LADWP Electric Transportation Program

Supporting Transit Agency Electrification
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Electric Transportation Program Manager

www.ladwp.com
LADWP’s Strategic Goal:
Facilitate Adoption of Electric Transportation in Los Angeles and Southern California

Zero-Emissions Vehicle Adoption:
• 145,000 EVs by 2022
• 25% ZEVs by 2025, 80% by 2035, 100% by 2050

Publically Available Chargers:
• 10,000 by 2022 (4,000 at City & LADWP property)
• 28,000 by 2028

Electrification of Busses and City Fleets:
• 100% of LADOT and MTA busses by 2030
• 100% of City Fleets by 2028 (where technically feasible)
Automaker Efforts

- 41 PEV models available in 2019
- 132 EV models projected by 2022
- Automaker investments likely to reach $100B by 2025
- Electrified model commitments announced by:

  - Tesla
  - KIA
  - Toyota
  - Jaguar
  - Rivian
  - TESLA
  - Ford
  - Toyota
  - VOLVO
  - BMW
  - GM
  - Mitsubishi
  - Mercedes-Benz

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EV Momentum

Source: EPRI’s 2019 EV Consumer Guide
Vehicle Classes

**Light-duty Vehicles**

- **Class One: 6,000 lbs. or less**
  - Full Size Pickup
  - Mini Pickup
  - Minivan
  - SUV
  - Utility Van

- **Class Two: 6,001 to 10,000 lbs.**
  - Crew Size Pickup
  - Full Size Pickup
  - Mini Bus
  - Minivan
  - Step Van
  - Utility Van

**Medium-duty Vehicles**

- **Class Three: 10,001 to 14,000 lbs.**
  - City Delivery
  - Mini Bus
  - Walk In

- **Class Four: 14,001 to 16,000 lbs.**
  - City Delivery
  - Conventional Van
  - Landscape Utility
  - Large Walk In

- **Class Five: 16,001 to 19,500 lbs.**
  - Bucket
  - City Delivery
  - Large Walk In

- **Class Six: 19,501 to 26,000 lbs.**
  - Beverage
  - Rack
  - School Bus
  - Single Axle Van
  - Stake Body

**Heavy-duty Vehicles**

- **Class Six: 19,501 to 26,000 lbs.**
  - Beverage
  - Rack
  - School Bus
  - Single Axle Van
  - Stake Body

- **Class Seven: 26,001 to 33,000 lbs.**
  - City Transit Bus
  - Furniture
  - High Profile Semi
  - Home Fuel
  - Medium Semi Tractor
  - Refuse
  - Tow

- **Class Eight: 33,001 lbs. & over**
  - Cement Mixer
  - Dump
  - Fire Truck
  - Fuel
  - Heavy Semi Tractor
  - Refrigerated Van
  - Semi Sleeper
  - Tour Bus
Impact on Power Systems

**Focus on Home Charging**

**Focus on Work Charging**

*Graphs courtesy of NREL*
## Bus Charging Infrastructure

<table>
<thead>
<tr>
<th></th>
<th>Plug-in</th>
<th>Overhead</th>
<th>Wireless</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activation</strong></td>
<td>Manual</td>
<td>Automated</td>
<td>Automated</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Conductive</td>
<td>Conductive</td>
<td>Wireless</td>
</tr>
<tr>
<td><strong>Power Range</strong></td>
<td>Up to 350 kW</td>
<td>Typically 350-500 kW</td>
<td>Up to 250 kW</td>
</tr>
<tr>
<td><strong>Voltage Type</strong></td>
<td>AC, DC, and AC + DC</td>
<td>DC</td>
<td>AC</td>
</tr>
</tbody>
</table>
Supporting Transit Bus Electrification

LADWP is in the process of establishing a strategy to support transit agency fleet electrification goals. These efforts include:

- Planning initiative to perform a system-level forecast to meet the need for distribution system infrastructure upgrades to serve medium- and heavy-duty charging loads.
- Support through the medium- and heavy-duty charging station rebate to offset the cost of the charging stations and installation for up to $125,000 per station based on the technical specifications and vehicle eligibility.
- Developing a Memorandum of Understanding (MOU) with LADOT & MTA to offset the cost of purchasing and installing BEB charging stations.
- Offering the new pilot contract rate to provide innovative options to lower the operational cost to charge BEBs.
- Support integration of clean grid technologies and optimal load management at charging depots where feasible.
- Increase customer awareness to begin early communications with Transit Agencies to better align LADWP planning with transit planning efforts.
### EV Incentives & Rebates for Customers

<table>
<thead>
<tr>
<th>rebate_type</th>
<th>incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential EV Charger Rebate</td>
<td>• Up to $1,000 toward cost of charger &amp; installation + $1000 for dedicated meter</td>
</tr>
<tr>
<td>Commercial EV Charger Rebate</td>
<td>• Up to $5,000 toward purchase and installation of chargers</td>
</tr>
<tr>
<td>Used EV Rebate (Pending)</td>
<td>• Up to $1,500 toward purchase of used EV</td>
</tr>
<tr>
<td>DC Fast Charger Rebate</td>
<td>• Up to $75,000 to apply toward the purchase and installation of the charger</td>
</tr>
<tr>
<td>Medium/Heavy-Duty Charger Rebate</td>
<td>• Up to $125,000 toward purchase and installation of the charger</td>
</tr>
</tbody>
</table>
Qualifying Charging Stations: Medium and Heavy-duty EVs

MD/HD: New!

- **Output power:** 6 kW or more for AC charging stations and 20 kW or more for DC charging stations
  - Up to $30,000 for AC charging stations
  - Up to $125,000 for DCFC

- **Connector standard:** No requirement

- **Certification:** Certified/listed by NRTL or field tested (recognized national safety standards). Approval by LA Building and Safety Electrical Testing Laboratory (LADBS-ETL) or testing agency recognized by LADBS-ETL required for field testing

**Must be purchased and installed between July 1, 2018 and June 30, 2022**

Vehicle and Access Requirements

- **Vehicles:** Must charge on-road MD/HD plug-in EVs:
  - Class 3 to Class 8 Vehicles
  - Must acquire at least one new MD/HD EV for each charging station rebate. The vehicle(s) must be eligible for financial incentives by a government agency of the state of California

- **Access:** No requirement
# Rebate Amounts: Medium and Heavy-duty EV Charging Stations

<table>
<thead>
<tr>
<th>Charging Station Type</th>
<th>Output (kW)</th>
<th>Maximum Rebate Amount (per charging station)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DC Fast Chargers for Light-Duty EVs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 1</td>
<td>50 - 99</td>
<td>$50,000</td>
</tr>
<tr>
<td>Tier 2</td>
<td>100 +</td>
<td>$75,000</td>
</tr>
<tr>
<td><strong>Charging Stations for Medium Duty - and Heavy-Duty EVs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC-1</td>
<td>6 - 49</td>
<td>$10,000</td>
</tr>
<tr>
<td>AC-2</td>
<td>50 - 99</td>
<td>$20,000</td>
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<tr>
<td>AC-3</td>
<td>100 +</td>
<td>$30,000</td>
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<tr>
<td>DC-1</td>
<td>20 - 49</td>
<td>$35,000</td>
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<td>DC-2</td>
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<tr>
<td>DC-3</td>
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<tr>
<td>DC-4</td>
<td>150 +</td>
<td>$125,000</td>
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</tbody>
</table>
End-to-end Customer Process

Customers may apply for a:
- Rebate reservation before completing deployment of charging stations, or
- Rebate after completing deployment of charging stations

In both cases, customers must submit:
- Program application
- Required documents (including proof of purchase and installation of qualified equipment)

Develop charging plans + complete submittal package → Obtain confirmation from LADWP’s EV Service Design → Apply for rebate reservation → Receive approval from LADWP on reservation → Procure charging stations; finalize design

Apply for permits → Submit copy of permits to LADWP → Deploy charging stations → Apply for rebate → Submit proof of deployment to LADWP

2 months from reservation approval

Receive rebate

6 months from permit issue date

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LA’s Bus Electrification Efforts

LADWP is an active partner helping transit agencies meet their electrification goals. This supports LA’s Green New Deal Initiative.

LADWP worked with Navigant to develop a five-year pilot electric rate with four options to support progress toward the City’s Green New Deal bus electrification goals. The proposed rate also supports electrification of commercial transport fleet vehicles.
RATE DESIGN STRUCTURAL COMPONENTS

Each rate option consists of multiple components to capture the cost of service.

<table>
<thead>
<tr>
<th>OPTION</th>
<th>ELECTRIC CHARGES</th>
<th>SPECIAL CHARGES</th>
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<tbody>
<tr>
<td>EV-Bus 1</td>
<td>Facilities</td>
<td>Energy</td>
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<tr>
<td></td>
<td>Service</td>
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<tr>
<td>EV-Bus 2</td>
<td>Connection</td>
<td>Storage</td>
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<td></td>
<td>Demand</td>
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<tr>
<td></td>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td>EV-Bus 3</td>
<td>Connection</td>
<td>Storage</td>
</tr>
<tr>
<td></td>
<td>Demand</td>
<td>Tier 3 REC</td>
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<tr>
<td></td>
<td>Energy</td>
<td>Option</td>
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<tr>
<td>EV-Bus 4</td>
<td>Connection</td>
<td>Peak</td>
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<tr>
<td></td>
<td></td>
<td>Tier 3 REC</td>
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<tr>
<td></td>
<td></td>
<td>Option</td>
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</table>