



EXPLORING CIVIC INNOVATION

Leading U.S. Approaches to
Civic Data, Technology, and Engagement

Presented to the Bill and Melinda Gates Foundation; Developed by MetroLab Network

Background

The Bill & Melinda Gates Foundation believes in a world where every person has an opportunity to lead a healthy, productive life—a vision that is as important in their hometown of Seattle as it is around the globe.

In the Greater Seattle region, where the Gates family has lived for generations and where the foundation's headquarters is located, the Foundation focuses on:

- **Education** of kids and communities.
- Cultivating and supporting a vibrant **Global Health and Development** sector.
- **Convening and activating** people who tackle big problems together.
- Strengthening **Community Based Organizations** that support the most vulnerable in the community.

As an extension of the Foundation's work in the Greater Seattle region, the Community and Civic Engagements (CCE) Team set out to learn more about the use and impact of data and technology on civic and community priorities. In particular, the team was interested in exploring models that inspire and enable civic innovation and participation to develop a healthy and vibrant community.

In the spring of 2018, MetroLab Network kicked-off a year-long effort with the CCE team to help inform their learning process. That process included six site visits to leading cities in civic innovation, data, technology, and engagement. The visits focused on a range of themes, including:

- Economic Mobility and Human Services
- Built and Natural Environment
- Civic Engagement
- Transportation and Public Services
- Data
- Institutional Partnerships

Through the visits, the CCE team met with dozens of organizations that address civic priorities through research, innovation, engagement, design, and more. Those organizations were often situated within a network of partners from across sectors, reflecting the tight-knit nature of the various civic innovation ecosystems.

The project concluded with a workshop that reflected on various themes inherent to civic innovation and considered the compelling models and ecosystems in the six cities that were particularly compelling.

MetroLab Network, on behalf of the CCE team, would like to thank the numerous organizations and individuals who met with us over the past year and shared their experiences working on civic technology and innovation with their communities. The purpose of this report is to share some of the insights gleaned through the visits and provide fodder for others working in the space to explore how their own efforts connect to the broader civic innovation ecosystem.

Summary of Cities Visited

MetroLab accompanied various members of the CCE team on six site visits across the US. The cities were selected to reflect a set of clear leaders in the civic innovation landscape, while also exploring cities and communities of different sizes and structures. The visits included meetings with local government, academia, non-profit, philanthropy, industry, and entrepreneurs. Like any selection of six cities, the visits did not provide an all-encompassing perspective of the civic innovation landscape; the six cities did offer compelling examples of success.

Highlighted in this report are the organizations included in each visit and perspectives on their roles and activities in their communities. This is not an extensive nor exhaustive review of each location’s ecosystem and not meant to serve as a definitive analysis on any of the locations surveyed.

Additionally, please note that the “about” summaries listed in this report were largely taken from each organization’s publicly-available information and the “activities” reflected are those that were discussed during the trek meetings, and also borrow from publicly available information.

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Boston



Summary and Takeaways: Boston has a rich history of civic innovation, anchored by the Mayor’s Office of New Urban Mechanics, a unique cross-functional office that works with city agencies, universities, industry, and nonprofit to take advantage of data, technology, and design to enhance government services. It is complemented by strong Boston-focused research efforts at Boston University and Northeastern University. Harvard and MIT house civic-facing programs that engage with U.S. and international cities and collaborators. The rich civic fabric extends beyond city government and universities to include the Metropolitan Area Planning Council, the Boston Fed, and other public agencies and entities. This ecosystem has outsized impact, despite a less robust set of corporate and philanthropic players, although the local Barr Foundation has played a critical role in supporting work at the city and universities.

Local Government



Federal Reserve Bank of Boston, Community Development

About

The community development function of the Boston Fed is to promote economic growth in New England's low-income communities, which is linked to the Federal Reserve System's overarching goal of achieving maximum employment.

Activities

- The [Working Cities Challenge](#), done in partnership with Living Cities, is a competition for cities in the Boston Fed’s jurisdiction that are interested in collaborative, cross-sector, community-engaged initiatives that use data and evidence to track progress and drive toward shared goals, largely related to improving the lives of low-income residents. The Working Cities Challenge was a response to a desire to cultivate a strong “civic infrastructure”, comprised of cross-sector leaders and institutions that can help foster economic growth. The Working Cities Challenge is supported by a range of funders and partners and has involved more than 60 cities from Massachusetts, Rhode Island, and Connecticut as participants, approximately a third of which received implementation or design grants. This effort revealed a number of factors that helped foster civic innovation in smaller cities and communities, including mechanisms to create alignment between governments, local institutions, and funders.



About

Metropolitan Area Planning Council, Data Services

The Metropolitan Area Planning Council (MAPC) is the regional planning agency whose mission is to promote smart growth and regional collaboration.

Boston



Activities

- Partner with local governments to develop and procure data tools and services that help drive “effective, efficient, and equitable planning and governance.” This activity includes overlaying human-centered design methods to develop better and more inclusive tools.
- Partner with other offices at MAPC on long-range planning activities to provide data and mapping capabilities.
- Play an active role in Boston’s civic data and tech landscape, by driving forward a number of regional data-related priorities, including support for data integration efforts, development and proliferation of shared data standards, and community engagement related to data efforts.



City of Boston, [Mayor's Office of New Urban Mechanics](#)

About

The Mayor's Office of New Urban Mechanics was formed in 2010 as one of the first municipal innovation offices in the world. Their research and design projects tackle a range of topics — from civic engagement to city infrastructure to education.

Activities

- MONUM works to promote collaboration across system boundaries to test new ideas, leveraging partnerships, data, technologies, and human-centered design to improve urban life for Bostonians.
- Rethinking community engagement, moving away from the town hall approach and toward alternative methods, like the use of third spaces to engage communities or use of technology to inspire conversations about urban space.
- Partnership with public agencies and civic organizations to lend expertise to develop new tools or approaches, including Streetcaster to facilitate sidewalk repair, Imagine Boston to inspire hyper-local planning, and the Housing Lab to address affordability issues in the city.
- Developed a “Civic Research Agenda” to help guide academic partners toward the issues that are relevant to MONUM, other city departments and agencies, and residents.
- Serve important convening function in the city at the intersection of government, technology, innovation, and design, and serve is key access-point for funders, corporate partners, and researchers.

Boston



Academic Institutions



Activities

Engagement Lab at Emerson College

The Engagement Lab at Emerson College is an applied research and design lab that investigates and creates media and technology to reduce disparities in civic participation.

- Emphasis on “civic” over “technology” with unique reach into communities on a range of applied research projects.
- [Civic Smart City](#), an open toolkit, guide, and workshop that promotes the design of equitable and ethical smart cities for municipalities.
- [Beta Blocks](#) is a scalable, flexible and re-usable platform for engaging Boston’s residents on issues of urban technology and data. Beta Blocks allow for data collection at a hyper-local level to drive systems change.
- [Civic Data Ambassadors](#), a curriculum for librarians, who seek to connect with community members on issues related to open data.



About

Activities

Boston Area Research Initiative

The Boston Area Research Initiative (BARI) is an interuniversity partnership that pursues original urban research on the cutting edge of both science and public policy, with an emphasis on the opportunities created by novel digital (i.e., “big”) data.

- Unique research collaborative housed at Northeastern University that includes a number of local universities and serves as a “front door” for research partnerships with local governments and civic institutions in the region.
- Focused on a cross-disciplinary approach to civic research that engages communities and helps advance evidence-based policies.
- [Opportunity Index](#) is one of many BARI projects, developed in partnership with the Boston Public Schools that quantifies the degree to which schools serve students in need, by incorporating various data that reflect factors that are outside of the school’s control but are also predictive of students’ academic outcomes, including: data related to a student’s home neighborhood, such as safety; income and education levels; and physical environment. The Opportunity Index is being used to direct \$6 million in funds to approximately 60 schools to provide

Boston



services that best meet the needs and priorities of their school communities.

Initiative on Cities

[Boston University Initiative on Cities](#)

About

The mission of the Initiative on Cities is to research, promote, and advance the adaptive urban leadership strategies and policies necessary to support cities as dynamic centers of economic growth and inclusive development in the 21st century.

Activities

- Serves as a hub for BU faculty and students focused on urban research, offering seed grants, fostering partnerships, and playing a convening role.
- Since 2014, has undertaken [Menino Survey of Mayors](#), which interviews mayors of cities with populations of more than 75k on a range of policy priorities and local challenges. Among the most popular topics in the 2018 survey were: housing, health, and social mobility.
- Home to [MetroBridge](#), a program that positions students to address urban issues while helping city leaders confront key challenges. Students connect with local governments in the state, and with guidance from BU faculty, help each city address its priorities.



[Ash Center for Democratic Governance and Innovation, Data-Smart City Solutions and Bloomberg Harvard City Leadership Initiative](#)

About

Data-Smart City Solutions is working to catalyze adoption of data projects on the local government level by serving as a central resource for cities interested in this emerging field.

The Bloomberg Harvard City Leadership Initiative is a collaboration among Harvard Kennedy School, Harvard Business School, and Bloomberg Philanthropies. Its mission is to inspire and strengthen city leaders, as well as equip them with the tools to lead high-performing, innovative cities.

Activities

- Data-Smart City Solutions houses the [Civic Analytics Network](#), a network of U.S. Chief Data Officers, that convenes regularly to share best practices, collaborate on projects, and offer policy leadership on a range of data-related issues facing cities.
- Data-Smart City Solutions leads the [Project on Municipal Innovation](#), launched in 2006, and supported by Living Cities. The Project on Municipal Innovation serves as a platform for cities to share and adapt best practices and innovative policy

Boston



ideas that increase efficiency and improve the lives of citizens, and includes 35 cities, each represented by either a Mayor's chief of staff or policy advisor.

- The Bloomberg Harvard City Leadership Initiative works with cities from around the world to help unlock the full potential and optimize the performance of cities. The program offers leadership and management training to mayors, including classroom training and professional development.



Berkman Klein Center for Internet and Society

About

The Berkman Klein Center's (BKC) mission is to explore and understand cyberspace; to study its development, dynamics, norms, and standards; and to assess the need or lack thereof for laws and sanctions.

Activities

- BKC, through fellowships, internships, convening, and interdisciplinary research, seeks to impact issues at the intersection of tech and society on a broad range of topics, including a focus on issues that intersect with civic data, tech, and innovation.
- Ben Green, one of BKC's Fellows recently released a book "[The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future](#)" which serves as a critique of a smart cities if not approached with purpose.
- Work on many projects connected to the way that cities and communities are approaching civic tech, including algorithmic ethics, open data, and privacy.



Massachusetts Institute of Technology, MIT Department of Urban Studies and Planning (DUSP) and Senseable Cities Lab

About

The Department of Urban Studies and Planning at MIT sees it as their mission to educate students while advancing theory and practice in areas of scholarship that will best serve the nation and the world in the twenty-first century.

Located in MIT's Department of Urban Planning and Studies, the Senseable City Lab investigates how digital technologies are changing the way people live and their implications at the urban scale.

Activities

- MIT DUSP uses of Participatory Action Research, an approach that captures community members experience to guide research-driven action to drive forward change.

Boston



- Researcher Caesar McDowell focuses on “designing for the margins” rather than human-centered design, which can lead to more inclusive communities and environments that yield benefits to all members of society.
- The Senseable Cities Lab takes a multi-disciplinary perspective on a range of projects related to issues facing cities, including mapping of global movement of trash; analysis of human waste to understand the use of bacteria, viruses, and metabolites; and analysis of potential traffic flows with the advent of autonomous and connected vehicles.

Pittsburgh



Summary and Takeaways: Pittsburgh is a city learning to use the talents and resources of its citizens and institutions to rebuild itself and stand out as a leader in data and innovation among its peers. Much of the data and innovation work is done in partnership between the City of Pittsburgh, Allegheny County, the nonprofit community, including the Western PA Regional Data Center and the local philanthropic community. Pittsburgh has a uniquely strong philanthropic community that has been a great asset to the civic engagement and urban innovation efforts underway in the community. Carnegie Mellon University and the University of Pittsburgh are key players in connecting research to the City's civic innovation priorities.

Local Government



[About](#)

Allegheny County Department of Human Services

Allegheny County has been a national leader in its use of integrated data and predictive analytics to improve outcomes for children in their welfare system. Developed using over 20 years' worth of administrative data, Allegheny County highlights how counties and other municipalities can leverage information they collect across a number of platforms to develop and implement a robust screening tool that has helped the county manage limited resources.

[Activities](#)

- The county has developed a data warehouse that is at the core of the Department's analytic capacities. The work of the data warehouse is guided by the principles that data are of and for the community; ultimately people want integrated services guided by data-driven decisions.
- Individual clients are able to access their own integrated data, including histories, case notes, assessments, 911 data, etc. Workers can connect with each other and discuss the integrated data they share. Tools are built to support integrated services, not just system analytics.
- The Department is now looking at other areas in which predictive modeling can be used, including homelessness, child welfare prevention models that offer the right supports at birth, etc. They are also exploring the creation of new web portals designed with the needs of specific users in mind.



[About](#)

City of Pittsburgh, Department of Innovation and Performance and Department of City Planning

Department of Innovation and Performance's mission is to deliver strategic technology services and support to all city departments, foster

Pittsburgh



technology innovation in city government and the broader community and facilitate efficient and effective city services by supporting data-driven decision making and continuous process improvement.

Department of City Planning works to create and maintain an orderly, timely, environmentally-sustainable, and consistent approach to land use and development within the City.

Activities

- The Department of Innovation and Performance works with the Western PA Regional Data Center, the official holder of the city's data systems, and legislation mandates that all data sets default to open if they are not mandated to be private. Data provided to the Data Center is reviewed by the Department of Innovation, the Department of Law, and the relevant department director whose data is being shared. The City seeks to move from simply sharing the data to using the data to drive decision-making.
- On the analytic front, the city's goal is to move from data collection and organization to artificial intelligence efforts that can predict where the problems will emerge next. This approach utilizes sensor technology with remarkable capacities to collect and analyze large quantities of data. The city is committed to using data to promote equity and inclusion.
- The Department of City Planning houses the Chief Resilience Officer for the city. The scope of work for this office is the intersection of policy, infrastructure, and practice. The Chief Resilience Officer seeks to develop concepts for the city that are focused on creating a foundation for sustainability internally and externally in city government, as well as connecting Pittsburgh to a larger network of urban resilience efforts of the [100 Resilient Cities](#) program.

Academic Institutions



About

Carnegie Mellon University, Metro21 Institute and Mobility21

CMU's Metro21: Smart Cities Institute seeks to research, develop and deploy 21st century solutions to the challenges facing metro areas.

Mobility21 aims to discover, shape and guide new possibilities to transform transportation as they know it for all modes and in all regions of the country.

Activities

- Metro21 works on research on issues related to cities in a system-of-systems approach. Systems include mobility &

Pittsburgh



transit, safe water, economic prosperity, smart buildings and infrastructure, and engaged citizens.

- Some examples of projects shared between both institutions include: 1) Equity & Ethics of transportation - Where are autonomous vehicles parking?; and 2) work with residents on collection of air quality samples in which data was shared with the EPA and a year later, the penalties levied as a result of the gathered data resulted in significant drops in asthma and cardiovascular disease.



[About](#)

[Activities](#)

Western Pennsylvania Regional Data Center

The Western Pennsylvania Regional Data Center provides a shared, inclusive infrastructure for open data. Staff associated with the Regional Data Center manage a shared community open data portal, automate data feeds from publishers, and build tools that make use of the data.

- The Regional Data Center is a partnership between the University of Pittsburgh, The City of Pittsburgh, and Allegheny County and houses 314 data sets from the City, County and local partners.
- The WPRDC also works to provide training opportunities, often in partnership with different community groups. Trainings are targeted at those new to using data for decision making. Resources are also provided for those with more data analysis experience.
- The WPRDC also provides a set of tools that aggregate data sets hosted at the WPRDC to create data tools that can be used for analysis. Tools include a property dashboard, performance metrics, and voting results.

Nonprofit and Philanthropy



[About](#)

[Activities](#)

The Heinz Endowments

The Heinz Endowments seeks to help their region thrive as a whole and just community, and through that work to model solutions to major national and global challenges.

- The Community and Economic Development Team works on the ground with the community and grantees. They also connect this work to the research horsepower at Carnegie Mellon University and University of Pittsburgh to provide a

Pittsburgh



source of R&D deployment tools otherwise unavailable to the community.

- As Pittsburgh recovers, a key question for the foundation is helping neighborhoods to survive and revitalize without displacing the long-term resident populations.
- Heinz grantees include community-based organizations, universities, city and county government, and civic organizations.



Hillman Family Foundations

About

Based in Pittsburgh, HFF supports the philanthropic and civic work of four generations of Hillman family members. With program interests in seven cities and regions across the United States, each of the 18 foundations has a unique mission and geographic focus.

Activities

- The Hillman Family has been a fixture in the region since the late 17th century. Their focus is on initiatives and not just projects. Foci include: smart transportation, research, development, deployment of “Traffic 21” that include prototypes addressing fuel economy, air quality, decreased congestion, reduced transit time, etc.
- Hillman funds targeted advocacy work, including low-income customer service projects. (e.g., the Pennsylvania Low Income Utility Project). The foundation supports roles that include technology co-incubators, accelerators, app development (e.g., prenatal app My Healthy Pregnancy).
- They seek to advance pooled funding approaches with government that include the Human Services Integration Fund and the Public Health Innovations Fund. They are part of a group of 15 foundations that meet regularly with the local public health authority to plan integrated approaches to core public health services.



About

Grounded

Grounded uses the process of reclaiming vacant and underutilized land as a platform for engagement, education, and building trust among communities. This “people and places” approach intentionally acknowledges that any physical interventions will need to be sustained by passionate and prepared individuals and that in order for residents to

Pittsburgh



thrive in all aspects of their lives, they must find support, safety, and pride in their physical environment.

Activities

- Grounded utilizes a community and technology interface to promote citizen engagement and problem solving, straddling the divide between community development, and the environmental sector.
- Their primary focus is on reducing blight, effective land use, creating green spaces, safe play spaces, and storm water runoff. They define one of their goals as preserving green spaces permanently in Pittsburgh as redevelopment and gentrification pressures increase. Their focus is on lower income, higher vacancy neighborhoods.
- They manage a local community ambassadors program and are using new technological tools and apps to better track hours served and to share the status of projects.



Academic Institutions



About

Activities

University of Illinois-Chicago, Institute for Policy and Civic Engagement

The Institute for Policy and Civic Engagement (IPCE) focuses on transforming democracy by creating a more fully engaged citizenry with more effective leaders.

- IPCE engages in research and contract work that focuses on three priorities: educating the public to be more engaged in democracy; leadership development that seeks to make youth, college students, and adults more effective community leaders; and making government more responsive to resident voices.
- They are driving more effective democracy through educational programs that support communities.
- They engage Chicago-area residents on issues at the neighborhood, city, and county levels—through the use of dialogue and deliberative processes. These engagement methods include brown bag discussions, speaker series, training and leadership development programs, and youth engagement.
- IPCE runs the Urban Public Policy Fellowship program, a leadership development program that engages historically underrepresented minority undergraduate students on policy-making, advocacy, and community development.



About

Activities

University of Chicago, Urban Labs

The University of Chicago Urban Labs works to address challenges across five key dimensions of urban life: crime, education, health, poverty, and energy & environment. They partner with civic and community leaders to identify, test, and help scale the programs and policies with the greatest potential to improve human lives.

- Urban Labs works in the Chicago region but also partners with other cities, including New York City and Los Angeles, leveraging data science, user-centered design, and behavioral economics to improve policy and service delivery. They use rigorous scientific methods like randomized controlled trials and machine learning to test different approaches to improving urban life and predict who will benefit most from them.
- They maintain more than 100 data sharing agreements with public agencies; moving towards master data-sharing

Chicago



Activities

- DSaPP runs trainings for students, public and private sector, and non-profit employees focused on the benefits of data-driven decision making and how to scope data science projects.
- They work with civic partners on projects across health, criminal justice, public safety, education, economic development, and transportation. These projects focus on data science approaches to operational priorities that often result in the development of new tools that help drive social impact and improved service delivery.
- DSaPP conducts research on needs to advance issues at the intersection of civic priorities and computer science, machine learning, artificial intelligence, and social sciences. These issues include algorithmic bias and transparency and validating and monitoring data science approaches.
- They also run the [Data Science for Social Good](#) (DSSG) fellowship, a summer program that partners data scientist students with governments and nonprofits to undertake social impact projects focused on education, health, energy, public safety, transportation, economic development, international development, and more. DSSG has been embraced as a national model that has spread to universities around the world.



About

Chapin Hall

Chapin Hall combines rigorous research methods to generate evidence, while providing implementation support to apply that evidence in the field. Experts work alongside community and agency partners to build more effective services and systems, accelerate the use of evidence in practice, and better serve children, youth, and families.

Activities

- Chapin Hall partners with a number of state and local governments in Illinois and the Chicago region, as well as a number of partners elsewhere in the country to conduct research, create new tools, and serve as a data intermediary.
- It manages the Integrated Database on Child and Family Services in Illinois, which brings together data from a range of public state and local agencies. The system serves as a platform for policy change, research, and the use of emerging computational and algorithmic methods to enhance the effectiveness of the system.
- The [Voices of Youth Count](#) is a national policy research initiative in 22 communities that captures data about youth homelessness to understand the size of that population and

Chicago



Nonprofit, Philanthropy and Industry



BrightHive

About

BrightHive is a data infrastructure company focused on helping the social sector get the data it needs to make better informed, real-time decisions. They believe that by building data sharing and analytics infrastructure we can enable faster, easier innovation by all. Their ultimate goal is to change the way social change is financed.

Activities

- Many of those on Brighthouse’s team have roots in Chicago’s civic tech and data science communities, including connections to Data Science for Social Good.
- Brighthouse develops data trusts, which allows networks of organizations to securely and responsibly share and collaborate with data, generating new insights and increasing their combined impact.
- Brighthouse’s data trusts embrace a number of design features and principles, including security and privacy, a unified legal framework, transparent governance, open source technology, embedded ethics, and a learning community.
- These data trusts offer promise for social innovation by developing a better “mousetrap” for data sharing and integration, allowing public sector and non-profit organizations to coordinate activities and develop cross-organization data-driven strategies and service delivery.

City Tech

About

City Tech is housed at UI LABS, which was established to bring together top talent from universities + industry (the “UI” in their name), and civic organizations to pursue innovation and drive tech-based economic development in the Midwest.

City Tech transforms cities into testbeds for new ideas. With partners and people, they remake essential services and infrastructure, from skills to skyscrapers. They then prepare these solutions for other cities, thus increasing the world’s odds of solving big, urban problems.

Activities

- City Tech leads the CUTgroup, which engages 2,000+ residents to contribute to emerging technology issues while providing public, private, and social sector partners with feedback to improve product design and deployment.

Chicago



- They undertook civic engagement for the Array-of-Things project, a large urban sensor project in Chicago, which included online and in-person engagement methods that explored issues related to governance and privacy of the deployment.
- They also developed the [Chicago Health Atlas](#), a data portal that draws for 30 public and private data sources, and allows users to understand health outcomes and statistics by neighborhood for the city of Chicago.
- Their focus is on leadership development, including the attraction and retention of data expertise in local government, ensuring there is a strong pipeline to fill jobs and sustain the work, and clarity in the role of key government innovation jobs.

MacArthur Foundation

About

John D. and Catherine T. MacArthur Foundation

The John D. and Catherine T. MacArthur Foundation supports creative people, effective institutions, and influential networks building a more just, verdant, and peaceful world. MacArthur is placing a few big bets that truly significant progress is possible on some of the world's most pressing social challenges, including over-incarceration, global climate change, nuclear risk, and significantly increasing financial capital for the social sector.

Activities

- The MacArthur Foundation was an early leader in civic tech, supporting efforts like the Smart Chicago Collaborative (now part of City Tech) and the Array-of-Things and national efforts, like the organization of MetroLab Network, and support for Living Cities and the Urban Institute.
- The MacArthur Foundation recently launched a new Chicago strategy, which included five funding priorities: Strong Organizations; Civic Partnerships; Vital Communities; Influential Leaders; and Arts & Culture.



Summary and Takeaways: New York stands out as a city home to a unique ecosystem of national organizations. Because of the size and scope of NYC organizations, many of the organizations like Sidewalk Labs, UrbanX, 100 Resilience Cities have national and international portfolios. There is, of course, a set of innovative work happening locally within the NYC Economic Development Corporation, New York University, and New York City Government, among others.

Local Government

NYC Analytics [Mayor's Office of Data Analytics](#)

About

The Mayor's Office of Data Analytics (MODA) is New York City's civic intelligence center, allowing the City to aggregate and analyze data from across City agencies, to more effectively address crime, public safety, and quality-of-life issues.

Activities

- MODA engages the public to think differently about data including what can be done with the results of data analytics. They have done this through: access to a good customer service platform, getting answers quickly to questions asked by the public, getting information to people through multiple channels, including email, creating opportunities to learn, e.g., “Open Data Week”, and building a community of people who value and use open data.
- In addition to engaging the public, MODA works with other city agencies to increase data-driven decision making. City agencies act as clients to MODA. MODA helps with business analysis and decision points.
- MODA convenes communities of practice including: Open Data Coordinators which are situated in each city department and act as change agents helping to inform and develop open data efforts; Analytics Exchange, a community of practice for data analysts across City agencies; and an [Automated Decision Systems Task Force](#), a group that convenes to address inequities and ways in which data algorithms in use by the City creates the risk of interference with due process, etc. That Task Force group is developing recommendations for 2019 for citywide policies and enforcement operations.



New York City Department of Information Technology & Telecommunications

About

The New York City Department of Information Technology & Telecommunications (DoITT) provides for the sustained, efficient, and effective delivery of IT services, infrastructure, and telecommunications to enhance service delivery to the City's residents, businesses, employees, and visitors.

Activities

- DoITT provides services for city agencies including operations & professional services, and City-wide network and telecommunications. DoITT serves 100 agencies, including mayoral agencies, non-mayoral agencies, city commissions, and community boards. DoIT seeks to provide a center of technical excellence for all their customers.
- DoITT also seeks to promote innovation, (e.g., Text 911 option, 311 project management and improvements, etc.).
- DoITT manages the open data platform for the Mayor's Office Of Data Analytics and is looking for ways to innovate and make that data more useful to the community and is seeking to move towards more and better predictive analytics through better integration of data sets.



New York City Economic Development Corporation

About

The New York City Economic Development Corporation (NYCEDC) consists of teams of skilled and dedicated individuals with know-how and expertise across many fields including community/neighborhood development, workforce development, real estate, industry and sector analysis, design, urban planning, marketing, engineering, financial analysis and more. NYCEDC is dedicated to the creation of a dynamic, equitable, and sustainable urban economy.

Activities

- The Initiatives Group seeks to create an innovation ecosystem that can diversify the traditional NYC economic base of finance and real estate and move it towards technology and innovation. The Urban Technology Team focuses on real estate, the built environment, water and waste, transportation and mobility, civic technology, and the transparency of government.
- NYCEDC also seeks to develop new models for cultivating local talent vs. important external talent. This requires exposing



youth to the issues at a hyper-local level to involve them in solution-oriented tech conversations at the neighborhood level. It also requires drawing tech sector interest into the local community and engaging them in community-driven dialogue about problems and solutions.

- One example of cultivating local talent included a hyper-local, community-driven solution: composting of waste by residents of public housing, use of a local aerobic digester that created fertile soil for community gardens. This created a decentralized approach to garbage, compost and gardening that changed the City's top-down approach to waste management with an alternative that operationalized a new approach from the bottom up.



bits + atoms

[About](#)

[Activities](#)

Bits and Atoms

Bits and Atoms is a network of urbanists and technologists who work with clients in industry, government, and the nonprofit sector to create the conditions for smart cities to flourish organically, by design.

- Bits and Atoms is working on rethinking things such as city charters for the digital age. They are looking at how data about citizens is collected.
- They are interested in exploring ways that government should be organized and restructured for the 21st century city.
- They explore questions such as: Who owns the data? Why is it being collected? Who gets to use it? What about those who don't want to participate in being observed?

Academic Institutions



NYU | WAGNER



NYU | Center for Urban Science + Progress

New York University's [Wagner Innovation Labs](#) and the [Center for Urban & Science Progress](#)

[About](#)

The Wagner Innovation Labs are a new series of policy experiments that marry theory and practice to promote informed, evidence-based decision-making in a complex world.

New York University's Center for Urban Science & Progress (CUSP) is a university-wide center whose research and education programs are focused on urban informatics. Their interdisciplinary research teams bring together experts in the physical and natural sciences, computer



Activities

and data science, the social sciences, engineering, and professional fields such as policy, design, and finance.

- The Wagner Innovation Lab serves as a think tank and interfaces with multiple networks across the ecosystem including the US Conference of Mayors, the Network of Chief Data Officers, the Harvard Kennedy School, and more.
- CUSP is focused on urban informatics and data science tools, with a weighted focus on what city agencies can do better. Graduate students completing “capstone programs” that address problems and challenges in the urban landscape. An example of a capstone project is the “Sounds of NYC”: Working with the Department of Environmental Protection on ways to enforce noise reduction ordinances.
- CUSP is also working on the Quantified Community Project. This project looks at how neighborhoods can impact individual and social/community outcomes over time through combining city administrative data, air and environmental sensor data, and citizen-generated data. This work is underway in five communities: Lower Manhattan, Governor’s Island, Brownsville, Red Hook and Hudson Yards.

Nonprofit, Philanthropy and Industry



About

100 Resilient Cities

In 2013, The Rockefeller Foundation pioneered 100 Resilient Cities to help more cities build resilience to the physical, social, and economic challenges that are a growing part of the 21st century. Cities in the 100RC network are provided with the resources necessary to develop a roadmap to resilience.

Activities

- Rockefeller 100 Resilient Cities Initiative provides two years of funding at city wages to launch CRO roles, and help the cities make the role sustainable. There are 85 active CROs with 46 established resilience strategies.
- The focus of the work is on helping cities address and manage “shocks, stresses, and risks” – the things that can happen in cities to throw them off pathways to existing pathways and priorities.
- Rockefeller’s goal is that the city owns a 30-year strategy with 30-year vision and goals around issues such as climate change, the economy, and the health of the community.



Obama Foundation

About

The mission of the Obama Foundation is to inspire, empower, and connect people to change their world. They are working to equip civic innovators, young leaders, and everyday citizens with the skills and tools they need to create change in their communities.

Activities

- The Foundations current activities include work exploring new methods of civic engagement, especially with youth. Current programs include: 1) Partnerships in the K-12 space to promote civics education in Chicago Public Schools, with a particular focus on how to ensure access to civics education is provided equitably, 2) On-line training and resources for civic learning that targets 18-25 year-olds and 3) Building out blended learning experiences in civic engagement. They have developed a pipeline of 800 emerging citizen leaders, from initial contemplation to specific activations in the community.
- Sample activities and projects of the young adults in the blended learning experience include: 1) Intentional community conversations that promote “deep listening”. One of the goals in this work is to distinguish between “communities of support”, (where I get my support to energize my work), and “communities of impact” (where I live and work); and 2) In Phoenix, three women have worked to break the taboos about discussing domestic violence and sexual assault and provide the community with access to information about how to get help. Their efforts have normalized talking about these difficult issues and connecting these issues to similar topics that emerge in the lived experiences of the community.



About

Living Cities

Founded in 1991, Living Cities harnesses the collective power of the world’s largest foundations and financial institutions to build a new type of urban practice that gets dramatically better results for low-income people, faster.

Activities

- Living Cities seeks to stimulate innovation in cities to create better results for low-income people.
- Living Cities recognizes a key part of this work is the use of data and resident engagement. As so they are working to: increase access to the data, develop the ability to process the data,



provide the ability to interpret the data, and apply the data to continuous quality improvement.

- Examples of Living Cities supporting work in this area include: 1) in St. Louis, the court system, which has been centralized in order to make a single system that is transparent and accessible across multiple court jurisdictions and 2) in Boston, a summer youth jobs program that is moving towards an automated process of co-designing a job-matching algorithm with the involved youth.

URBAN X

Urban X

About

Urban X is a unique startup incubator. Startups in their portfolio tackle some of the toughest challenges that cities face today. They create disruptive and scalable solutions across sectors such as real estate and construction, infrastructure, mobility, food, water, energy, and more.

Activities

- Every six months, Urban X selects up to 10 urbantech startups and invest \$150,000 per company. Their 20-week accelerator program equips startups facing the unique challenges of working with and in cities.
- Urban X shares the work of these cohorts of startups on a demo day, which provide an opportunity for new startups to showcase their work.



About

Sidewalk Labs

Sidewalk Labs is Alphabet Inc.'s urban innovation organization. Its goal is to improve urban infrastructure through technological solutions, and tackle issues such as cost of living, efficient transportation, and energy usage.

Activities

- Sidewalk Labs has established a [lab in Toronto](#) to help plan the development of a major portion of the city's waterfront area that is in the process of being developed. This is a large-scale urban design exercise that is trying to incorporate issues of affordability, access, and reduced emissions.
- They seek to create a "manifesto for the future of urban living" through addressing issues like social infrastructure, diversity and affordability, mobility and sustainability, product and technology, and governance.

Houston



Summary and Takeaways: Houston’s civic innovation ecosystem is relatively nascent and largely driven by a handful of major players in the region. Much of the civic innovation work underway with the City of Houston is done in partnership with Rice University, or with other academic institutions, nonprofits and other community organizations. As a large city with diverse constituents, there is interest from local researchers, activists and other community planners to continue to build out the civic innovation ecosystem. Natural conveners, like the Houston Endowment, are playing a role in bringing many of these disparate groups together.

Local Government



[About](#)

[Houston City Hall, Office of Innovation and the Department of Information Technology](#)

The Mayor's Office of Innovation is leading the City's efforts to provide insight to the public and City leaders, improve the way government operates and innovate so that Houston continues to grow as a world-class City.

The Department of Information Technology Services provides enterprise IT services for the City of Houston. These services include voice and network, cyber-security, email and communication platforms, and shared enterprise applications that are used by all City employees.

[Activities](#)

- Houston City Hall is working on improving access to open data.
- They are focusing on resiliency systems and services.
- City Hall is also working on encouraging entrepreneurial efforts through hackathons and work with the local universities on specific focus areas and projects.

Academic Institutions



[About](#)

[Kinder Institute for Urban Research at Rice University](#)

The Kinder Institute for Urban Research is a multidisciplinary think-and-do tank housed at Rice University in central Houston, focusing on urban issues in Houston, the American Sun Belt and around the world. Through informed research, data, and policy analysis, the Kinder Institute hopes to engage civic and political leaders to implement solutions to critical urban issues.

[Activities](#)

- The Kinder Institute research activities are centered around economic development, health, education, housing, transportation and Hurricane Harvey.

Houston



- There is an open data movement taking place in Houston and Kinder worked to develop a [Houston Community Connections Data Portal](#) to address data deficiencies across Houston and the region. The data portal provides trainings for not-for-profits on how to access and use the data, working to promote data literacy and staff skills in using and analyzing their own agency's data to inform decisions.
- In 2016 they joined the [National Neighborhood Information Partnership](#), supporting mapping projects in 144 neighborhoods.
- Kinder has been conducting the annual [Houston Area Survey](#) which collects data about the perceptions of a broad cross-section of residents in the Houston area, and is the longest-running public opinion survey in a large US city.

Nonprofit and Philanthropy



[About](#)

[Texas Criminal Justice Coalition](#)

The Texas Criminal Justice Coalition (TCJC) advances solutions and builds coalitions to reduce mass incarceration and foster safer Texas communities. In their vision, all Texans live in safe, thriving communities where incarceration is rare, and every person has the opportunity to succeed.

[Activities](#)

- The team in Houston maintains the [Criminal Court Dashboard](#), which includes 800,000 Harris County Criminal Court dispositions from 2010 to the present.
- TCJC encourages community-based organizations to utilize the data in ways that can confirm what communities, especially racially segregated communities with limited access to treatment and supportive resources, already know and to highlight the prevalence of racial disparities in law enforcement in affluent vs. poorer communities.
- One of the goals of the Dashboard has been to promote fluency in criminal justice data for elected officials.



[About](#)

[Arnold Ventures \(formerly the Arnold Foundation\)](#)

Arnold Ventures is a philanthropy dedicated to tackling some of the most pressing problems in the United States. They invest in sustainable change, building it from the ground up based on research, deep

Houston



thinking, and a strong foundation of evidence. They drive public conversation, craft policy, and inspire action through education and advocacy. Arnold Ventures works in four key issue areas: Criminal Justice, Education, Health, and Public Finance. Their work is guided by Evidence-Based Policy, Research, and Advocacy.

Activities

- Arnold Ventures prioritizes grants focused on results-driven government.
- The Evidence-based Policy Portfolio at Arnold Ventures developed the Arnold [Policy Labs](#), which focuses on Criminal Justice, Higher Education, Opioids and Public Health, Economic Opportunity and Health Care.
- The Policy Lab work has resulted in policy changes (new laws), process changes (reallocation of resources), and programmatic changes.

LINK HOUSTON

About

Activities

LINK Houston

LINK Houston advocates for a robust and equitable transportation network so that all people can reach opportunity.

- LINK Houston advocates for better public transit and pedestrian-bicycle safety and access.
- Community engagement has been the critical piece of LINK Houston's work. They have sought to go deep in these efforts, listening to — rather than talking to — the community, building the relationships that lead to candid assessments of transportation issues and gaps. Their primary focus has been on outreach to local communities — especially under-represented ones — to teach them how to advocate for themselves.

Sketch City

About

Activities

Sketch City Houston

Sketch City is an open community of technology advocates. They work together to advance technology and data in public-decision making.

- Sketch City Houston seeks to organize the tech community in Houston through structured activities, engagement regardless of skill set, and showcasing solutions to policy and other officials.
- They host the annual Houston Hackathon, in addition to a number of other events throughout the year.

Houston



About

Houston Endowment

Houston Endowment is a private philanthropic institution that works across the community for the benefit of the people of greater Houston. With assets of over \$1.6 billion, the foundation makes grants to nonprofit organizations in order to enhance civic assets, strengthen systems that support residents, promote post-secondary success, and build a stronger region.

Activities

- The Endowment grants \$70 million a year in 8 counties in the Greater Houston area, with a focus on improving economic disparities in the region.
- They maintain a broad, place-based mission with four specific focus areas: strong civic access, post-secondary success, thriving residents (health and human services), and a stronger region.
- The Endowment acts as one of the largest conveners of civic engagement in the Houston region.
- They are currently spearheading a lot of work focused on Census 2020 by deepening engagement with communities, bringing together collaborative leaders across communities, capacity building, and driving team-based decision-making approaches.



About

Houston in Action

Houston in Action is an initiative made up of people and organizations who have come together to advance their community forward through their respective and collective work to build a stronger Houston through a culture of civic engagement.

Activities

- Houston in Action brought together multiple constituencies and sectors to work together on common problems.
- The members of Houston in Action are no longer competitors (in terms of seeking the same, limited funding sources) and can now be supportive to increase their organizational capacities and their collective voice.
- They have created issue-specific task forces with a focus on both quick wins and long-term solutions.
- A part of their work is researching the use of technology and what is working and not working in reaching communities.

Houston



About

Activities

Flood Mitigation Consortium

Through the Greater Houston Flood Mitigation Consortium, leading researchers from institutions in the region came together to compile, analyze and share a rich array of scientifically-informed data about flooding risk and mitigation opportunities.

- The Consortium is a time-limited initiative. It was convened post-Harvey to explore what is next for the city, making use of local expertise. It has brought together knowledge from multiple sectors.
- The Consortium's researchers are collaborating to compile, analyze, and share scientifically-informed data about flooding risk and mitigation opportunities.
- They release reports and studies on an ongoing basis to help inform local officials, policy advocates, and the community.

Portland



Summary and Takeaways: Portland, with a unique form of local government with distributed control over departments, has pockets of leading civic innovation in city government, including work at their Bureau of Planning and Sustainability. Multnomah County’s “Idea Lab” and the County Library both work across departments to bring innovation, design-thinking, and new practices to County activity. Portland State University is critical for government workforce development and research partnerships, though some of the research activities with the most potential are nascent and are still seeking funding to achieve full impact. The Coalition for the Communities of Color plays a strong role as a small nonprofit that engages with the region and state in advocating for racial justice and data and leadership capacity. Make+Think+Code at the Pacific Northwest College of Art is a unique institution that emphasizes cross-disciplinary and socio-technical approaches on some civic data and technology issues.

Local Government



Multnomah County, [Office of Information Technology](#); [County Library](#); and [Idea Lab](#)

About

Multnomah County is Oregon’s most populous county, and home to Portland, the most populous city.

The Information Technology office offers traditional IT services, but also advances data-driven decision-making within the County.

Multnomah County Library’s mission: Empowering our community to learn and create. Their pillars are: free access for all, a trusted guide for learning, the leading advocate for reading, a champion for equity and inclusion.

Multnomah Idea Lab: charged with seeking policy and innovation solutions within the human services sector and local County government.

Activities

- The County houses a range of data and innovation activities, assembled throughout several offices and institutions, but connected through close collaboration.
- The Library, in addition to its vibrancy in traditional library services (it ranks #2 in annual circulation among U.S. libraries serving fewer than one million residents), focuses on data-driven civic engagement, with the goal of creating a “digital equity action plan” to promote digital inclusion, through connecting digitally excluded communities to the hardware, training, and internet access and skills. Its Rockwood Makerspace serves East Multnomah County, which has the lowest levels of internet access and tech resources and works youth and adults to cultivate skills in the STEAM fields.



- The Department of Criminal Justice Case Companion is a database and tool that keeps crime victims connected to the criminal justice system resources throughout their journey through the system.
- The County’s Service Coordination Portal Engine is an integrated data portal that promotes the coordination of services across human services, health and community justice systems and provides the public with an integrated data portal that offers a single access point for basic information about shared county clients.
- The County is working on plans for “A Smart and Equitable Multnomah County,” a smart cities agenda that would seek to connect disenfranchised communities with information, opportunities and solutions to fundamental community challenges.
- The Multnomah County Idea Lab is a learning lab to study and test new approaches to fight poverty and racism and seeks to positively change community conditions resulting from the intersection of poverty and race. Its work includes applied research and human-centered design and includes collaborations with a number of City and County departments.
- The Idea Lab has a program that houses homeless people in backyard dwellings that the owners can use for other purposes (e.g. rentals) after a certain period as a way of making housing available and affordable to people experiencing homelessness.
- It is also working on efforts to increase the rate of eligible people who claim the earned-income tax credit in the region.



Office of Mayor Ted Wheeler
City of Portland

About

City of Portland, [Office of the Mayor](#) and the [Bureau of Planning and Sustainability](#)

The Government of Portland, Oregon is based on a city commission government system. Elected officials include a Mayor, City Council, and a City Auditor. The mayor and commissioners (members of City Council) are responsible for legislative policy and oversee the various bureaus that oversee the day-to-day operation of the city. The auditor is responsible for ensuring that the government operates in good faith.

The Bureau of Planning and Sustainability takes action to shape the future of Portland and advance climate protection for a more prosperous, healthy, equitable and resilient city now and for future generations. Its Smart City PDX is partnering with the Portland community to make their city a place where data and technology are

Portland



used to improve people's lives, particularly in underserved communities.

Activities

- Addressing homelessness is a key city priority, working with Multnomah County on the “A Home for Everyone” coalition, which emphasizes equity as a core value behind budget priorities. There is an increasing focus on culturally specific providers with demonstrated outcomes in reducing homelessness.
- Another area of focus is on promoting equity between the east and west sides of the river, as it related to parks, roads, transportation and housing.
- The Bureau of Planning and Sustainability leads the Smart City PDX work, which is guided by an emphasis on equity, with outcomes focused on communities of color and people with disabilities.
- The City's Open Data work ([Portland Open Data Lake](#), or PUDL) seeks to achieve the fullest transparency while establishing a privacy framework that instills trust in the community. That approach includes an Open Data Work Group, which has established core values and is now focused on engaging the community.
- The City's “Digital Inclusion Network” includes civic non-profits, grass roots leaders and activists, the County Library, and others, focused on defining goals and principles related to digital includes and data privacy. That work is being conducted in partnership with the Office of Equity and Human Rights and the Mayor's Office.
- Civic engagement is an area of significant focus, with that priority being rolled into an Office of Community and Civic Life that will address equity and opportunity issues and align “spikes of innovation” across stakeholders in the civic ecosystem in government and communities.
- Among many sustainability efforts, the City partners with a community-based organization, [Verde](#), to build data analytic capacities around environmental issues .

Academic Institutions



About

[Portland State University](#)

Portland State is Oregon's most affordable public research university whose mission to "let knowledge serve the city" reflects its dedication



to turning ideas into action — in Portland and around the world. More than 27,000 students from all backgrounds bring diverse perspectives to academic and campus life.

Activities

- As the city’s primary research partner, Portland State is involved in a number of city initiatives, including the Portland Open Data Lake, the “A Home for Everyone” Initiative, and as a partner on Smart City PDX efforts.
- The university recently launched Homelessness Research & Action Collaborative, which addresses the challenges of homelessness in Portland and beyond through research and evidence-based science that uncovers conditions that lead to homelessness. The Collaborative’s goal is to help reduce homelessness and its negative impacts on individuals, families and communities.
- Digital City Testbed Center is another new initiative that establishes a network of campuses in the Pacific Northwest where smart city innovation can be carefully tested before being deployed in communities at large.
- PSU is active in driving forward efforts to consider technology, economic, and research integration across the Cascadia Corridor, from Portland to Vancouver.



About

[Make+Think+Code, Pacific Northwest College of Art](#)

MAKE+THINK+CODE is a technology-focused research studio, institute, creative incubator, and lab that brings together members of Portland’s vibrant creative, tech, civic, and educational communities to explore the powerful role that creativity and technology play in the search for imaginative and impactful solutions to complex and urgent problems.

Activities

- Convenes community events, workshops, and hackathons to encourage cross-disciplinary and cross-community participation on a range of topics, including smart cities deployments like sensor technologies.
- The Census Innovations Lab, which is developing new ways for communities to rally around Census 2020 activities and then use the data collected in ways that serve the community, including using the data collected about communities to advocate for and with communities.
- Co-hosted event on [civic data and digital privacy](#) in collaboration with Smart City PDX that focused on providing feedback, ideas, and insights to the City of Portland's efforts in



navigating the operational and ethical issues in open civic data initiatives.

Nonprofit and Philanthropy



Coalition of
Communities of
Color

[Coalition of Communities of Color](#)

About

Formed in 2001, the Coalition of Communities of Color (CCC) is an alliance of culturally-specific community based organizations with representation from the following communities: African, African American, Asian, Latino, Native American, Pacific Islander, and Slavic. The CCC supports a collective racial justice effort to improve outcomes for communities of color through policy analysis and advocacy, culturally-appropriate data and research, and leadership development in communities of color.

Activities

- The [Regional Equity Atlas](#) is a research, education, and organizing project dedicated to promoting stronger, healthier, and more sustainable communities in the Pacific Northwest. Currently in development, the Regional Equity Atlas 3.0 will include an online mapping tool and interpretive website, which will enable the understanding of how well different neighborhoods, communities, and populations across the region are able to access the resources and opportunities they need to meet their basic needs and advance their health and well-being.
- Provides fee-for-service work for its members and for the region that seeks to offer better data for health, homelessness and housing planning, with a particular emphasis on accurately reflecting communities of color for planning and advocacy purposes, specifically related to the disaggregation of ethnic data by sub-populations, (e.g., Asian communities) to promote equitable access to funding and programming across communities.
- Engages on a number of data-related efforts, including support for the 2020 Census to ensure a fair count of underserved groups; focus on ensuring open data and administrative data is collected with consideration for racial equity; and cautioning against the “weaponization of data” including the use of data to undermine certain communities.

General Observations and Key Takeaways

There has been a groundswell of interest in driving change and progress in communities by leveraging data, technology, and civic engagement. Such efforts take advantage of numerous technological advancements, including cloud storage and computing, sensor technology, machine learning and artificial intelligence, next-generation connectivity, all while considering social and behavioral dynamics in communities. As each community defines their vision of civic innovation and engagement, their work will serve as “laboratories of innovation,” serving as guides for the approaches that, if successful, will be adopted at greater scale. Through this exercise, The Gates Foundation and MetroLab were struck by the commitment and passion from communities seeking to leverage civic technology and innovation to drive social equity, policy priorities, and service delivery.

There are a number of take-aways that emerged from the site visits:

1. The secret to effective civic innovation ecosystems is more about a network of human relationships than data- or technology approaches.
2. The people that are empowered to cut across functions in local governments, philanthropy, universities, and companies are the critical nodes in a civic innovation ecosystem.
3. Identify and empower the most natural convener(s) — foundation, local government, or academic institution — to sustain your civic innovation ecosystem.
4. Leveraging data and technology to address civic priorities is not a shortcut; successful projects rely on months and sometimes years of sustained attention and commitment.

Once again, we would like to thank the various individuals and organizations that offered their time to the Gates Foundation. You represent the frontier of civic innovation and we look forward to following your work in the years to come!

About MetroLab and Project Team

[MetroLab Network](#) is a national collaborative of cities, counties, and universities focused on leveraging data and technology to address local government priorities. Its members are institutionalized local government-university pairs that focus on “tech transfer for the public sector”. It was launched as part of the White House Smart Cities Initiative in 2015. The team members for this project included Ben Levine, Katy Getsie, Stefania Di Mauro-Nava, and Duaa Adam.