think about sustainability goals – how to turn them into individual decisions in individual lives
<ul style="list-style-type: none"> • <i>Advice for cities on open data, long term maintenance, etc.</i> 	<ul style="list-style-type: none"> • We need to think of these things as products: the only way these things have impact is when there is someone / something behind it, consumed with the metrics of it. We need to get over the fear of ownership if we want real impact • There is nothing wrong with ownership. We need to understand that this is just like any other service we do, and budget
<ul style="list-style-type: none"> • <i>Access to multi-city perspective</i> 	<ul style="list-style-type: none"> • There is huge opportunity for impact in the multi-city context. Finding regional collaboration opportunities needs to be part of the conversation. There needs to be tech hubs in big regional cities that smaller cities can work with

Table A-5.5. Tumml Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Advice to cities contemplating investment in civic technology</i> • <i>How best to adapt processes</i> 	<ul style="list-style-type: none"> • Companies that Tumml works with are not looking to be hired directly by local governments. They may engage with cities in regulatory gray areas or through strategic partnerships (for example: established Chariot and existing Francisco's Wage Works use paychecks tax-free for commuting). The challenge is finding out where the programs are • Companies Tumml works with have found more success dealing with government advocates: often times specific city department heads have more sway – for example, working with economic / workforce development heads. The Chief Technology officer is a good place for companies to start

	engaging, but these folks often have short city lifespans
<ul style="list-style-type: none"> • <i>Specific challenges the organization is trying to solve</i> • <i>Defining the problem set</i> • <i>Funding the work</i> • <i>How cities can be helpful</i> 	<ul style="list-style-type: none"> • Cities don't have much of a play here, but they can be helpful in terms of raising the public profile / integration of companies that are doing good work in the community (i.e.. lend them a public platform and some legitimacy). • Tumml does not prescribe specific urban tracks like transportation and have companies apply to participate in one of those tracks. Civic tech is difficult for cities to push – which is why the push is coming from the private sector. • Funder investments serve as a market signal. Community start-ups are half as likely to secure seed funding
<ul style="list-style-type: none"> • <i>Strategic moves to nudge the field towards addressing sustainability</i> 	<ul style="list-style-type: none"> • Cities could start by supporting companies that are trying to do this type of work. They could introduce companies to local non-profits, to add legitimacy and facilitate growth. An example of this is dealing with the homelessness challenges every city faces: cities can embrace civic tech in this space early to build tools that are good for them • Sometimes the civic space in general serves as a “bitching platform” – unless there’s a government side mechanism for response. The key is to find technologies already out there and push them in interesting directions • Cities can push the industry in sustainable directions and make it easy, but ultimately they will be driven by business
<ul style="list-style-type: none"> • <i>Data gathering</i> • <i>Revenues, users, impacts</i> • <i>Uses / Findings</i> • <i>Ideas on field movement</i> 	<ul style="list-style-type: none"> • Tumml collects a lot of data to gauge impact. They use traditional business metrics (cities, customers) and also metrics unique to each company. They pick about 4 indicators to track over time. Business metrics are apples to apples, but comparing across start-ups isn't as successful. Operational business metrics are important– if you can't grow, you die • Start-ups go in and out of business, which is a challenge for cities. The Knight Foundation is shifting funding priorities, and appears to be moving towards place making. The Sunlight Foundation is funding open data, etc. • Investors don't want startups with data open sourced because there's no competitive advantage. This hurts the civic and urban space because the companies are asked to put all the data methods out there (by government and foundations) • These are projects, not business models. They makes sense for governments, not companies
<ul style="list-style-type: none"> • <i>Models cities should consider to advance civic technology</i> 	<ul style="list-style-type: none"> • Public private partnership that works the best are the ones that find businesses that already exist and have a strong base, and figuring out how the business can leverage their strong suits in the community (i.e., Yelp + health scores)
<ul style="list-style-type: none"> • <i>Thoughts on business models for civic applications that don't have a clear revenue stream</i> 	<ul style="list-style-type: none"> • Not every innovation has to be consumer facing – Valor Water analytics isn't and it very successful. The general public gets that they have to use less water, but we still have a crisis. Water utilities have business model issues. Can civic tech square the circle by digging into data to find cost effective solutions? The general public doesn't know or care
<ul style="list-style-type: none"> • <i>Advice for cities on open data, long term maintenance, etc.</i> 	<ul style="list-style-type: none"> • Hearing a lot of movement from the U.S. DOC to create a national standard for federal data, cities can get ahead of this • Cities shouldn't be in the business of working with start-ups because they aren't geared to work with uncertainty • The best way to engage with tech community isn't through start ups in the

	community, but with the older companies
<ul style="list-style-type: none"> • <i>Access to multi-city perspective</i> 	<ul style="list-style-type: none"> • Cities are helpful in terms of attracting innovators and raising awareness around good urban innovations, but multi-city government perspectives are not necessarily that helpful for the kinds of startups that Tumml works with

Table A-5.6. U.S. Open Data Interview for the USDN Civic Tech Scan.

Inquiry Category	Main Response Points
<ul style="list-style-type: none"> • <i>Advice to cities contemplating investment in civic technology</i> • <i>How best to adapt processes</i> 	<ul style="list-style-type: none"> • Think of CT (open data, service platforms, public facing applications) as problem solving tools that can answer strategic objectives rather than approaching it from the mind set of “we’d better figure out what this is and then get some” • Start easy: any data a city produces routinely (and isn’t sensitive) can be a good gateway. This could be the list of businesses with licenses, bus lines, etc. Someone could do something with it, and that’s (ideally) a win for the city
<ul style="list-style-type: none"> • <i>Specific challenges the organization is trying to solve</i> • <i>Defining the problem set</i> • <i>Funding the work</i> • <i>How cities can be helpful</i> 	<ul style="list-style-type: none"> • Data can be seen as a challenge rather than something that can ease life. It’s threatening to say the skill set isn’t there • Instead, the reaction is to say that [new thing] doesn’t fit to the vision, is too expensive, etc. • Many new software applications fail to make the lives of government employees or citizens easier • For example: one project Waldo worked on was with a state electoral board to aggregate registered voter data and explore it for trends. They wanted to see if they could atomize the data and publish as bulk data for each precinct. One of the IT guys asked that if this work went well, then what? Then the data is available, people do great things, etc., but it’s not in anyone’s job title. There was no promotion, no raise, no positive life effect / incentive. But if it goes badly, then he’s on the line – publically humiliated, fired. Best case: nothing. Worst case, fired • Small cities love the capacity to upload all their FOIA requests for anyone to download. It saves valuable staff time • Open information can lead to open data. The case needs to be made for how it is saving and/or making jobs better
<ul style="list-style-type: none"> • <i>Strategic moves to nudge the field towards addressing sustainability</i> 	<ul style="list-style-type: none"> • What if a city wants a social service that doesn’t have a business case? This is hard. It’s dangerous to say cities should only release data that can generate revenue. Cities have to address problems with an end user who pay • For example, homelessness: there needs to be Apps to find shelters. These are harder sells to the tech community • Generally, it’s way better to say an App can close holes in the budget
<ul style="list-style-type: none"> • <i>Data gathering</i> • <i>Revenues, users, impacts</i> • <i>Uses / Findings</i> • <i>Ideas on field movement</i> 	<ul style="list-style-type: none"> • City government employees are rational people. Waldo always assumes that any objection to tech is based on rationale developed from experience. He has yet to encounter any who haven’t had reasons for reluctance or skepticism • So when the industry tells him that cities are slow and stubborn, he thinks that perhaps the messaging around tech / open data is actually the issue. Much more compelling is a demonstration of how it can solve problems /

	<p>ease life.</p> <ul style="list-style-type: none"> • For example: if you just provide a list of registered business, then it's possible for someone to discover lost revenue • Open data incentives aren't well articulated, because the idea of putting a price-savings on it hasn't been developed
<ul style="list-style-type: none"> • <i>Models cities should consider to advance civic technology</i> 	<ul style="list-style-type: none"> • Testing with granting mechanisms is a good place to start making tech a natural part of how governments work • If you are doing something that's foundation funded, there's an assumption that a plan is being developed to take it over once the funding is gone. Foundation funds help get things started but are unsustainable without a plan for ownership
<ul style="list-style-type: none"> • <i>Thoughts on business models for civic applications that don't have a clear revenue stream</i> 	<ul style="list-style-type: none"> • This is hard. Reduce the larger abstract issues into dollars if possible. If not, try to find a foundation with a mission that matches the issue, and start there. There's no real answer to this question
<ul style="list-style-type: none"> • <i>Advice for cities on open data, long term maintenance, etc.</i> 	<ul style="list-style-type: none"> • Jump in. Start with developing a solid platform for open data. See where it goes, look for ways it can ease the lives of citizens and government employees
<ul style="list-style-type: none"> • <i>Access to multi-city perspective</i> 	<ul style="list-style-type: none"> • Don't write it off yet, but thinks this is premature and too far removed from what US Open Data does – they have a strict focus on open data. Less on "civic tech"

Table A-5.7. Funder Profile: Knight Foundation (Detroit Focus).

Scan Category	Supporting Organization
Who	<ul style="list-style-type: none"> • Knight invests in residents, including immigrants and entrepreneurs, as drivers of economic growth, job creation and neighborhood revitalization. Investments in this area are to accelerate the programs of the New Economy Initiative for Southeast Michigan and Global Detroit • Note: are in 26 communities (where Knight brothers owned newspapers). Direct grants go to: Akron, OH; Charlotte, NC.; Detroit, MI; Macon, GA.; Miami, FL; Philadelphia, PA; San Jose, CA; and St. Paul, MN. Partner with community foundations in the rest
What	<ul style="list-style-type: none"> • Knight Foundation invests communities by supporting civic innovation. They look for communities with robust civic engagement and area talent. In Detroit, Knight has made progress by investing in projects that fall into their innovative places, talent and civic infrastructure categories to accelerate Detroit's revitalization • Detroit also worked with Code for America to use a \$200K grant to pilot "Text My Bus" and then successfully embedded it into a city-funded program
When	<ul style="list-style-type: none"> • Since 1950, have invested more than \$841M in community initiatives
Where	<ul style="list-style-type: none"> • Some initial Detroit investments emphasize the Eastern Market and TechTown districts, but they also want prototype investments in areas of Detroit ready to accelerate talent and opportunity

Why	<ul style="list-style-type: none"> • Knight wants to grow innovation in governance / civic capacity. As Detroit navigates bankruptcy and a new civic infrastructure, Knight investments support development of these areas in partnership with the public and private sectors. They have recently moved towards art, and fund “Knight Arts”
How	<ul style="list-style-type: none"> • Knight has historically been very interested in and a heavy funder for civic tech. Recently, however, they have been shifting funding away from start-up tech investments, broadening attention to civic innovation in general, cultural development, and talent fostering and retention

Table A-5.8. Policy Profile: New America’s Open Technology Institute.

Scan Category	Data Access and Transparency, Data Utility, Supporting Organization
Who	<ul style="list-style-type: none"> • An organization that works on civic tech policy issues, such as data standards and equity • A research arm networked with community developers, entrepreneurs, academia, and industry • Brings together technologists, policy experts, lawyers, community organizers, and urban planners to examine the impacts of tech and policy on people, commerce, and communities • Current focus areas include surveillance, privacy and security, network neutrality, broadband access, and Internet governance. Implement open data pilot projects and proofs-of-concept prototypes. Expands use of open source software, interfaces, and access to open data
What	<ul style="list-style-type: none"> • The Open Technology Institute formulates policy / regulatory reforms to support open data • OTI Facilitates development / implementation of open tech and communications networks • OTI promotes affordable, universal, and ubiquitous communications networks through partnerships with communities, researchers, industry, and public interest groups • Committed to maximizing innovative open tech by studying their social and economic impacts – particularly for poor, rural, and other underserved constituencies. • Provides in-depth research, analysis, and findings for policy decision-makers and public
When	<ul style="list-style-type: none"> • Since 2009, and have a lot of initiatives to show for it
Where	<ul style="list-style-type: none"> • Washington D.C. – lobby to protect things like internet neutrality, work with the Federal Communications Commission, etc. Member of the Detroit Digital Justice Coalition
Why	<ul style="list-style-type: none"> • Want internet freedom, updates to government processes, wireless equity, and work on projects like: the California Civic Innovation Project, Commotion Wireless (a network created from mobile devices), Internet Measurement Lab, Media Policy Initiative, Open Internet Tools Project, etc.
How	<ul style="list-style-type: none"> • A program of the New America Foundation (politics, prosperity, big ideas, tech innovation). Keep a high profile and employees are often named top influencers in various polls

Table A-5.9. Non-Profit Profile: Smart Chicago Collaborative.

Scan Category	Supporting Organization
Who	<ul style="list-style-type: none"> • Smart Chicago is a civic organization devoted to improving lives in Chicago through technology • Work on increasing access to the Internet, improving skills for using Internet, and developing meaningful products from data that measurably contribute to the quality of life of residents • A startup founded by the City of Chicago, the John D. and Catherine T. MacArthur Foundation, and The Chicago Community Trust. • A funding collaborative that helps bring together municipal, philanthropic, and private investments
What	<ul style="list-style-type: none"> • The Smart Chicago model is based on a lean organization focused on have a broad regional impact, centered among philanthropy and government • There's been interest in helping creating similar organizations throughout the United States, so they are highly focused on transferability and open to outreach
When	<ul style="list-style-type: none"> • Smart Chicago was born in the conversations of the early to mid-2000s around closing the digital divide. As the Internet became an essential tool for citizenship, and a central place for people to gather, it became clear that uneven access to the Internet was a problem to be solved • The culmination of these conversations was the May 2007 report titled, "The City that NetWorks: Transforming Society and Economy Through Digital Excellence" (online)
Where	<ul style="list-style-type: none"> • Chicago-based, but interested in spreading the model to other cities
Why	<ul style="list-style-type: none"> • Interviewees mentioned Smart Chicago as the gold standard for how cities can strategically work to secure civic tech as a way of operating for the long term
How	<ul style="list-style-type: none"> • Formed by the City of Chicago to enable civic nimbleness on tech issues and in interactions with the tech community. Cited by some of the interviews as the secret of Chicago's success • Full model for download at: http://www.smartchicagocollaborative.org/about-us/our-model/

Table A-5.10. Company Profile: Socrata.

Scan Category	Data access and Transparency, Data Utility (Open Data)
Who	<ul style="list-style-type: none"> • A privately held cloud software company. Employs Software engineers, designers, open government advocates, and business professionals • Example user cities: <i>New York, NY; Boston, MA; San Francisco, CA; New Orleans, LA; Nashville, TN; Chicago, IL; Kansas City, MO; Seattle, WA, Tucson, AZ</i> • Sample City open data platform by Socrata: https://data.nashville.gov

What	<ul style="list-style-type: none"> • Works with the public sector to improve transparency, citizen service, and data-driven decision-making • Delivers data to governments trying to reduce costs, to citizens who want to understand how their tax dollars are used, and to civic hackers dedicated to creating new apps and improving services • Creates and manages open data products for all facets of industry, including cloud storage, networks, applications, and programs. Strive to be the best in the world at making data accessible and useful • Interesting goal: show the potential of open data to improve the world, and create an economic engine via the usage and flow of open data
When	<ul style="list-style-type: none"> • 2007 – present, very well established
Where	<ul style="list-style-type: none"> • Headquartered in Seattle with offices in Washington, D.C. and London
Why	<ul style="list-style-type: none"> • <i>“Unleash the power of data to improve the world”</i> • Provides applications and services directly to cities for open access to data • Nashville gave feedback on working with them: it was a good experience
How	<ul style="list-style-type: none"> • Venture Capital: Openview, Frazier Technology Ventures, Morgenthaler Ventures