Before we get started:

- All participants are muted by default
- Questions during the workshop should be posted to the GoToWebinar Questions box
  - Questions will be seen by webinar organizer
- During the Q&A session, questions will be posted on-screen and addressed
Workshop Topics

- Quick Background
- Preliminary Electrification Targets
  - Methodology
  - Assumptions
- Evaluating Impact on Low Income Drivers
- Continued work on the Greenhouse Gas (GHG) Targets
  - Occupancy Assumptions
- Other Requirements and Considerations
  - Requirements for Small Companies
  - Data Reporting
  - Maximum Vehicle Age
- Next Steps
Background: SB 1014 Metrics and Goals

**Key goals:**
Reduce GHG, promote electrification in transportation network companies (TNCs)

**Applicable to:**
Passenger service on TNC platforms

**Align with:**
SB 350, SB 375, ZEV Action Plan
Background: SB 1014 Deadlines

Jan 2020
• CARB establishes base year inventory

Jan 2021
• CARB adopts regulation

Jan 2022
• TNCs begin submitting 2-year plans

2023
• CPUC begins program implementation
Preliminary Electrification Targets (% eVMT)

Fraction of vehicle miles traveled by battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV)
Electrification Targets - Methodology

1. Start with base year 2018 eVMT
2. What ZEV technology exists?
3. Does the technology meet the needs of a TNC driver?
4. What does Cost Model say about electrification targets?
5. Are there enough ZEVs available?
By 2023, multiple models of EVs with range 250+ miles
• 44% of MY 2019 available ZEV ranges are 250+ mi
• Example 2020 vehicle model ranges (miles):
  • Chevrolet Bolt: 259
  • Tesla Model 3: 215 - 330
  • Hyundai Kona: 258
  • Toyota Mirai: 312
• When CMS period (2023+): used and new 250+ ZEVs
Does the technology meet the needs of a TNC driver?

- 95% of the drivers travel less than 250 mi/day
- 90% of drivers travel less than 200 mi/day
- TNC drivers willing to charge 90 minutes per day (survey)
Setting the Electrification Target Based on Cost

Cost Model

Vehicle Costs
Vehicle Efficiency
Fuel Costs

Output

% eVMT Target
Check number of available ZEVs
## Selected Cost Model Input Parameters

<table>
<thead>
<tr>
<th>Input Values</th>
<th>Outcome Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental costs of ZEVs by model year (MY) and age</td>
<td>High</td>
</tr>
<tr>
<td>Vehicle efficiencies by MY and vehicle type</td>
<td>Medium</td>
</tr>
<tr>
<td>Costs projections of gasoline, Level 2 (L2) and DCFC electricity, and hydrogen</td>
<td>Medium</td>
</tr>
<tr>
<td>Maintenance and insurance cost savings projections</td>
<td>Low</td>
</tr>
<tr>
<td>ZEV incentive amount, L2 charger installation costs</td>
<td>High/Low</td>
</tr>
</tbody>
</table>
Example of Passenger Car: Cost Projections for Battery-Electric

- Does not include Federal vehicle incentives
- ~80% of 2018 TNC VMT is from passenger cars

Source: CARB, ICCT: Update on EV Costs in US through 2030
Simulating the BAU TNC Fleet

• TNC growth assumptions for each calendar year (CY)
• Future TNC fleet simulations
  • Sampled from 2018 fleet with replacement
  • Vehicles inherit same age, VMT, and fuel type
  • Adjust future vehicle efficiency with LEVIII standards

<table>
<thead>
<tr>
<th>Example</th>
<th>In 2018</th>
<th>In 2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Year</td>
<td>2017</td>
<td>2022</td>
</tr>
<tr>
<td>Vehicle Age</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Vehicle Type</td>
<td>Passenger car</td>
<td>Passenger car</td>
</tr>
<tr>
<td>Efficiency</td>
<td>31 mpg</td>
<td>40 mpg</td>
</tr>
<tr>
<td>Technology</td>
<td>ICE</td>
<td>ICE</td>
</tr>
<tr>
<td>VMT per year</td>
<td>6,000 mi</td>
<td>6,000 mi</td>
</tr>
</tbody>
</table>
Cost Modeling of “BEV Switchers”

- One year of amortized costs for:
  - Incremental capital cost price of a similar BEV
  - Home charger costs
- One year of cost savings for fuel & maintenance
- Two strategies modeled with one-year amortized net costs:
  - Strategy 1: Individual driver breaks even
  - Strategy 2: Drivers save additional money before switching
    - Savings scale $35/wk in early years to $10/wk in later years
- Cost Model switches drivers with lowest net costs
First BEV Switcher Characteristics

Those who switch to BEV first are combination of:

- High Annual VMT
- Poor Fuel Economy
- Old Vehicles

Example: 2025

Solid Line: ICE  Dashed Line: BEV
Preliminary Electrification Targets

- **Strategy 1:** Individual Driver Breaks Even
- **Strategy 2:** Individual Driver Breaks Even but also Earns Extra $35/week
Preliminary Electrification Targets

- **Strategy 1:** Individual Driver Breaks Even
- **Strategy 2:** Individual Driver Breaks Even but also Earns Extra $35/week

---

**Graph:**
- Percent of TNC Fleet that must be ZEV
- Strategy 1: Cost Model
- Strategy 2: Cost Model
- Strategy 1: Preliminary Target
- Strategy 2: Preliminary Target
Are There Enough ZEVs in the CA Fleet?

- Number of ZEVs available from the ZEV Regulation
  - Based on EMFAC 2017
  - No PHEVs

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of ZEVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>37%</td>
</tr>
<tr>
<td>2024</td>
<td>62%</td>
</tr>
<tr>
<td>2025</td>
<td>100%</td>
</tr>
</tbody>
</table>

Graph showing projected number of ZEVs from 2023 to 2030:
- EMFAC 2017
- Strategy 1: Prelim. Target
- Strategy 2: Prelim. Target

By 2030, according to Strategy 2, 100% of the fleet will consist of ZEVs.
Alternative Scenario:

100% Electrification by 2030

Considerations:

- Driver socioeconomic status
- Home charging access
- High average driver turnover
- ZEV availability in CA
Evaluating Impact to Lower Income Drivers

Seeking driver socioeconomic status
  • Currently using driver registration ZIP code as a surrogate

Setting eVMT target with conservative cost assumptions

Evaluating incentive programs available for purchasing fuel efficient vehicles and BEVs
  • Are there programs that already apply to drivers now?
Evaluating Impact to Lower Income Drivers

<table>
<thead>
<tr>
<th>Percentage of drivers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SB 535</td>
<td>29%</td>
</tr>
<tr>
<td>Disadvantaged</td>
<td></td>
</tr>
<tr>
<td>Communities</td>
<td></td>
</tr>
<tr>
<td>AB 1550 Low-income</td>
<td>53%</td>
</tr>
<tr>
<td>Communities</td>
<td></td>
</tr>
<tr>
<td>SB 535 or AB 1550</td>
<td>56%</td>
</tr>
</tbody>
</table>
Incentives Available to Drivers

• Clean Vehicle Rebate Program (New Vehicle Purchase)
  • All TNC drivers eligible (rental companies have a cap)
• Clean Vehicle Assistance Program (New/Used Financing)
  • Statewide and Regional Programs
• Clean Cars for All (New/Used)
  • 4 Air Districts (Sacramento, Bay Area, San Joaquin Valley, South Coast)
• Regional and local incentives by air districts and utilities
• One-Stop-Shop (OSS) Program Outreach
Greenhouse Gas Target Metric

\[
\frac{g \ CO_2}{PMT} = \frac{\text{Total VMT}_{Period\ 1,2,3}}{\text{Total VMT}_{Period\ 3}} \times \text{CO}_2 \text{ per mile} \times \text{Occupancy}
\]
Setting the GHG Target

Fuel Efficient Vehicles (in progress)
- Evaluating TNC drivers switching to hybrids

Occupancy (Period 3)
- Proposing to provide default occupancy values for compliance
- Still evaluating pooling in setting target (in progress)

Deadheading (Periods 1 + 2)
- Staff is proposing not to include deadheading in setting the target but it can be used for compliance
Fuel Consumption Values for Compliance

Proposing to use “look up table” for fuel consumption based on vehicle category, model year and fuel type

<table>
<thead>
<tr>
<th>Model Year</th>
<th>PC/LDT</th>
<th>Gasoline (gCO2/mi)</th>
<th>Diesel (gCO2/mi)</th>
<th>Hybrid (gCO2/mi)</th>
<th>Plug-in Hybrid (gCO2/mi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values based on VMT-weighted 2018 TNC base year fleet and projecting to 2030.
Occupancy Values for Compliance

For gCO$_2$/PMT equation, proposing to use trip-weighted occupancy. Example structure shown here:

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-pooled</td>
<td>1.5</td>
</tr>
<tr>
<td>Pool Unmatched</td>
<td>1.5</td>
</tr>
<tr>
<td>Pool Matched</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Considering a credit to build early pool demand
GHG Results Based on Preliminary Electrification Targets Presented Today

![Graph showing GHG emissions trends over years with BAU, Strategy 1, and Strategy 2 lines. The graph displays gCO2/PMT emissions for years 2023 to 2030 with specific values for each strategy at different years.]

- BAU: 206.4 in 2030
- Strategy 1: 68.6 in 2030
- Strategy 2: 38.4 in 2030
Other Requirements Being Considered
Small TNCs

0.14% of Uber + Lyft

Small TNC total: 5.9 million miles
Highest Small TNC: 2.9 million miles
Uber + Lyft: 4.2 billion miles

Annual VMT threshold for exemption: 5 million miles per TNC
Small TNC Requirements

TNCs with less than 5 million annual VMT are exempt from:

- GHG and eVMT targets
- 2-year plan submittal
- Annual compliance report

Small TNCs are not exempt from:

- Continued annual data-reporting requirements

As small TNCs grow, full requirements would take effect beginning the first calendar year exceeding 5 million VMT (with some flexibility)
Data Reporting Requirements

Additional Required Fields

• Vehicle Make / Model / Model Year
• Passenger Car vs. Light Truck
• Fuel/Technology Type (gasoline, diesel, hybrid, plug-in hybrid, battery electric, fuel cell)
• Pool-matched Y/N
• Occupancy
Maximum Vehicle Age Requirement

Statewide maximum vehicle age limit of 10 or 15 years?

- TNCs already limit vehicle age to 15 years in California
- Makes vehicle age enforceable
- Prevent backsliding

2018 TNC vehicle age:
- 5 years or younger: 70%
- 10 years or younger: 90%
- 15 years or younger: 99%
Process

2Q 2020
- Public workshops
- Complete analyses & decisions

3Q 2020
- July – Public Workshop
- August – SRIA

4Q 2020
- Finalize regulatory proposal
- Board hearing
Request for Alternatives

Pursuant to SB 617[1] and the California Environmental Quality Act (CEQA)[2], CARB welcomes public input on alternatives to the proposed regulation targets discussed in this workshop.

In particular, CARB encourages public input on alternative Clean Miles Standard approaches that:

• May yield the same or greater benefits than those associated with the proposed regulation targets, or
• May achieve the goals at lower cost.

See also the Department of Finance’s implementing regulations Cal. Code Regs., tit. 1, § 2000-2004
Request for Alternatives

Please ensure that your submission discusses the alternative’s ability to fulfill the purposes of the regulation structure and targets as ARB has presented it.

• To submit an economic alternative for ARB to consider for analysis in its SRIA
  • Please submit proposed GHG/PMT and eVMT targets used each year as the alternative, as well as the associated cost/benefit information and their sources, to enable comparison of economic impacts. Please also submit a clear description of the basis for any cost calculations.

• To submit an environmental alternative for ARB to consider for analysis under CEQA
  • Please state the potentially significant adverse environmental impact(s) your alternative is seeking to address, and discuss how your proposed alternative would avoid or substantially lessen that impact while meeting most of the draft staff proposal’s basic purposes.
Requesting Stakeholder Feedback

Please submit comments and/or an economic alternative by **June 15, 2020** to cleancars@arb.ca.gov.
THANK YOU

cleancars@arb.ca.gov