Public Workshop in Fulfillment of Senate Bill (SB) 1 Requirements to Evaluate Emissions Reduction Needs from Commercial Motor Vehicles

August 11, 2022

Zoom Workshop Details

- Telephone Call-In: (215) 446-3656
- Access Code: 350021
- Questions:
  - In Zoom: Use “Raise Hand” feature
  - On phone:
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Today's Outline

1. Overview of Truck and Bus Regulation and Approach to Meet SB 1 Requirements
2. Compliance Rates of Truck and Bus Regulation
3. Upcoming State and Local Air Quality Goals
4. Evaluation of Tools and Policies to Achieve Air Quality Goals
5. Next Steps

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Overview of Truck and Bus Regulation

- Generally requires diesel-fueled vehicles with a Gross Vehicle Weight Rating (GVWR) greater than 14,000 lbs. operating in California to upgrade to 2010 or newer model year (MY) engines by Jan 1, 2023
  - PM filter (e.g. DPF) requirements started in Jan 1, 2012
  - MY 2010 engine requirements started in Jan 1, 2015
- Engine MY 2007-2009 and newer are currently compliant, but must be turned over to 2010 by Jan 1, 2023

Background on Senate Bill (SB) 1

- Signed into Law in 2017
- Invests $54 billion to California roads, freeways, bridges, transit, and safety
- Includes provisions for commercial (heavy-duty) vehicles

SB 1 Provisions for Commercial Vehicles

- DMV registration holds for vehicles that are not compliant with Truck and Bus Regulation starting in 2020
- Set a useful life period that prevents CARB from requiring the retirement, retrofit, or repower until the later of the following time periods:
  - 13 years from the model year the engine and emission control system are first certified
  - When the vehicle reaches the earlier of either 800,000 vehicle miles traveled or 18 years from the model year the engine and emission control system are first certified

SB 1 Direction for CARB

- Report to the Legislature on impact of useful life provisions on State and local clean air efforts
- Hold at least one public workshop on the report
- Make recommendations to the Legislature on additional or different mechanisms to achieve air quality goals

CARB's Proposed Approach to Meet SB 1 Requirements

- Evaluate compliance rates of Truck and Bus Regulation
- Assess the impact of the useful life provision on upcoming state and local air quality goals
- Evaluation of tools and policies to achieve air quality goals (through external contract)

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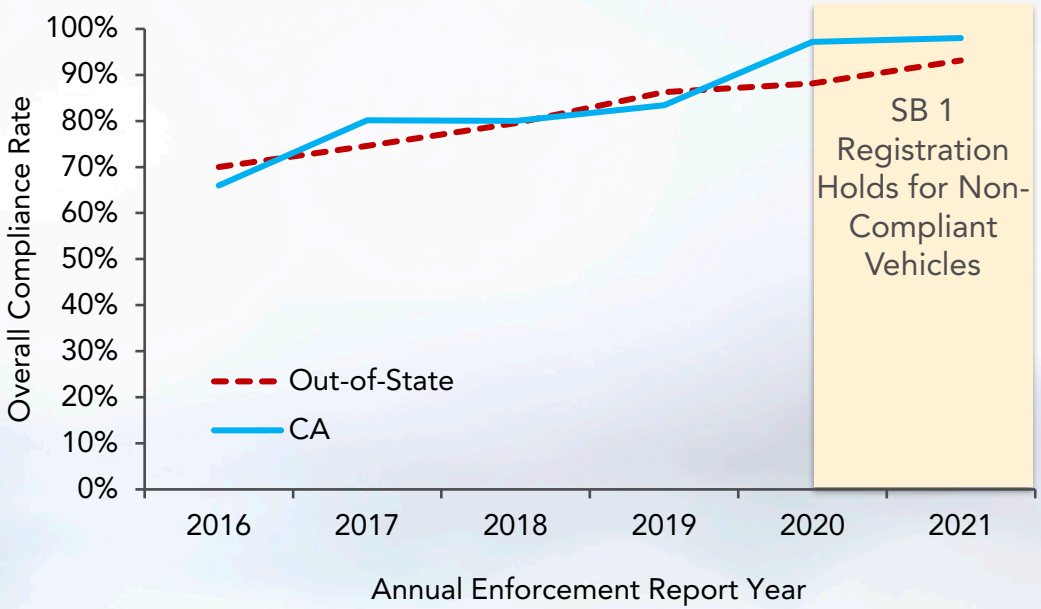
Compliance Rates of Truck and Bus Regulation: Data and Methods

- **Registration databases**
  - **CA DMV:** California-registered vehicles
  - **International Registration Plan (IRP):** Fleet-level info for out-of-state vehicles traveling in CA
- **Methods**
  1. Assess compliance for all vehicles registered in DMV and in IRP fleets with mileage in CA
  2. Collect Automated License Plate Reader (ALPR) data and link plates to vehicles in DMV and IRP

Compliance Rates of Heavy-Duty Vehicles



* Overall rates calculated from Appendix I in CARB's annual enforcement reports. Represents all GVWR > 14,000 lbs and all CA and Out-of-State vehicles.

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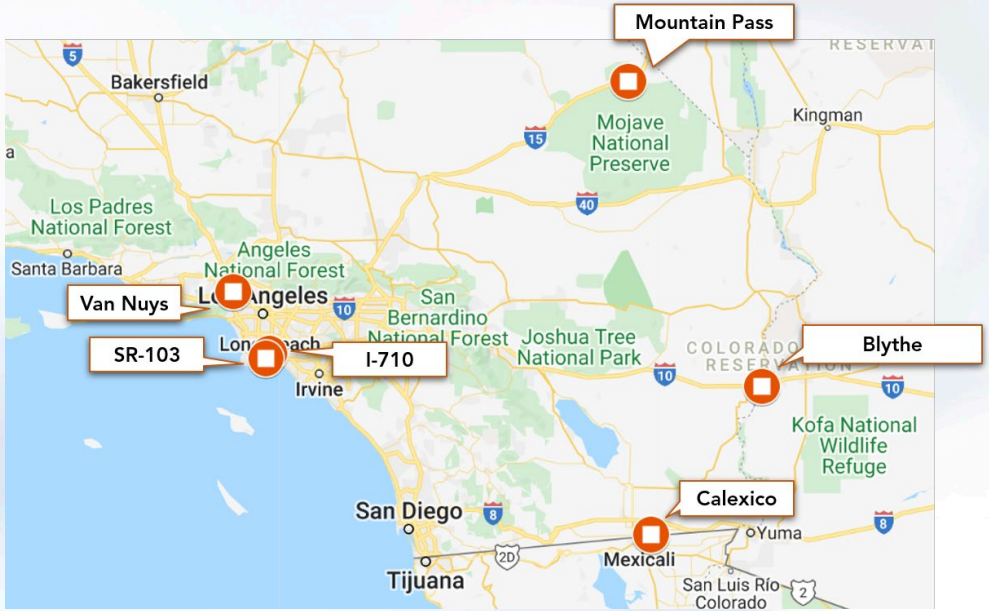
Compliance Rates for Vehicles Captured by ALPR

- CARB deployments of ALPR Systems*
- 1.4 million heavy-duty vehicles captured from Jan - May 2022
- Compliance rates for Class 4-8 trucks
  - CA: **99%**
  - Out-of-State: **96%**



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** ALPR Privacy and Usage Policy (2017)*
https://ww2.arb.ca.gov/sites/default/files/2021-07/arb_alpr_privacy_usage_policy_050317.pdf

Recap and Next Steps

- DMV registration holds correlated with increased compliance rates for Truck and Bus Regulation, especially CA-registered vehicles
- CARB staff plan to calculate and report on compliance rates through end of 2022
- Evaluate reasons for non-compliance, especially for fleet groups with lower compliance rates

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Upcoming State and Local Air Quality Goals

2023: South Coast & SJV Ozone

2024/25: South Coast & SJV PM2.5

2030: GHG 40 percent below 1990

2031: South Coast & SJV Ozone

2037: South Coast & SJV Ozone

2045: Carbon Neutrality

2050: GHG 80 percent below 1990

Community Emission Reduction Programs

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Assembly Bill (AB) 617 Selected Communities

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Executive Order N-79-20

100% ZEV sales by 2035

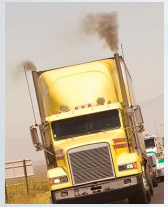
Full transition to
ZEV short-haul/drayage trucks
by 2035

Full transition to **ZEV buses** &
heavy-duty long-haul trucks
by 2045*

Full transition to
ZE off-road equipment
by 2035*

*where feasible

CARB Adopted Regulatory Measures from 2018-2021



HD Vehicle Inspection Program/Periodic Smoke Inspection Program

Innovative Clean Transit (ICT)

Advanced Clean Trucks (ACT)

Heavy-Duty Inspection and Maintenance

HD Engine Warranty

Zero Emission (ZE) Airport Shuttle Bus

HD Omnibus

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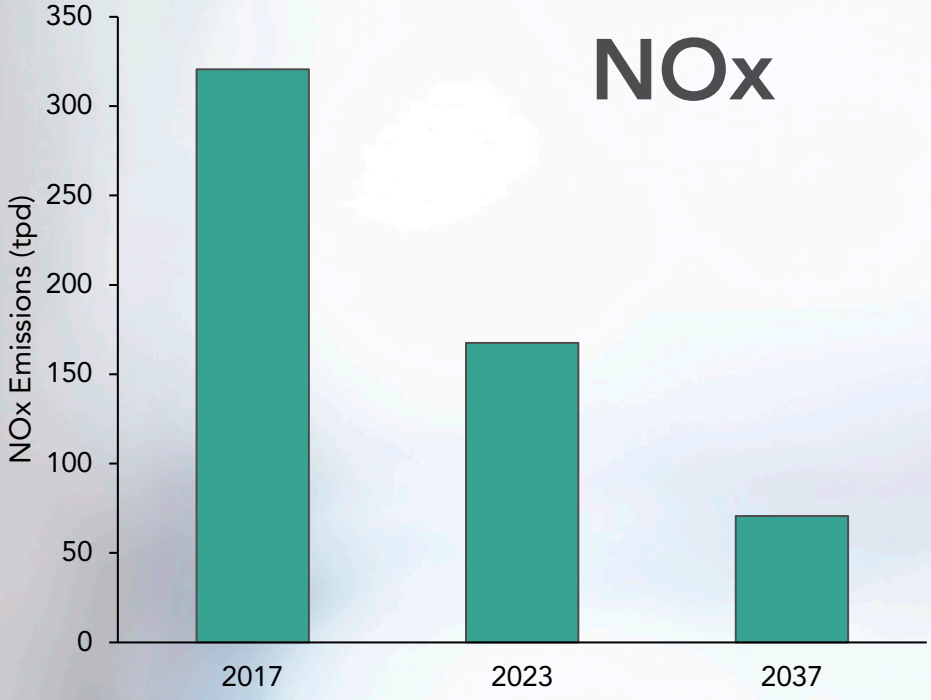
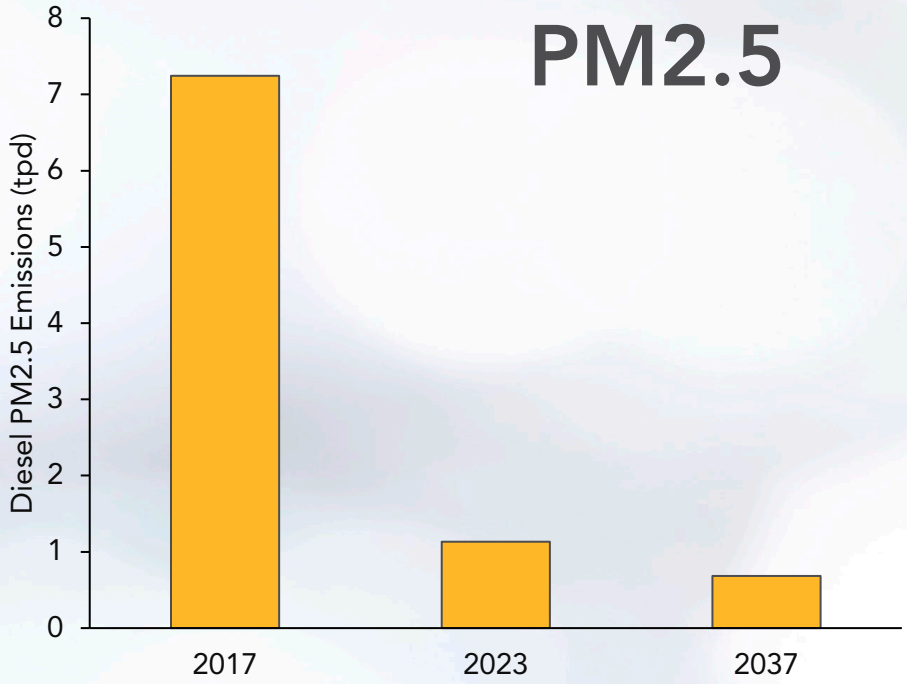
Projected Statewide Heavy-Duty Vehicle Emissions with Adopted Regulations





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CARB Measures and Federal Actions for Heavy-Duty Vehicles

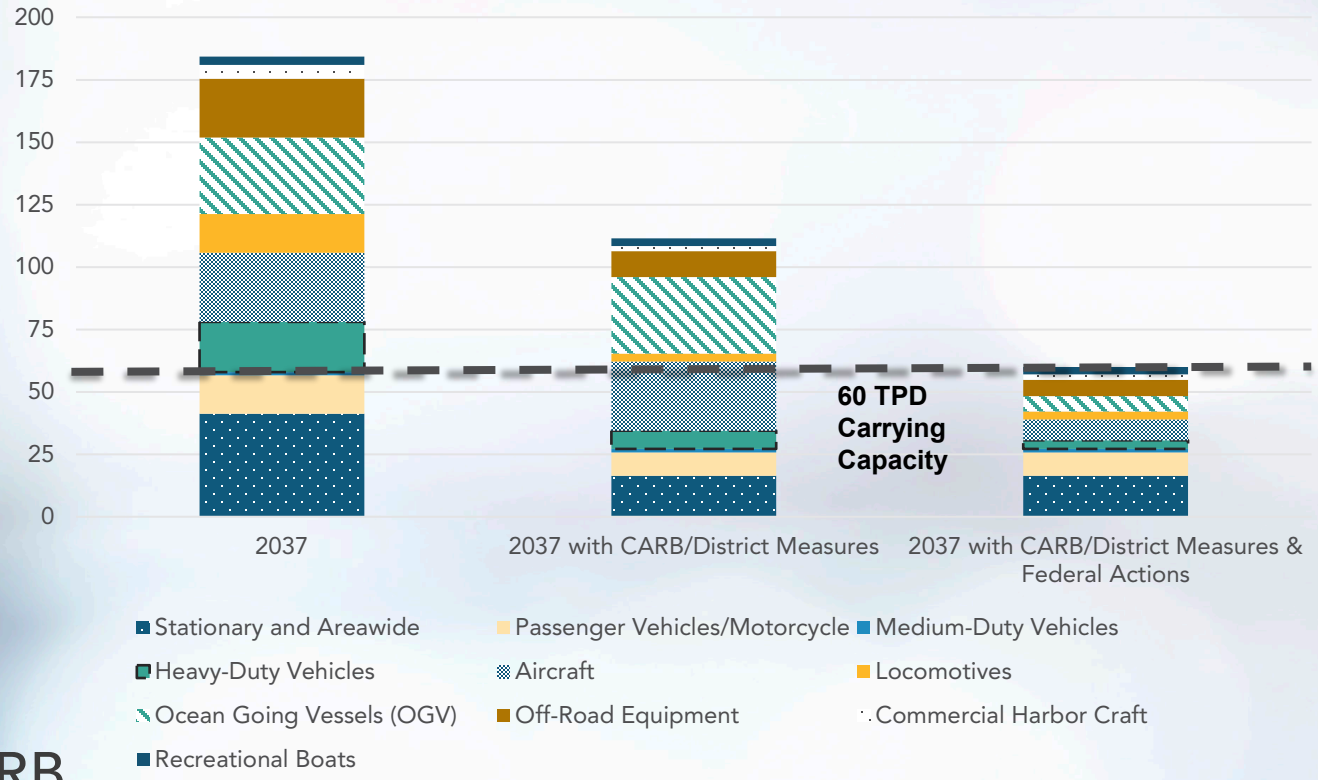
Under Development
Advanced Clean Fleets (ACF)
Federal Heavy-Duty Engine and Vehicle Standards

Future Actions
Zero Emission (ZE) Truck Measure

Zero Emission (ZE) Truck Measure

- Included in the 2022 State SIP Strategy
- After adoption of ACT and ACF, there will still be 480,000 combustion trucks on the road in 2037
- Potential options to transition remaining the heavy-duty combustion fleets to zero-emission:
  1. Flexible approach of differentiated registration fees, green zones, and/or ISR that would be less costly for fleets, but could require new authorities
  2. If new authorities not granted, then would use ZE fleet/upgrade requirements.

South Coast NOx Emissions with Measures and Federal Actions in 2037



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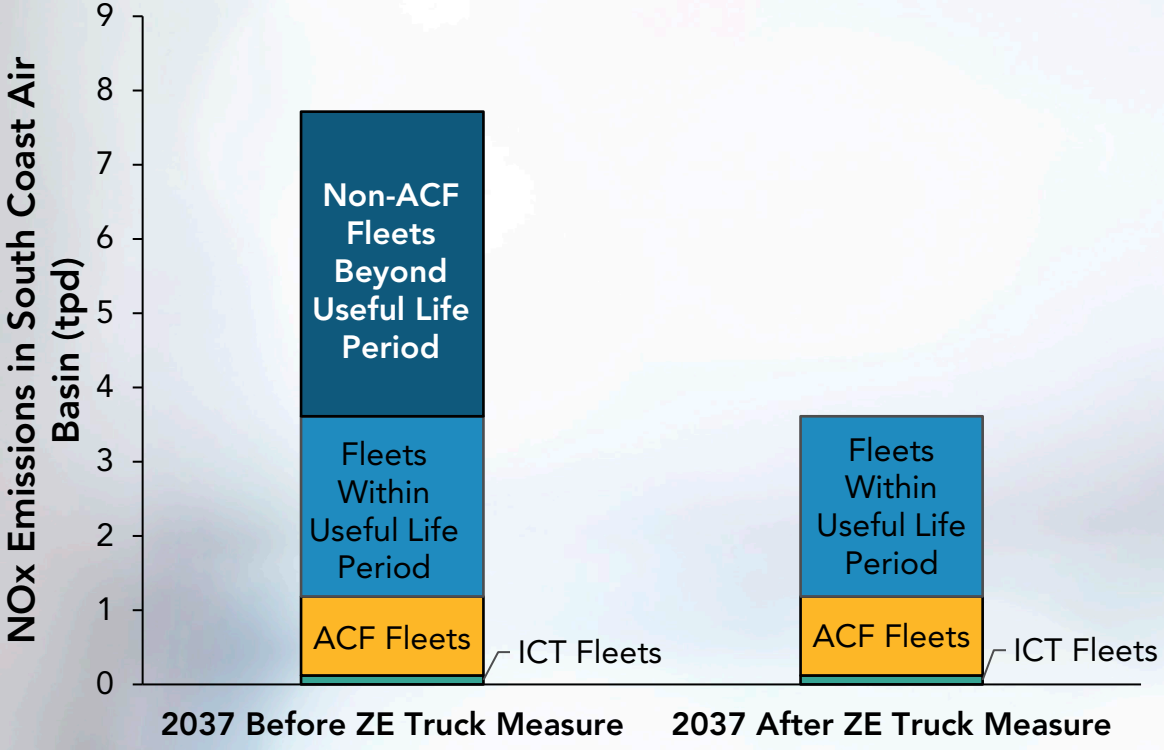
ZE Truck Measure is Needed to Attain Ozone Standard by 2037



- Measure would reduce remaining NOx from heavy-duty vehicles by >50 percent
- Additional benefits if vehicles within their useful life could be targeted

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Next Steps for State and Local Air Quality Analysis

- Update inventory to reflect the latest DMV and IRP registration data and inventory assumptions (i.e., EMFAC2021)
- Run multiple scenarios with and without useful life restrictions
- Perform analysis at statewide and air basin levels for attainment with federal standards
- Assess local impacts of on communities (e.g. impacts of toxics such as diesel PM)

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Evaluation of Tools and Policies to Achieve Air Quality Goals

- CARB initiated a 2-year extramural contract with University of California, Berkeley (began June 2022)
- Objective is to explore and identify strategies to further reduce emissions from heavy-duty fleet
- The next slides will be presented by UCB on their proposed evaluation

Achieving a Zero Emission Truck (ZET) Fleet

SB 1 Report Public Workshop

August 11, 2022

Berkeley Rausser
College of Natural Resources

UC Team Leads

- James Sallee, Associate Professor, Department of Agricultural and Resource Economics, UC Berkeley (sallee@berkeley.edu)
- Mark Jacobsen, Professor, Department of Economics, UC San Diego (m3jacobsen@ucsd.edu)
- Andrew Campbell, Executive Director, Energy Institute at Haas, UC Berkeley (acampbell@berkeley.edu)

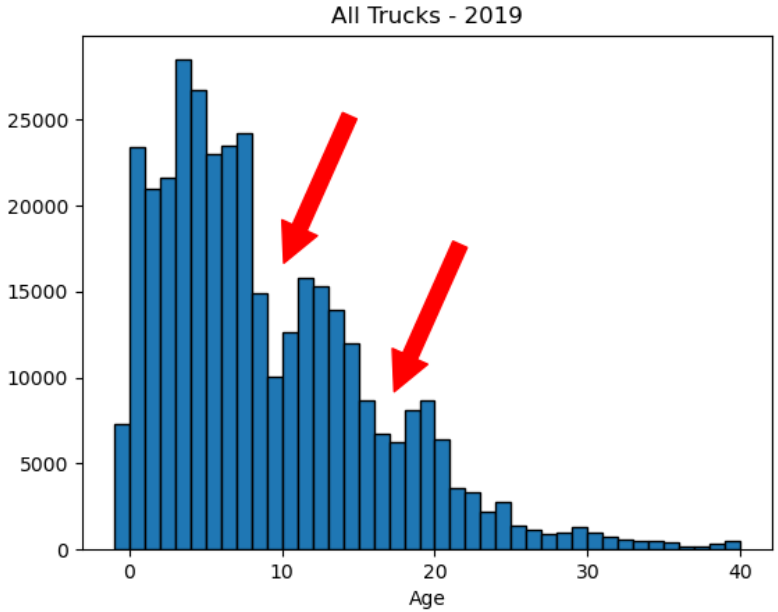
Tasks in SOW

- Task 1: Market overview, literature review and synthesis
- Task 2: Analysis of policies to accelerate retirement
- Task 3: Analysis of policies to accelerate ZEV adoption
- Task 4: Final report

Task 1: Market review

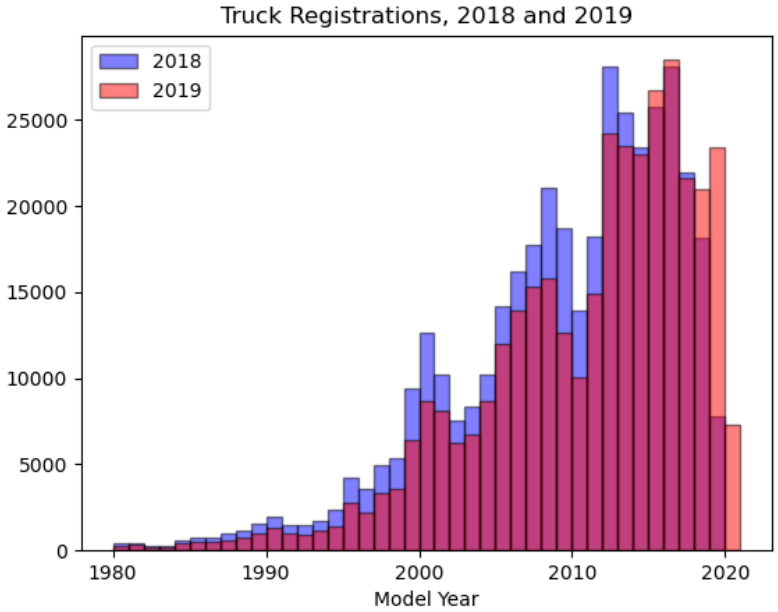
- Goal of the market review is to:
  - Characterize how many **older trucks** are in the state
  - Understand who is using older trucks and why (industry, firm size, truck type)
  - Characterize rates of turnover
- ZET adoption
  - Characterize how many **zero emission trucks** are in the state
  - Understand who is likely to use zero emission trucks and why (industry, firm size, truck type)

Age Distribution, All Trucks Registered in California, 2019



- Main data are DMV records
- Diesel Trucks with Gross Vehicle Weight Rating > 14,000 lbs
- Distribution of vehicle ages is a function of both past economic conditions and the decision to retain vehicles as they age
- In 2019, 62% are under age 10
- In 2019, 92% are under age 20

Inferring retention/replacement



Will use differences in registrations over time to infer retention and replacement of trucks

Can characterize how this differs by industry and firm characteristics, truck types

Task 2: Retiring older vehicles

*Goal of Task 2 is to make a list of **all** feasible policy options for accelerating retirement of older vehicles, and assess the strengths and weaknesses of each.*

- Review existing policy ideas
- Establish new policy ideas
- Qualitative analysis of policies in terms of efficiency, equity, efficacy and interaction
- Guide for future research and modeling: what data/parameters would facilitate in-depth quantitative modeling?

Task 2: Retiring older vehicles

- To encourage retirement of the oldest vehicles, one can:
  - Make older vehicles more expensive (e.g., vintage-based registration fees, fuel taxes, usage-based policy)
  - Subsidize retirement (e.g., scrap subsidies)
  - Constrain use of older vehicles (e.g., low emissions zones)
  - Make newer vehicles more appealing (better, less expensive)
- Options can be combined (e.g., use registration fees to fund a retirement subsidies), they interact with existing regulations
- Can be more or less differentiated

Task 3: Encouraging ZETs

*Goal of Task 3 is to make a list of **all** feasible policy options for accelerating adoption of zero emission trucks, and assess the strengths and weaknesses of each.*

- Review existing policy ideas
- Establish new policy ideas
- Qualitative analysis of policies in terms of efficiency, equity, efficacy and interaction
- Guide for future research and modeling: what data/parameters would facilitate in-depth quantitative modeling?

Timeline

- Task 1: Review–Summer/Fall 2022
- Task 2: Retirement–Fall 2022-Spring 2023
- Task 3: ZET–Fall 2022-Spring 2023
- Task 4: Draft Report to ARB–Summer 2023, Fall 2023

Send us resources, questions, comments:

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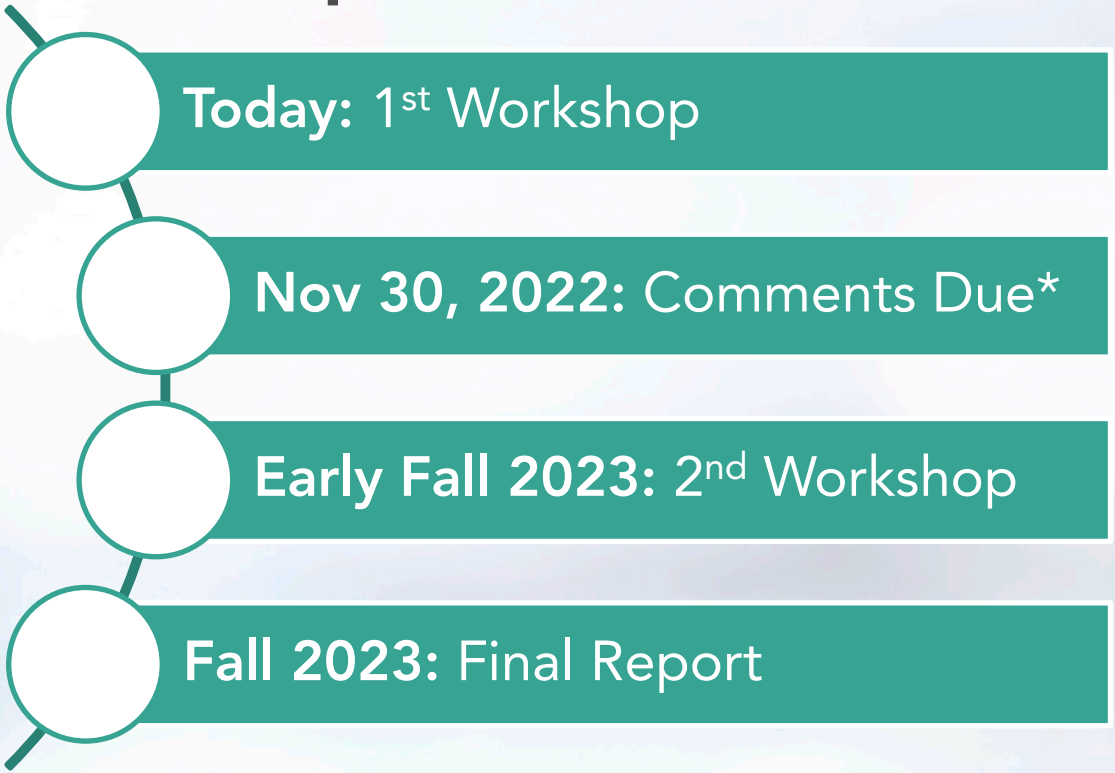
Proposed Timeline



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** Please send comments to Sara.Forestieri@arb.ca.gov*

Feedback Received at Recent Zero-Emission Trucks Listening Session

- Improve availability of infrastructure and zero-emission fueling network, including public charging
- Need for State policy to ensure all cities, counties, and State agencies are standardizing infrastructure planning; all to collaborate
- Make more funding/incentives available for the purchase of ZE trucks, including enough to cover rising prices
- Increase manufacturer production of heavy-duty zero-emission vehicles to lower prices
- Attendees also brought up green zones, stacking incentives, dedicated ZE truck freight lanes

Request for Comments

Any feedback or comments on scope of SB 1 report or heavy-duty programs, for example:

- Which strategies could CARB explore to encourage adoption of zero-emission trucks?
- Are there any additional data sources available to assess compliance or impacts of non-compliance on meeting air quality goals?
- What additional analyses should CARB perform to respond to direction of SB 1?

Contact Us

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James Sallee - Associate Professor at UC Berkeley
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https://ww2.arb.ca.gov/sb-1-report

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