



# Informational Update on Zero-Emission Vehicle Infrastructure

April 28, 2022

# Executive Order N-79-20 Transition from Combustion



**100% ZEV sales** by 2035

Full transition to

**ZEV drayage trucks** by 2035



Full transition to **ZEV buses & heavy-duty long-haul trucks** by 2045\*



Full transition to **ZE off-road equipment** by 2035\*

\*where feasible

# ZEVs are Critical to State SIP Strategy and Scoping Plan

- Draft 2022 State SIP Strategy heavily dependent on zero-emission vehicle measures
- Scoping Plan scenarios depend on phase out of combustion

# Infrastructure Deployment is Crucial





# Equity is Critical to the ZEV Transition

- ZEVs have to work for everyone and improve transport for underserved and disadvantaged populations
- Infrastructure cannot be a barrier
- Opportunity to build a ZEV ecosystem from the ground up with equity and accessibility in mind

# Advanced Clean Cars II Rulemaking

## ACC II being developed

- Targeting 100% ZEV & PHEV sales by 2035
- Requirements for ZEV consumer assurance
  - Charging standardization
  - Charging equipment



# Advanced Clean Fleets

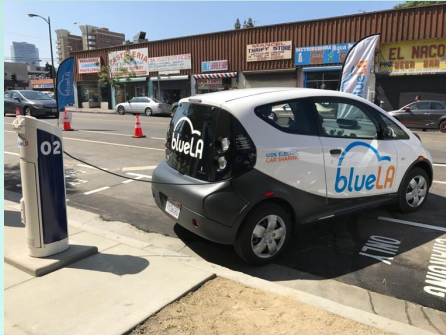
- Transitioning well-suited fleets to zero emission
- ZEV requirements for
  - Public fleets
  - Drayage trucks
  - High priority fleets
- 100% ZEV sales by 2040
- Expected ZEV sales with Advanced Clean Trucks
  - Over 500,000 by 2035
  - Over 1.25 million by 2045





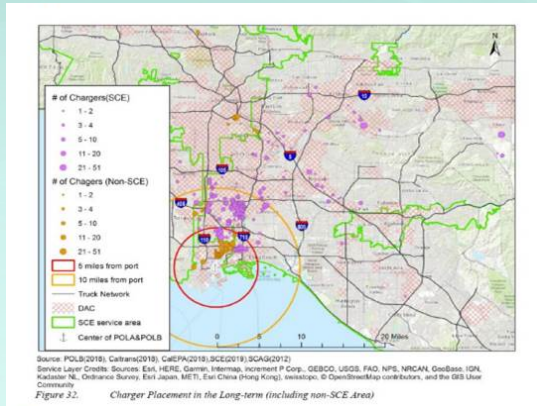
# Light-Duty Vehicle Infrastructure Needs

- Home charging
- Public charging/fueling
- Rural coverage
- Equitable access
- Reliability
- Ease of access



# MHD Fleet Infrastructure Needs

- Both electricity & hydrogen
- Equitable access
- Public fueling network
- Large scale, rapid deployment
- Grid planning
- Standards





# CARB's Role



Regulator



Information  
Source



Communications  
Facilitator

State Agency Infrastructure Partners



# Infrastructure Regulation

- EVSE Access regulation
- Proposed provisions in Advanced Clean Cars II
- Support for CalGreen Building Code
- Hydrogen fueling protocol development & testing



# Information Source

- Providing vehicle population & emissions impacts of technology shifts
- Coordinating on statewide infrastructure planning including:
  - Supporting CEC on the development of charging infrastructure needs (AB 2127) and fuel cell electric vehicle fueling infrastructure assessments (AB 8 and SB 643)
  - Assist with identification of Clean Freight Corridor Assessment (SB 671)
  - Providing expertise to HCD / CBSC adoption of EVSE standards for building codes



# Communications Facilitator

- Medium- & Heavy-Duty focused work group meetings
  - Business concerns
  - Hydrogen
  - Electricity & the grid
  - Costs & funding
- Jointly facilitated with agency partners (GOBiz, CEC, CPUC, CalSO)
- Virtual engagement through panelist discussion





# Work Group Stakeholder Concerns

- Significant public (retail) infrastructure is needed
- Operational requirements & reliability of EVSEs to handle medium- & heavy-duty vehicle duty cycles
- Reliable access to fuel (power outages & supply concerns)
- Availability & cost of low-carbon intensity hydrogen / electricity
- Costs & time to install infrastructure

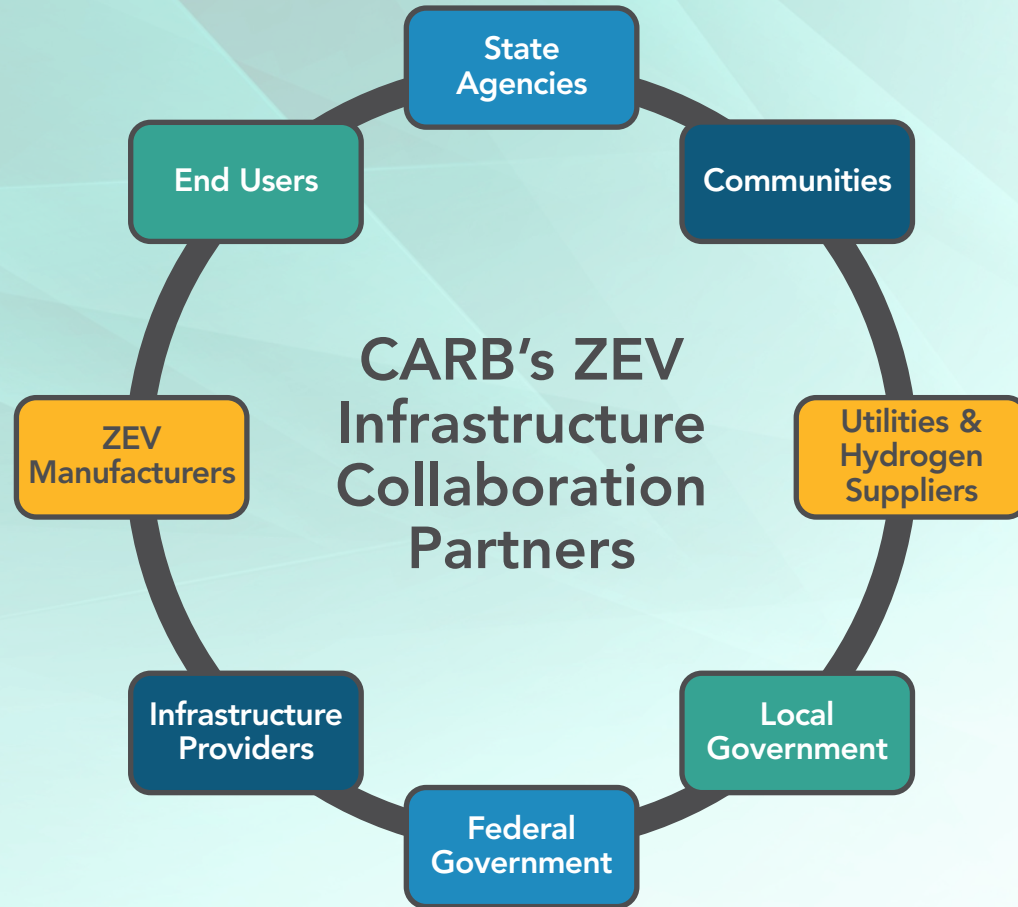
# Work Group Stakeholders Concerns (cont.)

- Equitable access to infrastructure
- Small fleet implementation
- Understanding infrastructure benefits / impacts to communities
- Property considerations / site control
- Integration of distributed generation (renewables) & energy storage

# Next Steps



- Moving forward with better shared understanding
- Need for early communication between fleets, utilities & infrastructure providers
  - Platform for information sharing
- GO-Biz creation of a consultant list
- More outreach, tools, case studies, & opportunities to connect fuel / infrastructure providers & fleets



# Speaker Introduction



Tyson Eckerle  
GO-Biz



Paula  
Gruending  
CPUC



Enrique  
Rodriguez  
CBSC



Kyle Krause &  
Mitchel Baker  
HCD



Lori Pepper  
CalSTA



Hannon  
Rasool  
CEC





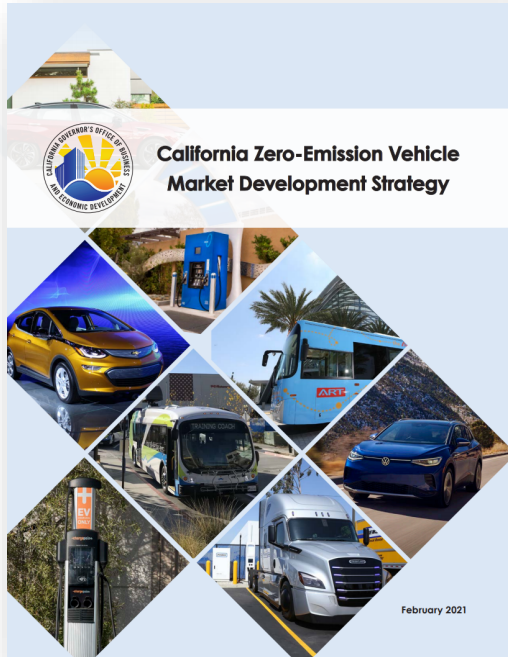
# ZEV Market Development Strategy Update

April 28, 2022

Tyson Eckerle  
Governor's Office of Business &  
Economic Development (GO-Biz)



# ZEV Strategy Overview



# State Agency Action Plans



## 1. Public ZEV Strategy Website

- Latest information; document repository
- Progress and metrics tracking

## 2. ZEV Strategy Document

- Guiding document: principles, objectives, direction
- Updated at least every 3 years

## 3. Annual State Agency Action Plans

## 4. Annual Pillar Priority Action Plans

- Equity Engagement & Implementation
- Multi-Pillar Action Plan

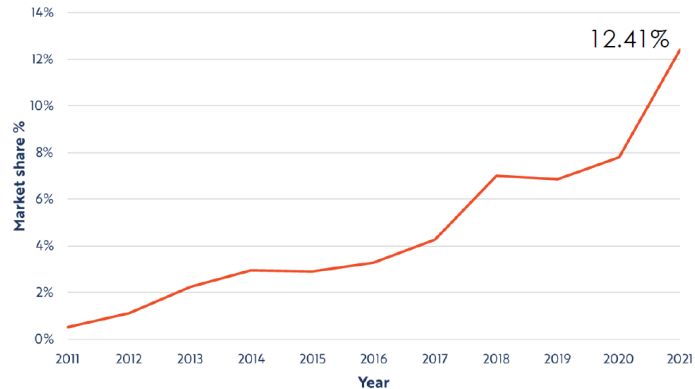


# Tracking Progress: ZEV Market Snapshot

## VEHICLES

### Light-Duty Passenger Vehicles

Target: 100% passenger car market share by 2035



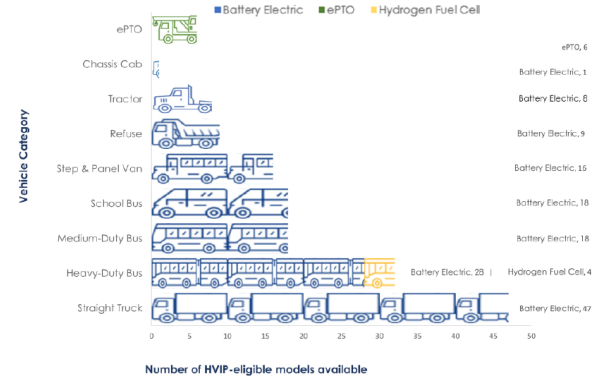
- ◆ **87** light-duty ZEV models available<sup>1</sup>
- ◆ **1 million+** ZEVs sold in California to date<sup>2</sup>
- ◆ Largest used ZEV inventory in the nation<sup>2</sup>

Data Sources

- 1. [Veloz Q4 Electric Vehicle Market Report](#) with data from the [California Energy Commission Zero Emission Vehicle and Infrastructure Dashboard](#)
- 2. [Recurrent California Electric Vehicle Trends](#)

### Medium & Heavy-Duty Vehicles

Target: 100% of vehicles in the state are ZEVs by 2045



- ◆ **159** HVIP-eligible models available
- ◆ **3%** of transit buses operating and **27%** of buses purchased in 2020 were zero-emission<sup>3</sup>

Data Sources

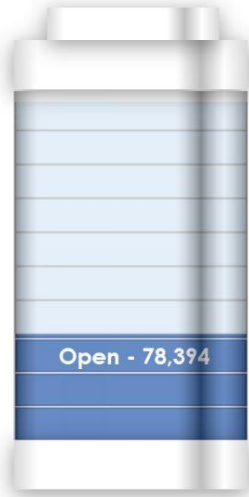
- Chart based on [CA HVIP Eligible Vehicle Catalog](#)
- 3. 2020 transit agency reports to CARB Innovative Clean Transit Reporting Tool. Retrieved October 25, 2021

# Tracking Progress: ZEV Market Snapshot

## INFRASTRUCTURE

### EV Charging

Target: 250,000 EV charging stations by 2025



100%

of target funded

31%

of target completed

### Hydrogen Refueling

Target: 200 hydrogen refueling stations by 2025



100%

of target funded

27%

of target completed

Data Sources:

[California Energy Commission Zero-Emission Vehicle and Infrastructure Statistics](#), Updated January 2022

[California Energy Commission 2021-2023 Investment Plan Update for the Clean Transportation Program](#)






# Tracking Progress: ZEV Market Snapshot

END USER	
Voucher & Rebate Programs	Consumer Awareness & Experience
<p><b>447,994</b></p> <p>Clean Vehicle Rebate Project Rebates issued over life of program—with <b>30%</b> of funds going to priority communities.</p> <p><a href="#">Data Source: Clean Vehicle Rebate Project Rebate Statistics</a></p>	<p><b>26%</b></p> <p>of Californians surveyed in 2020 said they definitely plan to buy an EV for their next car—compared to 4%* of people nationwide.</p> <p><i>*Recent nationwide surveys show an increase, but we are citing 2020 in order to ensure CA-US comparability</i></p> <p><a href="#">Data Sources:</a>  <a href="#">Consumer Reports 2020 survey of Consumer Attitudes in California</a>  <a href="#">Consumer Reports 2020 National Survey on Electric Vehicles and Fuel Economy</a></p>
<p><b>12,919</b></p> <p>ZEVs obtained through Clean Cars 4 All from June 1, 2015 through June 30, 2021</p> <p><a href="#">Data Source: EFMP Scrap &amp; Replace and CC4A Summary Report</a></p>	<p><b>\$5 million</b></p> <p>dedicated to GO-Biz to fund ZEV consumer awareness projects through May 2023</p> <p><a href="#">GO-Biz ZEV Consumer Awareness Grant</a></p>
<p><b>4,495</b></p> <p>vouchers issued for zero-emission trucks, buses, and off-road equipment through HVIP and CORE</p> <p><a href="#">Data Sources: CORE Voucher Funding Map, HVIP Voucher Data</a></p>	



# Tracking Progress: ZEV Market Snapshot

WORKFORCE	
<b>A framework for tracking and reporting additional ZEV workforce metrics is currently being developed. Future ZEV Market Metrics Snapshots may feature different workforce indicators and data sources.</b>	
 <p><b>43</b> ZEV-related manufacturing companies are based in California</p>	<p><b>2,040</b> contractors and electricians have been approved through the <a href="#">Electric Vehicle Infrastructure Training Program (EVITP)</a> to install EV charging infrastructure</p>
 <p><b>13,400+</b> jobs make California the <b>#1 state</b> in the nation for EV manufacturing jobs</p>	<p><b>\$250 million</b> in the <a href="#">California Comeback Plan</a> (FY 2021-2023 budget) allocated to boost ZEV manufacturing</p> 
<small>Data Source: <a href="#">Atlas Policy EV Hub</a>. Updated January 2022.</small>	





## Passenger Vehicles

Clean Vehicle Rebate Project: \$525M

Clean Cars 4 All & Other Equity Projects: \$400M + \$256M

ZEV Fueling Infrastructure Grants: \$300M + \$600M

*Equitable At-home Charging: +300M*



## Big ZEVs

Drayage Trucks & Infrastructure: \$470M + \$475M

Drayage Trucks & Infrastructure Pilot Program: \$65M

Transit Buses & Infrastructure: \$290M + \$460M

School Buses & Infrastructure: \$450M + \$1.5B

Clean Trucks, Buses and Off-Road Equipment: \$700M + \$1.1B

Near-Zero Heavy Duty Trucks: \$45M

*Ports: + \$400M*



## Additional Investments

ZEV Consumer Awareness: \$5M

ZEV Manufacturing Grants: \$250M

Transportation Package ZEV: \$407M + \$383M

*Community-Based Plans, Projects and Support / Sustainable*

*Community Strategies: + \$419M*

*Emerging Opportunities: + \$200M*

CA Budget FY2021-22: \$3.9B  
& Proposed FY2022-23 Budget: \$6.1B



## Charging Infrastructure

- \$5 billion in federal grants to build a network of charging stations along highway corridors (~\$383 million for CA)
- \$2.5 billion in competitive federal grants for alternative fuel infrastructure (Plug-in & H2 included)

## Hydrogen

- \$8 billion over five years to establish at least 4 regional hydrogen hubs
- \$1 billion over five years for the Clean Hydrogen Electrolysis Program
- \$500 million over five years for clean hydrogen manufacturing and recycling

## Additional ZEV-Related Funding Opportunities

- \$2.5 billion for electric school buses and \$2.5 billion for clean school buses
- \$7 billion in supply chain for batteries
- \$750 million in grants to support advanced energy technology manufacturing projects in coal communities

# Federal Bipartisan Infrastructure Bill (IIJA)

# California's Preferred Outcomes from Hydrogen Hubs Investment

- Time, money, and innovation:

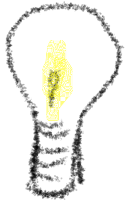


- *Time Outcome*: Federal money accelerates transition to zero carbon transportation and energy system.



- *Money Outcome*: A financially self-sustaining, and expanding, low carbon hydrogen market.

- *Industry: CA is the only place this is truly possible.*



- *Innovation Outcome*: California's hub fosters innovation and accelerates global adoption of clean hydrogen.



# CPUC Updates

April 28, 2022

Paula Gruending, Supervisor - Transportation Electrification Section  
California Public Utilities Commission



California Public  
Utilities Commission

# Game-changing programs and policies have been rolled out since February 2020 TEF release

- **New treatment of utility side of the meter infrastructure costs (AB 841)**
  - EV Infrastructure Rules
  - Common Treatment Policy extension
- **New Program Authorizations**
  - Two major IOU program authorizations (SCE CR2, SDG&E PYD2)
  - One new program application (PG&E EVC 2)
- **Three other decisions on TEF issues**
  - Vehicle to Grid Integration (SB676 implementation)
  - Low carbon Fuel Standards
  - Near Term Priorities
- **Resolution resolving critical technical communications protocol issues**
- **TE planning and process alignment work underway**
  - Alignment of infrastructure planning activities
  - Internal ED and interagency coordination ramping up

# Proposed TEF Amendments

- **Ruling issued February 2022 proposing updates to TEF**
  - Establish funding cycles based on simplified budget approval process
  - Dedicate \$1Billion over 5 years starting in 2025
  - Address lack of uniformity by establishing a statewide rebate program
  - Focus on BTM infrastructure, ME&O and technical assistance
  - Targeting MD/HD, multi-unit dwellings
  - Larger incentives for underserved communities
- **Proposed Decision on TEF open issues in 2022**
  - Many areas from draft TEF addressed already

# ED Staff Draft Proposal: Establishing Funding Cycles

- **Funding Cycle Zero: Present until 2024**
  - Current portfolio implementation, ~ \$1.5 billion available in various programs
  - Application-based programs
- **Funding Cycle One: 2025 through 2029**
  - Statewide rebate program
  - Stable funding levels
  - Target MDHD/MUDs, greater focus on MD/HD
- **Funding Cycle Two: 2030+**
  - Based on evolving need for ratepayer funding for BTM charging infrastructure and planning outputs

# Grid Readiness Activities

- **The CPUC, CEC, CAISO and CARB are currently working together on the specifications of a high electrification demand scenario** that places greater emphasis on electrification (buildings and transportation) than what was embedded within the CEC's adopted 2021 IEPR mid-mid managed demand forecast.
- **For high TE, the CEC will be forecasting the impact of CARB's pending ACCII and ACF regs, over and beyond what would naturally occur, out to 2035.** For high energy efficiency and high building electrification, the CEC will use the forecasts already developed for the 2021 IEPR.
- **Planning assumptions are currently scoped in the Distribution Planning Process as part of the High DER Proceeding and in the Integrated Resources Proceeding for assessment of infrastructure needs.**



# Public Safety Power Shutoffs

- Definition: PSPS events are temporary power shut-offs to areas that contain infrastructure that could cause a wildfire
- Update: IOUs are currently still implementing the guidance provided in D.20-05-051, which covers
  - How the IOUs are to notice EV drivers about a PSPS,
  - How they should increase the resiliency of EV charging infrastructure during and after a PSPS, and
  - How the IOUs should provide off-grid charging options to areas impacted by PSPS



About CBSC and CALGreen  
The California Green Building Standards Code  
Part 11 of Title 24

Enrique M. Rodriguez,  
Associate Construction Analyst  
California Building Standards Commission

April 28, 2022



# California Building Standards Commission

- ▶ Reviews state building standards proposed by agencies
- ▶ Develops building standards for non-residential occupancies where no other state agency has the authority (CALGreen)
- ▶ Adopts and approves building standards for publication
- ▶ Codifies approved building standards
- ▶ Files approved building standards with the Secretary of State
- ▶ Contracts to publish the California Building Standards Code
- ▶ Acts as the state depository for local government modifications



# CALGreen History

- ▶ Title 24, Part 11 is the California Green Building Standards Code – nicknamed CALGreen
- ▶ First in the nation GREEN building standards code
- ▶ In 2016, to further the goals of Assembly Bill 32 (AB 32, 2006), the legislature enacted Senate Bill 32 (SB 32, 2016)
- ▶ Requires CARB to ensure that California's statewide GHG emissions are reduced to at least 40 percent below 1990 levels by 2030.
- ▶ Buildings are the 2<sup>nd</sup> largest source of California's greenhouse gas emissions



# CALGreen Goals

- ▶ Reduce greenhouse gas emissions from buildings
- ▶ Promote environmentally responsible, cost-effective, healthier places to live and work
- ▶ Reduce energy and water consumption
- ▶ Respond to the environmental directives of the administration





# CALGreen Evolution

- ▶ First edition published in 2008, effective August 2009
  - ▶ These provisions were all voluntary
- ▶ 2010 CALGreen established mandatory regulations (Effective 1/1/2011)
  - ▶ Div. 1 - Planning and Design
  - ▶ Div. 2 - Energy Efficiency
  - ▶ Div. 3 - Water Efficiency and Conservation
  - ▶ Div. 4 - Material Conservation & Resource Efficiency
  - ▶ Div. 5 - Environmental Quality



# CALGreen Nonresidential Updates

- ▶ 2022 CALGreen Code (eff. January 1, 2023)
  - ▶ Overview of significant approved changes
- ▶ 2022 Intervening Code Adoption Cycle (eff. July 1, 2024)
  - ▶ Agency workshops mid-April - BSC, HCD, DSA
  - ▶ Feb/March 2023 – Code Advisory Committee meeting
  - ▶ April 2023 – Public Comment Period
  - ▶ July 2023 – Commission meeting for approval/adoption



# 2022 CALGreen Approved Changes

- ▶ 2022 CALGreen updates:
  - ▶ Significant expansion of EV regulations – Non-Res.
    - ▶ Newly constructed warehouses, grocery stores & retail stores with off-street loading spaces
    - ▶ Div. 5.1 Mandatory EVSE installations w/ L2 or DCFC
    - ▶ Addition of ALMS for use as an alternate compliance method
    - ▶ Mandatory EV infrastructure for MHD vehicles
    - ▶ Tier 1 = EV Capable spaces from 15% to 30%
    - ▶ Tier 2 = EV Capable spaces from 20% to 45%
    - Both require 33% of EV capable spaces to have EVSE installed



# 2022 Intervening Code Adoption Cycle Potential Changes

- ▶ BSC is researching potential code changes for the intervening cycle (blue supplement pages)
  - ▶ EV infrastructure for certain additions and alterations
  - ▶ Align with HCD for low power EV installations
  - ▶ Automatic Load Management Systems reference standard
- ▶ How to participate
  - ▶ Code Advisory Committee Meetings
  - ▶ Public Comment Periods





Department of Housing and Community Development (HCD)  
Division of Codes and Standards

# 2022 ZEV UPDATES FROM HCD

APRIL 28, 2022

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Presenter:

Kyle Krause, Deputy Director

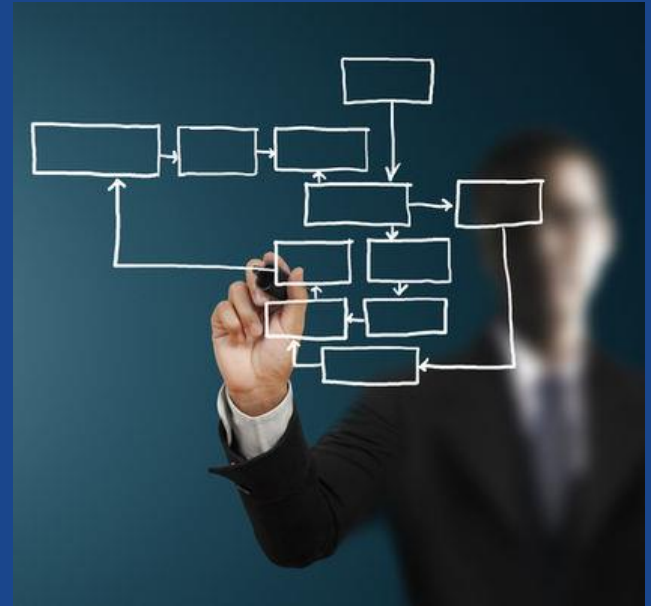
Mitchel Baker, Assistant Deputy Director





# ORGANIZATIONAL STRUCTURE

- Governor's Office
  - BCSH - Agency
    - HCD - Department
      - C&S - Division



# STATE HOUSING LAW PROGRAM, ROLE AND AUTHORITY

- Health and Safety Code (HSC) Section 17922 - Proposing Agency and Adopt Model Codes
- HSC Section 18941.10 – Electric Vehicle Charging Infrastructure Authority
- Department Regulations, Title 25
  - Administration and Enforcement
  - Construction, Additions, and Alterations
  - Existing Buildings
  - Actions and Proceedings
- Building Standards Commission – Control Agency



# BUILDING STANDARDS

## CALGreen Updates:

- Increasing opportunities for electric vehicle charging.
  - Applicable to multifamily, hotels, and motels
    - EV capable (10 percent parking)
    - Low-power receptacles (25 percent parking)
    - Level 2 charger (5 percent parking - if 20 or more dwelling units/guestrooms)
- New Construction vs. Existing Buildings
- Health and Safety Code, Sections 17912, 17922, and 17958.8



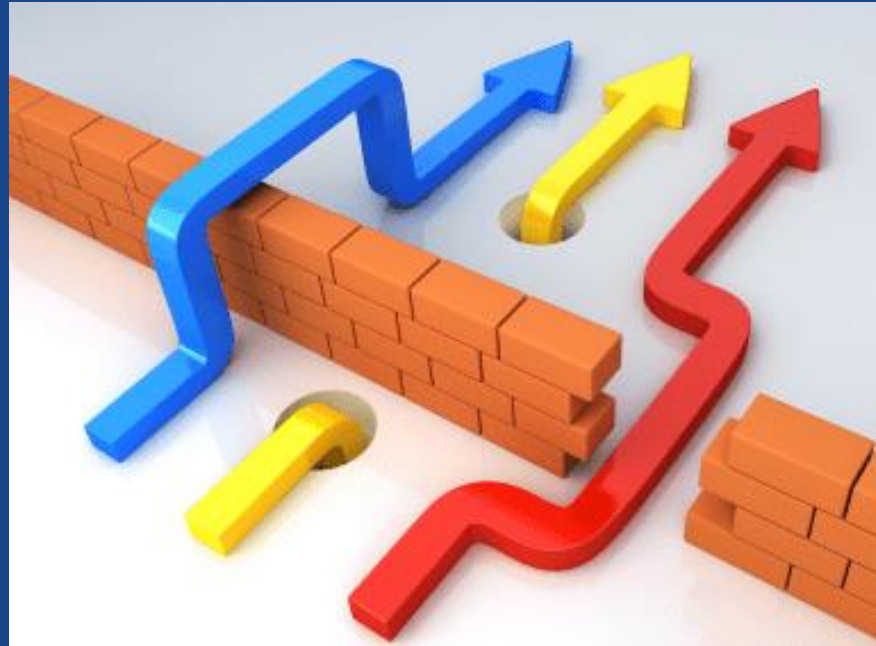
## NEXT STEPS

- 2022 Intervening Code Adoption Cycle
- EV Infrastructure in Multifamily, Hotels, and Motels



# EV INFRASTRUCTURE CHALLENGES

- Electrical Grid Stability
- Cost Barriers
- Building Code Limitations





# Bipartisan Infrastructure Law: ZEV Infrastructure Deployment

Lori Pepper  
Deputy Secretary for Innovative Mobility Solutions

April 28, 2022



# Climate Action Plan for Transportation Infrastructure (CAPTI) Is A...

## Holistic framework

For aligning State infrastructure investments with State climate, health, and equity goals built on the foundation of the “fix-it-first” approach established in SB 1

- **10 Guiding Principles** help create a vision for how transportation investments should be prioritized
- **Set of 8 Strategies and over 30 actions** outline initial areas of work



# National Electric Vehicle Infrastructure (NEVI) Formula Program



Fills gaps in the Alternative Fuel Corridors to establish an interconnected network of publicly available electric vehicle chargers



States required to submit an EV Infrastructure Deployment Plan to federal Joint Office of Energy and Transportation for approval by August 1, 2022



Limited to battery electric vehicle fast charging infrastructure

# California Implementation and Coordination on the NEVI Program

- Joint administration of NEVI by Caltrans and CEC
- Leveraging IIJA Transition to Zero Emissions Sub-working Group for stakeholder engagement
- Additional targeted stakeholder and public engagement touchpoints to be developed
- Caltrans/CEC to launch NEVI Coordinating Council for state agency input into NEVI implementation



# CEC Infrastructure Speaker

Hannon Rasool

Deputy Director

California Energy Commission

# Next Steps

- Proposed CARB ZEV Regulations – ACC II & ACF
- Tight coordination on planning and funding
- Continued dialog
- Tracking progress to plan



# Conclusion

- Clear commitment
- Cooperation
- Shared vision and priorities

