



# A Future Where Everyone Can Ride and Drive Electric

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Joint Office of  
**Energy and  
Transportation**



**Kamala Harris** ✓

@KamalaHarris

United States government official

The future of transportation in our nation and around the world is electric.

Our nation's ability to manufacture, charge, and repair electric vehicles will help determine the health of our communities, the strength of our economy, and the sustainability of our planet.

9:16 AM · Dec 17, 2021 · Sprout Social

# American-Made Electric Vehicles

New U.S. Electric Vehicle\* Component and Assembly Plant Investments Announced Under President Biden



# Historic Investment in American Made Manufacturing

>\$100 billion in the battery supply chain

>\$30 billion in EV manufacturing

>\$500M in EV charger manufacturing



Over \$30 billion announced so far



Over 80 new or expanded EV component or assembly plants



Over 40,000 new jobs



Technology Sub-type

- Assembly
- Components



Based on publicly available information. Many facilities are conditional on financing, funding, site control, and other factors. \*Light, medium, and heavy duty on-road vehicles in passenger and commercial use and select non-road applications.

# Major BIL Programs Supported by the Joint Office



National Electric Vehicle Infrastructure Formula Program (U.S. DOT)

\$5.0B



National Electric Vehicle Infrastructure Discretionary Program (U.S. DOT)

\$2.5B



Low-No Emissions Grants Program for Transit (U.S. DOT)

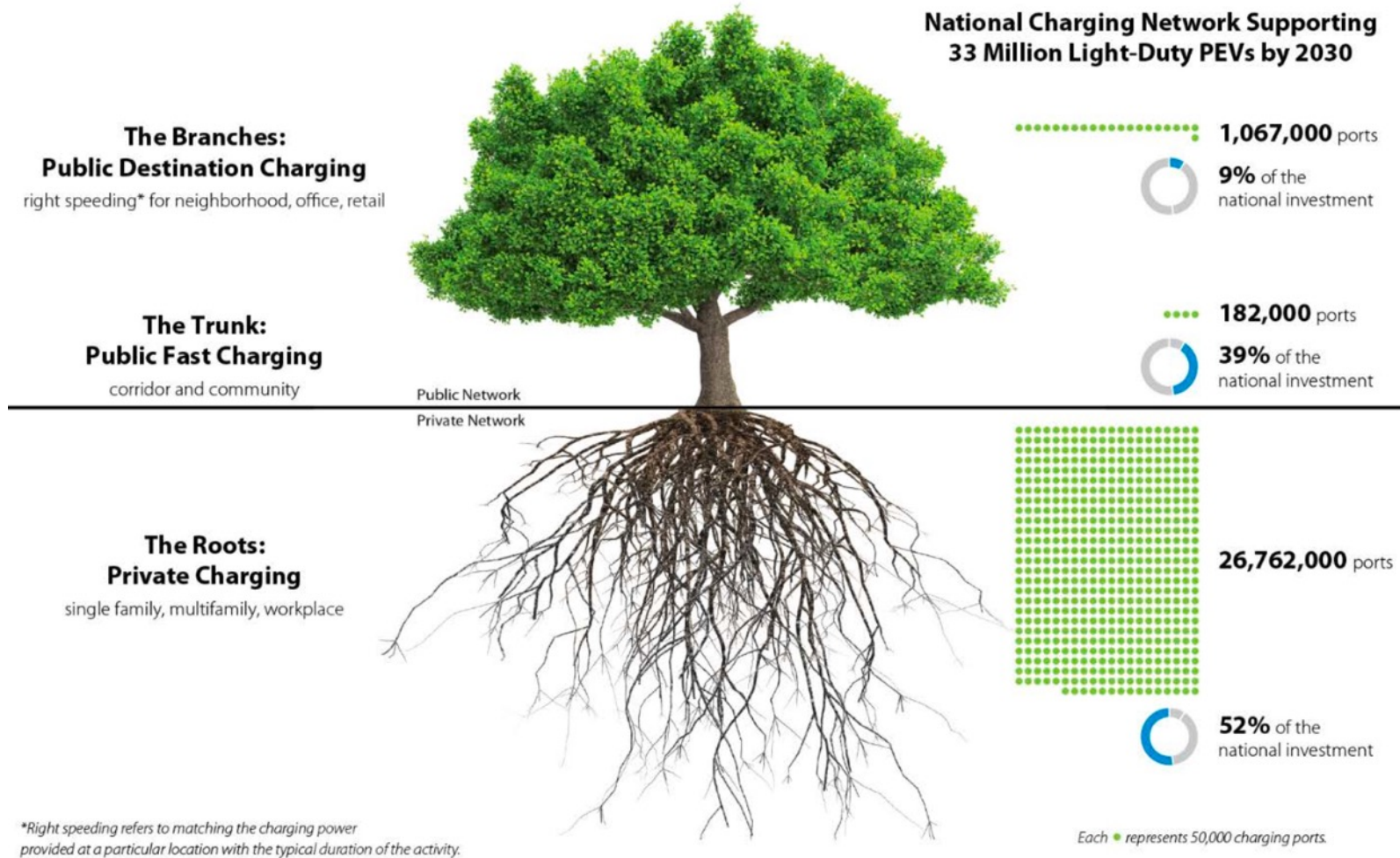
\$5.6B



Clean School Bus Program (U.S. EPA)

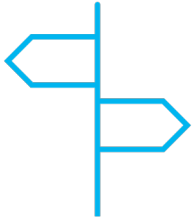
\$5.0B

# 500,000 EV Chargers and Beyond

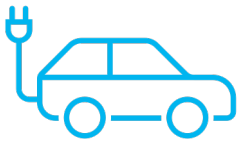


Source: Wood, Eric, et. al. "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure". National Renewable Energy Laboratory. 2023

# NEVI Formula Program Guidance



EV charging **every 50 miles** along Designated Corridors **within 1 travel mile**



≥ **Four 150kW DC Fast Chargers** with Combined Charging System ports



Minimum station power capability at or above **600kW** and supports at **least 150kW per port** simultaneously



# Joint Office Technical Work + Highlights



## EVChART

**What it is:** database of record for federally funded EV chargers

**Why it matters:** the largest EV charging database in the world will capture session level data and inform future program design and activities



## Reference Interoperability Architectures

**What it is:** open-source reference implementations of FHWA Standards (OCPP, OCPI, ISO 15118)

**Why it matters:** provide a common framework for EV charging companies and automakers to test against common implementations of key interoperability standards and ensure backwards compatibility



## National Charging Experience Consortium

**What it is:** National lab led consortium with 60+ organizations working on rapid solutions to ensure a reliable + frictionless charging experience

**Why it matters:** collaboration and technical solutions are needed to ensure that EV charging presents a superior experience

Project Name	Summary	Lab(s)
<a href="#"><u>Cybersecurity Technical Assistance</u></a>	Securing the National Charging Network	INL, PNNL
<a href="#"><u>EVSE Supply Chain Risk Evaluation, Analysis, and Mitigations</u></a>	Identifying the current state of cybersecurity in the supply chain	ANL
<a href="#"><u>Multi-family and Curbside Charging Study</u></a>	EV Charging Solutions for All Drivers	Volpe
<a href="#"><u>Urban Toolkit</u></a>	EV Charging Solutions for Urban Communities	Volpe
<a href="#"><u>EV Dashboard</u></a>	EV Market Analytics	ANL
<a href="#"><u>JUST Consortium</u></a>	Enhancing Equity and Community Engagement	ANL, NREL, LBNL
<a href="#"><u>CalderaCast</u></a>	EV Charging Demand Forecasting	INL
<a href="#"><u>ChargeX</u></a>	Improving the EV Charging Experience	ANL, INL, NREL
<a href="#"><u>EV Charging Business Model Assessment</u></a>	Financial Models for EV Charging	ANL, McKinsey
<a href="#"><u>EV Charging Soft Costs</u></a>	Reducing Costs to Install EV Chargers	INL, LBNL, NREL
<a href="#"><u>JD Power Analysis</u></a>	Performance and Satisfaction Data for EV Charging	ANL
<a href="#"><u>AFLEET</u></a>	Greenhouse gas estimation tool	ANL
<a href="#"><u>GUS + CHIP</u></a>	Electric Grid Integration for Electric Vehicles	PNNL
<a href="#"><u>BILD-AQ</u></a>	Air Quality Impacts Tool	LBNL, NREL
<a href="#"><u>EVI-X</u></a>	EV Charging Network Needs Identification Modeling	NREL
<a href="#"><u>Multi-State Transportation Electrification Impact Study</u></a>	Light-, Medium-, and Heavy-Duty Electrification Infrastructure Assessment	NREL, LBNL
<a href="#"><u>EV Charging PKI Analysis &amp; Assessment</u></a>	Cybersecurity implications of the EV charging system standards required by the NEVI Formula Program as it relates to PKI	SNL, PNNL, NREL



# Joint Office FY23 Ride and Drive Electric Funding Opportunity Topics

## Topic 1

Resiliency planning to prepare for emergency response for electric vehicles during extended power outages

## Topic 2a

Development of equity-focused business models for electric mobility

## Topic 2b

Workforce development programs for EV charging maintenance with emphasis on opportunities for underrepresented minorities

## Topic 3a

Expanded commercial certification and testing capacity for EV chargers

## Topic 3b

Third-party validation and training to measure EV charging station performance against FHWA standards



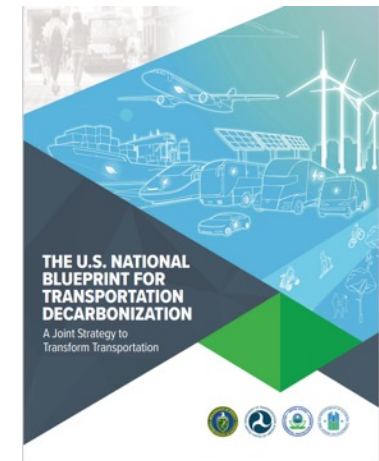
# Transportation Decarbonization Blueprint

# A Coordinated Approach

Four agency MOU signed 9/15/2022 established a historic, whole-of-government approach to transportation decarbonization

- Consistent and expanded stakeholder outreach
- Clear signals to industry
- Coordination at all staff levels:
  - RDD&D planning and execution
  - Infrastructure deployment
  - Policy & regulation development
  - Data, tools, education and training

Underpinned by a singular aligned transportation decarbonization vision/blueprint



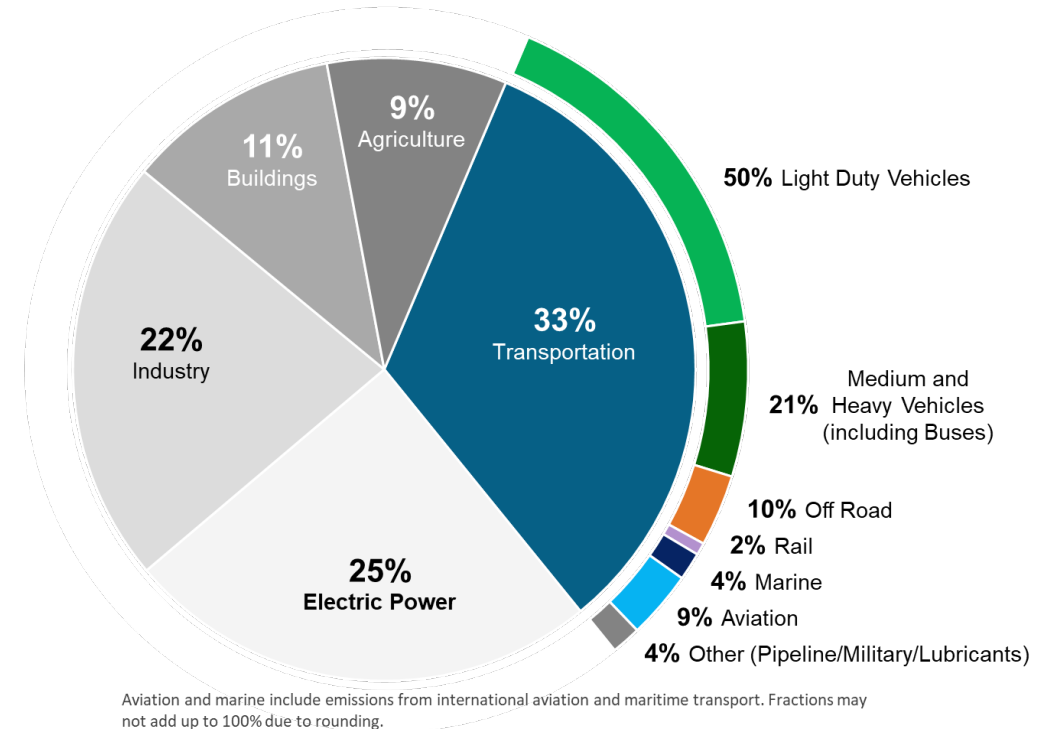
# Focus on the Entire Transportation Sector

The goal is complete decarbonization of the transportation sector

## The Blueprint

- Covers every mode and sets up **realistic, achievable** pathways based on innovation and science
- Builds on existing federal commitments
- Is a strategic approach that **leverages market forces** for **widescale** deployment of **cost-effective** clean transportation technologies
- Focuses on solutions that can be **incrementally deployed**, delivering results by 2030
- Addresses full **lifecycle emissions** and integration with the **electric grid**

## 2021 U.S. GHG Emissions



# The Strategies

Strategies to achieve decarbonization:

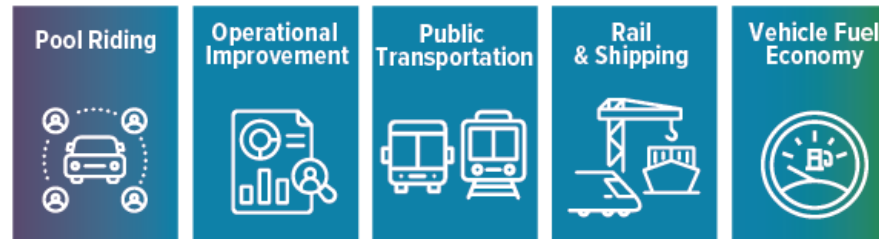
## Convenient



Improve Community Design  
and Land-use Planning

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

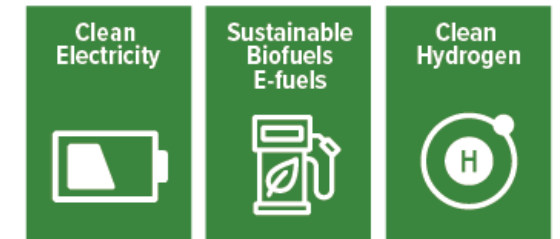
## Efficient



Increase Options to Travel  
More Efficiently

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

## Clean














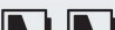






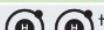
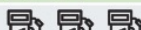


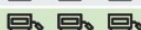
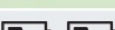


Transition to Zero Emission  
Vehicles and Fuels

Deployment of zero-emission vehicles, fuels and associated infrastructure

# Clean Solutions for All Modes

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
<b>Additional Opportunities</b>	<ul style="list-style-type: none"> <li>• Stationary battery use</li> <li>• Grid support (managed EV charging)</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy industries</li> <li>• Grid support</li> <li>• Feedstock for chemicals and fuels</li> </ul>	<ul style="list-style-type: none"> <li>• Decarbonize plastics/chemicals</li> <li>• Bio-products</li> </ul>
<b>RD&amp;D Priorities</b>	<ul style="list-style-type: none"> <li>• National battery strategy</li> <li>• Charging infrastructure</li> <li>• Grid integration</li> <li>• Battery recycling</li> </ul>	<ul style="list-style-type: none"> <li>• Electrolyzer costs</li> <li>• Fuel cell durability and cost</li> <li>• Clean hydrogen infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple cost-effective drop-in sustainable fuels</li> <li>• Reduce ethanol carbon intensity</li> <li>• Bioenergy scale-up</li> </ul>

\* All emissions shares are for 2019

† Includes hydrogen for ammonia and methanol



Thank You

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