



# **ISSUE BRIEF: CALIFORNIA WEIGHTS AND MEASURES STANDARDS FOR EV CHARGING**

**A Review of Early Implementation and Challenges**

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# The Role of Weights and Measures Standards in Commercial EV Charging

Weights and measures standards apply to [half of all U.S. products and services](#), requiring consistency and accuracy in measurement of weight, length, volume, and other quantities for commercial transactions. The goal is to ensure consumers get what they pay for, and products meet safety and quality expectations. The [National Institute of Standards and Technology \(NIST\)](#) sets uniform but nonbinding national standards via [Handbook 44 \(HB 44\)](#) and the [National Type Evaluation Program \(NTEP\)](#), while state and local agencies are responsible for regulation, enforcement, and inspections. [Gas pumps](#) have long been one of the most visible examples of enforcement, and the increasing strength of the electric vehicle market has led policymakers to consider the role of weights and measures standards for electric vehicle supply equipment (EVSE).

While the vast majority of charging happens [at home](#), which is not a commercial transaction, federal and state governments aim to ensure fairness and a positive driver experience for consumers when charging in public and other commercial sites. In these cases, EVSE typically bill based on the quantity of electricity dispensed, making them [subject to weights and measures standards](#). EVSE specifications were [added](#) to HB 44 as a tentative code in 2015 and became permanent in 2023. While not federally required, several states are adopting compliance requirements, and California began implementation before the permanent federal code.

Weights and measures standards must consider how different technologies operate or how quantities are measured. While gas refueling is a simple commodity sale, EVSE transactions are more complex.<sup>1</sup> The driver pays for both fuel (electricity) and infrastructure access, and the pricing may include energy and time components, as well as other fees. Charging options are also much more diverse than traditional refueling, with various business models, charger speeds, customer expectations, dwell times, and locations to consider. For some use cases, revenue is low relative to compliance costs, making them disproportionately burdensome and potentially making charging services less affordable or infeasible to offer. Additionally, unlike gas stations, electric refueling is typically not the site

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<sup>1</sup> While EVSE is often compared to gas pumps, other technologies such as electric meters may be more comparable in technology and use case to EVSE. Electric meters are [exempted](#) from weights and measures standards when they are already regulated under the jurisdiction of the [California Public Utilities Commission](#).

owner’s core business, particularly for Level 2 charging. Already, California has more [public and shared charging ports](#) than gas pumps, highlighting how EVSE requires a tailored approach to ensure customers get what they pay for at an affordable price (see Table 1).

Table 1: Comparison of Commercial Charging Use Cases and California Standards

<b>Commercial Charging Use Cases</b>	<b>Business Model Considerations</b>	<b>Customer Experience Expectations</b>	<b>Approximate Charger Cost</b>	<b>CA Weights and Measures Standards</b>
<b>Dedicated Level 2 Charger</b>	Often amenity at a residence or workplace with revenue being ancillary goal	Limited or no friction	<\$10,000 <sup>a,b,c</sup>	Depends on how customer is charged
<b>Shared Level 2 Charger</b>	Often amenity at a residence or workplace with revenue being ancillary goal	Limited or no friction	<\$10,000 <sup>a,b,c</sup>	Depends on how customer is charged
<b>Public Level 2 Charger</b>	Amenity at a commercial business with revenue being ancillary goal	Similar to gas pump	<\$10,000 <sup>a,b,c</sup>	Almost always applicable
<b>Public Fast Charger</b>	Fee for service business aiming to maximize revenue	Similar to gas pump	>\$50,000 <sup>c</sup>	Almost always applicable

The feasibility of complying with weights and measures standards depends on several factors. Customer expectations for the EV charging experience and the importance of revenue to the site’s business model varies by use case.

Sources: (a) [Veloz](#), (b) [ICCT](#), (c) [Maine Department of Transportation](#)

Below, we summarize California’s approach to weights and measurements standards for EV charging and early perspectives from conversations with select on-the-ground stakeholders, including county officials, charging service providers, and registered service agencies (RSAs).

# California was an Early Adopter of Commercial Charging Standards

California was an early adopter of applying weights and measures standards to EVSE. In 2020, the California Department of Food and Agriculture’s Division of Measurement Services (DMS) [adopted](#) the tentative code in HB 44 as its own [legally binding standard](#) for commercial charging transactions. The state made some changes, such as [additional requirements](#) for the format of receipts, higher durability expectations in extreme conditions, and stricter tamper-proof sealing rules. All equipment and software needs California Type Evaluation Program (CTEP) or NTEP certification at the time of manufacturing.<sup>2</sup>

Several years into initial implementation, some insights are starting to emerge. Stakeholders said that EVSE functions with higher accuracy and consistency than gasoline refueling equipment, making the measurement standards achievable. Rather, the most significant challenge cited comes from standards enforcement and [associated costs for EVSE owners](#), which drive up expenses for California drivers [already facing rising electricity rates](#). Weights and measures experts have had to rapidly get up to speed on EVSE, the industry must now comply with new regulations that could influence the viability of their business, and for many site owners like multifamily housing, charging is not a core part of their business and can be overwhelming or otherwise deprioritized. Further, enforcement relies on patchwork efforts by each county, and significant new staff and resources are needed to keep up with rapid EVSE growth across the state. We explore key implementation areas below.

## Applicability of Commercial Charging Standards

CTEP or NTEP certification is [required](#) for all EVSE used in commercial settings. Any charging equipment that bills based on the quantity of electricity dispensed, whether at a public and private setting, is considered commercial. Chargers are exempt if they do not bill by amount of energy (either provided free or based on a fixed fee), are owned by a public entity, are used by a public utility or municipality, or deliver wholesale electricity.

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<sup>2</sup> Each manufacturer of EVSE subject to CTEP must complete testing at an authorized laboratory for each product model and have it certified.

The standards went into effect for all Level 2 chargers installed after January 2021 and all Direct Current Fast Chargers installed after January 2023.<sup>3</sup> The standards also apply to Level 2 and Fast Chargers installed before January 2021 (“legacy” equipment)—of which there are many in California—but the programs allow for delayed enforcement until 2031 and 2033, respectively. In the meantime, consumers can still file complaints and trigger inspections for legacy equipment.

## Technical Requirements to Ensure Charging Accuracy and Price Transparency

California’s weights and measures [requirements](#) can be grouped into three areas.

1. **Type Approval.** Before installation, EVSE subject to weights and measures standards must be CTEP- or NTEP-certified at the manufacturing stage, which ensures the equipment can meet the technical standards before installation.
2. **Accuracy.** After installation, applicable EVSE must accurately measure the amount of electricity delivered to a vehicle in kilowatt-hours (kWh) within a mandatory tolerance level and display the measurement on a screen that customers can easily read.
3. **Transparency.** EVSE must clearly display the total energy delivered (quantity and rate) and current associated with the unit price offered (e.g., 25 kW direct current), the unit cost of energy (e.g., \$/kWh), and the total cost of the session. California law requires this information be shown [on the face of the equipment](#), although some manufacturers have received approval for equipment that shows it on a mobile app or screen within the car (e.g., [Tesla](#) and [Xeal](#)). All charges and fees must be noted for the consumer to ensure uniform price advertising and labeling, allowing drivers to compare costs across stations.

As previously mentioned, stakeholders agree that the technical requirements are reasonable for EVSE. So far, [DMS reported](#) that about 97 percent of Fast Charger inspections and about 47 percent of Level 2 charger inspections have been in compliance. The portion of Fast Chargers in compliance is similar to other types of weights and measures inspections, but Level 2 chargers are relatively low. Anecdotal evidence from interviews suggests that because manufacturers, installers, and operators are still learning about this new regulatory scheme, citations from county officials often occur from deviations in the way the equipment is labeled or information is displayed, and few or none

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<sup>3</sup> National standards went into effect January 2025.

are due to measurement accuracy issues. Additionally, while manufacturers are producing more certified models to meet new demand, challenges and delays sometimes arise when there are small variations of models (including using the same hardware with different software configurations) that need to be certified separately. This adds administrative burden to both manufacturers and the state.

## A Complex and Costly Enforcement Process

Once certified equipment is procured and installed, the device must be officially placed in service. This involves either a county sealer or an RSA<sup>4</sup> visiting the site, verifying compliance with technical requirements, and filing a [Placed in Service](#) report to the county within 24 hours of initial operation. A Placed in Service report is a state requirement, but some counties have additional forms or requirements. Many counties lack staff capacity, testing equipment, or experience to keep up with the current volume of EVSE installations and are relying on RSAs to perform enforcement functions. Adding to the complexity, this is a new regulatory area for electricians and installers, processes can vary by county, and very little training has been available to date. Stakeholders we spoke with have reported a lack of capable RSAs, which cause bottlenecks, see Box 1. Upon receipt of the Placed in Service Report, the county sealer schedules an inspection to verify compliance and apply an official county seal.

### Box 1. Significant Registration Gap for EVSE in California

By the end of fiscal year 2024-2025, California had record of [23,300 EVSE ports](#) registered with weights and measures officials. Data on EV charger locations from the California Energy Commission reveal that more than [200,000 public and shared charging ports](#) exist, and the state's charging network [continues to grow](#). While not every public and shared EVSE port will be subject to weights and measures standards, the large gap between registered and deployed EVSE indicates a sizeable backlog for counties to commit limited resources to. Large counties such as Los Angeles County and Sacramento County, which together represent 88,870 public and shared ports, have yet to begin weights and measures enforcement.

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<sup>4</sup> An external group, typically an electrician, given authority to verify weights and measures requirements.

While some counties have delayed full implementation, the state requires that each device be [tested](#) against a certified field standard to ensure accuracy within allowable tolerances as part of the verification process. Testing equipment is expensive, with estimates of [\\$50,000](#) to [\\$100,000](#) per device specific to this function. According to stakeholders, equipment is only available from limited suppliers. DMS has explored relying on [in-factory tolerance testing](#) to replace some of the burden of field testing. Stakeholders said that this workaround, however, is not allowed by all counties and manufacturers have not fully operationalized this process. Stakeholders have also reported confusion about whether RSAs and the county both need to perform tests, and redundancy exists.

Once placed in service, California law requires that devices be inspected by a county sealer at least every [two years](#) to ensure continued compliance. Despite enforcement beginning in 2021, many counties do not yet have the staff or equipment to keep up. Some counties have relied on spot checks or complaint-driven inspections and others have delayed enforcement altogether.

Stakeholders also describe inconsistent procedures across counties leading to different outcomes (e.g., approval or citation) for nearly identical installer or RSA processes. Also, if installers do not communicate proactively with county offices about new installations or there are delays in counties performing inspections, there can be unexpected citations from county officials long after the initial placement in service. Chargers have been temporarily shut down due to confusion or misinterpretation of enforcement specifications.

## Compliance Costs for EVSE Owners

[Compliance-related costs](#) are generally borne by charging owners or operators, including RSA service fees, registration fees, county-specific administrative fees if applicable, and the cost of project delays. Owners or operators must pay an annual registration (device) fee to the county, not to exceed [\\$26 per year per device](#) by state law. The sum of business location fees<sup>5</sup> and device fees cannot exceed \$1,200 per business location, and there is some variation between counties on how many chargers constitute a single business location. If a county has additional administrative fees above the mandated registration fees, that is not included in the \$1,200 cap.

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<sup>5</sup> Counties may collect a business location fee in addition to the device fee to compensate for time taken to inspect multiple EVSE at a single business location. A business location is defined as a location that requires the use of specialized testing equipment and necessitates not more than one inspection trip by a weights and measures official.

Stakeholders report that the annual registration fees are reasonable for Fast Chargers, although the burden is higher on Level 2 chargers with lower annual revenue (e.g., at multifamily housing or offices). The cost of RSA services is separate from registration fees and can be a larger pain point. In some cases, high fees can cause owners to cancel or to scale down projects. Commercial site hosts can use alternative pricing schemes (e.g., a flat fee rather than bill by amount of energy) to avoid the weights and measures standards altogether, but this is not feasible for all charging use cases.

Some states have not gotten far enough in the implementation process yet to determine specific fee structures, but those that have tend to be [at least as high](#) as California's with Maryland having announced the highest annual fees in the country at [\\$150 per port](#) (see Box 2). Notably, both government and private sector stakeholders we engaged agreed that the current California fees do not cover program costs, and increasing fees alone may not bring the program into balance because it would not necessarily alleviate capacity constraints.

### **Box 2: Maryland Has the Nation's Highest Fee for Weights and Measures Standards Compliance**

Like many states, Maryland has [existing law](#) that requires compliance with standards included in NIST HB 44 and automatically adopted EVSE standards for Level 2 and Fast Chargers starting in 2023. The Maryland Department of Agriculture initially announced [phased enforcement](#) beginning in 2025, starting by performing inspections based on customer complaints and then setting a deadline for existing chargers to register by December 2025 and pay an annual [\\$150 per port fee](#), or be immediately taken out of service. Going forward, all installations will have to be registered before operation, with full field testing to begin in Spring 2026. The relatively rapid implementation, treatment of legacy equipment, and high fee amount deviates from other states and has led to [considerable debate](#) about the requirements between industry, EV drivers, and the state agency tasked with implementation. As a result of stakeholder feedback, the state [recently announced](#) that it would delay the initial registration deadline to July 2026 and consider additional exemptions.

# Balancing Consumer Protection and Affordability

Permanently adding EVSE to NIST HB 44 in 2023 gave states authority to implement their own regulations if they choose to do so. NIST HB 44 is not legally binding on its own, but [many states](#) automatically adopt the standards based on existing law. Additionally, several other states are working on or have already enacted laws or rulemakings to adopt them. Because California's program is several years ahead of other states', pitfalls and solutions learned can inform policy decisions there and in other states.

The following challenges should be considered by states if they move forward with weights and measures programs.

- **Eligibility.** Ensure reasonable definitions for what charger settings (e.g., public, workplace, multifamily; Level 2 or fast charging) are considered commercial transaction and consider flexibility for legacy equipment.
- **Technical Requirements.** Ensure requirements are focused on the most important outcomes for consumers like price transparency, charging efficiency, and affordability, and make them clear to industry, RSAs, and county officials. Explore alternatives to mandatory field testing, as some site owners and operators have stated they are actively interested in, such as [factory testing](#), self-certification with random field testing, or leveraging telematics (which the California Public Utilities Commission is also [considering](#) for EV submetering).
- **Enforcement Process.** Where inspections are necessary, right-size the inspection requirements and frequency such that county and RSA capacity can meet demand and EVSE owners are not subject to excessive delays, project complications, or costs that impact affordability for drivers; Consider differentiating enforcement between different charging use cases; Provide adequate resources and training for all stakeholders and make roles clear; Explore standardization of processes at the state level where appropriate.
- **Compliance Cost.** Design a flexible enforcement fee structure such that the program can be self-sustaining without putting excessive financial burdens on enforcement agencies and EVSE site owners, particularly for use cases with low revenue and legacy chargers; Consider provisions addressing the total costs faced by site owners or operators rather than registration fees alone.

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