



City of San Diego
**Zero Emissions
Vehicles Strategy
DRAFT**

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Abbreviations

A2Z	Accelerate to Zero Emissions Collaboration
AB	Assembly Bill
CAP	Climate Action Plan
CBO	Community-Based Organization
City	City of San Diego
CFI	Charging and Fueling Infrastructure
COC	Communities of Concern
DCFC	Direct Current Fast Charge
EV	Electric Vehicle
GHG	Greenhouse Gas
HD	Heavy-Duty
ICE	Internal Combustion Engine
kW	Kilowatt
MD	Medium-Duty
MMP	Master Mobility Plan
MT CO2e	Metric Tons of Carbon Dioxide Equivalent
NEVI	National Electric Vehicle Infrastructure
SB	Senate Bill
SDCAPCD	San Diego County Air Pollution Control District
SDG&E	San Diego Gas & Electric
TOD	Transit-Oriented Development
V2X	Vehicle-to-Grid/Home/Building
ZEMBOP	Zero Emissions Municipal Buildings and Operations Policy ¹
ZEV	Zero Emissions Vehicle

SD The City of San Diego's Commitment to Zero Emissions

The City of San Diego's updated Climate Action Plan (CAP), Our Climate, Our Future², adopted in 2022, sets a target of net zero emissions by 2035. As transportation is the largest contributor to greenhouse gas (GHG) emissions in the City, the CAP actions related to transportation are extensive and varied as the City uses a multi-pronged approach to this sector. The CAP Measure 2.3. is focused on increasing electric vehicle adoption, including the action to develop a citywide electric vehicle strategy (Figure 1). This goal is combined with multiple actions in CAP Strategy 3 to reach an overall "Mobility 50/50" goal: shift 50 percent of all trips to modes other than private vehicles and transition remaining trips to zero emissions to the greatest extent possible. The City's mode-shift goals place a premium on developing programs that encourage the integration of all modes into the broader transportation network through the mobility loading prioritization (Figure 2). The San Diego Zero Emissions Vehicles (ZEV) Strategy, in conjunction with the San Diego Mobility Master Plan (MMP)³, identifies actions the City must take to accelerate and accommodate ZEV adoption throughout the City and provide equitable access to charging and clean fueling infrastructure.



FIGURE 2. 2022 CAP MOBILITY LOADING PRIORITIZATION

CAP MEASURE 2.3: INCREASE ELECTRIC VEHICLE ADOPTION

2030 Target

16% e-VMT out of all Light-duty VMT

2030 GHG Reduction

(MT CO₂e)
366,481

2035 Target

25% e-VMT out of all Light-duty VMT

2035 GHG Reduction

(MT CO₂e)
667,458

Core Benefits:



Jobs & Economy



Resiliency



Air Quality



Public Health

Action:

Develop a citywide electric vehicle strategy

Supporting Actions:

- ✓ Work with local businesses to expand EV charging stations on commercial property.
- ✓ Amend the building code to expand EV charging station requirements for multi-family and non-residential properties and require charging stations for electric bicycles.
- ✓ Explore the development of a citywide policy for surplus land for EV charging sites.
- ✓ Work with the APCD and school districts to support the conversion of the school bus fleet to ZEVs.
- ✓ Work with SANDAG, SDCAPCD, and MTS to procure a fully zero emissions bus fleet.
- ✓ Set a goal for installation of public EV charging stations on City property to support EV adoption.
- ✓ Work with regional partners on MD/HD ZEV infrastructure planning.

FIGURE 1. 2022 CAP MEASURE 2.3

Beyond the City

The transportation sector is the largest GHG contributor in not just the City, but across the region and the state (**Figure 3**). California policymakers have passed legislation, adopted policies, committed funding, and established programs and tools to help achieve local, regional, and statewide GHG emissions reductions (**Table 1**).

The City is also an active stakeholder in regional initiatives led by the San Diego Association of Governments (SANDAG). In addition to directly supporting regional mobility planning initiatives such as the Comprehensive Multimodal Corridor Plan, the City is a core member of the Accelerate to Zero (A2Z) Collaboration⁴ among SANDAG, County of San Diego, San Diego County Air Pollution Control District (SDCAPCD), and San Diego Gas & Electric (SDG&E).

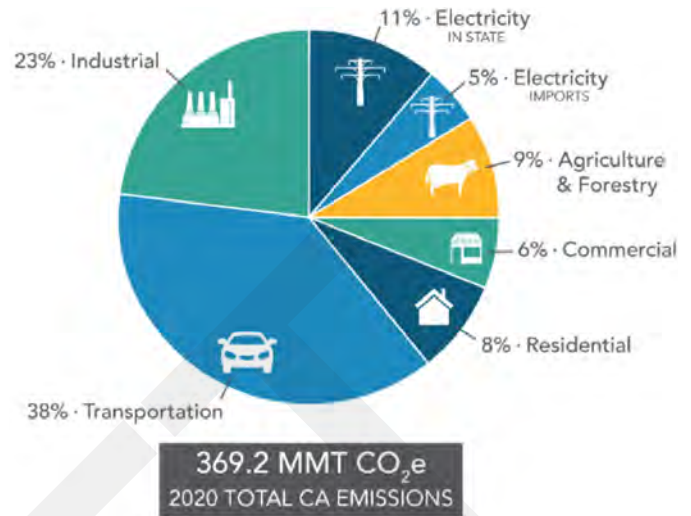


FIGURE 3. CALIFORNIA 2020 GHG EMISSIONS

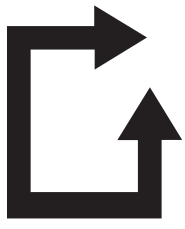
Executive Order N-79-20
In 2020, Governor Newsom established a transformative goal to ensure that 100 percent of the State's new passenger car and truck sales are ZEVs by 2035.

The A2Z Collaboration is a multi-jurisdictional effort to identify the local barriers and challenges to ZEV adoption and develop a shared vision and regional Electric Vehicle (EV) Strategy that will accelerate investment in ZEVs and infrastructure.

The City continues to work with these and other local and regional partners including, San Diego Community Power (SDCP), Port of San Diego (Port), and San Diego County Regional Airport Authority (Airport Authority), as well as state agencies like the California Energy Commission (CEC), Air Resources Board (CARB), Department of Transportation (Caltrans), and Public Utilities Commission (CPUC) to advance our zero emissions mobility goals.

Legislation	Purpose
SB 1291 (Archuleta, 2022)	Requires all California cities and counties to adopt streamlined permitting procedures for hydrogen-fueling station installations.
AB 970 (McCarty, 2021)	Requires all California cities and counties to adopt streamlined permitting procedures for EV charging stations.
AB 841 (Ting, 2020)	Publicly funded EV chargers installed by licensed contractors with EVITP certification. Utilities to establish new tariffs for EV charging electrical infrastructure.
AB 2127 (Ting, 2018)	Requires the preparation of a statewide infrastructure assessment every two years to support the goal of five million ZEVs by 2030.
AB 1633 (Frazier, 2018)	Roadside EV charging station business can be identified on highway exit signs.
SB 1000 (Lara, 2018)	Municipalities may not restrict the type of EVs accessing public passenger vehicle EV charging stations funded by the State or utility ratepayers.
SB 1 (Beall, 2018)	ZEV owners must pay an annual road improvement fee.
SB 454 (Corbett, 2013)	Creates the EV Charging Stations Open Access Act, prohibiting subscription fees for public EV charging and providing multiple payment options.
AB 118 (Núñez, 2007)	Creates the California Clean Transportation program to provide financial incentives for alternative and renewable fuels and technologies.

TABLE 1. SELECTION OF CURRENT CALIFORNIA ZEV LEGISLATION



The City of San Diego's Pathway to Zero Emissions: A Comprehensive Strategy

Achieving the ZEV goals outlined in the CAP will be challenging. Without a purposeful focus on equity, this evolving technology could leave some residents and businesses behind. The barriers to the widespread adoption of ZEVs include consumer familiarity, affordability, and the lack of accessible charging and fueling infrastructure. Without convenient and plentiful charging stations, potential ZEV drivers may be discouraged from purchasing or leasing these vehicles. A lack of consumer awareness, understanding, and familiarity with the benefits of ZEVs can also slow the rate of adoption as people often hesitate to invest in technologies they do not fully understand or trust. The cost of shifting to a new zero emissions car can be challenging for many, especially when their current gasoline vehicle still runs, even with higher operating costs. Each of these barriers must be addressed in different ways, with the individual in mind, to achieve the City's ZEV targets. The ZEV Strategy identifies areas of action, organized into five core strategy pillars centered around equity and the diversity of our residents and businesses, to help the City overcome ZEV adoption and deployment barriers, and reach its climate goals (**Table 2**).

Although core pillars focus on promoting equitable ZEV adoption, the ZEV Strategy also acknowledges the complex challenges inherent in transitioning the City's transportation system to zero emissions. Such a transformation extends beyond replacing conventional vehicles with ZEVs; it necessitates a comprehensive evaluation of the potential impacts on planning, infrastructure, energy systems, and economic dynamics highlighted throughout this Strategy. The shift will create changes in employment sectors related to transportation, as jobs focused on traditional vehicles transition to roles associated with ZEV technologies.

Each core pillar encompasses activities that are designed to operate concurrently. The actions identified in this Strategy range from those already underway to those with extended implementation timelines through the 2035 CAP horizon. The ZEV Strategy is designed to identify and address the short- and long-term challenges and opportunities of reaching the City's ZEV goals, prepare for the effects of the ZEV transition, and pave the way for a smooth and effective transition to a sustainable transportation system for all San Diegans.





ZEV Strategy Core Strategy Pillars and Actions

Core Strategy	Strategy Actions
 <p>Strategy Pillar I: Policies Support Equitable Transition to Zero Emissions Technologies through Local Policy and Planning</p>	<ul style="list-style-type: none">  Action 1: Update Zoning and Land Use Regulations Related to ZEV Infrastructure  Action 2: Update Building and Construction Codes for Roadway Infrastructure to Accommodate Current and Future ZEVs  Action 3: Update Building Codes to Require New Developments and Major Renovations to Include ZEV Charging Infrastructure  Action 4: Promote the Integration of ZEV Infrastructure in Multimodal Mobility Hubs and TOD  Action 5: Facilitate the Adoption of Hydrogen Fuel Cell Technology
 <p>Strategy Pillar II: Programs & Processes Facilitate Infrastructure Deployment through Streamlined Programs and Processes</p>	<ul style="list-style-type: none">  Action 1: Streamline Processes for Infrastructure Installation  Action 2: Establish Programs to Promote Electric Mobility Across All Modes  Action 3: Explore Funding Opportunities that Encourage Local ZEV Deployment and Offset Costs for Residents and Small Businesses  Action 4: Lead by Example and Electrify City's Own Fleet
 <p>Strategy Pillar III: Community Outreach & Engagement Foster ZEV Transition through Direct Community Outreach, Engagement, and Resources</p>	<ul style="list-style-type: none">  Action 1: Provide Targeted Support to Structurally Excluded and Disadvantaged Communities for ZEV Adoption  Action 2: Enhance Community Awareness of the Transition to ZEVs  Action 3: Provide Resources to Navigate Charger Permitting and Make Informed Charger Decisions  Action 4: Support Development of Technical Assistance Programs to Prepare Local Businesses, Fleets, and Dealerships for ZEV Transition
 <p>Strategy Pillar IV: Collaboration & Partnerships Coordinate Local and Regional ZEV Transition Strategies</p>	<ul style="list-style-type: none">  Action 1: Engage in Regional ZEV Collaboration to Optimize Community Interaction and Prioritize Equity  Action 2: Collaborate with Regional and State Representatives to Advocate for Legislation and Funding that Fosters Electric Mobility  Action 3: Collaborate with Labor, Community Colleges, and Workforce Partners to Support Workforce Development  Action 4: Promote Public-Private Partnerships and Explore New Charging Business Models to Meet Local Charging Needs  Action 5: Collaborate with Utilities to Provide Resources to Facilitate Informed Charger Decisions  Action 6: Collaborate with First and Second Responders on Vehicle and Battery Safety Training
 <p>Strategy Pillar V: Infrastructure Buildout Create Reliable, Accessible, and Equitable Charging Infrastructure</p>	<ul style="list-style-type: none">  Action 1: Develop an Equitable ZEV Infrastructure Distribution Framework  Action 2: Identify Public Land for ZEV Infrastructure Development  Action 3: Explore Opportunities to Improve Grid and Community Resiliency through EV Infrastructure and Advanced Technology Deployment

TABLE 2. ZEV STRATEGY CORE STRATEGY PILLARS



Strategy Pillar I: Policies

Support Equitable Transition to Zero Emissions Technologies through Local Policy and Planning

The City of San Diego's transition to zero emissions technologies relies on the strategic formulation and implementation of local policy and planning initiatives. Implementation of ZEV actions exist across multiple City departments and planning tools, including the CAP, MMP, street design and engineering tools, and Environmental Justice element. Shifting to zero emissions transportation technologies should encompass all aspects of ZEV mobility, from personal vehicles to public transit, micromobility infrastructure, and shared mobility services. Planning should prioritize the design and construction of infrastructure, such as EV charging stations and hydrogen refueling stations, especially in high-traffic areas, heavily traveled logistics routes, and structurally excluded and disadvantaged communities. The integration of ZEV infrastructure into existing and new multimodal mobility hubs and Transit-Oriented Development (TOD) will be a significant part of this strategic planning.

Action 1: Update Zoning and Land Use Regulations Related to ZEV Infrastructure

Action 2: Update Building and Construction Codes for Roadway Infrastructure to Accommodate Current and Future ZEVs

Action 3: Update Building Codes to Require New Developments and Major Renovations to Include ZEV Charging Infrastructure

Action 4: Promote the Integration of ZEV Infrastructure in Multimodal Mobility Hubs and TOD

Action 5: Facilitate the Adoption of Hydrogen Fuel Cell Technology



ACTION 1: UPDATE ZONING AND LAND USE REGULATIONS RELATED TO ZEV INFRASTRUCTURE

As urban areas evolve and new transportation technologies emerge, the City must adapt its zoning and land use regulatory frameworks to meet legislative, climate, and San Diegans' needs. As ZEVs replace internal combustion engine (ICE) vehicles, San Diego will face the challenge of repurposing existing ICE-related infrastructure. For example, the City could establish policies or guidelines to facilitate upgrades to conventional fueling stations into multiservice hubs with electric vehicle (EV) charging points near community amenities or major transportation corridors. By revising codes and regulations to consider ZEVs, sustainable transportation enterprises, and proactive urban planning, the City can minimize disruption, foster new business opportunities, support job creation, and ensure seamless integration of ZEVs into the City's transportation fabric. Engaging business owners and offering support, both technical and financial, can ease this transition. This starts with a detailed examination of zoning codes to identify constraints tied to ICE vehicles that are not applicable to ZEVs (e.g. air quality and noise pollution) and that could obstruct ZEV infrastructure expansion. Additionally, given the unique nature of hydrogen fueling, the City's zoning codes should also account for the specialized infrastructure demands of hydrogen stations.



ACTION 2: UPDATE BUILDING AND CONSTRUCTION CODES FOR ROADWAY AND INFRASTRUCTURE TO ACCOMMODATE CURRENT AND FUTURE ZEVs

As ZEVs become more common on roadways, in parking lots, and garages, the City needs to update our building and construction codes to accommodate the increased weight of all ZEVs, including medium- and heavy-duty. Battery weight currently makes EVs heavier relative to their ICE counterparts. The City's current standards for roadways and parking facilities were not designed with the increased weight in passenger vehicles and larger buses and trucks in mind. The increased weight could also increase roadway degradation rates and may exceed current design capacity thresholds. The City should analyze potential impacts of the increased weight of ZEVs and consider revising codes and standards to minimize disruption, avoid unplanned maintenance costs, and mitigate negative impacts of disruptions to the logistics economy.





ACTION 3: UPDATE BUILDING CODES TO REQUIRE NEW DEVELOPMENTS AND MAJOR RENOVATIONS TO INCLUDE ZEV CHARGING INFRASTRUCTURE

Integrating ZEV infrastructure requirements into local building codes for new developments and major renovations supports the growing number of ZEVs throughout the City. Quickly advancing these changes to building codes reduces the need for retroactive installations that could be more challenging and costly. As noted in the CAP Measure 2.3 supporting actions, the City is working to update building codes to increase EV charging infrastructure at commercial developments to allow drivers to leverage cheaper midday rates due to abundant renewable energy and greater grid capacity. Further expansion for new development or major renovations should be consistently assessed in relation to local EV adoption trends and charging behavior.



ACTION 5: FACILITATE THE ADOPTION OF HYDROGEN FUEL CELL TECHNOLOGY

The primary focus of state regulations has been on EV adoption due to commercial availability; however, it is important for the City to include fuel cell electric vehicles and associated hydrogen refueling infrastructure in future ZEV programs and planning. Hydrogen plays a crucial role in sectors that are hard to electrify, such as heavy-duty transportation (e.g. long-haul trucks, airport, and rail) and industrial processes, and provides a lower-carbon option for these essential vehicles. Recognizing the challenges in electrifying these sectors, the City should engage in a collaborative and strategic approach with these sectors to facilitate the integration of hydrogen technology and subsequent decarbonization.



ACTION 4: PROMOTE THE INTEGRATION OF ZEV INFRASTRUCTURE IN MULTIMODAL MOBILITY HUBS AND TOD

Strategically integrating ZEV infrastructure with broader mobility goals into the urban fabric of San Diego can expand the access and application of transportation options across the City. Mobility hubs and TOD, prioritized in City land use policies, CAP Strategy 3, as well as the SANDAG 2021 Regional Plan⁵, serve as focal points of transport convergence, where San Diegans move between various modes of transport, from buses to bicycles to ZEVs, and beyond. Thus, ZEV infrastructure is a critical component of multimodal mobility hubs and TOD. By embedding ZEV charging and supporting infrastructure into these focal points, the City can elevate the convenience and appeal of using ZEVs, while also facilitating charging solutions for on-demand mobility services and other transport providers, supporting its CAP goals.



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Strategy Pillar II: Programs & Processes

Facilitate Infrastructure Deployment through Streamlined Programs and Processes

The development of a broad and accessible ZEV infrastructure network is a multifaceted undertaking that necessitates well-coordinated and streamlined City services and processes. Streamlining helps mitigate potential administrative bottlenecks and make it easier for residents, businesses, and communities to participate and feel confident in the transition. Minimizing bureaucratic complexities and enhancing interdepartmental coordination aligns ZEV infrastructure deployment with sustainability targets and enables the City to respond to the evolving needs of all stakeholders. This strategic pillar is composed of four (4) interconnected actions, with the overarching goal of streamlining processes to facilitate the accelerated adoption of ZEVs.

Action 1: Streamline Processes for Infrastructure Installation

Action 2: Establish Programs to Promote Electric Mobility Across All Modes

Action 3: Explore Funding Opportunities that Encourage Local ZEV Deployment and Offset Costs for Residents and Small Businesses

Action 4: Lead by Example and Electrify City's Own Fleet



ACTION 1: STREAMLINE PROCESSES FOR INFRASTRUCTURE INSTALLATION

Complex administrative processes for site assessment, permitting, upgrading, and energizing essential charging and refueling stations can deter potential infrastructure developers, lengthen project timelines, raise costs, and slow ZEV adoption rates. The state has prioritized EVs and charging infrastructure, including the adoption of permit streamlining requirements (AB 1236, Chiu; AB 970, McCarty). To expedite ZEV infrastructure installations in the City, current permitting processes for EV charging installations should be regularly reviewed and improved as the workforce is trained and technology advances. The current permit streamlining process includes an online portal for easy access, submission, and tracking of permit applications. The City must also develop a permit streamlining process for hydrogen by 2030 per newly legislated requirements in SB 1291 (Archuleta). The City should review land use regulations in relation to suitability of ZEV infrastructure and areas where streamlining deployment may be beneficial to create a comprehensive charging and fueling network. Establishing a dedicated program or set of processes for EV charging installations in the public right-of-way should also be explored to optimize public accessibility to charging infrastructure for multiple modes.



ACTION 2: ESTABLISH PROGRAMS TO PROMOTE ELECTRIC MOBILITY ACROSS ALL MODES

There is a compelling need to craft programs and policies that encourage the electrification of diverse modes of transportation and trip-chaining, be it through shared electric bike initiatives or EV car-sharing platforms in alignment with the City's MMP. Integrating electric mobility solutions will enhance access and reliability for programs that provide trip connection options and support multi-modal transportation throughout the City and beyond. This could include the deployment of pilot projects and programs or the development of public Level 1 charging facilities for e-bikes and e-scooters in compliance with safety standards for the operation and charging of these devices in San Diego. Public-private partnerships can also help increase electric mobility options while reducing demands on City resources through the expansion of flexible fleet programs such as the FRED (Free Ride Everywhere Downtown)⁶ and Beach Bug⁷ neighborhood circulators.





ACTION 3: EXPLORE FUNDING OPPORTUNITIES THAT ENCOURAGE LOCAL ZEV DEPLOYMENT AND OFFSET COSTS FOR RESIDENTS AND SMALL BUSINESSES

The City should proactively pursue grants or subsidies to enhance local EV charging and refueling infrastructure, incentivizing local consumers to invest in ZEVs, and raising public awareness. These opportunities include the federal Charging and Fueling Infrastructure Program (CFI)⁸, National Electric Vehicle Infrastructure Program (NEVI)⁹, ChiLL-2¹⁰, CALeVIP¹¹, and clean transportation programs¹². This includes accessing grants and subsidies available through federal and state government clean transportation programs and incentives, as well as connecting local residents and businesses with non-profit and private sector initiatives to finance ZEV adoption. Funding programs partnerships could also be used to establish City-based rebates for ZEV purchases and charging subsidies for income-qualified residents.



ACTION 4: LEAD BY EXAMPLE AND ELECTRIFY CITY'S OWN FLEET

Conversion of the City's fleet is not only responsive to existing state and local regulations, but also directly contributes to improved air quality for our residents. These vehicles service neighborhoods on a daily basis for trash collection, street sweeping, public safety, and general community maintenance services at our parks and recreation facilities. By electrifying its own fleet, the City is showcasing the viability and benefits of these technologies including decreased maintenance costs and increased air quality for the communities they serve. The City is developing a fleet electrification plan that defines clear targets, timelines, and strategies for integrating charging infrastructure, budget allocation, personnel training, and updates to vehicle procurement policies. Upgrades to fleet maintenance and storage facilities will also be required. To ensure a seamless transition to these innovative technologies and empower its workforce with knowledge about EVs, the City should invest in employee education and training. The City's actions build public trust and conveys to industries, private individuals, and other stakeholders that the transition to zero emissions transportation is both achievable and beneficial.







Strategy Pillar III: Community Outreach & Engagement

Foster ZEV Transition through Direct Community Outreach, Engagement, and Resources

Tailored outreach, engagement, and resources for residents and local businesses are crucial to the ZEV transition. Community outreach and engagement enhances public awareness and understanding of ZEVs, their environmental and economic benefits, the infrastructure needed to support them, and increase acceptance among prospective consumers. There isn't a one-size-fits-all way to conduct outreach. Diverse engagement strategies that meet people where they are to address specific concerns and constraints will ensure that all communities in San Diego, regardless of age, language, culture or socioeconomic background, are included in this transition. Strong community relationships are critical to the development of inclusive strategies and resources for residents and business to make informed consumer decisions and disparities in ZEV access and adoption. These resources could include guidance on navigating the charger permitting process, market comparisons of different vehicles, and available incentive programs. To accomplish this, the City is taking a multifaceted approach with four (4) key actions that prioritize community engagement, provide resources and technical assistance.

Action 1: Provide Targeted Support to Structurally Excluded and Disadvantaged Communities for ZEV Adoption

Action 2: Enhance Community Awareness of the Transition to ZEVs

Action 3: Provide Resources to Navigate Charger Permitting and Make Informed Charger Decisions

Action 4: Support Development of Technical Assistance Programs to Prepare Local Businesses, Fleets, and Dealerships for ZEV Transition



ACTION 1: PROVIDE TARGETED SUPPORT TO STRUCTURALLY EXCLUDED FOR ZEV ADOPTION

The City must prioritize action and investment to support the members of our communities faced with constraints due to historic underinvestment, including transportation and electrical infrastructure. Leveraging tools such as the City's Environmental Justice Outreach and Engagement Plan¹³, ZEV adoption initiatives should focus on identifying and engaging communities through comprehensive public engagement, unique to each community, to understand these constraints. Continuing dialogues with structurally excluded communities and the organizations that serve them will provide insights into the unique barriers they face regarding ZEV adoption, including issues related to land use changes and amenity availability. Establishing open channels of communication helps the City address the specific needs of each community, ensuring that no group is left behind in this transition. Tailored campaigns targeting different demographics and needs and leveraging local ZEV advocates can ensure a wide-reaching and resonant message. To bridge knowledge gaps and language barriers around ZEV technology, the City could offer dedicated technical support through partnerships with Community-Based Organizations (CBOs) and/or local employers attuned to community requirements.



ACTION 2: ENHANCE COMMUNITY AWARENESS OF THE TRANSITION TO ZEVs

The transition to ZEVs presents both unique opportunities and challenges that a significant portion of the San Diego residents and businesses may not be fully aware of or understand. This gap in knowledge for residents and business owners can lead to hesitation in adoption and a slower realization of the broader environmental and economic benefits of ZEVs. To bridge this knowledge gap, the City should conduct comprehensive outreach and engagement to help educate and spotlight the benefits of ZEVs in partnership with local CBOs, businesses, service providers, and vehicle retailers and rental agencies. Partnerships with CBOs can provide insight on refinements to the City's outreach methods such as in-person events (e.g. Ride and Drives, workshops) and facilitate the successful distribution of educational materials (e.g. fliers and handouts, media publications) about policies, incentive programs, and community-wide benefits. Highlighting real-life challenges, paired with best practices and solutions, will empower the community to confidently embrace ZEVs and equip residents with best practices for navigating the ZEV transition.





ACTION 3: PROVIDE RESOURCES TO NAVIGATE CHARGER PERMITTING AND MAKE INFORMED CHARGER DECISIONS

Transitioning to a zero emissions transportation future involves technical, regulatory, and logistical challenges, particularly relating to the installation and use of EV chargers. Making informed decisions is crucial for investments in charging infrastructure to deliver optimal value and performance. For fleets, business owners, property developers, and residents, understanding the various types of chargers by power level (e.g. Level 1 vs. Level 2, or a 150kW vs. 350kW DCFC) can be overwhelming. Assumptions about charging behavior and location could lead to overspending or underspending on chargers. Simply complying with permit requirements can be a daunting task. In addition to developing a permitting guide for EV charging stations, the City should provide broader resources to stakeholders regarding charger types and use cases, the installation processes, power requirements, and other potential challenges of EV charger deployment. Workshops or webinars can offer a hands-on walkthrough of the permit process, addressing unique challenges for groups like fleet operators and property managers.



ACTION 4: SUPPORT DEVELOPMENT OF TECHNICAL ASSISTANCE PROGRAMS TO PREPARE LOCAL BUSINESSES, FLEETS, AND DEALERSHIPS FOR ZEV TRANSITION

In response to the unique challenges posed by the rapid transition to ZEVs, the City recognizes the need for technical assistance programs for local businesses, fleets, and dealerships. The City should engage with local businesses and dealerships, leveraging established relationships across departments such as Economic Development, General Services, and Development Services, as well as partners like the San Diego Regional Clean Cities Coalition, soliciting feedback on benefits, challenges, and needs. This engagement could inform the establishment of a platform or program to connect similar organizations; identify technical, financial, or policy needs and resources for industries facing similar challenges; and share best practices and lessons learned.





SD sustainability clean
energy vehicle

The City of
SAN DIEGO
101-193



Strategy Pillar IV: Collaboration & Partnerships

Coordinate Local and Regional ZEV Transition Strategies

Transportation electrification cannot be done in a vacuum; we need to collaborate not just within different City departments but also on a regional level to build an integrated and connected charging network. The actions outlined in the ZEV Strategy will help us contribute to the region and state GHG emissions reduction goals. Forming partnerships, especially with local businesses, nonprofits, and public institutions, are crucial for an integrated approach to expanding the ZEV ecosystem. Part of this strategy involves training or transitioning skills necessary to grow our local workforce, ensuring they are qualified to install, operate, and maintain chargers and vehicles. By leveraging existing relationships, we plan to synchronize and improve coordination among various community stakeholders, enhance engagement, and build trust across currently disparate industries of auto mechanics, electricians, emergency responders, micromobility operators, software developers, and cybersecurity managers. To accomplish this, the City is taking an intentional approach with six (6) key actions.

The City of San Diego should be at the forefront of promoting entrepreneurship and innovation in the clean technology sector. Leveraging local and regional innovation hubs and incubators, and partnership with private investors, there's a unique opportunity to spur funding and expansion for startups and enterprises focused on ZEV technologies and zero emissions transportation.

Action 1: Engage in Regional ZEV Collaboration to Optimize Community Interaction and Prioritize Equity

Action 2: Collaborate with Regional and State Representatives to Advocate for Legislation and Funding that Fosters Electric Mobility

Action 3: Collaborate with Labor, Community Colleges, and Workforce Partners to Support Workforce Development

Action 4: Promote Public-Private Partnerships and Explore New Charging Business Models to Meet Local Charging Needs

Action 5: Collaborate with Utilities to Provide Resources to Facilitate Informed Charger Decisions

Action 6: Collaborate with First and Second Responders on Vehicle and Battery Safety Training



ACTION 1: ENGAGE IN REGIONAL ZEV COLLABORATION TO OPTIMIZE COMMUNITY INTERACTION

The City values consistent and meaningful community engagement when promoting ZEV initiatives. With numerous regional and local agencies reaching out to the same communities on overlapping topics, residents risk becoming overwhelmed and losing interest because of the repetitive nature of the engagements. Leveraging the Equity Forward¹⁴ framework to create a more engaging experience, City departments can collaborate on outreach materials and events with local and regional partners. For example, the City should leverage its membership in regional planning boards, including the SANDAG and the AB 617 Community Air Protection Program, so that regional and local community engagement strategies are aligned and foster a unified, efficient approach to ZEV adoption with complementary interactions and messaging.



ACTION 2: COLLABORATE WITH REGIONAL AND STATE REPRESENTATIVES TO ADVOCATE FOR LEGISLATION AND FUNDING THAT FOSTERS ELECTRIC MOBILITY

The success of electric mobility relies on a comprehensive framework that exceeds local boundaries, necessitating collaboration with higher levels of government. By aligning efforts with regional and state agencies, and national programs such as NEVI and CFI programs, the City can maximize resources, share knowledge, and advocate more effectively for ZEV-related legislation. This collaborative approach amplifies the collective voice of municipalities and helps highlight unique needs and opportunities, crucial to influencing comprehensive ZEV policies including electric grid investments and technologies; hydrogen infrastructure and deployment; and cybersecurity standards. This collaboration also makes the City and region more competitive for funding and private investment.





ACTION 3: COLLABORATE WITH LABOR, COMMUNITY COLLEGES, AND WORKFORCE PARTNERS TO SUPPORT WORKFORCE DEVELOPMENT

To prepare for growth in ZEV and ZEV infrastructure, cities require a local workforce trained and certified to work on ZEV technologies. Without such, the deployment and maintenance of ZEVs will face constraints that could undermine sustainability goals. Community colleges and vocational institutions offer a foundation for nurturing the requisite skills. The City will continue to collaborate and support these institutions in crafting curricula centered on ZEV technology, guaranteeing a skilled workforce. Prioritizing workforce development allows the City to foster economic growth with the creation of local high-paying jobs, facilitate innovation within the sector, and support the skill development of its own workforce. Educational programs such as those provided through IBEW Local 569 and the Electric Vehicle Infrastructure Training Program (EVITP)¹⁵, can cater to the needs of the ZEV sector, establish pipelines for internships, apprenticeships and job placement partnerships, and ensure that businesses, potential employees, and current employees are prepared for the ZEV future.



ACTION 4: PROMOTE PUBLIC-PRIVATE PARTNERSHIPS AND EXPLORE NEW CHARGING BUSINESS MODELS TO MEET LOCAL CHARGING NEEDS

The City's initiative to expand the public EV charging network requires cost-effective, efficient, and innovative strategies. Public-private partnerships – combining private sector expertise, efficiency, and finances with public resources and values– lead to faster deployment, enhanced accessibility, and better adaptability to evolving EV technologies. Recognizing the changing market dynamics, the City's proposed Public EV Charging Program (Strategy Pillar V. Action 2) is an innovative example of this opportunity. Through a proposed exclusive multi-year concession agreement for installation of EV chargers on City-owned parking lots, the City's EV charging partnership would finance, design, build, operate, and maintain EV charging infrastructure on City-owned parking lots. This innovative approach would allow the City to quickly scale up infrastructure, enable equitable access, and increase installations across more sites while reducing upfront costs and risk to the City. This model can better leverage external funding opportunities to improve the overall return on investment and use of taxpayer funds. In anticipation of the increasing demand for zero emission medium- and heavy-duty vehicles, the City must collaborate with the private sector and regional partners to identify strategic locations along major logistics corridors for charging and fueling hubs for electric or hydrogen fuel cell commercial vehicles.



ACTION 5: COLLABORATE WITH UTILITIES TO PROVIDE RESOURCES TO FACILITATE INFORMED CHARGER DECISIONS

Collaboration with utilities is essential to ensuring enough capacity on the electrical grid to power EV chargers wherever they are needed. The City should collaborate with SDCP and SDG&E to develop tools, processes, and pilot programs to support real-time grid capacity insights, rate structures, and other resources to support timely deployment of infrastructure capacity, facilitate rapid interconnection, and incentivize charging best practices. This collaboration will be critical as the confluence of electrifying transportation and buildings, and integration of other new innovations, will impact ratepayer costs if not implemented with load management and grid-edge technologies (e.g. vehicle-to-grid, vehicle-to-home, charging management software, and energy efficient, price-responsive energy systems). The scale and diversity of the City's energy use offers a large opportunity to pilot new rates, programs, and technologies that can then be deployed across SDCP and SDG&E's service territories.



ACTION 6: COLLABORATE WITH FIRST AND SECOND RESPONDERS ON VEHICLE AND BATTERY SAFETY TRAINING

To fully advance the wide adoption of ZEVs, both EV and hydrogen fuel cell, and deploy the necessary infrastructure, all aspects of vehicle and infrastructure use must be considered. As this technology is more widespread, first and second responders will encounter more and more ZEVs on our roadways, and they must be properly trained. First responders like police, fire, and emergency medical personnel, and second responders, such as tow truck drivers, utility specialists, and social services, must be properly trained and equipped to arrive on the scene of an incident and ensure civilian and responders' safety. Examples of ways to prepare and improve confidence in dealing with ZEVs and ZEV technology include using National Fire Academy¹⁶ training modules, training materials, and resources. Ensuring that first and second responders have access to the latest firefighting and safety tools is crucial for guaranteeing their protection and full preparedness when arriving on the scene. Collective outreach and engagement to first and second responders, as well as community members and residents, will be crucial to ensure users are informed of the appropriate methods for usage, storage, recycling, and disposal of ZEVs and related technology. Educating these groups on best practices and safety protocols will be key in fostering a safe and efficient transition to ZEV adoption.



Strategy Pillar V: Infrastructure Buildout

*Create Reliable, Accessible, and
Equitable Charging Infrastructure*

The City of San Diego acknowledges the substantial need for expanding publicly accessible charging infrastructure. The 2021 A2Z Collaboration's San Diego Regional Electric Vehicle Gap Analysis (A2Z Gap Analysis¹⁸) estimated that the greater San Diego region will need over 100,500 public Level 2 charging ports, approximately 6,000 public DCFC charging ports, and 44 public hydrogen fueling points to meet forecasted ZEV demands by 2030 (**Figure 4**). Federal and state agencies have prioritized substantial infrastructure investments to ensure goals and targets are met. The Federal government continues to take steps to facilitate infrastructure installations on public and publicly accessible lands nationwide. Some examples include the establishment of Alternative Fuel Corridors and the NEVI and CFI Programs. The State is responsible for administering California's allocation of NEVI and, in conjunction, other state agencies continue to elevate the need and funding for the deployment of publicly accessible charging infrastructure.

There is uncertainty surrounding the extent to which local property and business owners will retrofit parking facilities to meet the demand for residential and workplace charging, and whether these locations will provide equitable access across communities. Therefore, the City must step in to help satisfy the demand for publicly accessible charging. This is particularly critical in neighborhoods projected to experience the greatest need for public EV charging facilities, including low- and moderate-income and multi-family residential communities where access to home charging may be limited. This strategy pillar calls for three (3) actions, with the core objective of establishing safe, reliable, accessible, and equitable public charging infrastructure.

Action 1: Develop an Equitable ZEV Infrastructure Distribution Framework

Action 2: Identify Public Land for ZEV Infrastructure Development

Action 3: Explore Opportunities to Improve Grid and Community Resiliency through EV Infrastructure and Advanced Technology Deployment



ACTION 1: DEVELOP AN EQUITABLE ZEV INFRASTRUCTURE DISTRIBUTION FRAMEWORK

The City is committed to an equitable distribution of public ZEV infrastructure, so that every San Diegan can access the benefits of the zero emissions transformation and areas of greatest need are not left behind. This is critical for the City's commitment to social justice and fairness. Establishing a distribution framework can maximize potential environmental benefits by promoting widespread adoption of clean transport options in diverse communities. To be effective, such a framework needs to focus on data-driven metrics to inform benchmarks for charger network density and location prioritization; and future assessments in areas with low rates of ZEV adoption to highlight infrastructure gaps and opportunities. The City should also continually monitor the policy, funding, and guidance of federal and state agencies so that projects and initiatives are consistent and eligible for these opportunities as technology and programs evolve.



ACTION 2: IDENTIFY PUBLIC LAND FOR ZEV INFRASTRUCTURE DEVELOPMENT

Public lands, because of their strategic distribution and availability, emerge as vital assets for the ZEV transition. Optimizing use of public lands can ease the cost barrier hindering private sector investment, catalyzing a more comprehensive and equitable charging network. As the City strives to meet increasing demands for EV charging infrastructure, it anticipates challenges related to site identification and availability of real estate. The City, as a significant landowner, can set a precedent by deploying infrastructure on its properties, prioritizing equitable access and ensuring operational uptimes for charging facilities across locales and demographics. The City's proposed Public EV Charging Program is an innovative means for achieving this goal. Based on extensive formal and informal market research, this program would employ a portfolio approach to EV charger deployment, balancing the private sector need for positive returns on investments with City equitable deployment priorities. The City would enter into an agreement with a contractor to finance and install EV chargers at City-owned parking lots, equitably distributing and operating a reliable EV charging network, while also facilitating innovative partnership opportunities (Strategy Pillar IV. Action 4). This Program would not only provide access to EV chargers across the City to those not able to charge at home, but also workplace charging for the over 11,000 City employees. The City is also responsible for managing on-street parking within the public right-of-way, which presents a unique opportunity for curbside charging for multiple electric mobility options. Installing chargers near light poles and at busy commercial corners can make infrastructure deployment more feasible and significantly extend its reach.

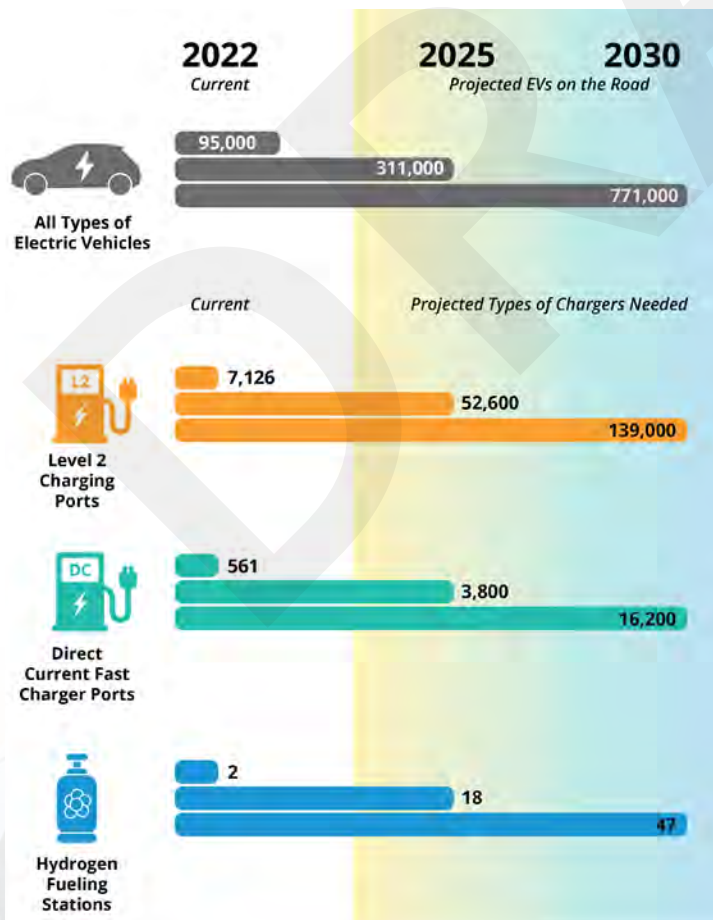


FIGURE 4. SAN DIEGO COUNTY TOTAL EV CHARGING AND HYDROGEN REFUELING INFRASTRUCTURE GAP ANALYSIS

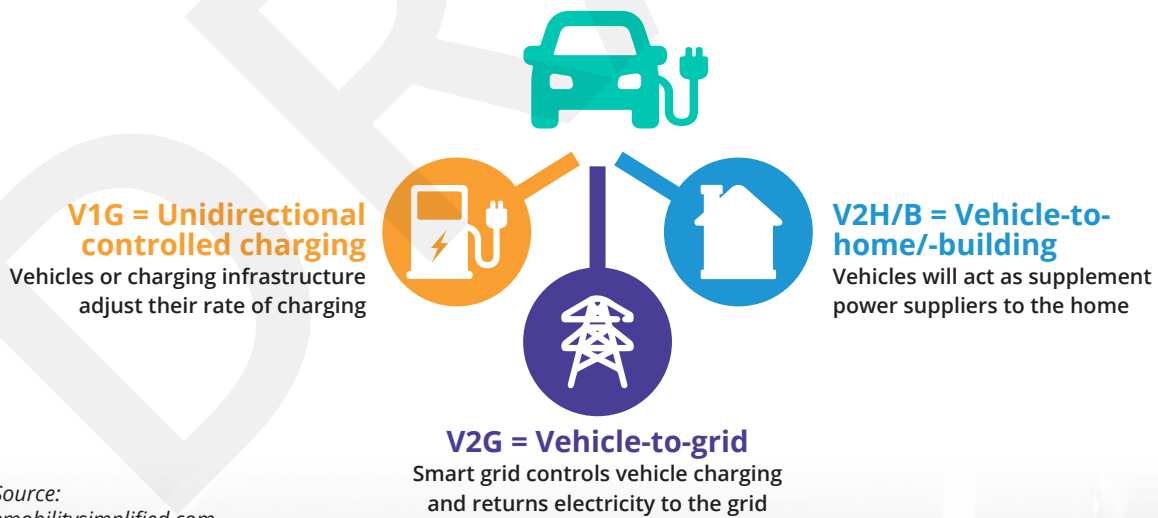


ACTION 3: EXPLORE OPPORTUNITIES TO IMPROVE GRID AND COMMUNITY RESILIENCY THROUGH EV INFRASTRUCTURE AND ADVANCED TECHNOLOGY DEPLOYMENT

The integration of ZEVs into San Diego’s transportation ecosystem presents new and innovative opportunities to connect people and places around the City and achieve our CAP goals. ZEVs promise reduced carbon footprints, improved air quality, and lower operational cost, but their increasing prevalence imposes significant demands on the power grid. Without strategic adjustments, these demands could strain the grid and contribute to disruptions and inefficiencies, particularly during peak demand. To proactively address these potential risks, the City should focus on distributed energy resources, load management solutions, and microgrid technologies. The City should explore opportunities to align EV charging with abundant daytime solar generation and

battery storage to avoid pulling power from the grid during more expensive times of the day, maximizing economic, environmental, and resiliency benefits of these technologies. Innovations such as charging demand–response programs where vehicles receive a signal to start charging when it’s less expensive, as well as vehicle-to-grid technologies where EVs act as grid service assets providing power or voltage regulation, present opportunities for dynamic energy management solutions and resiliency for our City.

As the City expands its charging infrastructure network, it should also explore opportunities to use EVs as a grid asset. Opportunities might include integrating grid management and microgrid technologies into public charging locations to improve grid resiliency and providing working examples for this technology on private property. Additionally, in conjunction with the City’s comprehensive climate resiliency plan, Resilient SD¹⁸, the City should conduct thorough site assessments that consider risks such as flooding, wildfire, and seismic events to inform decisions about infrastructure placement and to employ resilient design strategies tailored to each location’s unique impacts.



Source: *emobilitysimplified.com*

FIGURE 5. TYPES OF VEHICLE-GRID INTEGRATION (VGI) SMART CHARGING



The Road to 2035

The transition to ZEVs is not simply a shift in vehicle technology but an economic transformation that will affect a range of secondary industries and land uses. It requires the City acknowledge the likelihood of unknown and uncertain factors that will emerge and need a flexible, proactive response. The strategies and actions outlined in this Strategy are designed to be adaptable, allowing for necessary course corrections and refinements. They also aim to integrate with current and future initiatives to deliver a healthy and equitable future for all City residents.



On-Going Activities

As the City progresses toward a greener, cleaner, and more sustainable future, the ZEV Strategy includes actions already underway, which serve as a foundation for the City to build and expand upon and create greater opportunities in all communities. Some of the successful initiatives already underway are:





Tracking & Monitoring

Establishing and tracking metrics to monitor the impact of policies, programs, processes, and projects is crucial. Doing so ensures their effectiveness and value over time or highlights areas that need to change. Several of these metrics are already reflected in the Climate Action Implementation Plan¹⁹ and individual department CAP workplans. Future ZEV efforts will also be integrated into existing tracking and monitoring efforts to ensure consistency, minimize redundancy, and promote a collaborative approach in evaluating the ongoing effectiveness of initiatives aimed at reducing GHG emissions. Identification and review of new data sources also allows the City to provide up-to-date resources to residents and businesses. The City must continuously identify innovative technologies, compete for outside funding, and align with other agencies to ensure San Diegans have the best available information to facilitate smart decision-making and investments.

With consistent tracking and monitoring, the City can adjust programmatic and policy approaches, course correct projects and processes, and ensure we stay on track to meet our climate goals. The ZEV Strategy will be regularly updated in conjunction with the CAP to remain consistent and in alignment with City priorities and goals as well as local, regional, state, and federal policies and guidelines (**Figure 6**).

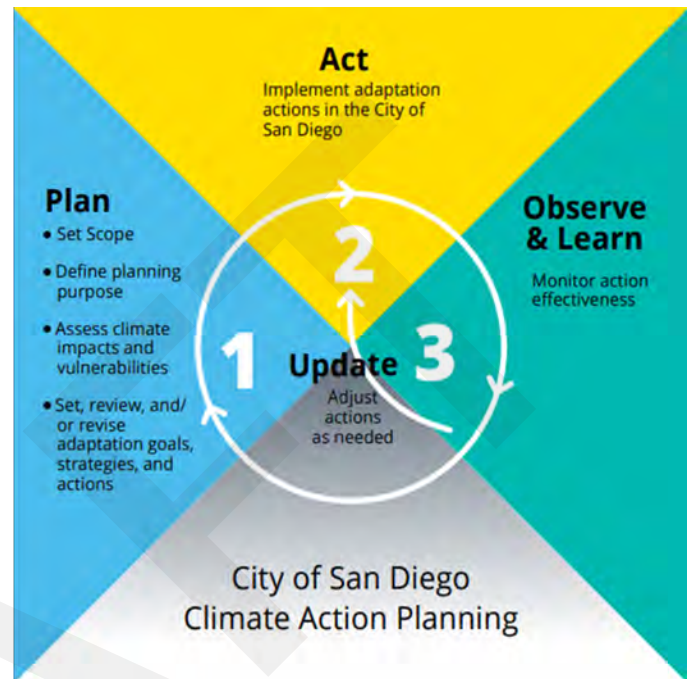


FIGURE 6. 2022 CAP UPDATE PROCESS





Driving Forward

The ZEV Strategy's core pillars, and the actions they comprise, will facilitate an accelerated and more equitable transition to zero emissions transportation. However, the City also understands that there are many components of this transition we cannot yet plan for or do not control. Each of our communities are unique and may not mirror trends or needs observed in other parts of the region, state, or the country.

As ZEV adoption increases, traditional land use planning and regulations will need to be evaluated for any necessary adjustments to accommodate these new needs, technologies, and transportation patterns. For example, opportunities to site chargers in locations where traditional fueling stations are not currently allowed could foster a more cohesive and inclusive charging network. Areas of the City that may currently preclude overnight parking, goods transport, or fueling due to noise or air quality concerns from combustion engines can be reevaluated. Additionally, charging needs for growing mobility types, like e-bikes, scooters, and neighborhood circulators, present distinct parking and charging demands than were present when many existing codes and regulations were adopted.

Workforce training is already changing to reflect these new technologies and infrastructure, with new career fields and certifications developing around them. Ensuring San Diego has strong workforce development programs to strengthen and grow a locally trained and skilled workforce to support the technological transition is crucial. These trades include vehicle mechanics, laborers, electricians, first responders, software engineers, and dealerships. Ongoing and regular engagement with the labor and educational communities should be a priority to establish strong and long-lasting programs for workers with opportunities for growth and long-term job security.

The additional weight of ZEVs on our roadways should be considered as part of broader policies related to medium- and heavy-duty trucks and transport vehicles. The increased weight may increase roadway degradation rates, inducing more frequent maintenance and operational disruptions. Reevaluation of construction design guidelines and policies will be crucial to ensuring existing and new roadways, parking lots/structures, and ingress and egress points can withstand the increased impact of these heavier vehicles.

The increase in ZEVs will have a significant impact on capacity and performance of the electric grid. Opportunities to leverage technology advancements and innovative solutions to help offset grid demand and enable charger deployment will be essential to equitably deploying a comprehensive EV charging network across the City. Technologies such as battery storage, on-site solar systems, microgrids, and V2X can lessen the burden to the grid and its users. Collaboration on these emerging technologies and requisite policy, regulatory, and legislative considerations at all levels of government will be necessary to successfully support grid reliability.

Vehicle transportation is a vast economic sector with multiple primary and supporting industries, ranging from personal cars to taxis and rideshare companies to transit vehicles; from micromobility to heavy-duty logistics and freight, and from vehicle manufacturers, dealerships and maintenance providers to electronics engineers and software developers. All these industries and more will be impacted in some way by the ZEV transition. Changes to how local jurisdictions approach land use, integrate new fuel types, support the automotive workforce, address electric grid capacity and resiliency, and adapt to behavior changes in the market, will affect each stakeholder differently. The City must approach stakeholders in all of these areas as partners who can amplify information to community members and customers; highlight potential constraints or confusion in City policies; and identify needs and innovation to expand access to the opportunity of this emerging economy. The City must remain adaptable, in partnership with trusted stakeholders, to ensure we can proactively respond to the effects of this ZEV transition – those we know and those we have yet to identify.



Charging Ahead

In alignment with the ambitious goals and actions set forth in the City's CAP, the multifaceted approach of the San Diego ZEV Strategy will guide decision-making, foster collaborative efforts among stakeholders, and promote a just transition toward a cleaner and more resilient City for future generations. The implementation of the ZEV Strategy will be marked by feedback loops and iterations within and between the strategy pillars to ensure efforts taken now and in the future are as informed and effective as possible. The actions are designed to be flexible, with each strategy pillar containing a mix of short and long-term objectives, allowing for adaptability and responsiveness to the City's evolving needs and circumstances. Implementation of many of the actions identified in this Strategy is underway.

More ZEV Strategy implementation actions are found in policies and plans already adopted including the CAP, MMP, and Resilient SD. To develop comprehensive and integrated implementation of the ZEV Strategy, staff will identify citywide actions where ZEV components will be proactively incorporated as well as those actions exclusive to the Strategy, and the metrics, data, and stakeholders necessary for their success. The ZEV Strategy is not an isolated effort; it will be reevaluated and revised in coordination with updated CAP goals, MMP updates, shifts in City and State policy directions, market dynamics, and other evolving factors, paving the way for a more sustainable, equitable, and prosperous City of San Diego.



Endnotes

- 1 [ZEMBOP](#)
- 2 [Our Climate, Our Future](#)
- 3 [Mobility Master Plan](#)
- 4 [A2Z Collaboration](#)
- 5 [2021 Regional Plan](#)
- 6 [FRED](#)
- 7 [Beach Bug](#)
- 8 [CFI Program](#)
- 9 [NEVI Program](#)
- 10 [ChiLL-2](#)
- 11 [CALeVIP](#)
- 12 [Clean transportation programs](#)
- 13 [Environmental Justice Outreach and Engagement Plan](#)
- 14 [Equity Forward](#)
- 15 [EVITP](#)
- 16 [National Fire Academy](#)
- 17 [A2Z Gap Analysis](#)
- 18 [Resilient SD](#)
- 19 [Climate Action Implementation Plan](#)

