
# Advanced Clean Trucks Workshop

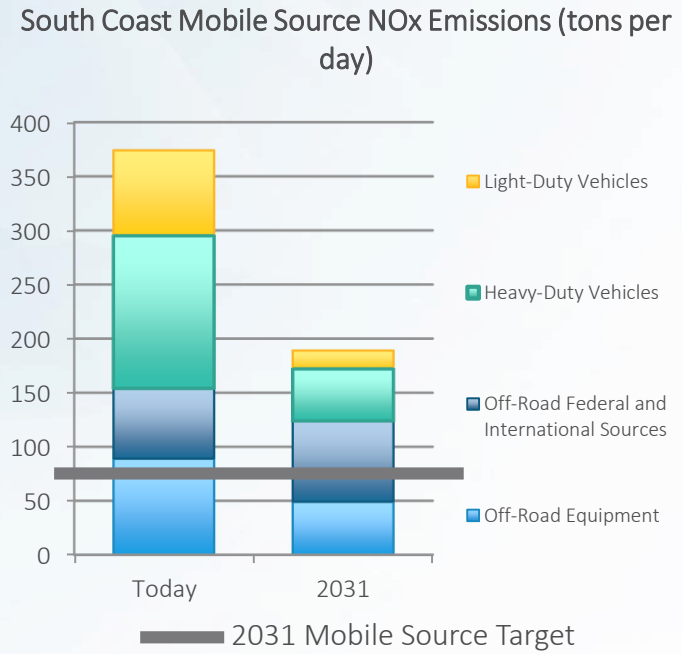
June 20, 2019

# Today's Overview

- Background
- Zero emission truck market outlook
- Summary of proposed regulation
- Proposed reporting requirement
- Next steps

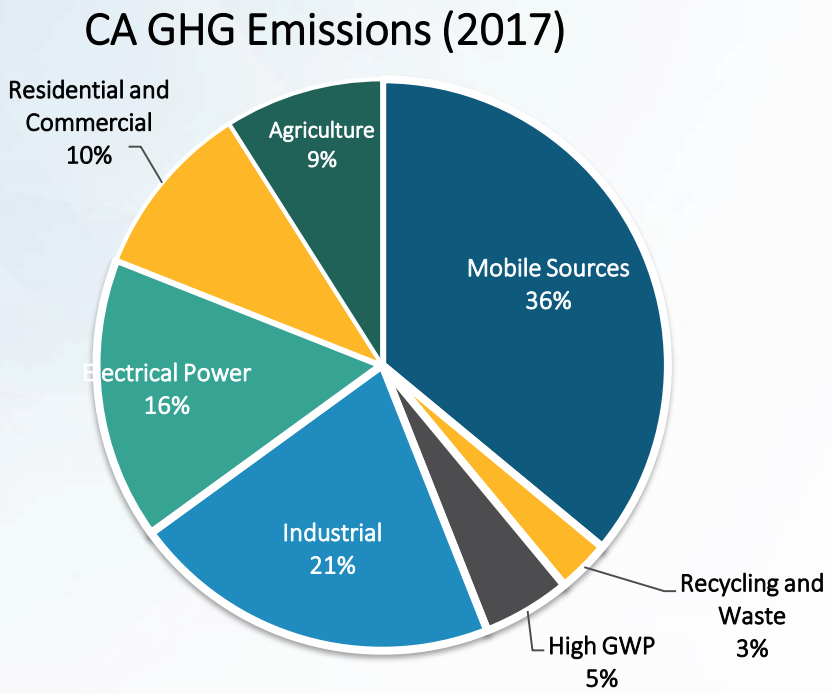
# Major NOx Reductions Needed

- Nearly all trucks to have 2010 model year engines by 2023
- Action beyond current programs needed by 2031
  - Mobile source emissions reduced more than 50%
  - Truck and bus emissions reduced by nearly 70%
- Heavy-duty trucks and federal sources remain largest contributors



# California's Climate Change Targets – Transportation Remains Largest GHG Source

- ✓ Achieve 1990 GHG levels by 2020
- 40% below 1990 levels by 2030
- 80% below 1990 levels by 2050
- Cleaner electricity targets (SB 100)
  - 60% renewable by 2030
  - Zero carbon by 2045
- Carbon neutrality by 2045




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

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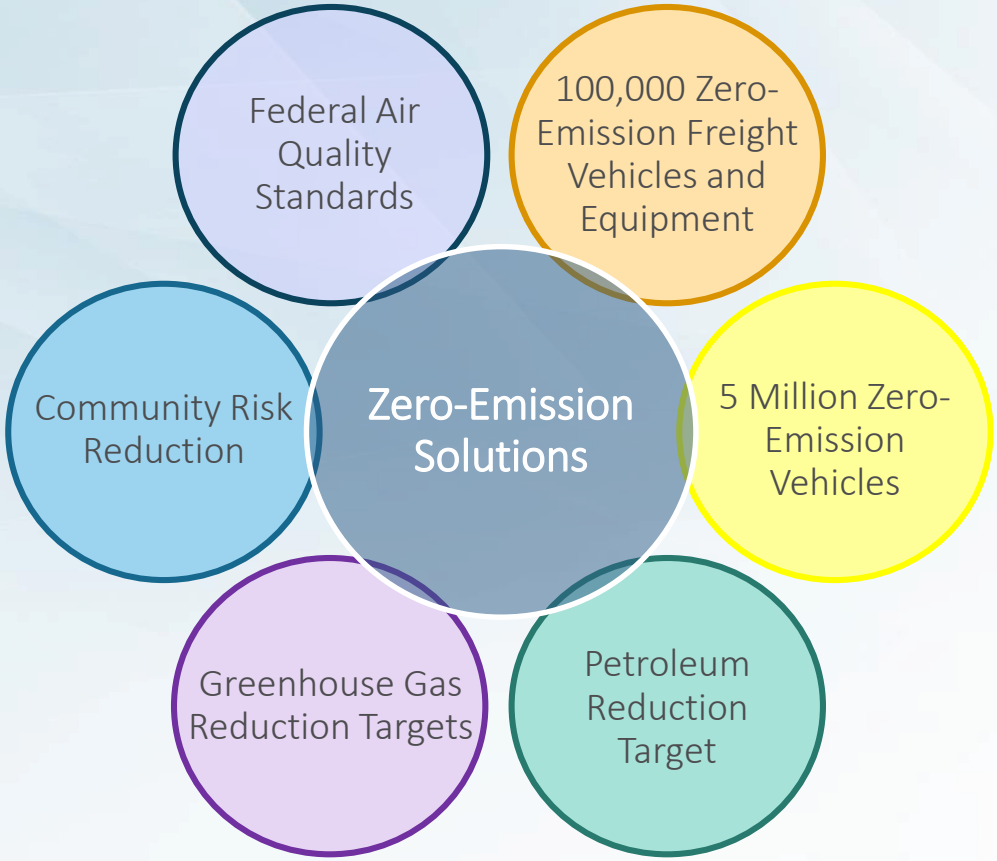
# California's Air Quality and Climate Goals

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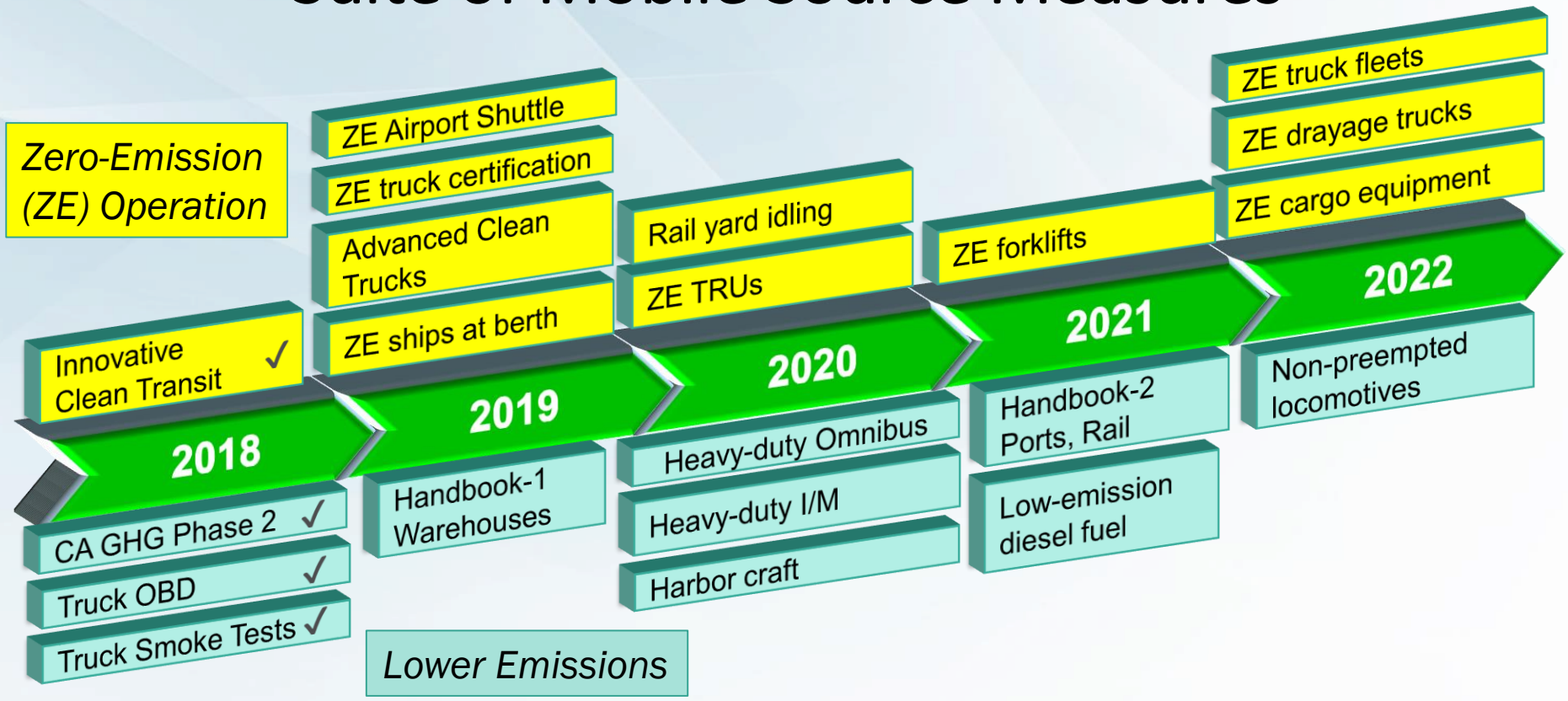
# Suite of Mobile Source Measures

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# Market Outlook

# Emerging Zero-Emission Truck Market

- Several manufacturers offering commercially available Class 3-8 battery electric (BE) trucks and vans
- Nearly all conventional OEMs have EV demonstrations or have announced plans for commercialization
  - Battery electric and fuel cell electric
- Announcements by several new entrants to truck market
  - Bollinger Motors, Nikola, Roush, Tesla, Thor Trucks

# Heavy-duty Electric Market Growing

| | 2B-3 | 4-5 | 6-7 | 8 |
|---|---|---|---|---|
| Commercial Today | | | | |
| Commercial Soon | | | | |
| Demos | | | | |

# Zero-Emission Truck Total Cost of Ownership

- Higher upfront costs for truck and infrastructure
- Lower operating costs (fuel and maintenance)
- Comparable total cost of ownership (TCO) over a 12 year period without rebates for some truck/use types[1]
- TCO is expected to continue to improve
  - Battery prices declining and technology continues to improve

[1]Draft Fleet TCO paper: https://ww2.arb.ca.gov/sites/default/files/2019-02/190225tco_0.pdf

# Low Carbon Fuel Standard (LCFS)

- Lowers carbon intensity of transportation fuels 20% by 2030
- Fleets earn credits if dispensing H2 or electricity for HD ZEVs
- Battery electric credit value goes to EVSE owners
  - $0.10/kWh* for Class 1-3 vehicles
  - $0.16 per kWh* for Class 4-8 vehicles
  - Offsets most or all electricity costs for charging

* Assumes LCFS credit price of $125 per credit
LCFS program information: https://www.arb.ca.gov/fuels/lcfs/lcfs.htm

# Fuel Cost Saving Opportunity


EV: 0.56 kWh/mi.
Diesel: 22 mpg

EV: 1.04 kWh/mi.
Diesel: 10 mpg

EV: 2.1 kWh/mi.
Diesel: 3.5 mpg

| | Airport Shuttle | Package Delivery | Local Drayage |
|---|---|---|---|
| Battery Electric vs Diesel | 45% | 55% | 70% |
| with LCFS | 75% | 100% | 100% |

Note: Example for 12 year period assumes average of $3.70/gal., about $0.16/kWh, and LCFS at $125 per credit

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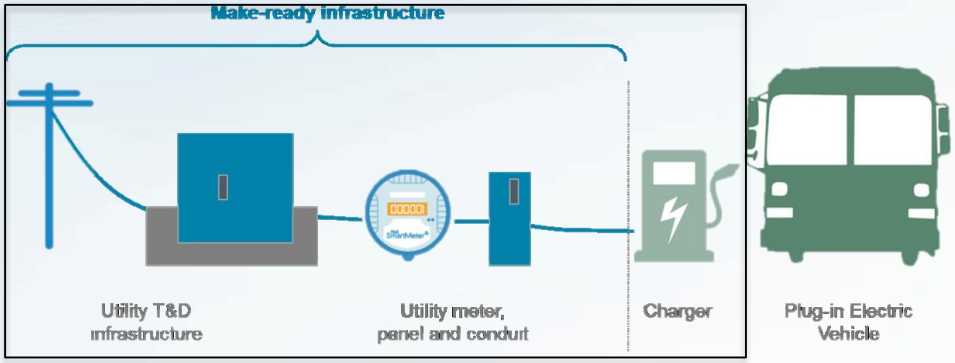
# SB350 Transportation Electrification for Medium and Heavy Duty

- California utilities supporting site upgrades and design
  - $579 million approved through 2023 (PG&E, SCE)
    - Can fund charging of 15,000 ZE vehicles
  - Additional $107 million under review (SDG&E)
- Publicly-owned utilities developing programs
- New rates being designed to encourage electric vehicles




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

# Significant Incentives Available Now

## HVIP

Low $NO_X$ engines, ZEVs plus infrastructure, advanced technology

**FY 18-19**
**$125 M**

## VW

Zero-emission truck and bus replacements

**$423 M**

## Carl Moyer

Cleaner engines & ZEVs plus fueling infrastructure

**FY 18-19**
**$79 M**

## AB 617

Engine replacement & infrastructure in DAC

**FY 18-19**
**$245 M**

## Truck Loans

Helps small businesses with 10 or fewer trucks upgrade to newer trucks

## Utility Programs

Charging infrastructure service upgrades and electricity rates (SB350)

**>$579 M**

## LCFS

Credits for using low carbon transportation fuels

**Offsets Most/All Electricity Costs for Trucks and Buses**

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More information at: https://ww2.arb.ca.gov/our-work/topics/incentives

# Fostering Zero Emission Truck and Bus Deployments

- Support early market development with incentives
- Early candidates for zero emission technologies
  - Centrally fueled, low average speed, stop-and-go duty cycles
- Regulations to accelerate self sustaining market and to provide certainty
- Early experiences benefit the market for other applications

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# Summary of Advanced Clean Trucks Proposed Regulation

# Regulatory Development Overview

- Initiated a manufacture sales concept – April 2017
- Held multiple public fleet/manufacturer meetings in 2018
- Governor issued directive to assess viability of ZEV fleet requirements - August 2018
- Expanded discussion to include potential fleet strategies
  - Need to assess fleet specific information
  - Explore other ideas to identify best overall approach
- 100% zero-emission pickup and delivery goal by 2040

ACT Website: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks
Governor's letter regarding ZE Fleet rules: https://ww2.arb.ca.gov/resources/documents/governors-letter-regarding-zero-emission-fleet-rules
ZEV Fleet Website: https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-fleet

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# Advanced Clean Trucks Summary

- Manufacturer sales requirement
  - ZEVs as a percentage of sales - 2024-2030 model year
  - Revisit in 2025 for post-2030 action
- Large company and fleet reporting requirement
  - Information about vehicles and contracted services
  - Future fleet rules, ZE truck standard, and/or other

# Manufacturer ZEV Sales Requirement

- Percent of California chassis/vehicle sales must be zero-emission
- Use new Zero-Emission Powertrain certification procedure starting 2024
- Credit system to encourage early sales and for flexibility

| Model Year | Class 2B-3[1] | Class 4-8[2] | Class 7-8 Tractors |
|---|---|---|---|
| 2024 | 3% | 7% | 0% |
| 2025 | 5% | 9% | 0% |
| 2026 | 7% | 11% | 0% |
| 2027 | 9% | 13% | 9% |
| 2028 | 11% | 24% | 11% |
| 2029 | 13% | 37% | 13% |
| 2030 | 15% | 50% | 15% |

1. Excludes pickups until 2027 MY
2. Except Class 7-8 tractors

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Note: Class 2B-3 (GVWR: 8,501-14,000 lb.), Class 4-8 (GVWR: 14,001 lb. or greater), Class 7-8 tractor (GVWR: 26,001 lb. or greater)


# Proposed Reporting Requirement

# Regulatory Strategy

- Goal is to align interests of all parties

Zero Emission Future

Large Employers

Manufacturers

Fleet Owners

Utility/Fuel Suppliers

Government

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# Principles for Developing Future Rules

- Expand ZE truck market to meet air quality and GHG goals
- Accelerate a self-sustaining market
- Maximize use of ZEVs where suitable
- Match ZEV availability with individual fleet operational needs
  - Initial focus on urban, short-haul, return to base
- Provide benefits in disadvantaged communities
- Expand infrastructure availability to enable new markets
- Ensure level playing field between types of fleet operators

# Regulatory Concepts to Explore

- Percent of fleet purchases must be ZEVs
- Fleets must meet a ZE truck standard
- Zero-emission zones (cities, or other boundary)
- Large entities to hire fleets that meet a ZE truck standard

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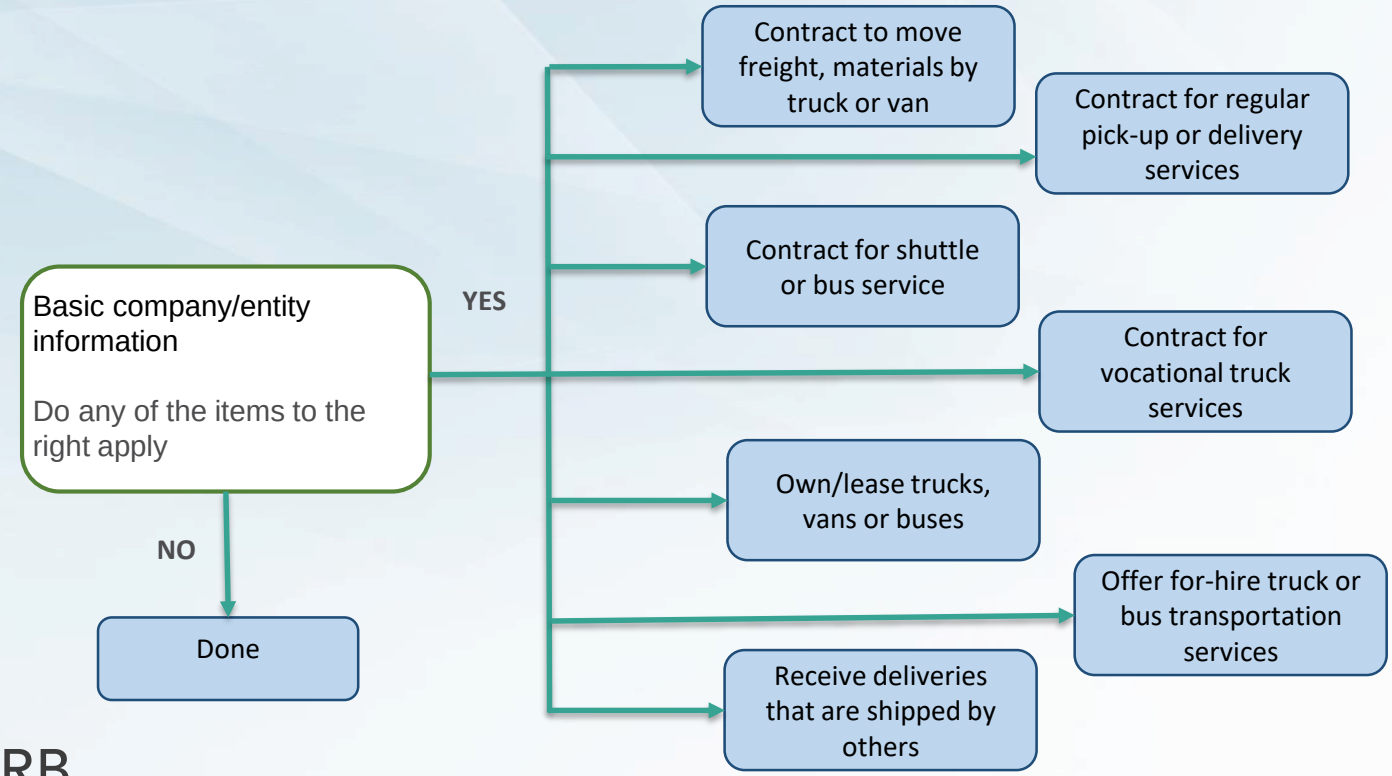
# Who Would Be Reporting

- All entities with gross receipts > $50 million annually and do business in California (may or may not own trucks)
  - Retailers, wholesalers, hotels, utilities, refuse/recycling services, port terminal operators, others
- Entities that own or direct 100 or more trucks (>8500 lb GVWR)
  - Motor carriers, freight forwarders, brokers, other
- Federal, state, county, and city governments
- Reporting required in early 2021

# Information Needed

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# Reporting for All Organizations

- Organization name
- Corporate parent information
- Contact information
- Headquarters address
- Business type (NAICS Code)
- General business description
- Revenue ($ million)
  - US (50-100, 100-1000, more)
  - California (<10, 10-50, 50-100, 100-1000, more)

# Reporting for All Organizations (continued)

- Provide additional information if any of the following apply:
  - Contract to move freight, materials by truck or van
  - Contract for regular pick-up or delivery services
  - Contract for shuttle or bus service
  - Contract for vocational truck services
  - Own/lease trucks, vans or buses
  - Provide for-hire truck or bus transportation services
  - Receive deliveries that are shipped by others

# Questions if You Contract to Move Freight or Other Materials

- Outbound from each of your facilities
  - Type of facility and address (warehouse, factory, store, other)
  - Type of freight/material/items shipped
  - Destination distance (local, regional in-state, out of state)
  - Destination facility type (store, warehouse, port, railyard, home, other)
  - Annual ton/miles; shipments; units moved
- Inbound to each of your facilities
  - Type of facility and address (warehouse, factory, store, other)
  - Type of freight/material/items shipped
  - Origin distance (local, regional in-state, out of state)
  - Origin facility type (store, warehouse, port, railyard other)
  - Annual ton-miles, shipments, units moved

# Questions if You Contract for Regular Pick-up or Delivery Service

- Facility location
  - Street, city, zip code
- Facility type
  - Store (grocery, restaurant, merchandise…)
  - Warehouse
  - Manufacturing plant
  - Other (office, hotel, bank, school, park, hospital…)
- Type of pick up or delivery service
  - Parcel, food, linen, garbage, home, recycling, supplies, other
  - Frequency (daily, weekly, monthly, other)

# Questions if You Contract for Regular Shuttle Bus Service

- Area of service (local, regional, long distance)
- Origin/destination includes (parking lot, transit hub, airport, other)
- Service period (week days, all week, other)
- Service type (fixed route, on demand, other)
- Annual miles, passenger miles
- Number of vehicles under contract
- Annual contract amount

# Questions if You Contract for Vocational Truck Services

- Type of service
  - Debris removal, tree trimming, sweeping, towing, etc.
- Do you specify the type of truck needed
  - Dump truck, flatbed, low boy, service truck…
- Frequency of service needed
  - Daily, weekly, monthly, seasonal, etc.
- Annual contract amount, other

# Questions if You Own Trucks and Buses[1]

- Upload truck data in TRUCRS for California fleet
- Provide additional information
  - Assigned terminal/yard/division (zip code, or city, other)
  - Average daily miles
  - Operating distance from base (50, 100, 200 miles)
  - Route characteristics (predictable, variable)
  - Location parked – yard, terminal, driver's home, other
  - Operation type (Return to base, other)
  - Towing needs
  - Number of daily stops
  - Daily hours of operation
  - Dwell time

1. Includes vehicles leased for one year or more

# Data Already Collected from Truck Owners in TRUCRS

## Vehicle Information

- VIN
- GVWR over 26,000 (Y/N)
- Manufacturer (vehicle/engine)
- Model year (vehicle/engine)
- Vehicle model
- Body type
- Fuel type
- License plate
- Registration state/type
- Odometer reading (if low-use)
- PTO hours (if low-use)

## Company Information

Name

Contact

Company/agency type

Business category

Motor carrier number

Tax payer-ID

Corporate parent ID

# Questions if You Provide For-Hire Transportation

- Company type
  - Motor carrier, broker, logistics company, other
- Service type
  - Truck load, less than truck load, flatbed other
- Freight types transported
  - Bulk material, liquids, dry goods, refrigerated goods…
- Total California loads (ton-miles, revenue, other)
- Portion of loads provided by sub-haulers or subcontractors (tons-mile, revenue, other)
- Annual number of subhauler trucks dispatched/directed

# Questions if You Receive Deliveries Shipped by Others

- Facility type (warehouse, retail store, other
- Facility location
- Type of products received (refrigerated, general merchandise, other)
- Owner or intermediary for shipment
- When are deliveries made (mornings, evenings, overnight, etc.)
- How are products received (loading dock, walk-in, etc.)
- Frequency of deliveries
  - Daily, weekly, monthly, seasonal, etc.
- How long are delivery trucks on site (1, 2, 4, other hours)

# Next Steps

- Staff report available October 2019
  - Formal comment period begins
- First of two board hearings in December 2019
  - Final decision mid-2020
- Plan future regulation for Board consideration in 2022
  - Initial implementation in 2024

# Additional Information

- Advanced Clean Trucks website
  - ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks
- Fact Sheet
  - ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-act-fact-sheet
- Contacts
  - Craig Duehring - craig.duehring@arb.ca.gov
  - Paul Arneja - paul.arneja@arb.ca.gov