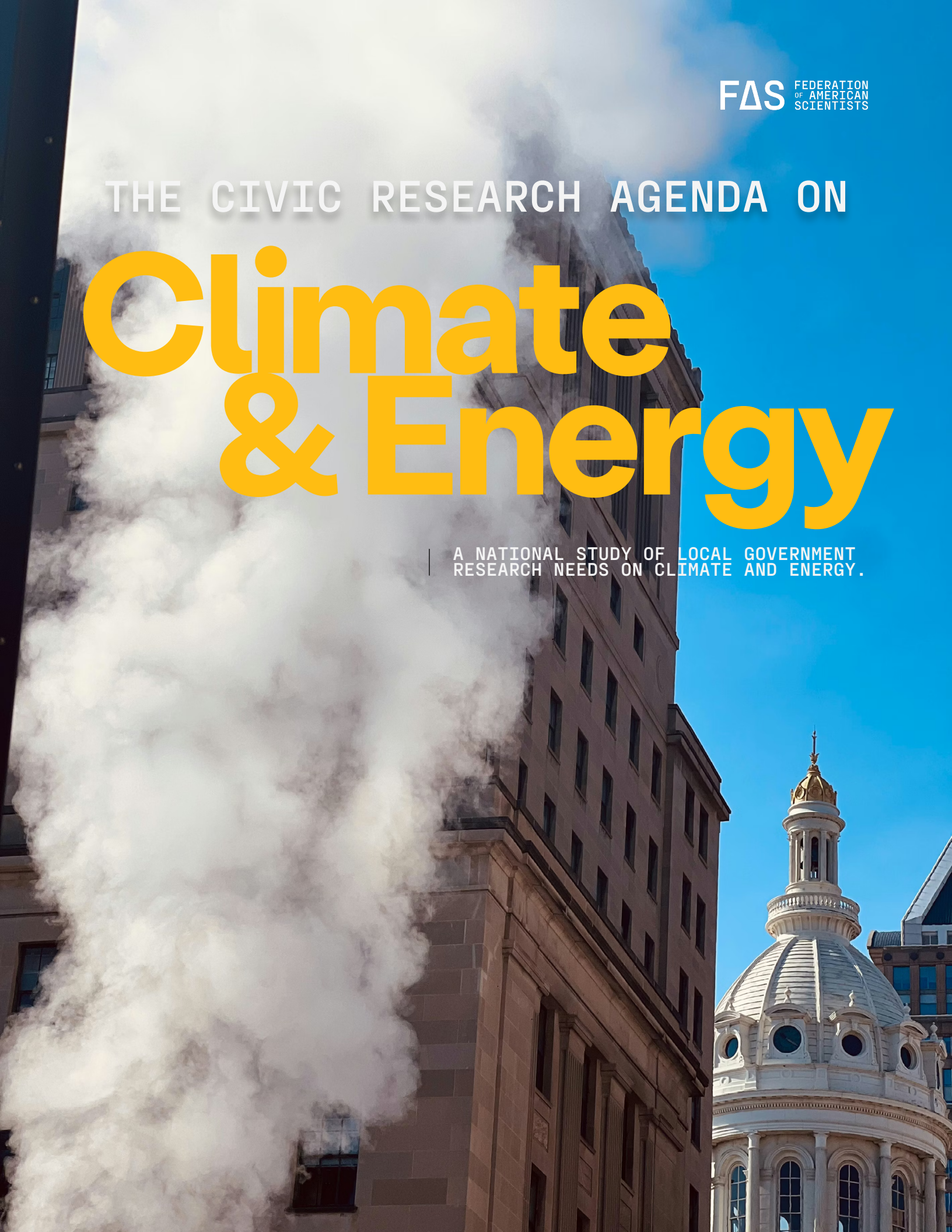


THE CIVIC RESEARCH AGENDA ON

# Climate & Energy

A NATIONAL STUDY OF LOCAL GOVERNMENT  
RESEARCH NEEDS ON CLIMATE AND ENERGY.



## About Us

### Lead author

↳ **Kate Burns**, Director, State and Local Innovation, Federation of American Scientists

### Contributing authors

↳ **Andy Gordon**, Associate Director, State and Local Innovation, Federation of American Scientists

↳ **Rose Mische Commins**, Senior Manager, State and Local Innovation, Federation of American Scientists

↳ **Stefania Di Mauro-Nava**, Consultant, State and Local Innovation, Federation of American Scientists

## About the Federation of American Scientists

The Federation of American Scientists (FAS) works to advance progress on a broad suite of contemporary issues where science, technology, and innovation policy can deliver transformative impact, and seeks to ensure that scientific and technical expertise have a seat at the policymaking table. Established in 1945 by scientists in response to the atomic bomb, FAS continues to bring scientific rigor and analysis to address national challenges. More information about FAS's work at [fas.org](https://fas.org).

The State and Local Innovation (formerly MetroLab) team within FAS aims to take good ideas from the lab to local governments through intentional, regular and impact-driven policy alignment. This mission is twofold: to put science in cities and to understand, support, and enable transformative partnerships between cities and universities. More information about the State and Local Innovation team's work at <https://fas.org/issue/metrolab/>.

Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the views of Schmidt Futures, our Steering Committee, nor the entirety of the Federation of American Scientists.

FAS can be reached at 1150 18th St. NW, Suite 1000, Washington, DC, 20036, [fas@fas.org](mailto:fas@fas.org), or through [fas.org](https://fas.org).

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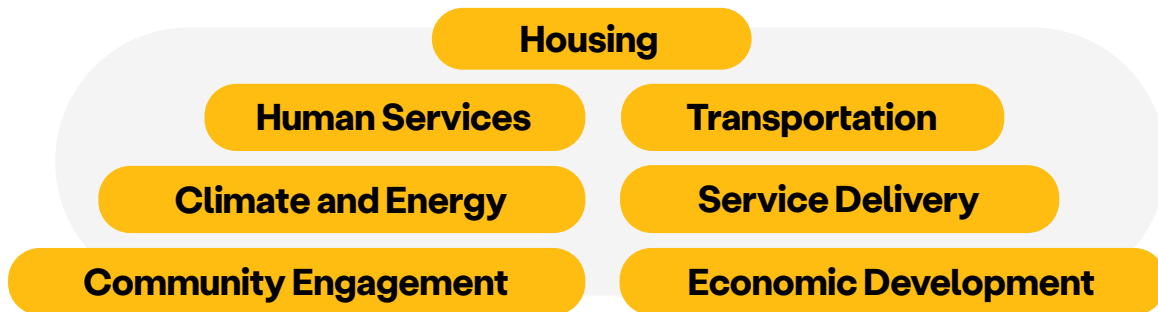
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## Executive Summary

The Civic Research Agenda is a culmination of several years of study, partnerships, and intelligence gathering that is the first comprehensive reporting on the priority research needs of American cities and counties. It considers the demand and supply of research: what are the research needs of local governments, and how can research outputs improve to “supply” or provide answers to better serve that audience?

The priority research needs for U.S. local governments are the following:



Beyond any specific policy domain, local governments expressed the desire for support from the research community in three overarching areas: 1) **evaluation**; how can the research community measure and provide evidence that a policy intervention has achieved desired (or negative) impacts; 2) **efficiency**; how can the research community help local governments do more with less; and 3) **data generation**; how can the research community create and provide access to useful data that do not currently exist.

This report provides the research needs specifically for climate and energy.

Based on demonstrated demand across national survey responses and in-person workshops, the top research questions representing priority needs from cities and counties on climate and energy are:

- ↳ **Support in creating a climate vulnerability assessment to city assets; that is, how can a local government generate and use localized climate data on flooding, heat islands, and air quality to inform infrastructure design and adaptation planning?**
- ↳ **How do disaster and flooding policies affect housing stability and displacement?**
- ↳ **What smart systems, maintenance strategies, or predictive technologies can strengthen infrastructure resilience and reduce vulnerability to severe weather events?**
- ↳ **How should environmental hazards in locations where a cluster of hazards are present be prioritized for mitigation?**

## Methodologies

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In 2024, the Civic Research Agenda project created a steering committee to support this endeavor. The purpose of this committee was multifaceted: 1) to provide guidance and assist MetroLab in selecting cities in which to conduct workshops; 2) ensure the agenda is representative of the diverse and dynamic needs of local governments across the country; 3) ensure that the agenda is appropriate in scope; an exhaustive research list doesn't necessarily reflect the priorities and urgency of local government research needs; and 4) review the final R&D agenda to ensure it is an actionable document that translates to the scientific ecosystem. The Steering Committee included the following individuals:

- ↳ **Hana Passen** | Director of Innovation & Partnerships, Stanford Impact Labs
- ↳ **Terri Matthews** | Director of Town+Gown:NYC @ NYC DCC
- ↳ **Joda Thongnopnua** | Directorate for Technology, Innovation and Partnerships (TIP), National Science Foundation
- ↳ **Justin Kits** | Assistant Vice President for Economic Development, The University of Tulsa (formerly Tulsa Innovation Lab)
- ↳ **Kevin Cooke** | Assistant Vice President, Research Policy, Association of Public and Land-grant Universities
- ↳ **Alvaro J. Muñoz** | Director, International, Community, and Economic Engagement, Association of Public and Land-grant Universities
- ↳ **Mark Ritacco** | Senior Advisor, Manatt, Phelps & Phillips, LLP (formerly Chief Government Affairs Officer, National Association of Counties)

Acknowledgement of these individuals demonstrates the collaborative and comprehensive nature of this effort. It does not, in any way, indicate that these individuals or their organizations condone this report and should not be taken as “sponsorship,” legal advice, or approval of its contents.

For the purpose of this report, “local government” is considered to include U.S. cities and counties, and “research” refers to the use of data, analysis, and evidence to inform local government decisions, policies, and implementation.

The Civic Research Agenda is informed by three primary sources, as described in detail below:

- ↳ A MetroLab-produced digital survey
- ↳ In partnership with the National League of Cities (NLC), a MetroLab-NLC digital survey
- ↳ In-person workshops hosted at nine locations

## **MetroLab Survey**

The Civic Research Agenda Survey was developed in order to gather feedback from a broader range of cities. MetroLab contracted with PorchLight Insights, a local government consulting firm based in Kansas City, MO, to manage survey development, administration, and analysis.

The survey instrument was developed with feedback from the Steering Committee, and sought to gather information about: 1) cities' experiences with research collaboration with university/college partners, including frequency and barriers; 2) priorities for research collaborations with university/college partners and feedback on specific ideas; 3) preferences for research reporting/communications; and 4) basic demographics about jurisdictions to allow for comparison (type, name, state, population). The survey was designed to primarily consist of multiple-choice or ranking questions to support a high rate of completion, with a few key open-ended questions. The survey was built in the Survey Monkey platform and tested for ease of use and readability with select local government staff.

While contact information was gathered in the survey to ascertain survey completion (particularly if multiple people from the same city or county took the survey), survey participants were informed that all individual responses would be kept confidential and not included in any reporting. Survey reporting was at the aggregate level, and any information that is attributable to individual answers was anonymized to exclude the participant name and the name of the jurisdiction.

The target survey audience was cities and counties across a range of population sizes and geographies that had some experience or opinion about local government research. To reach this audience, we partnered with other organizations that support local government research and innovation, including Results for America, the Alliance for Innovation, the Bloomberg Center for Government Excellence at Johns Hopkins University, and state municipal leagues. MetroLab and PorchLight Insights also distributed the survey through their respective contact channels. Outreach began in early April 2025 and continued through early July 2025 and each partner used their own distinct URL to allow targeted tracking of outreach. As this invite was sent to a network of local government representatives over several channels and over the course of several months, the total number of surveys "sent" are unknown. After cleaning the data, a total of 47 responses from local government staff were received through this survey outreach.

## **MetroLab-NLC Survey**

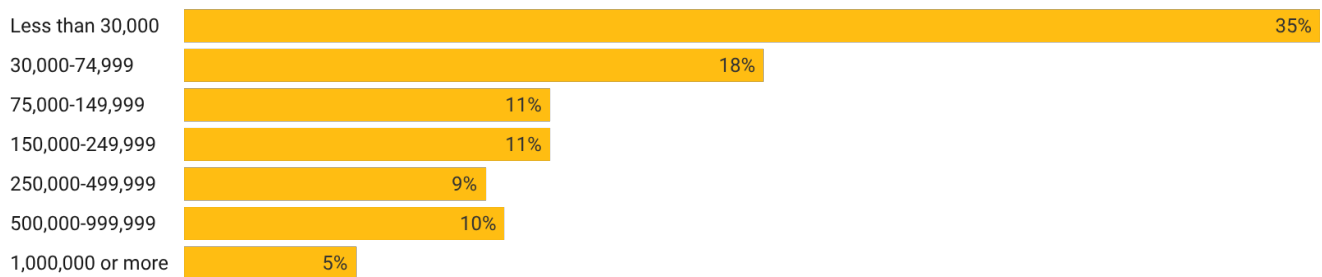
In an effort to further broaden outreach to cities, in June 2025 MetroLab partnered with NLC, which routinely sends "pulse" surveys via their platform to their network of municipalities to gather information about operations and best practices. To align with NLC's pulse survey structure, the Civic Research Agenda Survey was modified to include just five key questions, in addition to collecting basic demographic information. These questions all aligned with

questions from the full survey and included: 1) frequency of collaboration with university/college partners on research projects; 2) barriers to collaboration (open-ended); 3) priorities for research collaborations with university/college partners; 4) feedback on specific ideas for collaboration; and 5) research they would like to get from a college/university (open-ended).

NLC cleaned and provided the data to the project team, after which it was integrated into the previous survey with cross-cutting results reported. A total of 120 survey responses were received through the NLC survey process.

**In total, combining the MetroLab-NLC survey and the MetroLab survey,** this analysis includes a total of 167 survey responses. These responses represented 152 distinct jurisdictions and 37 states (plus the District of Columbia and Puerto Rico). The results primarily came from cities and towns (92%), representing a broad range of population sizes.

### Share of MetroLab-NLC Local Government R&D Survey responses by city population



### In-person Workshops

This initiative also included in-depth workshops with nine communities. MetroLab aimed to target cities and counties that represented a wide range of compositions. Ultimately, the nine workshops that were hosted showcase a mix of urban vs. rural, small vs. medium vs. large population, strong university partnerships vs. virtually non-existent, and geographic diversity.



Working collaboratively with mayors, county leaders, and university partners, these workshops allowed us to better understand best practices in creating actionable research, identify existing barriers, and to locally grow these ecosystems. The audience consisted of local government department leaders and staff, university faculty, and key community partner organizations (i.e., local community foundations, housing groups, and chambers of commerce).

TOTAL WORKSHOP ATTENDEES	
TOTAL NUMBER OF INDIVIDUAL PARTICIPANTS AT THE IN-PERSON WORKSHOPS	366
TOTAL NUMBER OF COMMUNITY PARTNERS	81
TOTAL NUMBER OF LOCAL GOV REPRESENTATIVES	139
TOTAL NUMBER OF UNIVERSITY REPRESENTATIVES	146
TOTAL NUMBER OF LOCAL GOVERNMENTS REPRESENTED	12
TOTAL NUMBER OF UNIQUE LOCAL GOVERNMENT DEPARTMENTS REPRESENTED	85
TOTAL NUMBER OF UNIVERSITY INSTITUTIONS REPRESENTED	42
TOTAL NUMBER OF COMMUNITY ORGANIZATIONS REPRESENTED	59

The “bucketing” of policy domains and sub policy domains were based on the following:

- ↳ Survey results
- ↳ Confirmation received across the workshops of including specific research questions were grouped with suggested policy domains

- ↳ The discretion and expertise of the FAS State and Local Innovation team. The policy domains align more closely with how local governments are structured (i.e. typical departments that sit within a local government, Department of Housing, Public Works, etc), versus typical academic structures (i.e. School of Engineering, Geography and Environment, Public Policy, etc).

## Priority Research Questions Concerning Climate and Energy

Climate and energy, as defined for purposes of this report, refers to **the local government policies, tools, and strategies that address climate mitigation, climate adaptation, environmental quality, and energy systems**. This includes city staff tools and implementation supports; emissions reduction; financing and economic impacts; flooding; forecasting and climate modeling; grid and infrastructure systems; mitigation strategies; and water systems and management.

Based on demonstrated demand across national survey responses and in-person workshops, the top four research questions representing priority needs from cities and counties in this domain are:

- ↳ **Support in creating a climate vulnerability assessment to city assets; that is, how can a local government generate and use localized climate data on flooding, heat islands, and air quality to inform infrastructure design and adaptation planning?**
- ↳ **How do disaster and flooding policies affect housing stability and displacement?**
- ↳ **What smart systems, maintenance strategies, or predictive technologies can strengthen infrastructure resilience and reduce vulnerability to severe weather events?**
- ↳ **How should environmental hazards in locations where a cluster of hazards are present be prioritized for mitigation?**

If you are in the research community and have a report or publication addressing a specific question listed that has been published after March 2025, please fill out **this form**.

FAS aims to support this community and support the responses/answers to this report will include it in a repository.

Building on this set of priority questions, the following additional research needs and knowledge gaps were raised during in-person workshops. These do not include the top research questions identified above.

## City Staff Tools

- ↳ How can cities significantly increase efficiency in buildings to achieve local climate goals?
- ↳ What data, partnerships, and best practices exist when building regional energy strategies?
- ↳ What utility management policies best support expansion and maintenance of broadband?
- ↳ What are procurement policies that should be considered across requests for proposals to further climate goals?
- ↳ What do local governments need to create climate tools that guide decision making across departments (particularly those that are NOT leading the charge for climate endeavors)?
- ↳ How can local governments accurately assess climate vulnerability at the local level?
- ↳ What turf and parkland management practices reduce chemical and water inputs while maintaining performance?
- ↳ Research request: research investigating cumulative pollution, water quality, and air disparities in historically underserved neighborhoods and how a local government can use that to prioritize targeted cleanup efforts and policy form.
- ↳ Research request: implementation support for a published/completed sustainability plan.
- ↳ What sustainable land management practices support small-scale and urban agriculture?
- ↳ What are use cases and best policies to reduce food waste?
- ↳ What data should local governments be collecting to improve solid waste and landfill management performance?
- ↳ What waste audit methodologies most effectively inform landfill diversion strategies?
- ↳ What is the relationship between community resilience strategies and housing affordability, particularly in areas vulnerable to climate-related disasters?
- ↳ How can a local government develop decision-support tools that visualize climate trajectories and policy trade-offs, helping planners and elected officials balance mitigation goals with fiscal and operational realities?

## Emissions

- ↳ How do local governments better collect specific data on climate emissions?
- ↳ What is the feasibility and impact of applying carbon capture and storage to natural gas power generation?
- ↳ What infrastructure changes enable rapid reductions in greenhouse gas emissions?
- ↳ What is the carbon sequestration potential of prairie grass and other native landscapes?
- ↳ What are the most effective methods for eliminating PFAS in water, wastewater, landfill, and environmental systems?
- ↳ How do residents working from home impact greenhouse gas emissions? How do you measure this?
- ↳ What strategies are most effective for reducing transportation-related emissions at the local level?



## **Financing and Economic Impacts**

- ↳ What are the economic implications of sustainability efforts (i.e., given a local government's specific size, budget and organizational complexity, what initiatives make the most sense)?
- ↳ What financing mechanisms, including green banks and endowment models, can support sustainability projects?
- ↳ How can a local government leverage green financing tools to advance resilience and sustainability projects?
- ↳ What are the long-term household-level economic impacts of major climate-related disasters?
- ↳ How might climate change influence migration patterns and population growth at the local level?
- ↳ How do federal floodplain and floodway policies influence local development patterns?

## **Flooding**

- ↳ How many lots were created after [a particular hurricane or flooding event] in a [specific city or county]?
- ↳ Evaluation request: What are the measurable benefits of flood mitigation infrastructure before and after major storm events?
- ↳ How can AI support better flood forecasting models?



## Forecasting

- ↳ How can climate models be applied to local government decision making (budgets, zoning, permits)?
- ↳ What is the effect of climate change on a city/county's water, land, animals, and people population?
- ↳ What are the environmental impacts of data centers on energy, water, and land use systems?
- ↳ How can a local government accurately assess climate vulnerability at the neighborhood level?
- ↳ How can disaster-prone cities work smarter on leveraging resilient infrastructure to offset high insurance costs for housing? What are specific examples?
- ↳ What should be included in a standardized decision process for energy deployment, specifically location and type of energy? What factors should be considered when choosing an approach for deployment?

## **Grid + Infrastructure**

- ↳ What are the best nature-based solutions for stormwater management?
- ↳ Research request: provide a tree-inventory analysis to demonstrate the value of tree canopy on the local economy and environment.
- ↳ What resilience benefits are provided by battery storage systems?
- ↳ What are the impacts of lithium-ion battery waste on solid waste management systems?
- ↳ How can distribution system planning increase adoption of distributed solar without shifting costs to non-solar customers?
- ↳ What evidence-based arguments most effectively build support for renewable energy?
- ↳ What are options for renewable energy in multi-family structures?
- ↳ How does road infrastructure impact housing and neighborhood issues, including the impact of flooding, heat, air pollution, and pedestrian fatalities? What are solutions to these issues?
- ↳ How should a regional energy strategy be designed to equitably distribute energy resources, encourage clean transitions, and avoid disproportionate burdens?

## Mitigation

- ↳ Research request: create a climate vulnerability assessment and adoption plan.
- ↳ What intermediate metrics can track the progress of climate interventions?
- ↳ How can mitigation measures be integrated into a single, user-friendly planning tool?
- ↳ What are use cases/best in class examples for climate mitigation?
- ↳ Do green space and health outcomes correlate?
- ↳ What do people litter? What policies best reduce litter occurrences?
- ↳ What strategies most effectively improve urban flood mitigation and heat island reduction?
- ↳ What natural treatment processes are most effective for land application of treated effluent?
- ↳ What is the value of green space, cooling centers, and aquatic facilities in reducing heat-related risk?
- ↳ What social factors should be explored when identifying high-risk communities for sensor deployment? How can this be done to inform interventions? Ex: research found LGBTQ community members faced higher risks of environmental hazards.

## **Water**

- ↳ What are best practices and policies to reduce water reuse?
- ↳ Throughout our water distribution system, where are water leaks before the water meter?
- ↳ What is the optimal structure for a local stormwater utility?



## Acknowledgements

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- ↳ Laura Furge, Ph.D., Provost, Muhlenberg College
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### **Baltimore, MD**

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- ↳ Caroline Cheong, Ph.D., Associate Director of Housing and Neighborhoods, Kinder Institute for Urban Research at Rice University
- ↳ Ruth N. López Turley, Ph.D., Professor of Sociology and Director, Kinder Institute for Urban Research at Rice University

**Kansas City, MO**

- ↳ The Honorable Quinton Lucas, Mayor of the City of Kansas City
- ↳ C. Mauli Agrawal, Ph.D, Chancellor, University of Missouri - Kansas City
- ↳ Troy Lillebo, Associate Vice Chancellor for External Relations, University of Missouri - Kansas City
- ↳ Gavriel Schreiber, General Counsel, The Office of Mayor Lucas
- ↳ Nataniel Addington, Director of Community Engagement & Outreach, University of Missouri - Kansas City

**Lincoln, NE**

- ↳ The Honorable Leirion Gaylor Baird, Mayor of the City of Lincoln Rodney D. Bennett, Ph.D, Chancellor, University of Nebraska - Lincoln
- ↳ Nathan Meier, Associate Vice Chancellor for Research, Capacity and Competitiveness, University of Nebraska - Lincoln
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- ↳ Riley M. Slezak, Senior Advisor to the Mayor, The Office of Mayor Gaylor Baird

**Little Rock, AR**

- ↳ The Honorable Frank Scott, Mayor of the City of Little Rock
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- ↳ The Honorable Ben Walsh, (former) Mayor of the City of Syracuse
- ↳ Lois Agnew, Ph.D, Interim Vice Chancellor, Provost and Chief Academic Officer, Syracuse University

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Syracuse University
- ↳ Carsten Østerlund, Ph.D, Professor and Associate Dean for Research, School of Information  
Studies, Syracuse University

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