

# UAB GRAND CHALLENGE – CONCEPT PAPER

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## URBAN SUSTAINABILITY

Global climate change – arguably the most pressing issue of our time – has brought the study, implementation, and evaluation of environmental sustainability, human health, and human rights to the forefront of global societies. One need look no further than the breadth of the signatory countries of the 2016 Paris Agreement to appreciate the immediacy of addressing carbon emissions so as to stave off growing impacts of anthropogenic climate change on both our environment, our health, and the way we live together.

The global urban population is nine times larger than it was 100 years ago. A better global future lies in urban innovation and action: as the majority of future humans will live in cities, it is likely that the solution to climate change should be addressed there. Birmingham is a hub of economic development and health innovation that offers dividends to our state. UAB is uniquely positioned to capitalize on local municipal infrastructure, our vast research capacity, community partners, local companies, and broad spectrums of socio-economic classes within our state to evaluate best approaches for building healthier and more resilient communities.

In this proposed Grand Challenge, UAB would partner with the city of Birmingham and area organizations to implement a major effort to develop evidence-based strategies for sustainable practices in mid-size cities that span educational, corporate, non-profit, state, and federal entities. This collaboration will focus on driving urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, wellbeing, and economic opportunities of citizens across the state. UAB and Birmingham can make a profound global difference by shaping our city as a model for addressing climate change and human rights on a city-by-city basis, particularly for mid-size cities that bridge the urban/rural divide. Proven assessment programs, such as STAR Communities ([www.starcommunities.org](http://www.starcommunities.org)) and C40 Cities (<http://www.c40.org/>), will be used to drive new partnerships and measure progress on each of the targeted goals.

### **Joint UAB - Birmingham endeavors:**

- Energy efficiencies in buildings
- Renewable energy (solar)
- Waste reduction
- Green corridors
- Livable communities
- Public transit, shared mobility, and multimodal transportation
- Water management, water quality testing, and floodwater mitigation

- Urban heat island mitigation
- Air quality
- Environmental equity
- Coordinated asset planning and management
- Educational days

**UAB-specific endeavors that engage all facets of the university:**

- ‘25 in 25’ – UAB project to secure 25% of its electrical energy needs from renewable energy sources by 2025 (a goal at the intersection of policy, technology, and commercialization)
- Integration of solar photovoltaic and energy storage systems to reduce reliance on traditional utility grid infrastructure and reduce greenhouse gas emissions (jointly with Southern Research)
- Pulmonary medical research and treatment related to diseases (asthma, COPD, lung cancer, etc.) caused by industrial air pollutants associated with ozone, particulates, nitrogen oxides, sulphur dioxides, mercury, arsenic, cadmium, etc. (a goal to balance the health care implications of economic choices and provide opportunities for innovative patient care)
- Heat stress related medical research and treatment of heat stroke, heat exhaustion, heat hyperpyrexia, heat exhaustion, heat cramps, heat syncope (jointly with the Deep South Center for Occupational Health and Safety)
- Social science research and mitigation strategy development for low income communities suffering disproportionate air, soil, and water pollution (jointly with Institute for Human Rights)
- Reduce UAB’s drive-alone commuters from 88% in 2016 to 83% in 2021 (employees) and 82.5% to 75% (students). Transportation research on technologies, alternative modes, and innovative urban revitalization to improve mobility and accessibility while reducing congestion and environmental impacts of traffic (jointly with the Regional Planning Commission of Greater Birmingham, the City of Birmingham).
- Materials research and development – sustainable products, circular supply chains
- Curriculum Initiatives:
  - Interdisciplinary sustainability course in the UAB undergraduate core curriculum
  - Exploration of sustainability learning outcomes across the institutional curriculum
  - Creation of novel campus-wide Minor or Certificate in Sustainability
  - Innovative development and implementation of STEM middle school education in climate change and urban sustainability (jointly with McWane Science Center)
- Community education, dissemination of findings, and development of policy recommendations relating to need for fundamental changes in practices in order to meet urban sustainability goals and objectives

**Prospective UAB Collaborators:**

College of Arts and Sciences  
Schools of Business, Engineering, Medicine, Public Health  
Undergraduate and graduate student organizations  
Office of Education Abroad  
Honors College, University Honors Program, Science and Technology Honors Program  
UAB Sustainability  
Deep South Center for Occupational Health and Safety  
Institute for Human Rights  
UAB Parking and Transportation  
UAB Planning, Design, and Construction

**Prospective Birmingham Partners:**

Mayor's Office  
Southern Research  
Birmingham Rotary  
Children's Hospital  
Southern Environmental Law Center  
Mercedes  
Honda  
Alabama Power  
Spire  
The Nature Conservancy of Alabama  
Gates Foundation  
Susan Mott Webb Foundation  
Birmingham Community Foundation  
Cahaba River Society  
Stewart Perry Architecture  
Harbert Construction  
McWane Science Center  
Urban Studio  
Freshwater Land Trust  
Regional Planning Commission of Greater Birmingham  
Birmingham Jefferson County Transit Authority  
Alabama Solar Industries Association  
Alabama Clean Fuels Coalition  
American Lung Association in Alabama  
American Cancer Society in Alabama