

Sustainable Transportation: Progress, Challenges, and Opportunities

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Sustainable Transportation Defined

- Clean transportation technology
- Reduction in vehicle travel (VMT), via expansion of mobility options

to achieve

- Improved health, mobility, economic opportunity, and quality of life
- Environmental stewardship

















Outline for Today's Talk

- Where do we need & want to go to achieve Sustainable Transportation?
- What tools (policies, programs, and regulations) are we using to get there?
- What challenges are we encountering now, and what are we doing to address them?
- What emerging challenges do we see on the horizon, and what does CARB have planned to address them?



Where do we need and want to go to achieve Sustainable Transportation?



California's Climate & Air Quality Goals



CARB

2030 Transportation Sector Targets

Clean transportation technology

- 5 million ZEVs & PHEVs
- 100% of new buses = ZEVs
- Transition freight to zero-emission everywhere feasible

Reduce per capita VMT 25% from 2005 levels (by 2035) - 1.6 miles/person/day Zero Emissions Vehicle & Plug-In Hybrid Electric Vehicle Cumulative Sales & Targets





Addressing Emissions Targets Requires Aggressive Strategies in Many Areas



Reduce Vehicle Emissions Rate Reduce Vehicle Miles Traveled Change Travel Mode Mix



Transportation Sector: Key Strategies



High density transitoriented housing

Walkable and bikeable communities

Cleaner fuels and vehicles

Clean and efficient freight system



Achieving Sustainable Transportation



Reducing Pollution in Burdened Communities







Efforts to Date

Increasing Access to Clean Mobility Options





Funding & Better Planning for Active Transportation & Transit





What tools* are we using to achieve Sustainable Transportation?

*policies, programs, and regulations



CARB Programs Working toward Sustainable Transportation



Cleaner Cars for Cleaner Air & Advanced Clean Cars



Low Carbon Fuel Standard Sustainable Communities & Climate Protection Program (SB 375)



Community Air Protection Program (AB 617)



Climate Change Investments (Greenhouse Gas Reduction Fund)



Heavy-Duty Vehicle Regulations



Long-Awaited Transportation Renaissance is Happening





Anticipated Cost Declines for EV Technology



What challenges are we encountering now and what are we doing to address them?



Californians Continue to Drive Alone as Primary Commute Option



2018 Progress Report: "California is not on track to meet the GHG reductions expected under SB 375..."





Why is this happening, and what can we do?

- Why?
 - Current laws & incentives
 - Politics
 - Competing mandates
 - Etc.
- What to do?
 - Systemic changes are necessary





Course Correction on SB 375 Implementation

2018 Progress Report Key Recommendation:

• Form interagency body for a plan of action

Plus "Opportunity Areas":

- Improve targeting of transportation, housing, and climate incentives
- Prioritize affordable housing near jobs
- Pilot test innovation
- Fiscally-sustainable, equitable transportation funding and policy
- Open data for planning and monitoring



Feds Propose to Revise Vehicle Standards





CARB's Response: Revoke "Deemed to Comply"



ARB

Board action ensures federal rollback on fuel efficiency and emission standards won't impact California vehicles

What emerging challenges are on the horizon? What does CARB have planned to address them?



Emerging Challenges & Opportunities

- Net effect of automated vehicles and shared mobility services
- Achieving sustainable freight
- Lack of affordable housing and implications for VMT
- Carbon neutrality by 2045
- Federal and state interactions



Unknowns about the Automated Vehicle Future

consumption

energy

Decrease

- Large uncertainties even when considering just one possible outcome variable: energy consumption
- What might the implications be for GHGs, equity, etc.?

- Ease of travel Travel cost reduction
- Higher highway speeds

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creat

- **Increased** features
- New user groups
- Mode switch

Vehicle/powertrain resizing Platooning Vehicle right-sizing **Eco-driving De-emphasized** performance Improved crash avoidance Changed mobility services **Congestion mitigation**



Automated Vehicle Principles for Healthy and Sustainable Communities*

State's Efforts to Nudge AVs Toward Sustainable Transportation Goals

- 1. Shared use
- 2. Pooled
- 3. Low-emissions
- 4. Right-sized

- 4. Part of an efficient multimodal system
- 5. Efficient land use
- 6. Complete and livable streets
- 7. Transportation equity

Now posted at OPR's <u>Automated Vehicles website</u>:



New Requirements for Fleets

Governor's Executive Order to begin fleet regulation

- Light-duty and heavy-duty
- Likely select fleets initially

SB 1014 (Skinner)

- Ride hailing fleets
- Include automated fleet vehicles
- New mechanisms to address VMT
- Encourage ZEVs









Freight Actions Milestones



Lack of Affordable Housing Means Living Farther from Work

Percent of Total Homes Needed that have Received Permits, by Income Level

Southern California Association of Governments



"The supply of housing in many regions is a small fraction of the need, particularly homes affordable to low-income communities, which is contributing to lengthening commutes."

> CARB's 2018 Progress Report



Data excludes jurisdictions without complete reports.

Accelerate Vehicle Electrification for Carbon Neutrality

- Vehicle costs declining, but need new actions to spur rapid demand growth for Electric Vehicles (EVs)
- Need to accelerate EV/hydrogen fuel infrastructure growth
- Need strategic plans for vehicle-grid integration in communities





Early Next Steps

- CARB's new Sustainable Transportation & Communities Division
- CARB is developing permanent relationships with other agencies, like California Transportation Commission





Thank you!



Backup / additional slides



Transportation Sector Goals

On-Road California GHG Emission Trends (under current programs) and GHG Targets Zero Emissions Vehicle & Plug-In Hybrid Electric Vehicle Cumulative Sales & Targets





ZEV Sales are Gaining Momentum & Market Share

Annual California ZEV and PHEV Sales (through August 2018)



Source: Auto Alliance Sales Dashboard



HDV Proposed Electric Drive Programs

- Innovative Clean Transit (Sept 2018)
 - Transit fleet transition to zero-emission by 2040
- Zero-Emission Airport Shuttle (Feb 2019)
 - Public and private fixed-route airport shuttles
 - All zero-emission by 2035
- Zero-Emission Powertrain Certification (Feb 2019)
 - Ensure greater transparency and in-use support for HD electric and fuel-cell vehicles and the powertrains they use
- Advanced Clean Trucks (Late-2019)
 - Manufacturer sales requirement
 - Portion of California sales as zero-emission
 - Start with model year 2024 (Class 2B+)







HDV Proposed electric drive programs (cont.)

- Zero-Emission Airport Shuttle Bus (Dec 2018)
 - Public and private fixed-route airport shuttle buses
 - All zero-emission by 2036
- Zero-Emission Powertrain Certification (Dec 2018)
 - Ensure reliability and performance for ZE trucks and buses
- Zero-Emission Drayage Truck Rule (2022)
 - Implementation 2026+







Carbon Pricing & Investments





Taking Action in Communities Most Impacted by Air Pollution



10 initial communities were selected to serve as statewide models

