

# Climate Change Research And Technology Program

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## Federal Climate, Clean Energy & Equity Investments

- Inflation Reduction Act
  - Largest climate investment in history
- Bipartisan Infrastructure Law
  - once-in-a-generation investment in our nation's infrastructure
- CHIPS and Science Act
  - Historic investments in U.S. manufacturing



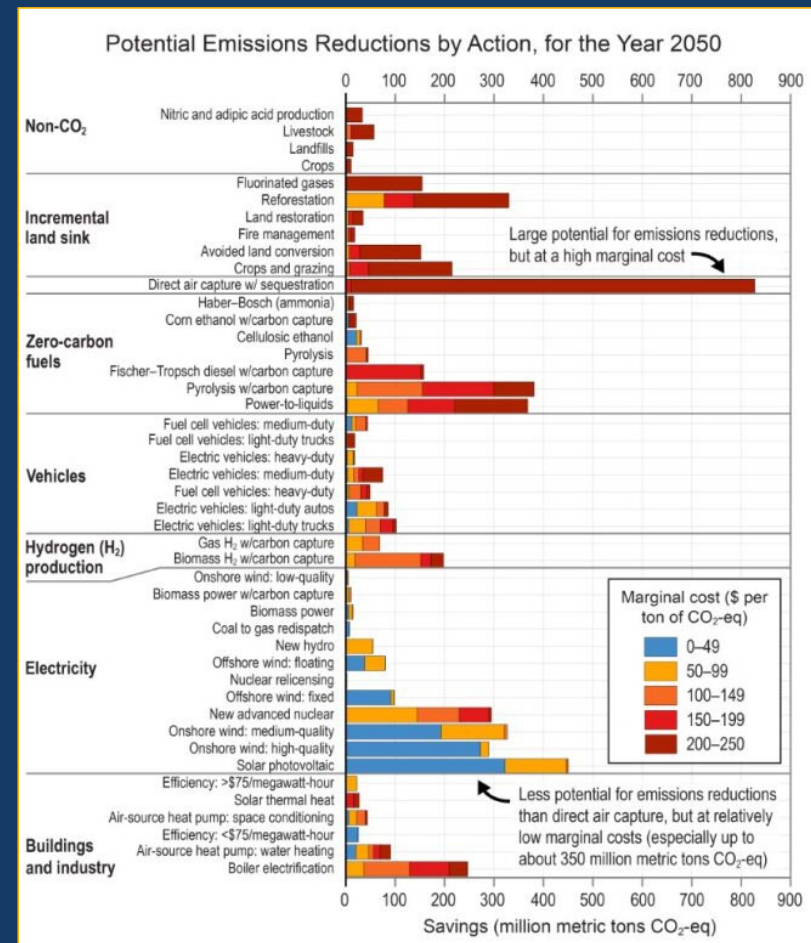
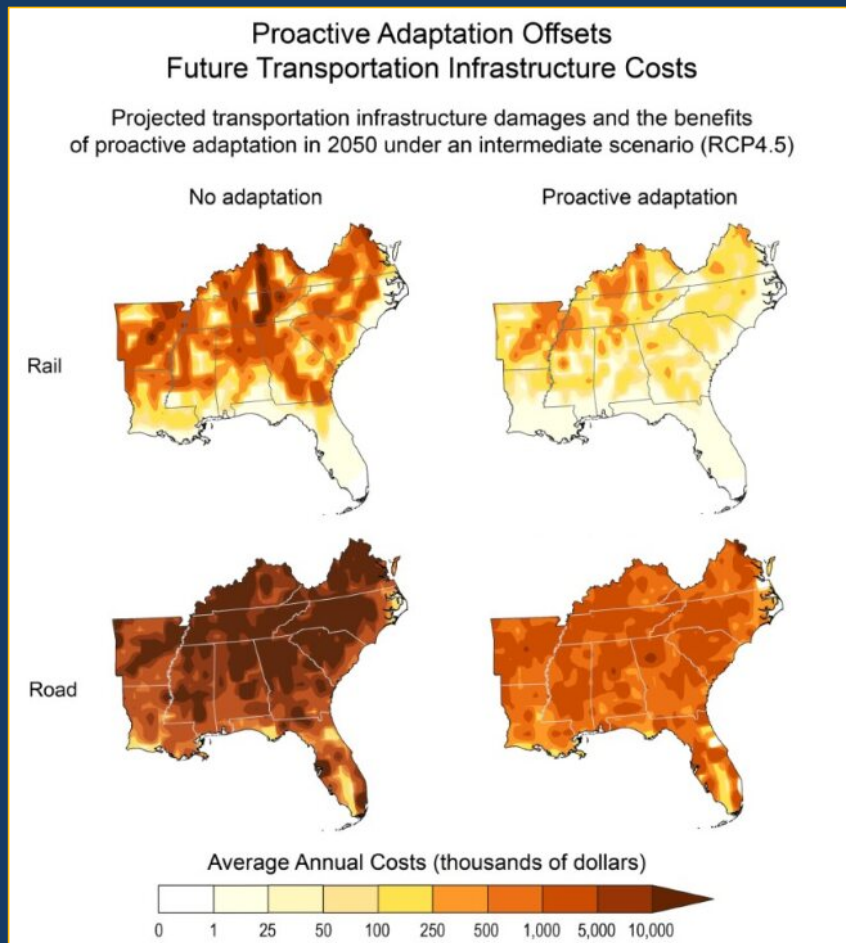
# Climate Change and Transportation Challenges



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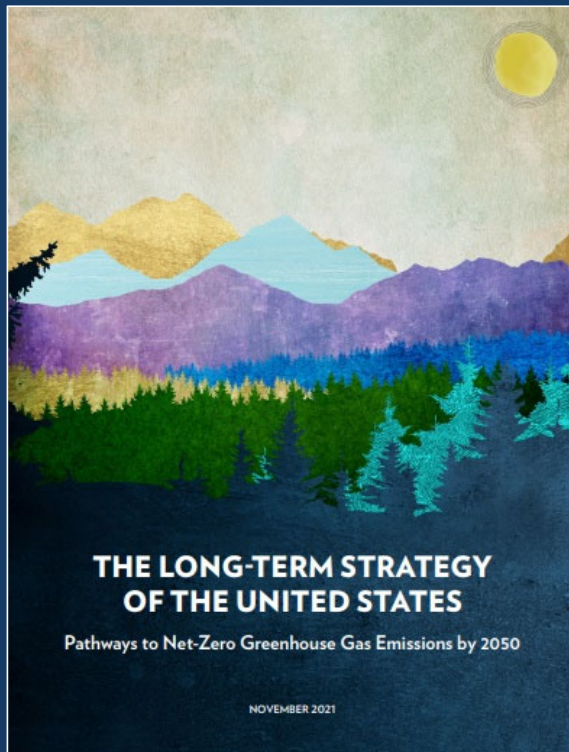
# The Need to Work Across Sectors and Across Levels of Government to Address Climate Emissions and Impacts



# National Transportation Decarbonization Goals



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“Federally-supported research, development, demonstration, and deployment can be the prime mover to carry new carbon-free technologies and processes from the lab to U.S. factories to the market.

R&D today will lay the technology foundation necessary to maximize economic benefits from the post-2030 transformation to net-zero.”



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## DOT Climate Change Research & Technology Program



*The **US DOT Climate Change Research & Technology Program** invests in research to substantially reduce transportation-related greenhouse gas emissions and pollution while building more resilient and sustainable transportation systems to benefit and protect communities.*

# Climate Change Research & Technology Program

- *Extramural Research Investments*
  - Embodied carbon and concrete research (\$5 m)
  - Climate Change & Transportation Research Initiative (\$2.5 m)
  - Mobility Equity Research Initiative (\$2.97 m)
- *Intramural Research and Tool Development*
  - US National Blueprint for Transportation Decarbonization Implementation
  - Focus on investments in innovative research and technology for multi-modal decarbonization strategies
  - Leading Resilience Coalition with AASHTO, industry, and government leaders to quantify and address resilience challenges
  - Deployment of decision-support tools for resilience investments
- *Policy Integration*
  - Support for evidence-based policy decisions across levels of government via the US DOT Climate Change Center



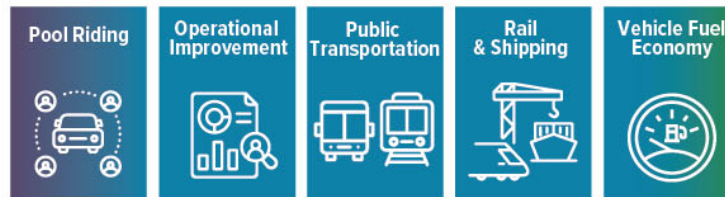
# US National Blueprint for Transportation Decarbonization: Strategy Implementation

## Convenient



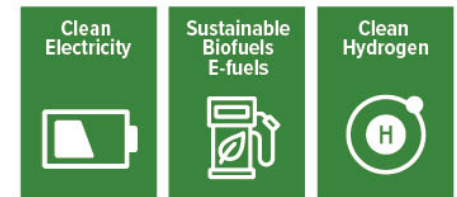
Improve Community Design and Land-use Planning

## Efficient



Increase Options to Travel More Efficiently

## Clean



Transition to Zero Emission Vehicles and Fuels

Prioritizing land-use decisions and community design solutions that prioritize access



























Expanding options to enable shifts in more efficient vehicles and transport modes

Deployment of zero-emission vehicles, fuels and associated infrastructure



# Transition to Zero Emission Vehicles & Fuels

Achieving net-zero emissions will require a suite of technology solutions across all modes of transportation.

	 <b>BATTERY/ELECTRIC</b>	 <b>HYDROGEN</b>	 <b>SUSTAINABLE LIQUID FUELS</b>
1 icon represents limited long-term opportunity  2 icons represents large long-term opportunity  3 icons represents greatest long-term opportunity 			
Light Duty Vehicles (49%)*		—	TBD
Medium, Short-Haul Heavy Trucks & Buses (~14%)			
Long-Haul Heavy Trucks (~7%)			
Off-road (10%)			
Rail (2%)			
Maritime (3%)			
Aviation (11%)			
Pipelines (4%)		TBD	TBD

\* All emissions shares are for 2019

† Includes hydrogen for ammonia and methanol

## Advancing Environmental Justice in Federal Climate Research



- **E.O. 14008. Tackling the Climate Crisis at Home and Abroad launches the Justice 40 program**
  - 39 USDOT programs are covered by Justice40 across 5 modes, totaling \$204 billion in Bipartisan Infrastructure Law funding for disadvantaged communities
- **E.O. 14096. *Revitalizing Our Nation's Commitment to Environmental Justice for All* affirms and strengthens U.S. environmental justice commitments.**
  - Section 5: Bolsters the role of Federal science, data, and research to inform environmental justice decision making across the Government.



# Infrastructure Resilience

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# DOT Infrastructure Resilience Activities (1 of 2)



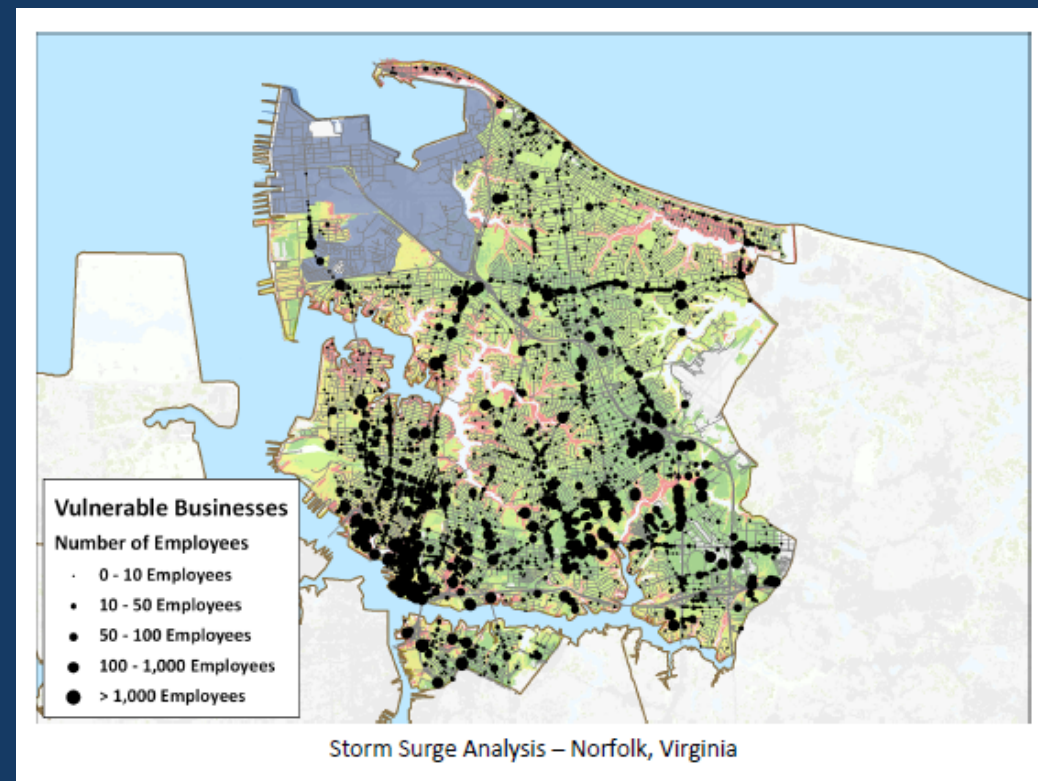
- **Coordination:** with DOT Operating Administrations, DOT Climate Change Center, Office of the Secretary-Policy Office, National Institutes of Standards & Technology, National Science Foundation, National Academy of Sciences, White House Office of Science and Technology Policy, National Institute of Building Sciences, American Association of State Highway and Transportation Officials, and others.  
**Status:** on-going.



- **Resilience Coalition:**
  - 15-member stakeholder coalition to identify and synthesize knowledge gaps for implementing resilience elements into transportation infrastructure.
  - Build towards development of comprehensive design guidelines and methodologies for resilience.
  - **Status:** white-paper near completion

## Infrastructure Resilience Activities (2 of 2)

- **NCHRP 23-32:** *Transportation Asset Risk and Resilience*. Manual for quantitative assessment of risk and resilience including benefit-cost analysis of resilience investments with National Cooperative Highway Research Program.  
**Status:** in progress.
- **RDR Tool:** Resilience and Disaster Recovery Tool Suite. Tool that analyzes resilience investments for Long-Range Transportation Planning. Now being implemented at state, local levels.  
**Status:** on-going.



# Decarbonization and Innovative Materials

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# Decarbonization/Infrastructure Materials Activities

- **Coordination:** with DOT Operating Administrations, DOT Climate Change Center, Department of Energy, National Institute of Standards & Technology, the White House Office of Science & Technology Policy, and others.  
Status: On-going.
- **\$5 million Funding Opportunity on Steel Slag and Cement/Concrete:** Congress mandated our office to evaluate use of steel slag in cement/concrete. The PI will be an academic institution that will partner with a steel manufacturer.  
Status: Under review process.
- **\$300,000 for Pozzolanic Concrete Research:** provide Report to Congress on use of pozzolanic concrete on federal infrastructure projects, assessment methods for strength, durability, cost, and environmental benefits.  
Status: Under planning process.

# Decarbonization/Infrastructure Materials Activities

- **DOT Cement/Concrete Research:** Strengthen DOT cement/concrete coordination to enhance internal communications and share research updates, given key players at Federal Highway Administration, Turner-Fairbanks Highway Research Center, and the Federal Aviation Administration.  
Status: Under planning process.
- **Request for Information (RFI):** Forthcoming RFI with sections on resilience and decarbonization/materials. Expectation is to understand the currently available and upcoming promising tools & technologies and novel materials.  
Status: Under internal review process.
- **Fall Webinar Series:** Webinars will cover research landscape and needs as perceived by the other federal agencies, different DOT operating administrations, state DOTs, NPO/NGOs, private industry and industry associations, and professional associations  
Status: under planning process.