

The Structure of Civic Technologies and their Impacts on Quality of Life and Social Equity

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Sustainable Urban Systems Conference

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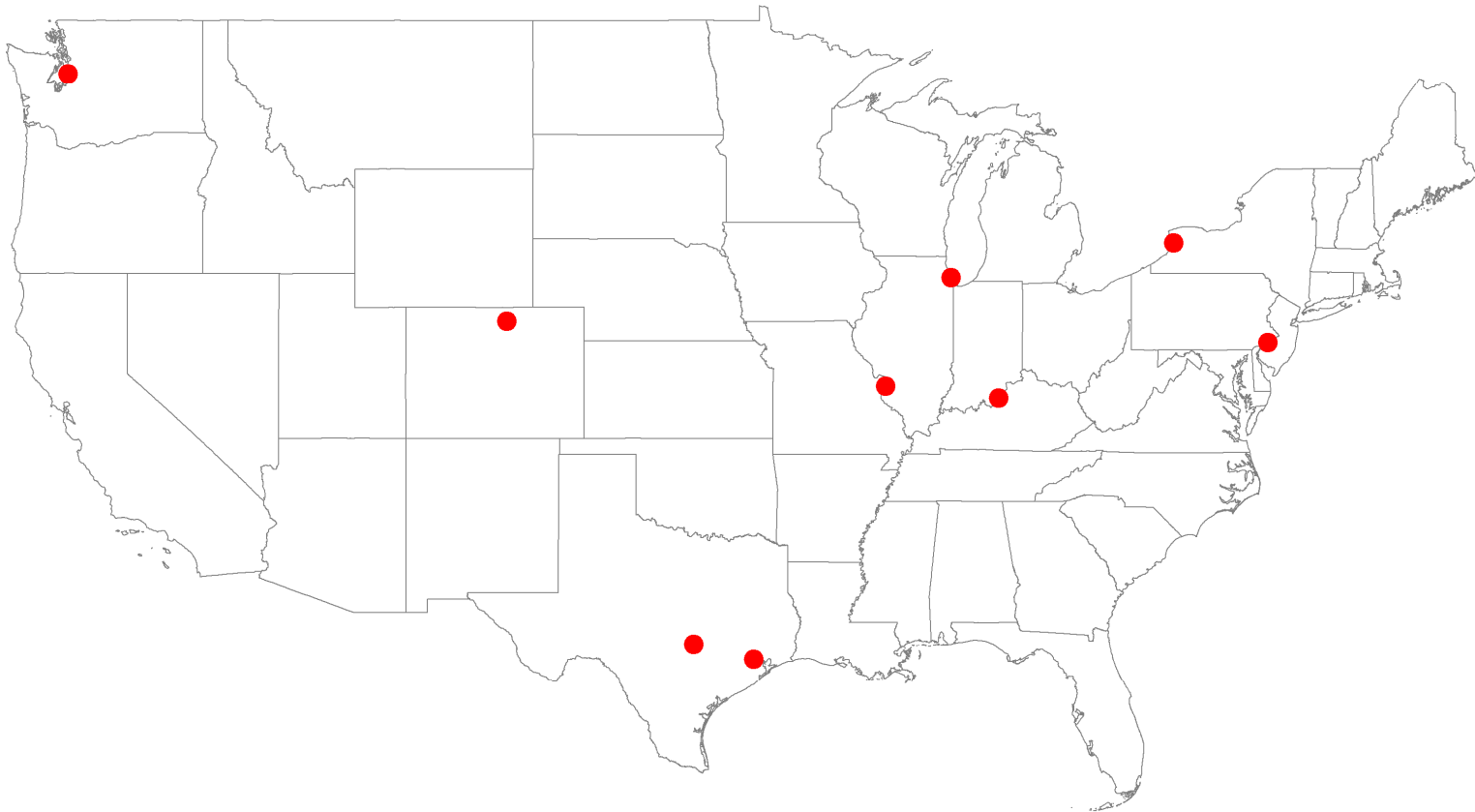
August 22, 2019

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Open Data & Civic Technology

Semi-Structured Interview Cities

N = 26





- Sensors that detect and collect
 - Hardware and software applications
 - Ubiquitous sensing
- Networks for transmitting and sharing data
 - Open data movement
 - Realtime monitoring
 - Internet of Things (IoT)
- People?
 - Citizens
 - Neighborhoods
 - Public officials



Source: Postscapes (<https://www.postscapes.com/anatomy-of-a-smart-city>)

Citizen Engagement vs. Citizen Participation



Citizen Engagement

- Government initiated
- Formal

Aim: improving public service deliveries and public policies programs



Citizen Participation

- Citizen initiated
- Informal

Aim: improving public service deliveries and public policies programs

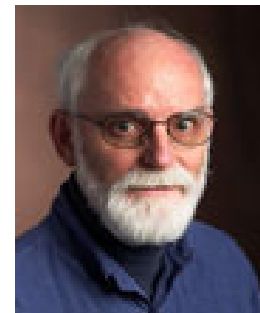
Participation

“The health of a ***democratic society*** may be measured by the quality of the functions performed by private citizens.”

Alexis de Tocqueville, *Democracy in America*

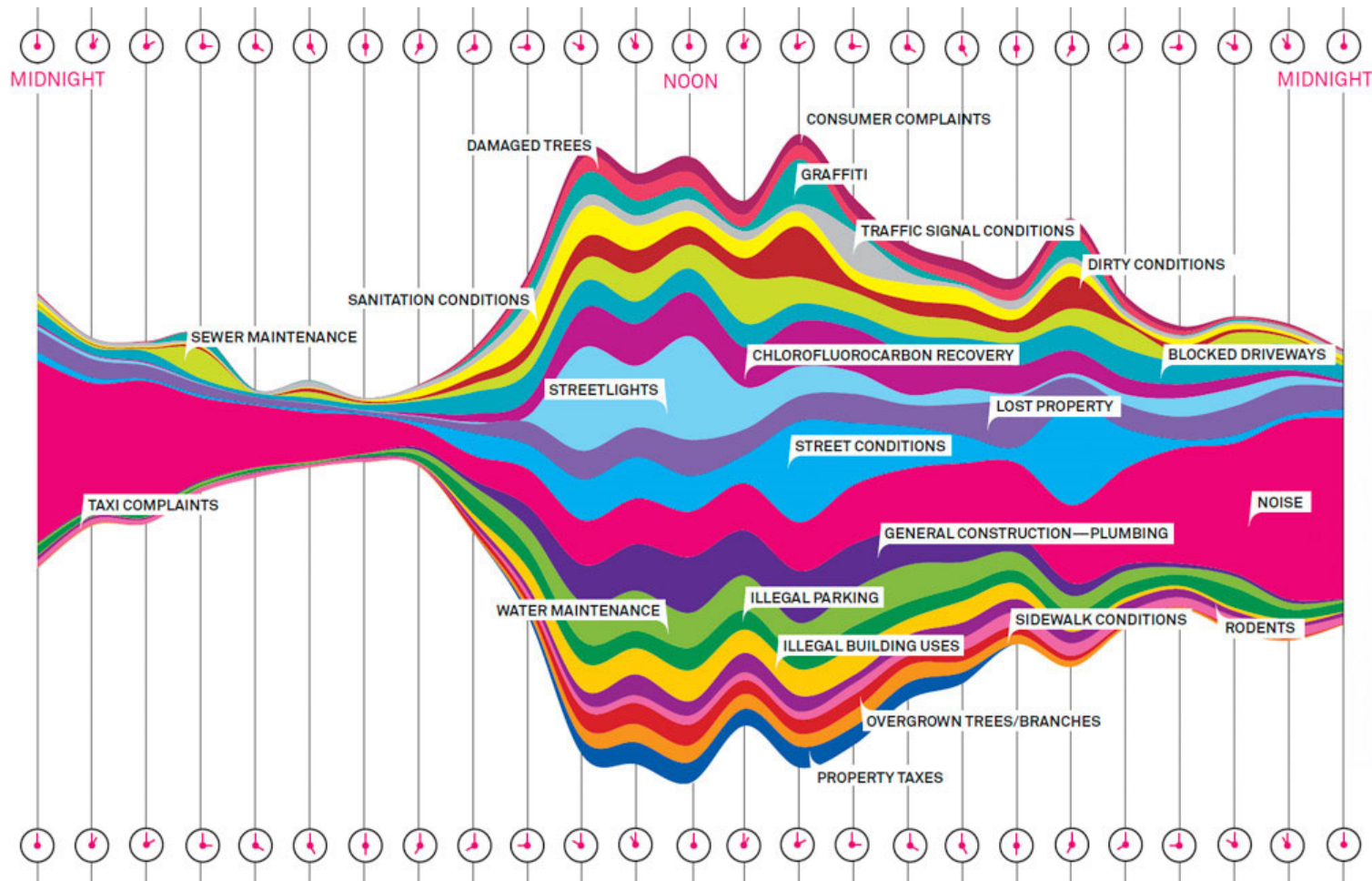
Participation

- Involving more people leads to ***better ideas***—***there*** are more brains at work
- Involving key actors at the outset makes it more likely that the plan, policy, or design ***will be used***
- Involving variety of stakeholders reduces likelihood of ***conflict and resistance*** later
- Participation cultivates the leadership and initiative that we need for a functional democracy—it ***creates citizens***



Lewis D. Hopkins

311 Calls in NYC



Complaint calls September 8 to September 15, 2010 by time of day.

Source: Steven Johnson, Wired Magazine.

So, what is civic technology? ■

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Source: mySociety, The Impacts of Civic Technology Conference 2015

*“‘Civic technologies’ are the **tools and processes** we create to **improve public life**. To help each other. To make our governments and our communities safe, joyful, equitable places to live out our lives.” (McCann 2015, p. 47)*

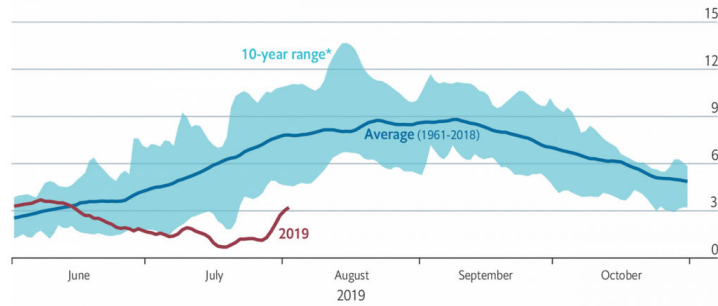
Daily chart

Why are water levels of the Mekong at a 100-year low?

Droughts, dams and politics spell trouble for one of Asia's great rivers

Staying afloat

Mekong water level at Vientiane, Laos, m



Source: Mekong River Commission

*Range for 2009-18

The Economist

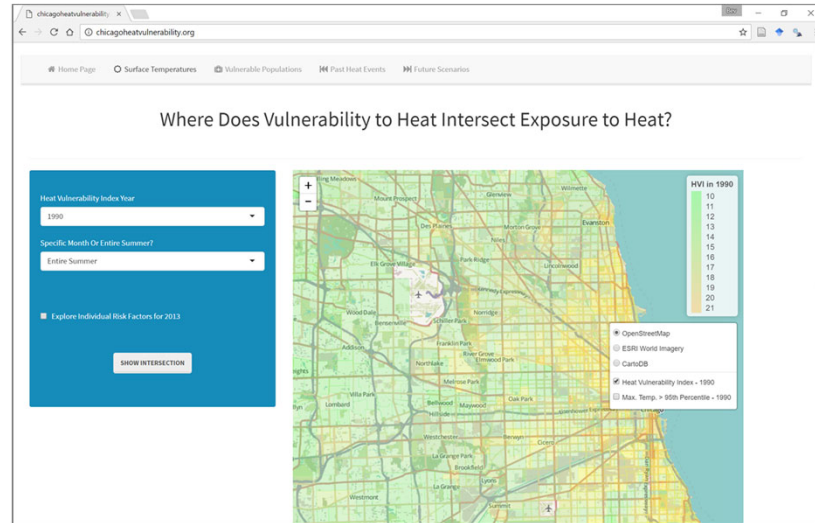
[Graphic detail >](#)

Aug 7th 2019



WAT NONG BUA YAI, a Buddhist temple in Lopburi province in central Thailand, has been under water ever since the nearby Pasak Chonlasit dam was built 20 years ago. This week, with water levels at record lows, the temple re-emerged drawing thousands of curious visitors. Such scenes are

Source: The Economist



Source: chicagoheatvulnerability.org



Source: Colin Shole



Weekly Chi Hack Night meeting

**NOTICE
OF
PUBLIC
HEARING**



Student-led geodesign process in Viola, IL

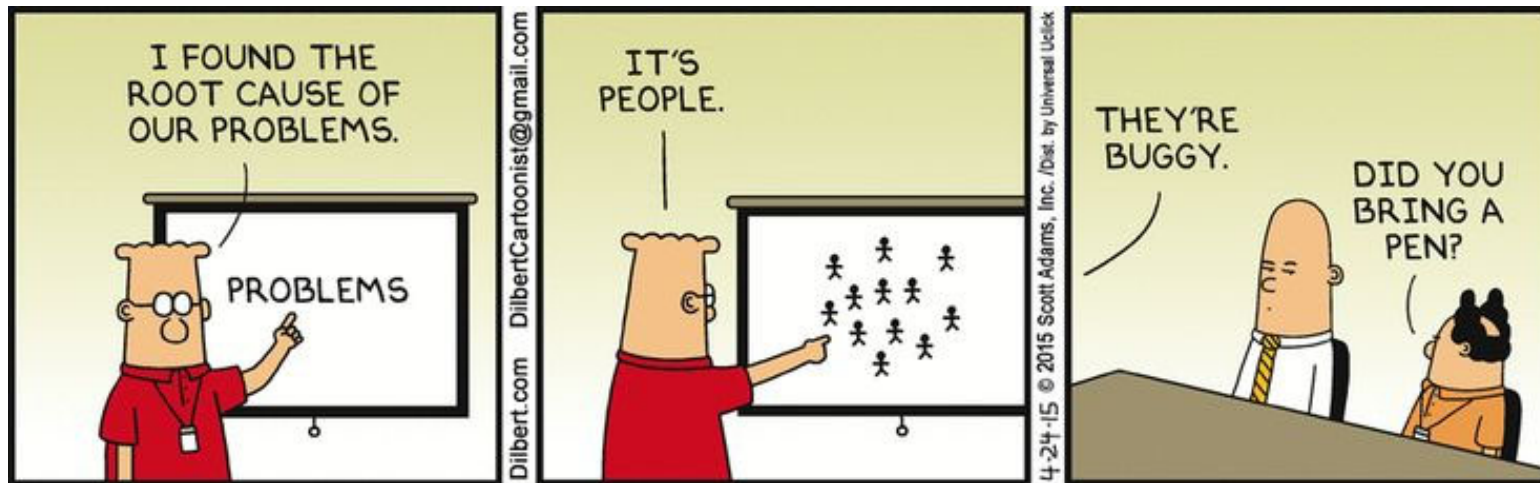
“...build **with**, not **for**...”

To prioritize people and build with them is to:

1. **Start with people:** Work with the real people and real communities you are part of, represent, and/or are trying to serve
2. **Cater to context:** Leverage and operate with an informed understanding of the existing social infrastructure and sociopolitical contexts that affect your work
3. **Respond to need:** Let expressed community ideas, needs, wants, and opportunities drive problem-identification and problem-solving
4. **Build for best fit:** Develop solutions and tools that are the most useful to the community and most effectively support outcomes and meet needs
5. **Prove it:** Demonstrate and document that community needs, ideas, skills, and other contributions are substantially integrated into -- and drive -- the lifecycle of the project



Source: McCann, L. (2015). *Experimental modes of civic engagement in civic tech*. Chicago, IL: Smart Chicago Collaborative.



“...not all problems have a *technical* solution.”

Who are the key actors and what are the common modes? ■

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Civic Hackers

OpenStreet Maps 101

Oct 20, 2018

OpenStreetMap 101

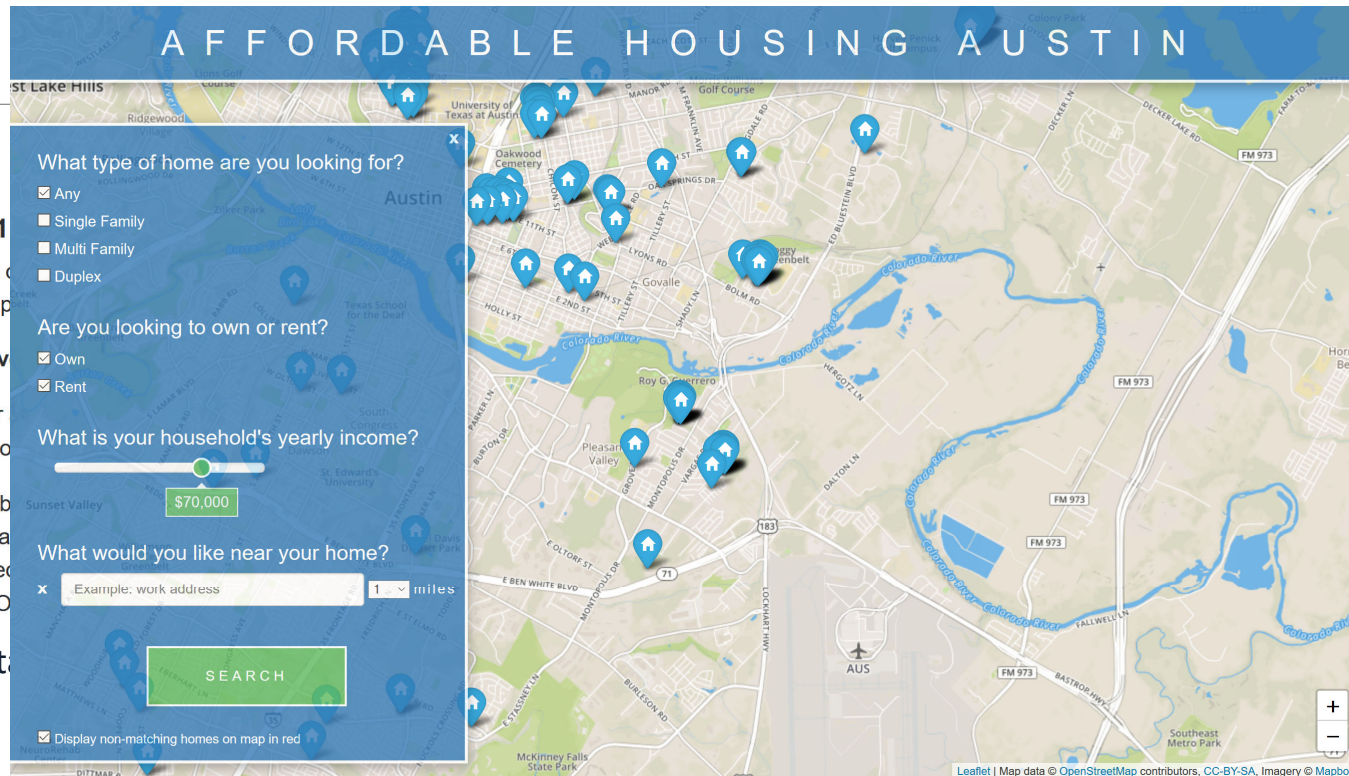
Learn how to add Points of Interest to your own map. Presented by Jeff McAdams plus participants.

Please RSVP for this event.

Bring your laptop, and/or your smartphone. We'll be working on open source repositories.

OpenStreetMap is built by volunteers. It's a map of the world, free to use and free to edit. It emphasizes local knowledge and user-generated content. Field maps to verify that OSM data is accurate.

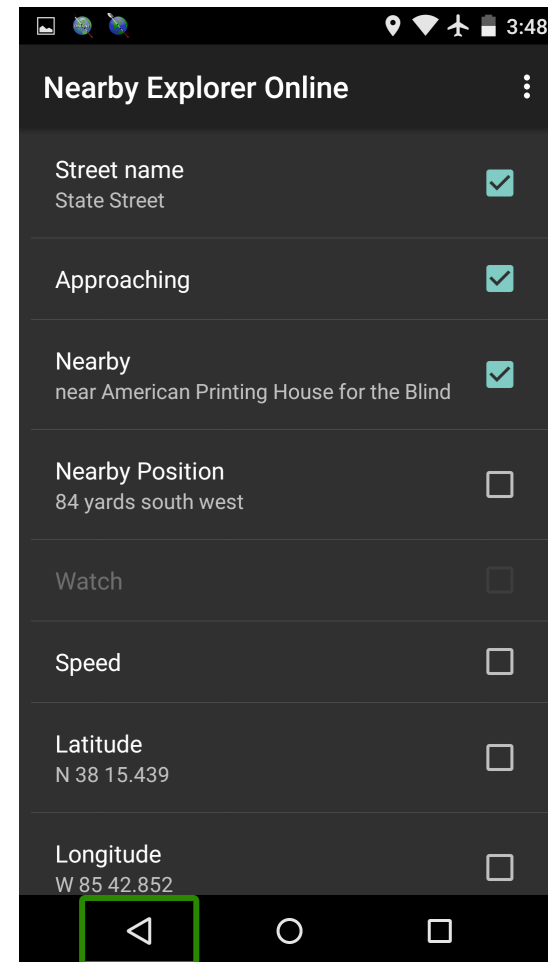
Source: Civic Data



Source: Rohan Mathur (austinaffordablehousing.com)



Non-Profit Organizations



Source: American Printing House for the Blind
https://tech.aph.org/neo_info.htm

Partnerships



The Waze Connected Citizens Program is a free, two-way data exchange empowering municipal decisions to achieve concrete community impact. Launched in October 2014 with 10 city partners, the program has expanded to 450 partners including city, state and country government agencies, nonprofits and first responders.

WAZE provides real-time, anonymous, proprietary incident and slow-down information directly from the source: drivers themselves

PARTNERS provide real-time and advance information on government-reported construction, crash and road closure data



Partnerships

The screenshot displays the DataUSA website interface. At the top, there is a dark navigation bar with a 'MENU' icon on the left, the 'DATA USA:' logo in the center, and a shopping cart and search icon on the right. Below this, a secondary navigation bar for 'Champaign, IL' features icons for 'ECONOMY', 'HEALTH & SAFETY', 'DIVERSITY', 'EDUCATION', and 'HOUSING & LIVING', along with a 'BACK TO TOP' link. The main content area shows a breadcrumb trail 'DATA USA: Stories' and a 'BACK TO ALL STORIES' link. The featured article is titled 'CHARACTERISTICS OF POWERFUL OCCUPATIONS' and is written by Danny Bachman, Ph.D., dated April 4, 2016. The article text discusses occupational categories, their economic value, and the prevalence of chief executives. A sidebar on the left contains a 'Wage by Race & Ethnicity' section with a list of categories and their average salaries.

Wage by Race & Ethnicity
The closest comparable is from the public use microdata series (PUMS) for Champaign, IL.

- HIGHEST AVERAGE SALARY
- 1. American Indian and Alaska Native
\$55,370 ± \$41,153
- 2. White
\$46,697 ± \$3,747
- 3. Asian
\$41,516 ± \$15,285

In 2016 the highest paid occupations in Champaign, IL were paid 119 times more than the second highest salary category.

This chart shows the average salary for the 5 most common occupations in Champaign, IL.

Dataset: ACS PUMS 5-year Estimates
Source: Census Bureau

CHARACTERISTICS OF POWERFUL OCCUPATIONS
WRITTEN BY DANNY BACHMAN, PH.D.
APRIL 4, 2016

US government statisticians have identified 478 detailed occupational categories. All play a role in the economy. Each occupation adds value through a unique set of skills and provides people employed in that occupation with income and the satisfaction of knowing they contribute to the entire country's well-being. But, let's face it, some occupations are more equal than others. Some people do, indeed, wield more power—power to make decisions that profoundly affect their fellow citizens. Through the lens of Data USA, we can learn something about those people.

The Census Bureau identifies these occupations as “Chief Executives and Legislators,” and counts some 1.1 million people in this category (out of about 145 million people working in the U.S. economy). Not surprisingly, the occupation is well paid—the fourth highest paid occupation in the database.¹

Chief executives are spread widely among industries, since just about any company needs somebody in charge. Industries which most commonly employ chief executives are those that are relatively fragmented, with many competing companies. As the figure shows, there are more chief executives in construction—a very fragmented and competitive industry—than in any other industry.



Source: DataUSA
<https://datausa.io/profile/geo/champaign-il>

City Government

The screenshot displays the OpenGrid web application interface. At the top, there is a search bar with the text "Find Places, Businesses, etc." and buttons for "Find Data" and "Clear Data". Below the search bar is a map of Chicago with various street names and landmarks visible. On the right side, a search results panel is open, showing a list of data sets. The panel has a "Search" header and a "Select Data" dropdown. Below this is an "Add dataset" button and a list of 15 data sets, including "311 Service Requests - Abandoned Vehicles", "311 Service Requests - Alley Lights Out", "311 Service Requests - Garbage Carts", "311 Service Requests - Graffiti Removal", "311 Service Requests - Pot Holes Reported", "311 Service Requests - Rodent Baiting", "311 Service Requests - Sanitation Code Complaints", "311 Service Requests - Street Lights - All Out", "311 Service Requests - Street Lights - One Out", "311 Service Requests - Tree Debris", "311 Service Requests - Tree Trims", "311 Service Requests - Vacant and Abandoned Buildings Reported", "Beach Lab Data - Culture Tests", "Beach Lab Data - DNA Tests", "Building Permits", "Building Violations", "Business Licenses", and "Business Licenses - Current Liquor and Public Places of Amusement Lic".



Source: City of Chicago
<https://chicago.opengrid.io/opengrid>

Corporations



PRODUCT USE CASES BLOG COMPANY ▾ FOR RESIDENTS LOGIN

REQUEST A DEMO

Unleash the Power of AI



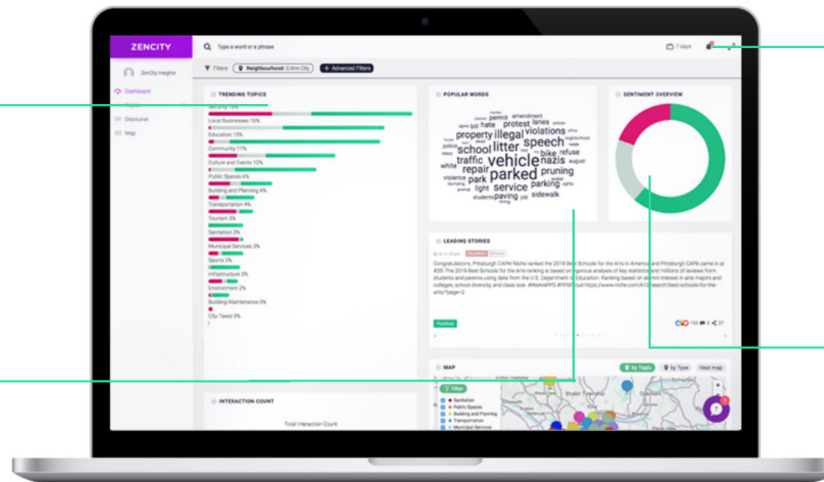
Recognize Topics

Automatically classify all conversations - social media, city hotlines and others, into topics relevant to city management, such as education, waste management and transportation



In-depth Analysis

See data by geography, data source, keywords and more - and even drill down to the story level



Alerts and Notifications

Receive push notifications about significant changes in categories, abnormalities, or specific issues that are trending - in real time or as periodical digests



Sentiment Analysis

Understand citizens' views towards different departments, subjects and actions of the city, and see the changes over time

REQUEST A DEMO



Source: ZenCity
<https://zencity.io>

Corporations

JanuaryAdvisors

Services Blog About Jobs Contact

We use **data**
the world &

Learn a

Data visualizations that shape policy.

We transform data into interactive stories that stick with you. Our maps help policymakers understand what's happening in your neighborhood.

How maps change minds >

We are a consulting firm. We work on data-related projects for our clients. This is an overview of the type of work that we do.

Data for advocacy

We locate data and build visualizations, helping advocates tell their stories using facts and numbers.

Some of our recent work includes:

- Dashboard and advocacy campaign for criminal justice reform.
- Data scrapers, API, and visualizations for environmental activism.
- Data visualization and campaign to encourage parental involvement in public schools.
- Data visualization for the first quality-based child care map of Texas.
- Data scraping and visualizations to coordinate affordable housing investments.
- Data visualization and storytelling assistance for disaster recovery.

Data strategy, policy, and infrastructure

We work with governments and non-profits to develop data strategies. Some of our recent work includes:

- Helping the United Way 2-1-1 in Houston develop strategies for collecting and managing social services data.
- Helped the City of Houston implement their open data policy, develop their general plan, and analyze Hurricane Harvey data.
- Helped Harris County prepare for Census 2020 by uncovering and validating previously missing residential addresses.
- Helping a management district plan for the growth of smart cities / connected devices.
- Helping a mid-size Texas city implement an open data policy and playbook.



Source: January Advisors
<https://www.januaryadvisors.com>

B Corporations

Over 2,600 companies in
60 countries



Legally required to “consider the impact of their decisions on their workers, customers, suppliers, community, and the environment.”

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B Corporations

Aunt BERTHA | Connecting People and Programs Support Sign Up Log In

Zip or keyword or program name Search for free or reduced cost services like medical care, food, job training, and more.

Select Language ▼

FOOD HOUSING GOODS TRANSIT HEALTH MONEY CARE EDUCATION WORK LEGAL

2202 programs
serve people in
Austin, TX (78705)

Type a search term, or pick a category

Browse Programs | Suggest Program | Claim Programs | About Us | Accessibility | Terms | Privacy
© 2011-2019 Aunt Bertha, a Public Benefit Corp.



Source: Aunt Bertha
<https://www.auntbertha.com>

B Corporations

The screenshot shows the Azavea website interface. At the top left is the Azavea logo. To the right is a navigation menu with links for 'What We Do', 'Research', 'About', 'Blog', and 'Careers', along with a search icon. The main heading reads 'Advanced geospatial technology and research for civic and social impact'. Below this is a screenshot of the 'British Columbia Wild Fires (July 2017)' calculator. The calculator interface includes a 'Learn more' button, a 'PRESENTED BY' section with logos for 'Raster Foundry' and 'planet', and two dropdown menus for 'Natural color (before)' and 'Burn Extent (after)'. A central map shows burn areas in red and orange. A text overlay on the map reads: 'British Columbia Wild Fire Impact Calculator uses the Raster Foundry API and a change detection model to highlight burn areas'. Below the map is a 'Read More' button and navigation arrows. On the left side of the calculator, there is a list of fire locations with details:

- Princeton** (49.9668, -120.5362)
Estimated Size: 2,958 HA
Approximate Date of Discovery: 2017-07-06
This fire caused an evacuation order of neighboring Princeton and took firefighters several days to contain the blaze.
- Elephant Hill** (50.8212, -121.3391)
Estimated Size: 52,600 HA
Approximate Date of Discovery: 2017-07-06
Elephant Hill is the largest fire burning in British Columbia today, with an extent close to 200,000 acres.
- Mount Brown** (52.3247, -118.3491)
Estimated Size: 2,300 HA
Approximate Date of Discovery: 2017-07-14
Lightning is the suspected cause of this wildfire, burning near Dawson Creek above where it feeds into Kinbasket Lake at the foot of Brown Mountain.
- Gannet Lake** (51.4802, -119.2853)
Estimated Size: 5.86 HA
Approximate Date of Discovery: 2017-07-14

At the bottom of the calculator, there is a legend for 'Transmission Lines', 'Natural Gas Pipelines', and 'Liquid Pipelines', and a scale for 'little/no damage' to 'very damaged' and 'non-vegetation' to 'vegetation'.



Source: Azavea
<https://www.azavea.com>

Why is open data important? ■

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If the collected data are open, a **variety of stakeholders** and users can leverage this information for purposes that support and facilitate more **inclusive and effective** planning (Batty, 2013)

Source: Open City
<http://opencityapps.org>



Conceptual Scaffolding



Information can serve as a centerpiece for *creating shared meaning*, building *social relationships*, and *cultivating network power*—defined as “a shared ability of linked agents to alter their environment in ways advantageous to these agents individually and collectively” (Booher & Innes 2002, p. 225).

- See also participatory GIS (Elwood, 2006), web-enabled participation (Sieber et al., 2016) and citizen science literature (Devisch & Veestraeten, 2013)

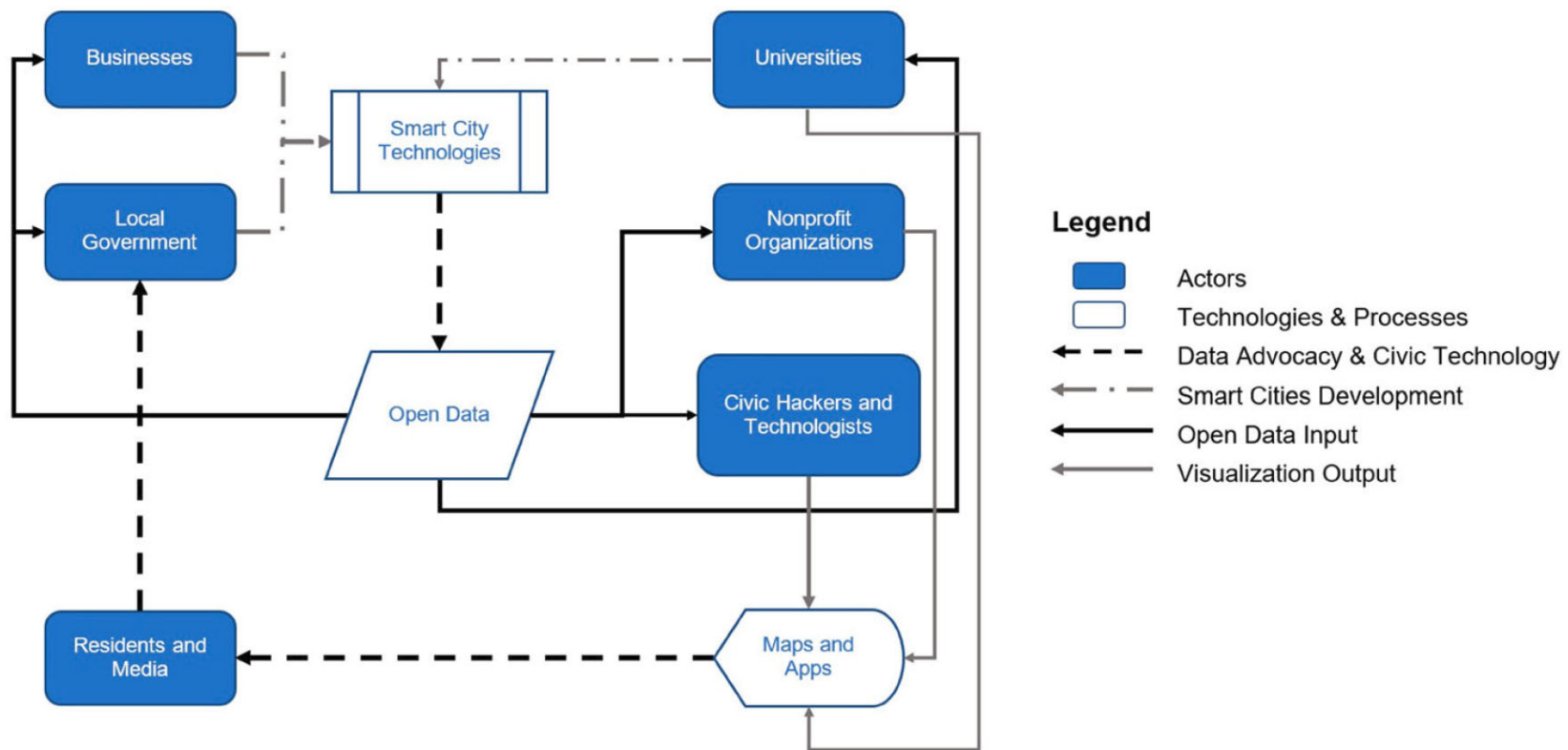
“...although data is available in a **machine readable format**, such data is **not really useful** unless it is **easily understandable**”
(Attard et al., 2015)



How to **activate open data** so that their purported benefits can be realized?



Source: Attard, J., Orlandi, F., Scerri, S., & Auer, S. (2015). A systematic review of open government data initiatives. *Government Information Quarterly*, 32(4), 399-418.



Source: Wilson, B., & Chakraborty, A. Planning Smart(er) Cities: The Promise of Civic Technology. (2019). *Journal of Urban Technology*, Forthcoming.

What currently works? ■

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Civic Hackers as Advocates

- Increasing interest in technology, particularly among youth
- *“Oftentimes, **civic technology helps to fill the gap** when there is a need, but not a business case [paying customer].” (Participant #15)*
- Mature civic hacking communities can take on an advocacy role and help drive governance of open data initiatives

Open Data By Default

- Some cities have adopted an official policy on open data



OPEN DATA
POLICY HUB

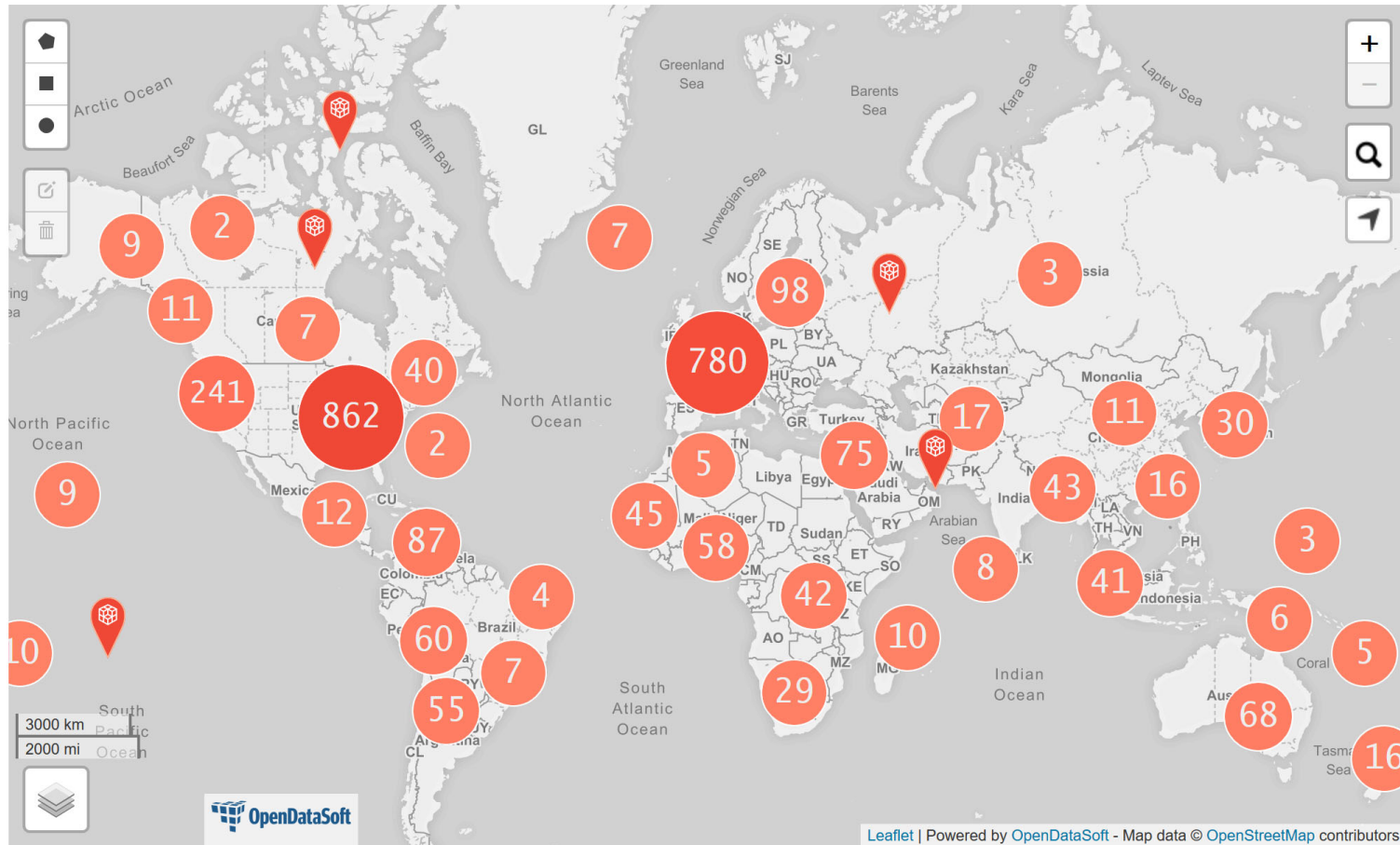


SUNLIGHT
FOUNDATION

- Over 130 local governments in the U.S. since 2009
- Catalyst is often executive order from the mayor (e.g., Louisville, Buffalo, Chicago, Philadelphia)

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Growth of Open Data



Best Practices

TOPICS ARTICLES REPORTS PRESS SPEECHES

PROJECT L.I.F.T. LAUNCHES NEW PROGRAMS TO CONNECT CHARLOTTE RESIDENTS WITH

Bloomberg Philanthropies

OUR WORK ABOUT US BLOG PRESS & MEDIA

GOVERNMENT INNOVATION

WHAT WORKS CITIES

What Works Cities 2017 SUMMIT

OVERVIEW
GET INVOLVED
SHARE

USING DATA AND EVIDENCE TO IMPROVE DECISION MAKING

The image is a screenshot of a Bloomberg Philanthropies website article. At the top, a navigation bar includes 'TOPICS', 'ARTICLES', 'REPORTS', 'PRESS' (underlined), and 'SPEECHES'. The main headline reads 'PROJECT L.I.F.T. LAUNCHES NEW PROGRAMS TO CONNECT CHARLOTTE RESIDENTS WITH'. Below the headline is a large group photo of people at a summit, with the text 'WHAT WORKS CITIES' and 'What Works Cities 2017 SUMMIT' overlaid. On the left side of the photo, there are menu items: 'GOVERNMENT INNOVATION', 'OVERVIEW', 'GET INVOLVED', and 'SHARE'. At the bottom of the photo, the text 'USING DATA AND EVIDENCE TO IMPROVE DECISION MAKING' is displayed. The Bloomberg Philanthropies logo is in the top left, and a navigation menu with 'OUR WORK', 'ABOUT US', 'BLOG', and 'PRESS & MEDIA' is in the top right. The background of the article header shows a person in a library or office setting.



What needs work? ■

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Literacy



LEARN. EMPOWER. CREATE.

DATA 101
CITY OF BUFFALO

DATA101 IS COMING TO BUFFALO!

LET'S INCREASE DATA LITERACY IN A DATA-SMART BUFFALO!

Join Mayor Byron W. Brown and Open Data Buffalo on shaping the curriculum for Data101

YOUR IDEAS MATTER.

Share your feedback today thru November 1, 2018 @ Facebook page: [Data101: Shaping the Curriculum](#) or email opendatabuffalo@city-buffalo.com

Data101 is a free, multi-session course designed to teach participants how to gather, understand and present data accessed via the City's Open Data portal. City data can be used in a variety of ways to further benefit the Buffalo community, from helping to strengthen neighborhood improvement grant applications to having a better understanding of what's happening in our City.

Help craft the curriculum!

We are looking for help building our curriculum from data professionals, academics, community activists, block club leaders, elected officials, and government employees.

- Are you interested in being a student? What would you like to learn about data and open data?
- Are you a data expert? What should we be teaching? What is important for students to know?



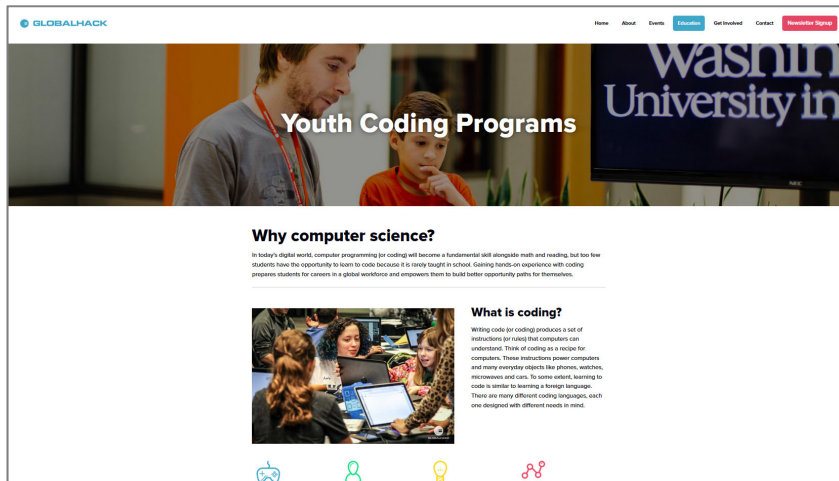
Share your feedback, comments, and recommendations through our Facebook page: [Data 101: Shaping the Curriculum](#), our [webpage survey](#), or by emailing us at opendatabuffalo@city-buffalo.com.



- *“We believe communities are stronger when residents are empowered through the use of data”*
- Four sessions plus final presentations (20 Dec. 2018)

Diversity, Equity, & Inclusion

“...you have [...] things like [local Code for America brigade] and stuff like that which are, you know, **a certain small subset of the community**. But there is **not a lot of outreach to general residents**. [...] It should be understanding what the residents want, need, what services or **what information would be best for them**, and then figuring out how technology could or could not, you know, address that. And I think **that’s an on-going challenge...**” (Participant #19)



The screenshot shows the 'GLOBALHACK' website with a navigation bar including 'Home', 'About', 'Events', 'Locations', 'Get Involved', 'Contact', and 'Remember Signin'. The main header features a photo of a man and a child looking at a computer screen, with the text 'Youth Coding Programs' and 'Washington University in St. Louis'. Below the header, there are two sections: 'Why computer science?' and 'What is coding?'. The 'Why computer science?' section includes a paragraph about the importance of coding in the digital world. The 'What is coding?' section includes a paragraph about what coding is and a small image of a group of people working on laptops. At the bottom of the page, there are four icons: a game controller, a person, a lightbulb, and a network diagram.



The screenshot shows the 'black girls CODE' website with a dark background. The logo features the text 'black girls CODE' and 'imagine. build. create.' with two stylized figures of girls coding. Below the logo, there is a navigation bar with links for 'HOME', 'ABOUT BGC', 'PROGRAMS/EVENTS', 'PRESS', 'JOIN US', 'CONTACT US', 'WEAR US', and 'PARENTS'. The main content area features a large photo of two young girls smiling and working on a computer. Below the photo, there is a section titled 'Our Vision:' which states the organization's goal to increase the number of women of color in the digital space by empowering girls of color ages 7 to 17 to become innovators in STEM fields, leaders in their communities, and builders of their own futures through exposure to computer science and technology. To provide African-American youth with the skills to occupy some of the 1.4 million computing job openings expected to be available in the U.S. by 2020, and to train 1 million girls by 2040.

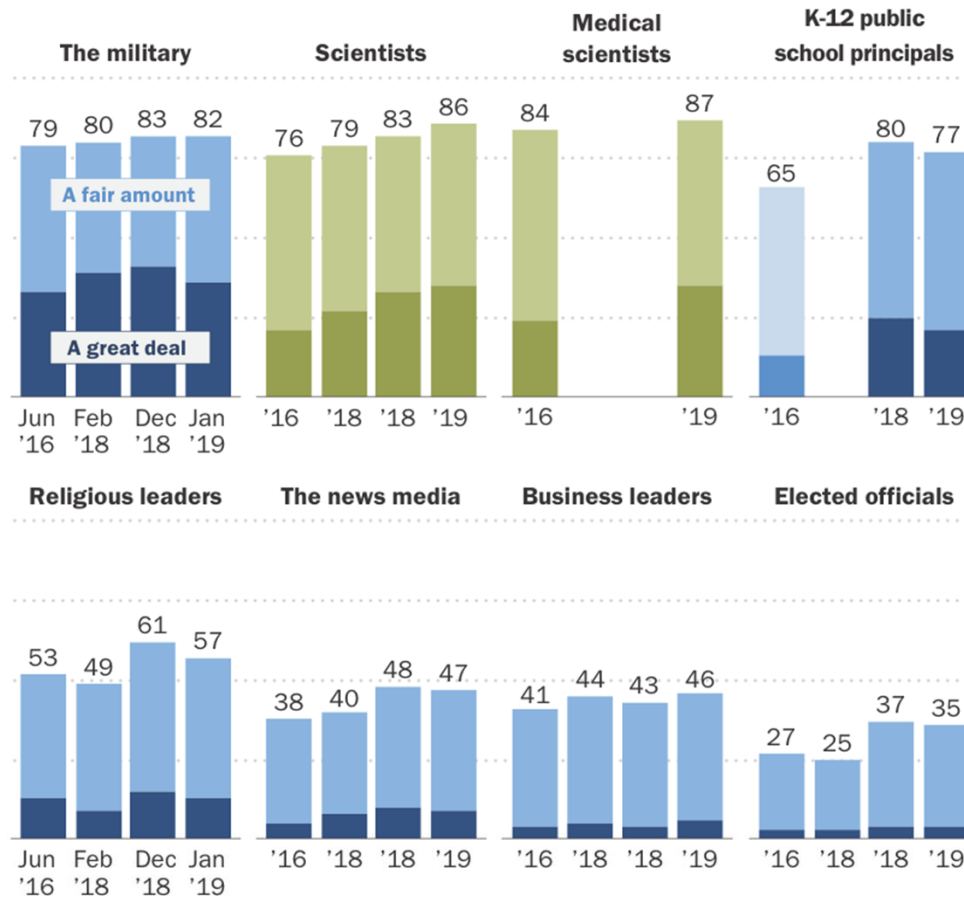
Strategies for moving forward ■

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Americans' confidence that scientists act in the public interest is up since 2016

% of U.S. adults who say they have a great deal or fair amount of confidence in each of the following groups to act in the best interests of the public



Note: In 2016, question asked about confidence in K-12 public school principals and superintendents. Respondents were randomly assigned to rate either their confidence in “scientists” or “medical scientists” in 2016 and 2019. Respondents who gave other responses or who did not give an answer are not shown.

Source: Survey conducted Jan 7-21, 2019.

“Trust and Mistrust in Americans' Views of Scientific Experts”

PEW RESEARCH CENTER



Getting There

- Strategies for activating SUSS parallel question of how to activate open data resources—cultivate a demand side
- Building technical capacity of the public, alongside development of institutions with staying power
- Strengthening partnerships within the university and beyond
- I** • Better outreach and storytelling

Thank you...

Bev Wilson, PhD, AICP

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