FINAL 2023 BUTTE ZERO EMISSION VEHICLE READINESS PLAN

PRESENTED BY: BUTTE COUNTY ASSOCIATION OF GOVERNMENTS

326 HUSS DRIVE, SUITE 150, CHICO, CA 95928

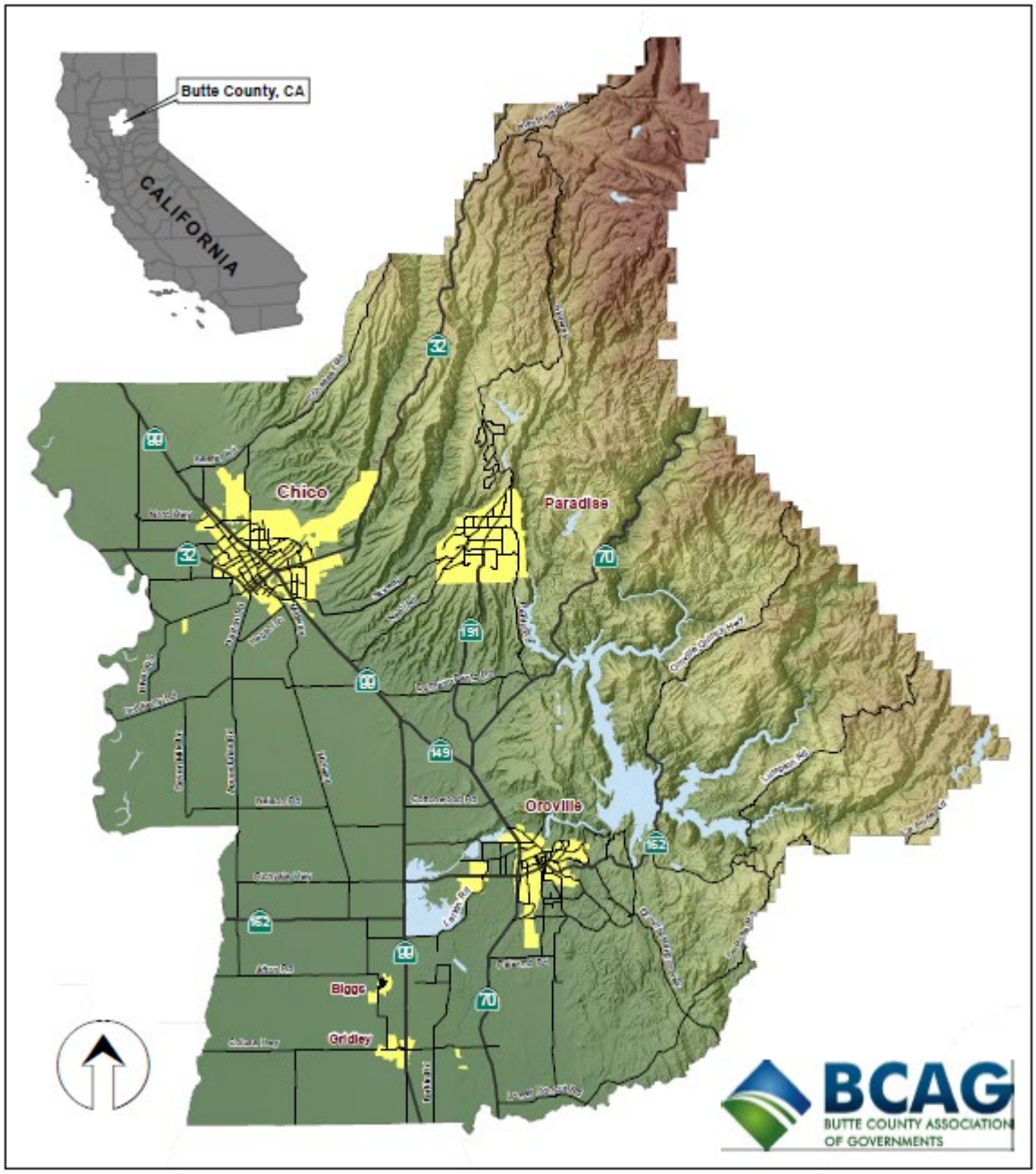

Figure A. Butte County Location Map

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

The following defines the acronyms, abbreviations and terms used in the Butte EV Readiness Plan.

AB	Assembly Bill
AC	Alternating current
ACC	Advanced Clean Cars Program
ADA	Americans with Disabilities Act of 1990, which prohibits discrimination based on disability.
Amps	A unit of electrical current
ARB	California Air Resources Board
BEV	Battery electric vehicle. A fully electric vehicle fueled only by the onboard battery. A BEV is a type of ZEV.
CALGreen	California Green Building standards
CAP	Climate Action Plan
CARB (or ARB)	California Air Resources Board
CCR, Title 24	California Code of Regulations, Title 24. Commonly known as the California Building Standards Code.
CEC (or Energy Commission)	California Energy Commission
CCSE	California Center for Sustainable Energy
Charging station	A parking spot with charging equipment designed to charge batteries or other energy storage options within electric vehicles. Chargers vary in electrical voltage. Term used interchangeably with EVSE.
Charging level	Standardized indicators of voltage at which an electric vehicle's battery is recharged. Commonly, these are Level 1 (120 VAC), Level 2 (208/240 VAC) and direct current (DC) fast charging.

Circuit breaker	A device that protects an electrical circuit from damage caused by overloaded electrical current by automatically interrupting the
CNG	Compressed Natural Gas
CVRP	Clean Vehicle Rebate Project
DC Fast Charger (DCFC)	Direct current fast charging is the quickest way to recharge a ZEV, taking between 30 and 60 minutes.
DMV	Department of Motor Vehicles
DOE	U.S. Department of Energy
Dwell time	The amount of time a ZEV spends charging
EMFAC	Emissions Factor Model. ARB tool for assessing the population, activity, and emissions from on-road vehicles including cars, trucks and buses.
EPRI	Electric Power Research Institute
EVITP	Electric Vehicle Infrastructure Training Program
EVSE	Electric vehicle supply equipment. This includes all components
EVSP	Electric vehicle service providers
FCEV	Fuel Cell Electric Vehicle. Fuel cell vehicles generate electricity to power the motor, generally using oxygen from the air and compressed hydrogen.
Fuel Cell	An electrochemical cell that converts the chemical energy from a fuel into electricity through an electrochemical reaction of hydrogen fuel.
GHG	Greenhouse gas. Any of the gases (e.g., carbon dioxide, methane, ozone and fluorocarbons) emitted that absorb outgoing short-wave radiation in the atmosphere,contributing to the greenhouse
HEV	Hybrid electric vehicle. A motor vehicle powered by both an electric propulsion system with a conventional internal combustion propulsion system. A hybrid electric vehicle does not plug into an off-board electrical source. HEV batteries are charged by the internal combustion engine (ICE).
HOA	Homeowners' association
HOV	High occupancy vehicle
ICC	International Code Council
ICE	Internal combustion engine. An engine that burns petroleum-based fuelto deliver power to a vehicle.
IOU	Investor-owned utility

J1772	Industrywide standard EV connector for Level 2 charging.
kW	Kilowatt. A unit of power equal to 1,000 watts.
kWh	Kilowatt-hour. A unit of energy commonly used for determining the speed of an EV charger, or measuring the energy capacity of a battery. It is also the common billing unit used by electric
Level 1	Level 1 charging uses standard 110 VAC outlets to charge ZEVs. Requires longest dwell times of 8-10 hours for full charge.
Level 2	Level 2 charging uses 240 VAC chargers to charge ZEVs. Requires 1-4 hours for full charge.
Local Agencies	The Cities of Biggs, Chico, Gridley, and Oroville, the Town of Paradise, and the County of Butte
LADWP	Los Angeles Department of Water and Power
MPO	Metropolitan Planning Organization
MUD	Multi-unit dwelling (apartment building, condominium, etc.)
MOU	Municipally owned utility
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code
NEV	Neighborhood Electric Vehicle. Small electric vehicles with top speeds of approximately 25mph.
OPR	Governor's Office of Planning and Research
ZEV	Zero emission vehicle. Includes both BEVs and PHEVs and alternative fuel vehicles
PG&E	Pacific Gas & Electric
PHEV	A plug-in hybrid electric vehicle (PHEV) is a hybrid electric vehicle that uses rechargeable batteries, or another energy storage device, that can be recharged by plugging it in to an external source of electric power. A PHEV shares the characteristics both of a conventional hybrid electric vehicle, having an electric motor and an
Plan	Butte Plug-in Electric Vehicle (ZEV) Readiness Plan
Prewiring	Providing sufficient infrastructure, such as wiring, conduits, junction boxes, outlets and adequate electrical panel and circuitry capacity to meetanticipated future EVSE demand.

RTP	Regional Transportation Plan, a planning document required of MPOs like BCAG
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SAE	Society of Automotive Engineers
SB	Senate Bill
SCE	Southern California Edison. Gas and electric provider for portions of southern California.
SCS	Sustainable Communities Strategy – required to be prepared by MPOs to contribute to reduction in regional GHG emissions
SR	State Route
TUCC	Tri-chapter Uniform Code Committee
UL	Underwriters' Laboratory
VAC	Volts alternating current
VMT	Vehicle miles traveled
ZEM	Zero emission motorcycle
ZEV	Zero-emission vehicle. A vehicle that emits no tailpipe pollutants.

EXECUTIVE SUMMARY

The Butte Zero Emission Vehicle (ZEV) Readiness Plan was developed to serve as a voluntary toolbox for the Local Agencies (Cities of Biggs, Chico, Gridley, the Town of Paradise, and County of Butte) to ensure they are prepared for an anticipated increase in ZEV use and demand in the region. An increase in ZEV use can have many positive effects, including decreasing greenhouse gas emissions and localized air pollution, reducing noise pollution in downtowns, and increasing energy independence through the utilization of locally-produced energy sources. Being ZEV-ready will help encourage ZEV use in the region, while allowing the Local Agencies to ensure a smooth transition to increased ZEV usage.

BY DEVELOPING THE BUTTE ZEV READINESS PLAN, THE BUTTE REGION IS DOING ITS PART TO ALIGN WITH STATE GOALS, AND BE PREPARED FOR INCREASED DEMAND BY THE GENERAL PUBLIC FOR ZEV CHARGING

Being ZEV-ready will also help the region be eligible for grant funding and align with state goals and mandates for increased ZEV use. The state of California has established aggressive ZEV and infrastructure targets which call for 5 million zero emission vehicles on the road by 2030, along with easy access to charging infrastructure. By developing the Butte ZEV Readiness Plan, the Butte region is doing its part to align with state goals and be prepared for increased demand by the general public for ZEV charging.

The Butte ZEV Readiness Plan (originally PEV Readiness Plan) was developed by the Butte County Association of Governments in cooperation with a Project Development Team (PDT) that included representatives from the Local Agencies as well as stakeholders including Butte County Air Quality Management District, California State University, Chico, Pacific Gas and Electric, Sierra Nevada Brewing Co., and the Chico Electric Vehicle Association. Funding for the project was provided by Caltrans through a Sustainable Transportation Planning grant.

This Plan focuses on steps that the Local Agencies can take to help them move towards ZEV readiness. These include identifying priority locations for siting public ZEV charging infrastructure, creating guidelines for installing chargers at diverse locations, and improving permitting processes, zoning ordinances, and building codes in order to remove key barriers to ZEV deployment.

Public workshops were held in March 2018 to solicit public input that was used to develop the final Butte ZEV Readiness Plan. BCAG held two public workshops in Chico and Oroville that included information contained in the Plan. Feedback received at the workshops was incorporated into the final version of the Plan.

In 2023, technical updates were made to this document, and it was renamed Butte Zero Emission Vehicle Readiness Plan. For general background information on ZEVs, please see Appendix A, *ZEV 101 Information.*

1. STAKEHOLDERS AND PARTNERSHIPS

In 2018, the Butte Regional Plug-in Electric Vehicle (PEV) Readiness Plan (Plan) was developed in cooperation with the Butte County Association of Governments (BCAG), Local Agencies (the Cities of Biggs, Gridley, Chico, Oroville, Town of Paradise, and Butte County), and numerous public and private stakeholders from throughout the Butte County region. Caltrans District 3 was instrumental in providing funding for the Plan which included a $114,000 grant award to BCAG through the Caltrans Sustainable Transportation Planning grant program. This grant award provided the funding necessary to develop the Plan.

A Project Development Team (PDT) was formed that provided oversight during Plan development and reviewed and commented on draft versions of the Plan. The PDT included representatives from the five incorporated cities, Butte County, Butte County Air Quality Management District, California State University Chico, Sierra Nevada Brewing Co., Pacific Gas and Electric Company, and the Chico Electric Vehicle Association. Table 1-1 below lists the various participants on the PDT.

A PDT kick-off meeting was held in August 2017 to initiate development of the project, and over the 14 months of developing the Plan, the PDT met five times to review and provide input on key components of the Plan as it was being developed.

Public workshops were held in March 2018 in both the Cities of Chico and Oroville, with identical “open house” formats at both locations. Several displays were provided highlighting the plan background, purpose and process, along with large-format maps detailing portions of the regional siting plan. Additionally, a PowerPoint presentation was provided covering various aspects of the plan. Several comments were received during the workshops that further informed the development of the Plan. Advertising for the public workshops included email notifications to numerous distribution lists, newspaper display ads in both the Chico Enterprise Record and Oroville Mercury Register newspapers, and notifications on the project website.

Table 1-1. Project Development Team Participants

NAME	AGENCY
Fletcher Alexander	CSU Chico, Sustainability Coordinator
Dan Blair	Pacific Gas and Electric
Dan Breedon	Butte County, Development Services
Pete Calarco	Butte County, Development Services
Cheri Chastain	Sierra Nevada Brewing Co., Sustainability Manager
Jon Clark	Butte County Association of Governments
Donna Decker	City of Gridley
Chris Devine	Butte County Association of Governments

Brian Lasagna	Butte County Association of Governments
Jason Mandly	Butte County Air Quality Management District
Mandi McKay	Sierra Nevada Brewing Co., Sustainability Coordinator
Tyler Smith	Chico Electric Vehicle Association
Tim Snellings	Butte County, Development Services
Luis Topete	City of Oroville
Brendan Vieg	City of Chico
Wyatt West	City of Chico
Joe Wilson	Pacific Gas and Electric

A publicly accessible website was developed for the Plan that provided information on draft documents, public workshops, and other information pertinent to the development of the Butte PEV Readiness Plan (http://www.bcag.org/Planning/Butte-PEV-Readiness-Plan/index.html).

In 2023, technical updates were made to this document, and it was renamed Butte Zero Emission Vehicle Readiness Plan. The purpose of this update was to streamline the size of the document, bring it up-to-date, and add information pertaining to the National Electric Vehicle Infrastructure program and planned highway corridors for future ZEV infrastructure installation.

2. INTRODUCTION

The Butte ZEV Readiness Plan has been completed to ensure the Butte region is prepared for an increase in ZEVs on the roadways in the coming years. Many factors are contributing to an increased demand for ZEVs in California and beyond including decreased cost of vehicle ownership, an expanding charging station network, more practical and better performing vehicles, and state mandates driving an expansion of ZEV use in the state. This Plan is intended to help the Local Agencies (the Cities of Biggs, Chico, Gridley and Oroville, the Town of Paradise, and the County of Butte) implement new or improved policies, procedures, and protocols to ensure they are prepared for the increase in ZEV use in the coming years.

THE BUTTE ZEV READINESS PLAN HAS BEEN COMPLETED TO ENSURE THE BUTTE REGION IS PREPARED FOR A POTENTIAL INCREASE IN THE NUMBER OF ZEVS ON THE ROADWAYS IN THE COMING YEARS

The development of the Butte ZEV Readiness Plan includes additional benefits beyond helping ensure the region is ZEV-ready – it can help contribute to better air quality in Butte County and the Sacramento Valley Air Basin (Figure 2-3), contribute to reduced greenhouse gas (GHG) emissions, and assist the Local Agencies in meeting air quality and GHG reduction targets.

The plan can also enable the region to receive grant funding for implementation of additional ZEV infrastructure installation and other ZEV-related programs and policies. Numerous state, federal and private sector funding sources are available for advancing ZEV use in California.

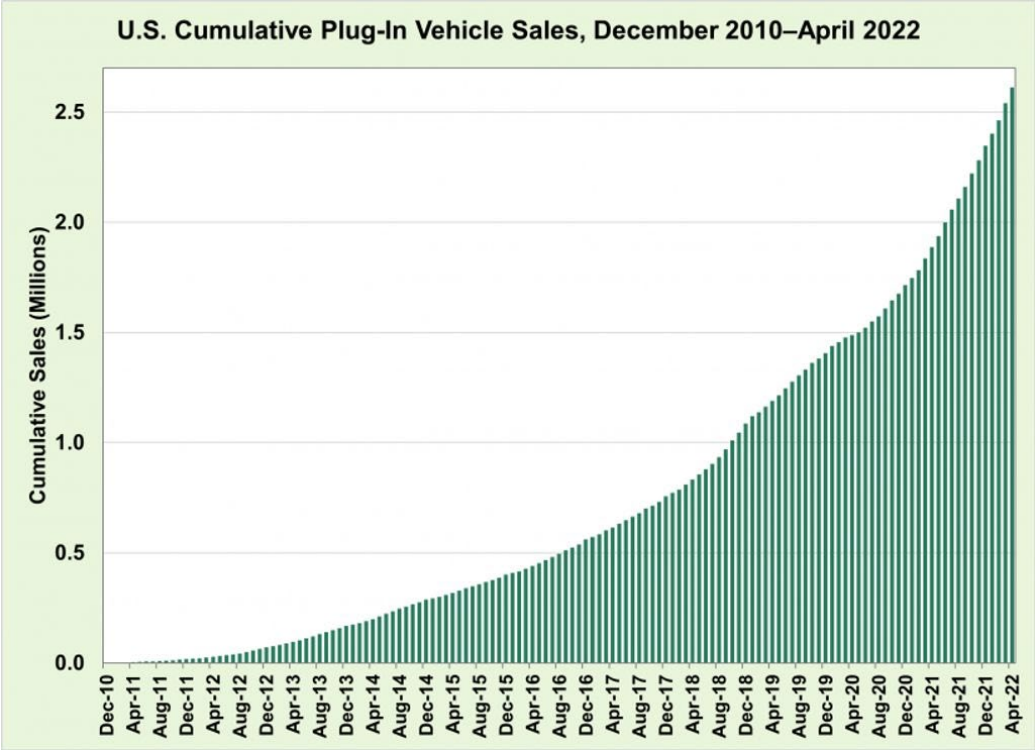
2.1 INCREASING EV DEMAND

Most automobile manufacturers are now developing ZEVs that are becoming faster, smarter, and more practical. Electric vehicles in the past were generally small in size, with poor overall performance and short driving ranges. ZEVs in the market today often out-perform conventional gasoline-powered automobiles, have advanced technical features, can travel over 300 miles when fully charged, and come in a range of sizes and styles, from sedans and sports cars to sport utility vehicles.

With the purchase price of typical ZEVs often the same as conventional engine vehicles, and the cost of charging an ZEV about one-third the cost of fueling a conventional car with gasoline, drivers are finding ZEVs to be a compelling option when purchasing a new vehicle.

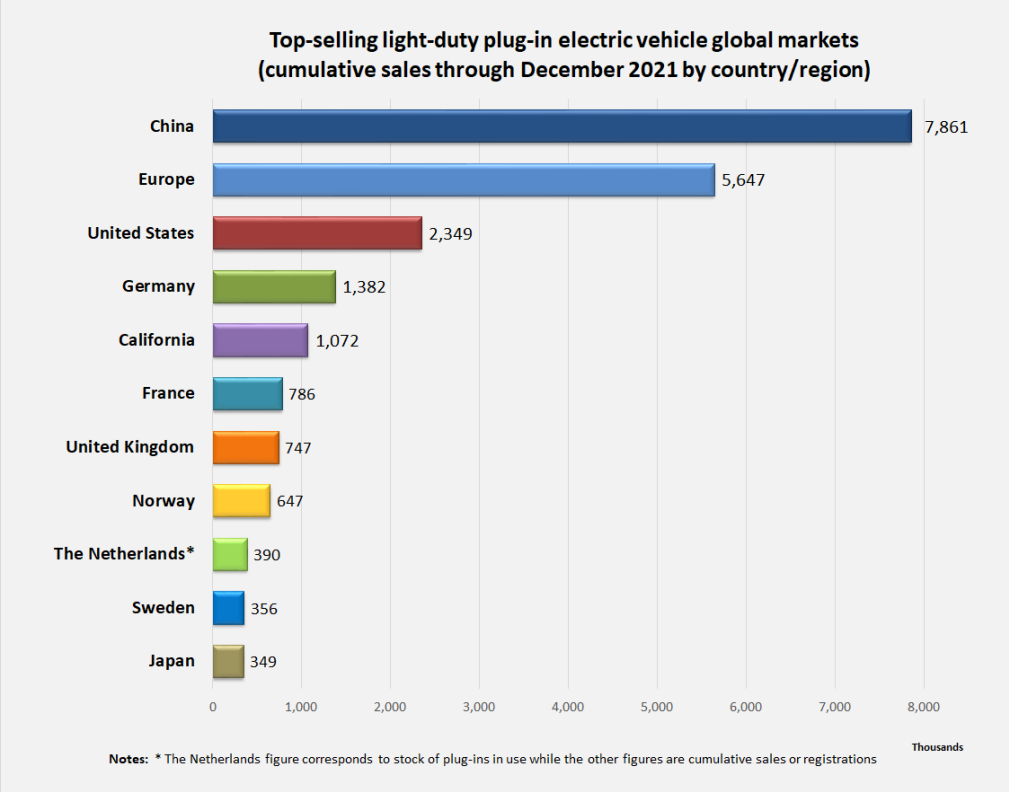
As shown in Figure 2-1, ZEV sales continue to increase nationally. Both California and the U.S. have seen sales increase steadily, as public demand for the next generation of automobiles continues to increase.

Figure 2-1. Cumulative Monthly U.S. Sales of Electric Vehicles (in # of Vehicles)



Source: *InsideEVs*

Figure 2-2. Total EV Sales (in # of Vehicles) by Country/Region



As Figure 2-2 shows, China and Europe lead the world in EV use, with the U.S. having the third most EVs on the road. California makes up almost half of the U.S. EV use due in part to the state government embracing the technology.

2.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Butte County is located in the Sacramento Valley Air Basin (Figure 2-3) and includes five incorporated jurisdictions: The Cities of Biggs, Chico, Gridley and Oroville, and the Town of Paradise.

Currently, Butte County is designated marginal non-attainment for the federal 8-hour ozone standard. Because vehicular emissions account for a significant amount of ozone pollution, replacing gasoline-powered vehicles with ZEVs can have a significant effect on improving air quality in our region. Additionally, our region can do its part to help reduce GHG emissions in part by increasing the percentage of ZEVs on the roadway.

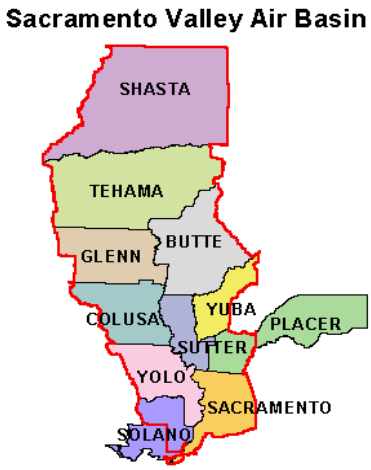


Figure 2-3. Sacramento Valley Air Basin Map

2.3 BCAG SUSTAINABLE COMMUNITIES STRATEGY AND LOCAL JURISDICTION CLIMATE ACTION PLANS

The Butte County Association of Governments (BCAG) is required to meet GHG reduction targets set forth in its required Sustainable Communities Strategy (SCS). In September 2008, Senate Bill (SB) 375, also known as the Sustainable Communities and Climate Protection Act of 2008, was enacted by the state of California. SB 375 prompts regions to reduce GHG emissions from passenger vehicles through the coordinated planning of long-range transportation plans. The legislation requires all Metropolitan Planning Organizations (MPO) in California to develop a Sustainable Communities Strategy, which meets regional passenger vehicle GHG emissions targets, as an additional element of their Regional Transportation Plans (RTPs). GHG emissions from the transportation sector is the largest of any GHG emitting sector in California (Figure 2-4). In 2010, the California Air Resources Board (ARB) set GHG targets for the BCAG region for on-road light-duty trucks and passenger vehicles as a 1% increase from 2005 emissions levels by 2020, and a 1% increase from 2005 emissions levels by 2035. The targets

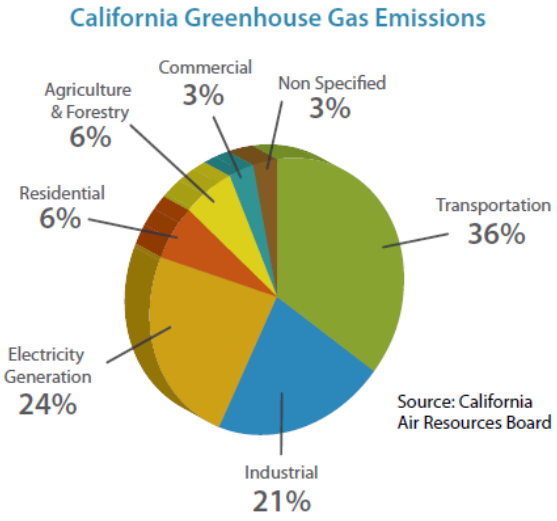


Figure 2-4. California Greenhouse Gas Emissions by Sector

were updated in 2017 to more stringent standards, and were incorporated into BCAG's 2020 RTP/SCS update. The targets apply to the BCAG region as a whole for all on-road light-duty trucks and passenger vehicle emissions, and not to individual cities or sub-regions.

Additionally, Local Agencies have developed Climate Action Plans that include goals, policies, and programs to reduce GHG emissions, address climate change adaptation, and improve quality of life. These Climate Action Plans are consistent with and support statewide GHG emissions reduction goals identified in Assembly Bill (AB) 32 and Senate Bill (SB) 375.

By completing the Butte ZEV Readiness Plan and making the region ZEV-ready, it is hoped that the number of ZEVs in the region will expand more rapidly, improving air quality and reducing GHG emissions. Additionally, BCAG and the local agencies can better account for the increase in ZEVs in the total countywide vehicle fleet, and be better able to reach the targets set forth in the RTP/SCS and Climate Action Plans.

2.4 CALIFORNIA ZEV AND INFRASTRUCTURE GOALS

This Plan aligns with state policies for deploying ZEVs across California. ZEVs and ZEV infrastructure are key components in achieving California's greenhouse gas reduction targets, petroleum reduction goals, and air quality standards. California has specific goals to increase the supply of ZEVs and infrastructure including:

- By 2025:
    - Having at least 1.5 million ZEVs on the road (Executive Order B-16-12).
    - Installing 200 public hydrogen-fueling stations and 250,000 battery-electric vehicle chargers, including 10,000 fast chargers (Executive Order B-48-18).
- By 2030:
    - Having at least 5 million ZEVs on the road (Executive Order B-48-18).
    - Operating light-duty autonomous vehicle fleets be zero-emission (Senate Bill 500).
- By 2035:
    - Transitioning to 100 percent of new sales of passenger vehicles and trucks to ZEVs (CARB. Advance Clean Cars II).
    - Transitioning 100 percent of operating off-road vehicles and equipment to zero-emission everywhere feasible (Executive Order N-79-20).
- By 2045:
    - Transitioning 100 percent of operating medium duty/heavy duty trucks and buses to zero emission everywhere feasible (Executive Order N-79-20).

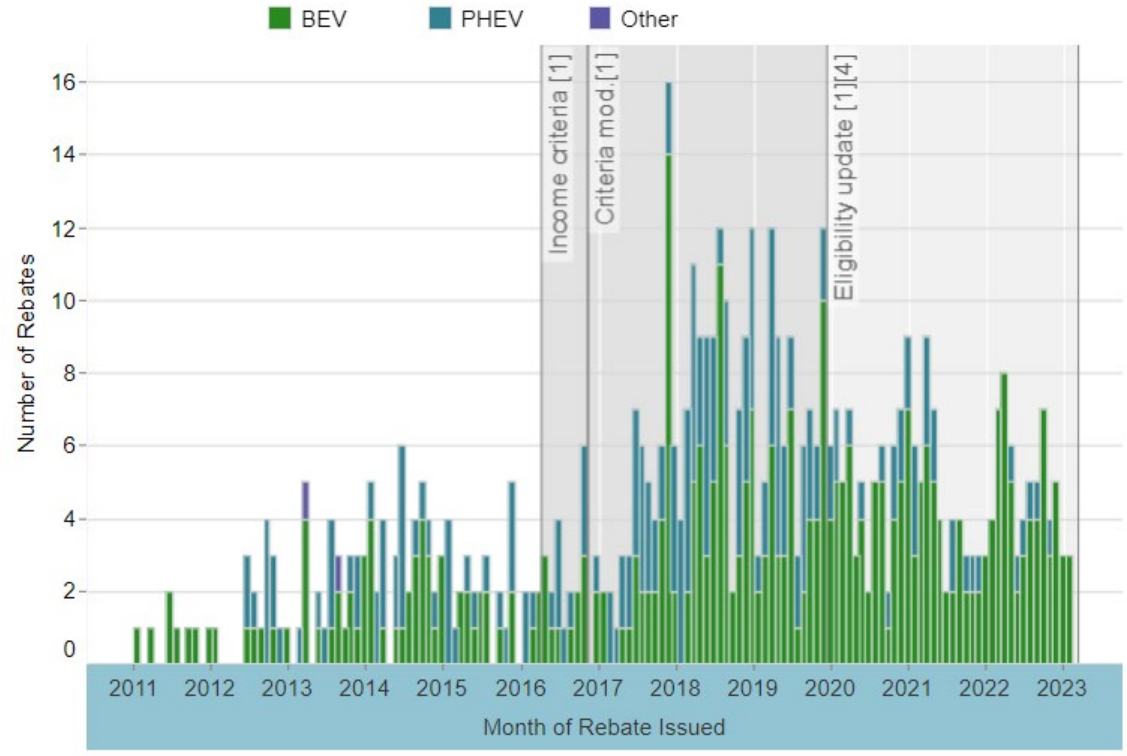
3. EXISTING ZEV USE IN THE REGION

The consumer demand for ZEVs in the Butte region has not been as strong as other more urbanized areas of the state due in part to the rural nature of much of the region, and the lack of focus on Butte County as a priority area for charging station installation. The major metropolitan areas of California continue to be the focus of dollars spent on EVSE installation and have the highest amount of ZEV ownership. However, the Butte County region continues to see increases in the number of ZEVs purchased, and the ZEV charging network continues to expand.

3.1 CURRENT ZEV DEPLOYMENT

Based on rebate information from the California Air Resources Board's Clean Vehicle Rebate Project, 571 ZEVs were purchased by owners in Butte County between March 18, 2010, and February 2023. Of these, 367 were Battery Electric Vehicles (BEVs) and 202 were Plug-in Hybrid Electric Vehicles (PHEVs), while 2 were "other" (includes non-highway motorcycle and commercial BEVs). Figure 3-1 indicates that sales in Butte County over the last five years have increased substantially compared to the first five years of the program, with the purchase of BEVs exceeding that of PHEVs.

Figure 3-1. California Vehicle Rebate Project (CVRP) Rebates by Month for Butte County



Source: California Air Resources Board Clean Vehicle Rebate Project (https://cleanvehiclerebate.org/eng/rebate-statistics)

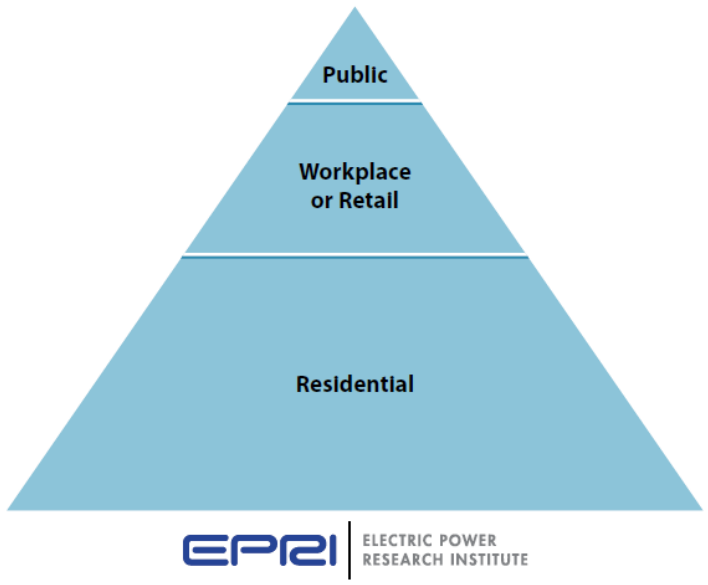
Although the CVRP data likely represents the majority of vehicles deployed in the region, there are several limitations to this data that likely contribute to underreporting ZEVs in the region

including the possibility that not all ZEV purchasers opted for the California rebate incentive, and certain vehicles were not eligible for the program.

3.2 EXISTING ZEV CHARGING STATIONS

The network of publicly accessible ZEV charging stations in Butte County continues to expand. It is important to note that the majority of ZEV charging typically occurs at home overnight while vehicles are parked (Figure 3-3). Home charging is typically achieved be either plugging the car into the existing 110-volt power outlet (Level 1 charging), or by installing a 220-volt Level 2 charger in the garage (Table 3-1). Charging times vary based on vehicle type and the extent that the battery charge is depleted prior to charging, but can typically be achieved by charging the vehicle overnight.

Public charging stations provide critical recharging for vehicles on longer trips, or for vehicles with smaller ranges, and help alleviate range anxiety or the fear running out of battery charge while driving. By providing a large public charging network of Level 2 and DC Fast Charger stations, range anxiety can be reduced or eliminated. This is also important to ensure ZEV purchasing rates can continue to increase, benefiting local air quality and contributing to reduced GHG emissions.



Source: Electric Power Research Institute

Figure 3-2. Electric Power Research Institute Charging Pyramid

Existing public ZEV charging stations in the region currently include the City of Chico area, Butte College main campus, and the Feather Falls Casino near the City of Oroville. Within the City of Chico, public charging stations are currently clustered along the Hwy 99 corridor, with a newer fast charging station located in downtown Chico.

Table 3-1. EV Charging Levels

Type of Charging	Power Levels (installed circuit rating)	Time for Full Charge	Average Cost of Equipment & Installation
Level 1 	110/120 VAC at 15 or 20 Amps	8-12+ Hours	$0-$500
Level 2 	208/240 VAC at 30 Amps 208/240 VAC at 40 Amps 208/240 VAC at 50 Amps 208/240 VAC at 100 Amps	4-8 Hours	$500-$7,000
DC Fast Charging 	440 or 480 VAC	30-60 Minutes	Up to $55,000

Source: Ready, Set, Charge California! A Guide to EV Ready Communities. Association of Bay Area Governments, Bay Area Climate Collaborative, EV Communities Alliance, CleanFuel Connection, and LightMoves Consulting.

For more detailed information on local public charging stations, visit www.plugshare.com.

3.3 EXISTING AND PLANNED ZEV-DESIGNATED HIGHWAY CORRIDORS

Designating highway corridors as either "corridor-ready" or "corridor-pending" can enable funding opportunities for ZEV infrastructure installation and expansion. The Fixing America's Surface Transportation Act (Dec. 4, 2015) required the U.S Department of Transportation to designate national alternative fueling corridors. Additionally, the Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (Nov. 15, 2021), updated the requirements related to the designation of national alternative fueling corridors, and established a discretionary grant program, the "Charging and Fueling Infrastructure Program".

This program calls for the strategic deployment of publicly accessible electric vehicle charging infrastructure, hydrogen fueling infrastructure, propane fueling infrastructure, and natural gas fueling infrastructure along designated alternative fuel corridors or in certain other locations that will be accessible to all drivers of electric vehicles, hydrogen vehicles, propane vehicles, and natural gas vehicles. The BIL also establishes the National Electric Vehicle Infrastructure Formula Program, or "NEVI Formula Program", to provide funding to states to strategically deploy EV charging infrastructure along designated alternative fuel corridors.

CORRIDOR DESIGNATION PROCESS

The FHWA will designate nominated highway corridors as either “corridor-ready” or “corridor-pending”. Corridor-ready segments currently contain a sufficient number of fueling facilities to allow for corridor travel with the designated alternative fuel. These include:

- EV Charging
    - Public DC Fast Charging no greater than 50 miles between one station/site and the next on corridor; no more than 1 mile from Interstate exits or highway intersections along the corridor; include four charging plugs; support at least 150kW per port simultaneously across 4 ports; maximum charge power per DC port should not be below 150kW.
- Hydrogen
    - Public hydrogen stations no greater than 150 miles between one station and the next on the corridor; no more than 5 miles from Interstate exits or highway intersections along the corridor.
- Propane
    - Public propane stations no greater than 150 miles between one station and the next on the corridor, and no more than 5 miles from Interstate exits or highway intersections along the corridor; should be limited to infrastructure for medium- and heavy-duty vehicles.
- CNG
    - Public fast fill, 3,600psi CNG stations no greater than 150 miles between one station and the next on the corridor, and no more than 5 miles from Interstate exits or highway intersections along the corridor
- LNG
    - Public LNG stations no greater than 200 miles between one station and the next on the corridor, and no more than 5 miles from Interstate exits or highway intersections along the corridor.

Corridor-pending segments must include a strategy/plan and timeline to be considered for nomination.

EXISTING “CORRIDOR-READY” HIGHWAYS IN BUTTE COUNTY

Only one highway in Butte County meets the NEVI definition of corridor-ready for EVs, Highway 99 through Butte County. This corridor has qualifying EV charging stations in Yuba City, Chico, and Red Bluff, all separated by less than 50 miles.

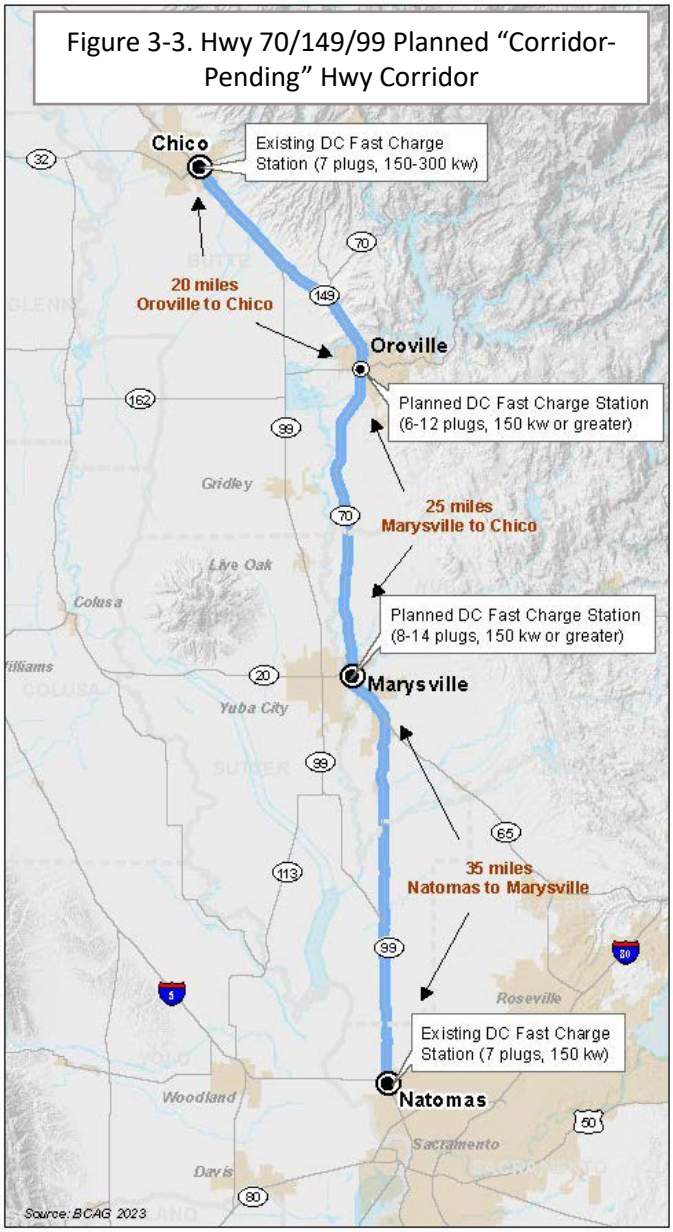
Highways 70, 162 and 32 do not currently meet the corridor-ready requirements due to a lack of sufficient ZEV charging infrastructure.

PLANNED “CORRIDOR-PENDING” HIGHWAYS IN BUTTE COUNTY

Establishing the Highway 70/149/99 corridor as corridor-pending is a high priority due to recent efforts by BCAG and Caltrans to improve and widen these roadways to improve safety. This has resulted in a rural 2-lane highway being improved to a 4-lane highway with center left turn lane. Posted speed limits have increased from 55mph to 65 mph for much of the corridor

and with the improved safety and ease of driving, the Hwy 70/149/99 corridor is expected to be the preferred travel route between Chico, Marysville/Yuba City, and Sacramento. Table 3.2 identifies a strategy and timeline for installation of public DC fast charging stations separated by no more than 50 miles within this corridor. EVSE should be installed within, or close to the 1-mile highway intersections buffer identified in Figure 4-4.

Figure 3-3. Hwy 70/149/99 Planned "Corridor-Pending" Hwy Corridor



As seen in Figure 3-3, currently there are no qualifying ZEV charging stations in the cities of Marysville and Oroville. Both cities have Level 2 ZEV charging stations, but DC Fast charging stations do not currently exist. To the south of Marysville, a Tesla super charging station exists, but because it is a proprietary network, it does not qualify under the current NEVI guidelines. The closest qualifying EVSE to the south of Marysville is located in Natomas off of Interstate 5, on Duckhorn Drive approximately 35 miles south of Marysville. Approximately 20 miles north of Oroville, qualifying EVSE is located in downtown Chico.

By installing qualifying EVSE in the cities of Marysville and Oroville, the corridor between Sacramento and Chico via Hwy 70/149/99 will have qualifying charging stations less than 50 miles apart, allowing the corridor to be elevated to "Corridor-Ready" status and enable the corridor to qualify for additional funding. Table 3-2 below identifies a strategy and timeline to accomplish this objective.

The goal for establishment of initial DC fast charging stations is 2024, with 8 and 6 charging plugs for Marysville and Oroville respectively, with a minimum charging speed of 150kW. At the time of installation, sufficient infrastructure will be included to allow the future build-out of these stations to 14 and 12 total chargers in Marysville and Oroville respectively by the year 2028.

Preferred locations in Marysville for qualifying EVSE installation include the downtown public parking lot on the corner of 4th and C Streets, and along Hwy 70 between 12th and 13th Streets.

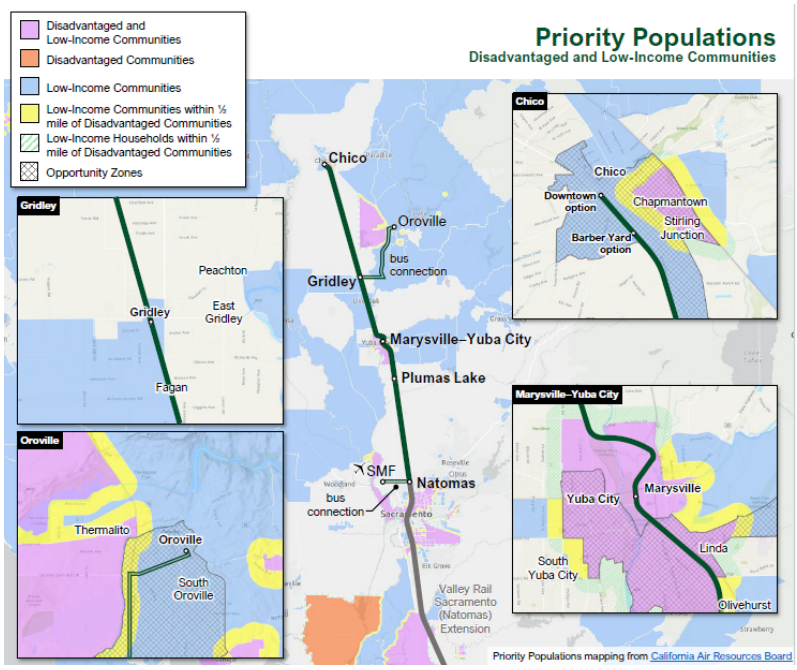
Preferred locations in Oroville include the downtown public parking lot on the corner of Montgomery and Huntoon Streets, and the Maverik Gas Station parking lot on the corner of Oro Dam Blvd E and Feather River Blvd. All locations are publicly accessible, located adjacent to restaurants, shops, etc., and are approximately 1-mile from a highway exit or intersection along the corridor.

Table 3-2. Hwy 70/149/99 Corridor ZEV Strategy and Timeline

Station Location	Number of Plugs – Initial	Number of Plugs – Build-out	Charging Speed	Timeline
Marysville	8	14	Minimum 150kW	2024 (initial), 2028 (build-out)
Oroville	6	12	Minimum 150kW	2024 (initial), 2028 (build-out)

An important benefit to installing EVSE in these communities is they are located within or adjacent to Disadvantaged or Low-Income Communities as designated by both California and the U.S. Department of Transportation and Energy Justice40 initiative (see Figure 3-4 below).

Figure 3-4. Priority Populations Hwy 70/149/99 Corridor



This would allow for improved access to ZEV charging for disadvantaged and low-income populations and help bring additional business to area shops and restaurants. At least 40 percent of the NEVI funding will be utilized in disadvantage communities designated under Justice40, making this corridor and ideal fit for this funding program. The initiation of North Valley Rail passenger rail service in 2030 (shown in Figure 3-4) will further benefit these priority populations and, when combined with increased EVSE along the corridor, will lead to improved air quality and GHG emissions within the region.

RURAL/UNINCORPORATED AREAS

While data regarding ZEV ownership in rural and unincorporated areas is limited, ZEV sales data indicates reduced ownership of EVs in the rural unincorporated areas of the region. This

trend is not unique to the Butte County region. A lack of rural residents utilizing ZEVs is a common trait throughout the state and is likely due in part to the higher costs of ZEV ownership, a lack of nearby charging infrastructure, and potentially a need/desire for vehicles with four-wheel-drive and/or larger engines that are capable of towing and/or driving on snowy or icy roads in the wintertime.

Despite these challenges, this does not mean that these residents cannot take part in the growing ZEV market. Figure 4-17 in Chapter 4 identifies priority locations for public EVSE installation in the rural unincorporated communities. Installing public EVSE in these key areas can help grow the ZEV market in the rural portions of the region. Recent advancements in charging equipment include mobile solar-powered ZEV charging stations that can be quickly deployed and don't rely on substantial electrical infrastructure (see example by Paired Power https://www.pairedpower.com/).

Level 1 charging (a standard 110-volt electrical outlet) is also generally available in all homes providing convenient but slower charging, and Level 2 chargers can be installed in the home quickly and relatively low cost.

In the eastern portion of Butte County, there are numerous isolated mountain communities that are vulnerable to wildfires in the summer months. Emergency evacuations of these areas can pose a concern in the event ZEVs aren't charged sufficiently to allow residents to completely evacuate the area. Often times, power will be turned off to areas under threat of wildfire, or transmission lines can be compromised by wildfires both near and far. Installing an on-site generator that can provide power to a home to allow level 1 charging can help mitigate some of this concern. However, rural residents who own ZEVs should consider developing an alternative evacuation plan to account for this potential situation, such as relying on a second gasoline powered vehicle, coordinating with neighbors with gasoline powered vehicles, or any other alternative means to evacuate successfully.

Paired Power's solar-powered EV charger. For more information, see: https://www.pairedpower.com/

Additionally, the Local Agencies should consider adding sections to their General Plans that include emergency evacuation plans for rural ZEV owners. These plans can provide suggested alternative evacuation means, direct routes to public EVSE locations, community gathering points where stranded residents can be evacuated, and other ideas to lead to successful evacuations.

4. REGIONAL SITING PLAN

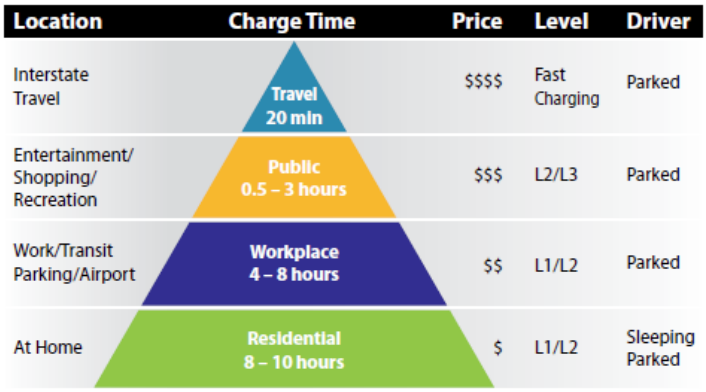
The regional siting plan identifies *priority sites* for future charging station installation in the Butte region. It is broken into five focus areas identifying priority locations for: 1) DC fast charging, 2) level 2 public access charging, 3) workplace charging, 4) multi-family residential charging, and 5) rural/unincorporated charging. Each section below identifies the methodology and priority location maps for each focus area. Figure 4-1 below identifies the different charging needs of ZEV drivers based on the type of location and charge time needed.

The regional siting plan is not intended to encompass every possible location for charging station installation in the region, nor is it intended to serve the need for "micro-siting", whereby locations for charging stations are determined with an engineering-level analysis. Rather, the regional siting plan is intended to ensure that the highest priority areas are identified and given greatest consideration for future installations.

The maps in this chapter can also guide other entities beyond BCAG and the Local Agencies who will be looking to install EVSE in the region, including PG&E, EVGo, Electrify America, etc.

4.1 DC FAST CHARGER PRIORITY LOCATIONS

Public DC fast charge stations provide ZEVs with rapid charging, usually between 30-60 minutes for a full charge. They are the most expensive to purchase and install, with costs typically averaging $75,000 for the charger and installation costs (see Chapter 10 for additional information on EVSE costs and funding sources).



Source: State of California, Governor's Office of Planning and Research,

Figure 4-1. Typical ZEV Charging Times by Location and Charger Level

For the DC fast charger siting analysis, priority locations have been identified along the urban areas of California State Route (SR) 99 and 70 within the region. The SR 99 and 70 corridors were chosen since they provide for the majority of through vehicle travel within Butte County. As discussed, through vehicle trips have origins and final destinations outside of Butte County, such as a vehicle traveling from Sacramento to Chico via SR 99 or 70. Vehicles may choose to stop along these corridors for the purpose of charging prior to continuing with the remainder of the trip.

Locations were identified within ½- and 1-mile of an urban highway exit or intersection. Primary destinations were identified within these ½- and 1-mile areas and summarized by retail building square footage. Primary destinations include supermarkets, department stores, malls, and restaurants. Locations were then prioritized (high to low) by the amount of total

retail square footage contained within the ½- and 1-mile buffered urban highway exit or intersection.

Data sources utilized for the DC fast charge siting include the BCAG commercial building footprints and roads geographic information systems (GIS) layers. The commercial building footprints layer is updated annually and represents the best available information as of May 2023. The roads layer is updated quarterly and represents the best available information as of May 2023.

Figures 4-2 through 4-4 identify the priority locations within the region for DC fast charger Stations.

Figure 4-2. DC Fast Charger Siting, Chico Area

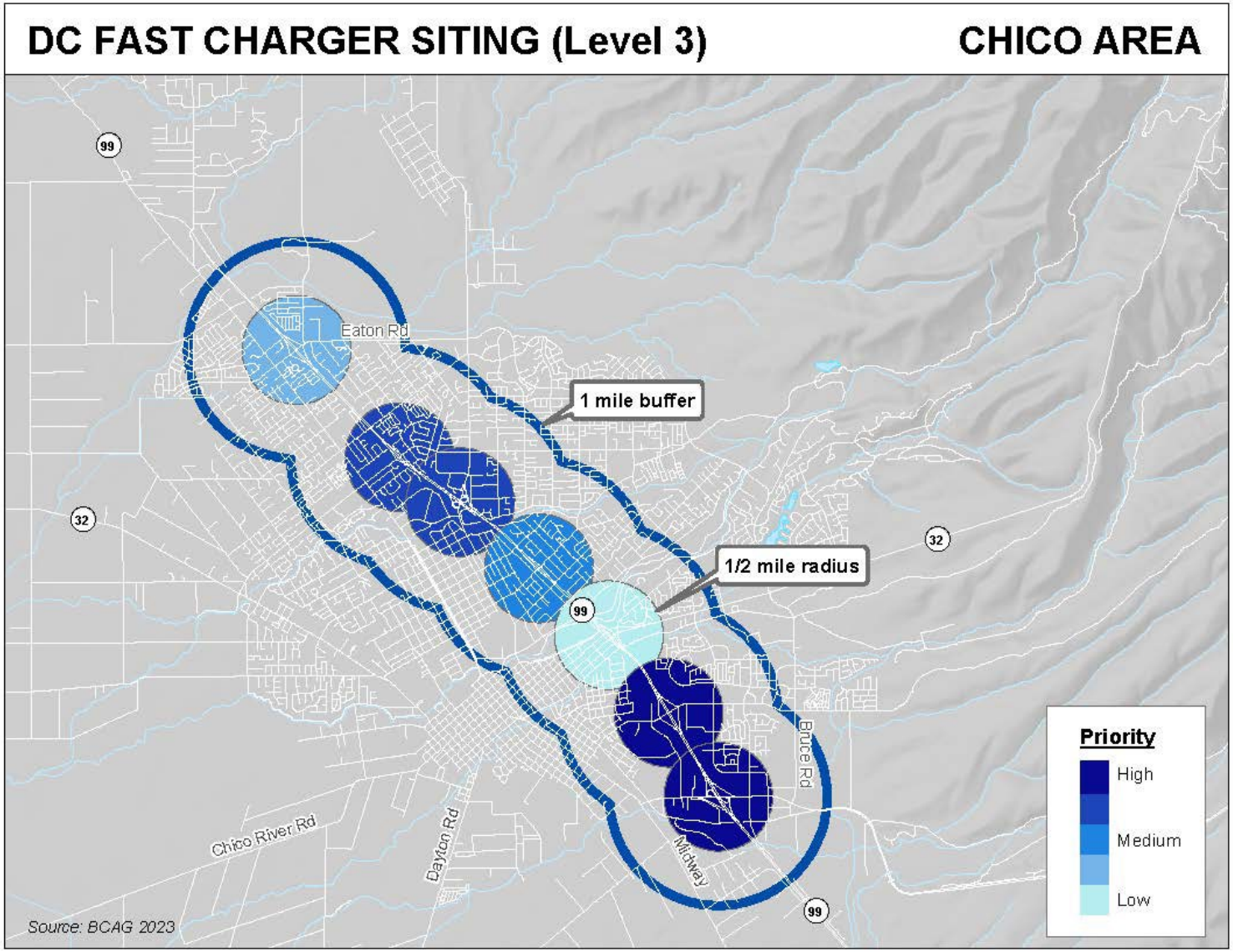


Figure 4-3. DC Fast Charger Siting, Gridley and Biggs Area

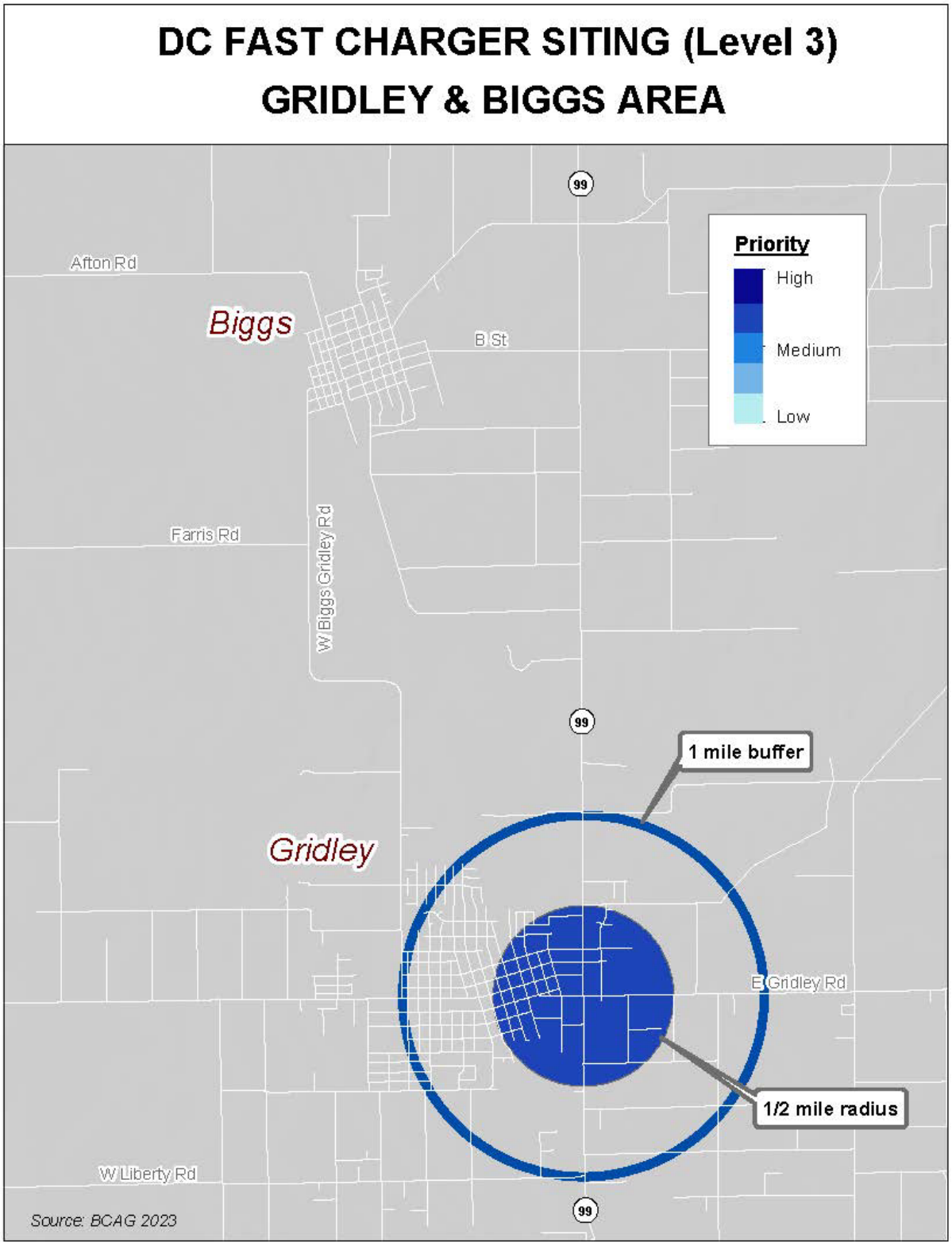
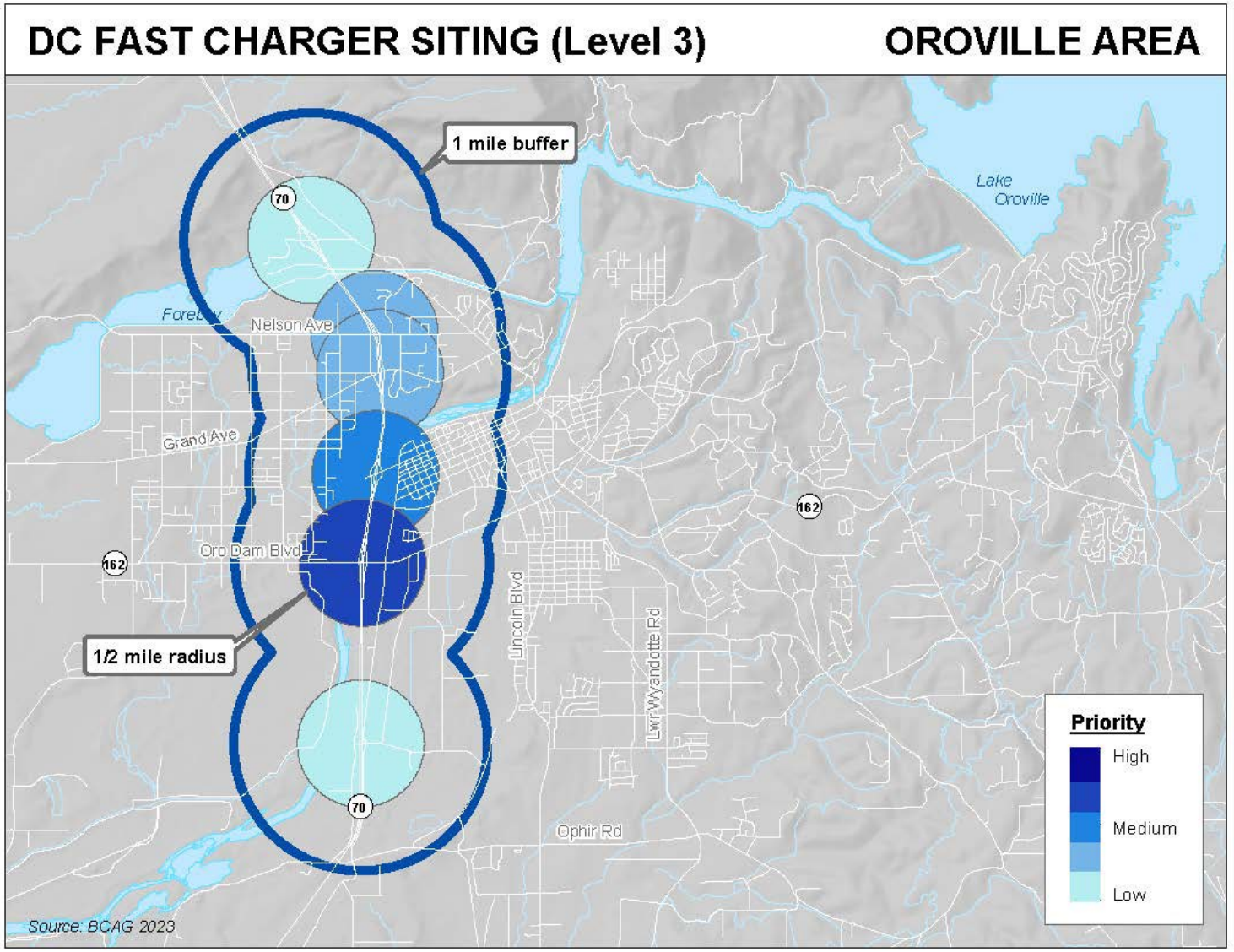


Figure 4-4. DC Fast Charger Siting, Oroville Area



4.2 LEVEL 2 PUBLIC ACCESS PRIORITY LOCATIONS

Level 2 public access charging stations provide ZEVs with moderate charging rates, typically providing a substantial battery recharge in several hours. Public access siting analysis focused on destinations located within urban areas where drivers will park their vehicles for periods greater than 1 hour. The San Joaquin Valley Air Pollution Control District, in their siting plan, reviewed the National Household Travel Survey and identified several land use categories which attract drivers to travel "medium-to-long" distances and stay for periods greater than 1 hour.

For the Butte ZEV Readiness Plan, the "medium-to-long" trip distances would represent interregional or intercity type trips. Interregional trips represent travel that originates outside Butte County and has a final destination within Butte County. Intercity trips represent travel between urban areas within Butte County.

Locations were identified and prioritized for each Butte County incorporated jurisdiction and expanded to the remaining urban area. Primary destinations include art galleries, museums, casinos, big box stores, supermarkets, hospitals, libraries, theaters, hotels, parks, restaurants, malls, universities, doctor/dental offices, and municipal buildings.

Hot spot density maps have been prepared for each urban area and locations are prioritized (high to low) based on the number of destinations in relation to each other. Destinations are weighted (scale of 1-5) based on the estimated amount of available parking, assuming these areas will attract a higher number of ZEV drivers.

Data sources utilized for the public access siting include the BCAG commercial building footprints, InfoUSA database, and Google search engine. The commercial building footprints layer is updated annually and represents the best available information as of May 2023. InfoUSA database is dated 2023 and the Google search engine was accessed in May 2023

Figures 4-5 through 4-8 identify the priority locations within the region for Public Access (Level 2) charging stations.

Figure 4-5. Public Access Siting (Level 2), Chico Area

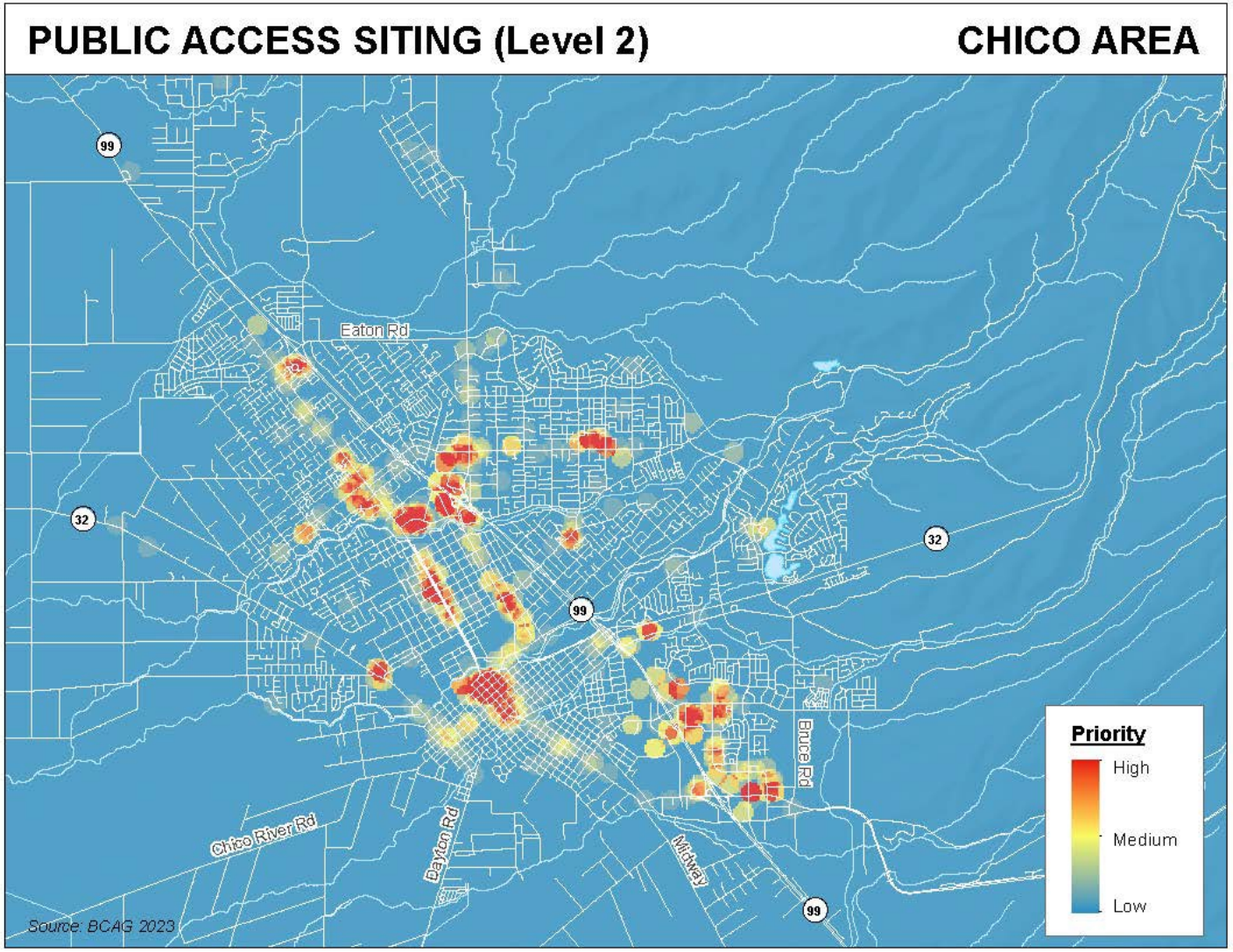


Figure 4-6. Public Access Siting (Level 2), Gridley and Biggs Area

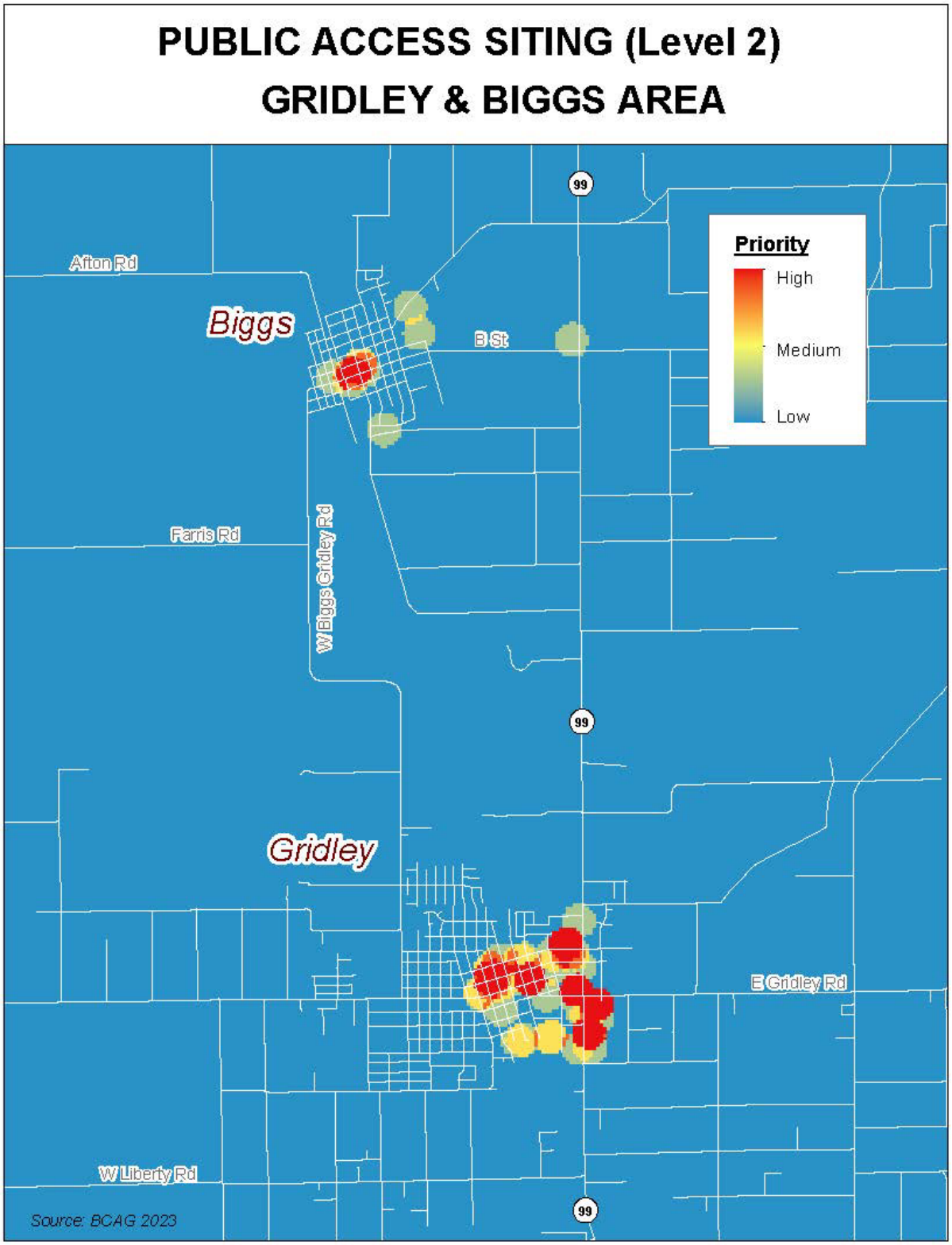


Figure 4-7. Public Access Siting (Level 2), Oroville Area

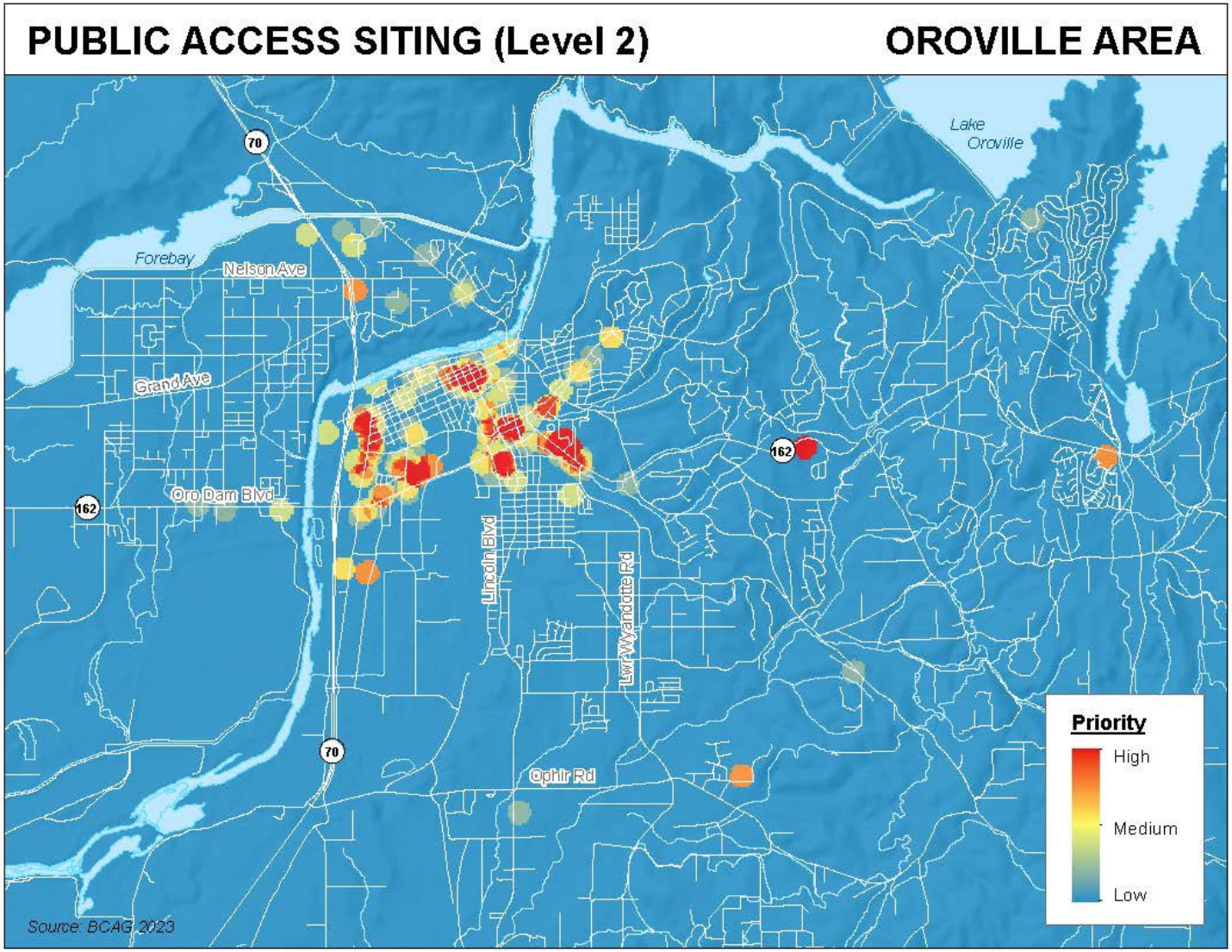
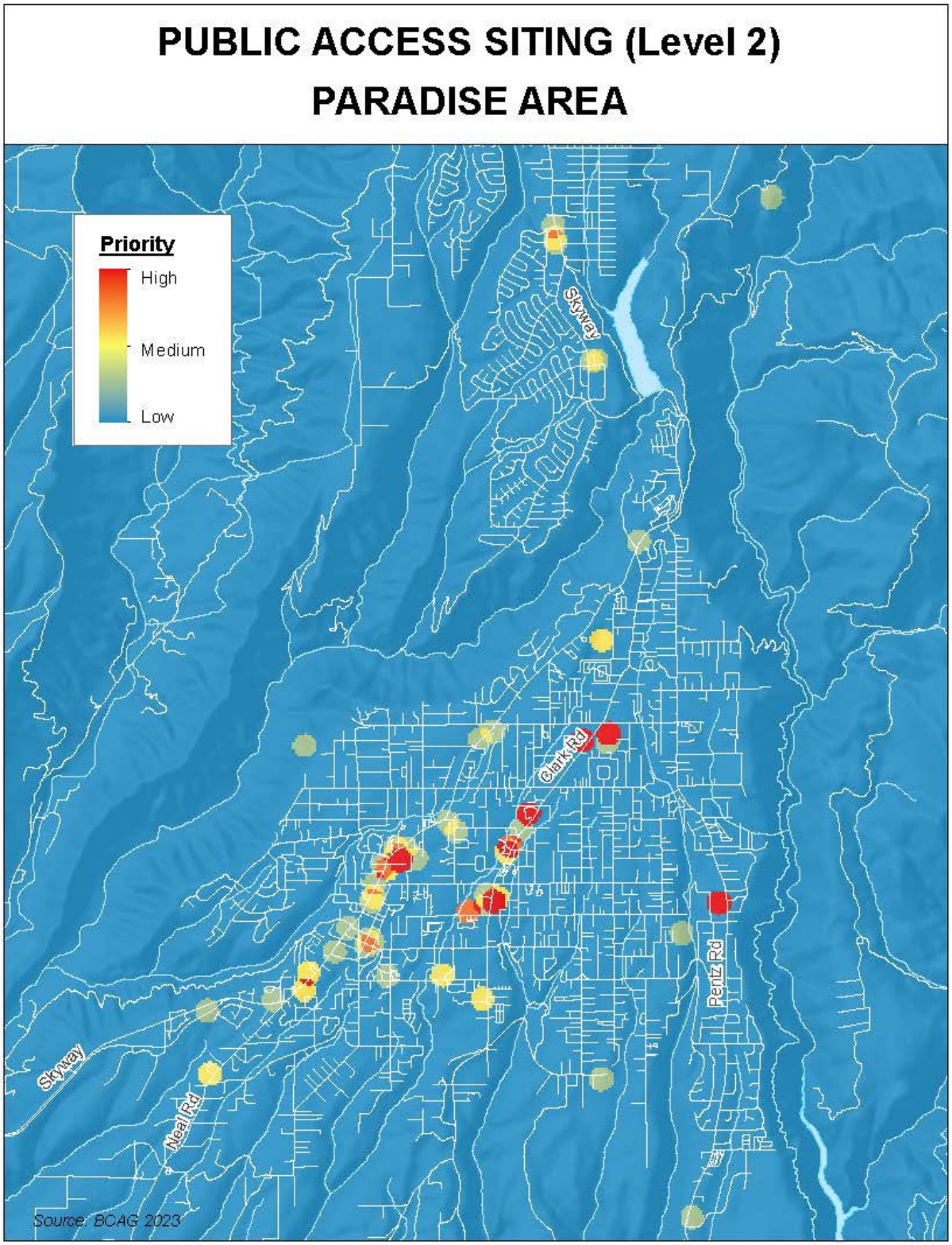


Figure 4-8. Public Access Siting (Level 2), Paradise Area



4.3 WORKPLACE PRIORITY LOCATIONS

Workplace charging siting analysis has been prioritized based on employment density and focused within the urban areas of Butte County. The workplace provides an opportunity for employees to charge their vehicles if lacking access to a residential charger, or for drivers with longer commutes who must charge in order to complete the return trip. Employees also tend to park at the workplace for periods greater than 4 hours, allowing enough time to complete a full charge (for more information on workplace charging, see Chapter 8).

Workplace locations were identified and prioritized for each Butte County incorporated jurisdiction and expanded to the remaining urban area. Primary charging locations include locations with the greatest density of employees. Hot spot density maps have been prepared for each urban area and locations are prioritized (high to low) based on the number of employees in relation to each other, assuming these areas will attract a higher number of ZEV drivers.

Data sources utilized for the public access siting include the BCAG commercial building footprints, BCAG school sites, and InfoUSA employment database. The commercial building footprints layer is updated annually and represents the best available information as of May 2023. The BCAG school site database was last updated in 2022 and the InfoUSA database is dated 2023.

Figures 4-9 through 4-12 identify the priority locations within the region for workplace charging stations (Level 2).

Figure 4-9. Workplace Siting (Level 2), Chico Area

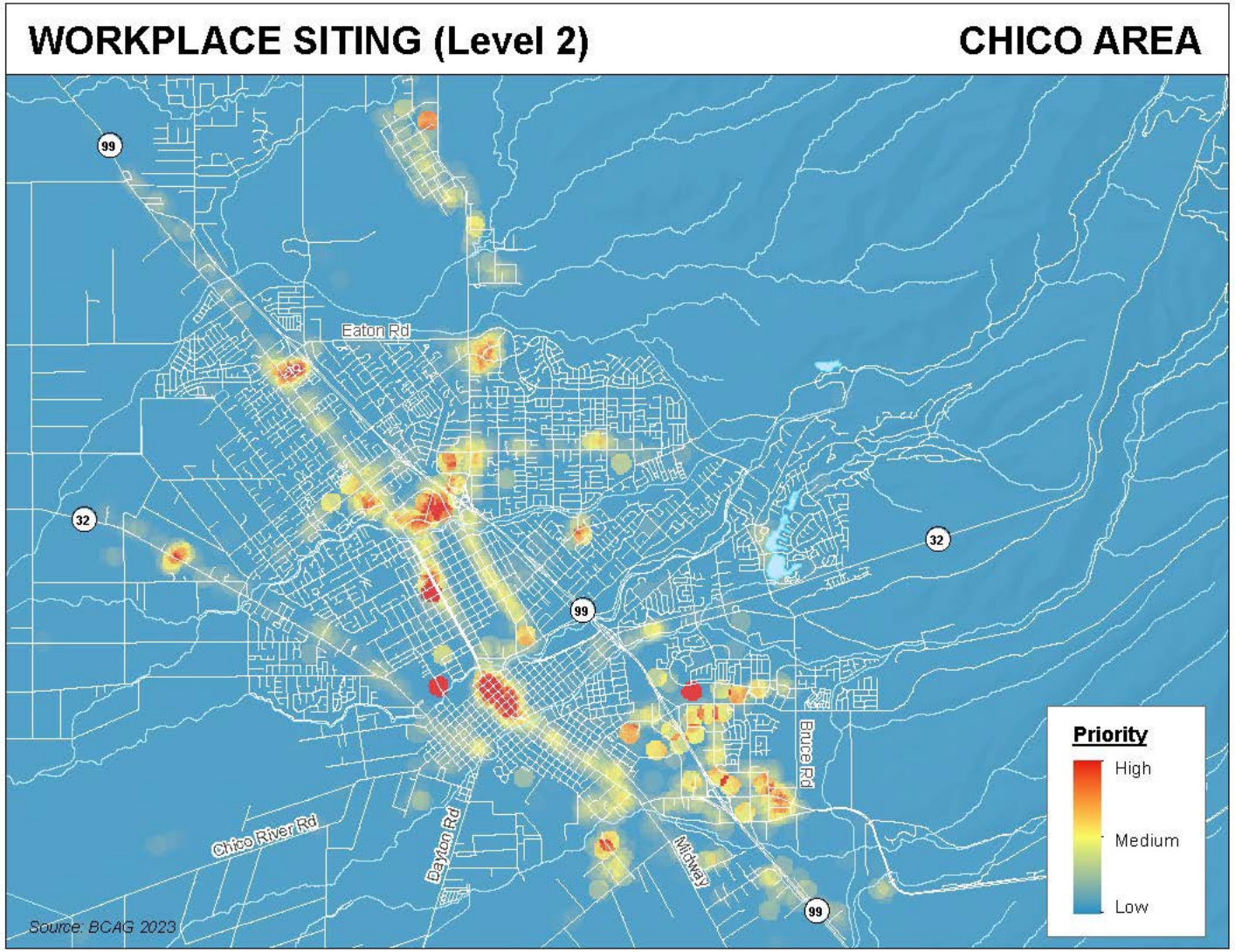


Figure 4-10. Workplace Siting (Level 2), Gridley and Biggs Area

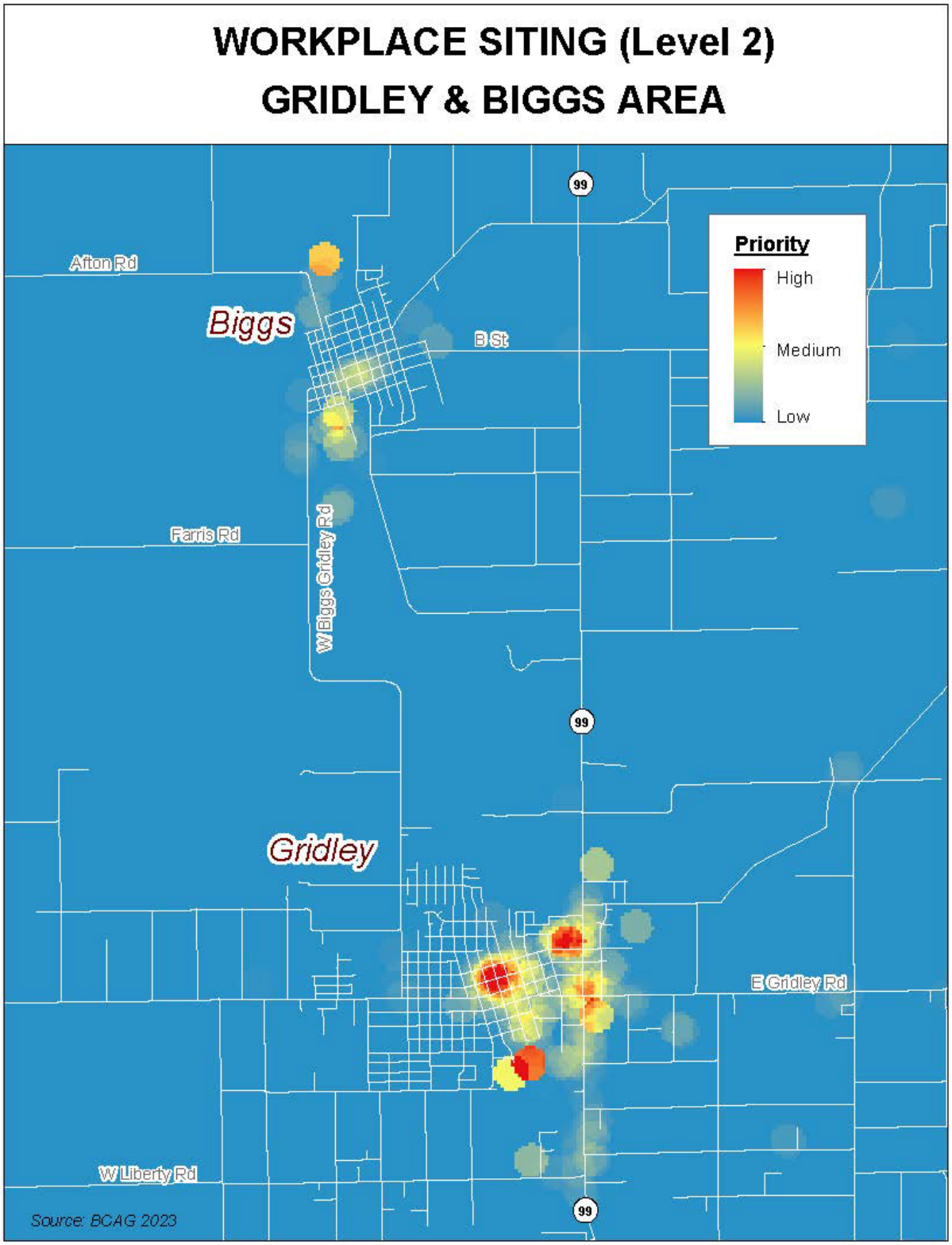


Figure 4-11. Workplace Siting (Level 2), Oroville Area

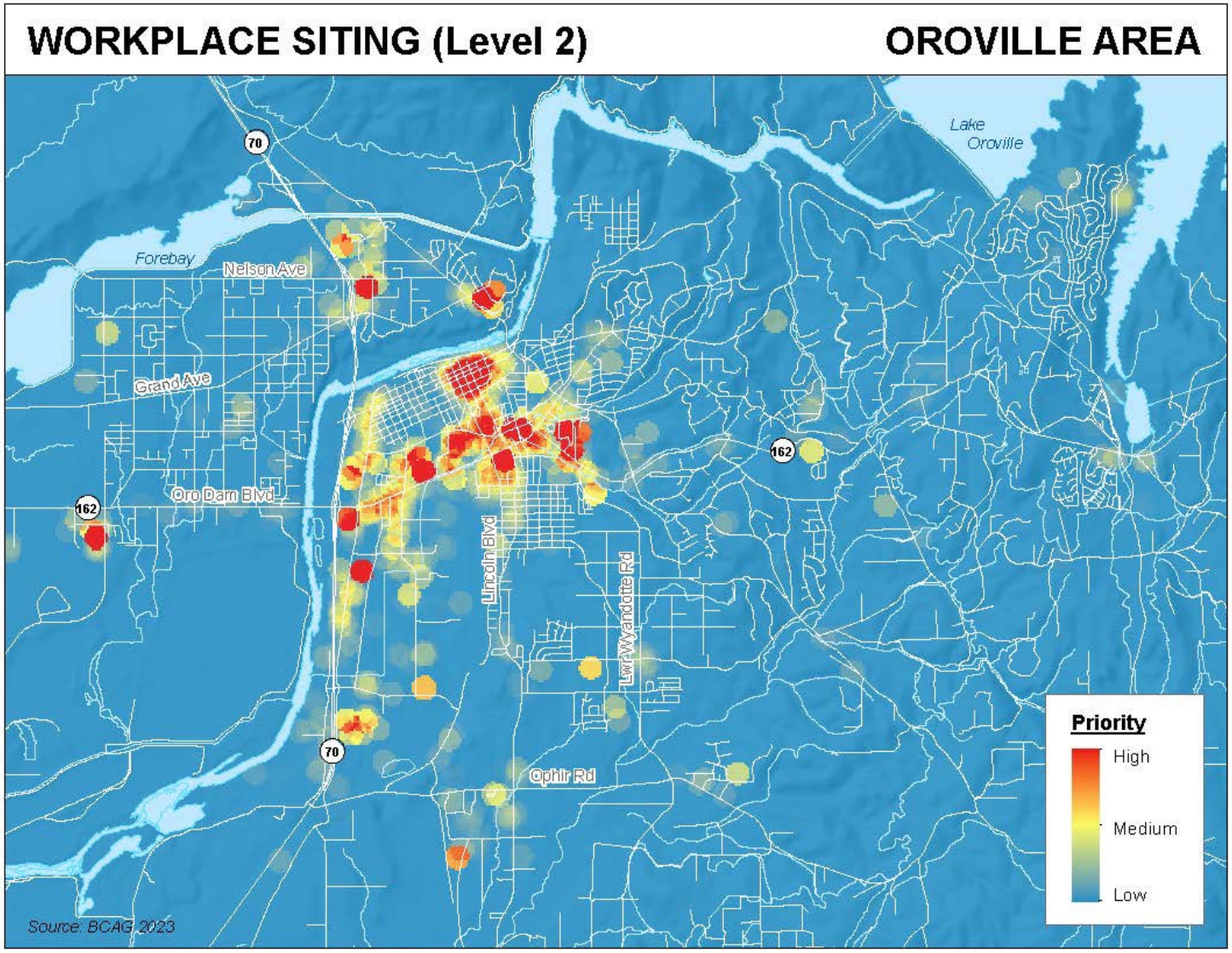
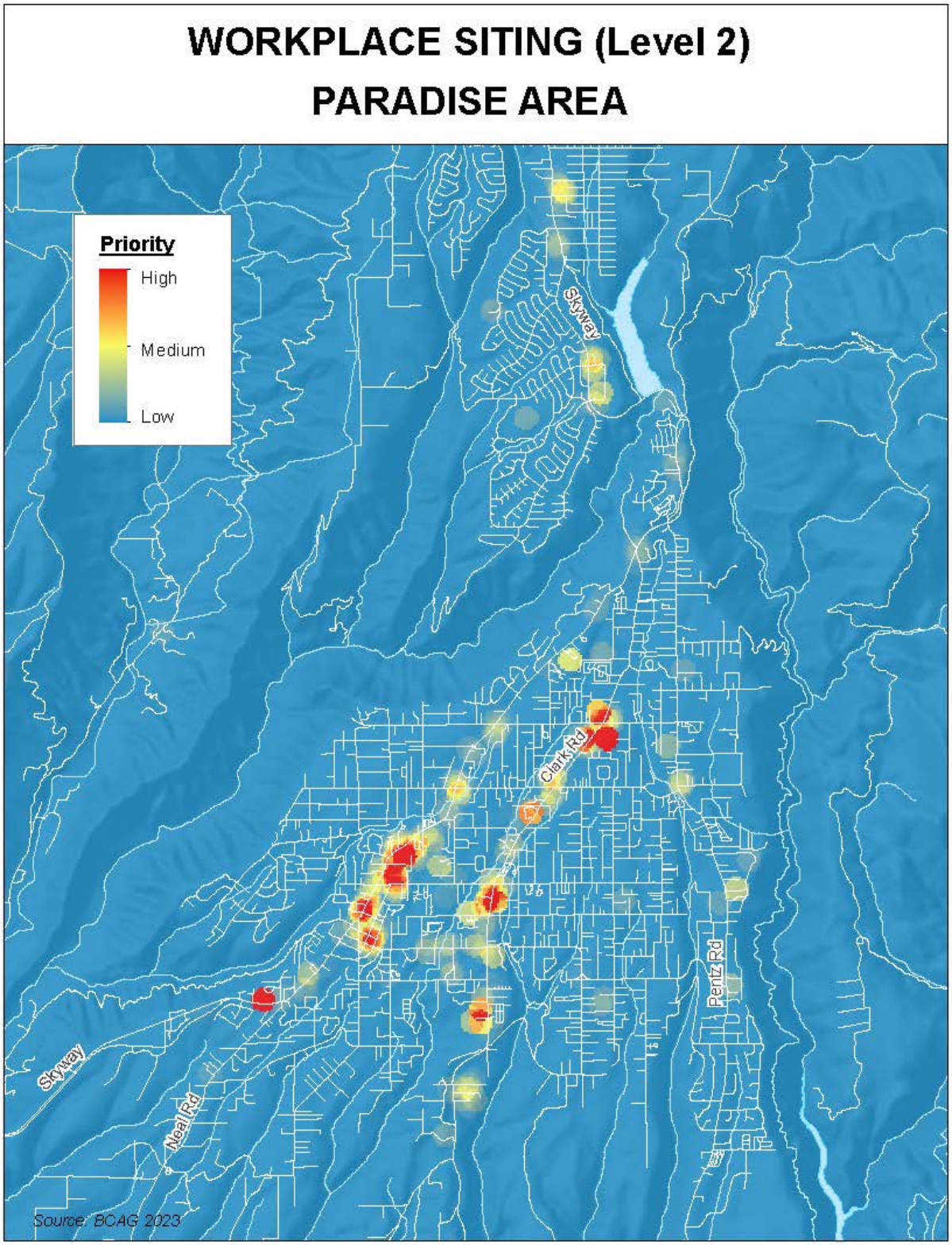


Figure 4-12. Workplace Siting (Level 2), Paradise Area



4.4 MULTI-FAMILY RESIDENTIAL PRIORITY LOCATIONS

The BCAG 2020 Regional Transportation Plan and Sustainable Communities Strategy estimates that 25% of the existing residential units within Butte County are multi-family. A driver's residence is the most frequented location for charging; however, installation of multi-family residential chargers presents unique challenges including parking and utility access, costs associated with installation and operation, and agreements between property owners and tenants.

For the purpose of the multi-family residential siting analysis, locations were prioritized based on the density of multi-family housing units within the urban areas.

Multi-family residential locations were identified and prioritized for each Butte County incorporated jurisdiction and expanded to the remaining urban area. Primary charging locations include the greatest density of multi-family residential units.

Hot spot density maps have been prepared for each urban area and locations are prioritized (high to low) based on the number of multi-family units in relation to each other, assuming these areas will attract a higher number of ZEV drivers.

The data source utilized for the multi-family residential access siting was the BCAG existing land use database in GIS format. The existing land use database is updated annually and represents the best available information as of May 2023.

Figures 4-13 through 4-16 identify the priority locations within the region for multi-family residential charging stations.

Figure 4-13. Multi-Family Residential Siting (Level 2), Chico Area

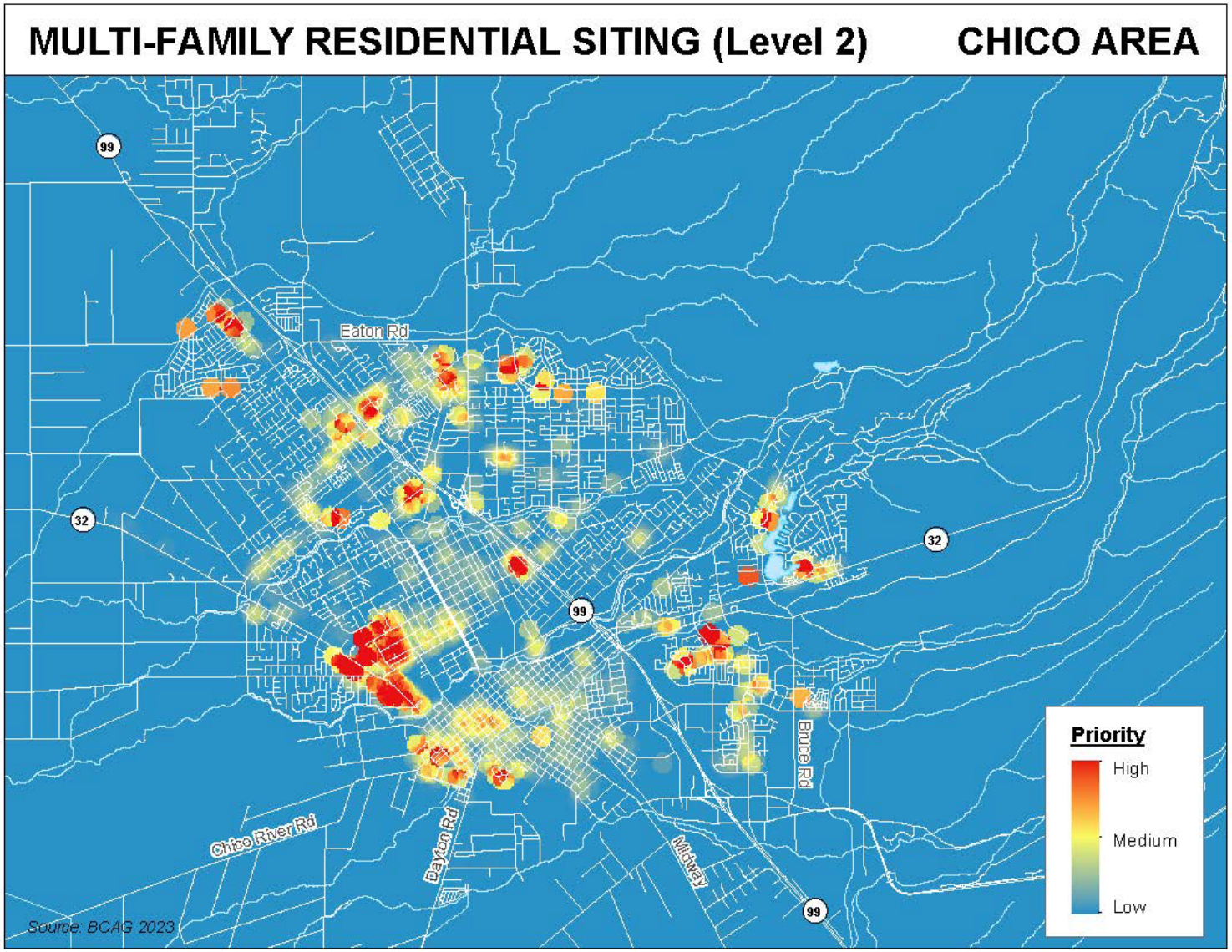


Figure 4-14. Multi-Family Residential Siting (Level 2), Gridley and Biggs Area

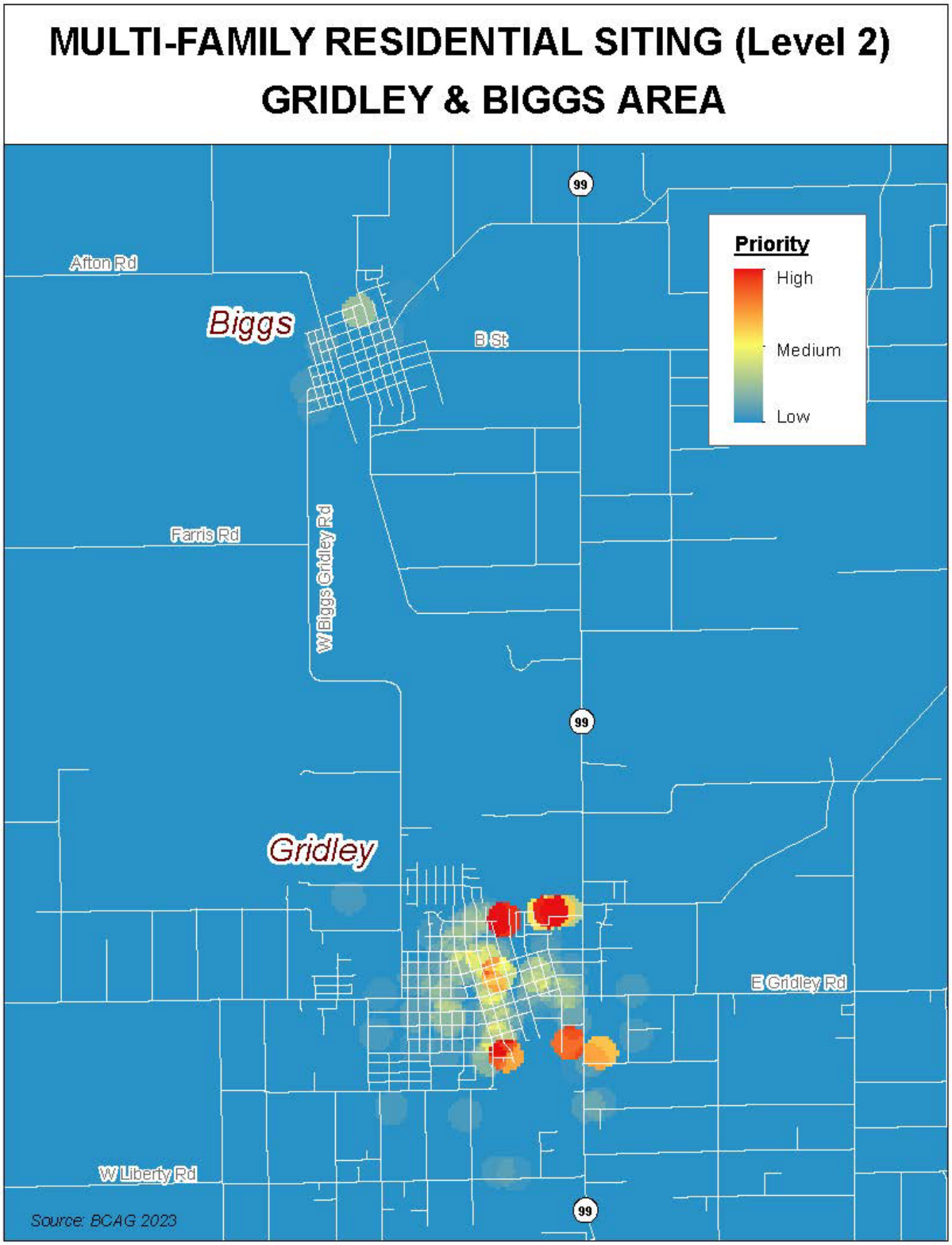


Figure 4-15. Multi-Family Residential Siting (Level 2), Oroville Area

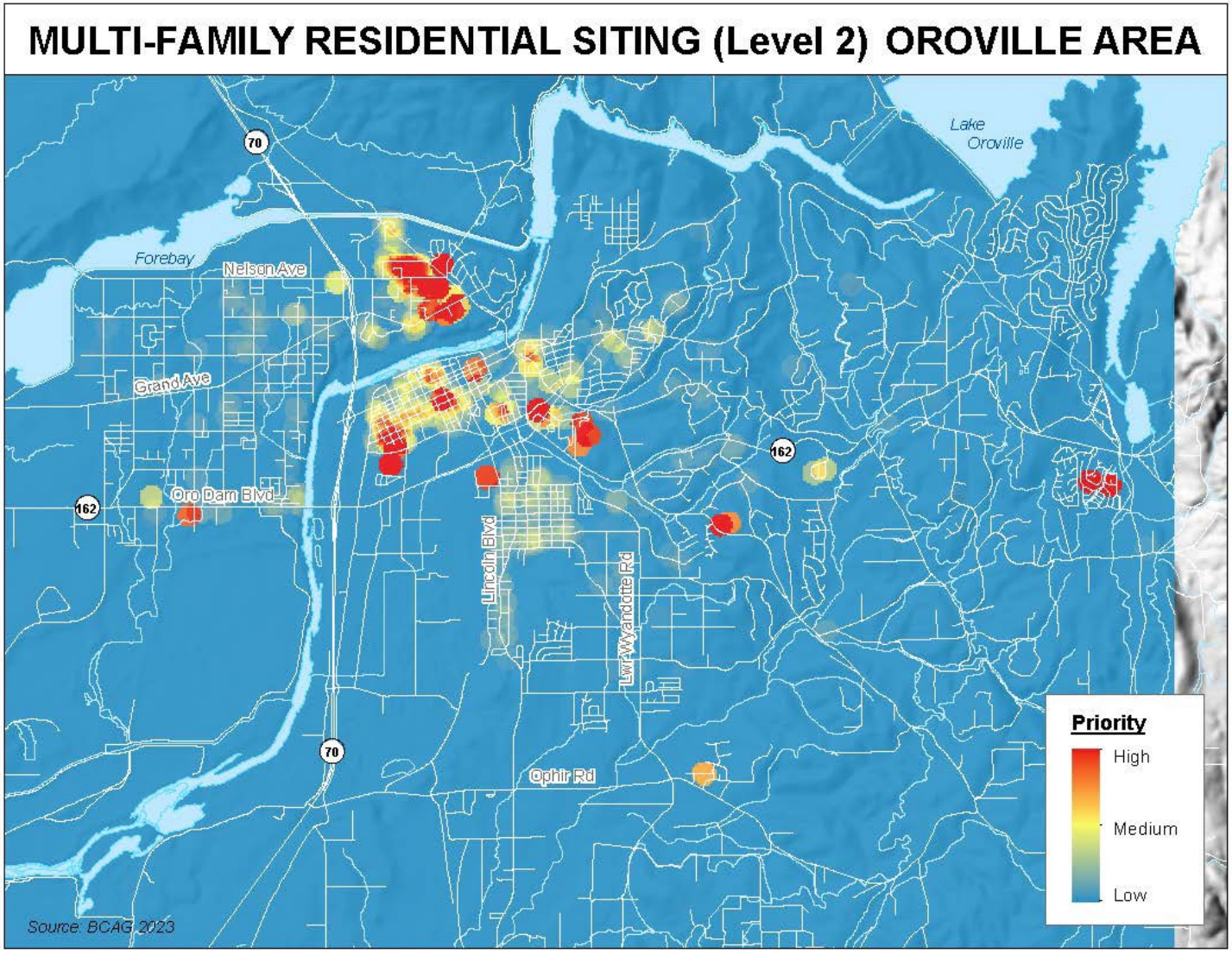
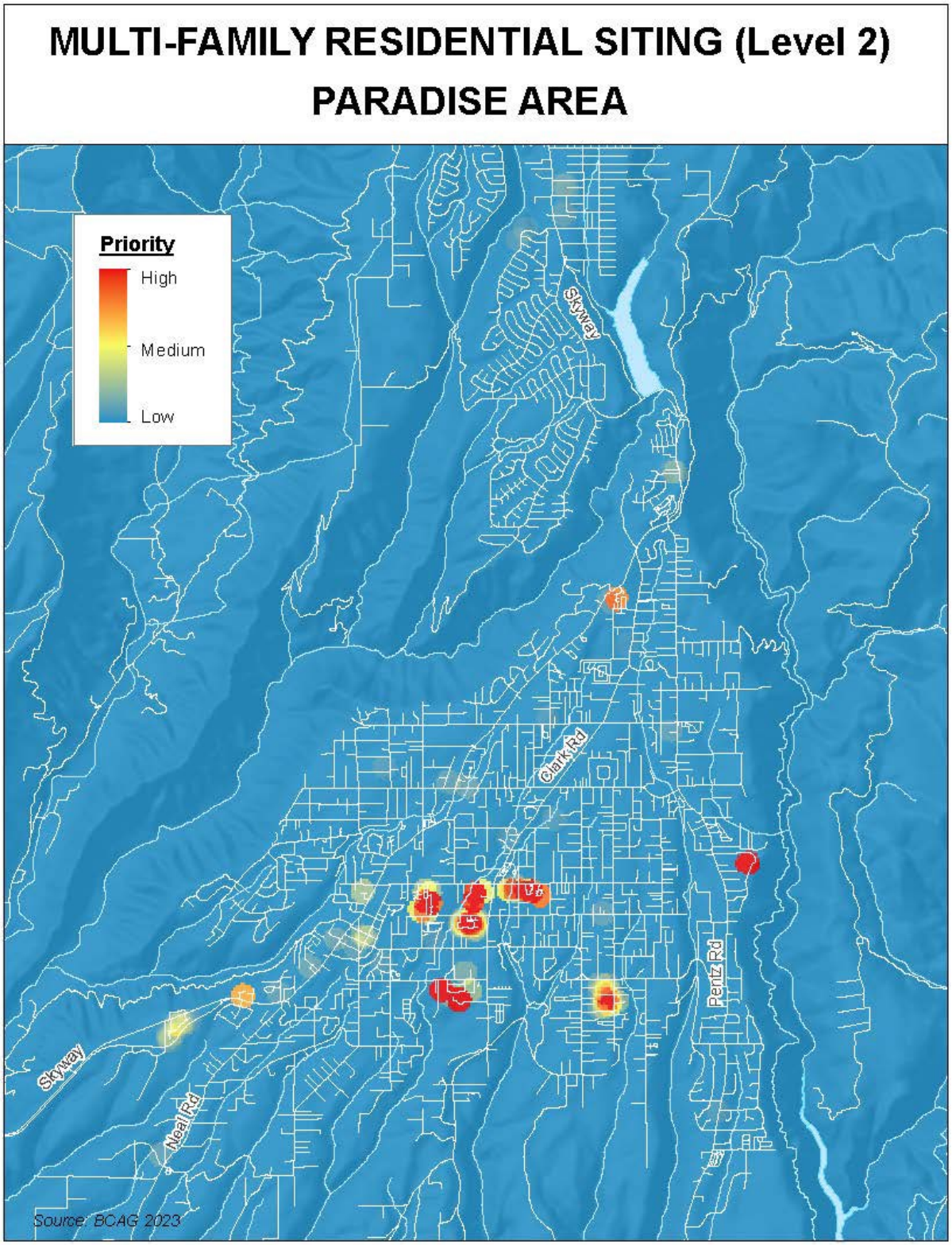


Figure 4-16. Multi-Family Residential Siting (Level 2), Paradise Area



4.5 RURAL/UNINCORPORATED PRIORITY LOCATIONS

Because the regional siting plan in the previous sections focuses primarily on the urban areas in the region, an additional step has been taken to identify priority locations for EVSE installation in the rural, unincorporated areas (Figure 4-17).

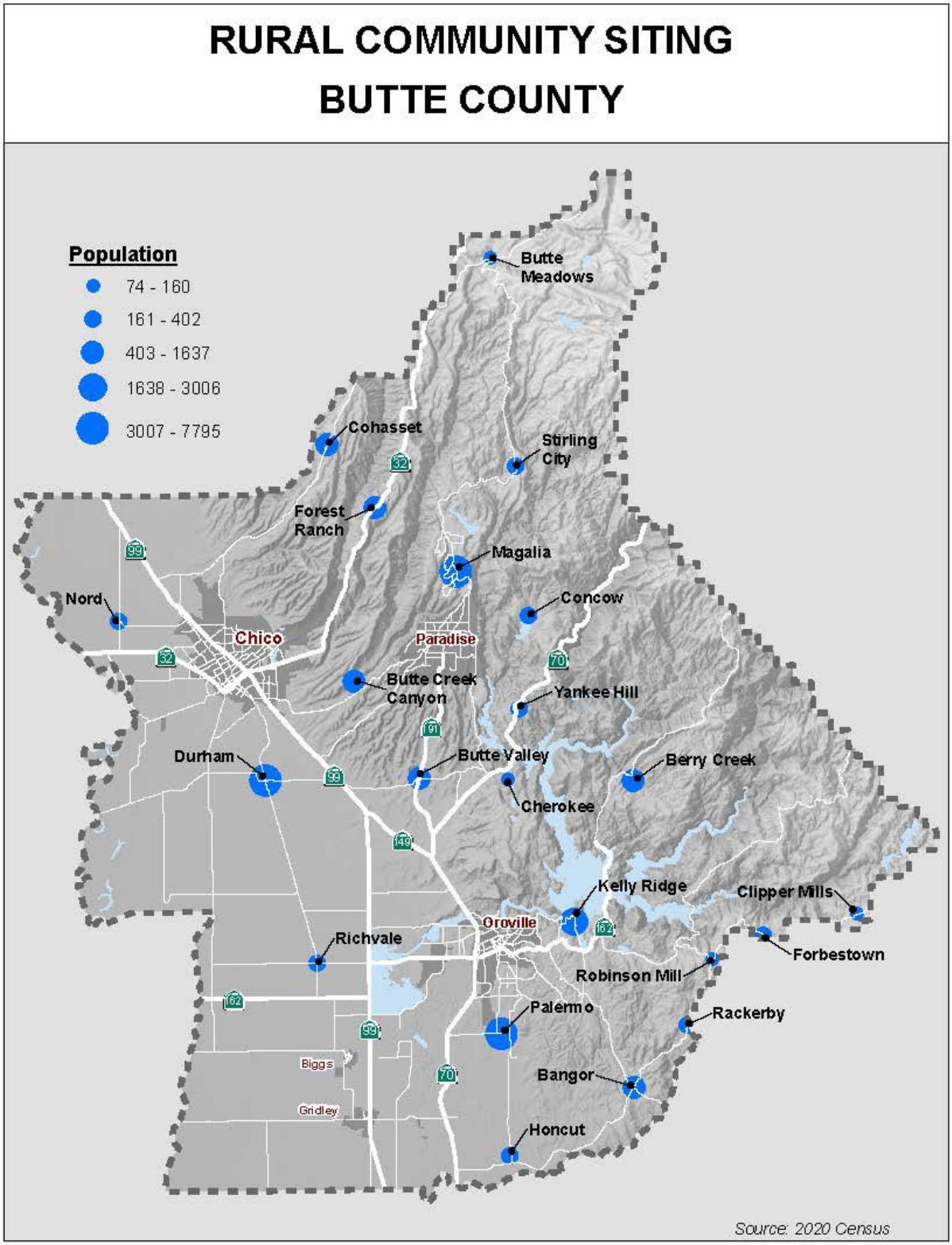
Figure 4-17 identifies preferred locations for rural charging stations. Communities with the largest populations like Magalia, Durham and Palermo represent the highest priority locations amongst the rural communities for EVSE installation.

Within these communities, installation sites should be located within land uses that are conducive to public charging, such as retail/commercial land uses, post offices, parks, etc.

Additionally, while not indicated in Figure 4-17, EVSE installation should be considered at many of the recreation and tourism sites throughout unincorporated Butte County such as Feather Falls Scenic Area, Bald Rock Dome, Jonesville Snowmobile Parking Lot, Table Mountain Ecological Reserve, Gray Lodge Wildlife Area, Sacramento River National Wildlife Refuge, Oroville Wildlife Area, Lake Oroville Recreation Areas, etc.

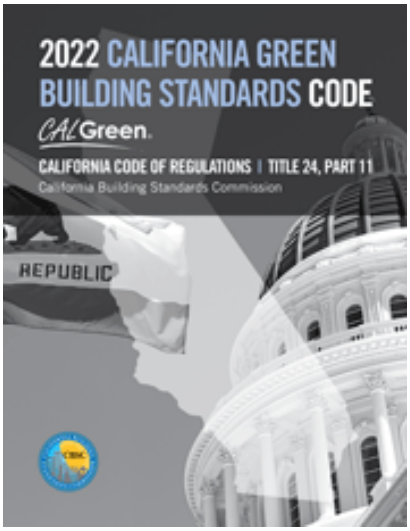
Rural unincorporated communities have unique challenges when it comes to ZEV ownership including limited public charging stations, emergency evacuation concerns, and terrain and weather factors including snow and ice. ZEV owners in rural areas must rely more on residential charging, and plan travel carefully to ensure their vehicles have enough charge to return home successfully from trips to urban and other outlying areas.

Figure 4-17. Rural Community Siting Map


RURAL COMMUNITY SITING
BUTTE COUNTY
Population
74 - 160
161 - 402
403 - 1637
1638 - 3006
3007 - 7795
Butte Meadows
Cohasset
Stirling City
Forest Ranch
Magalia
Nord
Concow
Chico
Paradise
Butte Creek Canyon
Yankee Hill
Durham
Butte Valley
Berry Creek
Cherokee
Kelly Ridge
Clipper Mills
Oroville
Richvale
Forbestown
Robinson Mill
Palermo
Rackerby
Biggs
Bangor
Gridley
Honcut
Source: 2020 Census

5. BUILDING CODES

5.1 INTRODUCTION



Several building codes are currently required for Local Agencies in California to support ZEV charging and future EVSE installation. There are also additional ZEV-friendly building codes that are not currently required that the Local Agencies should consider implementing to encourage the further growth of ZEVs in the region.

5.2 CALIFORNIA GREEN BUILDING STANDARDS CODE

The CalGreen document "*2022 California Green Building Standards Code"* identifies mandatory and voluntary building codes for ZEVs and charging stations in California. The link below includes information on all mandatory and voluntary CalGreen codes.

CalGreen also requires that a minimum number of parking spaces be dedicated to ZEVs and/or Clean Air Vehicles in multi-family residential parking lots and commercial parking lots. For additional information on all CalGreen building codes, see: https://codes.iccsafe.org/content/CAGBC2022P1/chapter-4-residential-mandatory-measures.

5.3 OTHER CALIFORNIA BUILDING CODE REQUIREMENTS

In addition to the CalGreen requirements, California Assembly Bill (AB) 1236 requires that all jurisdictions must "streamline" the ZEV permitting process. This bill requires local jurisdictions to adopt an ordinance with an expedited, streamlined process for permits for EVSE. Jurisdictions are free to define what this means, and how they will implement such measures. Many jurisdictions have focused on streamlining simple low-power residential installations (Level 1 and 2 charging installations). Sample ordinances and staff reports for implementing AB 1236 are available in Appendix M, *AB1236 Sample Ordinances and Staff Report*.

Other laws that address ZEV charging include AB 475, authorizing local jurisdictions to require that cars located at EVSEs must be plugged into the ZEV charger (see CA Vehicle Code 22511), and Senate Bill 880, which outlines rights and responsibilities of Homeowners Associations to ensure that EV drivers are not unreasonably prohibited from installing EVSE.

Local Agencies should also consider adopting some or all of the voluntary residential and commercial CalGreen requirements. These are included in the main CalGreen document that can be accessed from the link above.

Adopting the mandatory and voluntary EVSE requirements in Local Agency building codes can help promote and facilitate future EVSE installations and increased ZEV use and provide cost

savings on future installation costs. Electrical infrastructure for charging ZEVs can also be required in new industrial, public, and other non-required land uses, with sufficient size to ensure future accommodation of EVSE.

Local Agency ZEV-related building code standards should also address the following issues:

- Location of EVSE, including acceptable EVSE sites on a typical property and recommended locations of EVSE relative to vehicles and electrical panels.
- Electrical and technical standards for EVSE, including construction of equipment, wiring methods, and safety protection. Relevant standards can be found in the California Electrical Code and the Underwriter's Laboratories (UL) guidance on EVSE.
- Signage and marking requirements
- Ventilation requirements
- Permitting and inspection requirements.

To facilitate the installation of EVSE by residents, it is recommended that Local Agencies develop guidance documents that summarize local building code and permitting requirements related to EVSE installations. These can be provided both online, and in hard copy form at the local agency planning counter.

An additional complimentary requirement that Local Agencies should consider is including the same infrastructure for solar systems that can be used to power ZEVs, along with electrical needs of the residence.

6. PERMITTING AND INSPECTION

6.1 INTRODUCTION

The Local Agencies should streamline their permitting and inspection procedures to ensure a fast, simplified process. Applying for a permit and waiting for an inspector can be time intensive and costly – as many as three separate visits by the installer may be required to apply for the permit, perform the work, and complete the inspection. In addition, a fourth visit by the installer can be needed if the utility requires a separate inspection. All of these costs are typically passed onto the consumer.

A STREAMLINED PROCESS SHOULD BE EFFICIENT AND CONSISTENT, WHILE ENSURING SAFE INSTALLATIONS AND MINIMIZING COSTS FOR PROPERTY OWNERS

However, a variety of steps can be taken by the Local Agencies to reduce these delays and streamline the permitting and inspection processes. A streamlined process should be efficient and consistent, while ensuring safe installations and minimizing costs for property owners. Streamlined processes can also reduce complexity for all participants, allowing installers to clearly set expectations of ZEV owners, providing electrical contractors with clarity on procedures and requirements, and giving Local Agency staff well-defined, repeatable actions.

6.2 RECOMMENDATIONS FOR PERMITTING AND INSPECTION BEST PRACTICES

The process of installing charging equipment involves several steps, some of which add time and could potentially discourage potential new ZEV owners. Streamlining the processes for receiving local agency permits, as well as the inspection process, will provide benefits to all parties, particularly as the number of new ZEV owners continues to grow.

STREAMLINE EVSE PERMITTING PROCESS

As noted in Chapter 5, California Assembly Bill (AB) 1236 requires that all jurisdictions must "streamline" the ZEV permitting process. This bill required local jurisdictions to adopt an ordinance with an expedited, streamlined process for permits for EVSE. Jurisdictions are free to define what this means, and how they will implement such measures. Many jurisdictions have focused on streamlining simple low-power residential installations (Level 1 and 2 charging installations). Sample ordinances and staff reports for implementing AB 1236 are available in Appendix M, *AB1236 Sample Ordinances and Staff Report*.

Table 6-1 below identifies recommendations for streamlining the EVSE permitting process.

Table 6-1. Recommendations for Streamlining EVSE Permitting Process

Recommendations for Streamlining EVSE Permitting Process
1. Implement online permitting. Local Agencies should enable homeowners and licensed contractors to submit ZEV charger permit applications online for installations at a pre-determined complexity level to reduce the number of time-consuming trips to the local agency permitting office.
2. Provide online information describing EVSE requirements. Local Agencies should provide information on their websites describing EVSE requirements. Additional outreach material should also be considered including general information on ZEV benefits and types, available EVSE options and other helpful ZEV resources to prepare homeowners and licensed contractors for the permitting process.
3. Prioritize EVSE permitting. To promote adoption of ZEVs, Local Agencies should consider prioritizing the processing of EVSE permits to ensure faster turn-around time.
4. Utilize standard permit application forms and checklists. Local Agencies should adopt standardized permit application forms and checklists to streamline and simplify the permitting process. Appendix D, *Example EVSE Permit Application Forms and Checklists,* includes sample permit applications forms and checklists.
5. Establish flat fees for standard installations. Flat fees should be set for standard installations, rather than determining fees as a percentage of the overall cost of a project as is often the case. The flat fees can be recovery-based to ensure Local Agencies are able to recover all costs associated with EVSE permit issuance.
6. Eliminate plan check requirements for simple single-family residential installations. Local Agencies should consider eliminating the requirement for formal drawings for a standard installation that does not require re-wiring or panel upgrades. In many cases, a permit application and a sketch of the installation location can often be sufficient to obtain a permit.
7. Allow EVSE across different zoning classifications. Because EVSE is complimentary to many different land uses, it should be allowed across different zoning classifications (see Table 7-1, Chapter 7).
8. Consider Certain EVSE installations as either “not a project” or “exempt” from CEQA. Many simple EVSE installations can be considered exempt from CEQA. Consider other more complex EVSE installation projects as being exempt from CEQA on a case-by-case basis.
9. Count ZEV charging stations toward meeting minimum parking requirements. This will help encourage the use of ZEVs within a jurisdiction.
10. Consider allowing the installation of ZEV charging stations as a mitigation measure for large projects. This requirement can help ensure the continued expansion of the ZEV charging network.

STREAMLINE EVSE INSPECTION PROCESS

A streamlined process for inspection of EVSE installations is also needed to encourage ZEV use in the region. Table 6-2 identifies recommendations for streamlining the EVSE inspection process.

Table 6-2. Recommendations for Streamlining EVSE Inspection Process

Recommendations for Streamlining EVSE Inspection Process
1. Remove inspections for simpler installations. For the most basic installations, consider simply removing the need for an inspection.
2. Consider spot inspections for simple installations. To speed up simple installations that do not require electrical systems upgrade, Local Agencies should consider adopting a process whereby registered, licensed, and appropriately-screened electricians can self-certify that they have installed equipment according to code. This is a similar approach as is commonly used for large appliances, such as electric water heaters.
3. Condense inspections and waive plan check requirements for certain complex installations. Local Agencies should consider eliminating progress inspections and waive plan check requirements for more complex installations that do not include panel upgrades or underground conduit.
4. Establish a flexible inspection request program. Establishing an EVSE inspection program that includes an online or 24-hour request system through voicemail is strongly encouraged for scheduling inspections. If possible, same-day inspections are encouraged.
5. Provide shorter inspection windows. If possible, establish 2-hour windows for site inspections to limit customer wait time.
6. Avoid requiring an electrician to be present during inspection to decrease consumer costs. This can make scheduling inspections easier, and decrease time and costs for the consumer.

For additional information, see Appendix E, *Streamlining the Permitting and Inspection Process for Plug-in Electric Vehicle Home Charger Installations.*

7. ZONING, PARKING AND SIGNAGE

7.1 INTRODUCTION

Efforts to improve, clarify and streamline zoning ordinance regulations that govern the access to and use of ZEV charging infrastructure within a jurisdiction should be implemented by the Local Agencies. These zoning code provisions can encourage the appropriate placement of EVSE in various land-use designations. They can also include requirements regarding purpose, definitions, allowed uses, design and installation criteria, signage, accessibility, quantity, lighting and maintenance.

Local Agencies should specify where EVSE is allowed as an outright permitted use, or as an accessory to an outright permitted use, and if applicable, specify which EVSE (Level 1 or Level 2, DC fast charge, etc.) apply. Specifications for these criteria are located in Appendix C, *Ready Set Charge*, with recommendations in Table 7-1 below.

7.2 ZONING

Determining whether ZEV charging should be a principal use, or an accessory use will dictate what kind of permit and planning review process is needed. Table 7-1 below provides sample "Allowed Uses" for EVSE placement in typical zoning districts. Additional information on zoning, including sample zoning code and ordinance amendments, can be found in Appendix C, *Ready Set Charge,* in Section 3.2.

Table 7-1. Sample Zoning Districts and Allowed EVSE Uses.

Zoning District	AC Level 1 and 2 Charging Station	DC Fast Charging Station	Battery Swap Station
Low Density Residential	P-A	P-A	
High Density Residential	P-A	P-A or P*	
Mixed Use	P	P or P*	
Commercial	P	P	P
Industrial	P	P	P
Institutional	P	P	P
Recreational	P-A	P-A	

P = Permitted use, P-A = Allowed only as an Accessory to a principal outright permitted use, P* = Local jurisdictions may choose to allow DC fast charging stations as an outright permitted use or to adopt development standards applicable to high-density residential, mixed-use residential or other zoning districts.

Principal use refers to the main purpose of the site and the uses allowed, such as shops in a business district or houses in a residential district. Accessory uses are secondary to the principal use, such as a garage in a house. Accessory uses can avoid the need for additional planning review.

Level 1 and Level 2 charging can often be seen as accessory uses and therefore may only need an electrical permit to install. DC fast charger installations require significantly greater electrical work, and typically require a longer planning and permitting process. The Local Agencies can clearly define ZEV chargers as a permitted use, or list ZEV charging directly as a principal or accessory use to better help guide planners on which permits are needed for the installation.

Local Agencies can also use the following methods to better address EVSE installation in their zoning code:

- Allow charging as an accessory use that does not require more than a simple planning clearance, as long as charging is not the primary purpose of the site.
- Allow installation of chargers as an outright permitted or accessory use as appropriate in zones that present the most significant local opportunities for ZEV charging
- Require a minimum percentage of parking spaces in new construction be ZEV-ready based on current and anticipated ZEV demand.
- Zoning ordinances that allow charging as a permitted or accessory use should tailor any additional conditions of installation to the type of building specified in the ordinance.
- Allow developers to develop more intensively than zoning codes typically allow in exchange for more ZEV parking spaces and EVSE.

Additional information on zoning, including sample zoning code and ordinance amendments, can be found in Appendix C, *Ready Set Charge,* in Section 3.2.

SITING AND DESIGN GUIDELINES FOR ZEV CHARGING STATIONS

Proper siting and design of ZEV charging stations can ensure easy use by ZEV drivers if developed correctly. Before deciding where to place EVSE, there are several factors to take into account:

- The source of electricity and location of electrical panels/circuits
- The load level of the electrical panel and its capacity to handle the additional charging load
- The locations for disabled-accessible parking spaces for ZEVs
- Placement of charging cables to reduce hazards
- Opportunity cost of parking spaces dedicated to ZEV charging
- The types of parking policies to be established

For additional information on siting and design for ZEV charging stations, see Appendix C, *Ready Set Charge,* Section 3.4 and Appendix E, *Accessibility and Signage for Plug-in Electric Vehicle Charging Infrastructure*.

7.3 SIGNAGE FOR ZEV CHARGING

Signs for ZEV charging should be clear, consistent and visible to ensure ease of use and reduce potential issues and conflicts. The California Manual of Uniform Traffic Control Devices (https://dot.ca.gov/programs/safety-programs/camutcd) contains a series of standard signs

and markings for ZEV charging stations and parking stalls. Additional information on signage can be found in Appendix H, *Policy Directive MUTCD ZEV Signs &Pavement Markings 2013.* For signage specific to accessible ZEV charging stations, see Appendix L, *Accessibility and Signage for Plug-in Electric Vehicle Charging Infrastructure*. These resources should be used by all Local Agencies to ensure consistency of signage throughout the region. Several examples of signs for ZEV charging are included below in Table 7-4.

Table 7-4. Examples of Recommended ZEV Signage

Sign Example	Sign Purpose
 	ZEV Charging Station Identification. Identifies charging stations, and when accompanied with arrows, assist in directing ZEV drivers to charging stations from freeways, local arterial roadways, etc.
	Permissive Charging Sign. Indicates the time that charging will be available at a specific location. Many charging stations are available 24 hours a day, while other use a reduced timeframe. Establishing a time limit on charging (in this case 4 hours) helps ensure proper rotation of vehicles through a charging station. The time limit should correlate with the level of charging provided (less time permitted for a DC fast charger, more time for a Level 2 charger)
	No Parking Sign. Indicates no parking is allowed except for electric vehicle charging. Note that only vehicles that are actively charging are permitted to park at a ZEV charging station.
	ZEV Tow-Away Sign. Identifies that vehicles will be towed if not utilizing the available charging station. This sign includes the tow-away symbol with the following language: "UNAUTHORIZED VEHICLES NOT CONNECTED FOR ELECTRIC CHARGING PURPOSES WILL BE TOWED AWAY AT THE OWNERS EXPENSE".

Source: California Department of Transportation, "*California Manual of Uniform Traffic Control Devices 2023*" (https://dot.ca.gov/programs/safety-programs/camutcd)

8. WORKPLACE CHARGING

8.1 INTRODUCTION

Workplaces present an important opportunity for ZEV charging that can benefit both employees and employers. After residences, they are the second most important location for ZEV charging. Vehicles typically have a dwell time of several hours while parked at workplaces, making it possible for them to sufficiently recharge before commuting home or making other late afternoon trips such as taking kids to practices, going shopping, or pursuing after-work recreational activities.

The ability to charge at work may also encourage ZEV adoption by those that feel residential charging is cost-prohibitive or logistically difficult, particularly residents of older multi-family dwellings such as apartments or condominiums where charging may simply be unavailable. If implemented properly, workplace charging can help bridge the gap between residential and publicly accessible charging.

There are many large employers in Butte County that are logical locations for EVSE installation. Some of the larger employers have already installed charging stations, including California State University Chico, Enloe Medical Center and Sierra Nevada Brewing Co. in Chico, and Feather Falls Casino in Oroville. Chapter 4, Section 4.3 identifies priority locations in the region for workplace charging.

8.2 BENEFITS OF WORKPLACE CHARGING

Workplace ZEV charging offers many benefits to employees, employers and building owners (Tables 8-2 and 8-3). For a project to be successful, it is important for all parties to understand these benefits.

Table 8-2. Workplace Charging Benefits for Employees

Benefits for Employees
Range Security: The ability to charge at work can help alleviate “range anxiety”, a driver’s uncertainty about the vehicle’s ability to reach a destination before depleting the battery’s charge. Many workers also have after-work responsibilities and activities that require additional miles of driving, making workplace charging an extremely valuable asset to them.
Range Extensions: Charging at the workplace can potentially double daily all-electric driving range, accommodating longer commutes and additional trips between the workplace and meeting locations, site inspections, etc..

Benefits for Employees
Greater Flexibility: By extending range, workplace charging opens up options drivers might not otherwise have, making it easier to manage special circumstances, unexpected meetings or inspections, and unexpected changes in plans or schedules. If an urgent meeting suddenly arises in a neighboring town or city, workplace charging can provide the missing link to allow such trips to be made and alleviate employee stress. Workplace charging also provides flexibility in the location and timing of charging, which may be helpful for drivers whose residential charging options are somewhat limited, inconvenient, or even nonexistent.
Increased Incentive for ZEV Adoption: The ability to charge at work may provide the encouragement and assurance an employee needs to make the switch from a conventional vehicle to a ZEV, and to take advantage of the financial and environmental benefits of such a switch.
Thermal Preconditioning: On very hot or cold days, workplace charging allows ZEV drivers to achieve a comfortable cabin temperature and to preheat or precool the battery while the vehicle is still plugged in. This extends the vehicle's range by reducing the climate-control load on the battery.

Table 8-3. Workplace Charging Benefits for Employers and Building Owners

Benefits for Employers and Building Owners
Employee Recruitment and Retention: The availability of charging sends the message that an organization stays on the leading edge of technological development, even to workers who don't drive ZEVs. And employers that offer charging may be better positioned to attract and retain employees who do drive ZEVs
Furthering Sustainability Goals: The availability of ZEV charging can be a strong addition to an organizations larger portfolio of sustainability practices, especially if the organization has existing objectives related to employee commuting practices, transportation air quality emissions reduction goals, or greenhouse gas reduction targets in climate action plans or sustainable community strategies.
Public Image: Providing workplace charging can help demonstrate an organization's leadership in supporting cutting-edge, clean transportation technologies to customers, consumers, and the surrounding community.
Employee Satisfaction: Workplace charging can be an attractive addition to an organization's existing employee benefits package.
Tenant Attraction and Retention: Building owners that offer workplace charging at their facilities convey an image that they are interested in providing smart, proactive solutions for tenants' present and future needs.

8.3 EVALUATING AND PLANNING FOR WORKPLACE CHARGING

The successful implementation of workplace charging often requires careful planning to address potential challenges, and ensure a project is successful in meeting the unique physical, cultural, and organizational needs of each workplace.

FACILITIES OWNERSHIP CONSIDERATIONS

Implementing ZEV workplace charging is easiest when the employer owns and operates its facility. Planning and installation will be a more straightforward process if the employer has total control of real estate, including the affected parking area(s), building(s), and electrical infrastructure.

Planning and installation may be more complex when multiple stakeholders are involved. For example, a business may lease office space in a building that is owned by one entity, operated, and maintained by another entity, with a parking facility operated by yet another entity.

For assistance with evaluating the scope of a workplace charging project in Butte County, organizations should contact the Sacramento Clean Cities Coalition, who work with vehicle fleets, fuel providers, community leaders, and other stakeholders to reduce petroleum use in transportation (see link): http://www.cleancitiessacramento.org/

IDENTIFYING KEY STAKEHOLDERS

As ZEV ownership increases, organizations will likely find that employees will drive the conversations for installing workplace charging stations. In small organizations and businesses, informal discussions are often all that's needed to determine whether the organization should explore the possibility of adding workplace charging. However, medium and large employers may need to follow more formal processes and protocols.

Typically, key decision makers include a management-level designee, a sustainability lead, the building owner (if different from the employer), the parking lot operator (if different from the employer), facilities operations staff, human resources staff, and legal counsel. Employers and employees with complex building ownership and/or parking arrangements should engage all relevant stakeholders to ensure that EVSE planning, installation, and operations take all parties' interests and needs into account.

EVALUATING EMPLOYEE DEMAND

Medium and large employers often find it useful to gauge potential employee demand for workplace charging before committing the time, money, and energy to such a project. Employee surveys can be useful for this purpose. A survey should not only assess existing demand, but also help predict future demand.

See Appendix I, *Workplace Charging Sample Survey* for additional sample employee surveys for workplace charging.

The organization's decision-makers should evaluate survey results to help determine the number of charging stations that may be needed. Employers should allow for the possibility of future expansion when developing their workplace charging plans. This may include upgrading a facility's electrical service beyond what is necessary for short- term demand.

SELECTING A LEVEL OF CHARGING FOR YOUR WORKPLACE

When determining which type(s) of charging equipment to provide at your workplace, important considerations include EVSE system cost, proximity of electricity service to parking areas, potential electrical upgrade requirements, EVSE security, and potential maintenance. Perhaps most importantly, employers must consider the commuting distances of their employees.

Level 2 charging (providing 10 to 20 miles of range per hour of charging) at the workplace can provide ZEV drivers with a high level of range security and are the most commonly installed EVSE at workplaces. A single Level 2 EVSE unit could potentially serve multiple vehicles throughout the day, as long as each ZEV driver makes room for another after charging is complete.

Many available mobile applications notify ZEV drivers when their batteries are fully charged. Employers must consider whether it is feasible for employees to take the time to move their cars during the workday. A company charging policy can help ensure employees move their vehicles from the charging location once charging is complete.

Level 1 charging (providing 2 to 5 miles of range per hour of charging) is also a viable option, given that ZEV drivers are likely to be parked at work for several consecutive hours, and that ZEVs used for commuting will most likely have a partially charged battery when they arrive at the workplace. Because Level 1 EVSE can be as simple as a three-pronged extension cord and a standard electrical outlet on a dedicated branch circuit, implementing Level 1 charging is a relatively easy and low-cost strategy to rapidly expand EVSE infrastructure at workplaces.

Using Level 1 as a stepping stone, a business can gain experience and information about how its employees are using workplace charging and gauge employee satisfaction with Level 1 EVSE. The business can then use that information to determine whether to provide faster charging options in the future.

There are many different manufacturers that offer EVSE, and product offerings vary in the types of features they include and the corresponding prices. Level 1 equipment ranges in cost from $0 to $500. The price of Level 2 equipment ranges from about $500 to $7,000 (before incentives), depending on the level of sophistication and number of stations purchased. The most basic products have only standard safety features and status lights. More advanced products have features such as enhanced displays, charging timers, communications

capabilities, keypads, and enhanced durability and ergonomics. “Intelligent” or “smart” products may have features like payment card readers, billing software, advanced displays, wireless communication, automated diagnostics, internal metering, and smart-grid compatibility and controllability.

COST CONSIDERATIONS

Employers seeking to provide workplace charging will need to consider costs associated with equipment, installation, maintenance, and electricity. As shown in Table 8-4, equipment costs for Level 1 and Level 2 EVSE range from about $0 to $7,000.

Installation costs and services vary considerably, so employers should consider obtaining several quotes before moving forward. Factors affecting installation cost (and time) include the number of circuits and EVSE units installed, indoor versus outdoor installation, required electrical upgrades, and permitting and inspection costs. If necessary for a project, trenching, replacing concrete or asphalt, and adding electrical service or panels may add the greatest cost.

Table 8-4. Levels of Charging and Cost of Equipment

Type of Charging	Power Levels (installed circuit rating)	Miles of Range per Hour of Charge	Average Cost of Equipment
Level 1 	110/120 VAC at 15 or 20 Amps	~4-6 miles/hour	$0-$500
Level 2 	208/240 VAC at 30 Amps 208/240 VAC at 40 Amps 208/240 VAC at 50 Amps 208/240 VAC at 100 Amps	8-12 miles/hour 16-24 miles/hour 32-48 miles/hour >60 miles/hour	$500-$7,000
DC Fast Charging (DCFC) 	440 or 480 VAC	~80% in <30min	$75,000

Source: Ready, Set, Charge California! A Guide to EV Ready Communities. Association of Bay Area Governments, Bay Area Climate Collaborative, EV Communities Alliance, CleanFuel Connection, and LightMoves Consulting.

If an organization anticipates expanding the number of EVSE units in the future, it should consider adding extra circuits, electrical capacity, and conduit from the electrical panel to potential EVSE locations during initial installation. This is highly recommended. It is less expensive to install extra panel and conduit capacity during initial construction than to modify the site later. For the same reason, it is a good idea to consider electricity infrastructure for EVSE during the planning phases of new facilities.

A typical budget for a workplace EVSE project might include the following line items:

- EVSE unit(s)
- Contracted labor
- In-house labor
- Material/incidentals
- Equipment rental (backhoe, jackhammer, etc.)
- Sidewalk demolition and repair
- Optional EVSE equipment (e.g., card readers)
- Signage and paint
- Permitting and inspection costs
- Incentives (if available)

Typically, there are fairly few EVSE maintenance requirements, and associated costs are relatively low. Cords should be properly stored and inspected periodically for damage. Periodic EVSE inspection, testing, and preventive maintenance by a qualified technician may be recommended by the equipment manufacturer. Employers should have a clear process, budget, and schedule in place to abide by the recommendations.

Electricity costs will depend upon the type of EVSE and the extent to which it is used by ZEV drivers, as well as the electricity rate structure applied to the site. Maximum potential electricity use from Level 1 EVSE will total about 4,000 kWh/year. At Level 2, use could range from 6,500 kWh to 13,000 kWh per year, depending on the vehicles using the EVSE and the electrical circuit's capacity.

Charging ZEVs during peak electricity demand periods may move a customer into a higher rate category and result in higher electricity costs. However, the advanced capabilities of some EVSE products can be useful for optimizing load management. It is important to discuss the effects of ZEV charging on electricity rates and loads with your utility. Ask the utility whether it offers special ZEV charging rates. This is a fairly straightforward process with most utility providers due to the recent proliferation of EVSE installations.

IDENTIFYING INCENTIVES

Discounts and incentives can lower the costs associated with establishing workplace charging. Employers may be eligible for incentives from the state, city, or utility. To find current incentives, search the Alternative Fuels Data Center's database of federal and state laws and

incentives at www.afdc.energy.gov/laws. For further information about incentives in the Butte region, contact the Sacramento Valley Clean Cities coordinator: http://www.cleancitiessacramento.org/.

8.4 WORKPLACE CHARGING – MANAGEMENT AND POLICY PLANNING

It is important for employers that provide workplace charging to develop a clear internal policy that governs access, security, usage, and other issues.

ACCESS TO EVSE

Employers providing workplace charging should include internal policies that require that EVSE parking spaces are for use only by vehicles that are actively charging. If an employer adopts such a policy, parking signage should clearly indicate the requirements. The employer may decide to limit EVSE use to employees only or to allow visitor use as well. An employer or building owner may decide to place a daily limit on the amount of time a vehicle can occupy a charging space. Access policies should identify the parties responsible for enforcement. Some smart EVSE products can control access through badges or other identification systems.

REGISTRATION AND LIABILITY

Some workplace charging programs require users to register to use the equipment and sign a standard waiver of liability. A registration form could include language requiring vehicle owners to agree that the employer is not responsible for any costs related to vehicle purchase or repairs or for any damage to the vehicle that occurs while it is parked at the charging station. It could also specify a timeframe within which the employer is obligated to address maintenance issues with the charging stations upon notice of the problem.

HOURS OF USE

An employer may decide to limit EVSE use to normal business operating hours. If the employer chooses not to institute such a limitation, it should decide whether any restrictions (such as per-vehicle time limits on charging or employee-only access) are applicable outside of regular business hours.

PAYMENT FOR EVSE USE

Employers that provide workplace charging must decide whether and how employees will pay for EVSE use. Many existing workplace charging programs are free for employees. As the number of ZEVs expands, providing free charging may merit reconsideration.

Some employers charge their employees a fee for using workplace charging equipment. Fees can help offset capital and operational costs associated with workplace charging and can take the form of a charge-per- use or a monthly or annual subscription rate. If an employer does decide to institute a payment system, it is important to develop a fee structure that doesn't discourage use of the EVSE. See Appendix N, *Workplace charging Station Cost Recovery Strategies* for additional information on developing fee structures for employee and general public use of ZEV charging stations.

SECURITY OF EQUIPMENT

It is important for the employer and/or building owner to identify any necessary measures to prevent vandalism and theft of EVSE. The employer should also ensure that the communications and information technologies of the EVSE comply with the organization's cyber security policies

ETIQUETTE FOR SHARED EVSE

Employers should consider developing a well-defined charging etiquette policy that guides drivers in cases where the number of ZEVs exceeds the number of EVSE parking spaces available. The focus of such policies is generally to encourage drivers to make room for another ZEV once they have finished charging. Several solutions are shown in Appendix J, *Workplace Charging ZEV Coalition* (page 14).

ADMINISTRATION OF EVSE OPERATIONS AND MAINTENANCE

Employers that provide workplace charging should designate the party responsible for ongoing operation and maintenance issues and any related costs. For example, in the case of a damaged cord, the employer's policies should clearly indicate which stakeholder should arrange for the repair and how it will be paid for.

8.5 WORKPLACE CHARGING - INSTALLATION

Many parties will be involved in the installation of workplace charging. It is important to consult with your utility, governing authority, electrical contractor, EVSE provider, and other stakeholders early in the process. Below are some of the site and equipment issues organizations must consider when installing EVSE for workplace charging. An employer should discuss these and any site-specific issues with its electrical contractor, utility, and EVSE provider, all of whom should be familiar with these topics

WORKING WITH AN ELECTRICAL CONTRACTOR

A certified electrical contractor should carry out the installation of EVSE who is familiar with the National Electric Code Guidelines found in NEC Article 625, which pertain to EVSE installation. The electrical contractor will serve as the point of contact in coordinating local permitting, inspections, utility upgrades (if needed), equipment purchasing, and installation of the EVSE. The contractor should understand the relevant codes and standards and obtain approval from the local building, fire, environmental and electrical inspecting and permitting authorities before installing EVSE. After installation, the contractor should walk through the site and review the EVSE operation with the owner of the equipment

ENGINEERING AND CONSTRUCTION

Because EVSE installations involve specialty equipment, extensive electrical work, and standard civil engineering work, select well-qualified contractors with experience in the relevant fields. The condition and location of existing electrical equipment will determine the complexity of the required electrical installations. If the existing electrical system does not

support the required EVSE input voltage range, a transformer may be required to step voltage up or down.

SIGNAGE

Signage for ZEV parking spaces should clearly communicate that the spaces are only to be used by ZEVs that are actively charging (See Chapter 7, Section 7.4). It can also be useful to paint the pavement of the parking space to provide an additional visual cue. In facilities where enforcement is limited or non-existent, signage may be the only deterrent against parking by drivers of conventional vehicles

9. VEHICLE FLEETS

9.1 INTRODUCTION

There are numerous public and private vehicle fleets throughout the Butte County region. Some of the larger public fleets include the County of Butte's vehicle fleet housed in Oroville, the City of Chico and Town of Paradise fleets in their respective jurisdictions, the B-Line bus fleet operated and administered by the Butte County Association of Governments in Chico, the U.S. Postal Service fleet throughout the county, and California State University, Chico's fleet near downtown Chico. Larger private vehicle fleets operating in the region include Pacific Gas and Electric (PG&E), which is headquartered in south Chico, Federal Express (FedEx) which is headquartered in central Butte County, and United Parcel Service (UPS) which is headquartered in south Chico.

PUBLIC AND PRIVATE VEHICLE FLEETS PLAY A SIGNIFICANT PART IN OUR REGION'S TRANSPORTATION EMISSIONS, AND THE SWITCH TO ELECTRIC VEHICLES AND HYBRIDS IS AN EASY WAY TO ADDRESS THE PROBLEM

Hundreds of thousands of gallons of gasoline are consumed every year from vehicle fleets. Public and private vehicle fleets play a significant part in our region's transportation emissions, and the switch to electric vehicles and hybrids is an easy way to address the problem. Many entities throughout the U.S. and beyond have already begun the transition, providing successful examples for others to follow. Table 9-1 identifies some of the main benefits from adding ZEVs to vehicle fleets.

Table 9-1. Four Main Benefits from Adding ZEVs to Vehicle Fleets

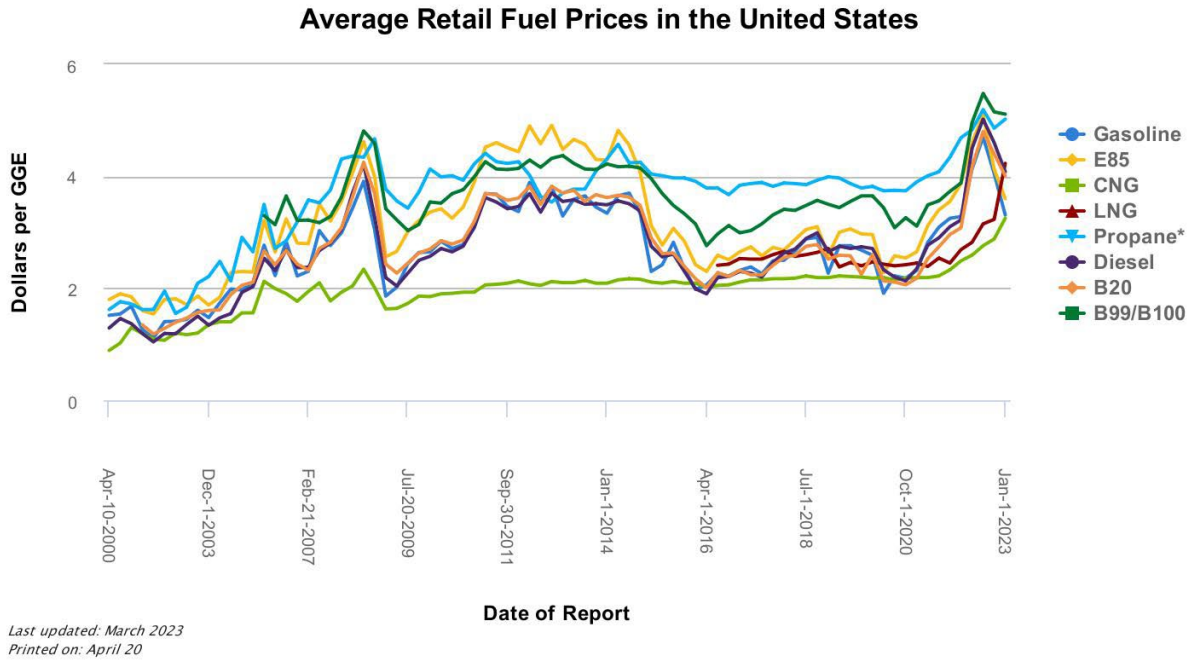
Four Main Benefits from Adding ZEVs to Vehicle Fleets
1. Cost Savings – The City of Los Angeles, reported saving 41% for the vehicles that switched from gas engines to battery power. Compared to $0.37 for conventional city cars, ZEVs would cost $0.21 to operate per mile.
2. Air Quality Improvement – many vehicle fleets operate in urbanized areas where air pollution is at its worst. Putting cleaner-operating ZEVs into service improves the quality of life for residents by improving air quality on city streets.
3. Reducing Noise Pollution – As our cities and communities become more crowded, noise pollution will only increase, affecting those dining at sidewalk cafes, pedestrians, and sensitive wildlife. Silent ZEVs create an instant impact on areas plagued by noise issues.
4. Meeting Emissions Goals – Reducing emission is a priority for all areas in California and beyond, with many agencies working towards stringent

Four Main Benefits from Adding ZEVs to Vehicle Fleets

emissions reduction goals that are rapidly approaching. Converting large vehicle fleets to ZEVs is a quick way to remove polluting vehicles from the roadways to get a jump start on meeting emission reduction goals.

Replacing gas-powered vehicles with ZEVs in a fleet can save greatly on operations and maintenance costs. Many of the maintenance requirements of gas-powered vehicles are not necessary with ZEVs; full electric powertrains never require oil changes, exhausts, air filters, spark plugs, belts, or transmission fluid. Additionally, the cost of charging ZEVs compared with the price of gasoline results in substantial cost savings across the vehicle fleet. Figure 9-1 shows the cost differences between gasoline, electricity, compressed natural gas (CNG), and other fuel types.

Figure 9-1. Average Retail Fuel Prices in the U.S. (2000-2023)



Source: Alternative Fuels Data Center (https://www.afdc.energy.gov/fuels/prices.html)

9.2 ESTABLISHING CHARGING STATIONS

The number of charging stations needed to accommodate a municipality's EV fleet can be determined by the number of vehicles being deployed. "Dwell time" (the amount of time a vehicle spends charging) is also taken into consideration. Estimating the amount of time that a fleet will take to charge all of their ZEVs will establish where to build stations and how much electricity is needed for each (Level 1 or 2 chargers or DC fast chargers).

9.3 ADDITIONAL INFORMATION RESOURCES FOR ZEV FLEET ADOPTION

Additional information resources for ZEV fleet adoption can be found in the U.S. Department of Energy document *Plug-in electric Vehicle Handbook for Fleet Managers:*
https://afdc.energy.gov/files/pdfs/pev_handbook.pdf

9.4 RECOMMENDATIONS FOR NEXT STEPS

All public and private sector entities who operate vehicle fleets should consider phasing out older gasoline powered vehicles with electric vehicles. There are consultant groups available to help entities make this transition. Working with a consultant adds an additional, sometimes significant expense, but entities have found that the extra cost can be worthwhile as consultants can make the transition easier for fleet managers by providing the needed data and statistics to ensure a successful fleet conversion.

10. APPENDICES

See project website at http://www.bcag.org/Planning/Butte-PEV-Readiness-Plan/index.html