Challenges: Air quality and climate change impacts from transportation

**California GHG Emissions (2017)**
- High GWP 5%
- Recycling and Waste 3%
- All Other Transportation 7%
- Industrial 21%
- Electric Power 16%
- Light-Duty Vehicles 29%
- Residential & Commercial 10%
- Agriculture 9%

**South Coast Air Basin NOx Emissions (2017)**
- Heavy-Duty Vehicles 30%
- Light-Duty Vehicles 18%
- Stationary 13%
- Mobile Sources ~80%
- Other Mobile Sources 30%
- Areawide 4%
- Residential & Commercial 10%
- Agriculture 9%

**Mobile Sources ~50%**
California’s Key Targets

NOx, South Coast, All Sources

- 2023 South Coast Target
- 2031 South Coast Target

Adopted Programs*

GHGs, Statewide, All Sources

- 1990 Level
- SB 32 40% Reduction
- 80% Reduction
- Carbon Neutrality

*Adopted through 2017
What Will It Take?

Statewide On Road Population

- Millions

- Gasoline Vehicles
- PHEV
- ZEV

ICE
PHEV
ZEV
ZEV+PHEV Sales Fraction

Annual ZEV and PHEV Sales %

2018
2022
2026
2030
2034
2038
2042
2046
2050

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
California Light-Duty ZEV Market Growing

California New ZEV and PHEV Sales


BEV PHEV FCEV

Market Share

Sources: Auto Alliance Sales Dashboard, InsideEVs, and CA Auto Outlook
Light-Duty ZEV Model Availability Expanding

<table>
<thead>
<tr>
<th>EPA Class Size</th>
<th>Minicompact</th>
<th>Subcompact</th>
<th>Compact</th>
<th>Mid-Size</th>
<th>Large</th>
<th>Small Wagon</th>
<th>Small SUV</th>
<th>Standard SUV</th>
<th>Mini-van</th>
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</thead>
<tbody>
<tr>
<td>Number of Available Models</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>14</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>1</td>
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</table>
Medium- and Heavy-Duty ZEV Model Availability Expanding

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Number of Available Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo van</td>
<td>5</td>
</tr>
<tr>
<td>HD truck</td>
<td>18</td>
</tr>
<tr>
<td>MD step van</td>
<td>9</td>
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<tr>
<td>MD truck</td>
<td>12</td>
</tr>
<tr>
<td>Refuse truck</td>
<td>6</td>
</tr>
<tr>
<td>School bus</td>
<td>12</td>
</tr>
<tr>
<td>Shuttle bus</td>
<td>14</td>
</tr>
<tr>
<td>Transit Bus</td>
<td>36</td>
</tr>
<tr>
<td>Yard tractor</td>
<td>4</td>
</tr>
</tbody>
</table>

- **FCEV**
- **BEV**
6 Million Light-Duty ZEVs Globally

Additional Heavy Duty ZEVs:
- 500,000 Electric Buses
- 100,000 Heavy Trucks

Source: ICCT and EV-Volumes
Regulations
Help ensure ZEVs are produced and that fleets use them

Incentives
Help encourage consumers and fleets to purchase and test ZEVs

Supporting Programs
Help provide fueling infrastructure, education, and best practices

ZEV Programs
Light-Duty Vehicle Regulations that Impact ZEVs

• Advanced Clean Cars II (2021 board item)
  • Requirements on automakers for post 2025 MY
  • ZEV Regulation
  • GHG Regulation
  • Criteria Regulation

• Clean Miles Standard (2020 board item)
  • Requirements on ride hailing passenger vehicle services
  • Minimum required electric VMT to be included
Innovative Clean Transit

- Advanced Clean Trucks
- ZE HD Certification
- Innovative Clean Transit

ZE Airport Shutte ✓
ZE HD Certification ✓
Advanced Clean Trucks ✓
ZE Airport Ground Support Equipment ✓
ZE Truck/Trailer Refrigeration Units ✓
ZE Forklifts ✓
ZE Truck Fleets, including drayage ✓
ZE Cargo Handling Equipment ✓

2018
2019
2020
2021
2022

On-Road
Off-Road

✓ Already considered by the Board
1) ZEV Targets that Lead to a Full Transition to ZEVs

2) Making ZEVs More Financially Feasible
   - Increased incentive funding to provide purchase incentives with a focus on priority populations
   - Pricing strategies (e.g., Feebate or road-usage program that incentivize ZEVs)

3) Ensuring Fuel Prices Support Transportation Electrification
   - Accelerate efforts to design electricity rates to support transportation electrification
ZEV Policy Areas

4) Holistically Plan and Invest in ZEV Infrastructure
   • Extend alternative fuel funding programs with a focus on zero emission infrastructure
   • Prioritize infrastructure investments within or near priority populations, and for high-mileage passenger and delivery services

5) Strengthen Role of Local Governments to Incentivize ZEVs
   • Enable local jurisdictions to implement pricing and other policies that encourage ZEVs
6) Increasing Zero Emission Miles in Fleets
   - Adopt zero emission mileage requirements in all high-mileage and new mobility fleets (e.g., delivery services, car sharing)
   - Establish ZEV and/or eVMT targets for government fleets

7) Expand ZEV Outreach and Education
   - Dedicate additional State funding for ZEV consumer and fleet outreach and education campaigns, and training for gov’t and building officials

8) Support the ZEV Transition Through Workforce Development and Training
Role of Fleets in ZEV Expansion

1) Assess current and future fleet needs
2) Understand zero emission options, infrastructure, incentives, and policies
3) Collaborate with internal and external stakeholders
4) Plan fleet and infrastructure roll-out
5) Share your ZEV fleet experiences with others
Conclusions

• The magnitude and speed of change needed to achieve California’s goals is unprecedented.

• The State has implemented many programs to promote ZEVs, but new programs and policies will be needed.

• Even under an aggressive scenario, need for significant VMT reductions and renewable fuels.