



**National Laboratory
of the Rockies**

Stations Tool for Automated Permitting (S-TAP) User Manual

Erin Andrews-Sharer, Emily Dalecki, Alexandria Danner,
Noah Frey, Umapriya Renganathan, Mark Singer, and
Austin Willman

National Laboratory of the Rockies

The National Laboratory of the Rockies is a national laboratory of the U.S. Department of Energy, Office of Critical Minerals and Energy Innovation, operated under Contract No. DE-AC36-08GO28308.

Technical Report
NLR/TP-5400-98402
June 2026

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Disclaimer

Alliance is not a permitting agency or jurisdiction and has no authority to issue permits of any kind. This manual is a user manual for the Stations Tool for Automated Permitting (S-TAP), a tool which is intended to provide information regarding existing requirements and to supplement the permitting process. AHJs are responsible for following all applicable legal procedures and regulations to ensure that contractor licenses and insurance are valid, projects are designed to meet code, and all required permissions have been obtained. For contractors or installers using S-TAP to theoretically validate code compliance as part of a permit application submission, Alliance is not liable for the failure of any permits to issue or be approved. The contractor remains liable for their work and ensuring that it meets code.

List of Acronyms

AHJ	authority having jurisdiction
DCFC	direct-current fast charging
EV	electric vehicle
EVSE	electric vehicle supply equipment
IBC	International Building Code
ICC	International Code Council
NEC	National Electric Code
NFPA	National Fire Protection Association
NLR	National Laboratory of the Rockies
PV	photovoltaic
S-TAP	Stations Tool for Automated Permitting

Executive Summary

The permitting process for electric vehicle supply equipment (EVSE) varies significantly across authorities having jurisdiction (AHJs), who regulate localities spanning urban to rural spaces. This variance, which manifests in multiple components of the process including the steps to obtain a permit, the code requirements, and the type of permit or reviews required (i.e., electrical, building, zoning), can lead to uncertainty surrounding EVSE project requirements and time delays in both the development and review of project plans. Ultimately, these delays add time and cost to the projects and are a commonly noted barrier to successful EVSE installation (Gilliand and Graff 2023; Nelder and Rogers 2019; O’Grady and Way 2019).

The Stations Tool for Automated Permitting (S-TAP) is a spreadsheet-based tool designed to validate nonresidential EVSE projects against code requirements and reduce the time required for AHJs (i.e., the permitting authority) to issue the permit. The tool consists of a questionnaire that evaluates project inputs based on widely adopted model codes¹ (National Electric Code and International Building Code) and select local regulations, through a series of validation logic. The consistent evaluation of project specifications based on set model codes standards within the tool, with some elements that are designed for AHJ-specific inputs, provides the effect of streamlining the codes that define the EVSE project design and installation. The goal of the tool is to reduce the time required during the permitting process for the AHJ staff to review the plan and evaluate the EVSE project for code compliance, specifically for high-frequency and low-complexity projects, thereby allowing AHJ staff to focus time and attention on higher-complexity projects.

This user manual provides an overview of S-TAP, including the methodology leveraged to develop the tool, technical guidance on how to use the tool, and the purpose or use case for this tool with different audiences.

¹ Model codes are template codes developed and updated by an organization (e.g. International Code Council) specifically for this purpose.

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1 Introduction

The permitting process for electric vehicle supply equipment (EVSE) varies significantly across authorities having jurisdiction (AHJs), who regulate localities spanning urban to rural spaces. This variance, which manifests in multiple components of the process including the steps to obtain a permit, the code requirements, and the type of permit or reviews required (i.e., electrical, building, zoning), can lead to uncertainty surrounding EVSE project requirements and time delays in both the development and review of project plans. Ultimately, these delays add time and cost to the projects and are a commonly noted barrier to successful EVSE installation (Gilliand and Graff 2023; Nelder and Rogers 2019; O’Grady and Way 2019).

In response to these variabilities across AHJs, the National Laboratory of the Rockies (NLR) developed the Stations Tool for Automated Permitting (S-TAP) to provide an option that streamlines code requirements and permit issuance for nonresidential EVSE. S-TAP is a spreadsheet-based permitting tool designed to validate EVSE projects against code requirements and reduce the time required for AHJs (i.e., the permitting authority) to issue the permit. The tool leverages two primary model codes,² the National Fire Protection Association (NFPA) 70 National Electric Code (NEC) (code years 2020 and 2023), the International Building Code (IBC) (code years 2021 and 2024) developed by the International Code Council (ICC), and any other relevant model codes referenced within the IBC and NEC as the primary code basis, while also incorporating common standards from local codes and regulations to inform some project design elements.

The tool consists of a questionnaire that evaluates project inputs based on these codes, through a series of validation logic. While some code components related to local regulations can be adjusted by AHJs to meet their relevant codes, most of the questions are based in the same model codes, providing the effect of standardizing the codes that define the EVSE project design and installation. Additionally, the incorporation of validation logic within the tool ensures consistent application of the codes and reduces the time required for AHJ staff to calculate and confirm code compliance. S-TAP is designed to evaluate nonresidential EVSE installations that are high-frequency and low-complexity projects, thereby allowing AHJ staff to focus time and attention on higher-complexity projects.

Researchers with experience in automated permitting developed this tool with insights from AHJs, EVSE installers, EVSE equipment manufacturers, and code officials, in addition to leveraging learnings from relevant research in the permitting space. This manual provides an overview of the methodology leveraged to develop the tool, technical guidance on how to use the tool, and the purpose or use case for this tool with different audiences.

1.1 EVSE Installation Tools and Research Context

S-TAP is situated among a suite of NLR tools and research addressing the soft costs, project timelines, and permitting processes associated with EVSE (Figure 1). NLR’s Electric Vehicle Infrastructure – Locally Optimized Charging Assessment Tool and Estimator (EVI-LOCATE) focuses on the design phase of EVSE installation by providing a platform to lay out a proposed

² Model codes are template codes developed and updated by an organization (e.g. International Code Council) specifically for this purpose.

site and project location-specific costs for installation.³ Aligned work on soft costs benchmarking provides research on specific soft costs associated with EVSE installation to better understand how those costs relate to the type, power level, and size of installation.⁴ To better understand the permitting process specifically, NLR developed an EVSE permitting process flowchart that maps out steps in the process, which permits are typically required, and how certain conditions or requirements may lead to increased time from application submission to permit approval. The subsequent interconnection flowchart illustrates how permitting with the AHJ falls within the broader process for interconnection with the utility.⁵ And finally, NLR researchers developed a large-language-model database with EVSE permitting documents across the country.⁶ Each of these efforts has uniquely informed the development of S-TAP, which provides one solution addressing EVSE permitting timelines.

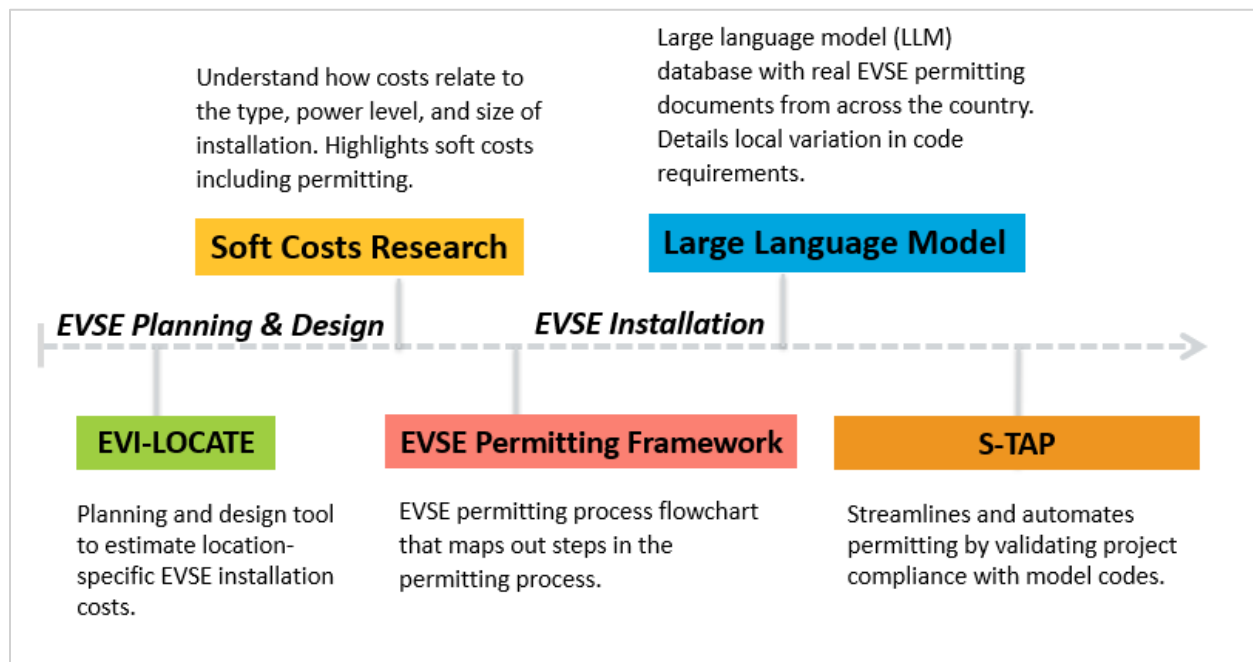


Figure 1. NLR - led EVSE research related to planning, design, and installation phases of deployment

³ evi-locate.nrel.gov

⁴ www.nrel.gov/transportation/electric-vehicle-charging-soft-costs-analysis

⁵ www.nrel.gov/docs/libraries/transportation/ev-charging-permit-process-flowchart.pdf

⁶ catalog.data.gov/dataset/llms-for-ev-infrastructure-permitting

2 Methodology

The team leveraged stakeholder interviews with code officials, installers, AHJs, and existing permitting companies to develop a baseline understanding of the EVSE permitting process and best practices when developing expedited permitting platforms. Building from this foundational knowledge and a synthesis of model codes regulating EVSE installation, the team then developed a series of questions and associated logic designed to evaluate code compliance, emulating the code checks that often happen during the plan review phase of a permitting process. The research team held a series of one-on-one and group feedback sessions with installers, code officials, AHJs, and other relevant stakeholders to review the initial questionnaire. The team leveraged these feedback sessions to identify which type of projects require additional review beyond the tool's capabilities and how to handle local variation such as zoning and parking regulations, and to ensure that all critical safety compliance is checked and verified through the tool as it relates to electrical and building code standards.

There are several defining components that create the framework for the tool: the code basis, the eligible projects or tool use cases, and the extent to which the tool automates the plan review (i.e., code compliance check) portion of the permitting process.

2.1 S-TAP Code Basis

The tool primarily integrates the two most recent code cycles for IBC (2021 and 2024) and NFPA 70 (i.e., NEC) (2020 and 2023), as well as all other referenced model codes within these two codes. These are the more commonly adopted code cycles among AHJs, and as they continue updating their electrical and building codes, newer editions will be the most relevant going forward. Because EVSE is relatively new technology, newer code cycles include more detailed requirements and best practices.

Establishing the basis for the tool in model codes is important because these model codes are the standard from which locally adopted building and electrical codes are derived. However, EVSE installation in most AHJs is subject to a series of model codes and local codes (see Figure 2), and the locally adopted version of the model code may differ (or go above and beyond) what is set by the national or international standard. This variance in local and model code implementation highlights a key challenge for installers who may need to adjust designs and plans for each specific location.

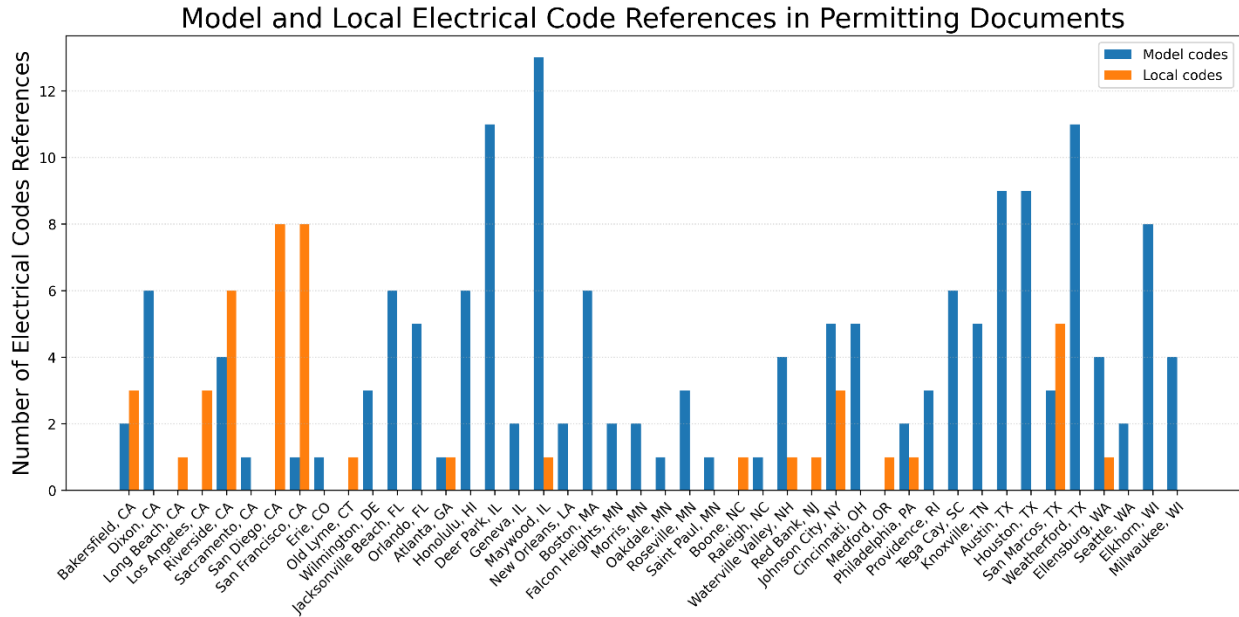


Figure 2. Model versus local EVSE electrical codes by city, documented through a large-language-model-derived database. Cities listed are cities that have EVSE specific permitting processes or documentation.

In an effort to streamline the expected standards for EVSE installations, S-TAP implements model codes, with some specific settings that can be adjusted to match local codes particularly for zoning, parking, and other design elements.

Table 1 summarizes which model code sections are directly integrated into the questionnaire and logic within the tool.

Table 1. Summary of Model Codes in S-TAP

Model Code	Sections
IBC (2024)	1106.7 1107.2; 1107.2.1 1604.5 1613.2 1904.2 1907.3
IBC (2021)	1106.7 1107.2; 1107.2.1 1604.5 1613.2; 16.13.2.5 1904.2 1907.1
ICC A117.1 (2024, 2021)	309.2 309.3 502.2; 502.4; 502.5; 502.6

Model Code	Sections
ASCE 7 (2022, 2016)	13.1.3; 13.1.4 20.1
NFPA 70/NEC (2023)	110.4; 110.9; 110.26; 110.27 (B); 110.28 220; 220.70; 220.87 240.4; 240.6; 240.21 (C) 250.20 (B); 250.122 300.5 310.16 450.3 (B) 625.4; 625.6; 625.17 (C); 625.40; 625.41; 625.42 (A); 625.43; 625.50
NFPA 70/NEC (2020)	110.4; 110.9; 110.26; 110.27 (B); 110.28 220; 220.87 240.4; 240.6; 240.21 (C) 250.20 (B); 250.122 300.5 310.16 450.3 (B) 625.4; 625.5; 625.17 (C); 625.40; 625.41; 625.42; 625.43; 625.50

2.2 Tool Use Cases

The tool is designed to validate a subset of nonresidential EVSE installations that include scopes for high-frequency and low-complexity projects. The focus on high-frequency projects enables the tool to have greater impact, reducing the volume of projects that require in-depth review from AHJ staff who may already be constrained on capacity. Low-complexity projects are well situated for automation because they can be objectively validated for code compliance based on the standard model codes, requiring little to no additional review from AHJ staff. This framework reserves the review and approval of more technically complex projects for AHJ staff.

Table 2 outlines the types of nonresidential EVSE installations that are eligible and not eligible for code validation through the tool. Systems and project types outside the current scope (i.e., not eligible) are being tracked for future development.

The tool's questionnaire and logic are designed to focus on the code elements that must be validated before the permit is issued and construction begins, while reserving some components that will be evaluated through inspections during and after project construction. In addition to completing a project submission by utilizing the tool, jurisdictions may require submission of site plans, single-line diagrams, and equipment specifications. These additional submissions may be reviewed by the staff prior to permit issuance or may be leveraged during inspections to ensure that the information validated within the tool matches what is outlined in the plans and on-site. With this in mind, staff time will still be required for aspects such as pre-application meetings, inspections, or certain reviews such as structural reviews, which are not currently incorporated into the tool.

Table 2. Project Eligibility for Using S-TAP

Eligible	Not Currently Eligible
Commercial and multifamily EVSE installations	Residential EVSE installations
Existing parking lots or parking garages	New construction projects
Chargers for accessory use only	EVSE chargers that are considered primary use (e.g., charging hubs)
Level 2 and direct-current fast charging (DCFC)	Level 1, wireless (inductive), overhead, and bidirectional charging
Wall-mounted or pedestal-mounted chargers	Energy storage systems and photovoltaic (PV) systems
Accessible charging (Americans with Disabilities Act)	EVSE installations at gas stations
NEC 2020/2023, IBC 2021/2024, and some local code compliance	Additional model codes, most local codes, and atypical requirements

2.3 Tool Components

The spreadsheet-based tool includes the following tabs (sections):

- **Introduction:** Provides a high-level overview of the tool and how to use it.
- **AHJ Settings:** Designed for AHJs to complete with relevant local code information that will feed into the tool's validation. This tab will remain visible and accessible to the installers as a reference while filling out the EVSE Permit Form. Section 3.3 provides details on how to fill out this tab.
- **EVSE Permit Form:** Permit validation form that the installer should complete, prior to submitting the entire spreadsheet to the AHJ.
- **Issues To Address:** Automatically summarizes error messages prompted by installer inputs in the EVSE Permit form, that indicate what components of the system need to be changed to meet code compliance or to be eligible for validation through the tool.
- **Next Steps:** Outlines the next steps in the process for the installer regarding how to proceed and submit the permit application.
- **Definitions and Resources:** Defines key terms used in the tool and lists relevant resources related to codes.
- **Notes:** Place for the installer to leave notes for the AHJ. For example, the installer may want to reference a specific row in the permit form and comment on where in the plan set (additional submission) the AHJ might find additional information.
- **Parking Calculator:** Calculator that models how the maximum allowable parking decrease is calculated. An AHJ should leverage this calculator when determining the appropriate percentages by property use. An installer may reference this to better understand how the parking validation is calculated.
- **Standard Ampere Ratings:** Reference table.

Sections 3 and 4 discuss these components in detail, providing instructions to AHJs, installers, and other users on how to implement the tool and use it to validate code compliance for project installations.

3 How To Implement the Tool

This tool functionally operates as a questionnaire designed to validate project plans for code compliance. The tool has features that an AHJ will tailor or preset. An AHJ wishing to utilize the tool as part of their permitting process would adjust the settings in the tool to match their relevant codes and make it available for download on their website. The installer would then download the tool, fill in the project's specifications, and then submit to the AHJ the completed tool and validated project plan with the remaining required permit application documents. The AHJ would review the completed tool, permit application, and relevant documents to ensure consistency within the plans and then issue a permit. Because the tool provides most of the validation necessary to ensure code compliance, the review time for the AHJ would be significantly reduced. In the scenario where the tool flags an input as "invalid by tool", the AHJ may still choose to allow an installer to submit the tool (with certain project components validated) while planning for some additional reviews (i.e., structural reviews) before issuing the permit.

There are several benefits to this high-level approach to utilizing the tool. First, the jurisdiction reduces the amount of time spent ensuring project plans meet standard codes that are objectively evaluated by calculations. Leveraging the tool for code validation ensures consistency across projects in how code compliance is evaluated. Second, the installer receives immediate feedback. While utilizing the tool, if the installer inputs specifications that do not meet code, they will receive that feedback in real time and can adjust project specifications to meet code before submitting the permit application. This real-time feedback additionally reduces the number of times that the plans go back and forth between installer and AHJ with requested changes. Finally, the tool helps ensure that installers are submitting complete applications that meet standard code requirements.

3.1 AHJ Preparation Before Tool Implementation

AHJs should first consider their current permitting process for EVSE and determine which steps the tool can replace or complement elements of that process. Figure 3 illustrates the typical steps in a permitting process and to what extent the tool addresses or automates each step. For AHJs who differentiate from the steps outlined below, they may individually consider how the tool might address their steps.

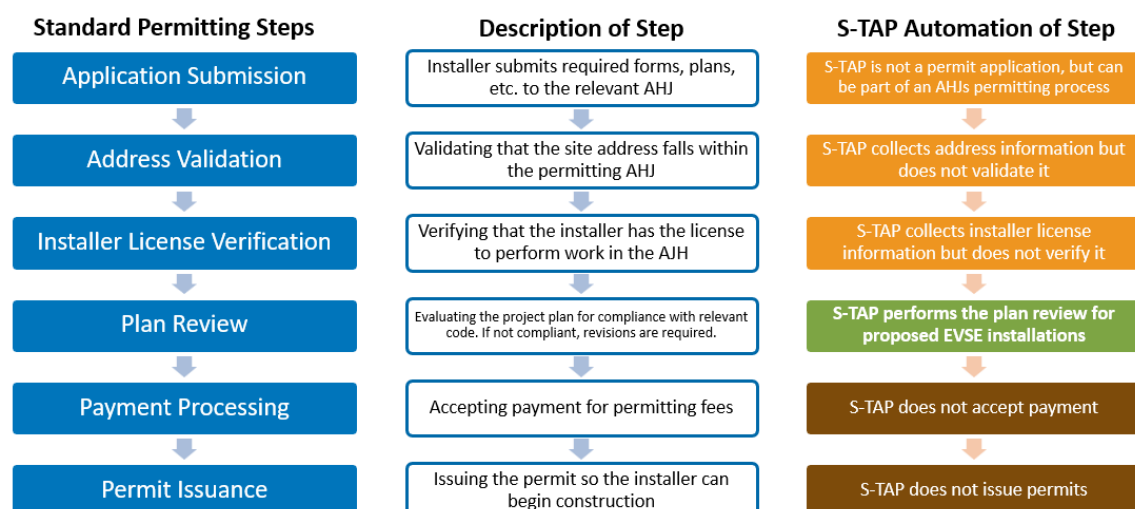


Figure 3. Level of S-TAP automation in permitting steps

Next, AHJs should consider what their current process is for the “plan review” step or, evaluating the project plan for code compliance. For example:

- **If the AHJ has an expedited⁷ permit process for certain EVSE:** The tool can simply replace that permit application and review process.
 - Consider when (or whether) additional reviews may be needed beyond the tool validation.
- **If the AHJ does not already have an expedited permit process for certain EVSE installations:** Consider what permits are currently required for the EVSE installation.
 - If there are required components in those permits that are not addressed directly by the tool (e.g., specific environmental or public works requirements), which of those requirements are critical to ensure appropriate health and safety reviews for the projects?
 - How will the process need to be changed to utilize the tool, and what departments, entities, or individuals do you need to work with to ensure that the new process delivers desired results?

AHJs will then need to consider the following to finalize the process:

- Determine a method for submission (e.g., email, incorporation into existing online portal).
- Determine if a plan set (i.e., site plan, single-line diagram, load calculations) will be a required submission in addition to the tool; if yes, determine to what extent those plans will be reviewed and establish and communicate a reasonable timeline for the review. For example, an AHJ may wish to review the plans for alignment with the permit tool, while leveraging the tool’s validation for code compliance checks.

⁷ An expedited permitting process is different from a typical permitting process in that it specifically assigns a shorter review time for projects that fit within a certain category. Often it includes a permit application form specific to that project (in this case EVSE).

- Work with inspectors to train them on how to use information from the tool for required inspections.

Finally, AHJs should consider what current local codes regulate EVSE installation and compare those to what codes are implemented in the tool. While the majority of the tool is predefined to validate based on the 2024 IBC and 2023 NEC, several components are designed for specific AHJ input. Section 3.2 provides more detail on how to complete the *AHJ Settings* tab of the tool, which enables the incorporation of some local codes into the tool's validation.

In addition to utilizing this tool, AHJs may want to consider additional steps they can take to ensure their codes and processes are ready to incorporate new technology like electric vehicle (EV) charging stations, such as those outlined in by the Charging Smart program.⁸

3.2 Preparing the Tool: AHJ Settings Tab

The *AHJ Settings* tab is the primary place where an AHJ will need to input relevant local code information to ensure that the tool validates certain specifications based on select local codes. Filling out the *AHJ Settings* tab may be a light lift for AHJs who have minimal local regulations related to EVSE. For AHJs with more extensive EVSE related codes, this tab might take several hours to complete. This step in the process will require individuals with expertise in land use regulations (i.e. zoning, parking) such as a planner, and someone familiar with local building and electrical codes such as a building official or plan reviewer. This section walks through how to appropriately complete this tab. For the purposes of this tab, blue cells are cells with requested inputs, and gray cells do not require AHJ input.

The AHJ should first fill out the basic information at the top of the tab, indicating a point of contact and contact information should the installer have questions about the tool or process. Next, the AHJ should indicate which IBC and NEC code cycle matches their adopted codes. The *EVSE Permit Form* will automatically adjust to incorporate the relevant code cycle based on this selection.

The *General Settings* section includes required settings that the AHJ must fill out. The tool comes with default standards built in; however, the AHJ should review its zoning, land use, or development code to determine the appropriate standard to input. If the AHJ's codes do not provide these specific standards, the AHJ may choose to establish their own standards or utilize the default standards. To the right of the *General Settings* table is a space for AHJ staff to link relevant code references and resources, such as a map of historic district areas, if applicable.

The AHJ will also need to fill out the *Existing Property Uses and Permitted Parking Space Decrease* section (see Figure 4). The list of property uses, which should be adjusted by the AHJ to match the categories in their code or land use regulations, will be used to automatically generate a drop-down in the *EVSE Permit Form* so that the installer can select the existing property use for the site. The corresponding percentages indicate the maximum allowable parking decrease and should be updated by the AHJ. Often in EVSE installations, the total number of parking spaces in an existing parking lot will reduce due to the removal of spots to accommodate access aisles and equipment. Additionally, most EVSE spaces are designated for

⁸ irecusa.org/programs/charging-smart/

EVs and/or EV charging only, thus “reducing” the number of standard parking spaces. The *EVSE Permit Form* will take the total number of existing parking spaces and subtract any spaces removed due to equipment or design for the spaces, and then additionally subtract the number of EVSE parking spaces that will be installed. That remaining number will then be used against the initial total to calculate the percentage decrease. This is the percentage decrease that the AHJ is asked to input into this *Existing Property Uses and Permitted Parking Space Decrease* table.

Property Uses	Number of parking spaces shall not decrease by more than:
Commercial	50%
Industrial	50%
Special use/public use	50%
Mixed-use residential and commercial	50%
Medium-/high-density residential	50%
Low-density residential*	50%
Office	50%
Recreation	50%

Figure 4. Settings for existing property uses and permitted parking space decrease

The use of a percentage decrease is intended to allow the AHJ to set a standard for how much parking decrease (by percentage) is allowed per property use type before it is flagged and potentially needs additional review by the AHJ. This allows simple installations that do not significantly impact the number of total parking spaces at a property to move through without complications while flagging extreme cases where installations might remove 50% of standard parking in a parking lot, for example. The *Parking Calculator* tab (see Figure 5) is designed to model the calculation that happens within the *EVSE Permit Form* so that AHJs can test out different percentages with different-sized parking lots and EVSE installations, to better understand how the percentage that they set impacts certain designs.

It is important to note that the parking calculation built into this tool focuses on how the proposed project impacts the parking lot and user experience within the parking lot (i.e. are there enough standard or non-EVSE parking spaces to meet customer needs). This calculation does not incorporate all possible parking requirements at the local level.

Example Parking Calculator	
Total existing parking spots	20
New EV parking spaces	5
Parking spaces removed due to access aisles, equipment, or other reasons	2
Standard parking spots remaining	13
Percentage decrease of standard parking spots	35%

Figure 5. Parking calculator

Most AHJs have specific requirements about the minimum number of off-street parking spaces required for certain commercial uses. Some AHJs and states also set standards on how EV charging spaces are intended to count toward those minimums. Because S-TAP is designed to be a tool that broadly accounts for model codes and some variation at the local level, it is not designed to account for the specifics of off-street parking minimums and how EV spaces count toward those minimums. AHJs that choose to require additional off-street parking space requirements, or other related parking requirements, should include links to the parking code documents and additional references on how EVSE spaces are counted towards parking maximums or minimums.

The next section is the *Optional AHJ Code Inclusion*. The AHJ will need to determine if they want to include these components in the validation check, and then select “include” or “exclude” for each component. If the AHJ chooses to include the component, there will be additional follow-up questions.

“What is the property zoned for?”: Select the “Include” if the AHJ wishes to input zoning code information into the tool. In order to leverage this feature, the AHJ should have a zoning code that indicates in which zones EVSE is permitted as an accessory use.

The AHJ should then fill out the *Zoning Categories* table (see Figure 6) to match their actual zoning code. The *Zoning Key* column is not utilized in the tool for validation checks but may be a helpful reference for the AHJ and installer. For each zone, the AHJ must indicate if EVSE is permitted as an accessory use.

Additionally, the AHJ must indicate the minimum allowable distance that the EVSE (both charger and equipment) is permitted from the property line. This entry will replace the entry above that asks the same question about minimum allowable distance from the property line, but without attribution to a specific zone. Note that this standard for the minimum allowable distance that EVSE is permitted from the property line does not have to be that zone’s setback requirement. Many AHJs choose to waive the setback requirement for EVSE due to installation complications and the low impact that EVSE has on neighboring properties.

Finally, AHJs may have overlay zones that impact EVSE installations as it relates to EVSE as a permitted accessory use or the minimum allowable distance from the property line. AHJs should provide links to details on those relevant overlay zones to the right of the *Zoning Categories*

table and provide some notes as to how the overlay zone will impact EVSE installations in that zoning context.

Optional AHJ Code Inclusion	Input	Required Actions
Which of these additional questions would you like to include in the EVSE Permit Form?		
1) What is the property zoned for?	Include	If you want to evaluate the project based on a zoning code, check the box and fill out the "Zoning Categories" table below.

Zoning Categories	Zoning Key	EVSE Permitted Accessory Use?	Minimum Allowable Distance From Property Line (ft)
Commercial	C	Yes	10
Downtown	CM	Yes	0
Office	O	Yes	0
Public Use	P	Yes	0
Low Density Residential	R1	No	0
Rural	R	No	0
Medium Density Residential	R2	Yes	0
High Density Residential	R3	Yes	0
Mixed Use	MR	Yes	0
Industrial	I	Yes	0
Recreation/ park	G	Yes	0

Figure 6. Zoning code input in the AHJ Settings tab

“Will any landscaping or trees be removed?”: If the AHJ chooses to include this question (see Figure 7), then the AHJ will need to select which of the follow-up questions they would like to have, depending on whether the installer responds “yes” to the initial question.

- Option A will require the AHJ to work with the installer to ensure that their landscape mitigation measure does reflect “like for like” mitigation.
- Option B will require the AHJ to input which landscape mitigation measures they would like to be included as a drop-down in the form on the next page. This will then be automatically populated. The blue cells underneath the landscape mitigation measures table can be populated with any text that the AHJ deems appropriate as a response to the question.

2) Will any landscaping or trees be removed?	Include	If you want to evaluate whether there will be any landscaping disturbance and resulting mitigation, check the box and then choose which follow-up question you want to include for instances in which the answer to this question is "yes." You may choose only one follow-up option.
[Option A] If yes, will the landscaping be replaced per AHJ requirements with like-for-like mitigation?	Include	If you select this option, this is an attestation question in which the installer is required to confirm they will mitigate the landscape disturbance with an equivalent landscaping option.
[Option B] If yes, what is the proposed landscape mitigation measure?	Exclude	If you select this option, edit the landscape mitigation strategies in the table below. These will be the dropdown selections that are then available in the EVSE Permit Form tab.

Below are example landscape mitigation measures. If you choose option B for the follow-up landscaping question above, please update the list below to reflect the maximum of (3) landscape mitigation efforts you will permit

Landscape Mitigation Measure Options
Trees, shrubs, or other like-for-like landscaping within the same plot
Trees, shrubs, or other like-for-like landscaping in approved alternative location
Approved non- like-for-like mitigation (i.e. tree replacing shrub)

Figure 7. Landscape question selection and mitigation drop-down options

There are designated cells to the right of the table for the AHJ to input links or references to code documents related to landscaping.

Finally, the AHJ may choose to include a question about whether the installation will comply with local signage, striping, and lighting requirements. If the AHJ checks the box to include this question, this will be an “attestation-based” question (i.e. certifying or agreeing to terms) included in the zoning section for the installer. It is recommended that the AHJ provide links to relevant codes or design guidelines in the table to the right of this question, for the installer to reference to ensure that their design meets code.

When an AHJ has finished completing this section, it is highly recommended that they lock the cells to ensure that all changes are preserved in the tool.

Installers should review this section to understand what local specifications the AHJ will be integrating into the tool or reach out directly to the AHJ to understand what local specifications the AHJ requires. If an installer wishes to utilize this tool to inform project planning in an area where the AHJ is not utilizing the tool as part of the permitting process, the installer can utilize the default settings or reach out to the relevant AHJ to determine what local regulations would influence these settings.

3.3 Permit Submission

S-TAP is designed to be a tool that includes enough relevant information for an installer to know both what steps need to be taken and what information needs to be provided to submit a complete permit application. However, this means that some additional measures must be taken by an AHJ to ensure that the installer has the relevant local information needed to be successful. After completing the *AHJ Settings* tab, the AHJ should review the *Introduction*, *Next Steps*, and *Definitions and Resources* tabs:

- **Introduction:** The AHJ may choose to refine some of the instructions provided here to clarify which projects are eligible for use of this tool and how they intend for an installer to use this tool. Additionally, the AHJ may choose to update the steps listed under “How to Use the Tool”.
- **Next Steps:** Update this tab to accurately reflect what additional documents must be submitted with the tool to complete the application, and to provide guidance on how to submit the tool, provide payment for the permit, and finalize the process.
- **Definitions and Resources:** The AHJ should link relevant code resources and any local design guidelines the AHJ is choosing to implement and ensure that all definitions match the AHJ code definitions.

4 Using the Tool for Project Validation

S-TAP is designed to verify whether a project's specifications meet code compliance. The *EVSE Permit Form* is where the installer or contractor will fill out all relevant information for the project and receive real-time feedback on whether the project meets code requirements.

4.1 Guide for Installers Filling Out the Form

The AHJ will not need to change any settings on the *EVSE Permit Form* tab. The installer should work from top to bottom through the form.

General tips:

- Blue cells are required for the installer to fill out; all questions, unless grayed out, must be answered.
- Gray cells are the result of a calculation based on previous inputs.
- Questions that are grayed out in full are inputs that are not required for this type of installation.
- Code references are included to the right of certain input rows, if the installer wishes to better understand the model code requirements related to a certain question. If a question relates to a local code outlined in the *AHJ Settings* tab it will say so.
- Validation checks will appear to the left of the questions. A green box with a checkmark indicates that the answer is valid; a red box with an "x" means that the answer is invalid based on code compliance; an orange circle indicates that the answer is invalid based on tool compatibility, or that the project is not eligible for code validation through the tool. If you need further information on why an answer is invalid, review the *Issues To Address* tab, which will summarize error messages for each invalid response.
- The legend on the *EVSE Permit Form* (see Figure 8) outlines many of these tips.

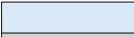
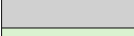
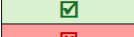
Legend	
	User input
	Calculation result
	Valid answer
	Invalid by code
	Invalid with tool

Figure 8. Legend for the EVSE permit form

The form includes the following high-level sections:

- **Contractor Information:** Basic information (such as license information and site address) for the installer or contractor to fill out. This information will be validated separately by the AHJ after submission.
- **Scope and Site Characteristics:** General-scope questions that help eliminate projects that may not be eligible for validation through this tool and provide general project site information for the AHJ.
- **Site Use and Zoning:** Questions about existing property use, site zoning, and key site plan information (e.g., easements, installation distance from property line). Some questions in this section are optional for an AHJ to include. Most of these questions are

related to information that the AHJ inputted in the *AHJ Settings* tab, as they are based on local codes and regulations.

- **Basic System Characteristics:** High-level information on quantity, type, and location of charging stations; serves to validate later inputs as well.
- **Parking Spaces:** Validation based on AHJ inputs, verifying that remaining parking spaces meet parking space requirements established by the AHJ.
- **Building Code and Structural Considerations:** Validation checks for basic building code requirements for nonstructural components such as EVSE and associated electrical equipment; checks to see if there is a need for structural review.
- **Charging Equipment Information and Calculations:** Based on the input charger types. Be sure to fill out information for each charger type indicated above; these inputs will be used to validate the system.
- **General Electrical:** Electrical system questions related to Ampere Interrupting Capacity (AIC) rating, working space, and other general electrical code requirements.
- **Panel Information:** Information on each EVSE source panel, and how many of each charger type are connected to that panel.
- **Existing Panel Information and Calculations; New Panel Information and Calculations:** Fill out based on whether the installer is utilizing an existing or new panel (the others will be grayed out); provides information necessary to validate the load calculations.
- **Transformer Information and Calculations:** Checks to ensure that there is enough capacity on the transformer(s) supplying the panels in this system.
- **Existing Transformer Information and Calculations; New Transformer Information and Calculations:** Fill out based on whether the installer is utilizing an existing or new transformer (the others will be grayed out); provides information necessary to validate the load calculations.
- **Upstream Power Source Information and Calculations:** Inputs for the upstream power source, typically a switchboard, *directly* supplying power to one or several components of the EVSE electrical system. Note that for the purposes of this section, “switchboard” refers to any upstream distribution equipment *directly* powering new transformers, panelboards, DCFCs, or a combination of all.
- **Accessibility:** Inputs to validate that the project design meets accessibility requirements for number of spaces and operable parts.

Additional features to note:

- Some input cells contain “Tool Tips” or notes in the cell providing guidance on how to fill out the cell. Roll your cursor over the cell to see the tip.
- If you are uncertain about what a term means, refer to the *Definitions and Resources* tab.
- All blue cells in the *EVSE Permit Form* must be filled out for the tool to accurately validate the whole system.
- At the end of the form, there is a location for the installer to input their name and the date the spreadsheet is submitted to the AHJ for review. Likewise, the AHJ staff reviewing and approving their form may utilize this section to input their name and date when the project is approved for a permit.
- There is a red box at the bottom of the form that summarizes how many issues there are to address (i.e. items invalid by code or tool).

4.2 Evaluating Project Validation

When an installer finishes filling out the *EVSE Permit Form*, the installer should check for project validation before submitting to an AHJ. The validation symbol will indicate if an input is valid, invalid based on code compliance, or invalid based on project eligibility with the tool (see Figure 7 for the legend). Each invalid row must be addressed to ensure project validation through the tool. For inputs that are invalid due to code compliance, the installer should refer to the code reference on the right-hand side of the form to understand what code specifications need to be met. For inputs that are invalid due to project eligibility with the tool, the installer should communicate with the AHJ to determine how to proceed. The AHJ may wish for the installer to use S-TAP for partial project validation while also requiring additional reviews that the tool is not able to validate (e.g., structural reviews).

The *Issues To Address* tab is another resource that will provide a summary of the invalid responses so that the installer can go through each instance and address them. Each entry in the *Issues to Address* tab has a reference line number that indicates its location within the *EVSE Permit Form* and clicking on that reference will take the user to the appropriate location within the *EVSE Permit Form*.

When the AHJ receives the tool as part of a permit application, the AHJ should check the *Issues To Address* tab to ensure that there are no outstanding issues with code compliance that the AHJ has not approved. The AHJ should make sure that the installer included the attachments listed out in the *Next Steps* tab. Finally, the AHJ should review the *EVSE Permit Form* and validate the contractor information, site address, and other additional features that are required through their process.

Ultimately, a project that has met all of the validation checks within the tool has been “validated” based on the selected model codes (2023 NEC and 2024 IBC, or 2020 NEC and 2021 IBC) and local code inputs from the *AHJ Settings* tab.⁹ Most AHJs have additional steps in place, after permit approval, to confirm that projects are built as planned and in a way that meets code. AHJs should still implement such measures, including inspections, to ensure safe infrastructure installation.

⁹ Note, the contractor remains liable for their work and ensuring that it meets code.

5 Additional Opportunities for Implementation

While the previous sections describe how an AHJ can utilize this tool to create an EVSE permit process in which the tool checks project specifications for code compliance as part of the process to issue a permit, installers, permitting companies, and AHJs may leverage the tool for additional benefit. Installers may wish to determine if a specific project plan or new design meets basic code requirements for the relevant model codes. In this scenario, an installer would download the tool with default AHJ settings (or adjust these settings according to a specific location) and test out various project plans to better understand whether components are meeting code compliance.

Permitting companies may also be leveraging the tool as they consider building out software-integrated methods to automate EVSE permitting. The Excel-based tool outlines the recommended inputs and associated logic to validate a project. The tool, which has been vetted by code officials, experienced installers, and jurisdictions, provides a framework through which a permitting company may choose to build their own platform.

For AHJs who may not be interested in directly utilizing the tool but would rather implement their own EVSE expedited permit application, the questionnaire may still serve as guidance. AHJs might choose to utilize similar questions or validate similar code compliance topics as what is presented in the tool. For this purpose, the tool is designed to be transparent about what information is requested and how that information is being used to ensure code compliance.

Ultimately, this tool will help provide both increased consistency in project evaluation within an AHJ and uniformity in expectations across all AHJs who leverage this tool for project evaluation. This decreases ambiguity for installers and sets clear expectations about code requirements while paving the way for future growth in the automated permitting industry.

6 Frequently Asked Questions

1. What is S-TAP?

S-TAP is a spreadsheet-based plan review questionnaire designed to evaluate whether an EVSE system design is code compliant and safe. The tool incorporates key questions related to building, electrical, structural, planning, and zoning aspects of a proposed EVSE installation. If the system design and inputs are determined to be code compliant, the installer can expect to receive an expedited permit from the participating AHJ.

2. How was S-TAP developed?

The S-TAP was developed by NLR—with funding from the Joint Office of Energy and Transportation—in collaboration with AHJs, EVSE installers, EVSE equipment manufacturers, code officials, and national safety organizations.

3. What types of systems are eligible for S-TAP review?

S-TAP is designed to review proposed commercial and multifamily EVSE installations in existing parking lots or parking garages. Systems may include Level 2 and DCFC units, which can be wall- or pedestal-mounted.

The following systems are not currently eligible for review through S-TAP:

- New construction projects
- EVSE with energy storage systems
- EVSE with PV systems
- Wireless (inductive) charging
- Bidirectional charging
- EVSE installations at gas stations
- EVSE chargers that are considered primary use (i.e., charging hubs).

Project types that are not currently eligible for review through S-TAP are being tracked for a future product roadmap.

4. What model code years does S-TAP enforce?

S-TAP validates the 2023 and 2020 versions of NFPA 70 NEC and the 2021 and 2024 versions of the IBC developed by the ICC, as well as any other model codes referenced within them. Additional model codes and local codes/regulations are not currently incorporated into the tool but are being tracked for a future product roadmap.

5. How does S-TAP check for code compliance?

The tool provides a standard questionnaire regarding EVSE specifications and certifications, site conditions, installation methods, and other essential details. The tool validates answers to each question based on specific code specifications and system calculations. The tool provides instant feedback to installers when responses are not code compliant or not compatible with the tool.

The tool also provides a list of required “uploads” that should be submitted to the jurisdiction approving the permit.

For AHJs leveraging the tool within their permit process, it remains the AHJ's responsibility to check that the specifications in the tool match the other forms submitted as part of the permit application (i.e., site plan if required).

6. How does S-TAP benefit EVSE installers?

For EVSE installers, S-TAP expedites approvals and reduces delays, so projects can move from planning to construction more quickly and reliably. Because the process is standardized, installers spend less time correcting mistakes or resubmitting applications, which helps keep projects on track and on time. In the long run, this efficiency allows companies to take on more work, serve more customers, and build stronger reputations for delivering timely, hassle-free EV charging installations.

7. How does S-TAP benefit AHJs?

For AHJs, S-TAP saves staff time and energy. Routine and standardized projects are automatically validated for code compliance prior to the installer submitting a permit application, which minimizes the amount of time staff spend verifying the project specifications and issuing a permit. This allows staff to focus on the more complex projects that truly need their attention. The system also improves safety by applying consistent code checks every time, defining the relevant requirements early in the process, and reducing the risk of errors or oversights. Perhaps most importantly, faster and more predictable processing helps communities expand their EV charging infrastructure without overburdening local departments, while also improving public satisfaction with permitting services.

8. How is S-TAP used?

Participating AHJs will provide the spreadsheet file (or a link to the spreadsheet) on their webpage, along with relevant EVSE permitting information. EVSE installers in their area can fill out the spreadsheet, check their project for code compliance, and provide the approved spreadsheet (along with any other required documentation) directly to the AHJ when applying for their permit. The AHJ will then review S-TAP's output, perform any additional reviews and verifications that they see fit, and issue the permit for the installation directly to the installer.

9. How much does S-TAP cost?

S-TAP is free for both AHJs to offer and EVSE installers to use. It does not influence permitting fees established by the AHJ. Installers should note that AHJs have the opportunity to customize certain variables within the tool and should ensure that they contact the AHJ to obtain the correct tool.

10. Is S-TAP customizable based on jurisdiction requirements?

There are several aspects of S-TAP that are customizable by jurisdiction such as use allowances within the zoning code, installation distance from the property line, and certain parking variables.

11. Does S-TAP assume liability for permits issued?

As is the case today with all EVSE projects permitted via the traditional pathway, all liability for code compliance remains with the installer.

References

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