Clean Transportation Collaborative (CTC)

Facilitating thought leadership in the transition to a low-emissions transportation system

Texas A&M Transportation Institute

CARTEEH

Agenda

Texas A&M Transportation Institute

11:00-11:15
Joe Zietsman
Opening Remarks
Overview of CTC

11:15-11:25
Greg Winfree
High-Level Remarks
Introduce Michael Berube

11:25-11:40
Michael Berube
Keynote Speech

11:40-11:45
Alice Grossman
Introduce Rachael Nealer

11:45-12:00
Rachael Nealer
Keynote Speech

12:00-12:25
Alice Grossman
Q&A Session

12:25-12:30
Joe Zietsman
Closing Remarks

CARTEEH

Center for Advancing Research in Transportation Emissions, Energy and Health (CARTEEH)

Texas A&M Transportation Institute

www.carteeh.org

CARTEEH

Why Did We Establish the CTC?

Texas A&M Transportation Institute

Push for Clean Transportation

Requires an interdisciplinary approach

Research needs to be informed by practice

CARTEEH is perfectly positioned

CARTEEH

What is the CTC?

Mission

The CTC brings together academic partners, private industry, and the public sector to facilitate interdisciplinary collaboration in the pursuit of clean, healthy, and equitable low-carbon transportation options.

What is the CTC?

Goals

Facilitate **stakeholder collaboration** between the Transportation and Energy sectors.

Serve as a clearinghouse of **scientific information** to inform decision-makers

Stay abreast of relevant **new technologies** and approaches.

Address all topics through an **equity** lens.

Disseminate information and perform **outreach** amongst members, stakeholders, and the public.

How Will the CTC Function?

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Current CTC Members

Alamo Area Clean Cities	EVgo Services LLC	New Mexico Bureau of Geology	Texas Department of Transportation
Alamo Area Council of Governments	EVNoire	NFI Industries	Texas Electric Transportation Resources Alliance
Arizona Department of Transportation	Federal Highway Administration	Nigel Clark Consulting	Texas Energy Summit
Bayerische Motoren Werke AG	Frio Valley Infrastructure	North Central Texas Council of Governments	Texas Trees Foundation
Beverly Scott Associates	General Motors	Nuro	TxEtra
BP	Georgia Tech	Octopus Energy	U.S. Department of Energy
Capital Area Metropolitan Planning Organization	GP Red	Priority Power Management	U.S. Department of Transportation
Center for Environmental Research and Technology	Grid Focus LLC	Proterra	U.S. Environmental Protection Agency
Center for Transportation and the Environment	H-E-B	Rivian	University of California, Riverside
Chargepoint, Inc.	Houston Advanced Research Center	S. Bertin Consulting	University of Texas at Austin
CPS Energy	Houston-Galveston Area Council	Sacramento Metropolitan Air Quality Management District	University of Texas at El Paso
Einride	International Council on Clean Transportation	Shell	University of Washington
El Paso Metropolitan Planning Organization	Introducing Youth to American Infrastructure Inc	South Coast Air Quality Management District	University of Wisconsin-Madison
Electrification Coalition	Johns Hopkins University	Stoic Energy Consulting	Venn Strategies
Electrify America	Lone Star Clean Fuels Alliance	TESIAC	VIA Metropolitan Transit
ElectroTempo, Inc.	Metropolitan Transit Authority of Harris County	Texas 2036	Volvo Group North America
Eno Center for Transportation	MP2 Energy	Texas A&M University	
Environmental Defense Fund	National Association of State Energy Officials	Texas Advanced Energy Business Alliance	
Ernst & Young LLP	Navistar	Texas Commission on Environmental Quality	

U.S. DEPARTMENT OF ENERGY
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Decarbonizing the Transportation Sector

Michael Berube
Deputy Assistant Secretary for Sustainable Transportation
DOE's Office of Energy Efficiency and Renewable Energy

April 2022

EERE Mission & Goals

EERE MISSION

Our mission is to drive the research, development, demonstration and deployment of innovative technologies, systems, and practices that will put America on an irreversible path to:

- **Achieve a carbon-free electricity sector by 2035; and**
- **Equitably transition America to net-zero greenhouse gas emissions economy-wide by no later than 2050**

KEYS TO ENSURE THE GREATEST IMPACT

Environmental and Energy Justice

Workforce Development

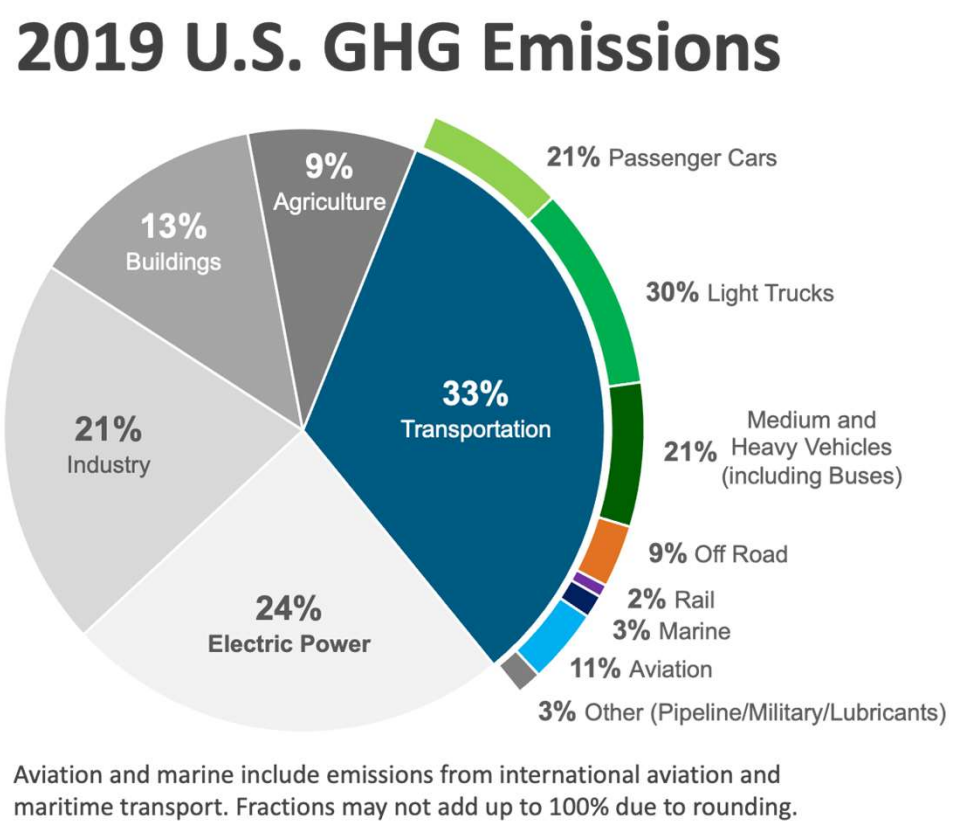
Diversity in STEM

State and Local Partnerships

PRIORITIES

- 100% decarbonized electric grid by 2035
- Decarbonize energy intensive industries
- Decarbonize transportation across all modes
- Reduce the carbon footprint of buildings
- Enable a net-zero agricultural sector

Transportation in Climate Change Mitigation



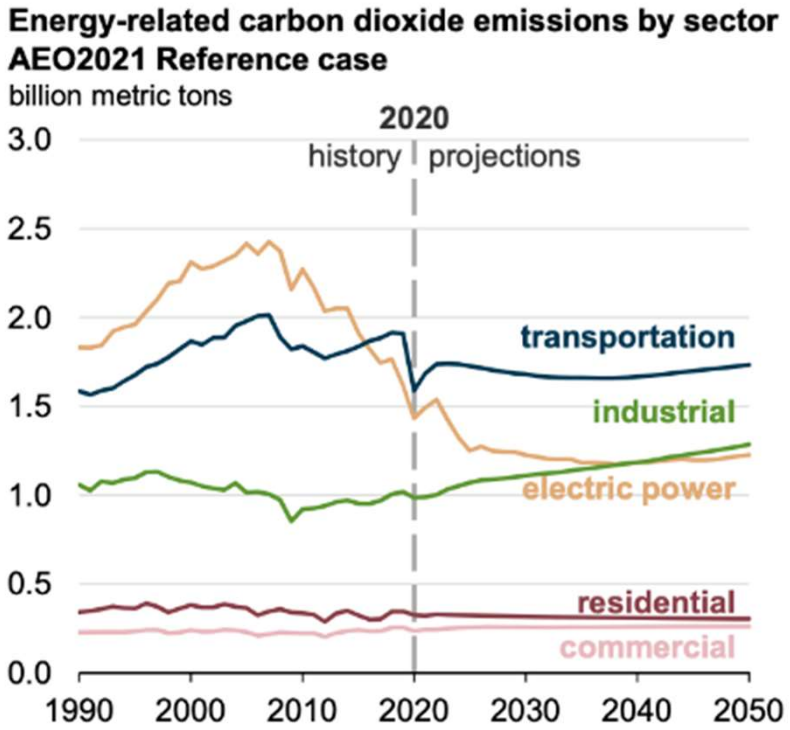
Aviation and marine include emissions from international aviation and maritime transport. Fractions may not add up to 100% due to rounding.

- Transportation is the **largest source of CO_2 emissions** today
- Also responsible for **50% of energy expenditures** and major **local pollution** issues
- The climate crisis requires **rapid, widespread, and major transformation of many complex systems** that are closely intertwined
- Impacts every part of the economy and way of life, including **all transportation systems**

Achieving Net-Zero by 2050 Requires Change from the Status Quo

Incremental change does not get us to net-zero, it requires coordinated strategy and direction NOW.

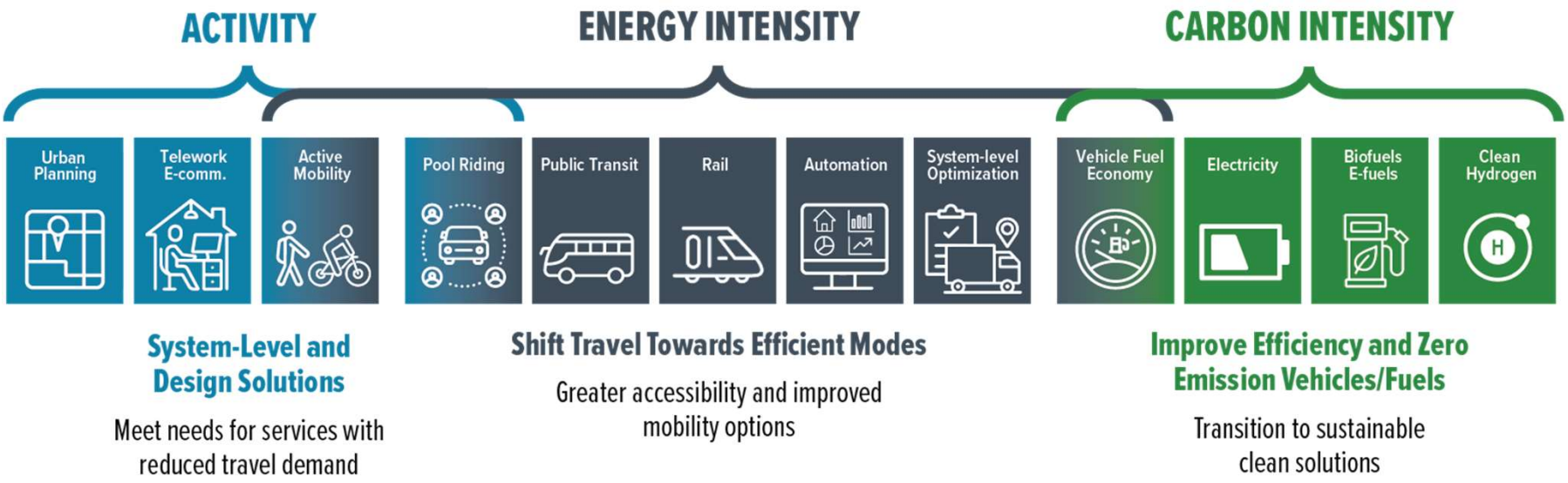
- The magnitude of industrial change and direct consumer touch points with transportation require **market-pull solutions.**
- We must **support demand for growth in mobility options** – fuel switching, and vehicle/system efficiencies must dominate.



The Strategies

$$Emissions = Activity * Energy\ Intensity * Carbon\ intensity$$

Three strategies to address these three fundamental drivers of transportation emissions:



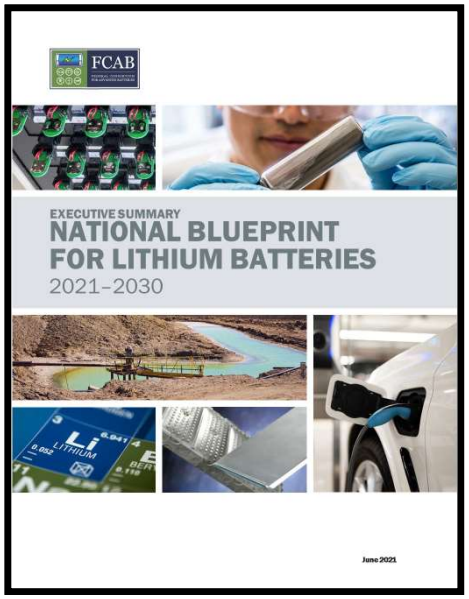
Multiple, Targeted Solutions are Needed

- **Light Duty** (cars/SUV/PU) have largest share of the pie (~52%), and can largely be electrified leveraging **cheap and abundant clean electricity**
- Strategy must also address **remaining 45+% of transportation** (projected to grow more rapidly)
  - **Hydrogen** and **Biofuels** will be critical to these other sectors
  - Diversification also improves resiliency
- Focus on solutions that can be **incrementally deployed**, delivering results by 2030
- Full **lifecycle emissions** must be addressed
- Effective **integration with the grid** and energy infrastructure

U.S. National Battery Strategy – FCAB

The Federal Consortium of Advanced Batteries (FCAB) issued the first **U.S. National Battery Strategy**

By 2030, the U.S. and its partners will establish a secure battery materials and technology supply chain that supports long-term economic competitiveness & job creation, enables decarbonization goals, and meets national security requirements.



Minerals

Battery Materials

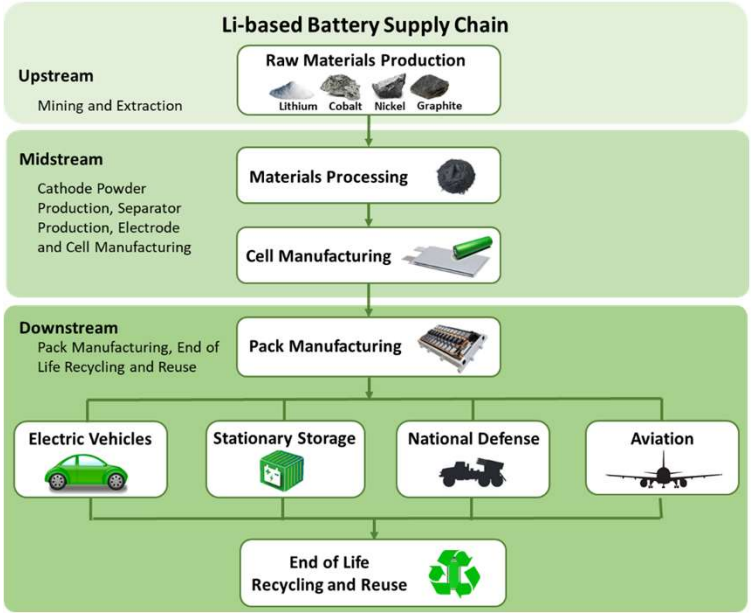
Cells/Packs

Recycling

Innovation

Bipartisan Infrastructure Law – Battery Provisions

- Over **$7 billion** to accelerate innovations and facilities across the battery supply chain
- In February 2022, DOE announced two **Notices of Intent** to invest **$3 billion** to strengthen the U.S. supply chain for advanced batteries for vehicles and grid energy storage:
  - DOE intends to issue two funding opportunity announcements this Spring:
    - Battery Materials Processing and Battery Manufacturing (BIL sections 40207 b and c); and
    - Electric Drive Vehicle Battery Recycling and Second Life Applications (BIL section 40208).



Bipartisan Infrastructure Law - Hydrogen Highlights

- **Covers $9.5B for clean hydrogen:**
  - $8B for at least four regional clean hydrogen hubs
  - $1B for electrolysis research, development and demonstration
  - $500M for clean hydrogen technology manufacturing and recycling R&D

President Biden Signs the Bipartisan Infrastructure Bill on November 15, 2021.
Photo Credit: Kenny Holston/Getty Images

- **Aligns with Hydrogen Shot priorities by directing work to reduce the cost of clean hydrogen to $2 per kilogram by 2026**
- **Requires developing a National Hydrogen Strategy and Roadmap**

Decarbonization is part of a Broader Sustainable Transportation Approach

Meet Everyone's Needs

Reliable mobility solutions for people and goods recognizing diverse needs of different communities and stakeholders

Affordable

Affordable (for consumers) and competitive for industry by supporting economy/jobs

Environmental Quality

High quality local air and water in addition to GHG emissions

Thank you.

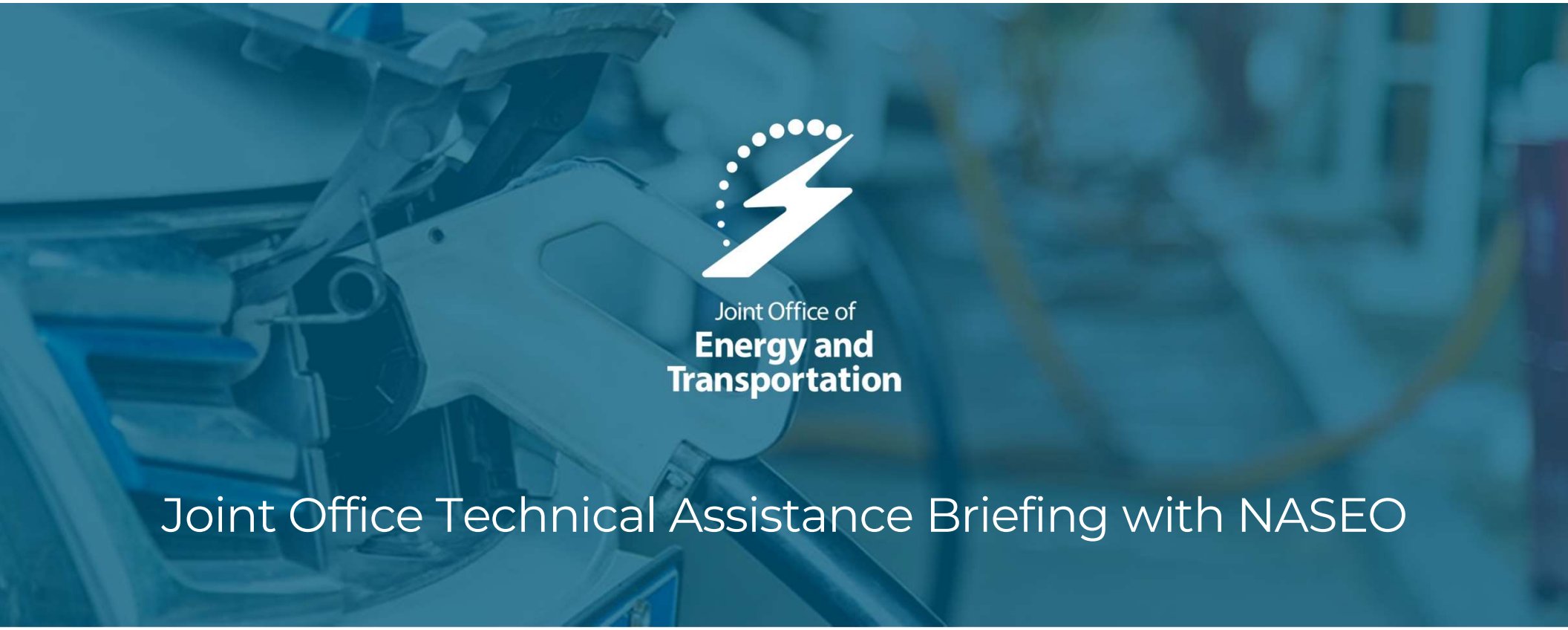
Michael Berube

Deputy Assistant Secretary for Sustainable Transportation
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Michael.Berube@ee.doe.gov

Are You A Clean Energy Champion?
¿Eres un campeón de energía limpia?

energy.gov/eere/cleanenergychampion



Joint Office Technical Assistance Briefing with NASEO

April 12, 2022

Dr. Rachael Nealer, Joint Office of Energy and Transportation

driveelectric.gov

Joint Office of Energy and Transportation

Established in the Bipartisan Infrastructure Law to address areas of joint interest to the Departments of Energy and Transportation

$300M

in FY22 funds to DOT
with transfer authority to DOE

9

major areas of emphasis

Areas of emphasis summary

1) technical assistance of vehicle charging
2) data sharing
3) performance of a national and regionalized study vehicle charging
4) training and certification programs
5) a program to promote renewable energy generation, storage, and grid integration
6) transmission pilots in the rights-of-way
7) research, strategies, and actions to mitigate the effects of climate change
8) development of a streamlined utility accommodations policy for transmission in the transportation right-of-way
9) any other issues that the Secretary of Transportation and the Secretary of Energy identify as issues of joint interest

Immediate-Term Bipartisan Infrastructure Law Priorities for the Joint Office

The Joint Office will provide unifying guidance, technical assistance, and analysis to support the following programs:

National Electric Vehicle Infrastructure Formula Program (U.S. DOT)
$5 billion for states to build a national EV charging network along corridors

National Electric Vehicle Infrastructure Discretionary Program (U.S. DOT)
$2.5 billion in community grants for EV charging, as well as hydrogen, natural gas, and propane fueling infrastructure

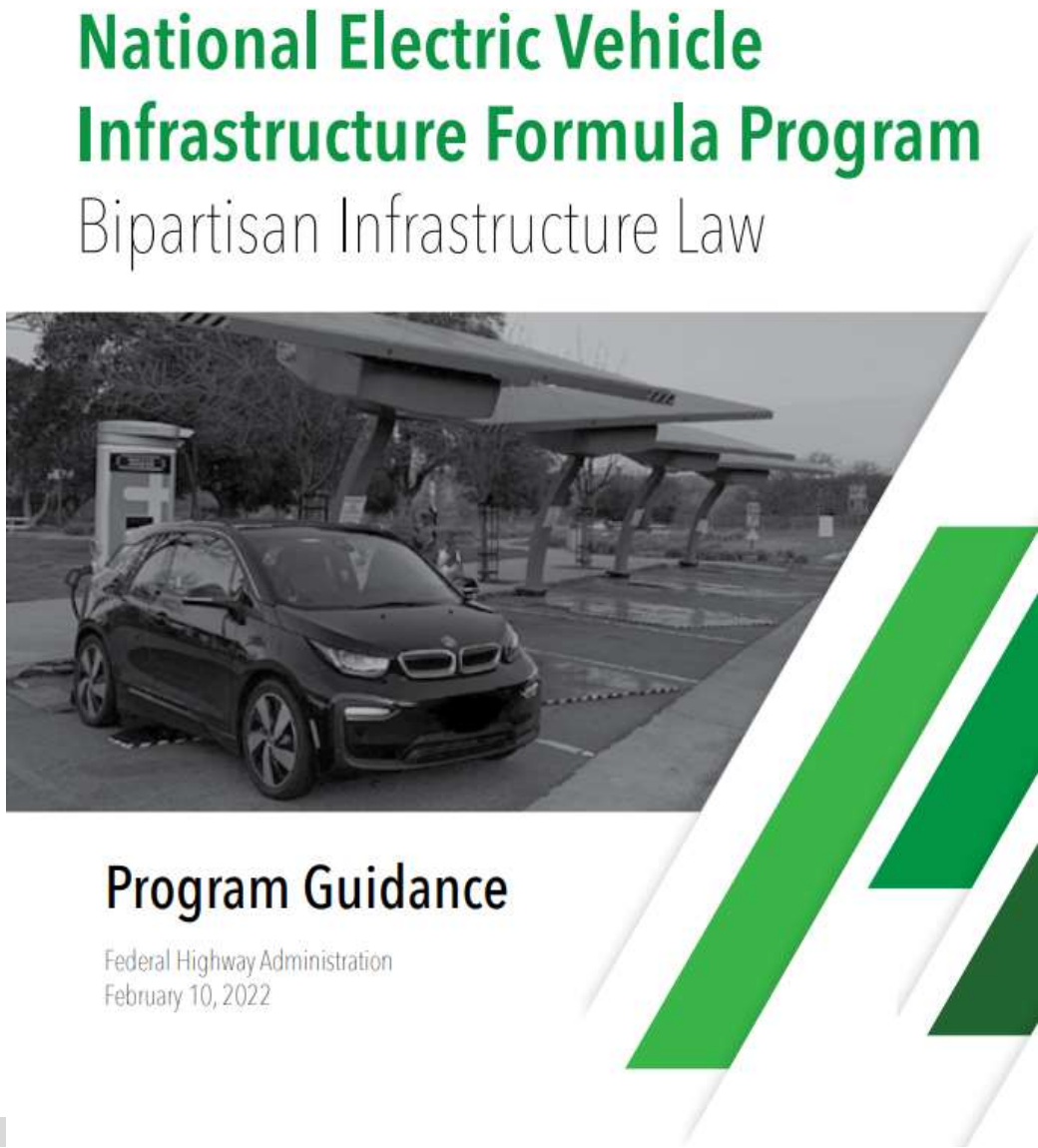
Low-No Emissions Grants Program for Transit (U.S. DOT)
$5.6 billion in support of low- and no-emission transit bus deployments

Clean School Bus Program (U.S. EPA)
$5 billion in support of electric school bus deployments

NEVI Formula Program Guidance

Publication kicks off the state planning process:

- Funding Features
- State EV Infrastructure Deployment Plans
- Project Eligibility Provisions
- Program Administration
- Technical Assistance and Tools



NEVI Formula Program- Important 2022 Dates

Feb 10:

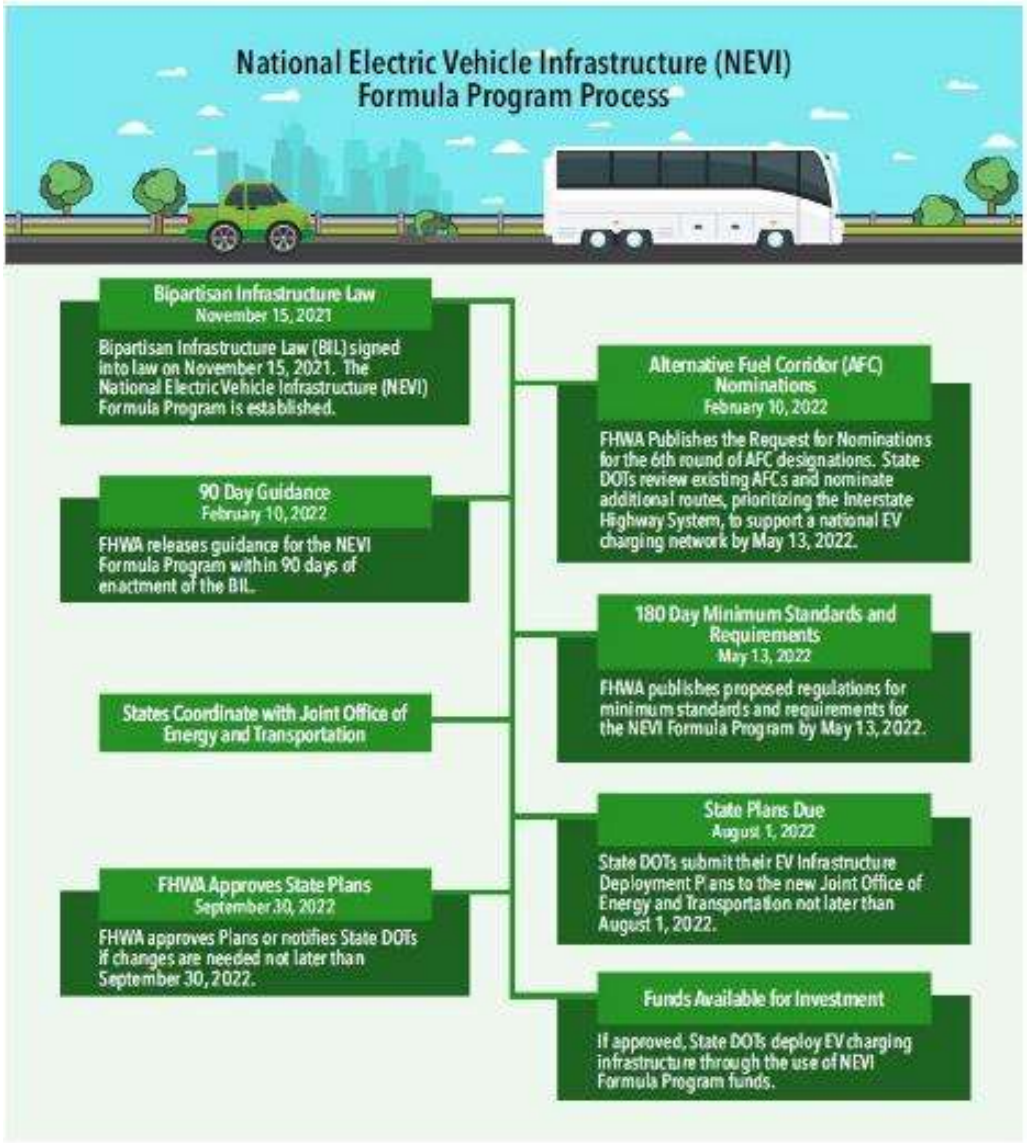
- NEVI Formula Program Guidance
- Alt Fuel Corridor Round 6 Request For Nominations

May 13:

- 180 Day Minimum Standards published
- Round 6 Nominations Due

Aug 1: State Plans Due

Sept 30: FHWA approves State Plans



NEVI Formula Program Guidance – EV Charging

Provides guidance on EV charging infrastructure attributes:

- EV charging infrastructure is installed **every 50 miles** along the State's portions of the Interstate Highway System **within 1 travel mile of the Interstate**, unless a discretionary exception has been granted;
- EV charging infrastructure includes **at least four 150kW DC Fast Chargers with Combined Charging System (CCS) ports** capable of simultaneously charging four EVs;
- EV charging infrastructure has minimum station power capability **at or above 600kW and supports at least 150kW per port simultaneously across four ports for charging**;
- Such additional considerations deemed necessary and appropriate by the Secretary of Transportation.

NEVI Formula Program- Project Funds Eligibility

- The **acquisition or installation of electric vehicle charging infrastructure**;
- **Operating assistance** for costs allocable to operating and maintaining electric vehicle charging infrastructure acquired or installed under this program, for a period not to exceed five years;
- **Development phase activities** relating to the acquisition of stations and equipment as well as installation of EV charging infrastructure
  - This includes community outreach and participation, including with rural, Tribal, and disadvantaged communities, to facilitate equitable and accessible deployment of EV charging infrastructure
- **On premises signs** to provide information about electric vehicle charging infrastructure acquired, installed, or operated.
- **Data sharing** about EV charging infrastructure to ensure the long-term success of investments
- The acquisition or installation of **traffic control devices** located in the right-of way to provide directional information to electric vehicle charging infrastructure acquired, installed, or operated under the NEVI program
- **Mapping and analysis activities** to evaluate, in an area in the United States designated by the eligible entity

Details Available:

Section IV.A- Project Eligibility Provisions

Joint Office Technical Assistance Principles

Respectful collaboration with the electric charging experts that have preceded the Joint Office to accomplish our shared vision:

A future where everyone can ride and drive electric

- In our goal to build a reliable, convenient, equitable national network, Technical Assistance will
  - Dive into the hard challenges alongside states and our partners in order to create something revolutionary.
  - Help states getting started build on the successes and learn from the challenges of states with more mature networks.
  - Utilize the people, programs, and relationships that came before us and enable future charging experts.

Primary Audience – Phase One

Provide proactive and reactive support to State DOTs for NEVI guidance roll-out, capacity building, and state plan development

Proactive and Reactive Technical Assistance

DriveElectric.gov

Website connects state DOTs and other stakeholders to technical assistance resources, including:

- NEVI guidance
- State plan template
- Technical assistance concierge
- Supporting data and tools
- Will continue to update as new resources become available

Foundational NEVI/Alternative Fuel Corridor (AFC) data

- Provides data that meet NEVI requirements
- Provides all DC Fast stations for upgrade analyses
- Provides number of EVSE ports and connector breakdown

Webinars

- Proactively push information to states and partners
- Rotate between open and state focused topics
- Workinars for specific guidance and plan topics

State One-on-One Meetings

Individual meetings between states and the Joint Office

- General assistance developing NEVI plans
- Specific areas of assistance
- Support with Round 6 AFC nominations
- Coordination with existing state EV charging plans
- Clarification on guidance

Email or use contact form for assistance

Actual State One-on-One Topics

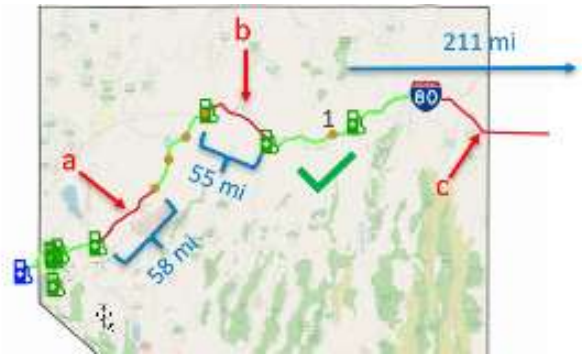
- As of 3/22, 40 states have reached out to the Concierge
- Inquiries have resulted in 27 state one on ones

- Exceptions
- Cost Share
- Delegating to Other State Agencies
- De-designations of Corridors
- Strategy for New Corridor Designation
- Eligible roadways for NEVI
- Timing of plans
- J40 compliance
- Details needed for state plans
  - Station siting
  - Signage

Discuss Analysis and Data Needs

- Joint office has analysis capabilities and can draw on National Laboratory colleagues for support
- Working on engaging other analysis partners

- Identify what stations need upgrades to meet NEVI
- Calculate stations needed along corridors
- Clarify ready – pending – fully built out continuum
- Evaluate which stations are in Justice40 regions
- Identify roadways where 50 miles may be challenging
- Assess roadways for exceptions
- Evaluate where NEVI requirements for stations may not be enough for expected traffic
- Evaluate state allocations versus potential corridor build out cost



Joint Office of
Energy and Transportation

Thank You

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