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Advanced Clean Fleets Regulation Workshop

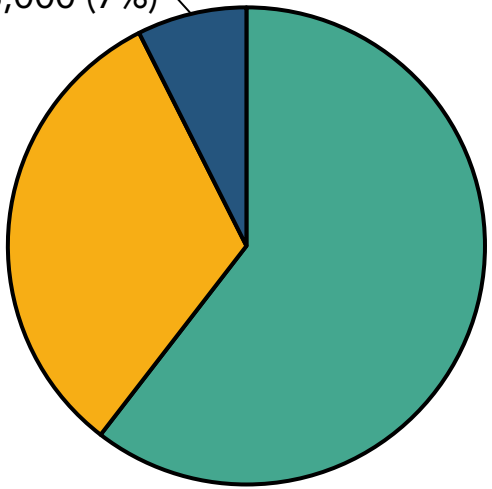
March 2 and March 4, 2021

Revised March 2, 2021

Today's Outline

- Introduction
- Zero-emission vehicle (ZEV) market
- Fleet regulation proposal
  - Public fleet requirements
  - Drayage fleet requirements
  - Private and federal fleet requirements
- Encouraging use of zero-emission fleets
- Alternatives

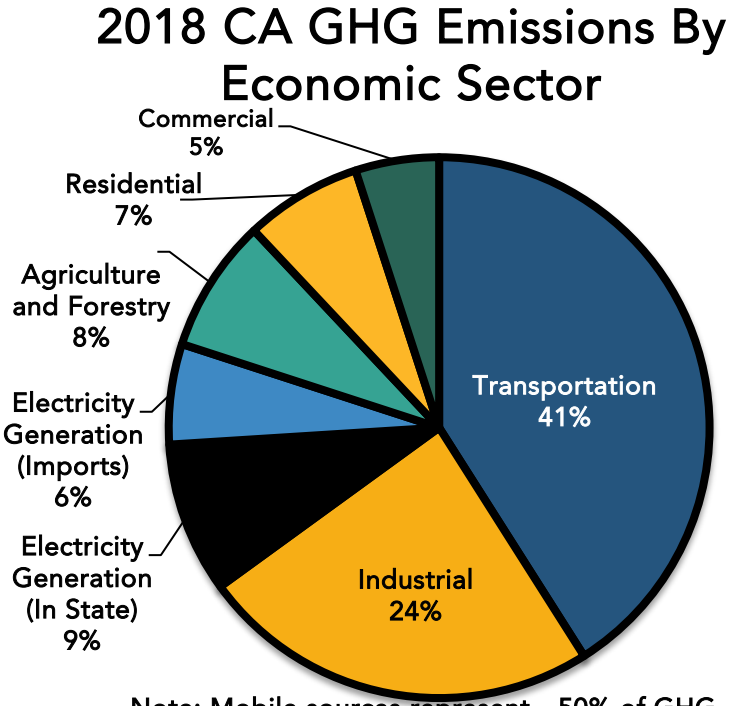
California Truck Populations



Source: EMFAC 2021, 2021 Calendar Year, includes California IRP, excludes out-of-state IRP trucks, motor homes, transit buses, and school buses

Transportation Is Largest Source of Greenhouse Gases (GHGs)

- California's climate change targets
  - 40% below 1990 levels by 2030
  - 80% below 1990 levels by 2050
  - Carbon neutrality by 2045
- Clean electricity
  - 33% renewable by 2020
  - 60% renewable by 2030
  - Zero-carbon by 2045



Note: Mobile sources represent ~50% of GHG inventory when including emissions from fuel production

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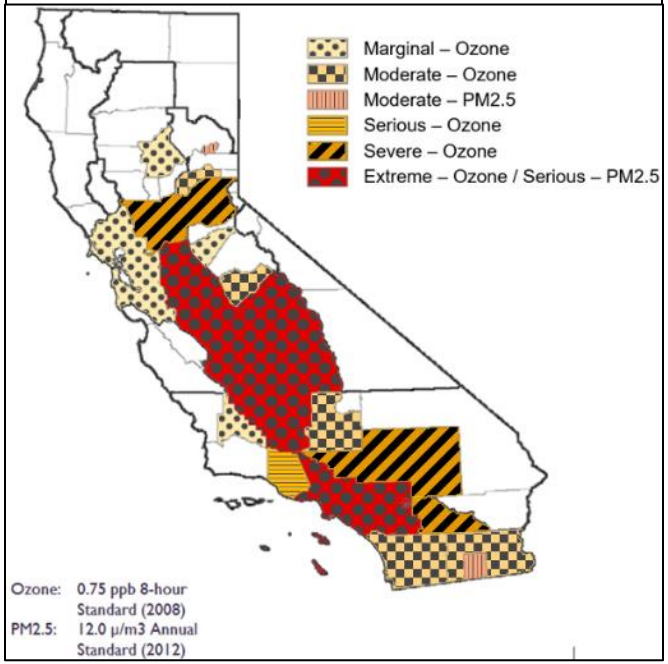
California GHG Inventory: https://ww2.arb.ca.gov/ghg-inventory-data

Major NOx and $PM_{2.5}$ Emission Reductions Needed

- California has the worst air quality in the nation
- Key challenges in San Joaquin Valley and South Coast
- Heavy-duty trucks and federal sources remain largest contributors
- Action beyond current programs needed by 2031
  - Nearly all heavy trucks to have 2010 model year engines by 2023

California Ozone and PM2.5 Non-Attainment Areas



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Disadvantaged Community Focus

- Assembly Bill 617 directs CARB to identify community level strategies
- Communities seek action on transportation and freight emissions
- Seek rapid transition to zero-emissions

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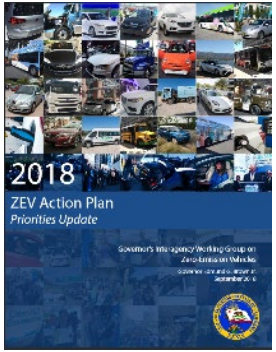
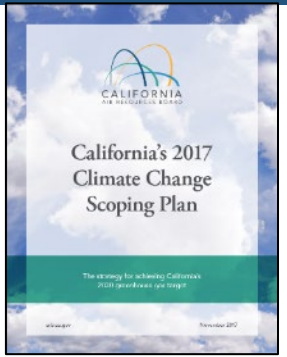
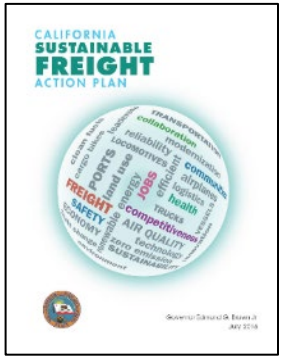
Zero-Emission Key to California's Future

- Multiple NOx and GHG reduction plans
- Core strategies
  - Zero-emissions everywhere feasible
  - Cleaner fuels and cleaner combustion everywhere else







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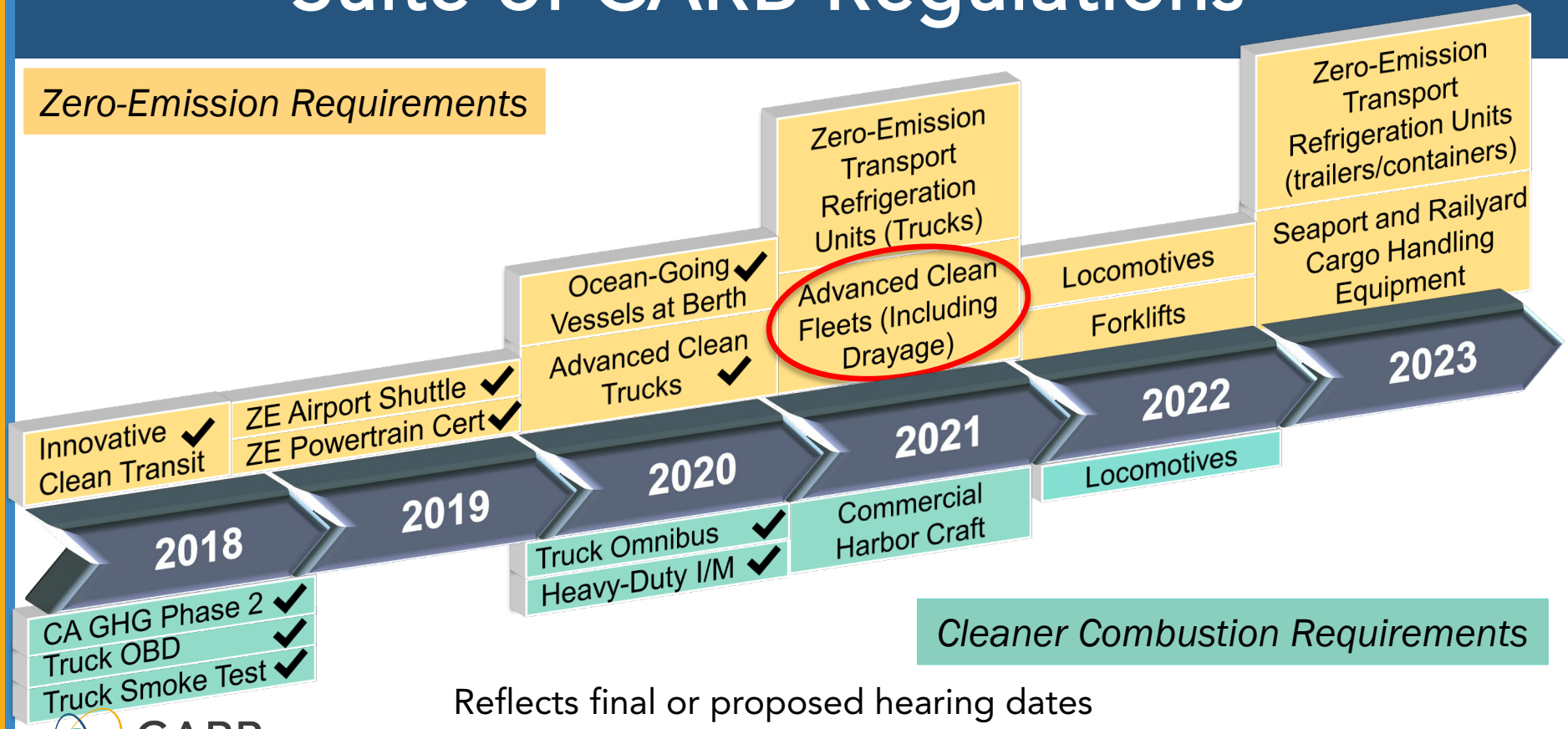
Suite of CARB Regulations



Reflects final or proposed hearing dates
Updated February 18, 2021

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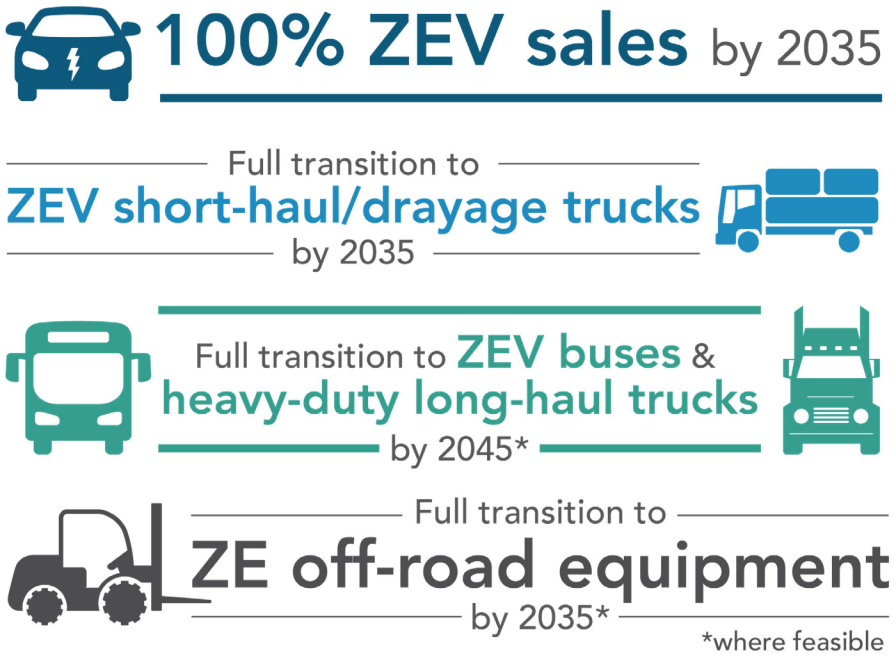
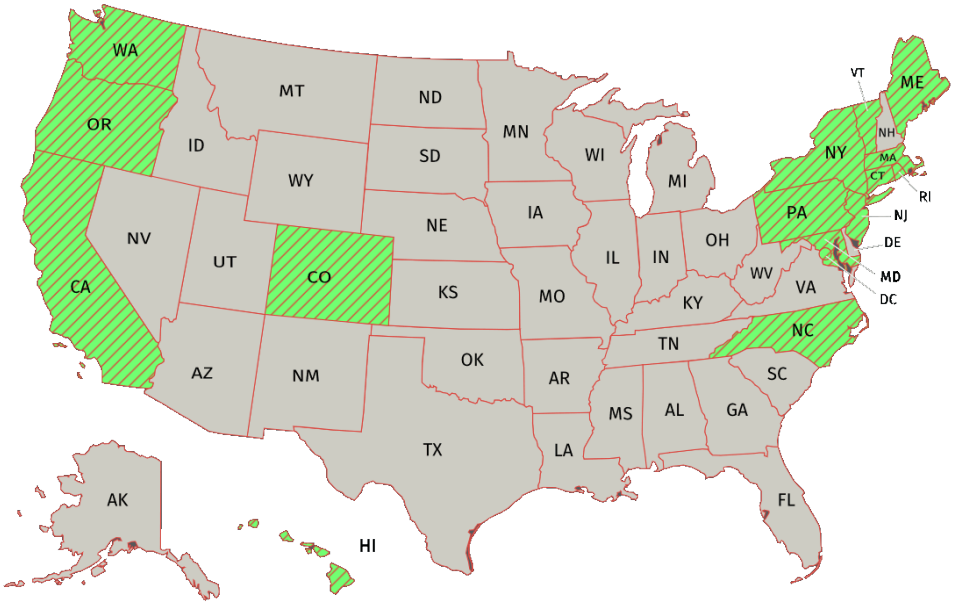
Executive Order N-79-20



Executive Order N-79-20: https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-text.pdf

Multistate ZEV Truck Targets

- 15 states and the District of Columbia signed a memorandum of understanding to support rapid expansion of ZEV truck market
- Sets ZEV sales targets
  - 30% sales by 2030
  - 100% sales by 2050
- Develop truck ZEV action plan



Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding:
https://www.nescaum.org/documents/multistate-truck-zev-governors-mou-20200714.pdf

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Advanced Clean Trucks (ACT) Overview

- Heard June 2020

Manufacturer Sales	Large Entity Reporting
• Zero-emission vehicles as a percentage of annual sales	• One time reporting in April 2021 • Where and how existing vehicles are operated

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ACT - Manufacturer ZEV Sales

- Zero-emission vehicles as a percentage of annual sales*
- Begins with 2024 model year
- Credit for sales start in 2021
- Minimum tractor sales
- Flexibility to shift sales between categories

Model Year (MY)	Class 2b-3	Class 4-8	Class 7-8 Tractors
2024	5%	9%	5%
2025	7%	11%	7%
2026	10%	13%	10%
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035+	55%	75%	40%

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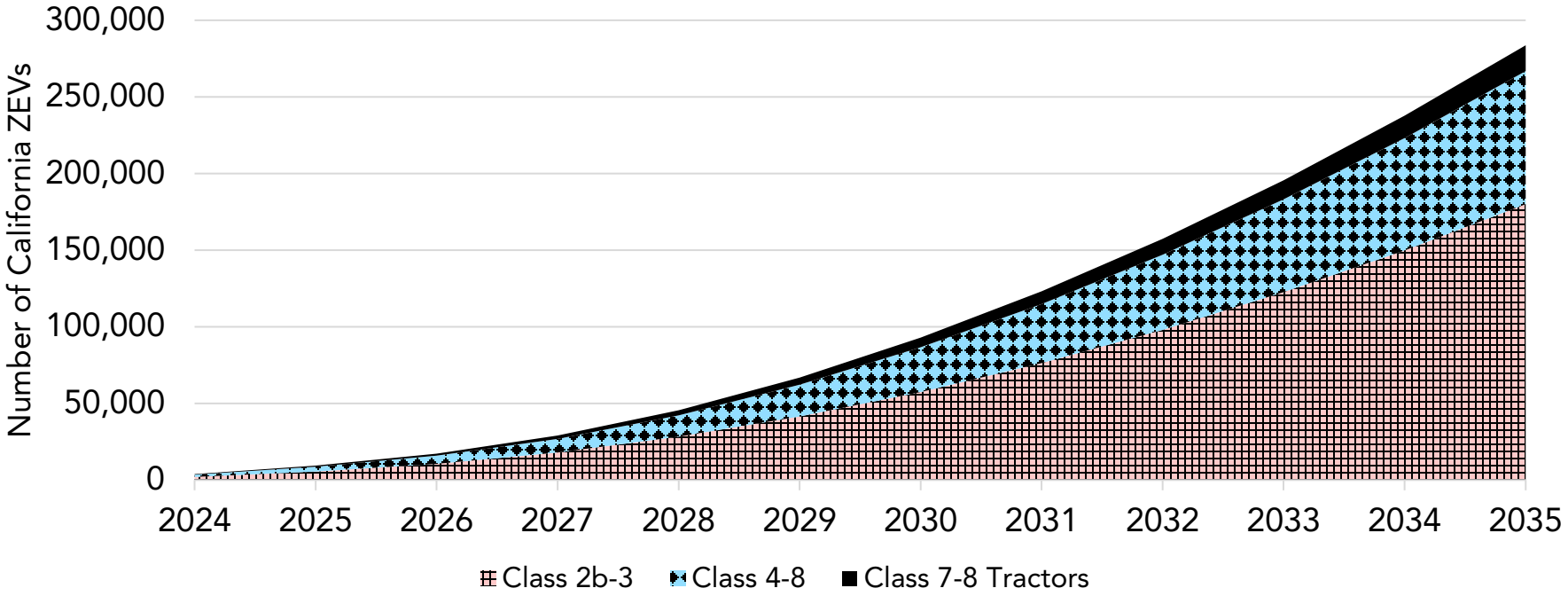
* Partial credit for plug-in hybrids with minimum all electric range

ACT – Projected ZEV Population



Based on ACT ZEV sales percentage in 2019 EMFAC analysis

ACT - Large Entity Reporting

- About vehicles with GVWR >8,500 lbs. by April 1, 2021
  - Vehicle type, usage, and home base information
- Report vehicle information if any of the following apply:
  - Total annual revenue >$50 million
  - Government agency
  - Own, direct or dispatch >50 vehicles
- Reporting process summary
  - Download a reporting spreadsheet
  - Complete the spreadsheet on your own computer
  - Return to upload the data

Large Entity Reporting: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks/large-entity-reporting

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ACT - Board Resolution

- Return by the end of 2021 with a zero-emission fleet rule
- Support transition California to zero-emissions where feasible
  - 2035 – Drayage, public fleets, last mile delivery
  - 2040 – Refuse, buses, utility fleets
  - 2045 – For all other trucks and buses where feasible
- Work with sister agencies
  - Workforce development
  - ZEV infrastructure

ACT Resolution: https://ww3.arb.ca.gov/regact/2019/act2019/finalres20-19.pdf

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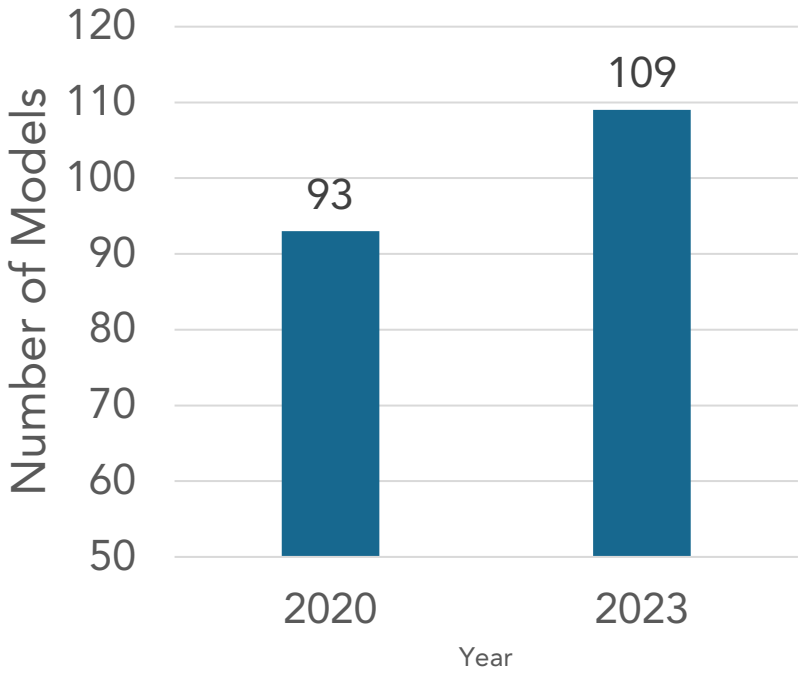
Zero-Emission Vehicle Market Overview

Zero-Emission Truck and Bus Market

- Wide variety of zero-emission trucks and buses available
  - New and start-up manufacturers lead the way
  - Major manufacturers entering market
  - Major parts suppliers introducing commercial components
- Continued improvements expected
  - Technology advancement
  - Continued incremental cost reductions
  - Infrastructure build-out

Image Source: Rivian

Straight Truck Availability



Source: CalStart Zero Emission Technology Inventory

ZEV Tractor Commercial Availability

Today

- BYD 8TT
- Lion Electric LION8

- Peterbilt 579EV
- Kenworth T680E
- Volvo VNR Electric
- Tesla Semi

2021

- Freightliner eCascadia
- Hyundai XCIENT

2022

- Nikola One/Two

2023

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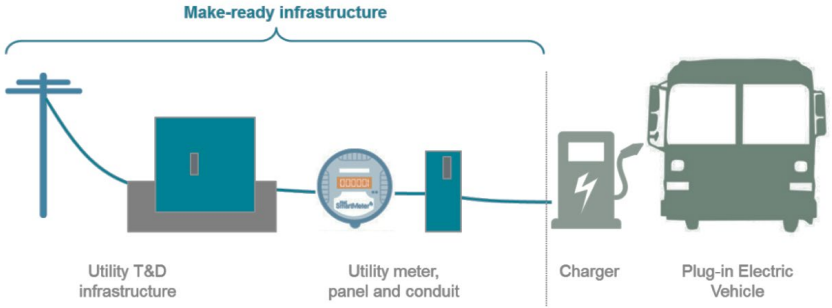
Source: CalStart Zero-Emission Inventory Tool

SB 350 Transportation Electrification

- California utilities supporting battery electric truck and bus deployments
- $686 million approved through 2023 for three largest utilities
  - Supports charging for 18,000 trucks, buses, and off-road vehicles
  - Pay for design and electrical service upgrades on customer property
  - Rebates for chargers in disadvantaged communities
- New electricity rates to encourage electric vehicles



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Transportation Electrification (SB 350): www.cpuc.ca.gov/sb350te/

Infrastructure Coordination

- California Energy Commission
  - Biennial statewide charging infrastructure assessment (AB 2127)
  - Light-duty, heavy-duty, off-road
  - Spatially model future infrastructure and energy demand
- California Public Utility Commission
  - Developing Transportation Electrification Framework
  - Support SB 350 and other transportation electrification goals
- Go-BIZ coordinating infrastructure support and deployment

LCFS Can Lower ZEV Fuel Costs

- Low-Carbon Fuel Standard (LCFS) regulation
  - Market driver for low carbon fuels
- Credit goes to station owner/operator
  - Charging station
  - Hydrogen station
- Credits sales offset fuel costs

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More information on LCFS: https://ww3.arb.ca.gov/fuels/lcfs/lcfs.htm

Example Battery Electric Fuel Cost Saving

Electric vs Diesel	Airport Shuttle	Package Delivery	Local Drayage
Fuel Savings w/o LCFS	$1,200	$4,000	$9,400
Fuel Savings w LCFS	**$2,700**	**$8,400**	**$27,900**

Note: Example assumes average fuel prices of $3.40/gal. per EIA 12/28/20, $0.18/kWh (includes transmission, energy, fixed fees, and demand charges), and LCFS credit value at $125 per credit

- Airport Shuttle at 25,000 miles/yr, 0.6 kWh/mile BEV compared to 22 mpg diesel
- Package Delivery at 25,000 miles/yr, 1.0 kWh/mile BEV compared to 10 mpg diesel
- Local Drayage at 50,000 miles/yr, 2.1 kWh/mile BEV compared to 6 mpg diesel

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Advanced Clean Fleets Proposed Regulation

Advanced Clean Fleets (ACF) Overview

- Initial focus on high priority private fleets, drayage and government
- Applies to vehicles with a gross vehicle weight rating >8,500 lbs.
- Proposed implementation timeframe from 2023 to 2045
- Contribute to full transition to zero-emissions where feasible
- Complement Advanced Clean Trucks sales requirement
- Prioritize benefits in disadvantaged communities
- First hearing December 2021

ACF – Proposal Outline

- General scope summary
- Proposed zero-emission fleet requirements
  - Public fleets*
  - Drayage trucks
  - Federal and high priority fleets
- Recognition for using zero-emission fleets

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* Excludes federal

General Scope Summary

- Fleet vehicles include all of the following
  - Any vehicle with a GVWR above 8,500 lbs.
  - Off-road yard tractors
- Excludes the following
  - Transit vehicles subject to the Innovative Clean Transit regulation
  - Military tactical vehicles as described in 13 CCR 1905
  - Emergency vehicles defined in Vehicle Code Section 165
  - Motorhomes for non-commercial private use
  - School buses

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Public Fleet Proposed Requirements

Public Fleet ZEV Purchases

- Scope includes cities, counties, special districts, state agencies*
  - Entities with exempt plates from DMV
- ZEV purchases required when adding to the fleet
  - 50% of 2024-2026 model year vehicles must be ZEVs
  - 100% of 2027 and newer model years must be ZEVs
- Three-year exemption in designated counties until 2027
- Plug-in hybrids (NZEVs) count same as ZEVs until 2035

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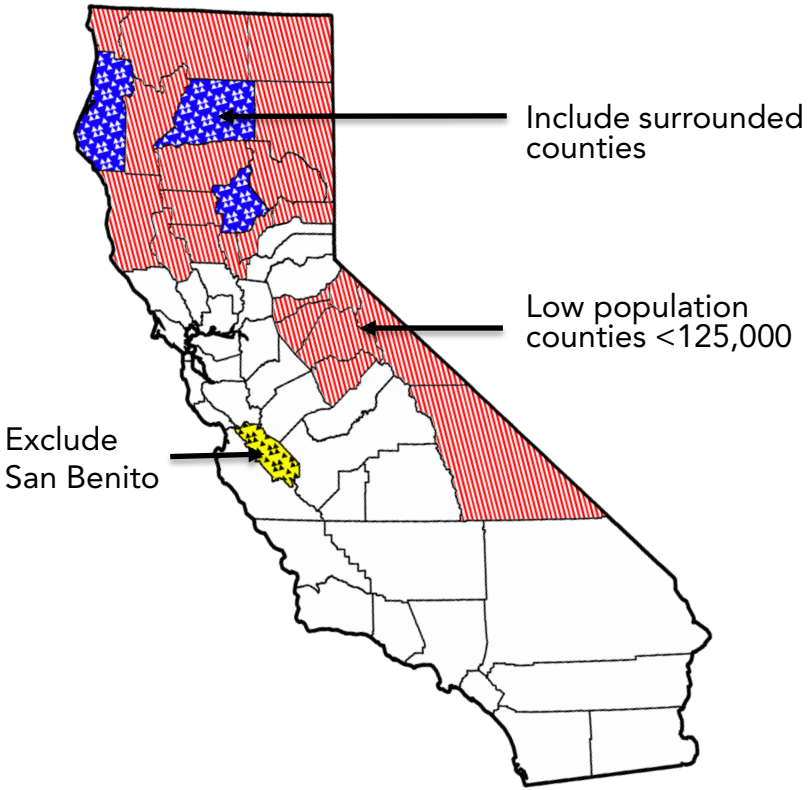
* Federal fleets addressed with private fleets
NZEV: Near-zero-emission vehicle as defined in ACT regulation

Public Fleet Designated Counties

- Three-year exemption counties
- Included low population counties
  - Alpine, Amador, Calaveras, Colusa, Del Norte, Glenn, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Plumas, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, and Yuba
- Include Butte, Humboldt, Shasta
  - Surrounded by low population counties
- Exclude San Benito



Public Fleet Exemptions

- Apply to situations beyond fleet control
- Exemptions if new ZEVs are not available
  - ZEV chassis or complete vehicle is not available from more than one manufacturer
  - Available chassis cannot be upfitted to meet fleet needs
- Vehicle manufacturer delays

Public Fleet Reporting

- Report compliance annually by May 1
  - Within 30 days of adding vehicles to the fleet
- General entity information
- Vehicle information
  - VIN, fuel/drivetrain type, vehicle body type

What It Means for Public Fleets

- ZEV purchases only required at time of normal replacement
  - Aligns with normal purchase cycle
  - Consistent with AB 739 for state fleets
  - No requirements to replace
- More time for fleets in low population counties
- Exemption process if needed
  - If no ZEV is available or cannot meet fleets needs

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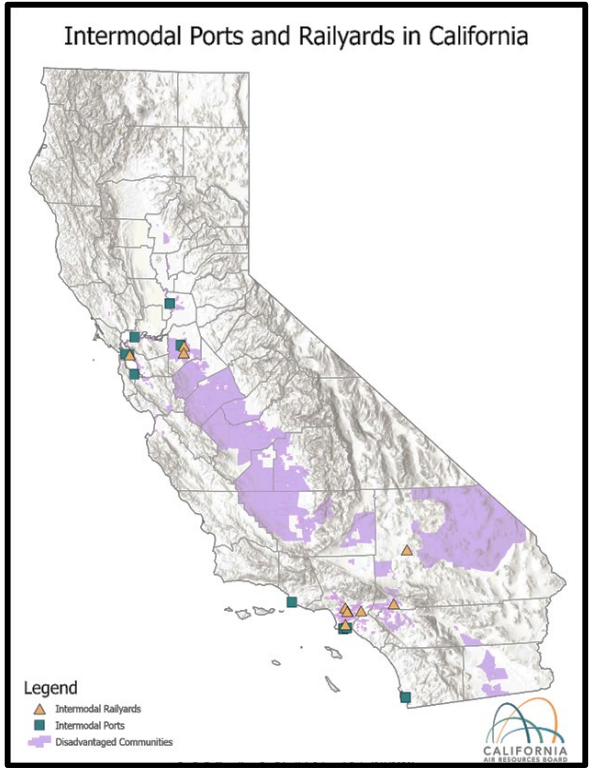
Proposed Drayage Truck Requirements

Drayage Truck Proposal Considerations

- Current drayage truck regulation sunsets in 2022
  - Trucks will have to meet 2010 MY engine standards beginning in 2023
- Impacts to disadvantaged communities
  - The intermodal seaports and railyards under the current Drayage Truck Regulation are all located in or within ~1 mile of a disadvantaged community



2035 Zero-Emission Drayage Goal

- Transition all Class 7 and 8 drayage trucks operating at California's intermodal seaports or railyards to full zero-emission by 2035

2035 Zero-Emission Drayage Transition

- Truck must meet the following requirements to continue drayage operations:
  - Report odometer annually for vehicles with a model year engine older than 13 years
  - Have <800,000 miles and be less than 18 years old
- Trucks must visit a California seaport or railyard at least once in 2023, to remain in CARB Drayage Truck Registry
- After January 1, 2023, only zero-emission trucks are eligible to be added to the CARB Drayage Truck Registry

Current Drayage Truck Definition

§ 2027. In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks.

Drayage trucks ***are****:*

Any in-use on-road vehicle with a gross vehicle weight rating (GVWR) greater than 26,000 pounds that is used for transporting cargo, such as containerized, bulk, or break-bulk goods, that operates:

- on or transgresses through a port or intermodal railyard property for the purpose of loading, unloading or transporting cargo, including transporting empty containers and chassis or,
- off port or intermodal railyard property transporting cargo or empty containers or chassis that originated from or is destined to a port or intermodal railyard property.

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Final Reg language (ca.gov)
https://ww2.arb.ca.gov/sites/default/files/classic//msprog/onroad/porttruck/finalregdrayage.pdf?_ga=2.215666647.1107543387.1606146193-354412339.1596474861

Current Drayage Truck Definition (Cont.)

§ 2027. In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks.

Drayage trucks ***are not***:

- Vehicles operating off of port or intermodal railyard properties that transport cargos that have originated from a port or rail yard property but have been off-loaded from the equipment (e.g., a trailer or container) that transported the cargo from the originating port or rail yard

or

- Vehicles operating off of port or intermodal railyard properties that transport cargos that are destined for a port or rail yard but will be subsequently transferred into or onto different equipment (e.g., a trailer or container) before being delivered to a seaport or intermodal railyard.

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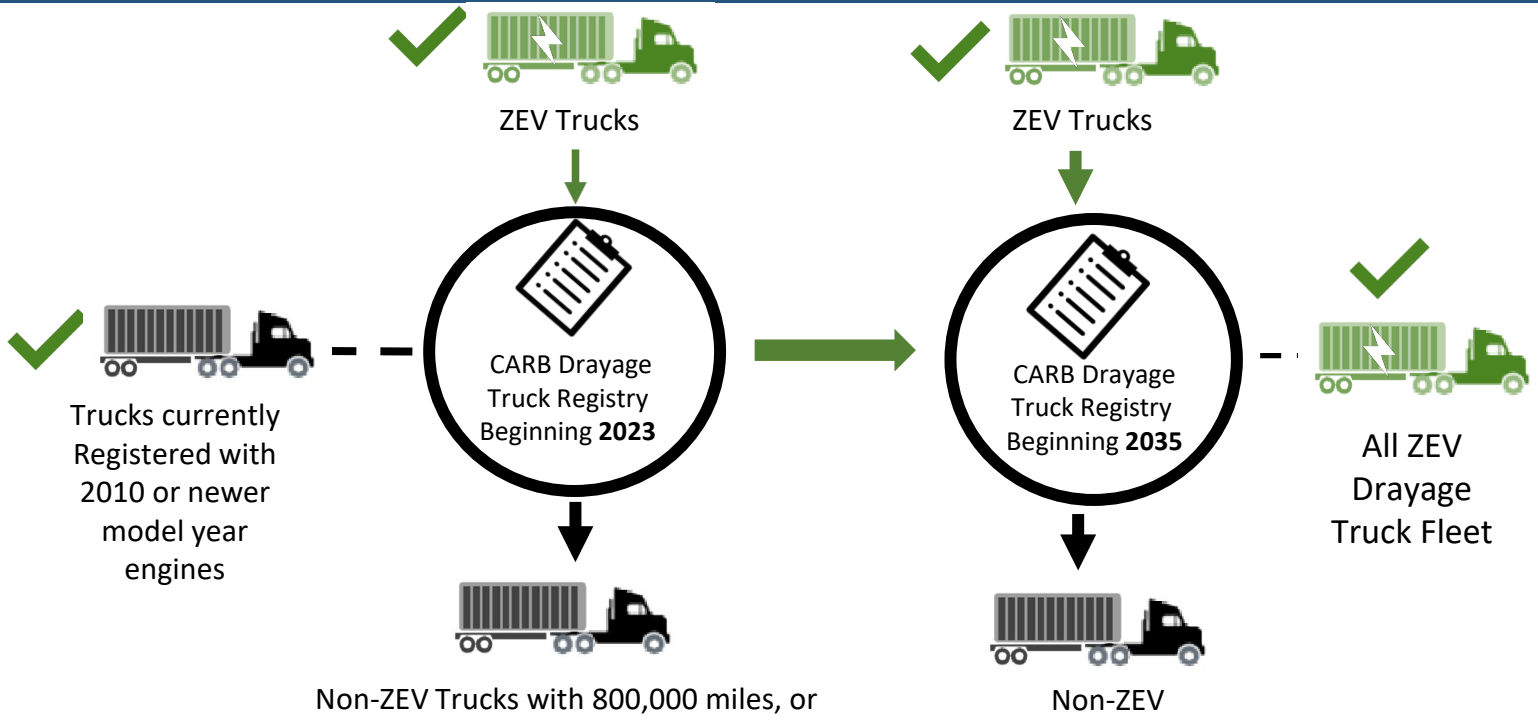
Final Reg language (ca.gov)
https://ww2.arb.ca.gov/sites/default/files/classic//msprog/onroad/porttruck/finalregdrayage.pdf?_ga=2.215666647.1107543387.1606146193-354412339.1596474861

Port and Rail Reporting Requirements

- Truck Reporting
  - Owner information
  - VIN, engine MY, license plate
  - Odometer reading if engine is over 13 years old
- Seaport and Railyard Reporting
  - Report truck visit information annually
    - VIN, license plate, and visit frequency
  - Reporting for 2023 will establish baseline drayage fleet

Drayage Truck ZE Fleet Transition



Calendar Year 2019 Drayage Truck Inventory

Vehicle Category	Port of Oakland (POAK)	Port of LA/LB (POLA)	Other Seaports*	Railyards **
Instate Class 8† *Active Trucks****	**4,224‡**	**13,951‡**	**1,453‡**	TBD
Instate Class 8 † *Inactive Trucks****	n/a***	2,770		
Instate POAK Class 8 already in POLA†	136			
Class 4-7†	22	180		
Out of State†	823	854		
Total	**4,224**	**13,951**	**1,453**	**TBD**

† *Non-gasoline*

‡ *T7 POLA Class 8, T7 POAK Class 8, and T7 Other Ports Class 8 in EMFAC202x*

* *Estimate based on past Surveys; Requesting updated information from other seaports*

** *To be determined (TBD); Requesting information from Railroads*

*** *For POLA, trucks with more than 112 visits/year are considered as "active trucks". 112 visit/year was determined based on POLA monthly active truck counts. POAK did not provide monthly visit data and therefore all of their class 8 in-state trucks were considered active.*

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What it Means for Drayage Trucks

- Builds on existing drayage truck registry process
- Drayage trucks registered prior to 2023 continue operating as usual until odometer or age limit exceeded
- Requirements for zero-emission trucks start in 2023
- Achieves all zero-emissions drayage truck fleet by 2035

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Private and Federal Fleet Requirements

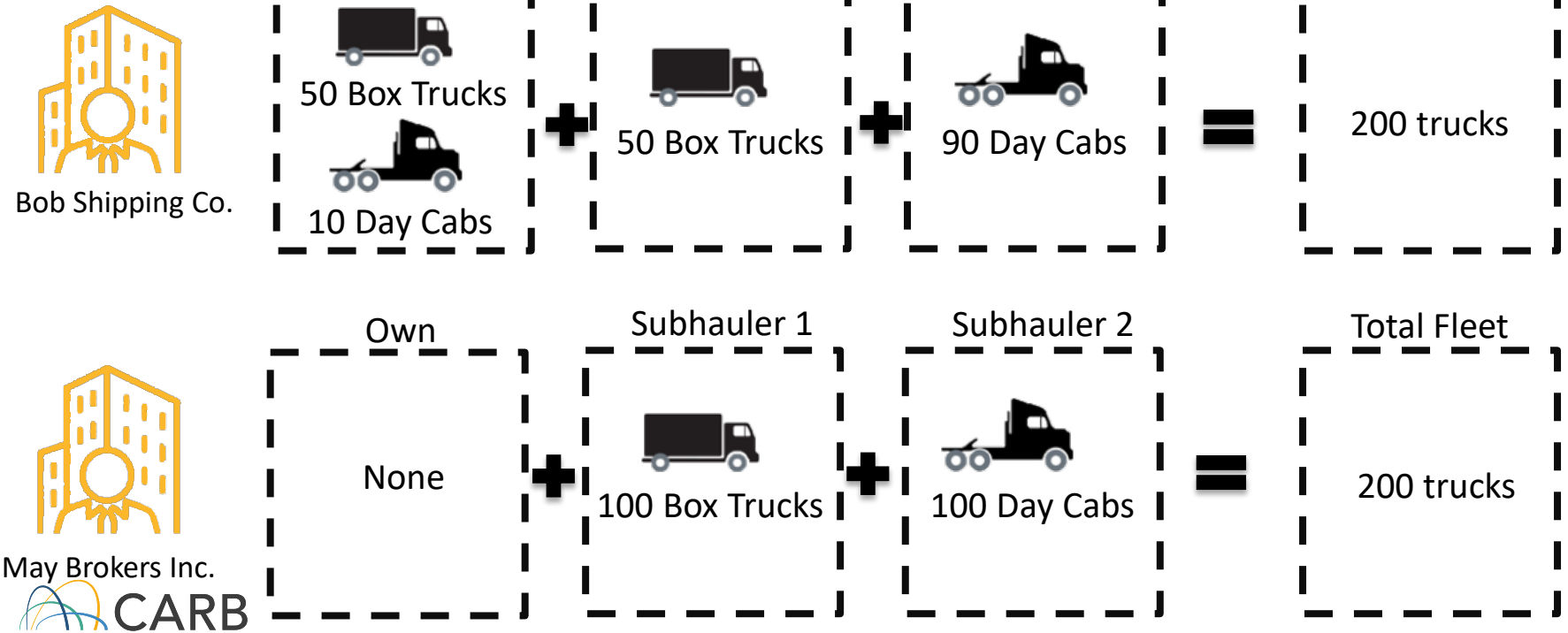
Private and Federal Fleet Overview

- Applies to high priority private fleets and federal fleets
  - Own vehicles and subhauler vehicles
- Phase-in ZEVs as a percentage of the total fleet
  - Scheduled phased-in by vehicle body type and ZEV suitability
- Reporting required

Private and Federal Fleet Definitions

- Fleet means all vehicles under common ownership and control
  - Owned and operated
  - Rented or leased for a period of one year or longer
  - Subhauler vehicles (3rd party)
- Subhaulers are for-hire motor carriers who provide transportation services on the behalf of another for-hire motor carrier or broker
  - Examples include owner-operators hired by a freight company, vehicles dispatched by a broker

Private and Federal Fleet Examples



High Priority Fleet Definition

- An entity with more than $50 million annual revenue that operates at least one vehicle in California
- Any entity that owns or controls more than 50 vehicles; or
- Any broker that dispatches more than 50 vehicles per year; or
- Any federal agency that operates vehicles in California

Vehicle means on-road vehicles with a GVWR greater than 8,500 lbs

ZEV Suitability by Body Type

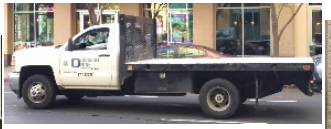
Increasing ZEV Suitability

- Vans, box trucks, 2 axle buses, yard tractors
- Work trucks (single-unit trucks used at job site), motor coaches, day cab tractors
- Sleeper cab tractors and specialized equipment
  - Heavy cranes, hay squeezes, two-engine vehicles, log trucks, work-over rigs, others











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Note: Suitability primarily based on ACT market segment analysis

ZEV Target Phase-In Schedule

- High priority fleets and federal fleets
- Meet ZEV targets as a percent of the total fleet
- Target number of ZEVs is based on vehicle body type category
- Target number can be met by any ZEV type within category

Percentage of Fleet that Must be ZEV	10%	25%	50%	75%	100%
Box trucks, vans, two-axle buses, yard trucks	2025	2028	2031	2033	2035
Work trucks, day cab tractors, three-axle buses	2027	2030	2033	2036	2039
Sleeper cab tractors and specialty vehicles	2030	2033	2036	2039	2042

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"Work truck" means any single-unit truck that is not a box truck, van, or bus
NZEVs same as ZEVs until 2035 model year

Box Truck ZEV Target Phase-In Example

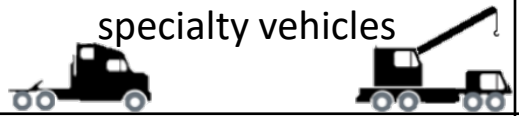
- ZEV target phase-in example 60 box truck fleet

Calendar Year *ZEV % for Box Trucks*	2025 *10%*	2028 *25%*	2031 *50%*	2033 *75%*	2035 *100%*
Number of ZEVs to Meet Target 	6	15	30	45	60

Note: Conventional rounding used if calculated number of trucks is not a whole number

Private and Federal

Mixed Fleet ZEV Target Phase-In Example

	# of Vehicles	ZEVs in 2025	ZEVs in 2029	ZEVs in 2033	ZEVs in 2037	ZEVs in 2041	ZEVs in 2045
Box trucks, vans, two-axle buses, yard trucks 	**60**	6	15	45	60	60	60
Work trucks, day cab tractors, three-axle buses 	**20**	0	2	10	15	20	20
Sleeper cab tractors and specialty vehicles 	**20**	0	0	5	10	15	20
Total	**100**	**6**	**17**	**60**	**85**	**95**	**100**

Private and Federal Vehicle Exemptions

- Circumstances beyond fleet control
- Must show no ZEV or NZEV is commercially available
- Must show no other vehicle in the fleet can be zero-emission
  - Available ZEVs do not meet mileage needs
  - Weight limitations
- Back-up vehicles may be excluded from ZEV fleet requirements
  - <5,000 total miles per year until 2040
  - <1,000 total miles per year thereafter
- Vehicles awaiting sale

Private and Federal Reporting

- Owner/entity information
- Vehicle information
  - VIN, Fuel/drivetrain type, vehicle body type
  - Within 30 days of adding non-ZEV vehicles to the fleet
- 3rd party subhauler information (if applicable)
  - Subhauler CARB Fleet ID, start/end date of service
  - Subhaulers must report own fleet information
- Report compliance annually by March 1

Owner name exactly as displayed on DMV/IRP registration card

What It Means for Fleets

- Places responsibility on controlling party
- Provides flexibility for controlling party to partner with subhaulers
- Requires minimum progress to phase-in ZEVs
- Includes flexibility to meet targets across ZEV vehicle types
- Built in exemptions process if needed
- Annual reporting required for all regulated fleets and subhaulers
- Provides method to recognize any ZEV fleet

Other Considerations

- Record keeping requirements
- Disclosure language when selling vehicles
  - Dealers, auction houses, and others
- Maintain requirement to hire compliant California fleets
- Certificate of reported compliance

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Encourage Hiring ZEV Fleets

ZEV Fleet Hiring Concept

- Method to recognize entities that hire ZEV fleets when outsourcing
- Allows government agencies and major businesses to support ZEV transition and emission goals even if no trucks owned
  - Grocery stores, manufacturers, retailers, banks, hotels, others
- Certified ZEV fleets listed on CARB website

Government

Hotel

Bank

Business

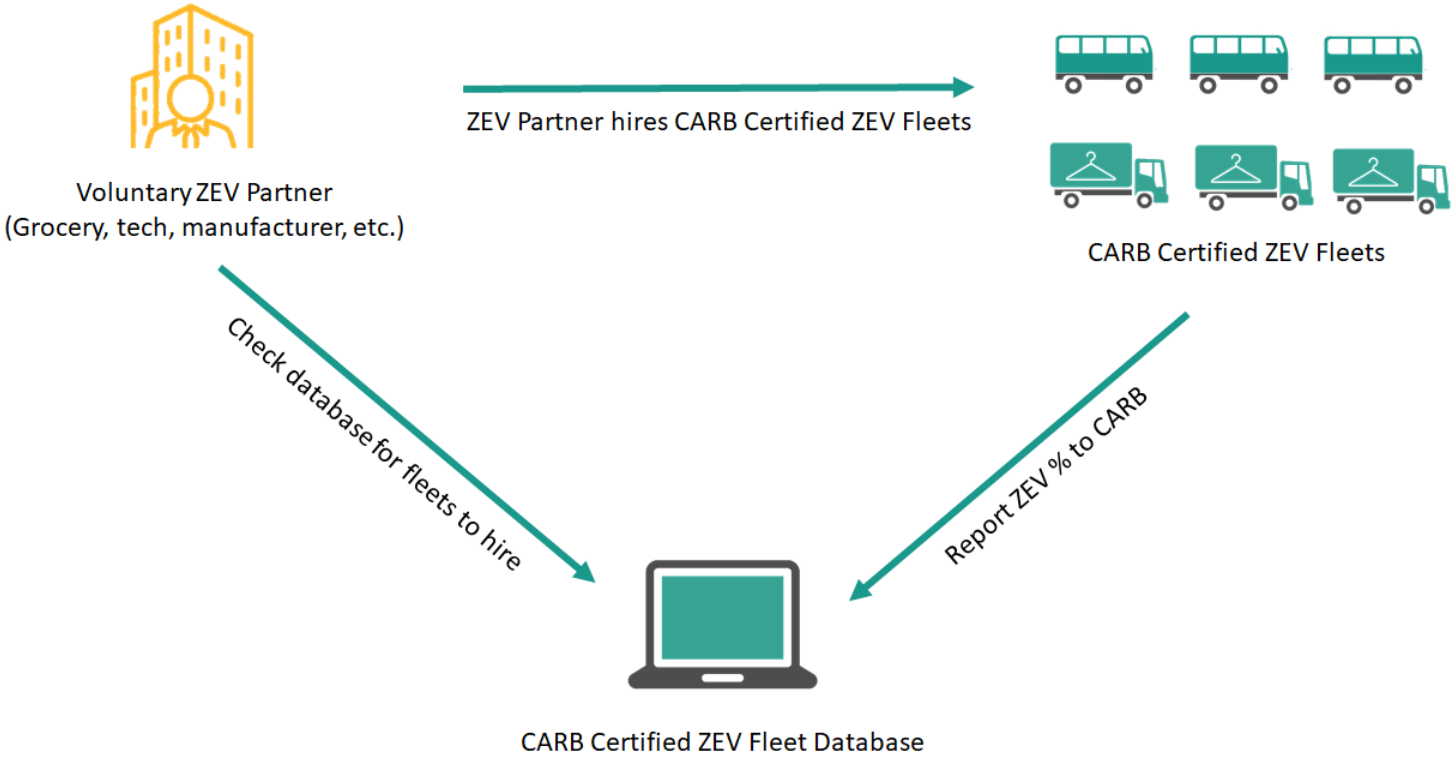
Optional ZEV Fleet Certification

- Recognizes early actors and compliant high priority ZEV fleets
- Fleet eligible if meeting all of the following:
  - Has at least one ZEV, and
  - ZEVs are more than 5% of total fleet; and
  - Meets or exceeds ZEV Milestone Phase-In Schedule
- List certified ZEV fleets online starting 2023

Encourage ZEV Fleet Hiring

- Guidelines to identify your entity as a ZEV Partner
- Hire certified ZEV fleets based on the follow schedule
  - Last mile delivery and private shuttle services starting 2025
  - Waste hauling and regional delivery starting 2027
  - All other delivery and passenger services starting 2030
- Creates demand side driver for all zero-emission fleets
- Does it facilitate including transportation in sustainability goals?

Example of Voluntary ZEV Fleet Hiring



CARB

Alternatives and Next Steps

Environmental Analysis

- Draft Environmental Analysis (Draft EA) being prepared analyzing potentially significant adverse impacts caused by reasonably foreseeable actions that may occur in response to the proposed regulation
- Meets requirements of CARB's certified regulatory program authorized under the California Environmental Quality Act (CEQA)
- The CEQA Environmental Checklist (CEQA Guidelines Appendix G) is used to identify and evaluate potential indirect impacts
- The Draft EA will be an appendix to the Staff Report (ISOR)

Environmental Analysis (Cont'd)

- The Draft EA will include, at a minimum:
  - Description of proposed project, which is the proposed amendment to the regulation, and objectives of the proposed project
  - Description of reasonably foreseeable actions taken in response to proposed amendments to the regulation.
  - Programmatic level analysis of potential adverse impacts caused by reasonably foreseeable actions
  - Beneficial impacts
  - Feasible mitigation measures to reduce/avoid significant adverse impacts
  - Alternatives analysis
- Input invited at this early stage on appropriate scope and content of the Draft EA
- Draft EA will be released for 45-day public comment period

CARB

Soliciting Alternatives

- CARB is soliciting alternatives that will meet the goals outlined for the Advanced Clean Fleet regulation
- Please submit alternative proposals to ZEV Fleet Email (zevfleet@arb.ca.gov) by March 31

Next Steps

- Continue individual meetings with fleets and stakeholders
- Continue workshops/workgroups throughout this year
  - Infrastructure workgroup – April
  - Cost workgroup – April/May
- Receive fleet reported data April 2021
- Rule recommendation to Board in December 2021