



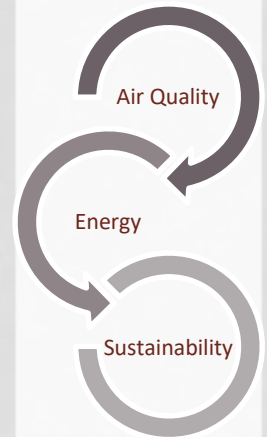
STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION



DIVISION OF AIR QUALITY AIR QUALITY, ENERGY, AND SUSTAINABILITY

CALIFORNIA ADVANCED CLEAN TRUCK REGULATION

BUREAU OF MOBILE SOURCES



Stakeholder Meeting - September 10th, 2020

ACRONYMS

- CARB – California Air Resources Board
- NOx – Nitrogen oxides
- PM – Particulate matter
- GHG – Greenhouse gas
- ZEV – Zero emission vehicle
- ZE – Zero emission
- OEM – Original equipment manufacturer
- MY – Model year
- CY – Calendar year
- MD – Medium duty
- HD – Heavy duty
- CNG – Compressed natural gas
- LNG – Liquified natural gas
- LPG – Liquified petroleum gas
- DAC – Disadvantaged communities (CA's term for environmentally overburdened areas)
- NZEV – Near zero emission vehicle
- BEV – Battery electric vehicle
- FCEV – Fuel cell electric vehicle

CARB STRATEGIES FOR MEDIUM AND HEAVY VEHICLES

- CARB is introducing multiple initiatives to reduce GHG and NOx from medium and heavy-duty vehicles.
- New Jersey is considering several of those strategies.
- We will profile each of these strategies today.

CARB STRATEGIES FOR MEDIUM AND HEAVY VEHICLES

1. Advanced Clean Truck (ACT) regulation– requires OEMs to sell ZEVs.
2. Heavy-Duty Engine and Vehicle Omnibus regulation – establishes more stringent NOx emissions standards for new engines.
3. Zero Emission Fleets – requires fleet owners to purchase ZEVs.
4. Drayage Trucks at Seaports and Railyards – directs a transition to zero emission operations at ports.

OVERVIEW















1. What strategies are we proposing?
2. New Jersey medium and heavy vehicle fleet statistics.
3. What is the Advanced Clean Truck regulation?
4. Answer questions and discuss issues.

REGULATORY CONCEPT

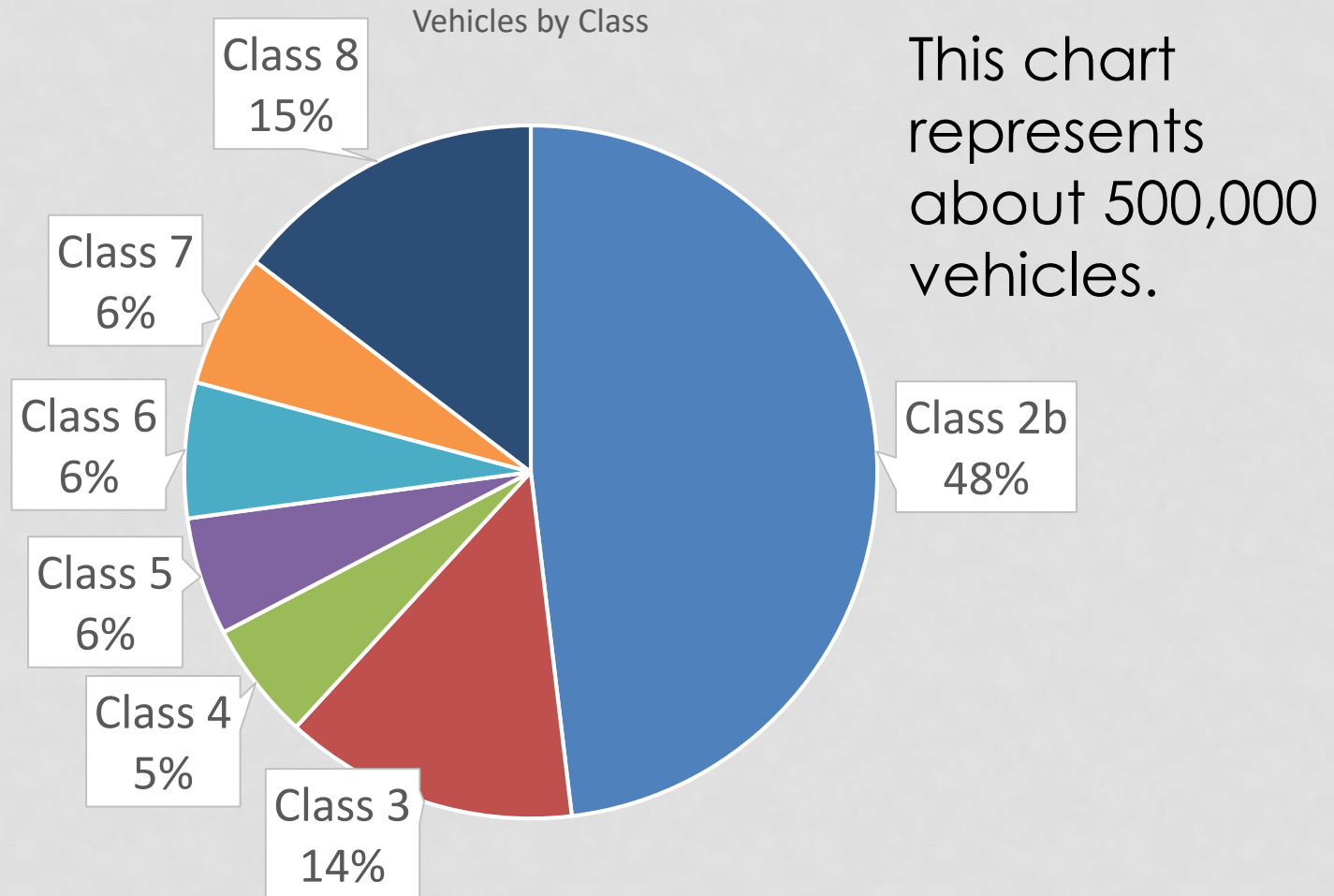
- California has proposed regulatory changes to increase the number of medium and heavy-duty electric vehicles.
- New Jersey could consider adoption by reference of relevant sections of the California Code of Regulations.
- Similar to our adoption by reference of the California Low Emission Vehicle program for light duty vehicles in 2006.
- ACT would affect medium and heavy-duty vehicles, of all fuel types, in New Jersey

WEIGHT RATINGS AND VEHICLE CLASS

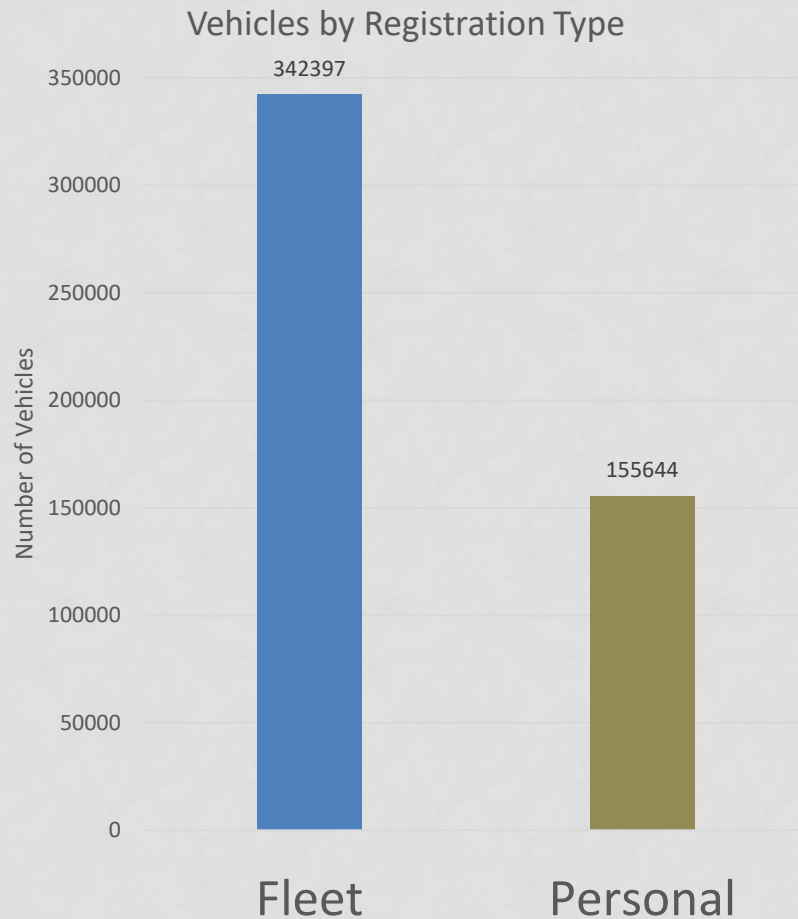
- This proposal would affect class 2b through class 8 vehicles.
- Class 2b is 8,500 to 10,000 lbs.
 - Mostly heavier pickups, vans and SUVs.

Class 1 - 6,000 lbs & Less
   
Minivan Cargo Van SUV Pickup Truck
Class 2 - 6,001 to 10,000 lbs
   
Minivan Cargo Van Full-Size Pickup Step Van
Class 3 - 10,001 to 14,000 lbs
   
Walk-in Box Truck City Delivery Heavy-Duty Pickup
Class 4 - 14,001 to 16,000 lbs
  
Large Walk-in Box Truck City Delivery
Class 5 - 16,001 to 19,500 lbs
  
Bucket Truck Large Walk-in City Delivery
Class 6 - 19,501 to 26,000 lbs
   
Beverage Truck Single-Axle School Bus Rack Truck
Class 7 - 26,001 to 33,000 lbs
   
Refuse Furniture City Transit Bus Truck Tractor
Class 8 - 33,001 lbs & Over
   
Cement Truck Truck Tractor Dump Truck Sleeper

NJ MEDIUM/HEAVY VEHICLE POPULATION BY CLASS



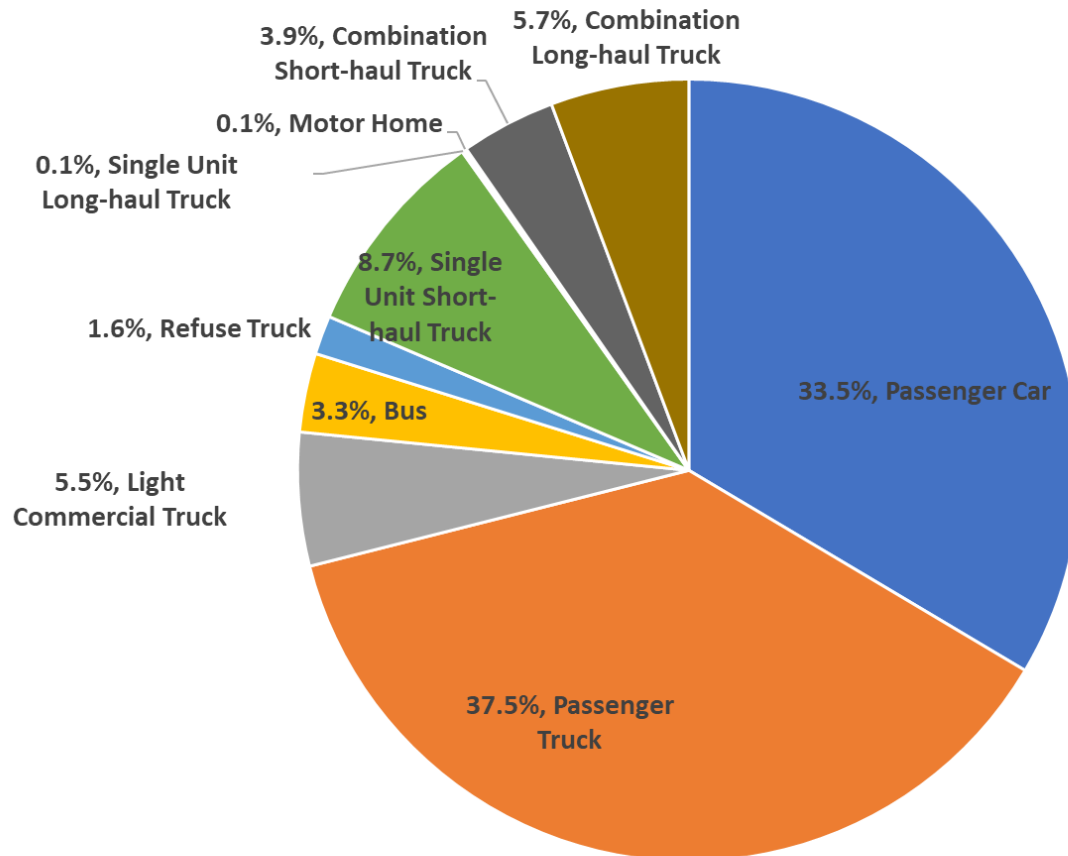
NJ MEDIUM/HEAVY FLEET STATISTICS



GREENHOUSE GAS EMISSIONS

Medium and heavy-duty vehicles represent almost one third of GHG emissions from vehicles.

Greenhouse Gas Emissions from On Road Vehicles



WHAT IS THE ADVANCED CLEAN TRUCK REGULATION

- Holistic approach to accelerate a large-scale transition to zero-emission medium and heavy-duty vehicles in Class 2b to Class 8.
- The proposed regulation has two components:
 1. Manufacturer sales requirement;
 2. Reporting requirement.

MANUFACTURER SALES REQUIREMENT

- **Zero-emission truck sales:**
 - Manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines would be required to sell zero-emission trucks as an increasing percentage of their annual sales from 2024 to 2035.
 - By 2035, zero-emission truck sales would need to be 55% of class 2b – 3 truck sales, 75% of class 4 – 8 straight truck sales, and 40% of truck tractor sales.

Proposed ZEV Sales Requirements

- Manufacturers with New Jersey sales
 - Exemption for <500 annual sales
- Zero-emission Powertrain Certification required starting 2024 MY
- Credit for near-zero-emission vehicles
 - Minimum all-electric range
 - Up to 75% of a ZEV credit
- Credits tradable across weight classes
- Minimum tractor sales required

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 and beyond	55%	75%	40%

ONE-TIME REPORTING REQUIREMENT

- **Company and fleet reporting:**
 - Large employers including retailers, manufacturers, brokers and others would be required to report information about shipments and shuttle services.
 - Fleet owners, with 50 or more trucks, would be required to report about their existing fleet operations.
 - This information would help identify future strategies to ensure that fleets purchase available zero-emission trucks.

Proposed Large Entity Reporting

Who would need to report (one-time)?

Businesses >\$50 Million in Revenue

- With facilities in California (may not own vehicles)

Large Fleets Own 100+ Vehicles¹

- With facilities in California

Brokers Directing 100+ Vehicles¹

- To or from California

Government All Levels

- Municipalities, State, Federal Agencies

Why do we need reporting?

Support ZE regulatory frameworks

- Fleet standards, purchasing requirements, must contract with ZE fleets, ZE zones

Ensure level playing field

- Large fleets vs. small fleets
- Owned trucks vs. contracted services

Assessing infrastructure needs

- Energy demand, barriers, build-out planning

Match technology with duty cycles

- Understanding spectrum of existing use cases

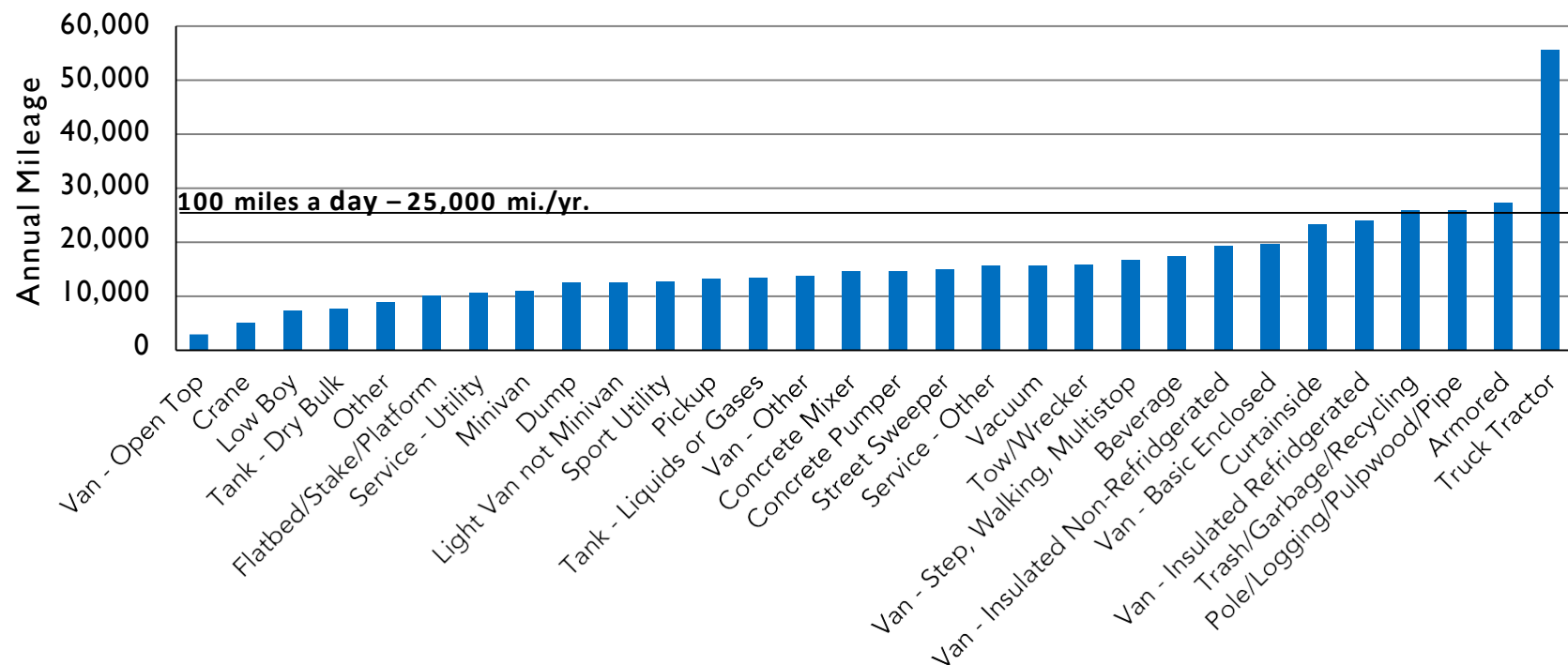
Fleet Questions for ZEV Feasibility

- Group by vehicle body type fuel type and assigned facility
- Onsite fueling infrastructure
- Daily and total annual miles
- Variable or predictable use
- Portion that returns-to-base
- How long are vehicles kept
- How many have GPS tracking
- How many stay close to base
- How many tow trailers >100 mi.
- How many are at a weight limit
- How many are registered in CA
- How many at facility for >8hrs.
- How many used for emergency
- How many have all-wheel drive

WHAT TYPES OF TRUCKS ARE CURRENTLY SUITABLE FOR ELECTRIFICATION?

- Today, electric drivetrains are well suited to operating in congested urban areas for stop-and-go driving where conventional engines are least efficient.
- Battery-electric and fuel-cell electric trucks, buses, and vans already are being used by fleets that operate locally and have predictable daily use where the trucks return to base to be charged or fueled.

Most Trucks Average Below 100 Miles/day

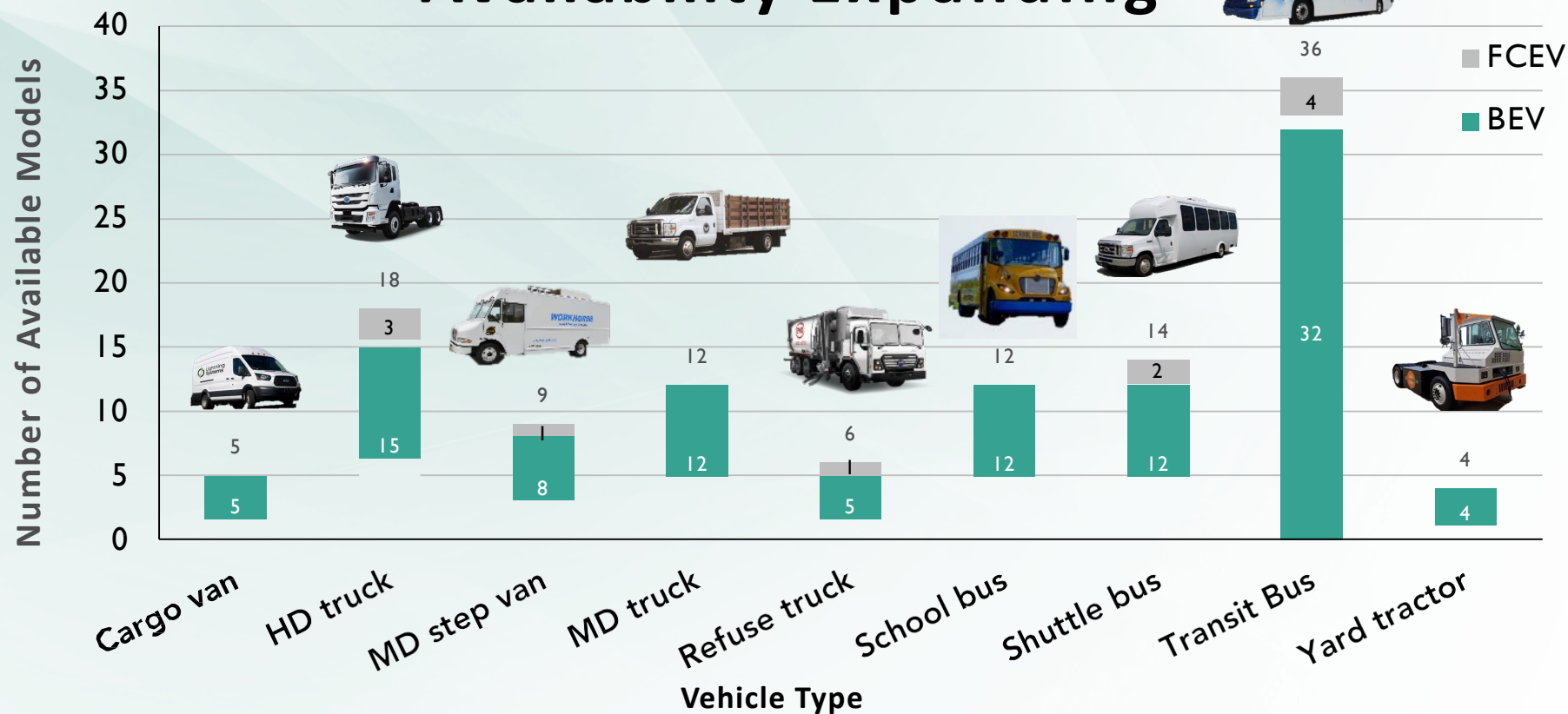


Source: 2002 VIUS survey <https://www.census.gov/library/publications/2002/econ/census/vehicle-inventory-and-use-survey.html>

ARE ANY ZERO-EMISSION TRUCKS COMMERCIALLY AVAILABLE?

- More than 70 different models of zero-emission vans, trucks and buses commercially available from several manufacturers.
- Most trucks and vans operate less than 100 miles per day and several zero-emission configurations are available to serve that need.
- As technology advances, zero-emission trucks will become suitable for more applications.
- Most major truck manufacturers have announced plans to introduce market ready zero-emission trucks in the near future.

Medium- and Heavy-Duty ZEV Model Availability Expanding



Major Manufacturers Entering Market

- Many major manufacturers have plans to enter the ZEV market prior to 2024
 - Cummins, Ford, Freightliner, Mack, Navistar, Mitsubishi Fuso, Peterbilt, Tesla, Volvo have announced plans for commercial products



Image source: [Ford](#), [Cummins](#), [Mack](#), [Trucks.com](#)

Major Suppliers and Service Providers Entering Market

- Established suppliers entering ZE truck supply chain
 - Partnering with existing ZE vehicle/drivetrain manufacturers
 - Numerous demonstrations underway
- Established companies servicing, distributing, training, leasing ZE trucks

Electric Powertrain Providers



Service, Support, Training



Technology Outlook for the Future

- ZE truck demonstrations for types previously assessed as challenging
- Battery density and cost reductions expected to continue
 - Decreases weight or enables greater range
- Innovative designs create other advantages
 - Skate board platforms, composite bodies, e-axles
 - Some with better payload and lower weight than diesel today
- Fueling/charging network development to expand market potential



Image Source: Workhorse Group, Rivian

CAN FLEET OWNERS AFFORD TO OPERATE ZERO-EMISSION TRUCKS?

- Higher upfront costs but lower operating costs than conventional trucks.
- Total cost of ownership can be comparable to conventional trucks for certain duty cycles without grants or rebates.
- As battery prices fall and technology continues to improve, the total cost of ownership is expected to become more favorable.
- Incentives are currently available to offset some of the early infrastructure costs to help fleets begin transitioning to zero-emission vehicles now.

STAKEHOLDER FEEDBACK OPPORTUNITIES

- Are there any questions about this material?
- Specific issues for consideration and discussion are on subsequent slides.

DISCUSSION ISSUES

- Issues for discussion:
 - Schedule
 - California adoption in 2020 for MY 2024 implementation
 - Need two year lead time
 - Two year lead puts us at beginning of CY 2024 or MY 2025 implementation
 - Are there issues with CA's phase-in with respect to classes and expected available ZEVs?
 - Industry assistance
 - Can industry organizations help us with outreach and education?
 - Enforcement
 - Same as light duty LEV program
 - No enforcement action has been required to date for LEV

COMMENTS

Please send comments and/or technical support information to:

njairrulesmobile@dep.nj.gov

Use the following heading in the subject line of the email:
California Advanced Clean Truck Regulation

By September 24, 2020