Margaret Cederoth, Director of Planning and Sustainability
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CONNECTING CALIFORNIA
CALIFORNIA HIGH-SPEED RAIL

Increase Mobility

Needed Alternative

Better Air Quality

Job Growth

Phase 1
Phase 2
Stations
STRONG BOARD AND EXECUTIVE LEADERSHIP HAS INSPIRED GROUNDBREAKING COMMITMENTS FOR OVER A DECADE

• 2008 – Board Adopts 100-percent renewable energy for operations
• 2011 – Incorporated in California Air Resources Board (ARB) Scoping Plan for AB32
• 2012
  » Net-Zero direct greenhouse gas emissions (GHG) for construction
  » Net-Zero air quality emissions for construction
  » Proactive construction requirements, including requiring Tier 4 vehicles and 100-percent recycling requirements
• 2013 – CEO Signs Sustainability Policy
• 2014
  » First infrastructure project to require disclosure on major materials, informed AB 262 Buy Clean California Act
  » EMMA developed to track and monitor program and contractor progress
• 2016 – Board Adopts Sustainability Policy
• 2017 – Incorporated in ARB Scoping Plan Update
• 2019
  » Required performance targets for embodied energy (concrete and steel)
  » Zero emissions fleet vehicles (25 percent of on road fleet) for contractors
  » Direct GHG emissions target set for construction tied to a bonus/penalty
HIGH-SPEED RAIL DELIVERS A STRONG GREENHOUSE GAS EMISSIONS RETURN ON INVESTMENT

**GHG Emission Reductions From Full High-Speed Rail System**

- 102 MMTCO₂e

**Cumulative GHG Emissions Reductions From Implemented Projects**

- 45 MMTCO₂e

Legend:
- High-Speed Rail
- Sustainable Communities and Clean Transportation
- Energy Efficiency and Clean Energy
- Natural Resources and Waste Diversion
ENERGY AND EMISSIONS
Delivering journeys in half the time and using renewable energy

Technology of the future

• Electricity enables speed and HSR travel times deliver reduced vehicle miles and plane trips

• Renewable energy generated on-site and linked with battery storage is a means of reducing electricity cost and increasing system resilience.

• Energy Net-Positive facilities

Running 100 percent on renewable electricity means truly zero emissions transportation.
PROTECTING COMMUNITIES IN CONSTRUCTION
Reducing and offsetting criteria air pollutants

<table>
<thead>
<tr>
<th>Criteria Air Pollutants</th>
<th>Typical Fleet Emissions</th>
<th>HSR Fleet Emissions</th>
<th>Percent Difference</th>
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</thead>
<tbody>
<tr>
<td>NOx (Nitrogen Oxide)</td>
<td>83,366 lbs.</td>
<td>42,507 lbs.</td>
<td>49% LESS</td>
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<td>ROG (Reactive Organic Gas)</td>
<td>7,898 lbs.</td>
<td>2,802 lbs.</td>
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<td>PM (Particulate Matter)</td>
<td>4,700 lbs.</td>
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<td>BC (Black Carbon)</td>
<td>3,796 lbs.</td>
<td>1,869 lbs.</td>
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ZERO EMISSION VEHICLES THROUGHOUT OPERATIONS
ZEV Requirements for HSR Construction and Operations

- New ARB Requirements: "Advanced Clean Truck"
- Increase of ZEV requirement for light-duty vehicles in contractors’ fleet
- Market Availability of ZEV
- Energy Net-Positive facilities

<table>
<thead>
<tr>
<th>Model Year</th>
<th>Class 2b-3 Group</th>
<th>Class 4-8 Group</th>
<th>Class 7-8 Tractors Group</th>
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