



2020 Mobile Source Strategy

October 28, 2021



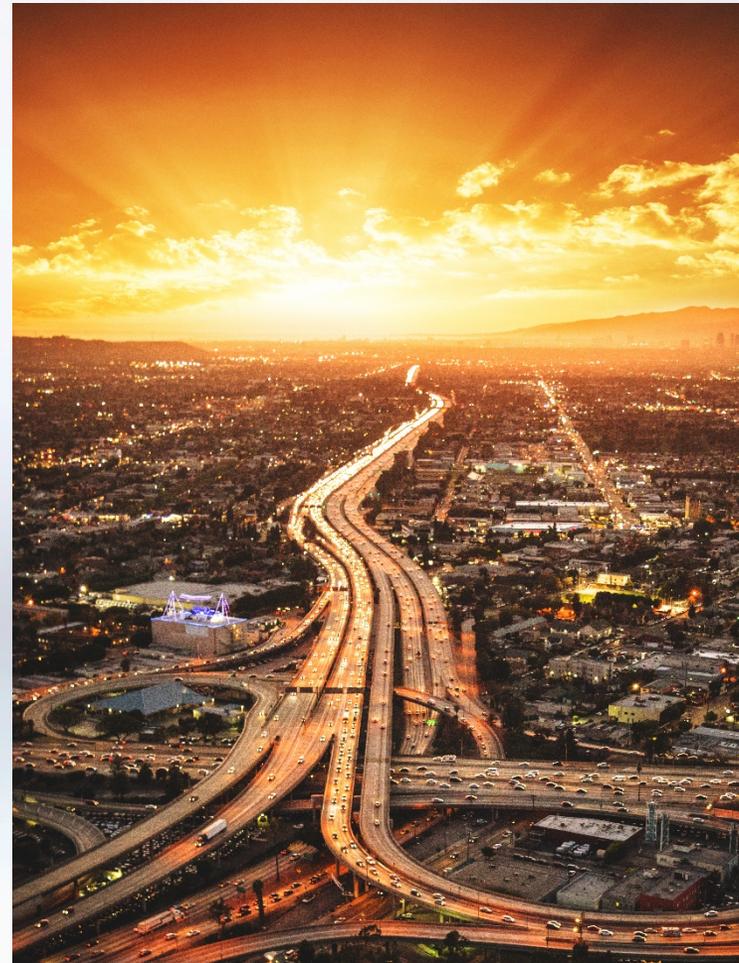
Senate Bill 44

- Requires CARB to update the Mobile Source Strategy and submit to the Legislature every 5 years
- Update must include a comprehensive strategy for the deployment of medium- and heavy-duty vehicles in the State
- Include emissions reduction goals consistent with air quality and climate goals



2020 Mobile Source Strategy

- Conceptual scenario approach to illustrate:
 - Magnitude of needed reductions
 - Role of various strategies
- Identifies technology mixes needed to meet toxics, air quality and climate targets
- Builds on 2016 Mobile Source Strategy
- Concepts provide basis for potential 2022 State SIP Strategy measures



Addressing Multiple Goals



2023:
South
Coast &
SJV
Ozone

2030:
GHG
40 percent
below
1990

2037:
South
Coast &
SJV
Ozone

2050:
GHG
80 percent
below
1990



2024/25:
AB 617
Communities
South Coast
& SJV PM2.5

2031:
South
Coast &
SJV
Ozone

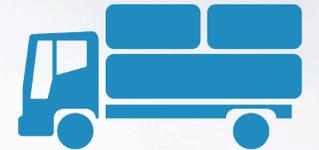
2045:
Carbon
Neutrality

Executive Order N-79-20

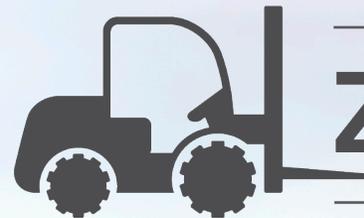


100% ZEV sales by 2035

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

Extensive Public Process

March 2020:
1st Public
Webinar

April 2020:
Informational
Update to the
Board

Sept/Oct 2020:
Release of
Workshop
Discussion
Draft,
2nd Public
Webinar

Nov/Dec 2020:
Release of
Draft 2020
MSS,
Informational
Update to the
Board

Apr/May 2021:
Release of
Revised Draft
2020 MSS,
3rd Public
Webinar

Sept/Oct 2021:
Release of
Final
2020 MSS,
Board
Consideration

Responses to Public Feedback & Board Direction

- Added Near-term Focused Chapter
- Added Environmental Justice Chapter
- Expanded Discussion on Federal Actions Needed
- Updated/Expanded Discussion on VMT Reduction
- Updates to Scenarios as Needed

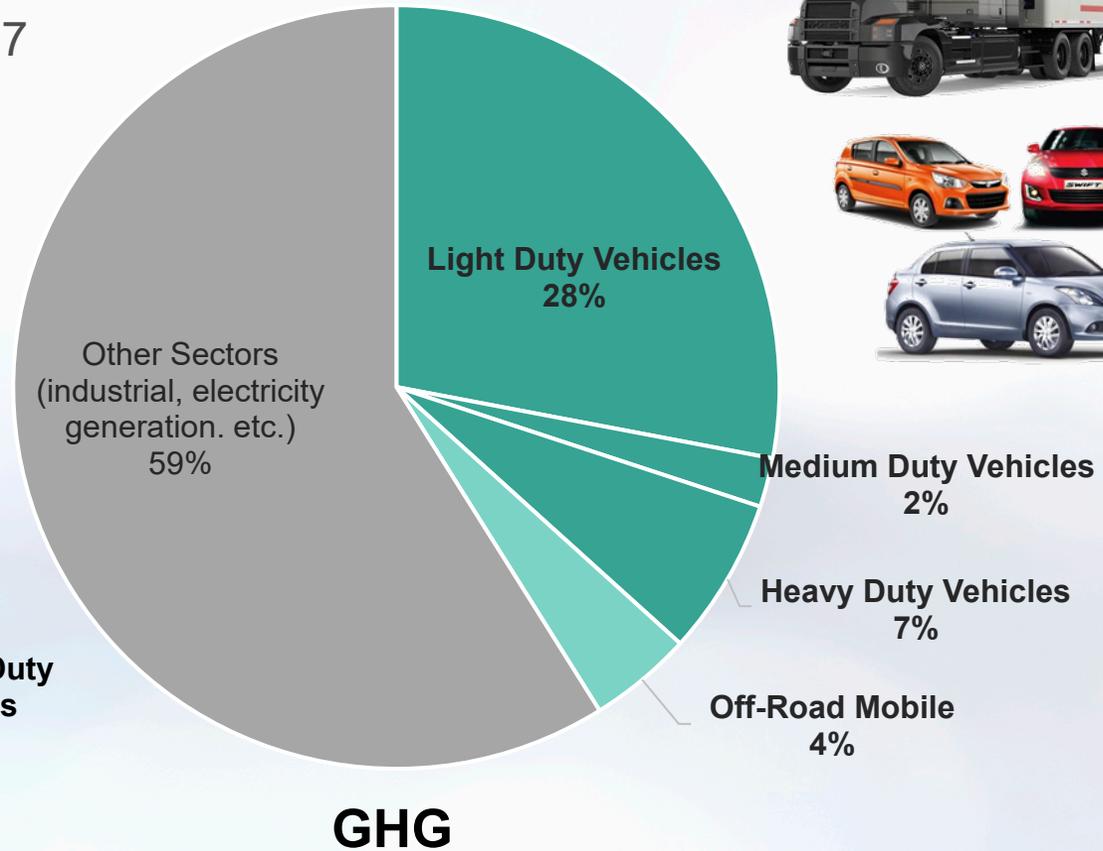
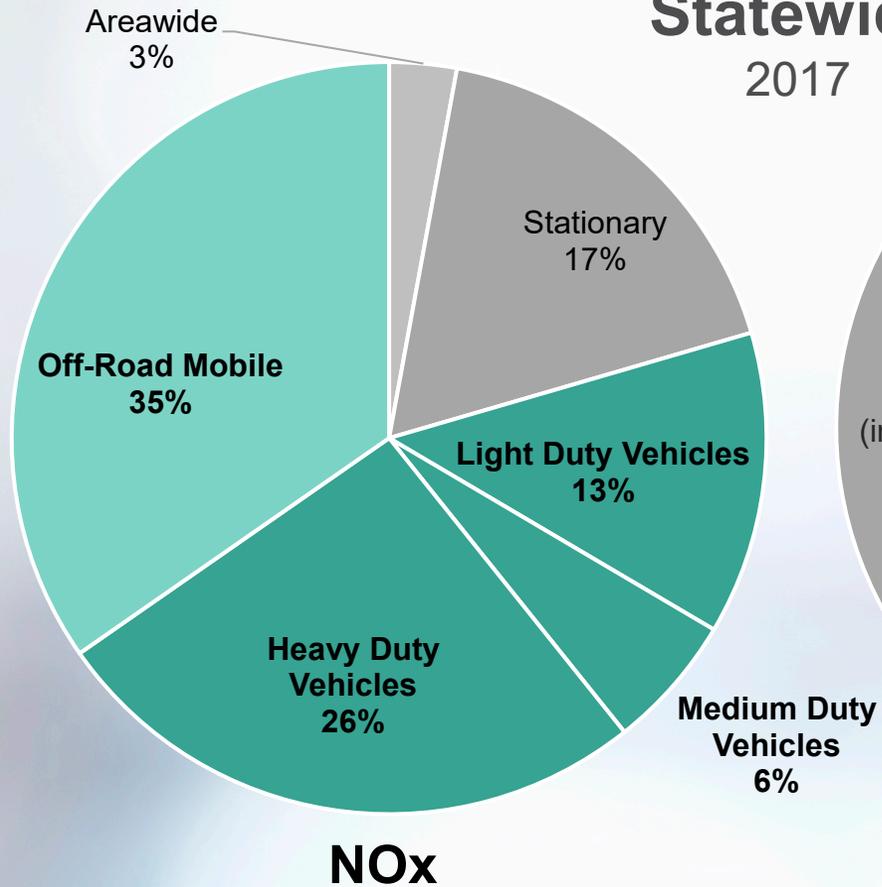
Potential Upcoming NOx Reductions

(tons per day)

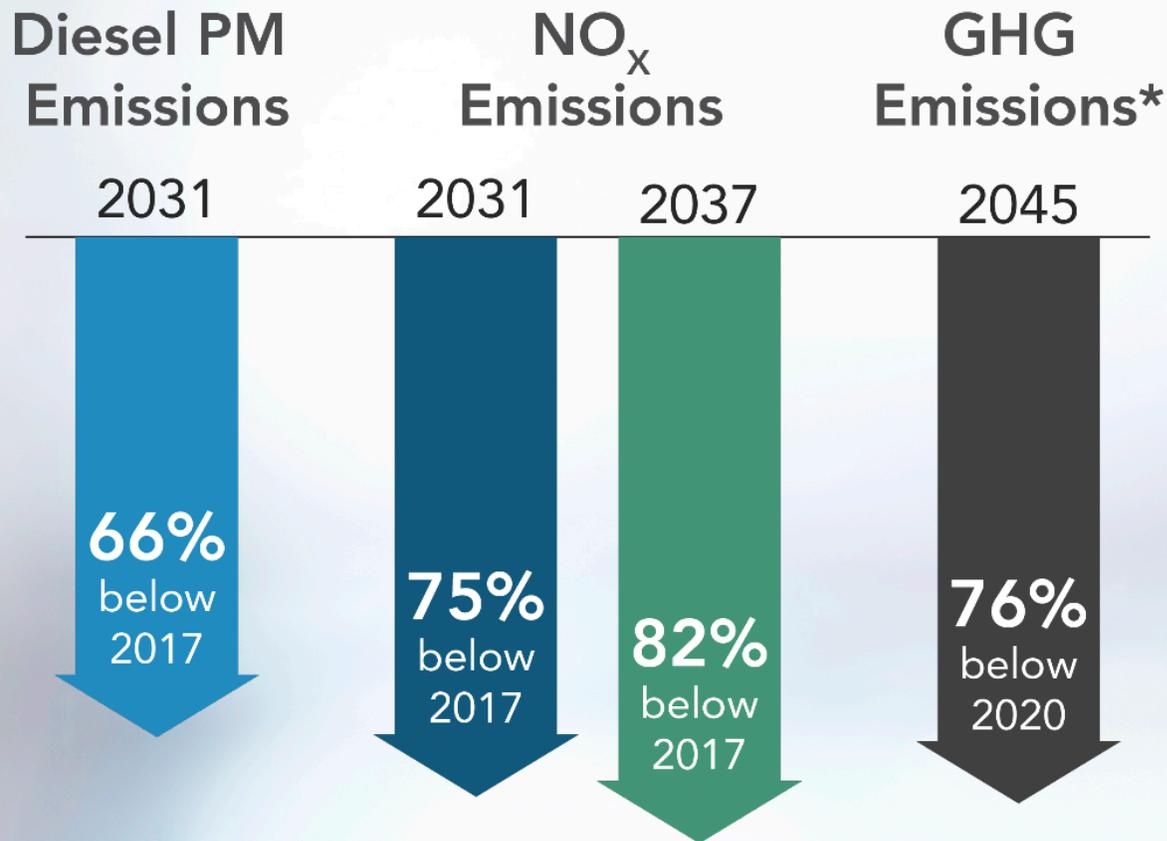
Measures	Adoption	Implementation	South Coast 2023	San Joaquin Valley 2024	South Coast 2031
Advanced Clean Cars II	2022	2026	0	0	3.2
ACT and HD Omnibus	2020	2024	<0.1	<0.1	7
U.S. EPA Clean Trucks Plan	2021	~2027	0	0	4
Ocean Going Vessels At Berth	2020	2024	1.1	<0.1	3.6
Small Off-Road Engines	2021	2024	0	<0.1	2.8
Transport Refrigeration Unit	2021	2024	0	<0.1	0.4
Zero-Emission Forklift	2022	2025	0	0	3.7
Heavy-Duty I/M*	2021	2023	3.5	11	18
Zero-Emission Drayage and Advanced Clean Fleet*	2021	2023	0	<0.1	6-10
Commercial Harbor Craft*	2021	2023	0.8	<0.1	2.5
In-Use Locomotive*	2022	2024	0	0.55	7
Cargo Handling Equipment*	TBD	TBD	0.1	<0.1	0.9
Construction & Mining*	TBD	TBD	<0.1	<0.1	3.4
TOTAL			5.5	11.55	63-67

Mobile Source Emissions

Statewide
2017



Potential Statewide Benefits Under 2020 Mobile Source Strategy Scenarios



85 percent
of passenger cars
ZEV & PHEV in 2045



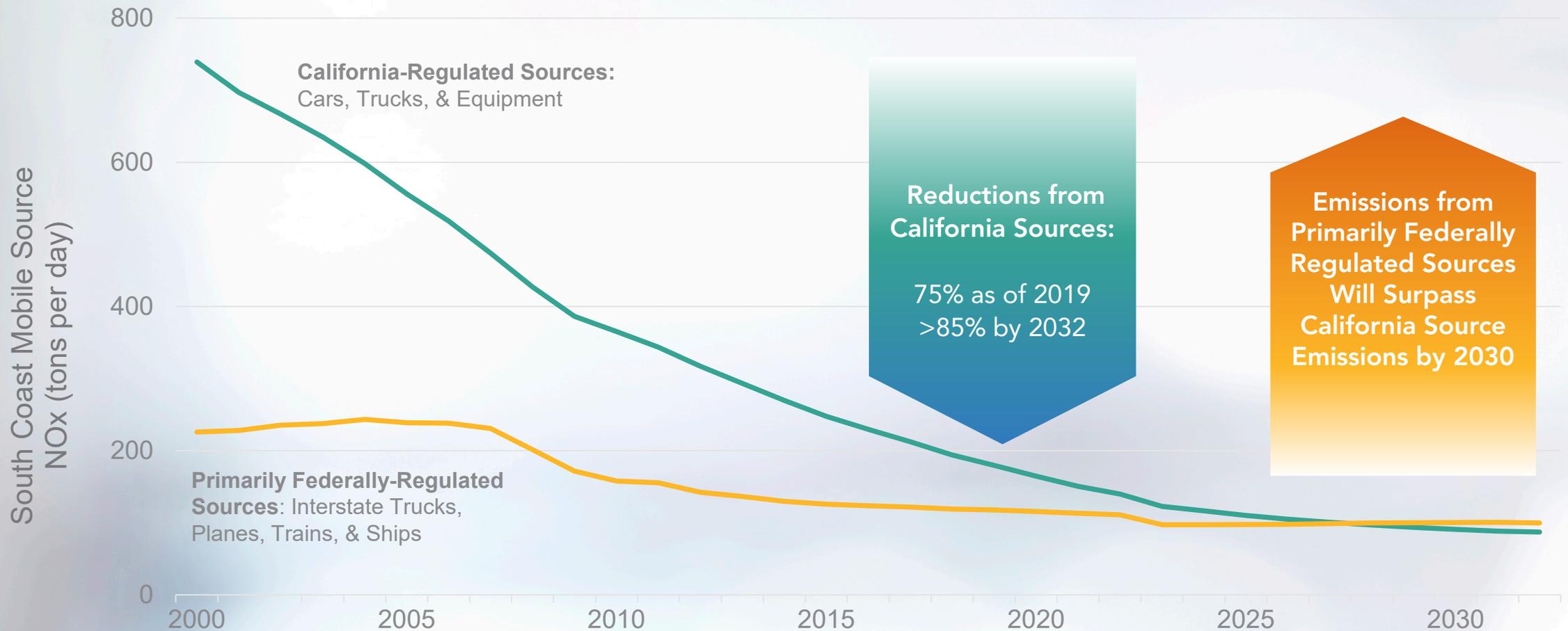
77 percent
of heavy-duty fleet
ZEVs in 2045

Important to Prioritize Benefits in Low-Income and Disadvantaged Communities



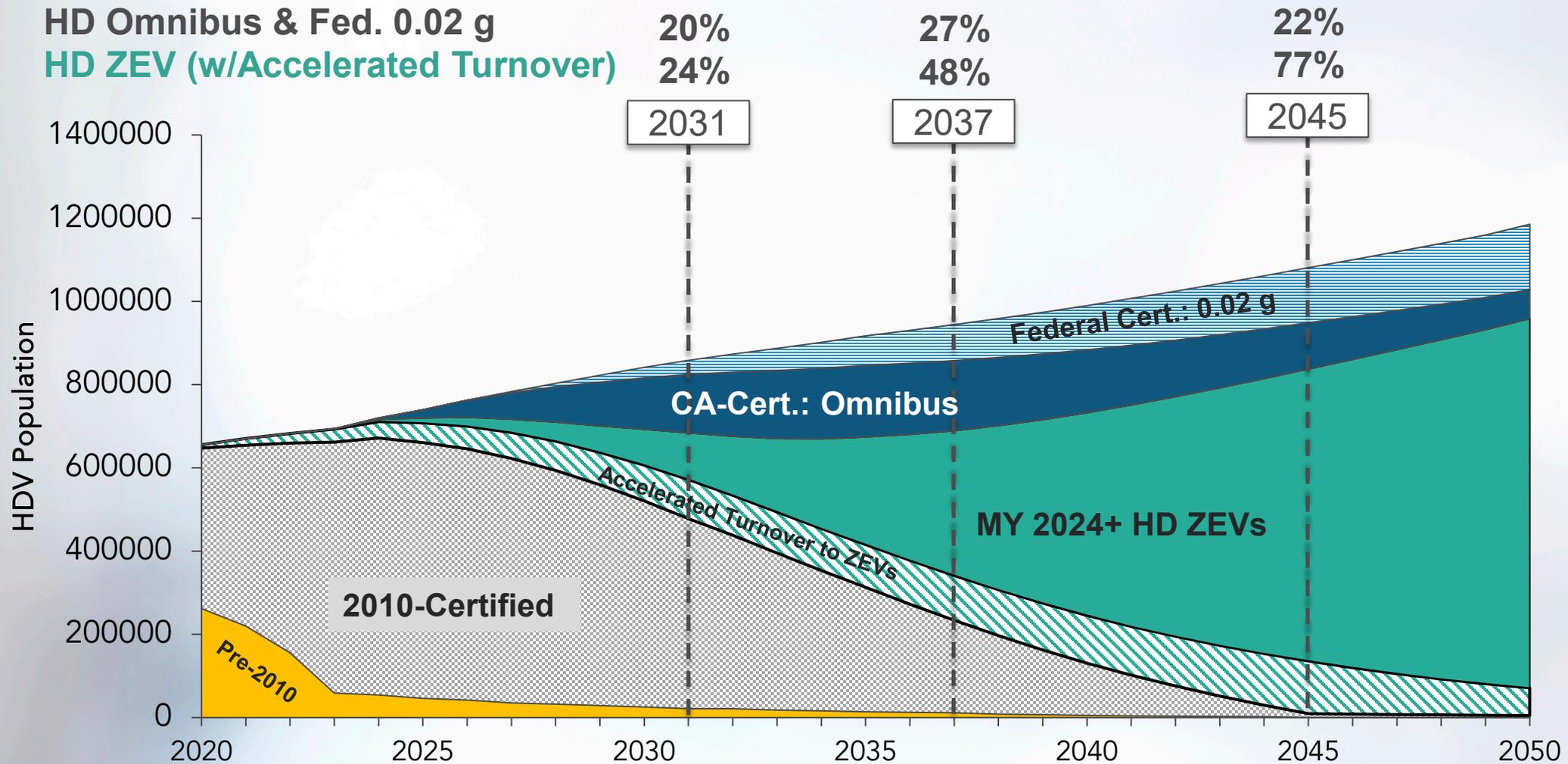
- MSS seeks rapid transition to zero-emission technology in and near low-income and disadvantaged communities
- MSS reductions will highly benefit near-source communities
- Complements AB 617 strategies & consistent with CARB's equity goals

Controlling Federal Sources is Critical to Achieving our Clean Air and Climate Targets

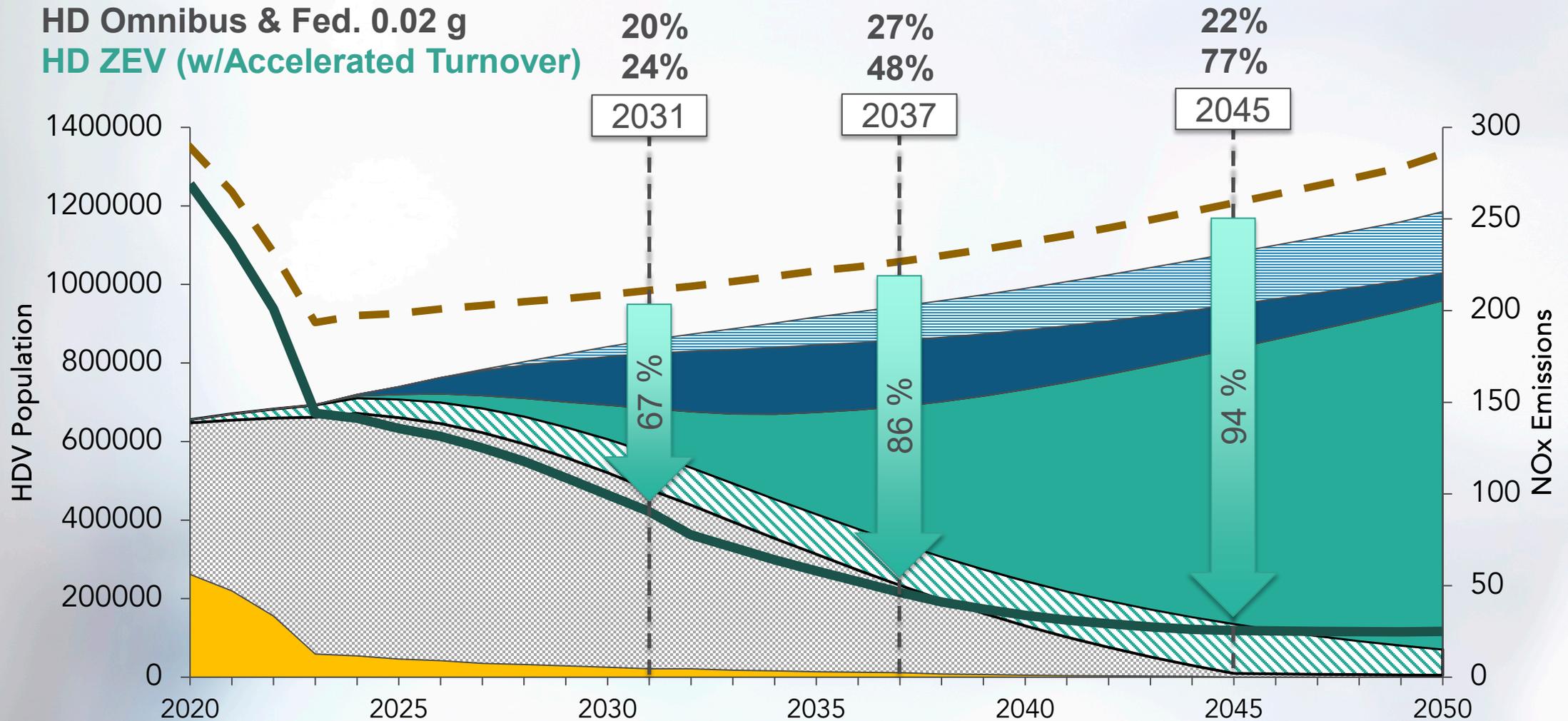


Source: CARB, CEPAM 2016 SIP - Standard Emission Tool (v1.05), <https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php>

On-Road Heavy-Duty Scenario



On-Road Heavy-Duty Scenario



Technology Scenario Mixes in a Nutshell



Passenger Vehicles: 100% ZEV and PHEV sales in 2035, along with ~25% reduction in statewide VMT per capita by 2035 relative to 2005



Heavy Duty Vehicles: 100% CA fleet purchases being ZEV starting in 2035 combined with cleaner combustion (Omnibus, HD I/M, EPA CTP) in near term



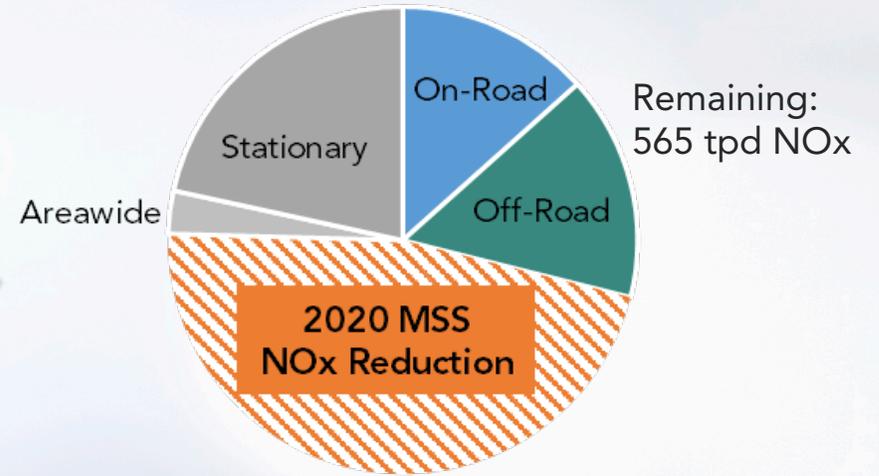
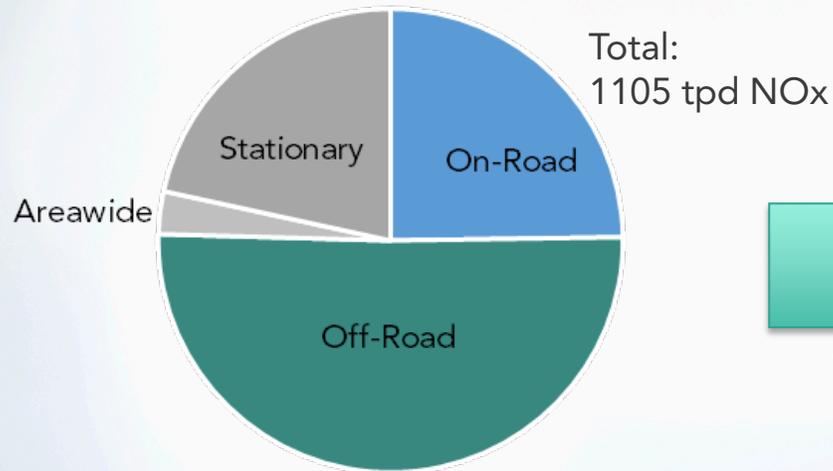
Smaller Off-Road (e.g., forklifts, TRU, SORE): Full transition to zero-emission by 2035 for most off-road sectors with smaller engines.



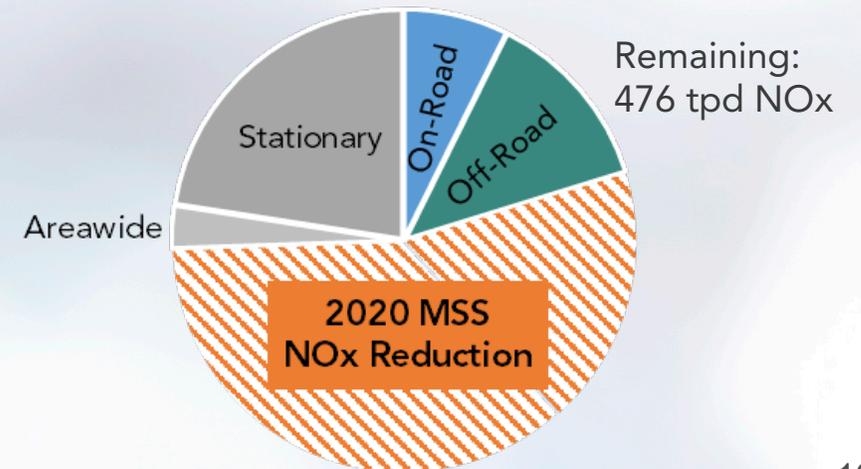
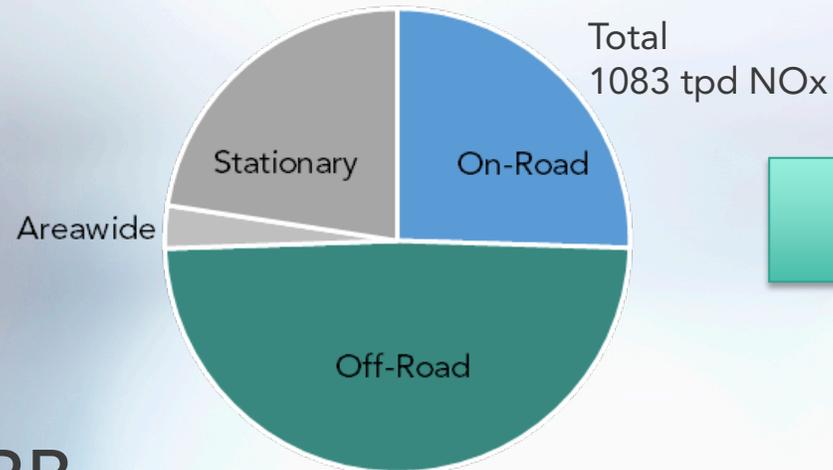
Heavier Off-Road (e.g., marine, construction, locomotive): Zero-emission wherever feasible, and cleaner combustion engines along with low-carbon fuels in hard-to-electrify sectors

2020 MSS Estimated NOx Reductions

2031



2037



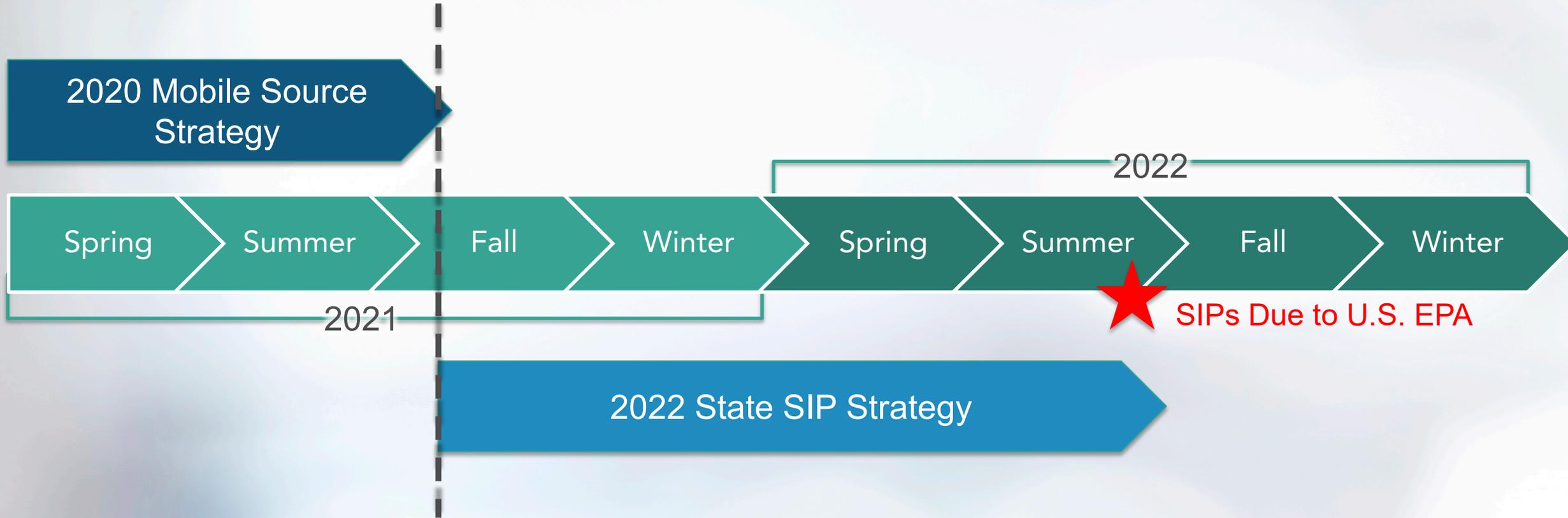
Potential Health Benefits

CARB health analysis of the MSS estimates potential annual Statewide benefits from PM2.5 reductions:

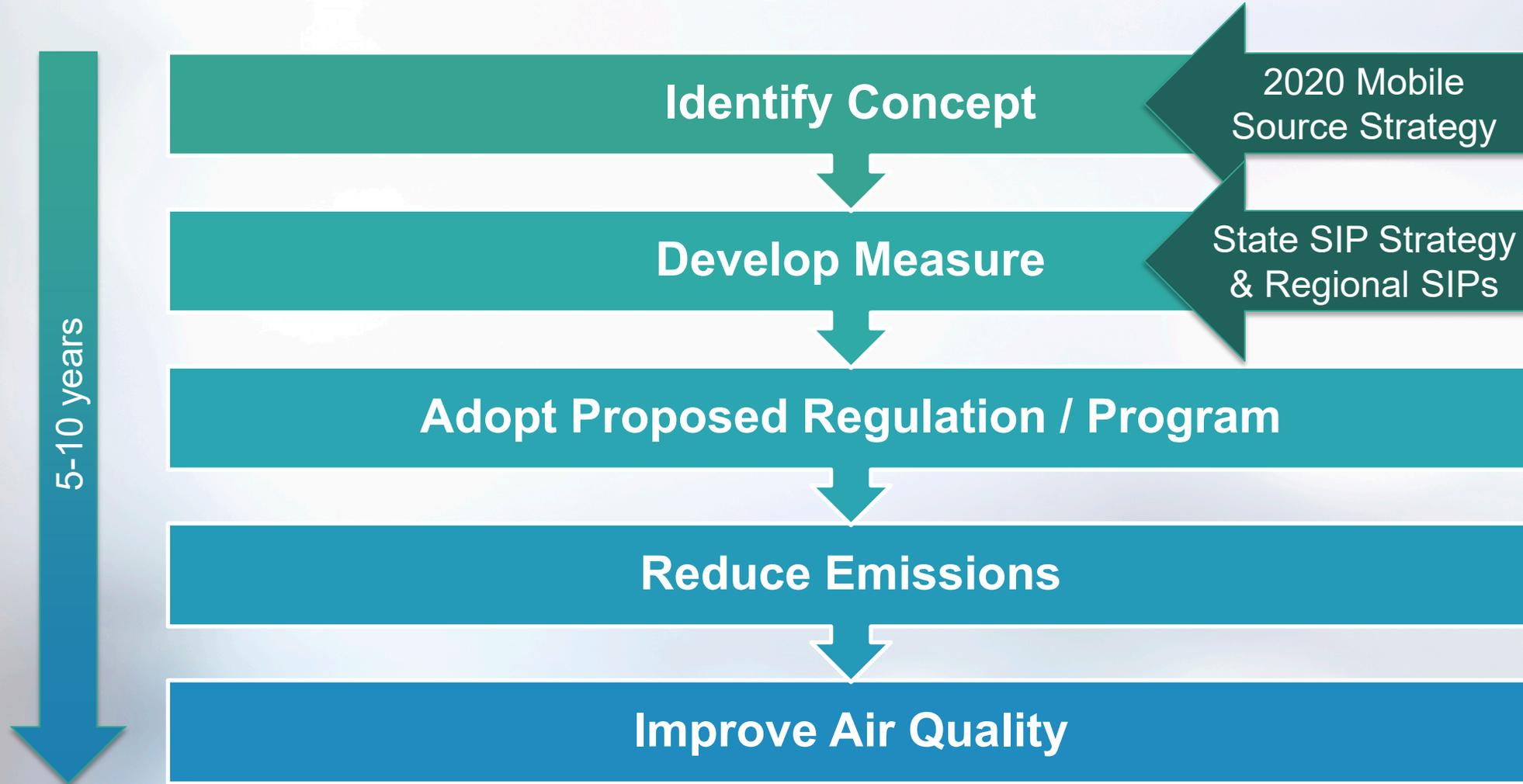
- 3,700 – 4,100 fewer premature deaths*
- 1,700 fewer emergency room visits* (respiratory)
- 725 fewer hospital admissions* (respiratory and cardiovascular admissions)
- Reduced cancer risk from diesel particulates



Pivoting to State SIP Strategy



From Concept to Cleaner Air



Board is Taking Action

2020

Heavy-Duty Omnibus Regulation

Advanced Clean Trucks Regulation

OGV At Berth Regulation

2021 and 2022

Advanced Clean Cars II

Heavy-Duty Inspection and Maintenance Program

Small Off-Road Engines

Zero-Emission TRU (Part I)

Zero-Emission Forklifts

Consumer Products

Ongoing

Incentivized Turnover of Vehicles & Equipment



Potential New State SIP Strategy Measures

On-Road

Advanced Clean Fleets Regulation

GHG Standards for MD/HD Vehicles, Phase 3

On-Road Motorcycles New Emissions Standards

Clean Miles Standard

Off-Road

Tier 5 Off-Road Engine Standard

Amendments to In-Use Diesel-Fueled Fleets Regulation

Zero-Emission TRU (Part II)

Commercial Harbor Craft Amendments

Cargo Handling Equipment Amendments

Off-Road Zero-Emission Targeted Manufacturer Rule

Clean Off-Road Fleet Recognition Program

CORE – Construction

Spark-Ignition Marine Engine Standards

Primarily Federally-Regulated

In-Use Locomotive Regulation

Future Measures for Aviation Emissions Reductions

Future Measures for OGV Emissions Reductions

Other

Consumer Products

Zero-Emission Standard for Space and Water Heaters

Public Measure Suggestions

On-Road Mobile Source Strategies

On-Road Heavy-Duty Useful Life Strategy

Additional Incentive Programs – Zero-Emission Trucks

Enhanced Transportation Choices

Enhanced BAR Consumer Assistance Program

Stationary/Area Source Strategies

Suggested Control Measure – Indirect Source Rule

BACT/BARCT Determinations

Additional Building and Appliance Emission Standards

Pesticide Regulation

Federal Actions Needed

On-Road Heavy-Duty	Low-NOx truck standard (Petition Sent)
	ZE requirements
Locomotives	Tier 5 Standard for remanufactured locos (Petition Sent)
	ZE standards for switchers
Off-Road Equipment	Tier V standard for preempted engines
	ZE standards where feasible
Ocean-Going Vessels	More stringent NOx & PM standards
	Clean fuel/vessel requirements
Aviation	More stringent engine standards
	Clean visit/fuel & ZE on-ground operation requirements

Workshop Feedback on Potential New SIP Measures

Districts

- Support potential CARB actions on primarily-federally regulated sources, especially vessel speed reduction
- Support call for immediate federal actions

Public Advocates

- Support potential new measures and inclusion of CERP actions, especially heavy-duty useful life strategy and SCM for ISR
- Request accelerated action & additional LDV fleet measures

Industry

- Concerned with ability of ZEV-driving measures to provide near-term reductions
- Support potential zero-emission appliance standards

SIP Contingency Measure also Needed

- September Board discussion on development of contingency measures
- Clean Air Act and relevant court decisions make clear that contingency measures must:
 - Be already adopted with triggering provisions, and
 - Themselves provide for all reductions needed for contingency



CARB and District Collaboration



Moving Forward: 2022 State SIP Strategy

1 st Public Workshop	July 2021
Release of Draft Measures & 2 nd Public Workshop	October 2021
Release of Draft 2022 State SIP Strategy	Winter 2022
Informational Update to the Board	Early Spring 2022
3 rd Public Workshop	Spring 2022
Release of Proposed 2022 State SIP Strategy	Early Summer 2022
Board Consideration of 2022 SSS and District SIPs	Summer 2022
70 ppb Ozone SIPs Due to U.S. EPA	August 3 rd , 2022

Next Steps



Transmit the 2020 Mobile Source Strategy to the Legislature



Further develop MSS concepts into 2022 State SIP Strategy measure proposals



Continue to work with the Districts on SIPs and define attainment needs



Begin public process on Contingency Measures



Board update on the 2022 State SIP Strategy (Q1 2022)

Thank you