



# EVSE Permitting and Inspection Best Practices



**The Permitting and Inspection Process for  
Plug-in Electric Vehicle Charging**

EVITP EV Community Readiness Seminar



**This report was developed by the California Plug-In Electric Vehicle Collaborative, a multi-stakeholder partnership working to ensure a strong and enduring transition to a plug-in electric vehicle marketplace.** Members played guiding and consulting roles in developing this report, although individual organizations may not formally endorse every recommendation.

**The PEV Collaborative would like to thank Alex Keros of General Motors as the lead author of this report.**

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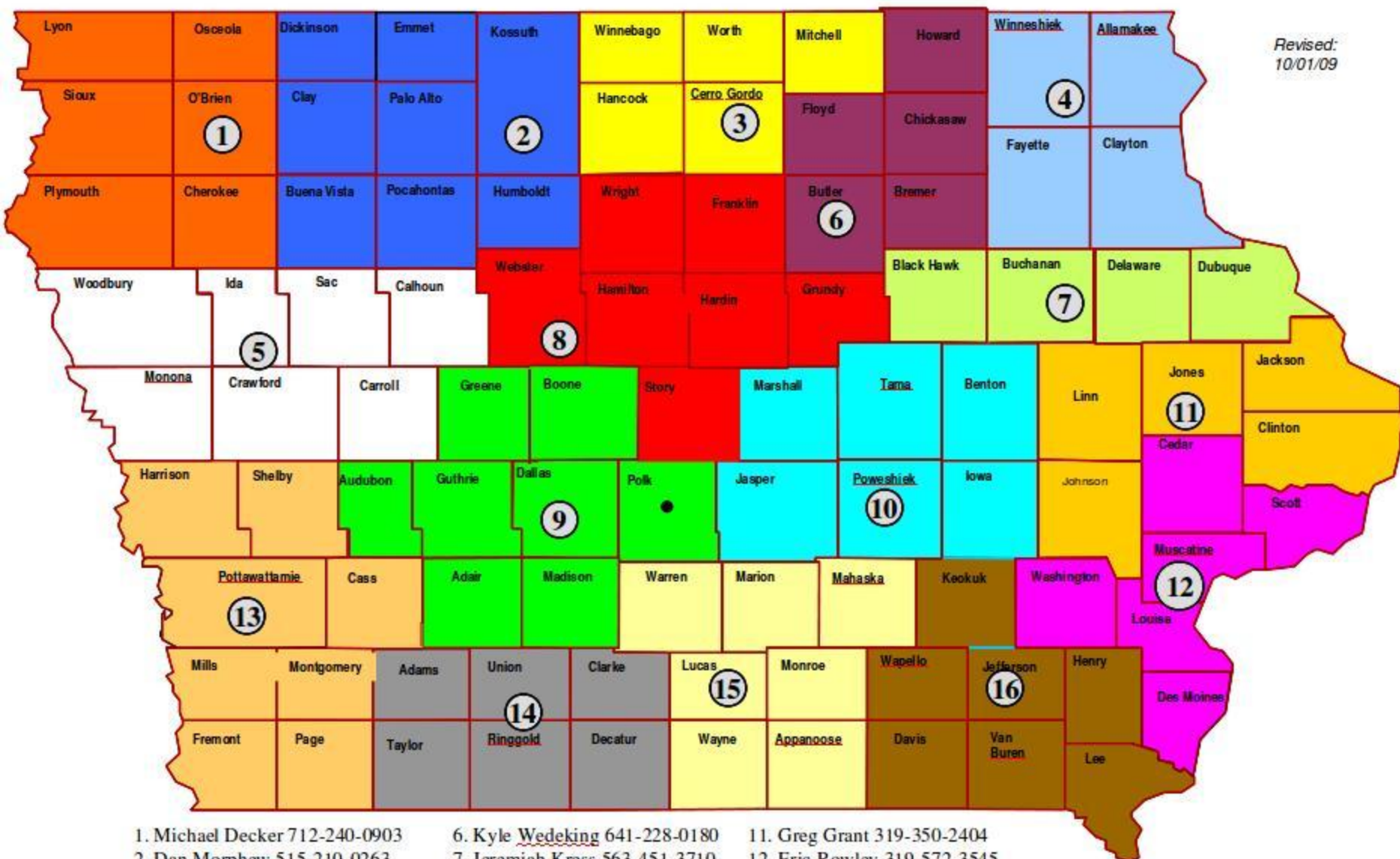
Toyota North America

# Report Issues

- **Permitting and inspection steps of the EVSE installation:** How do the local jurisdictions have to implement and interpret the code? How do permitting documentation requirements vary? Are local inspectors familiar with the charging station products being installed (and with the vehicles themselves)?
- Ultimately, all stakeholders, including electricians and contractors, EVSE hardware and service providers, utilities, city officials, and vehicle manufacturers, will need to understand how these factors contribute to the overall customer experience.
- **Establishing a common understanding is an important step toward standardizing charging station installation process across all markets.**

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# Report Issues (Cont'd)

- This paper characterizes key aspects of the installation process as they relate to permitting and inspection considerations and highlights common challenges and questions that arise.
- **Seeks to address a troubling trend:** the permitting and inspection process for charging equipment installations is becoming more onerous in some jurisdictions over time.
- For example, it appears that local jurisdictions are increasingly requiring formal plan checks, which increase the cost of the permit and the time to issue the permit.
- Furthermore, the complexity of the installation does not necessarily correlate to the complexity of the permitting process.

# Report Results

*This paper provides recommendations and references so that practitioners can design streamlined yet safe procedures for permitting and inspection in their jurisdiction. It also identifies additional informational resources.*





# Remain Flexible and Adaptive

These “best practices,” are not fixed.

**The EV industry is only taking its first steps** toward widespread adoption of PEVs and PEV charging.

Over time, all stakeholders, PEV owners included, will become more familiar with and effective at completing the charging installation process.

It is strongly encouraged when implementing any recommendation in the near term that approaches remain flexible and adaptive to accommodate future learning.

# No Current Standards

There is no current “standard” process for permitting and inspection of residential EVSE installations; the process can vary significantly based on many factors, including the number of steps required for completion.



# Costs

- There are two primary cost components of permitting a residential EVSE installation:
  - 1) The permit fee, itself, and
  - 2) The electrician's indirect costs to complete the paperwork, including time and material necessary
- For a jurisdiction issuing a permit, **the cost of the permit should cover the time necessary to issue the permit (including necessary plan checks), as well as the time to inspect the installation.**

# Costs

- (However, the manner in which a permit fee is calculated varies; a flat-fee can be based on a published fee schedule, the total project cost, or the scale of the project. Furthermore, a separate plan check fee may also be applied.)
- **According to national data from SPX, permit fees have ranged from \$0 to \$624.27 In California, the average permit fee is among the highest in the nation, \$208 in Southern California and \$185 in Northern California. The range of permit fees in California is illustrated in this Table ...**

**Table 3<sup>30</sup>**

<b>Jurisdiction</b>	<b>Permit Fee (SPX)</b>
<b>Mountain View</b>	\$56.51
<b>Yorba Linda</b>	\$62.25
<b>City of Los Angeles</b>	\$97.20
<b>Irvine</b>	\$98.00
<b>Alameda County</b>	\$161.40
<b>San Francisco</b>	\$164.20
<b>Menlo Park</b>	\$207.00
<b>Palo Alto</b>	\$250.00
<b>Riverside</b>	\$260.71
<b>Anaheim</b>	\$261.00
<b>Malibu</b>	\$624.00

# Installation Cost

- The typical cost of a residential EVSE installation can **range from \$300 to \$1,900.31** The associated permit fees typically contribute 5% to 20% of the total cost of the installation and can vary in adjacent jurisdictions and, potentially, within the same jurisdiction.
- Depending on jurisdictions' **permitting and inspection processes, additional indirect costs associated with the electrician's time** and materials— examples include plan check or required attendance at the inspection—can accrue. At prevailing wages, the additional **two to three hours of work can increase the installation cost by \$100 to \$300.33**

# A Tale of Two Cities

## *Comparing Two Southern California Cities*

### **City #1**

An EVSE installation involved a dedicated EV TOU meter in a Southern California city. The city charged a \$250 permit fee and a \$140 plan check fee.<sup>34</sup> The total installation cost, approximately \$2,400, included three additional hours of labor for the electrician to complete the plan check documents and travel to obtain the permits.

### **City #2**

A comparable job in a different Southern California city cost approximately \$1,800.<sup>35</sup> Therefore, in the former case, the permitting-related fees accounted for almost 17% of the installation cost and increased the total cost to the customer by hundreds of dollars.

# Consistent Process Needed

- **A consistent process will enable electricians to adequately predict both direct and indirect permitting costs.**
- Permitting and documentation requirements are becoming more complicated over time, and therefore dramatically impacting the cost of the installation.
- Overall, the goal must be to lower installation costs, including any avoidable costs associated with the permitting process.



# Recommendations

There is no current “standard” process for permitting and inspection of residential EVSE installations; the process can vary significantly based on many factors, including the number of steps required for completion. ***Standardization is needed.***



# Compliance?

- **Reducing cost and complexity of the residential EVSE installation is an important step toward enabling mass-market adoption of PEVs.**
- Moreover, continued complexity and/or increasing costs may discourage PEV owners from taking the proper steps to install EVSE safely and correctly.
- **Varying processes generate customer confusion and dissatisfaction** as individuals compare the cost and time to complete the installation.

# Consistency

- The most important step toward streamlining the permitting and inspection process is to create consistency for PEV owners, local officials, and electricians.
- **Ideally, one uniform permitting process for EVSE would enable electricians to be prepared more easily.** In the absence of one uniform process, setting consistent guidelines based on typical EVSE installations would be favorable.
- **An EVSE permitting process should be published online** so local residents and electricians can easily locate permitting information.

# 1. A Unique EVSE Permit

**A “Best Practice” permitting process for EVSE would include the following elements:**

**1. A unique permit application** for electric vehicle charging equipment would allow PEV owners and electricians to know exactly what is required to complete the permit process. The application might be equivalent to what is required for a 240V circuit installation, but identifying it as an EVSE permit provides quick reference and guidance for inquiries.

In most cases, jurisdictions with distinct EVSE permits have also researched and fully understand the process a PEV owner must take to complete the installation.

## 2.

**2. Online (if available) or Over-the-Counter Permit Process** – Jurisdictions can support PEV adoption by reducing the complexity and time to permit an EVSE.

Online permitting, when available, provides a PEV owner and electrician an opportunity to immediately schedule an installation. In some cases, the installation may be completed right after the electrician provides an estimate to the PEV owner.

Avoiding multiple trips to the installation location and jurisdiction permitting office can significantly reduce cost.

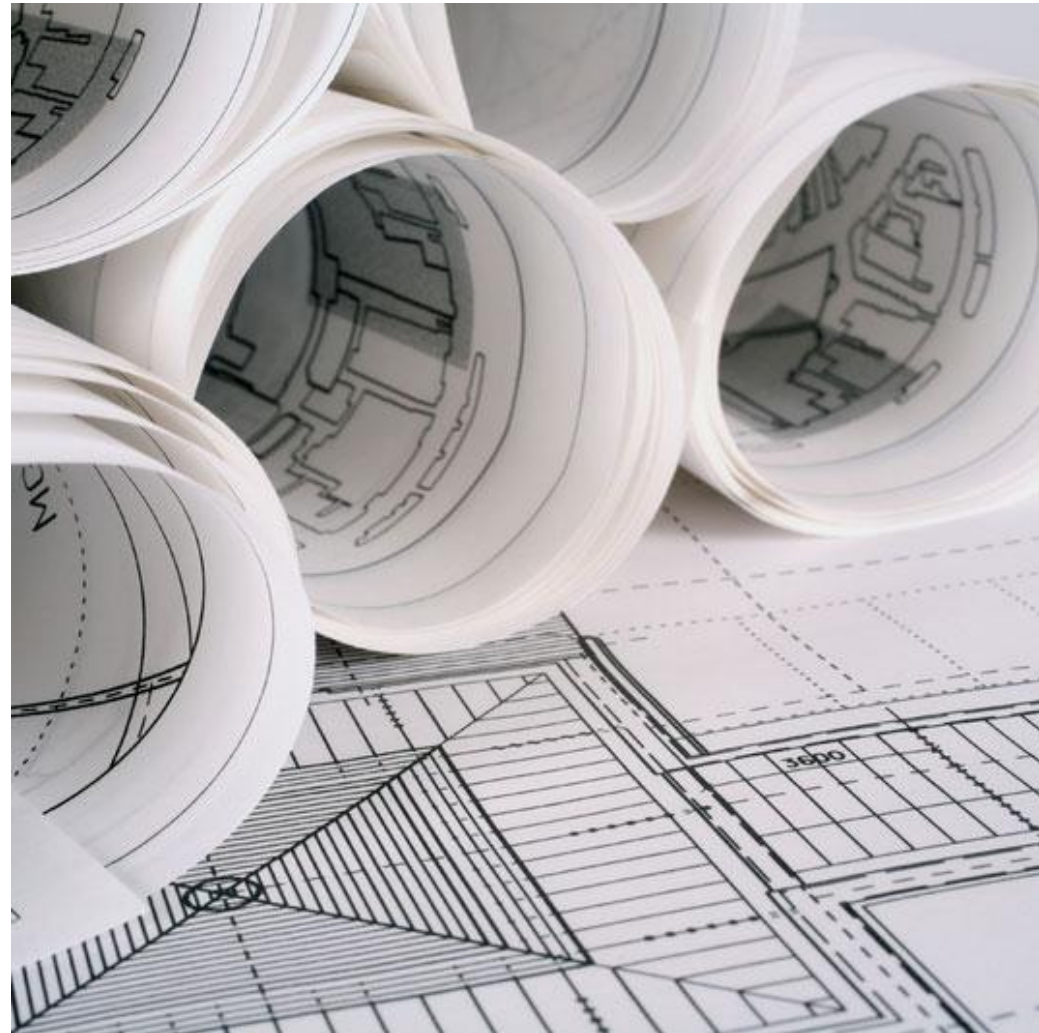
# Continued

- **When online permitting is not available or feasible, a simple over-the-counter permit process can suffice. In these cases, the electrician would provide a simple scope of work along with the specification sheet for the EVSE in order to obtain the permit.**
- An over-the-counter process reduces the time and effort to obtain the permit and facilitates scheduling and completing the installation, whereas a plan check requires multiple trips and coordination to schedule and complete the installation.

# Continued

A plan check could be avoided for the vast majority of standard EVSE installations.

A jurisdiction should determine what is standard and non-standard.



# 3.

**3. Template-based Forms** – If a jurisdiction requires formal documentation to be submitted to receive the permit, it is **strongly recommended that simple, straightforward forms be provided for PEV owners or electricians to complete.**

Providing template-based forms ensures that all required information is available during the permitting process.

If plan check is not required for EVSE installations, but the required documentation is necessary, it is recommended this documentation be made available for review at the time of the inspection. Required documentation might include:

- Site plan (simple)
- Specification sheet
- Line drawing (simple)
- Load calculation (required: 60A or 100A panels)

***(Pass out form)***



# 4.

## 4. A Unique EVSE Permit Fee

A distinctive, predictable permit fee based on comparable 240V circuit installations is suggested.

Defining a repeatable process should enable jurisdictions to properly define their cost to properly permit and inspect an installation. It also provides a transparent cost to the PEV owner and to the electrician who provides the quote.

**APPROVED**  
**NILES TOWNSHIP**  
*BUILDING DEPT.* *PH. 269-687-2741*

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*PERMIT NO.*

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*TYPE OF INSP.*

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*INSPECTOR*

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*DATE*

# 5.

**5. Avoid Electrician Required Attendance at Inspection –** Jurisdictions should avoid requiring an electrician to be present at the time of inspection—a practice that is uncommon, however not unheard of.

Given 2–4-hour inspection windows, this practice places a **significant time burden on PEV owners and electricians and increases the cost of the installation.**

It also creates a lost opportunity cost for the electrician. In some cases, inspectors require electricians to complete the installation during the inspection to verify that work, such as proper torque value, has been properly completed.

# 6.

**6. Develop Outreach and Training Plans** – Early adopters of any technology can be characterized as highly engaged advocates.

PEV owners are no different. Therefore, it is strongly recommended that **a jurisdiction develop an education and outreach plan for both internal and external stakeholders.**

Internal staff and key departments should be included in the training and outreach about PEVs and PEV charging.

## 6. (Cont'd)

### **Staff curriculum should include:**

- PEV offerings and technology overview
- EVSE offerings overview
- NEC considerations for PEV charging stations
- Installation process overview—strongly consider local electrician participation
- Utility considerations—strongly consider local utility participation

## 6. (Cont'd)

(General internal “outreach” should include:

- PEV offerings and technology overview
- EVSE offerings overview
- Installation process overview
- Department’s plan to support PEV owners)



# General Recommendation

(Taking the time to work through a specific permitting process for home charging station installations will help develop a consistent, predictable process for each stakeholder.

PEV owners will clearly understand the requirements, electricians will understand expectations and be prepared, and officials will have the familiarity and background necessary to properly approve an installation.)

# Key Recommendations

*The key recommendations of this report are as follows:*

- *Establish a unique EVSE permit application for PEV charging equipment.*
- *Adopt a permit process that is online (if available) or over-the-counter.*
- *Create simple, template-based forms for electricians and residents.*
- *If a review of the installation information is required, completed forms should be required at the time of the inspection.*

# Key Recommendations

*The key recommendations of this report are as follows:*

- *Establish a unique EVSE permit fee which is comparable to 240V circuit installations.*
- *Avoid requiring electrician attendance during the inspection.*
- *Develop an outreach and training program for internal and external stakeholders.*
- *Include relevant staff and key departments*



# Conclusions

- **A jurisdiction that implements a majority of these elements will make significant progress toward simplifying the permitting and inspection steps of the residential installation process.**
- **Taking these steps will result in time-efficient installation and lower costs to the PEV owner.**
- **Furthermore, these steps can reduce complexity and potential uncertainty experienced by each of the parties.**
- **Altogether, they reduce potential barriers related to EVSE installations and assist in the widespread adoption of PEVs.**



With Appreciation To

