

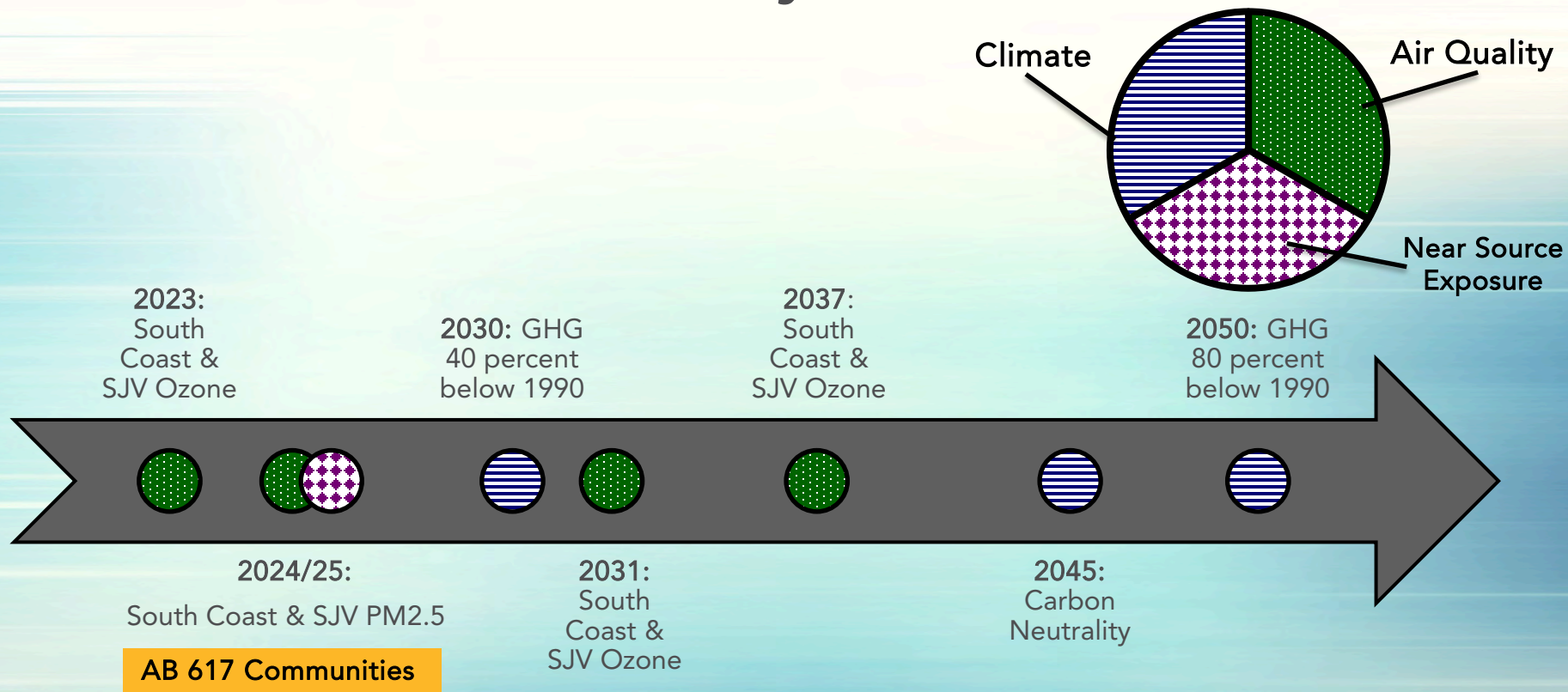


# Advanced Clean Fleets Regulation Emissions Inventory Workgroup

Air Quality Planning and Science Division

November 17, 2021


# California's Air Quality and Climate Goals



# California Leading the Way for a Sustainable Future

Governor 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



# Advanced Clean Fleets Overview

- General scope summary
  - Any vehicle with a manufacturer's gross vehicle weight rating (GVWR) above 8,500 lbs.
  - Off-road yard tractors
- Proposed zero-emission requirements
  - Public fleets\*
  - Drayage trucks
  - High priority and federal fleets
  - 100% ZEV sales by 2040



# Examples of Affected Vehicles

Class 2b-3



Class 4-8



Class 7-8 Tractors

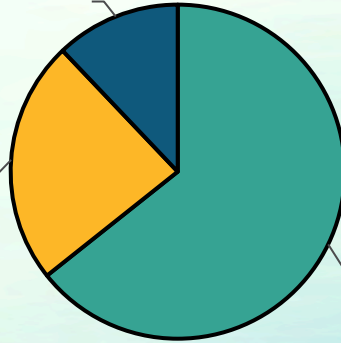


# Daily Truck Populations and Emissions

## Daily Truck Population



Class 7-8 Tractors  
219,000 (12%)



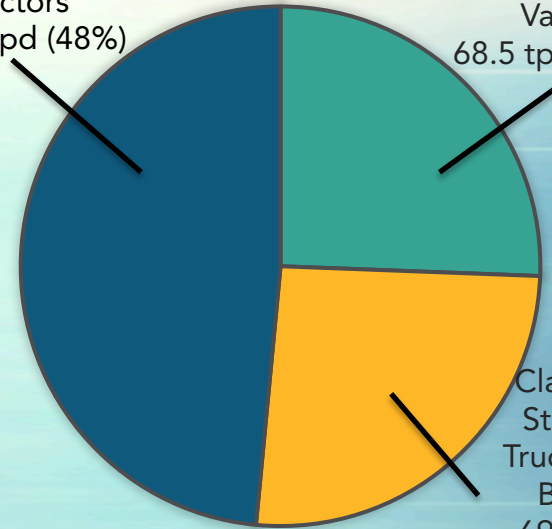
Class 4-8 Straight  
Trucks and Buses  
427,000 (24%)



Class 2b-3 Trucks  
and Vans  
1,164,000 (64%)

## Daily NOx Emission

Class 7-8  
Tractors  
129.7 tpd (48%)



Class 2b-3  
Trucks and  
Vans  
68.5 tpd (26%)

Class 4-8  
Straight  
Trucks and  
Buses  
69.3 tpd  
(26%)

Source: [California Air Resources Board \(CARB\) Emissions Inventory EMFAC2021](https://arb.ca.gov/emfac/), (<https://arb.ca.gov/emfac/>) Calendar Year 2021, including California International Registration Plan (IRP) and out-of-state IRP trucks; excludes motor homes, transit buses, and school buses.

# Public Fleets





# Emission Modeling - Public Fleets

- Public Fleets identification for emission inventory:
  - Vehicles with exempt plates in CA DMV Vehicle Registration
  - Including Class 2b-8 trucks and buses (excluding transit and school buses)
  - In CY2019, 74,800 Class 2b-3 and 63,800 Class 4-8 Vocational vehicles have been identified to subject to the ACF public fleets requirement
- Applies to new vehicle purchases:
  - 50% ZEV for 2024-2026 model year
  - 100% ZEV for 2027 MY onwards
- Designated counties with 3-year exemption
- NZEV is not included in the inventory model

# Drayage Trucks

# Drayage Trucks Proposal

- Drayage trucks are on-road, heavy-duty trucks that transport containers and bulk to and from the seaports and intermodal railyards
- Accelerated transition of drayage trucks operating at intermodal seaports or railyards to zero-emission



Transition to Zero  
Emission



# Zero-Emission Drayage Transition

- Starting late-2023, only ZEVs may be added to the CARB Drayage Truck Registry
- Legacy drayage service ends when engine model is 13 years old or 800,000 miles, whichever comes last (no more than 18 years)
- Trucks must visit a California seaport or railyard at least once a year beginning in late-2023 to remain in CARB Drayage Truck Registry



# Calendar Year 2019 Drayage Truck Inventory

Vehicle Category	Port of Oakland (POAK)	Port of LA/LB (POLA)	Other Seaports*	Railyards**
Instate Class 8 <sup>†</sup> Active Trucks***	4,224 <sup>‡</sup>	13,951 <sup>‡</sup>	1,453 <sup>‡</sup>	8,988
Instate Class 8 <sup>†</sup> Inactive Trucks***	n/a***	2,770	n/a	n/a
Instate POAK Class 8 already in POLA <sup>†</sup>	136	n/a	n/a	n/a
Class 4-7 <sup>†</sup>	22	180	n/a	n/a
Out of State <sup>†</sup>	823	854	n/a	n/a
<b>Total</b>	<b>5,205</b>	<b>17,755</b>	<b>1,453</b>	<b>8,988</b>

<sup>†</sup> Non-gasoline

<sup>‡</sup> T7 POLA Class 8, T7 POAK Class 8, and T7 Other Ports Class 8 in EMFAC2021

\* Estimate based on past surveys; requesting updated information from other seaports

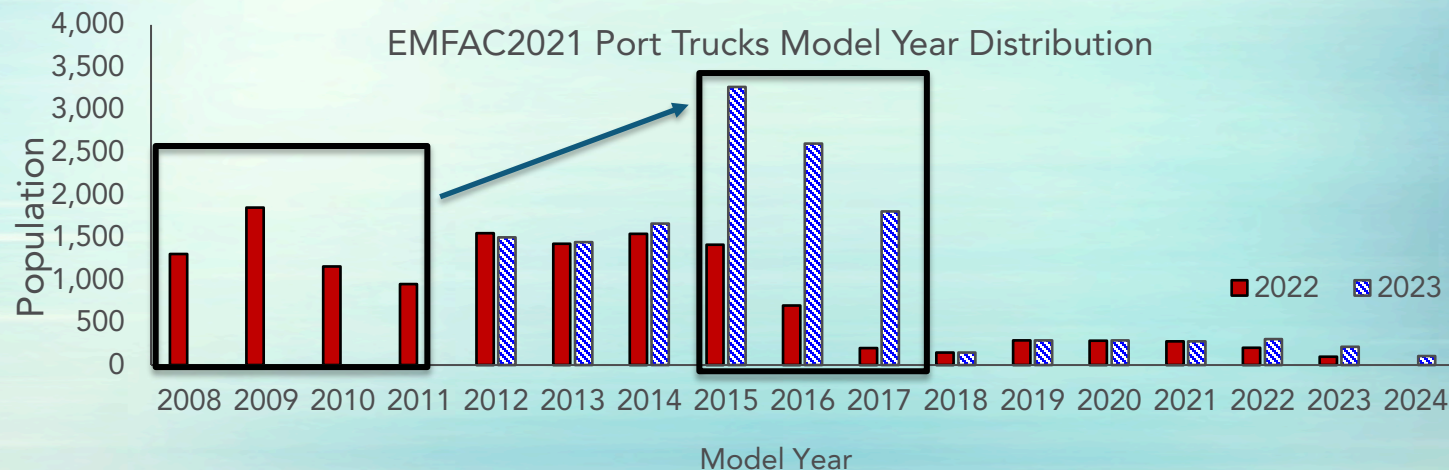
\*\* Estimated based on information provided by Union Pacific (UP) Railroad and Burlington Northern and Santa Fe (BNSF) Railway

\*\*\* 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 POAK Class 8 in-state trucks were considered active.

# Calendar Year 2022/2023

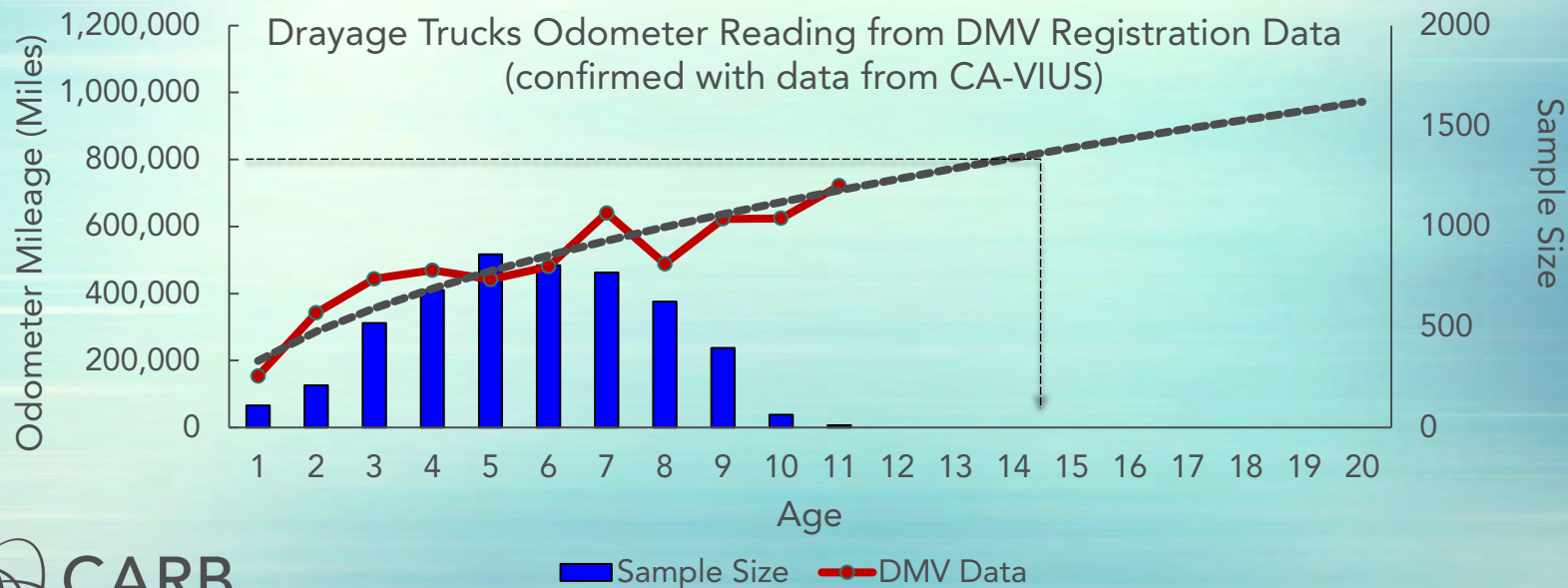
## Statewide Drayage Truck Inventory

- EMFAC2021 baseline inventory assumes used truck purchases prior to 2023 as a result of Truck & Bus rule
- The 2024 baseline inventory is used to project emissions benefit of ACF Drayage requirements



# Legacy Drayage Truck

- Legacy drayage truck: Assumed to be removed from registry when engine age reaches 15 or more



# Emission Modeling- Drayage Trucks

- Starting 2024, all new drayage trucks of MY 2024+ are assumed to be ZEVs
- Beginning in 2024, vehicles added to the drayage truck registry must be ZEVs (ICE vehicle population will shrink)
- Legacy diesel trucks will be removed from registry when engine age reaches 15 or more
- Current inventory includes both
  - Port drayage: Drayage categories in EMFAC
  - Rail drayage: Originally from Class 8 Tractors in EMFAC



# High Priority and Federal Fleets

# High Priority and Federal Fleets

- Own or dispatch 50 or more vehicles under common ownership or control
- Earned >\$50 million gross annual revenue with at least 1 vehicle
- Are federal government fleets
- Hired affected fleets
- Subsidiaries or fleet combinations totaling 50 or more trucks



# ZEV Milestone Phase-In Schedule

- High priority and federal fleets milestones
  - Percentage of the total fleet must be zero emission
  - Flexibility to meet percentage requirements with any vehicle type
- Exemptions if suitable ZEVs are not available

Zero-Emission Fleet Percentage	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



# Emission Modeling - High Priority Fleets

- High priority fleets identification for emission inventory
  - Entities with more than \$50 million annual revenue that operates at least one vehicle in California were determined using Dun & Bradstreet database
  - Entities that own more than 50 vehicles were determined using DMV & IRP Registration database
  - Subhauler population were estimated using ACT Large Entity Reporting
  - Off-road yard tractors identified through DOORS Database
- ZEV fractions between the phase-in target years are linearly interpolated



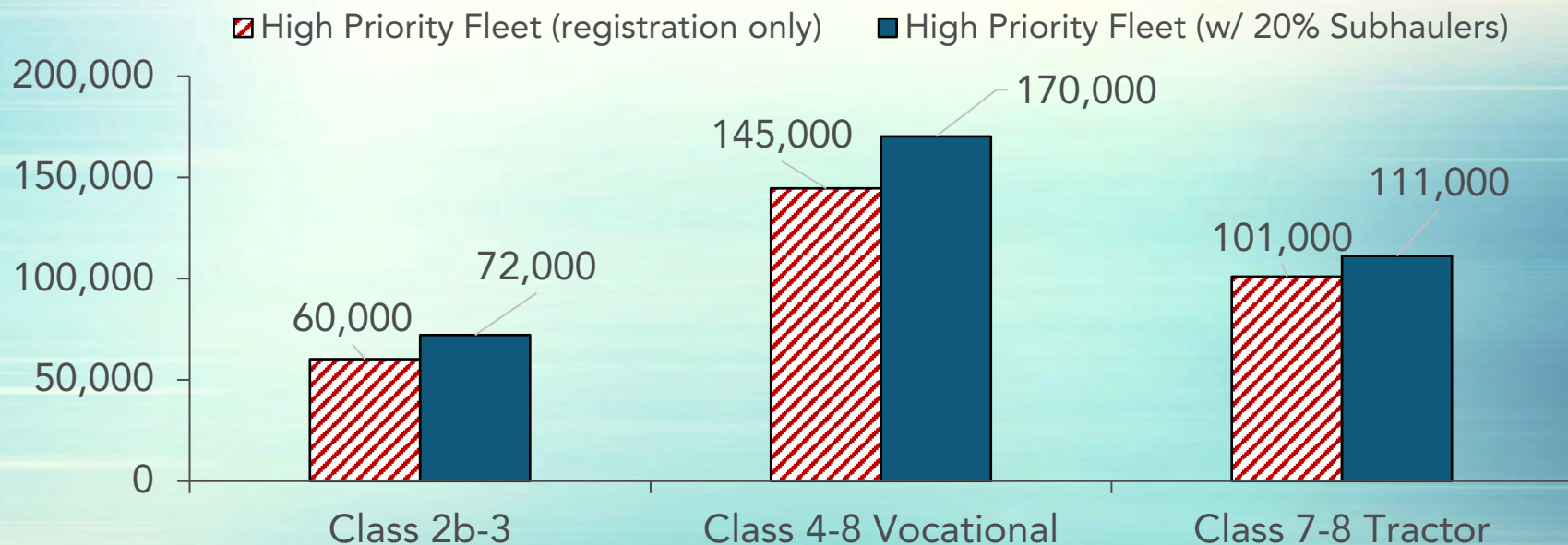


# Emission Modeling- Subhauler Fraction

- Large Entity One-Time Reporting was required as part of the Advanced Clean Truck (ACT) regulation adopted in 2020
  - Affected entities need to report information such as vehicle information and facility or home-base location.
- Estimated number of vehicles operated by subhaulers and operated under the same motor carrier authority
  - Staff assessment showed that subhauler vehicles are 20 percent of priority fleet population
  - A scaling factor was applied to identified instate vehicles to account for subhauler population.

# Emission Modeling- High Priority Fleets Population

High Priority Fleets based on Vehicle Registration Database in CY2019

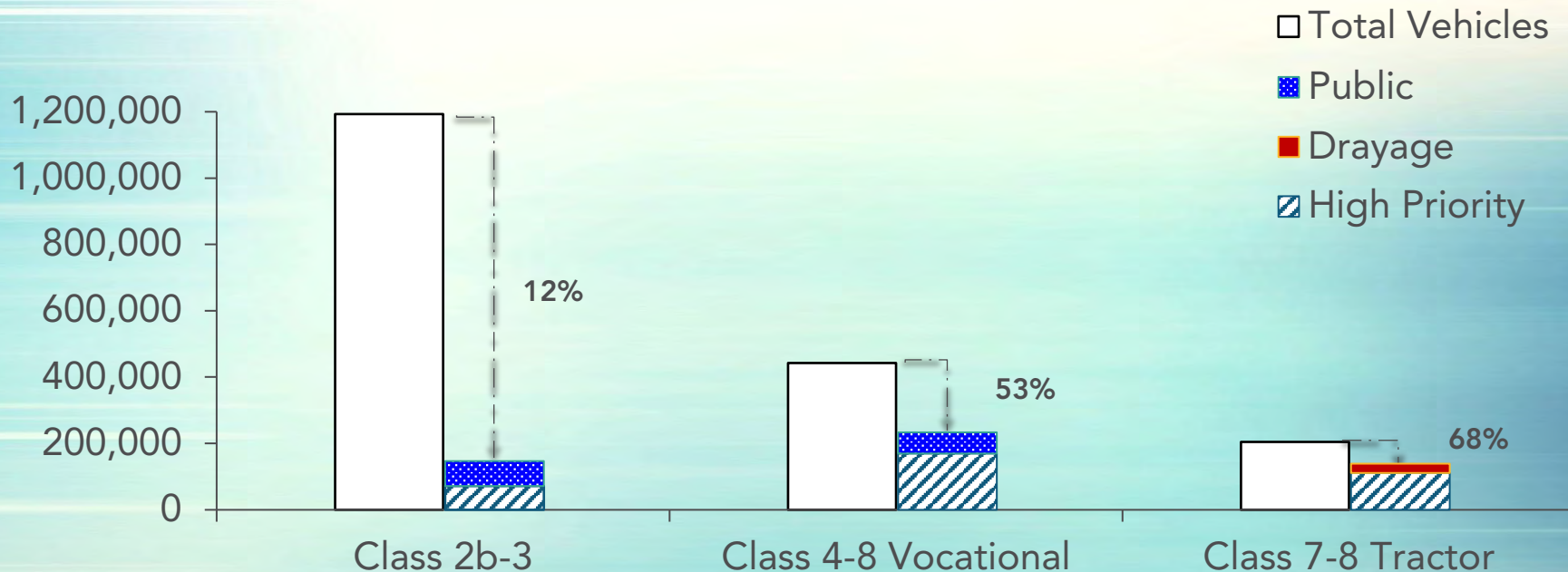


Subhauler scaling factor applied to instate vehicles only (Utility, SWCV, Off-Road Yard Tractors excluded);  
Priority fractions capped at 100%.

# Emissions Inventory Modeling Results

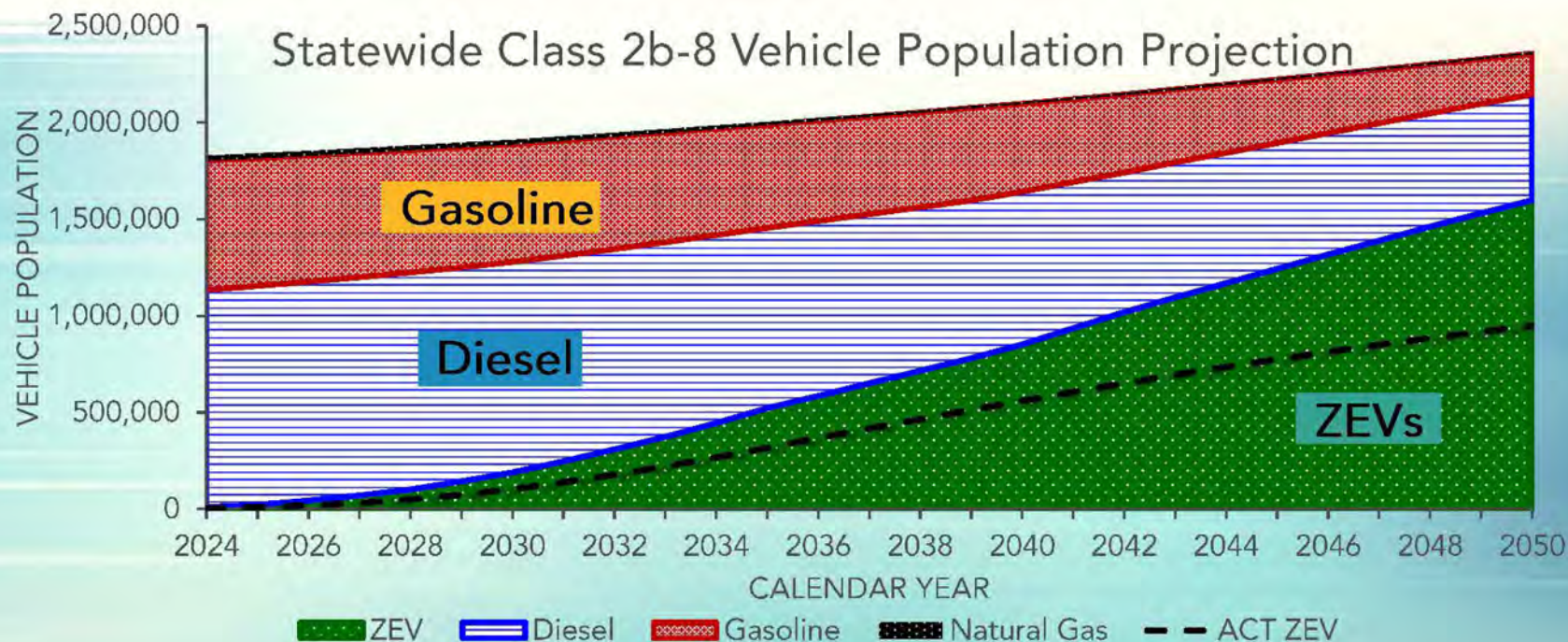
# Total Affected Vehicles Under Current ACF Proposal

Vehicles Subject to ACF Public, Drayage, and High Priority Fleet Requirement in CY2019

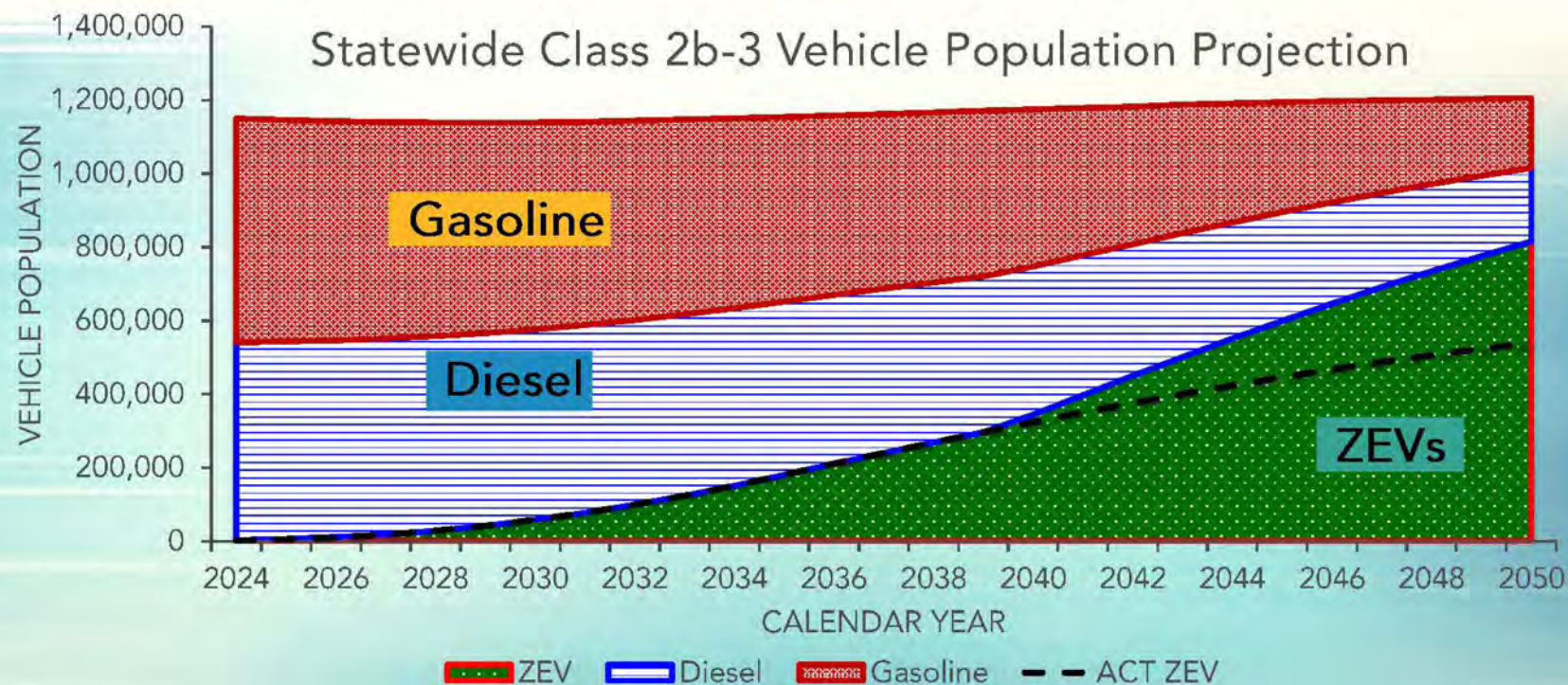




# Projected Technology Distribution Under ACT and ACF Proposal

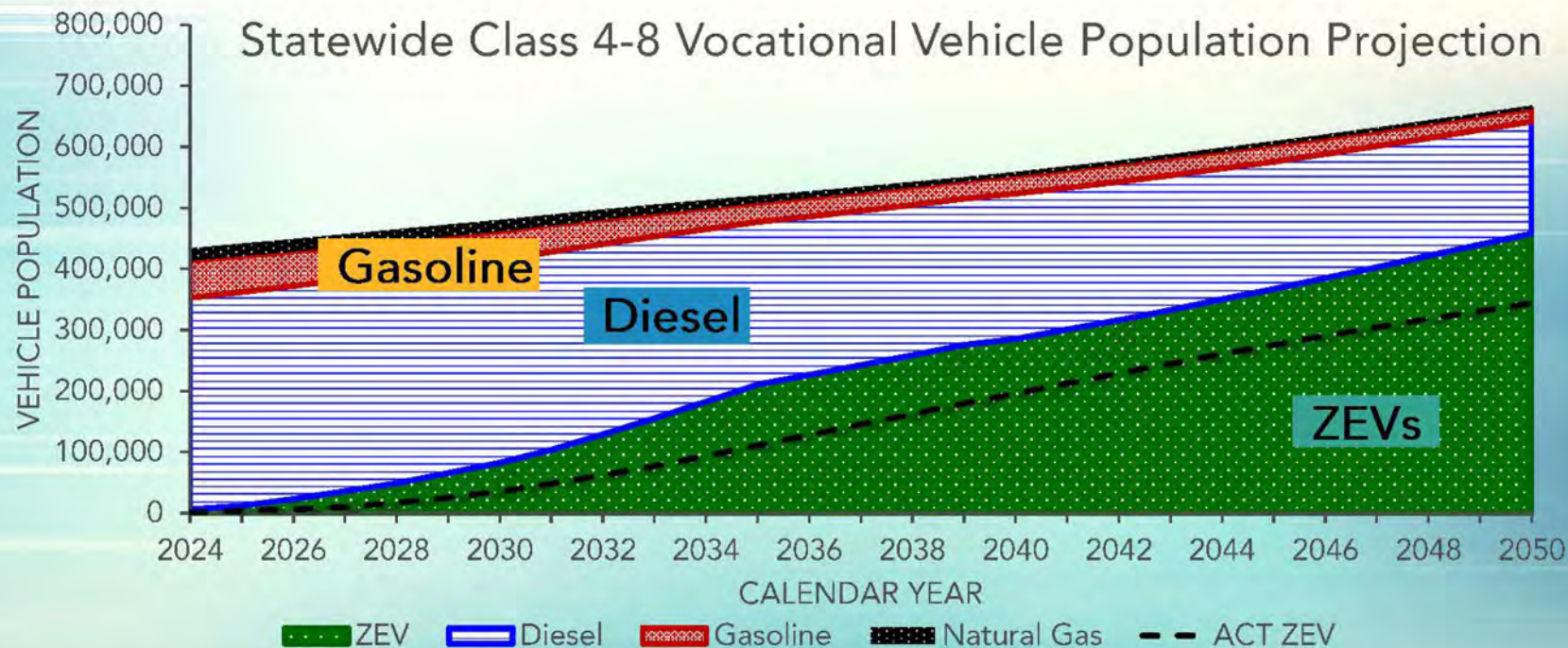


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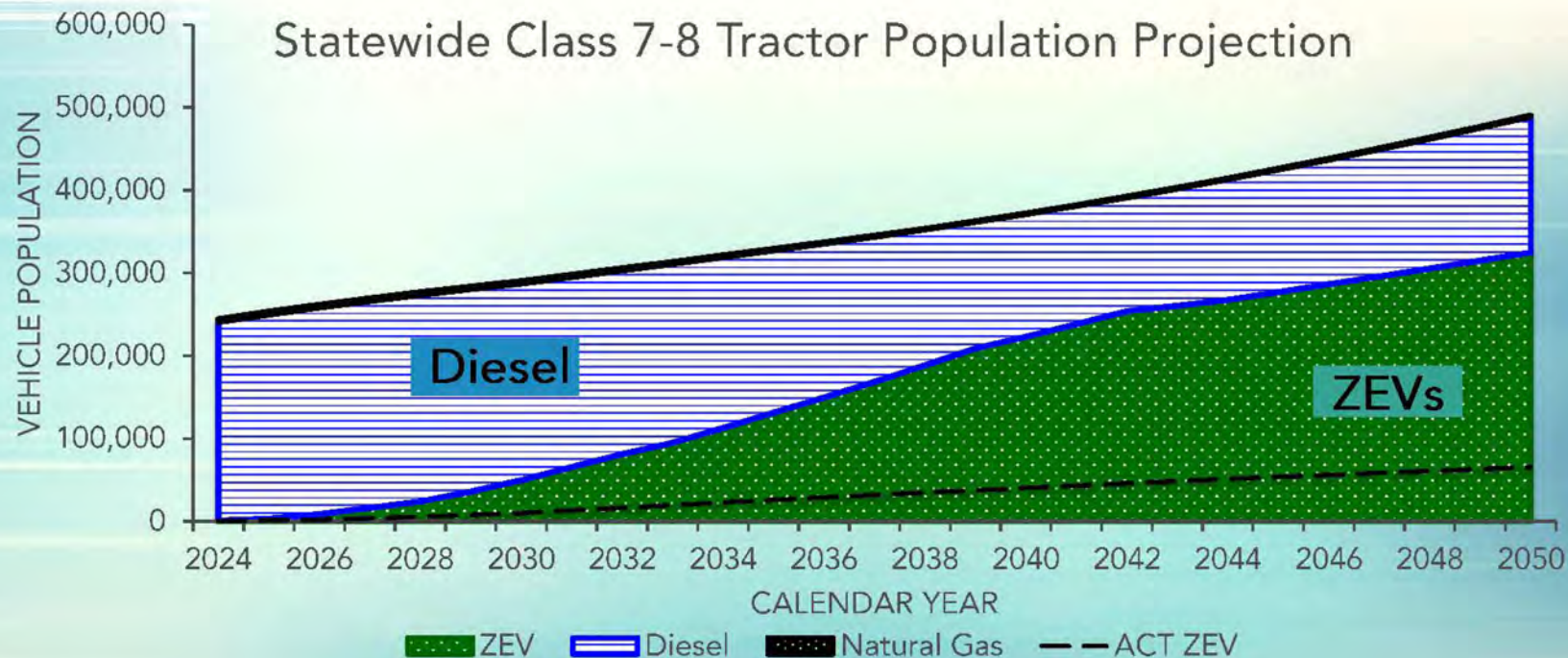




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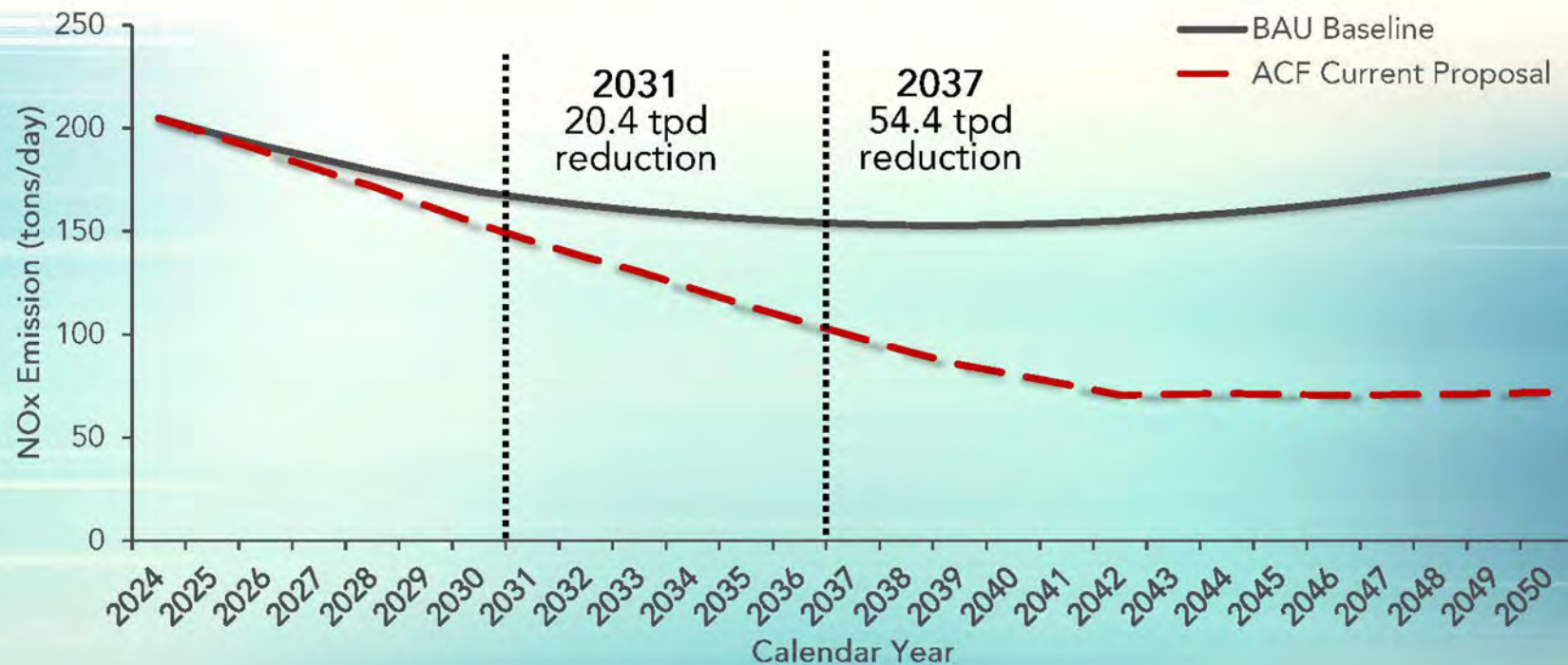


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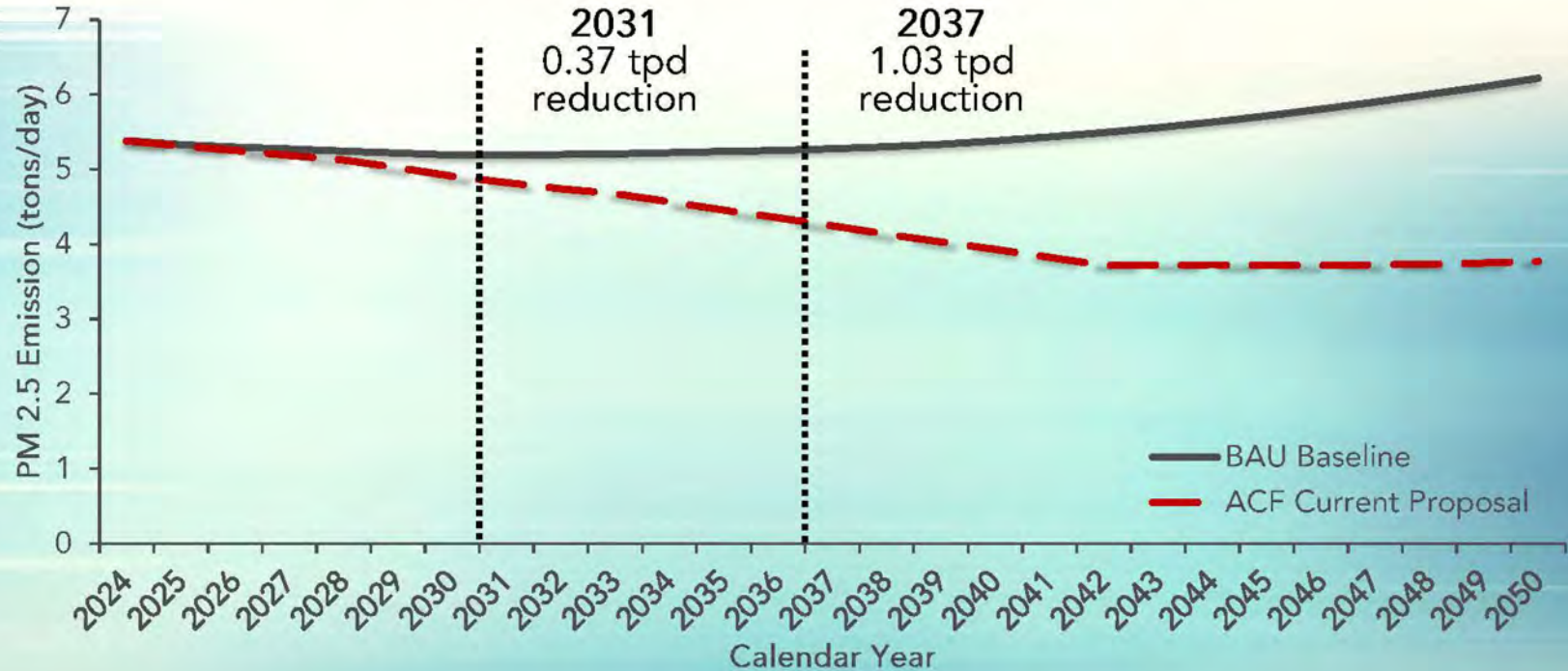




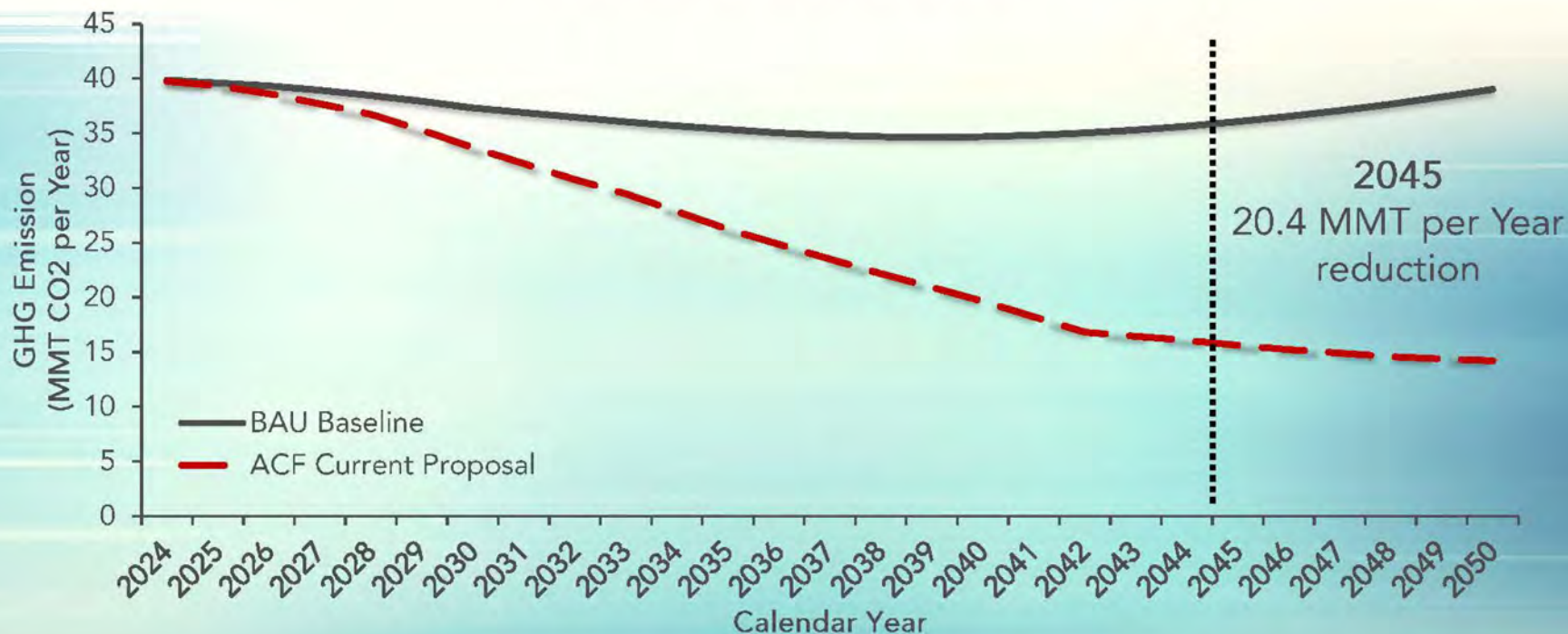
# Projected Statewide NOx Emissions



# Projected Statewide PM<sub>2.5</sub> Emissions (Exhaust and Brake Wear)



# Projected Statewide Tank-to-Wheel GHG Emissions





# Next Steps

- Seek feedback on the emission inventory development
- Work with the regulation development team to improve the emission inventory
- Implement the ACF requirements in the next version of EMFAC
- **Contact information:**
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  - [Fang Yan](mailto:fang.yan@arb.ca.gov) (fang.yan@arb.ca.gov), Manager, On-Road Model Development Section
- For EMFAC questions, please contact [EMFAC staff](mailto:emfac@arb.ca.gov) (emfac@arb.ca.gov)