BERKELEY CLIMATE MAP – CLIMATE & TRANSPORTATION JUNE 2025
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The transportation sector – primarily cars and trucks – is the #1 GHG producer in California and the U.S. and to-date has been the toughest sector in which to make progress. Transportation's significance and difficulty can both be traced to California's 38 million people and decades of land use development that is highly car-dependent. Making a massive shift to clean transportation will require a combination of significant behavior change (buying electric vehicles, driving less) and statewide action (EV mandates/incentives, robust charging infrastructure, electric grid improvements, stricter emissions standards, expanded public transit, bike/walk and telework). Transportation GHGs can also be reduced through improvements in aviation and shipping.

Berkeley has a long history with transportation research and action around policy, technology, behavior change and more. Much of this work has been done under the Institute for Transportation Studies umbrella. Campus experts from Engineering, Law, Goldman Policy, and Lawrence Berkeley Lab have influenced state leaders for decades and are currently investigating these climate/transportation topics:

- Equity and electric vehicles
- Air pollution and health
- Self-driving cars and trucks
- China and U.S. transportation strategies
- Transit-oriented development (TOD)
- Land use policies
- Sustainable aviation
- Batteries and battery supply chains
- Hydrogen fuel
- Transportation infrastructure
- Smart Cities
- Advanced transportation technology
- Pavement
- Transportation behavior
- Freight decarbonization
- EVs and the electrical grid
- Heat impacts from transportation facilities and land use
- Shared mobility
- Advanced transportation modeling
- Vehicle standards and safety
- Port of Oakland
- Decarbonization of ocean-going vessels

First	Last	Primary Affiliation	Summary	Selected Projects/Reports/Classes
Ken	Alex	Law	Electric vehicles	Electric Vehicle Equity Initiative
Joshua	Apte	Engineering, Public Health	Air pollution and transportation emissions and public health	
Nitash	Balsara	Engineering	Balsara Lab works on the development of polymer electrolytes that enable the rapid transport of lithium ions between the battery electrodes. Our work encompasses materials design, synthesis, characterization, and performance evaluation in applications. We have developed microphase separated block copolymer electrolytes wherein one of the microphases is soft and ion-conducting, while the other is a rigid insulator. This design enables independent control over the electrical and mechanical properties of the electrolyte. We combine electrochemical characterization with advanced characterization methods such as synchrotron hard X-ray microtomography, X-ray photon correlation spectroscopy, and atomic-scale cryogenic electron microscopy to determine the molecular underpinnings of our observations. While we mainly focus on fundamental studies that are published in peer-reviewed journals, we also publish patents when we perceive that our work may have direct societal impact.	Based on our patents, group alumni have cofounded two battery start-up companies: Seeo (founded in 2007) and Blue Current (founded in 2014).
Alex	Bayen	Engineering - Electrical Engineering and Computer Science	Director of CITRIS. Bayen's general area of research lies at the intersection of control, optimization, and machine learning. Current applications include mobile robotics and transportation, including reinforcement learning for traffic to reduce energy use and GHGs.	Self-Driving Trucks Berkeley Mobile Sensing Lab

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	California Partners for Advanced Transportation Technology (PATH)	Campuswide	James Fishelson, Executive Director Scott Moura, Faculty Director PATH's aim is to realize a safe, equitable, efficient, and carbon-neutral transportation system for all, seeking to transform transportation through leading edge research and the development and demonstration of emerging technologies and ideas. PATH includes experts in technologies ranging from automated vehicles, connectivity, advanced data management systems, traffic simulation and control, human factors, multimodal transportation, freight and logistics, and much more.	Qijian Gan – 2023 UCOP Proposal: A Macroscopic Approach to Prioritizing Charging Infrastructure for Statewide Deployment of ZEVs PI on the Caltrans project, "System Impact of Connected and Automated Vehicles: An Application to the I-210 Connected Corridors Pilot", to develop an integrated platform in microsimulation to enable the modeling of CAVs and to evaluate potential impacts of CAVs on current ICM systems.
	California-China Climate Institute	Law	Exploring strategies in China and the U.S. to reduce emissions from transportation	"Driving to Zero: California and China's Critical Partnership on Zero Emission Vehicles" "Electric Vehicle Growth in China: What's Next?": Low Carbon Transportation and Zero Emission Vehicles
Robert	Cervero	CED – City and Regional Planning	Transportation policy, transit-oriented development	
Gerbrand	Ceder	Engineering	Ceder Group does cutting-edge research that has led to record-breaking battery materials and identification of new frontiers.	Ceder Group at Berkeley and LBL

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Elizabeth	Deakin	CED - City and Regional Planning, Institute for Transportation Studies	Deakin's research focuses on transportation and land use policy and the environmental impacts of transportation.	Report for the CA Strategic Growth Council (AB 285) (2021) Evaluation of California State and Regional Transportation Plans and Their Prospects for Attaining State Goals (climate, equity, etc.) Paper 1 – History/ How We Got Here https://lnkd.in/dHwCcX8W Paper 2 – State Plans https://lnkd.in/ddP3fNgx Paper 3 – MPO Plans https://lnkd.in/dHcvs5P9 Paper 4 - Funding Issues https://lnkd.in/dXtv6vsU Paper 5 – Flexibility for Change https://lnkd.in/d2YdUyS8
Ethan	Elkind	Law -- Center for Law, Energy and Environment	Director, CLEE Climate Program The Climate Change & Business Research Initiative engages business, nonprofit and government leaders in a collaborative project to achieve economic and environmental benefits from California's climate policies and program. The series includes over 20 reports spanning seven sectors of the economy, all of which are available at climatepolicysolutions.org.	Webinar and report "Possible Options for Sustainable Aviation in California" The California Roadmap (September 2020) Sustainable Drive, Sustainable Supply: Priorities to Improve the Electric Vehicle Battery Supply Chain (July 2020) Building a Sustainable Electric Vehicle Battery Supply Chain: Frequently Asked Questions (April 2020) Electric Vehicle Batteries: A Guidebook for Responsible Corporate Engagement Throughout the Supply Chain

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				Clean Takeoff: Policy Solutions to Promote Sustainable Aviation in California
Grace	Gu	Engineering - Mechanical Engineering	Composites, additive manufacturing, fracture mechanics, topology optimization, machine learning, finite element analysis, and bioinspired materials.	2023 UCOP Proposal: Development of high-pressure hydrogen storage solution for fuel cells used in zero-emission aircraft
Mark	Hansen	Engineering - Civil and Environmental Engineering	Hansen's research focuses on urban transportation planning, modeling air transport systems, air traffic flow management, and aviation systems performance analysis.	Berkeley co-director of the National Center of Excellence in Aviation Operations Research, a multi-university consortium sponsored by the Federal Aviation Administration.
Arpad	Horvath	Engineering - Civil and Environmental Engineering	Head of the Energy, Civil Infrastructure and Climate Graduate Program, Director of the Transportation Sustainability Research Center, and Director of the Engineering and Business for Sustainability Certificate Program. Horvath's research focuses on life-cycle environmental and economic assessment of products, processes, and services, particularly answering important questions posed about civil infrastructure systems and the built environment. He has conducted studies on the environmental implications of various products, processes and services, in particular, transportation systems, water and wastewater systems, buildings, concrete and other construction materials, pavements, and biofuel.	2023 UCOP Proposal: Life Cycle Analysis and Strategies for decarbonizing California Buildings with consideration to (and in light of) racial equity and housing affordability. CE268E Environmental Life-cycle Assessment (Fall 2023) CE11 Engineered Systems and Sustainability (Spring 2024)

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	Institute for Transportation Studies	Campuswide	Daniel Rodriguez, Director Laura Melendy, Assistant Director ITS develops leading-edge innovations influencing movement of people and goods and advancing sustainability, economic health, and quality of life. ITS hosts a number of faculty members from nine UC Berkeley academic departments and schools and approximately 150 researchers and students are associated with ITS through our various research and educational activities. ITS Berkeley is the umbrella organization for seven research centers: California Partners for Advanced Transportation Technology Berkeley DeepDrive Transportation Sustainability Research Center Safe Transportation Research and Education Center Smart Cities NEXTOR UC Pavement Research Center And two education centers TechTransfer Transportation Library	Hydrogen an Option for U.S. Trucking: Is Hydrogen Too Expensive For Trucks? Europe's second biggest truck manufacturer thinks so, but American experts disagree. (OCT 2023) Scaling Up Shared Rides: Pricing and Matching Policies Robotaxis and AI: Navigating Mobility Innovation and the Public Good
	Joint Bioscience Institute	LBNL	The JBEI is a U.S. DOE Bioenergy Research Center dedicated to developing advanced biofuels—liquid fuels derived from the solar energy stored in plant biomass that can replace gasoline, diesel and jet fuels. Selected in 2017 as one of four DOE Bioenergy Research Centers and was awarded a total of $125	

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			million over five years to support innovative research on biofuels and bioproducts.	
Tom	Kirchstetter	LBNL - Energy Analysis & Environmental Impacts Division	Director, Energy Analysis & Environmental Impacts Division EAEI conducts research on energy consumption and related impacts to inform policy, standards, and decision-making for the benefit of society and the environment. • Environmental Science and Technology • Healthy and efficient buildings • Cal THRIVES toolkit • Technoeconomic and lifecycle modeling • Energy efficiency • Energy markets and policy • Renewable energy • **Transportation systems** • Research Facilities • Tools Kirchstetter's current research interests in air pollution science and technology include the evaluation of in-use performance of vehicle emission controls, environmental impacts of freight x and decarbonization, inventing and benchmarking air pollution sensors, air pollution monitoring in communities, climate and air pollution footprints of municipal solid waste-to-energy, and the drivers of airborne transmission of SARS-CoV-2.	**Mobility Decision Science** Through our WholeTraveler project, we strive to understand trends and patterns in transportation behaviors of multiple relevant populations, including both the demand and supply of emerging transportation services such as ridehailing and vehicle sharing platforms. We quantitatively analyze how travelers, consumers, firms and government institutions make travel decisions across different timescales, as well as the technological transitions that can impact energy demand. We use these insights to inform technological, and economic pathways to an energy secure transportation future. **Vehicles & The Grid** To complement technology development efforts, system modeling and analysis are necessary to accelerate pathways to large-scale electrified transport. In this research area we assess the long-run economic, environmental and energy benefits, and costs of substantially electrifying U.S. road transportation.

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Tim	Lipman	Institute for Transportation Studies	Research focuses on electric-drive vehicles, fuel cell technology, combined heat and power systems, biofuels, renewable energy, and electricity and hydrogen energy systems infrastructure.	Director of the Northern California Center for Alternative Transportation Fuels and Advanced Vehicle Technologies (NorthCAT)
Rachel	Morello-Frosch	RCNR, Public Health	Environmental health equity, air pollution from transportation	
Daniel	Rodriguez	CED - City and Regional Planning	Director, Institute for Transportation Studies Examining the mortality consequences of past extreme heat events; whether greenspaces and air pollution ameliorate or exacerbate those effects; and how mortality will change as heat events increase under global emissions scenarios for the midcentury. CEEJ Advisory Council	
Samveg	Saxena	LBNL	Electrification of transportation, EVs and power grid, vehicle energy efficiency	Hydrogen and vehicles
Corinne	Scown	LBNL - Energy Analysis & Environmental Impacts Division, Energy & Biosciences Institute	Deputy for Research, Energy Analysis & Environmental Impacts Division Scown's research includes: • Technoeconomics analysis • Waste biomass to energy • **Liquid fuels** • Plastic waste management and recycling Vice President and founder of the Life-cycle, Economics, and Agronomy Division (LEAD) at the	Life-Cycle Assessment Considerations for Batteries and Battery Materials Complementary roles for mechanical and solvent-based recycling in low-carbon, circular polypropylene

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			Joint BioEnergy Institute (JBEI), and Head of Sustainability at the Energy and Biosciences Institute (EBI).	Techno-economic analysis and life-cycle greenhouse gas mitigation cost of five routes to bio-jet fuel blend stocks
Susan	Shaheen	Engineering	Shared mobility, EV adoption, climate impacts of mobility systems	
	Smart Cities Research Center	Campuswide - Institute for Transportation Strategies	Jane MacFarlane, Director, Smart Cities Research Center Our Mission: Improve mobility and quality of life in our cities, in a sustainable and energy efficient way, by advancing quantitative modeling of urban systems. Foster interdisciplinary training to solve real-world challenges of managing modern cities. Smart Cities Research Center is a collaboration between UC Berkeley and Lawrence Berkeley National Laboratory to improve energy-efficient mobility systems. Urban mobility understanding can be greatly improved by taking advantage of a new generation of data that has been collected by mobile devices. We study mathematical models and data analytics with approaches ranging from urban-scale simulation to control theory. We work with industry and public agencies to collect and model data for	At the center of our work is Mobiliti, our cutting-edge software system that accurately simulates the movement of an entire population through a region's road networks. Unlike traditional simulation capabilities, Mobiliti is able to handle the incredible volume of data that comes with modeling millions of trips across an entire metropolitan system. Just how well does Mobiliti scale? For the entire San Francisco Bay area (population ~8 million), the system can simulate a whole day's worth of trips in **under four minutes.**

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			the purpose of developing more efficient transportation networks.	
	Sustainable Transportation Initiative	LBNL	Batteries and Fuel Cells Big Data for Mobility Connectivity and Autonomy Emissions and Controls Vehicles and the Grid Mobility Decision Science Urban Mobility Modeling Vehicle Standards and Safety	
	Transportation Sustainability Resource Center	Campuswide - Institute of Transportation Studies	Susan Shaheen, Co-Director Tim Lipman, Co-Director Arpad Horvath, Co-Director. TSRC conducts research on a wide array of transportation-related issues, addressing the needs of individuals as well as the public. Research efforts are primarily concentrated in six main areas: 1. Advanced Vehicles & Fuels 2. Energy & Infrastructure 3. Future of Mobility 4. Goods Movement 5. Mobility for Special Populations 6. Shared Mobility	2024 Advanced Air Mobility Hackathon (AAM)
Joan	Walker	Engineering – Civil and Environmental Engineering	Walker's research focuses on behavioral modeling, with expertise in discrete choice analysis and travel behavior. She works to improve the models that are used for transportation planning, policy, and operations.	

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David	Wooley	Goldman - CEPP	Director, Center for Environment and Public Policy davidwooley@berkeley.edu	Project 2025 Report on Transportation Much work with Port of Oakland Lead author: The Future of Energy, Environment and Natural Resources for the California 100 Project CEPP Project: Policy Options for Decarbonizing Ocean-Going Vessels
Jin	Xu	LBNL	Emissions modeling and fuel economy and transport scenarios	