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of Transportation

Towards a Decarbonized Transportation System:

A US Department of Transportation Perspective

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A Need for an Integrated and Innovative Approach on Climate and Transportation

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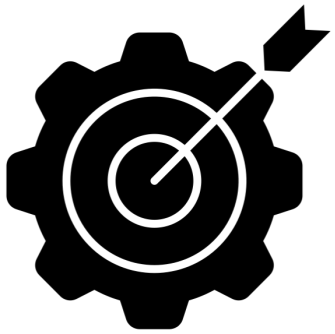
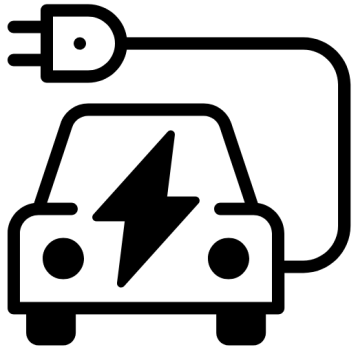
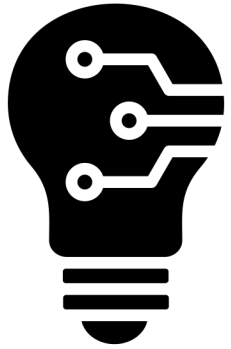


Setting Goals and Charting a Path



Leveraging Research and Techology



Looking to the Future

Unprecedented Climate, Clean Energy & Equity Investments

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- **Bipartisan Infrastructure Law**
  - once-in-a-generation investment in our nation's infrastructure
  - $27 billion to DOT for GHG emissions reduction investments
- **Inflation Reduction Act**
  - Largest climate investment in history
- **CHIPS and Science Act**
  - Historic investments in U.S. manufacturing

A Need for an Integrated and Innovative Approach on Climate and Transportation

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2022 U.S. Greenhouse Gas Emissions

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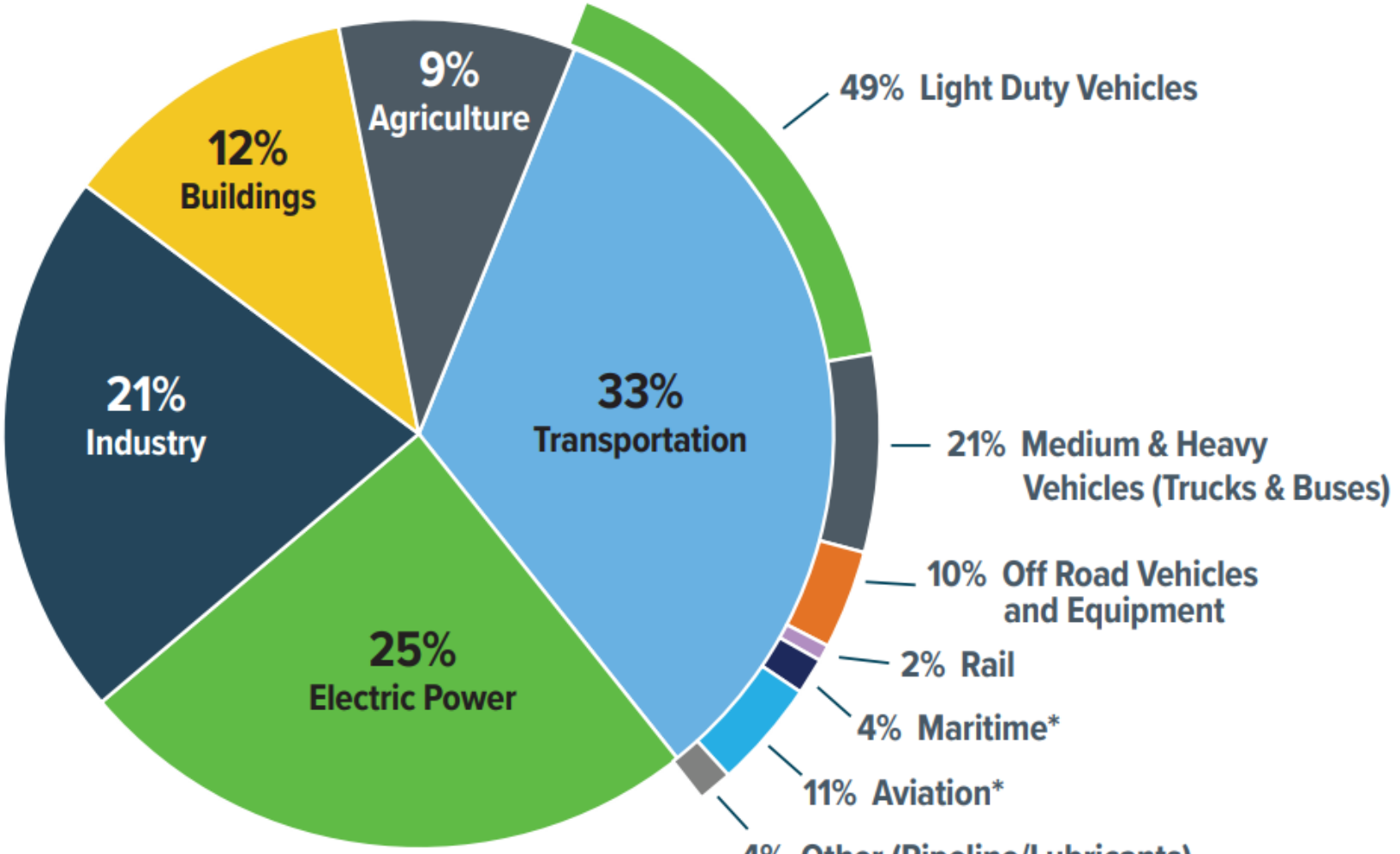

* Aviation and marine include emissions from international aviation and maritime transport. Military excluded except for domestic aviation.

Setting Goals and Charting A Paths

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The U.S. National Blueprint for Transportation Decarbonization

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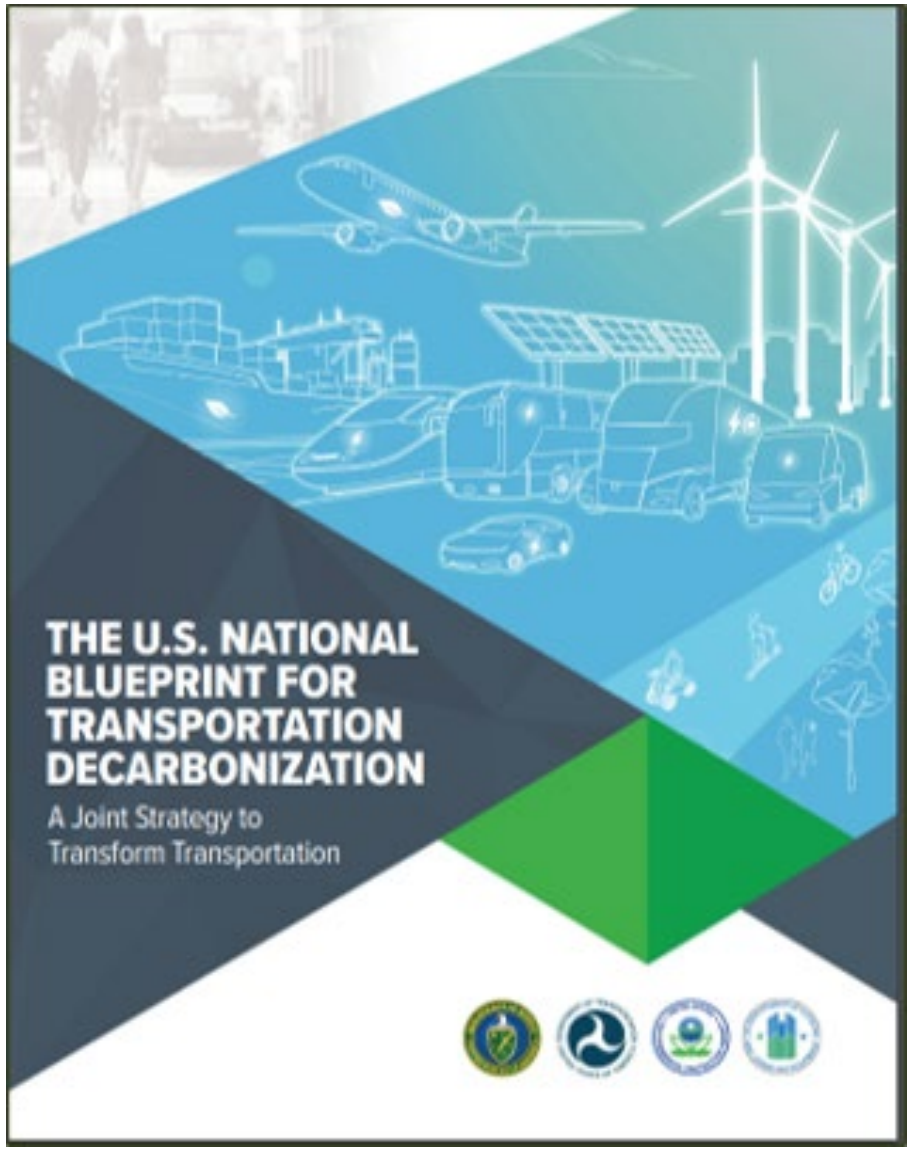
Goal of complete decarbonization of the transportation sector

- Partnership between the Departments of Transportation, Energy, Housing and Urban Development, and the Environmental Protection Agency
- Covers every mode of transport and sets realistic, achievable pathways based on innovation and science
- Focuses on delivering results by 2030
- Relies on collaboration across levels of government



National Progress and the Need to Accelerate

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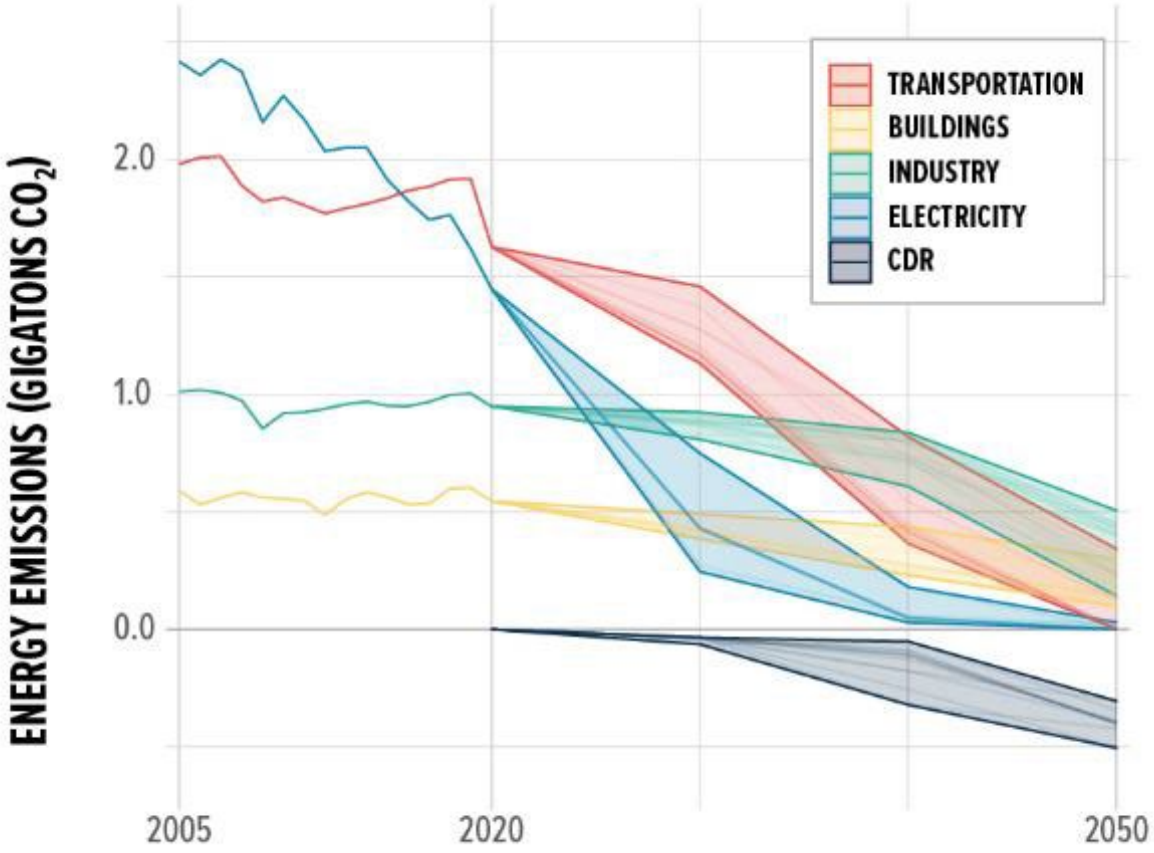
- Transportation is the **largest source of U.S. greenhouse gas emissions;**
- The U.S. is committed to:
  - Net-zero GHG emissions by 2050
  - 50-52% reduction from 2005 levels in economy-wide net GHGs by 2030
- Transportation is **complex:**
  - A **multitude of stakeholders and decision makers** with distributed and siloed responsibilities.
  - **High-inertia systems** that require decades to transition.
  - **Decisive actions are needed now**



THE U.S. NATIONAL BLUEPRINT FOR TRANSPORTATION DECARBONIZATION

US National Blueprint for Transportation Decarbonization: Implementing Strategies

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Convenient

Improve Community Design and Land-use Planning

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

US National Blueprint for Transportation Decarbonization: Implementing Strategies

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Improve Community Design and Land-use Planning

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Increase Options to Travel More Efficiently

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

US National Blueprint for Transportation Decarbonization: Implementing Strategies

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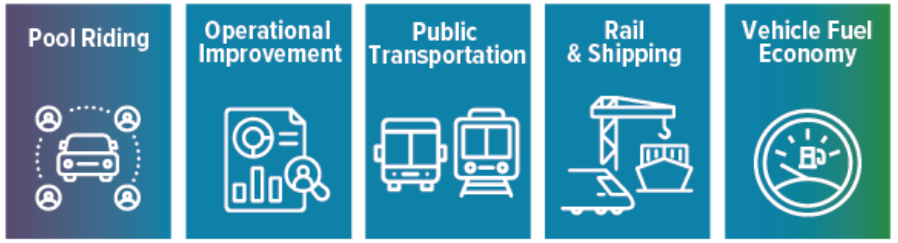
Convenient

Improve Community Design and Land-use Planning

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

Efficient



Increase Options to Travel More Efficiently

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

Clean

Transition to Zero Emission Vehicles and Fuels

Deployment of zero-emission vehicles, fuels and associated infrastructure

Increasing Convenience: Funding and Technical Assistance

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Transit-oriented Development

Federal Transit Administration program supports local planning

Credit assistance eligibility for TOD infrastructure

Active Transportation

$5 billion for safety action planning and implementation grants

Reconnecting Communities Program

$1 billion to reconnect communities historically cut off from transportation access

Carbon Reduction Program

$6.4 billion for projects to reduce transportation emissions and state carbon reduction strategies

Increasing Efficiency: Funding Programs and Policy

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Movement Efficiency

- Up to $108 billion for public transportation
- $2.25 billion **to improve** the efficiency, safety, or reliability of goods movement **at ports**

Vehicle Efficiency

- Fuel economy standards
- Aviation airframe and engine technologies that reduce fuel burn and emissions
- Reducing pipeline leaks to mitigate methane emissions and improve safety

Increasing Efficiency:
Corporate Average Fuel Economy (CAFE) Standards

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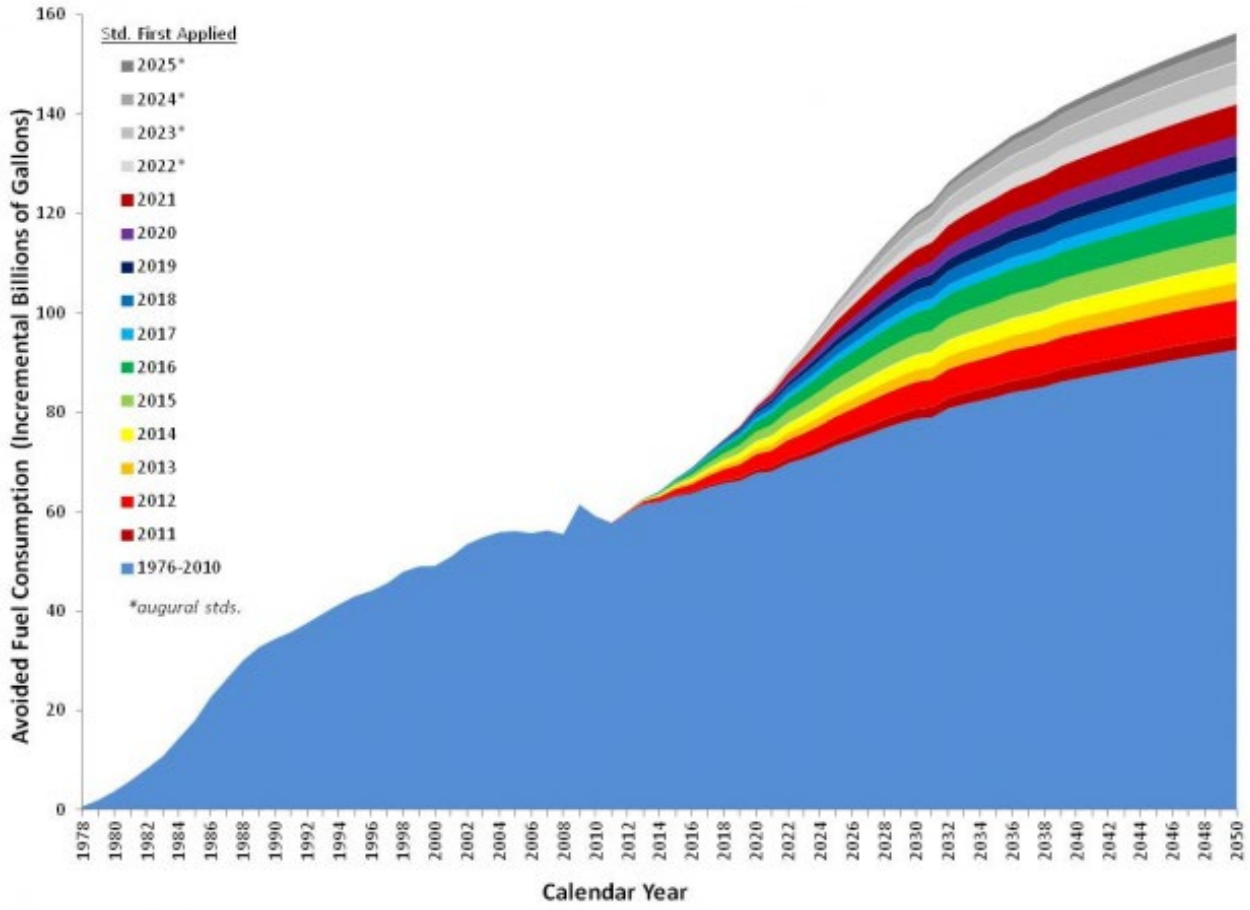
- Reduce energy consumption by increasing vehicle efficiency.
- **June 7 Standards Release:** Industry-wide fleet average of:
  - 50.4 mpg in model year 2031 for passenger cars and light trucks
  - 2.851 g/100 mi. in modal year 2035 for heavy duty pickup trucks and vans
- **New standards projected to avoid 710 m mt of CO_2 by 2050**



Est. fuel savings frome increased fuel economy since 1978

Clean: Technology Deployment for Zero Emission Vehicles

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- National EV Infrastructure Formula Program:
  - $5 billion to deploy EV light, medium, and heavy-duty charging infrastructure along designated Alternative Fuel Corridors (AFCs)
- Charging and Fueling Infrastructure Discretionary Grant Program:
  - $2.5 billion to deploy EV charging and hydrogen/ propane/natural gas fueling infrastructure along AFCs and other publicly accessible locations.
    - **Corridor Charging:** Along designated AFCs.
    - **Community Charging:** Locations on public roads, schools, parks, and in publicly accessible parking facilities.
- Low and No-Emission Grants/Bus and Bus Facilities Discretionary Grants:
  - $1.69 this year for the purchase or lease of no- and low-emission transit buses, construction, and leasing of supporting facilities.

Source: Stan Honda / AFP via Getty Images, accessed at Grist

Leveraging Science and Technology

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The Role of Research and Technology in Decarbonization

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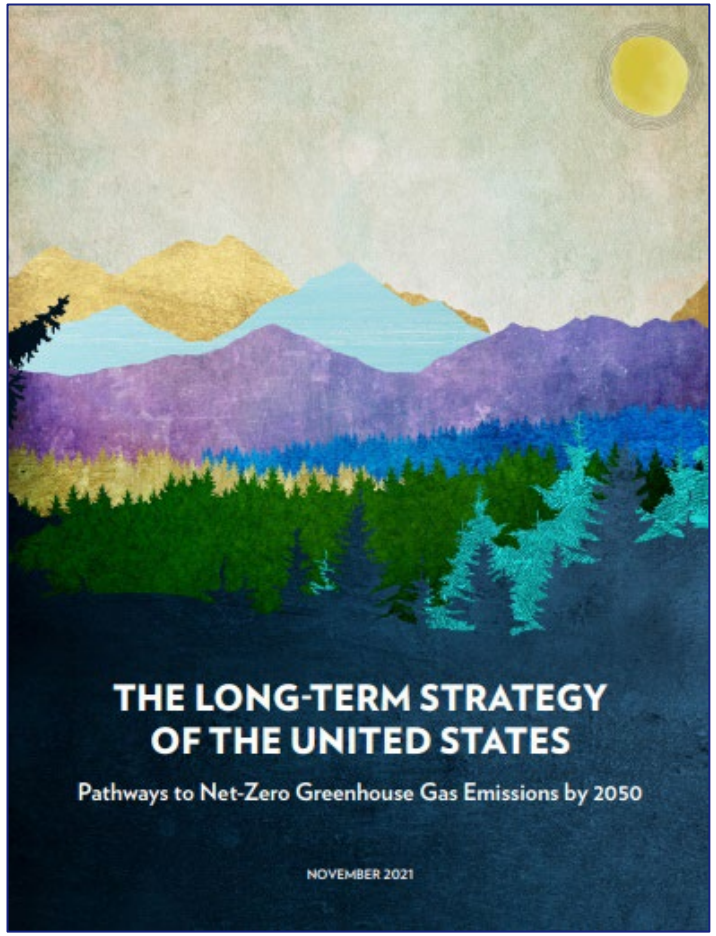

"Federally-supported research, development, demonstration, and deployment can be the prime mover to carry new carbon-free technologies and processes from the lab to U.S. factories to the market.

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

A Research Agenda for the US DOT Climate Change Research & Technology Program

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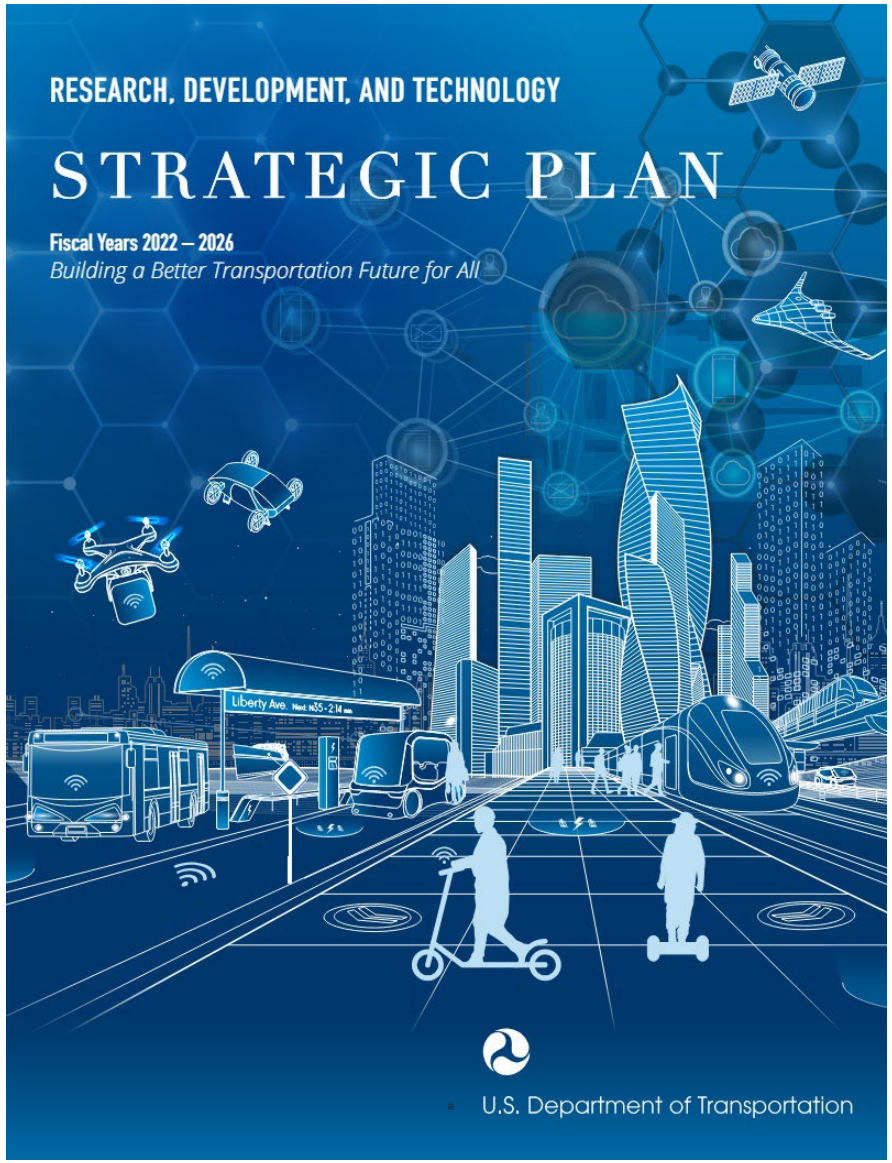

- Research Priority: **Climate and Sustainability**
  - Research Areas: Decarbonization, Sustainable and Resilient Infrastructure
  - Grand Challenge:

    Create a transportation system that supports an economy with net-zero greenhouse gas emissions.

- **DOT Climate Change R&T Research Agenda: Under Development**
  - Goal advance research, policy-relevant analytics, and technology transfer activities related to climate and transportation, leveraging USDOT strengths, while avoiding duplication of Federal activities

DOT Climate Change Research & Technology Program

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- ***Extramural Research Investments***
  - Embodied carbon and concrete research ($5 m)
  - Climate Change & Transportation Research Initiative ($1.7 m)
  - Mobility Equity Research Initiative ($2.97 m)
- ***Decision-relevant Tools and Analysis***
  - 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

Strengthening Mobility and Revolutionizing Transportation (SMART)

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SMART

www.transportation.gov/SMART

Eight technology areas:

- Coordinated automation
- Connected vehicles
- Intelligent sensor-based infrastructure
- Systems integration
- Delivery / logistics
- Innovative aviation
- Smart grid
- Traffic signals

- Discretionary grant program created under BIL to fund demonstration projects focused on **advanced smart city or community technologies and systems.**
- Provides **$100M annually** from FY22 – 26 to eligible projects in States, political subdivisions of a State, Tribal governments, transit agencies, toll authorities, MPOs, and groups of eligible recipients.
- Funds **purpose-driven innovation** and discourages investment in technologies that do not provide an improvement over the status quo.
- The structure is a **2-stage program.**
  - Stage 1: Planning and Prototyping, up to $2M over 1.5 years
  - Stage 2: Implementation, up to $15 over 3 years

Looking to the Future

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Where We Need To Go From Here (1 of 3)

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- **Additional investments in GHG reduction strategies**
  - e.g. CRP, NEVI, CFI
- **Convenience Strategies**
  - Increase investments in active transportation and micromobility projects
  - Support local congestion pricing initiatives
  - Institutionalize coordination between DOT and HUD
  - Support local government actions

Smart Growth

Smart growth strategies promote vibrant communities and increased density through mixed land uses, while preserving open space. This can result in a significant reduction in VMT as high as 5 to 20 percent, as more daily destinations are easily accessible by walking, biking, and transit.

Complete Streets

Redesigning streets for all users and enhancing the safety of bike lanes and sidewalks creates more options for all and reduces the need for car-based trips.

Transportation Demand Management

This strategy includes adding High Occupancy Vehicle (HOV) lanes, "cash out" programs for employee parking spaces, employer-sponsored transit passes, carpooling, and more. Using strategies like these, Seattle recently reduced their single occupancy vehicle use to only 25% of trips.

Pricing

Congestion pricing, gas taxes, and fees for driving each have their own advantages. Transportation can also be 're-priced' in an equitable manner to save travelers money while encouraging more efficient travel choices, including by making prices such as for insurance mileage-based and by unbundling parking from housing rents. Fees for driving have been shown to have the largest impact with an estimated 15 percent VMT reduction linked to a $.25 per mile tax in a regional Massachusetts study.

Fix Existing Highways Before Building New Ones

Though highway expansion may appear to decrease congestion, it has been shown to induce demand in the long-term, as drivers become reliant on more lanes instead of traveling by other means or moving to denser areas. Prioritizing maintenance and efficiency of existing highways over highway expansion projects avoids inducing additional driving and emissions.

Where We Need To Go From Here (2 of 3)

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- **Efficient Strategies**
  - Expand public transit service
  - Reduce customization of federally funded buses
  - Reduce freight-related emissions through multi-modal freight planning
  - Reduce methane leaks and prepare for pipeline transportation of clean energy

Where We Need To Go From Here (3 of 3)

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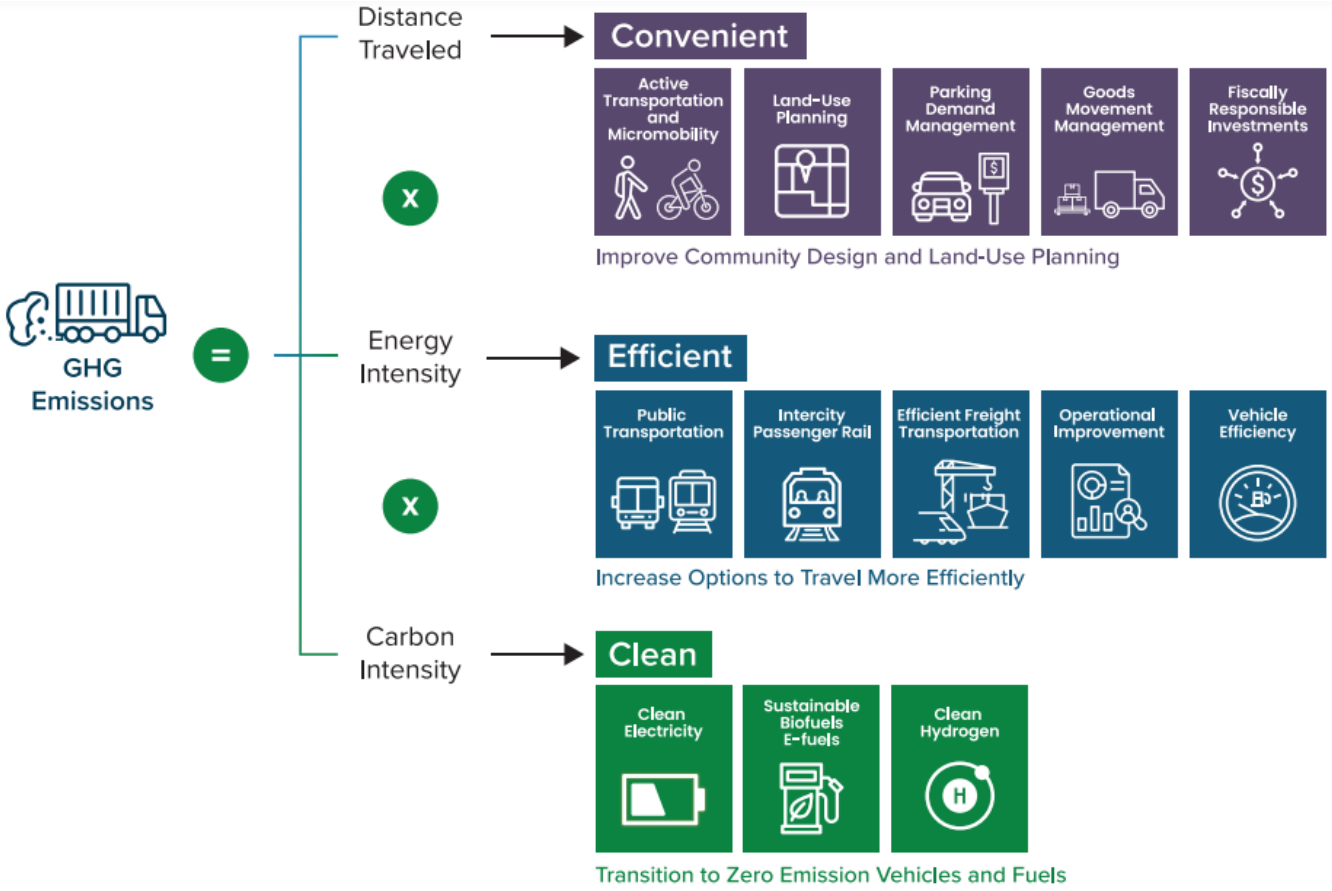

- **Clean Strategies**
  - Expand emissions reduction programs (e.g. FTA Low or No Emission Bus Program, Consolidated Rail Infrastructure and Safety Improvement)
  - Invest in clean maritime transportation (e.g. the Federal Ship Financing Program/Title XI)
  - Implement global market-based measures of the International Civil Aviation Organization
  - Encourage training and workforce development

Looking Ahead

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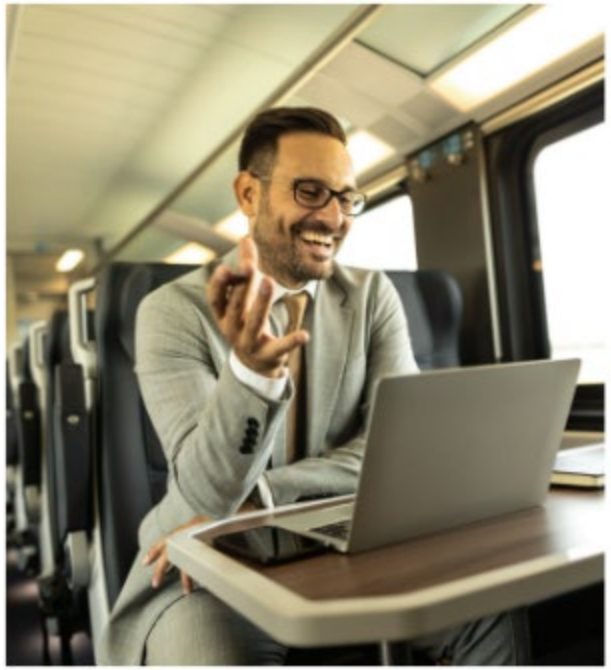

- Significant Federal investments towards transportation decarbonization
- Accelerated in recent years by the Inflation Reduction Act, Bipartisan Infrastructure Law, CHIPS and Science Act, other Administration and Congressional direction.
- Huge potential for new applications of research and technology to meet climate and equity goals for the transportation sector