



A proposal to the  
U.S. Department of Transportation for a  
**National Center**  
Addressing the Statutory Research Priority Area of  
**Preserving the Environment**

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US DOT Strategic Goals Supported by the UTC

Primary  
**Climate and Sustainability**

Secondary  
**Equity and Transformation**

## Research Abstract

The **National Center for Sustainable Transportation (NCST)** has for nine years led the nation in research, education, and policy engagement in environmental sustainability in transportation. Our consortium includes many of the most accomplished and influential researchers in sustainable transportation in the world, with expertise across a range of environmental issues, especially decarbonization in the transportation sector. The NCST team is now pleased to welcome Texas Southern University and its expertise in sustainable transportation and transportation equity to our partnership.

NCST researchers have completed 280 research projects that have produced more than 225 research reports and white papers, 275+ journal articles, books and chapters, and conference papers, and 200+ conference presentations to date. This work has informed policy and practice at all levels of government. Examples include widely adopted tools for emissions modeling, the development and evaluation of a shared-mobility program for rural areas, and the citation of our research in landmark legislation.

With its established partnerships and exceptional record of impactful research, the NCST is uniquely positioned to further US DOT goals in the Priority Area “**Preserving the Environment.**” Our activities will touch on all of the non-exclusive topic areas identified by DOT as relating to preserving the environment but especially electrification, alternative fuels, air quality, mode shift, and environmental justice. The primary DOT Strategic Goal that our research activities will advance is **Climate and Sustainability**; the goals of **Equity** and **Transformation** are secondary but also essential.

The NCST addresses the especially pressing challenge of **accelerating reductions in greenhouse gas emissions while simultaneously enhancing transportation equity**. We do so by producing research that supports innovation in policy by informing legislation and regulation, reforming professional practices, and reshaping programs and plans. Our work contributes to the **fundamental policy transformation** essential to accelerating decarbonization in a way that ensures that the benefits of the transportation system are broadly distributed and that the well-being of people in overburdened and historically disadvantaged communities is substantially improved.

We support **policy innovation** to achieve **equitable decarbonization** through four kinds of research activities inspired by the US DOT goal of **matching research and policy to advance breakthroughs**:

- building **tools** to support policy making, including datasets, lifecycle assessments, and predictive simulation models that support scenario planning;
- developing **policy elements**, such as evidence-based standards, model regulations, pricing strategies, funding strategies, and others;
- conducting **evaluation studies** that assess the outcomes of policies using techniques such as experimental designs and econometric modeling; and
- undertaking **basic research** that provides a solid foundation for each of these activities by improving our understanding of the transportation system.

Through these activities, the NCST brings **scientific rigor** to the transformation of policy towards equitable decarbonization. We focus on three critical transportation domains that span both passenger and freight travel, all modes of travel, and all travel settings: **vehicle technology**, **infrastructure provision**, and **travel demand**. With the new grant, we propose to leverage our exceptional qualifications to strengthen existing programs while adding important new initiatives, including cutting-edge research on the critical issues of **vehicle electrification**, **rural mobility**, and **sustainable freight**. Each year we will fund approximately 32 research projects on these issues, selected through a rigorous peer-review process, that build on our prior work to address the most pressing challenges and most stubborn obstacles to policy transformation.

We also aim to **transform the culture of transportation research** by building policy transformation and equity considerations into project development. We require researchers to articulate the relevance of their work for policy and practice and to address its implications for transportation equity and environmental justice. We will be requiring NCST researchers to participate in new workshops on the co-creation of knowledge with the communities impacted by our work, especially communities that have historically been marginalized by transportation policy and by academic research.

Our research will only succeed in creating breakthroughs if our products make it into the hands of policy makers and transportation practitioners—and if they are trusted by them and the people they serve. We disseminate our work through printed materials, events, briefings, webinars, social media, and other techniques—but go beyond dissemination to truly engage stakeholders in shaping our research program. Our education programs provide a conduit for the products of our research to our students, who then bring this knowledge to their work in the transportation field. In these ways, the three elements of the NCST program are complementary and intertwined:

- We deliver a cutting-edge **research program** that provides the new tools and datasets, policy elements, evaluation studies, and basic knowledge necessary for a policy transformation that equitably decarbonizes the transportation system;
- We shape and deliver our products through an innovative **engagement program** using multiple techniques and involving all levels of government, tribal councils, other public and private sector stakeholders, and communities themselves;
- We provide **education and workforce development programs**, including community college collaborations, that build multiple pathways to careers in transportation, diversify the transportation workforce, and provide the training needed to take on the challenges of equitable decarbonization.

The NCST's activities have already had **transformational impacts** on the system and its users and is uniquely positioned to further DOT's goals. Our work contributes to **accelerated adoption of vehicles and fuels** that minimize GHG emissions, **new approaches to infrastructure provision and systems operation** that lessen environmental impacts, and **a shift towards modes other than driving** so as to reduce vehicle miles traveled while improving accessibility. These transformations help the country reduce its greenhouse gas emissions while reducing other environmental harms, enhancing social equity, and supporting economic vitality.