

CITY AND UNIVERSITY PARTNERSHIPS OFFER INNOVATION OPPORTUNITIES



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INTERVIEW WITH METROLAB NETWORK

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declining air quality. Cities have been unable to adequately research and develop solutions to these problems due to budget and/or human resource shortages, now exacerbated by the COVID-19 pandemic. However, these problems could present opportunities to harness smart innovations that will broadly benefit many cities. One approach for addressing these challenges is to encourage collaboration between cities and local universities.

Enter MetroLab Network¹, a nonprofit innovation promotion organization. The MetroLab Network works to connect cities and universities, enabling university researchers to leverage cities as “living labs” to address urban problems with an eye toward spreading solutions from one city to others across the U.S. In addition to scaling up its efforts nationally and globally, MetroLab is now poised to deepen its private sector partnerships, seeking to accelerate smart city innovations. Washington CORE spoke with Ben Levine, Executive Director of the MetroLab Network to learn about MetroLab's recent activities.

Historically, one of the strengths of U.S. cities has been their energy and ability to innovate.

Today, U.S. cities face a variety of challenges including the growing isolation of senior citizens, a rise in the number of homeless people, worsening traffic congestion, and



When Mr. Levine worked as a policy adviser for the U.S. Department of the Treasury under the Obama administration, he was involved in developing infrastructure and finance policy for state and local governments. Following that, he worked closely with the White House Office of Science and Technology Policy to organize and establish the MetroLab Network.

ADDRESSING URBAN CHALLENGES THROUGH COLLABORATION BETWEEN LOCAL GOVERNMENTS AND UNIVERSITIES

Universities across the U.S. have formidable technologies and resources at their disposal that could be used to address the challenges facing U.S. cities. As residents and stakeholders in their communities, universities develop an understanding of local problems and issues confronting city governments. The MetroLab concept is based on developing city and local university partnerships to serve as a problem solving platform.

MetroLab Network was established in 2015 under the Obama administration as part of the White House Smart Cities Initiative. Currently, 30 cities and universities participate in the Network, and 127 projects have been launched. Representative partnerships include Boston and Boston University and Northeastern University, Atlanta and Georgia Tech, and Austin and the University of Texas.

REAL PROBLEMS AND REAL SOLUTIONS

“When we think of smart cities, we tend to associate them with new technologies and consider how to implement them in cities. However, we should start working on actual problems first,” said Mr. Levine. In cities across the country, mayors and their deputies, police and other city organizations responsible for welfare, mobility, recreation, disaster and waste management, and health services are trying to address a myriad of day-to-day problems.

MetroLab promotes innovation via engagement and information exchanges, including an annual summit. It also works with federal agency partners that provide research grants to universities. In April 2020, in collaboration with the National Science Foundation, MetroLab launched the “Civic Innovation Challenge” to promote innovation in the areas of “community and mobility” and “disaster resilience”. The challenge solicits proposals for solving community-based problems and will award \$1 million to the winning university/city teams. MetroLab is organizing similar competitions on a smaller scale, like the “MetroLab Student Cup” in which individual students will compete for \$1,000 prizes for projects with impacts in their communities.

LIVING LABS: SMART CITY PROOF OF CONCEPTS

Innovation projects coordinated by MetroLab attempt to make real progress by applying cutting edge technologies. For example, Austin utilizes AI for a triage tool developed by the University of Texas to classify types of homelessness and decide how to best support each individual based on their circumstances. Given that there are many reasons for and types of homelessness, a variety of solutions and approaches are needed².

In Atlanta, Georgia Tech is trying to address the so-called “last mile” problem, where socially disadvantaged or “transportation challenged” people are unable to get to their destinations. Georgia Tech’s Socially Aware Mobility Lab uses machine learning technology to enhance the public transportation system to reach vulnerable people and improve access. The Georgia Tech program is multi-disciplinary and goes beyond transportation, seeking also to improve accessibility to jobs, health care, healthy food and education³. In Memphis, efforts are underway to improve response times for emergency services, such as a more effective way to dispatch fire engines⁴. In Cleveland, during the COVID-19 pandemic, AI has been used to help determine which parts of the city are safe to reopen for normal business, and which should remain under social distancing restrictions to minimize new infections. The AI tool analyzes current infection counts, population density, and awareness levels of proper social distancing protocols⁵.

In addition to helping solve important challenges for cities, MetroLab projects also help to advance cutting-edge university R&D. In Chicago, as part of the MetroLab Array of Things Project, the Urban Center for Computation and Data at the University of Chicago installed more than 500 intelligent sensors in utility poles to measure traffic conditions, urban floods, air quality, and other indicators to help inform city leader policy decisions⁶. In Pittsburgh, Carnegie Mellon University is creating a 3D simulation of the



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city's downtown using visualization technology that uses geospatial data and tools from partners in the city planning office and software companies such as SimCoach Games and Esri⁷. In Memphis, the Computational Intelligence Laboratory at the University of Memphis, in collaboration with the Federal Express Institute of Technology is developing brain-inspired algorithms to enable automated monitoring of video from surveillance cameras and identification of abnormal objects that may indicate security issues⁸.

According to Mr. Levine, some initiatives developed in one city are being replicated elsewhere. In Pittsburgh, for example, Carnegie Mellon developed a "Smart Traffic Signals"⁹ solution to reduce traffic congestion by coordinating traffic signals, and this Smart Traffic concept is now being widely adopted throughout the cities in the U.S. Also in Pittsburgh, a sensor-based system attached to vehicles monitors road surface conditions to determine maintenance priorities, an idea that has since scaled nationally¹⁰. Boston's Civic Research Agenda, developed to provide guidelines for policymakers on collaborating with external partners, has become a must read for cities pursuing digital transformation (DX).

METROLAB EXPANDING ITS REACH

One of MetroLab's goals is to expand its city-based success globally. To achieve this goal, MetroLab has been active in collaborating with international partners. Already, it is working with universities in the UK and Canada, such as the University of Glasgow and the University of Liverpool in the UK and the University of Alberta in Canada, and it is seeking to build relationships with more global partners.

In addition, after five years of developing partnerships between cities and universities, MetroLab has begun reaching out to private companies. MetroLab believes private industry can play a key role in improving quality of life via scaled up and expanded adoption of MetroLab-developed innovations.

Participating in the MetroLab Network can provide companies with insights into the challenges U.S. cities currently face, including the digital divide, civil rights, privacy and security issues. As Mr. Levine stated, "Start with the problems." Companies may also benefit from learning about the kinds of technology research that universities are exploring to address these problems, and opportunities to collaborate with universities to commercialize cutting edge solutions. Understanding the challenges and applicable technologies is essential to finding real solutions and will lead to a win-win-win relationship among cities, academia and private technology providers.

Endnotes

1 <https://metrolabnetwork.org>

2 <https://www.govtech.com/health/Using-AI-to-Assist-Those-Experiencing-Homelessness-in-Austin.html>

3 <https://www.govtech.com/transportation/Data-Driven-Research-Aims-to-Solve-First-Last-Mile-Problem.htm>

4 <https://www.govtech.com/public-safety/Data-Drives-Down-Nashvilles-Emergency-Response-Times.html>

5 <https://www.govtech.com/health/Real-Time-Risk-Assessment-Tool-Could-Aid-Reopening-Measures.html>

6 <https://datasmart.ash.harvard.edu/news/article/a-guide-to-chicagos-array-of-things-initiative-1190>

7 <https://www.govtech.com/analytics/Is-3-D-Visualization-Software-the-Future-of-Urban-Planning.html>

8 https://www.memphis.edu/fedex/research/smartcities/documents/presentations/banerjee_bonny_presentation.pdf

9 <https://www.cmu.edu/homepage/computing/2012/fall/smart-traffic-signals.shtml>

10 <https://www.roadbotics.com/company-about>

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