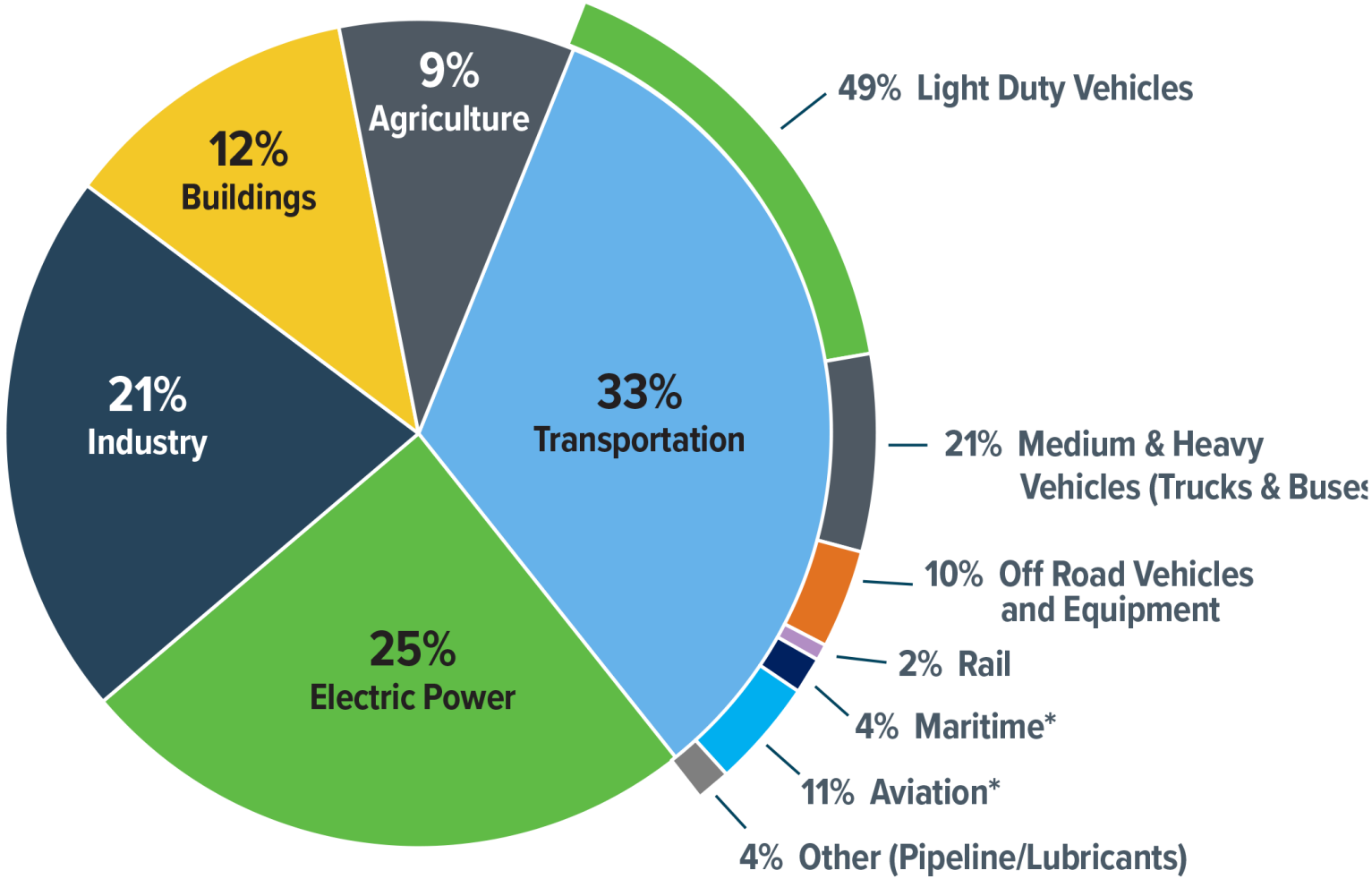
Land Use for Climate Action:
Strategy, Funding, Impacts

Emissions Trends and Goals

U.S. Department of Transportation

- Transportation is the **largest source** of U.S. greenhouse gas (GHG) emissions
- **U.S. Economy-wide Goals:**
  - 50-52% below 2005 levels by 2030
  - Net zero by 2050



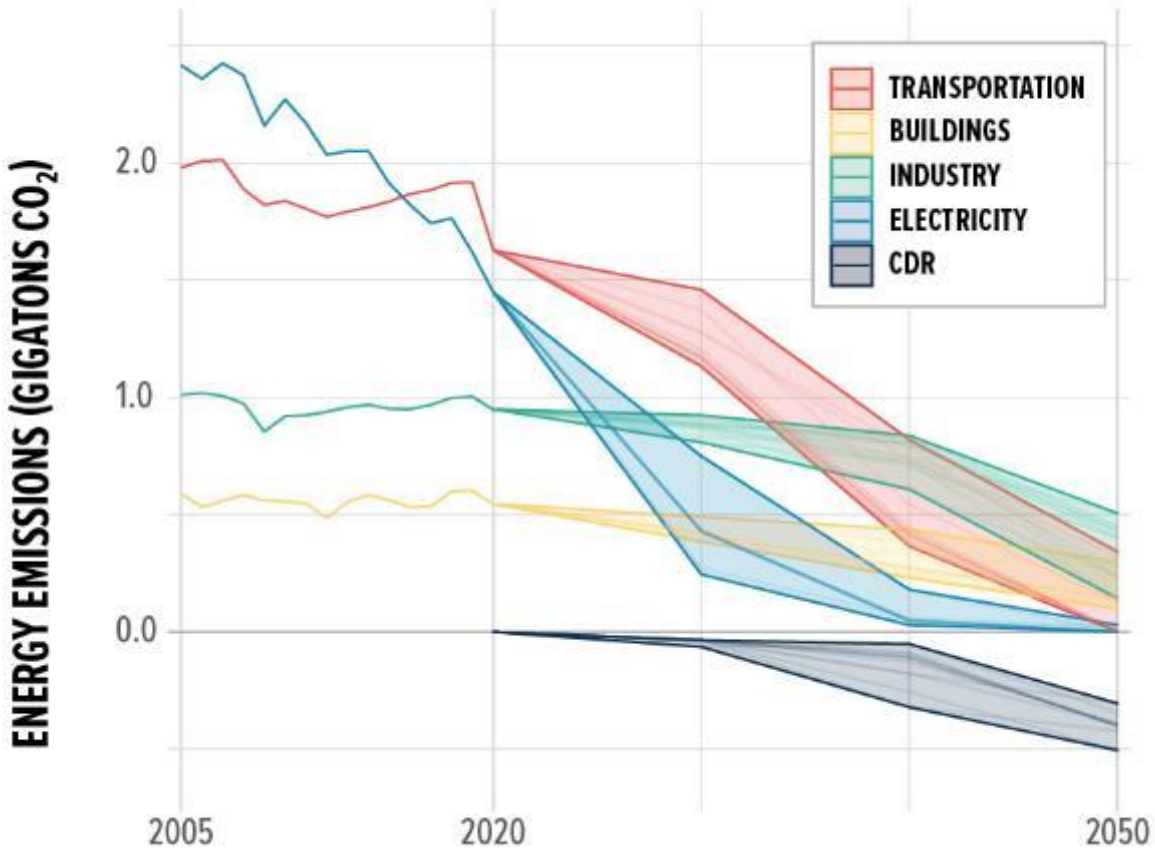
* Aviation and marine include emissions from international aviation and maritime transport. Military excluded except for domestic aviation.

U.S. making progress, but needs to accelerate to meet targets

- 2005 to 2021: U.S. GHG emissions fell 20%, led by reductions in the electric power sector

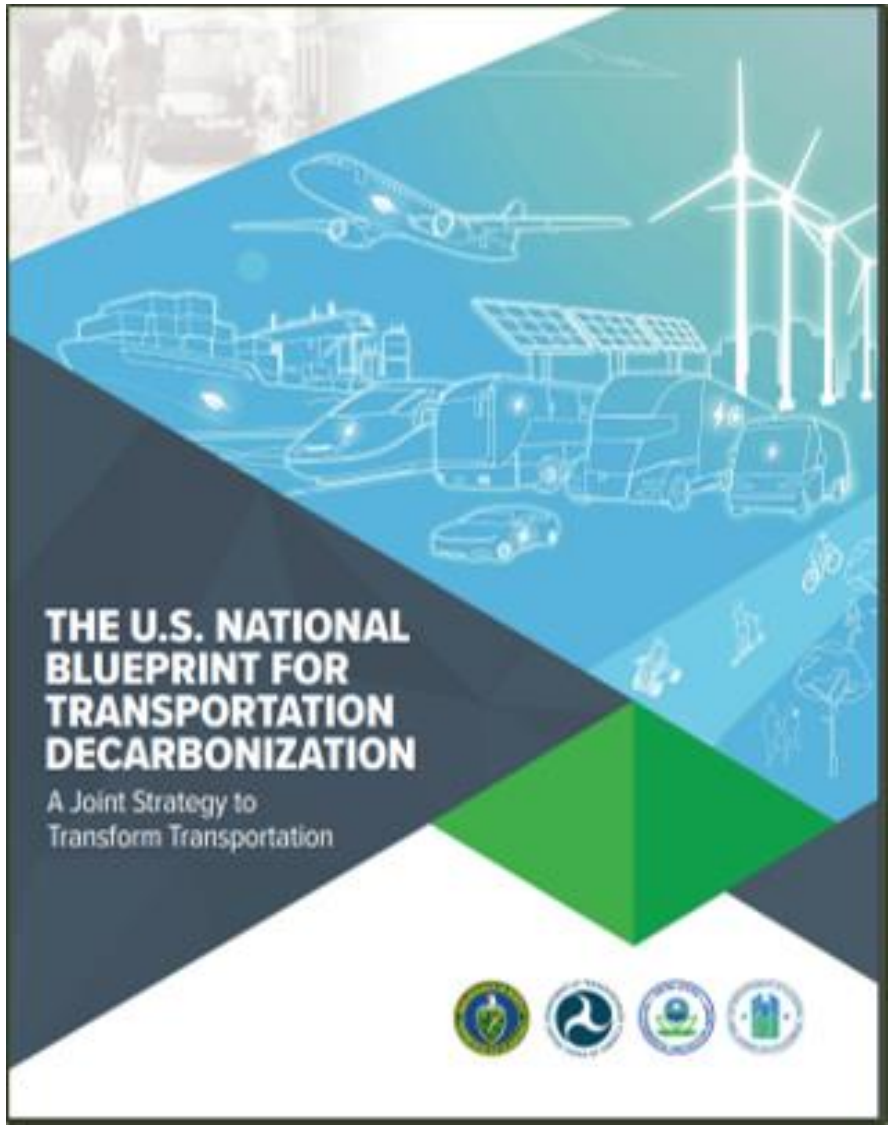
- U.S. transportation GHG emissions fell only 8% during that same time

➢ **Transportation GHG emissions must fall dramatically to meet national targets**



Historic U.S. CO2 by sector from 2005 to 2020 and target ranges for 2020 to 2050 according to the Long-Term Strategy of the United States, November 2021

The Blueprint



US National Blueprint for Transportation Decarbonization

- Developed by DOT, DOE, EPA, HUD
- Released January 2023
- Strategy to reach Net-Zero transportation GHG by 2050

US DOT Report to Congress: Decarbonizing U.S. Transportation

U.S. Department of Transportation

"The U.S. will not be able to decarbonize the transportation sector by midcentury <u>without addressing increased demand for vehicle travel</u>."

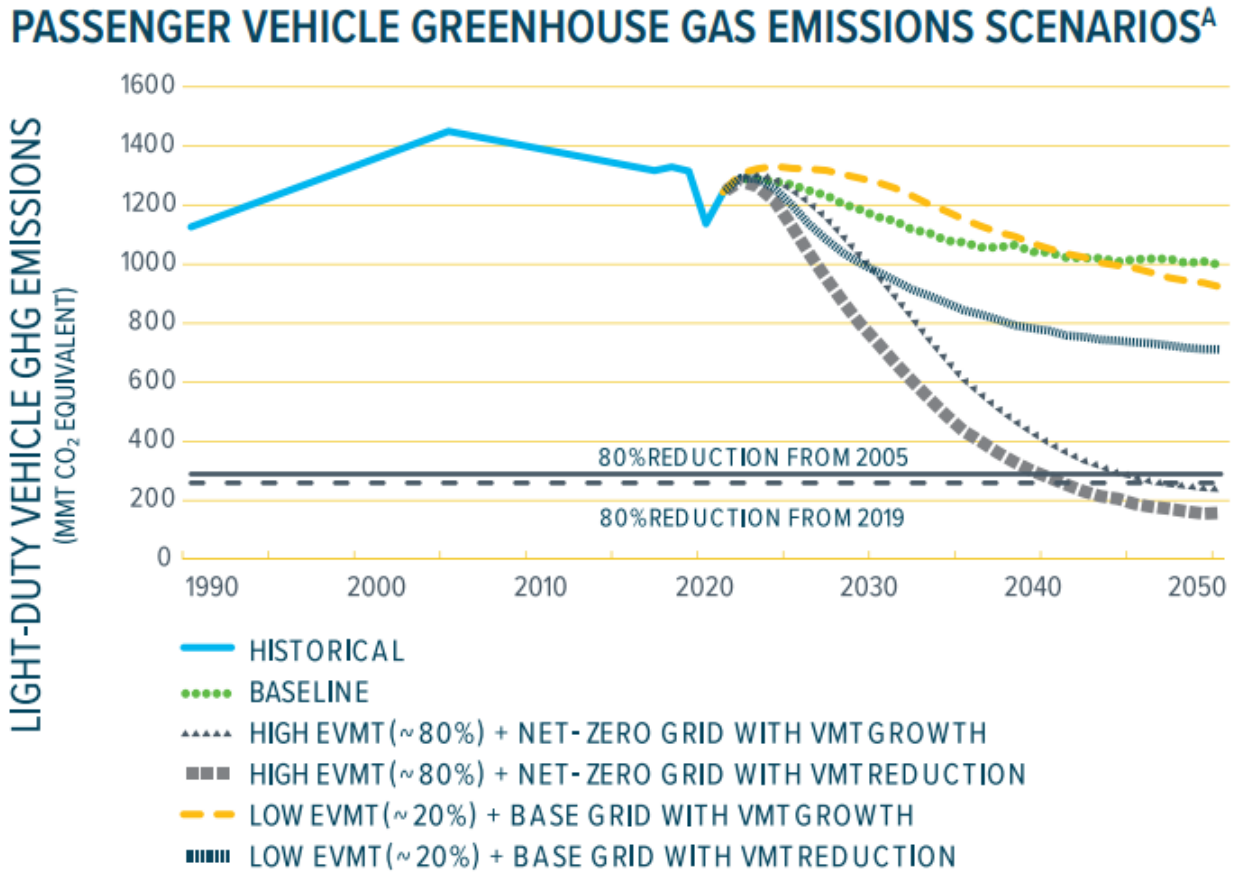
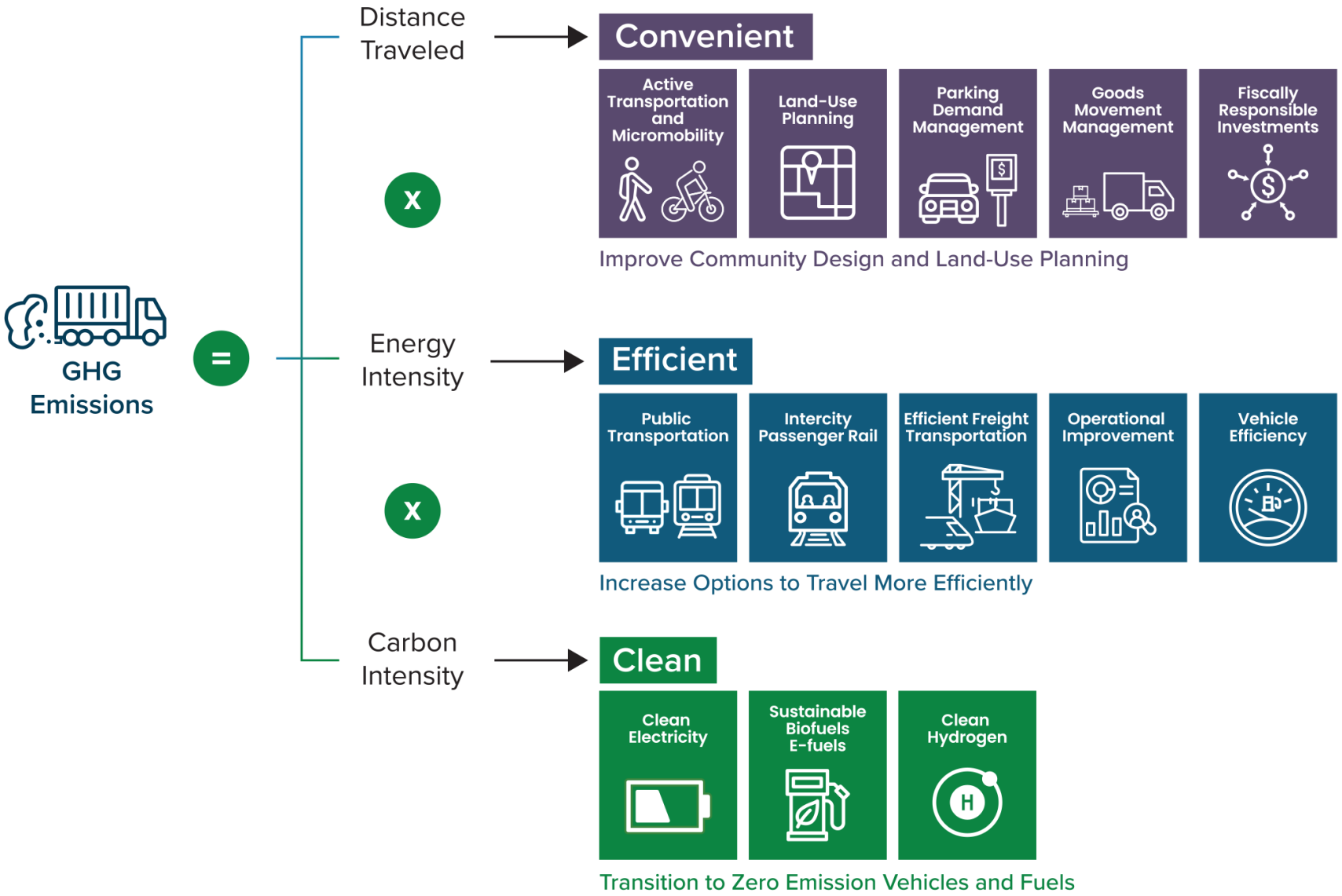


Figure 7: GHG emissions scenarios depend on EV adoption as well as VMT change. (Source: Hoehne, C., Muratori, M., Jadun, P., Bush, B., Yip, A., Ledna, C., Vimmerstedt, L., Podkaminer, K. and Ma, O., 2023. Exploring decarbonization pathways for USA passenger and freight mobility. Nature Communications, 14(1), p.6913.)

Transportation Decarbonization Strategies



Our Panel

U.S. Department of Transportation

Ann Shikany

US Department of Transportation

Deputy Assistant Secretary

Kera Package

US Department of Housing and Urban Development

Deputy Assistant Secretary

Chris Hoehne

National Renewable Energy Labs Research Scientist

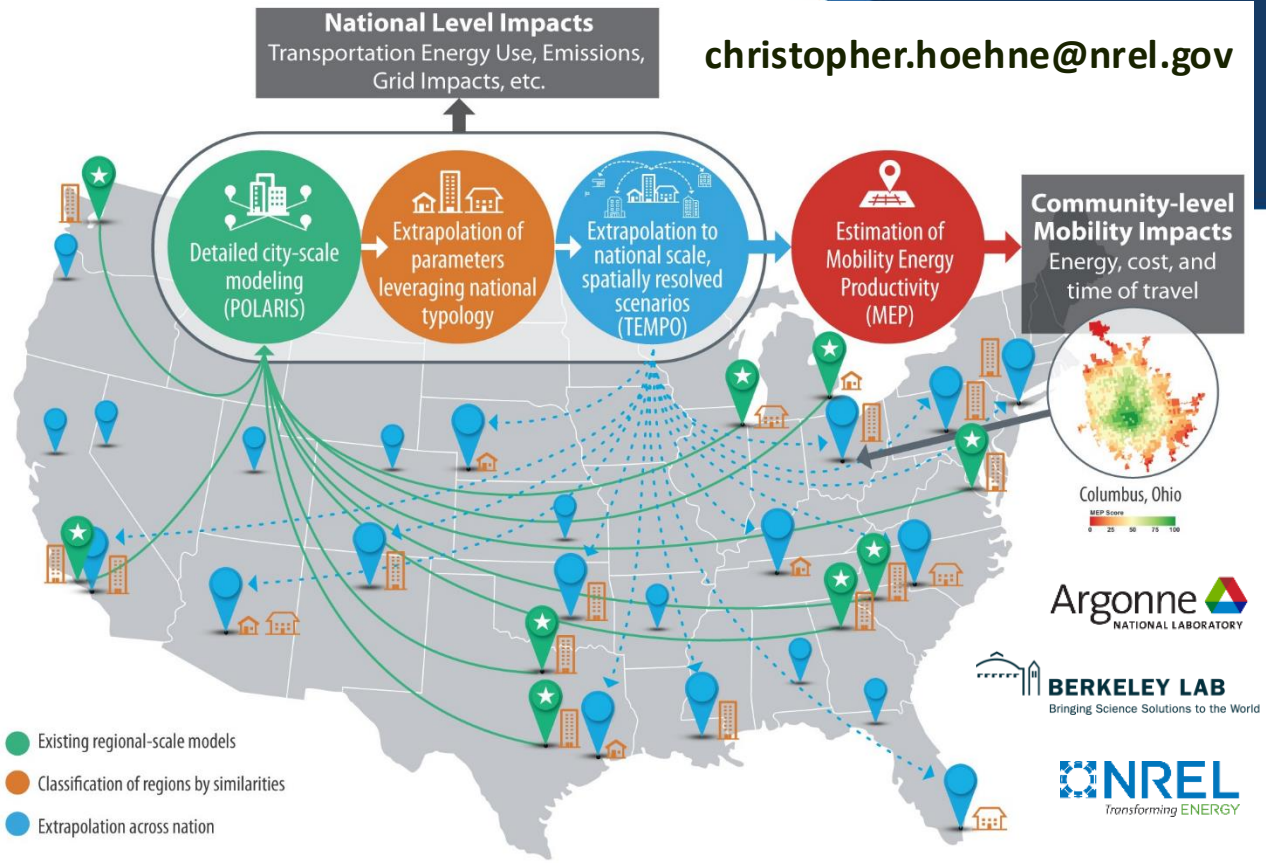
Liya Rechtman

US Department of Transportation

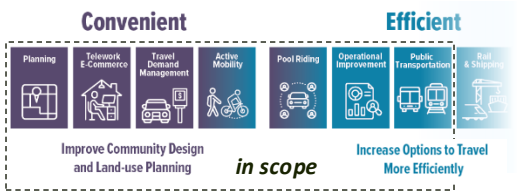
Multi-lab Research Project to Address Gaps

christopher.hoehne@nrel.gov

This project is fillling a strategic gap by linking key state-of-the-art transportation modeling capabilities from three National Labs to facilitate assessment of decarbonization strategies at national & community scales.



RESEARCH MOTIVATION:



Transportation Decarbonization Blueprint

- Focus on convenient pillar motivated by Blueprint
- Improving mobility convenience (e.g., land-use planning) to achieve decarbonization will require capturing regional heterogeneity and informing national-level impacts
- Communities with limited resources need insights from state-of-the-art tools to improve energy-efficient access, reduce emissions and costs, and achieve greater equitable mobility

Economy-wide modeling insights from 37th Energy Modeling Forum (EMF-37)

- US economy-wide modeling across dozens of teams/models from various institutions
- Insights from the Transport Study Group: state-of-the-art economy-wide models show no potential for land use or mode shift to support transport decarbonization (gap in capabilities)

Literature review on convenient & Travel Demand Management (TDM) strategies

- At regional level, clear potential for mode shift, VMT reduction, etc.
- No current TDM research is national in scope and forward looking
- Recent national analysis with NREL's TEMPO model shows importance of TDM in decarbonization to ease ramp up of low-carbon electricity supply

POLARIS: highly-resolved agent-based transport model, only available in select US metros, maintained by (**Argonne Lab**)

TEMPO: US-wide, county-resolved transport model for exploring long-term scenarios of sector outcomes (**NREL**)