

# EVI-LOCATE

One stop solution for estimating cost of installing EV charging stations



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# Agenda

- Context
- EVI-LOCATE
  - What is it?
  - Why do we need it?
  - Cost Estimator
  - Example

# Problem and Objective



**Problem Statement:** Design costs and timelines add significantly to EV charging station installation scope

**Objective:** Simplify the EV charging station installation design and cost estimation process with a web tool

# Why is telematics important?

- Informs how and when the fleets are getting used
- Which and how many conventional vehicles should be replaced by Electric Vehicles (EV)
- Where to install EV charging stations
- Number and types of charging stations required
  - Directly affect the costs of installations

# EVI-LOCATE (Electric Vehicle Infrastructure – Locally Optimized Charging Assessment Tool and Estimator)

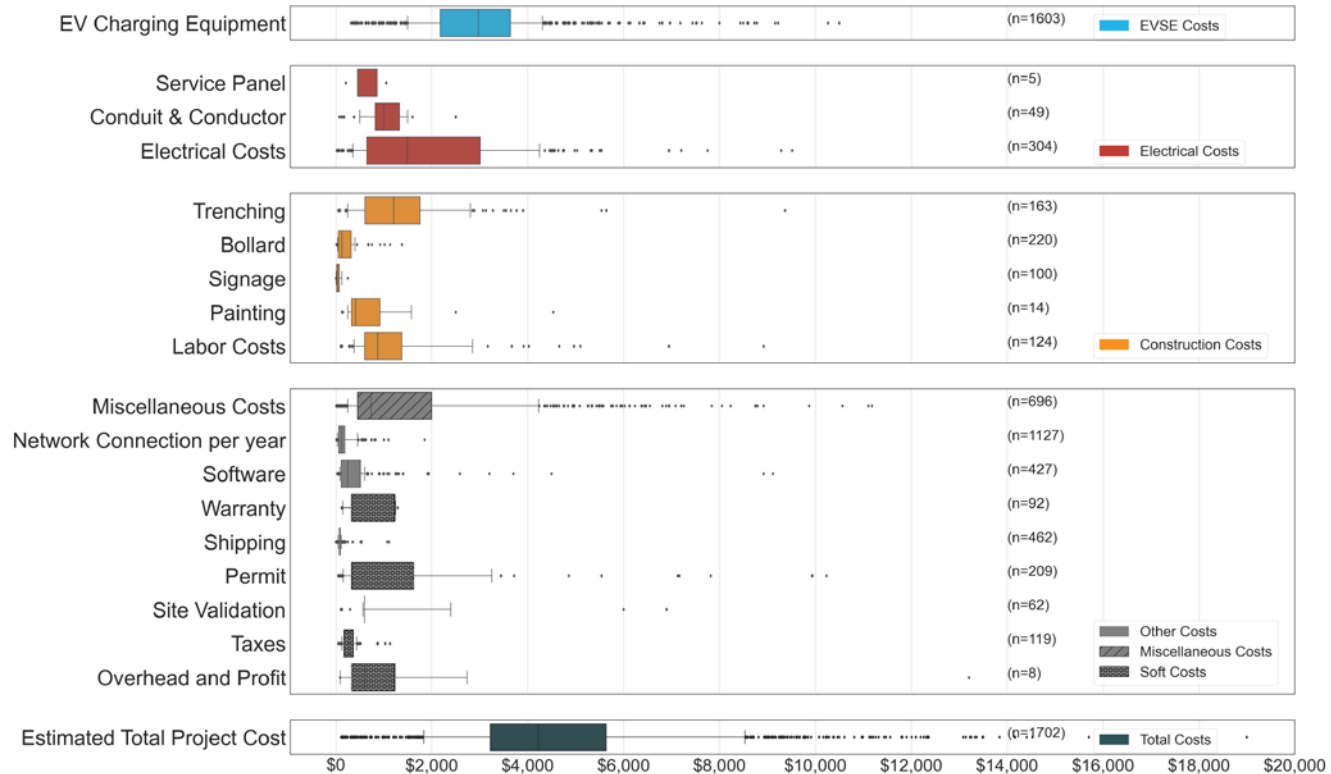
Plan charging  
station  
deployments

Assess site-  
specific  
electrical needs

Calculate local  
project costs

# How much does the cost of installation vary?

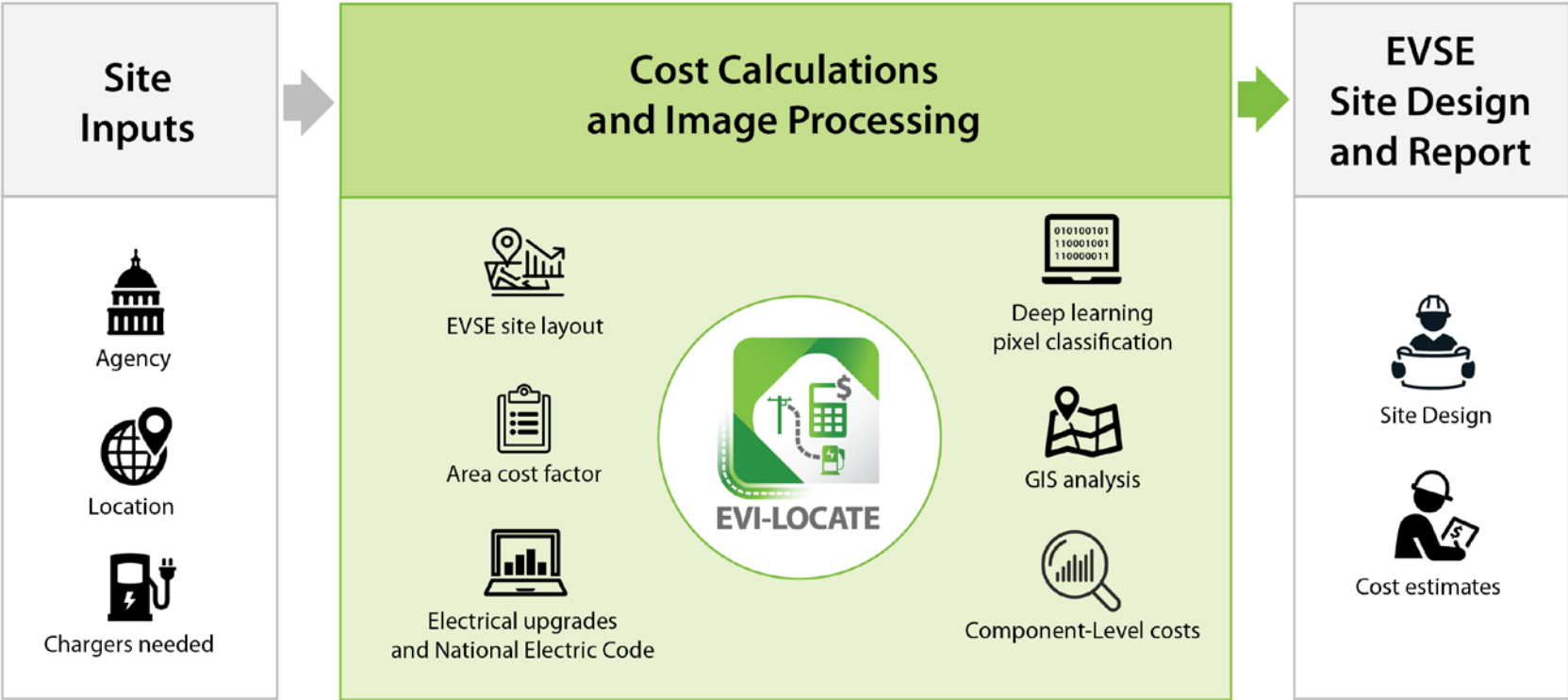
EV Charging Station Installation Costs Per Port



- Public Level 2 EV Charging stations
- Data from three different state agencies

⚠ Work in progress

# EVI-LOCATE: EV Charging Station Design Tool





- Website: <https://evi-locate.nrel.gov>
- Email: [evi-locate@nrel.gov](mailto:evi-locate@nrel.gov)
- Federal employees can sign up for accounts directly
- Federal contractors need to email [evi-locate@nrel.gov](mailto:evi-locate@nrel.gov) with Federal EVI-LOCATE users CC'ed

Request a New Account  
Account Information

Email

user.name@nrel.gov

First name

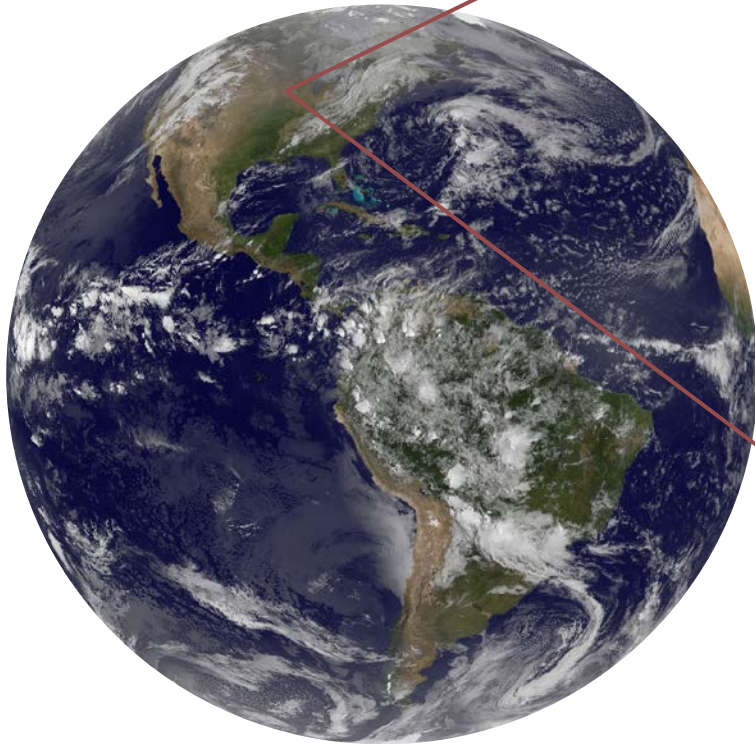
Last name

Phone

Password

Password confirmation

# EVI-LOCATE Site Tour



Click to Get Started

## Welcome to EVI-LOCATE

The Electric Vehicle Infrastructure-Locally Optimized Charging Assessment Tool and Estimator (EVI-LOCATE) is a comprehensive design tool to get you started on your electric vehicle charging station deployments plans from layout to cost estimates.



Here are some key points to help you get started:

- Charger requirements (desired number of charging ports and power level)
- Existing utility assets (transformers and service panels that might connect to your chargers)

It is fine if you do not have all the information now. Your work will be saved, you can come back and edit your project later, and you can review sticking points with EV charging experts at NREL. Contact us at [evi-locate@nrel.gov](mailto:evi-locate@nrel.gov) if you have any questions.

# Site Selection

## EVI-LOCATE

Select Agency

Select State

For Department of Defense > Select Base

- Steps
- 1 Select Agency
  - 2 Locate My Site
  - 3 Add Site Requirements
  - 4 Add EV Chargers
  - 5 Manage Transformer
  - 6 Manage Service Panel
  - 7 Review Design
  - 8 Estimate Cost
  - 9 Site Report

### Select your Agency

This should default to the agency that you registered with, but some folks may represent multiple agencies.

Pick from the Agency list below.

Defense Agency

Select your Agency

Air Force

Select State

Colorado

Select Base

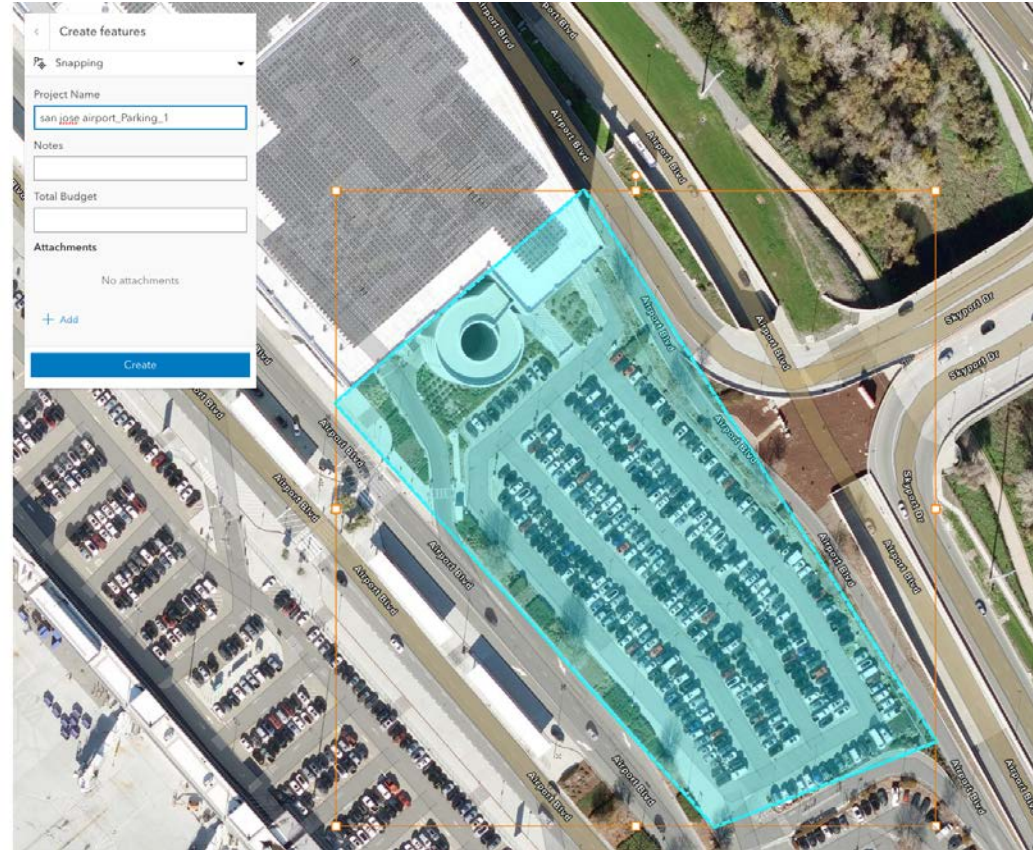
Buckley Air Force Base

Save & Continue

# Define Site Boundary

## Define Site

- Draw a polygon around EV parking area
- Name your site
- Make sure the polygon is large enough to include service transformer, panel and charging stations





# Select EV Charger Type

## Select EV Charger Template

- Users can filter to their preferred charger or select generic charger option

### Create EVSE Configuration Template

Charger Level Clear Selection

Level 2

Mount Type Clear Selection

Pedestal

Number of Ports Clear Selection

Dual

Network?

Yes

Manufacturer

- ✓ ATOM POWER
- BTC POWER
- CHARGEPOINT
- EFACEC USA
- EVOCHARGE
- EVSE LLC
- GARAGE JUICE BAR LLC
- JUICEBAR
- LIVINGSTON ENERGY GROUP
- LOOP INC
- POWERCHARGE
- SEMACONNECT
- Generic

#### Electric Vehicle Supply Equipment (EVSE) Type Selection

If you would like to select a generic EVSE for planning purposes, select it from the dropdown menu below available through GSA's EVSE blanket purchase agreement.

EVSE Type:

Generic Level 2 Dual Port Pedestal

#### EVSE Template Details

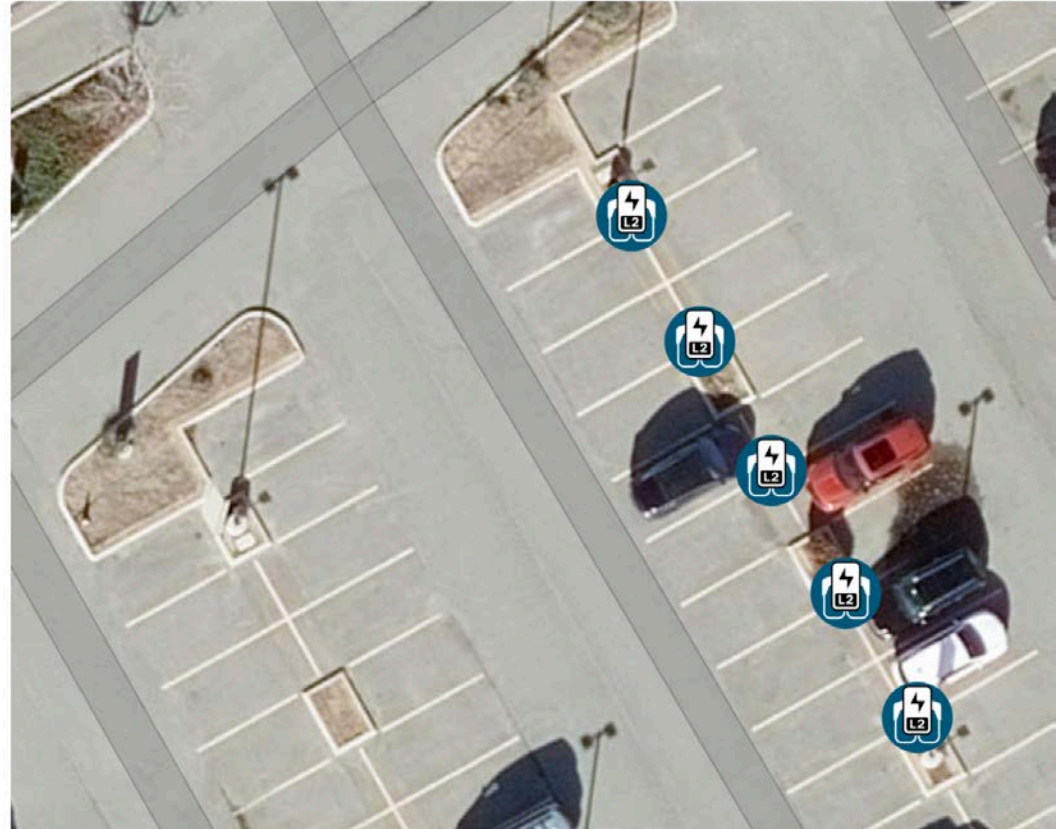
**Charging Level:** Level 2  
**Manufacturer:** Generic  
**Model Number:** Generic  
**Unit Price:** \$5,300  
**Network Provider:** NA  
**Annual Network Cost:** NA  
**Number of Ports:** Dual  
**Mounting Type:** Pedestal  
**Ampere:** 45  
**Purchase Availability:**

# Locate Chargers

## Drop Chargers on Map

- Currently users can only select AC Level 1 and Level 2 uni-directional chargers
- Working on DC fast chargers and bidirectional chargers

Total of new **Generic Level 2 Dual Port Pedestal EVSEs** Added: 5



# Transformer and Service Panel

- Decide if the costs would be included or not
- Assess if the existing infrastructure sufficient or not

**Manage Transformer**  
These questions will help you identify whether you need a new transformer to support EVSE charging stations or have sufficient physical and electrical capacity to use your existing transformer. You can default to a new transformer if you would like.

Would you like to include Transformer costs in your project estimate? [?](#)  
 Yes  No

**Details**

EVSE Charger Level: Level 2  
Total Number of EVSE Ports: 10  
Amperage: 45  
Power Factor: 0.95 [\[OK\]](#)  
Loading Limit: 85% [\[OK\]](#)

Do you want to add a new transformer or upgrade an existing transformer?  
 Add New [?](#)  Upgrade Existing [?](#)

What is the secondary voltage rating for the existing transformer? [?](#)  
208V

What is the rating (in kVA) of the existing transformer? [?](#)  
200 kVA

What is the total peak load (in kVA) drawn from the existing transformer? Must be less than 170 (existing rating x loading limit) [?](#)  
50 kVA

Success! Your existing transformer appears to have sufficient capacity to connect the EVS charging stations to this transformer and that a new transformer is not required.

What is the voltage rating of your service panel? [?](#)  
208V

Are there any open spaces to install additional circuit breakers in the existing service panel?  
 Yes  No

How many unused Circuit Breaker spaces are available on the existing service panel to support EVSE charging stations?  
**10 spaces**

What is the current rating in ampere (A) of the Main Circuit Breaker on the existing service panel? [?](#)  
**200 ampere (A)**

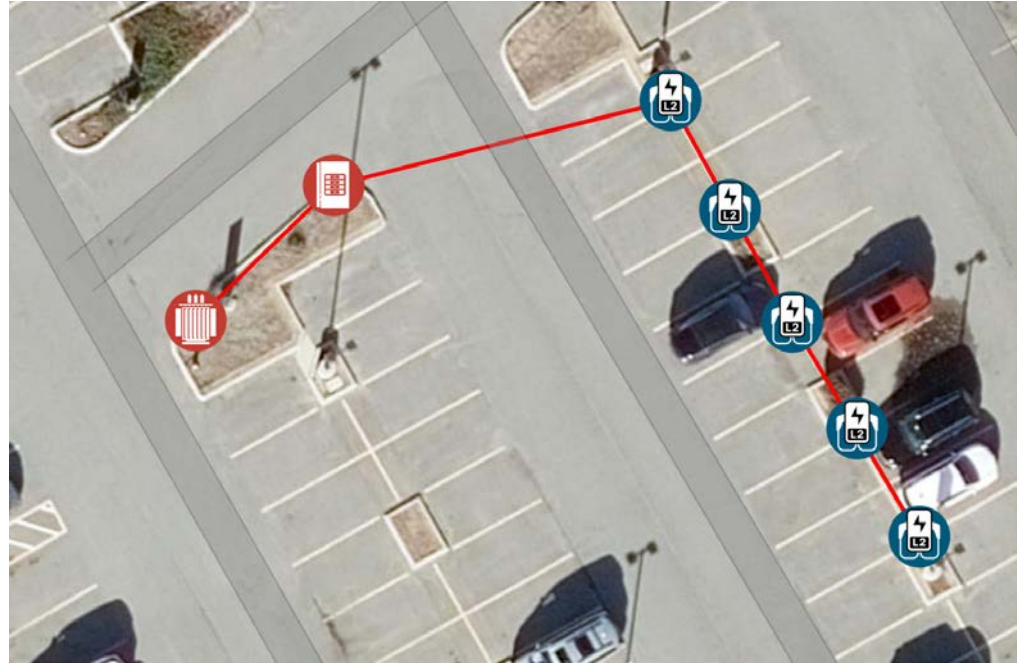
What is the total peak load (kW) drawn from the existing service panel? [?](#)  
**50 kilowatt (kW)**



# Wiring: Connecting the Equipment

## Wiring Run

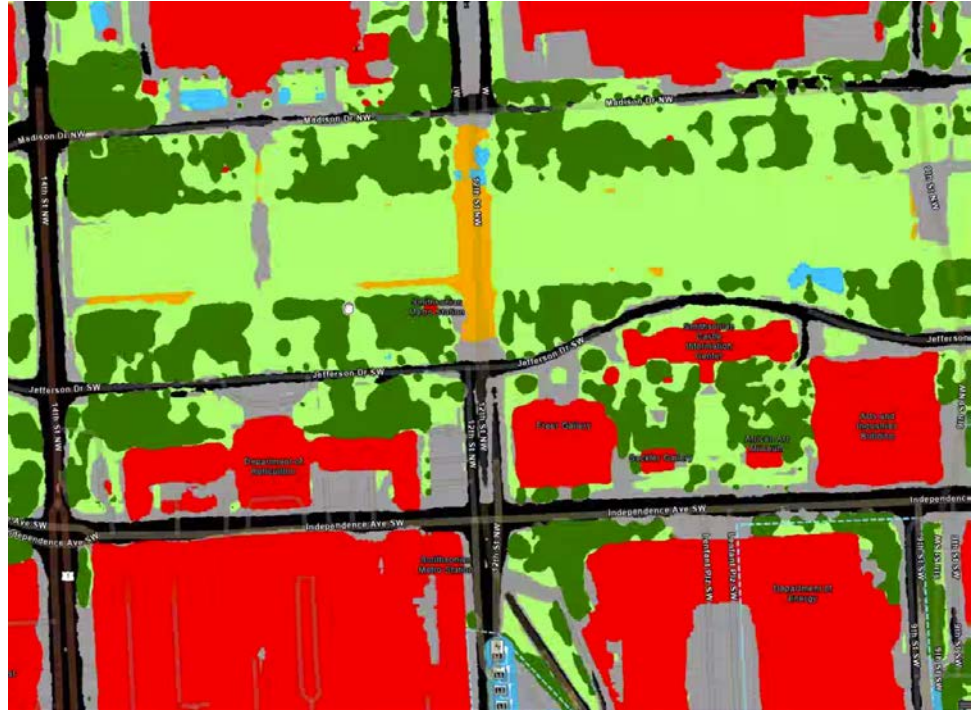
- Tool identifies low-cost line from transformer to panel to chargers
- Identifies hardscape and softscape



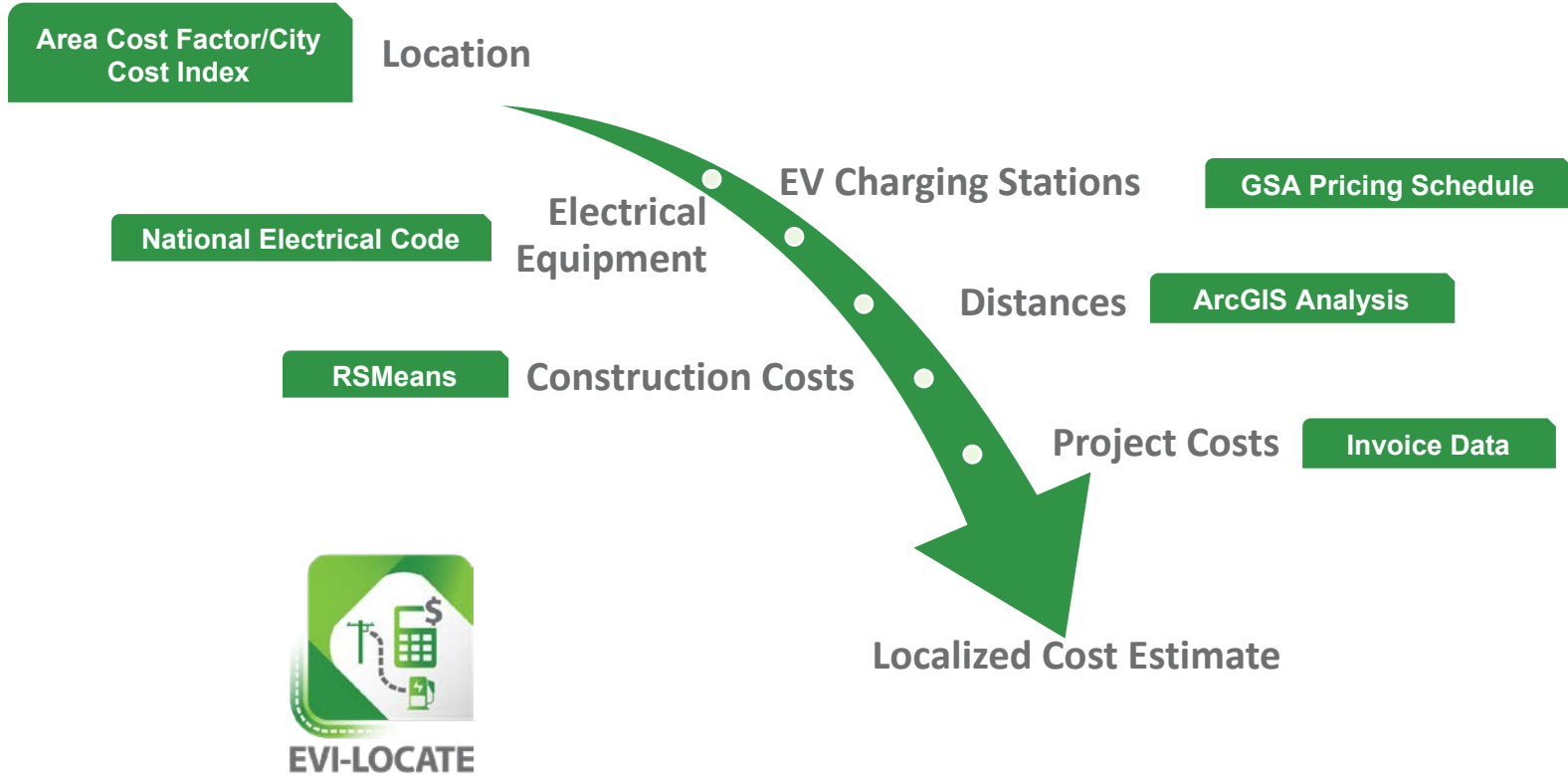
# Wiring: Behind the scenes

## Wiring Run

- Siting algorithm uses near infrared imagery to distinguish surface type and buildings
- Identifies least cost path to run conductors and conduit



# Cost Estimator Components and Data Sources



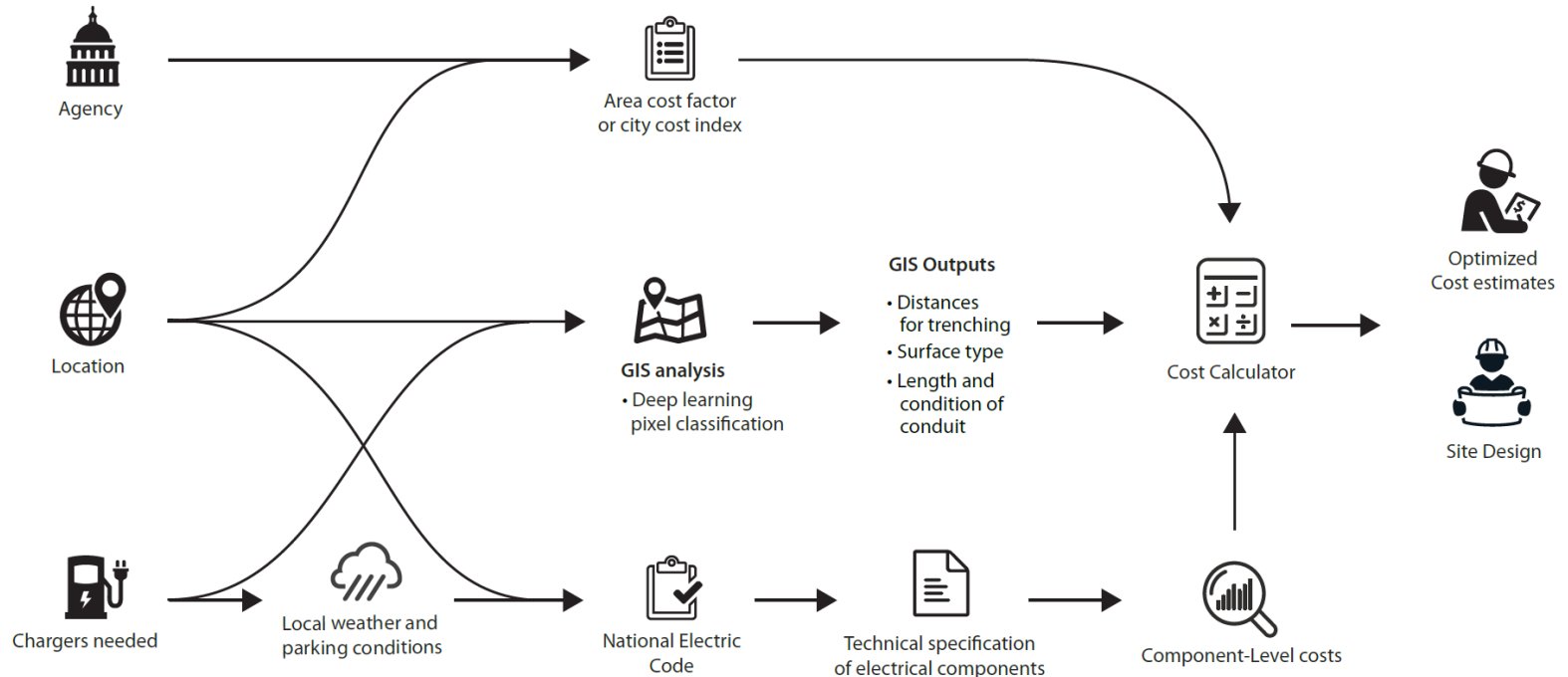
*EVI-Locate (Electric Vehicle Infrastructure - Locally Optimized Charging Assessment Tool and Estimator) [SWR-23-52]. Web. doi:10.11578/dc.20230920.2.*

# Behind the scenes

## Site Inputs

## Cost Calculations and Image Processing

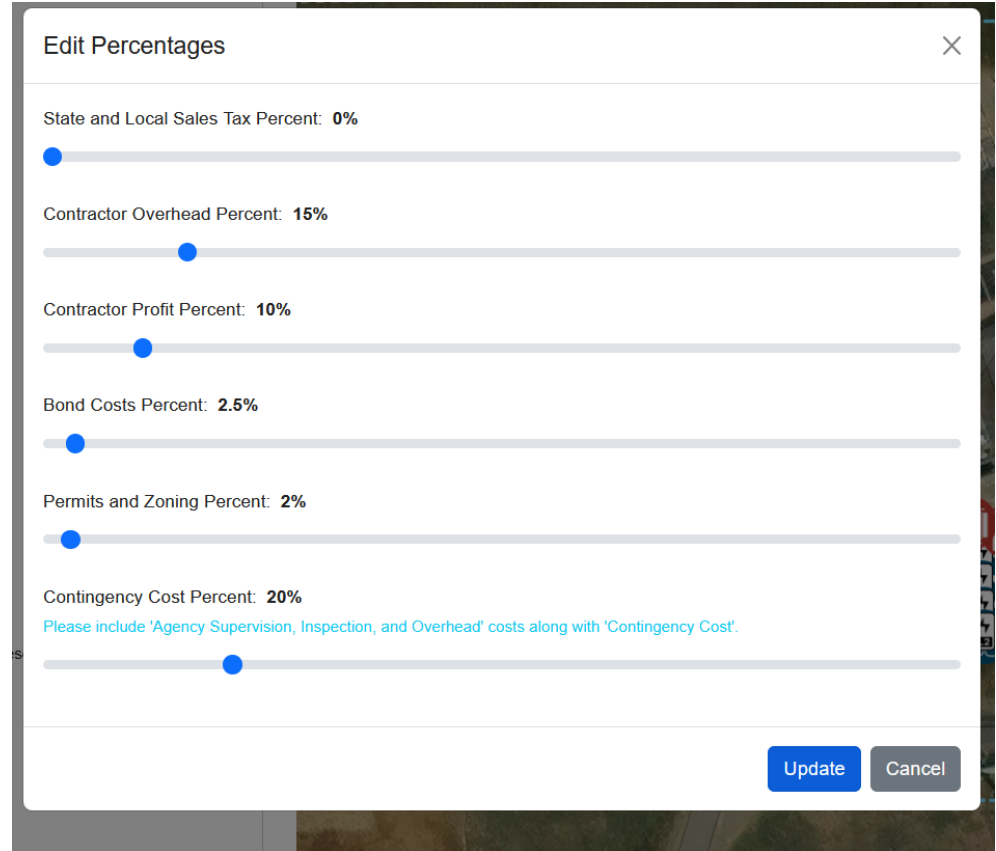
## EVI-Locate Outputs



# Cost Calculations

## Cost Adjustment

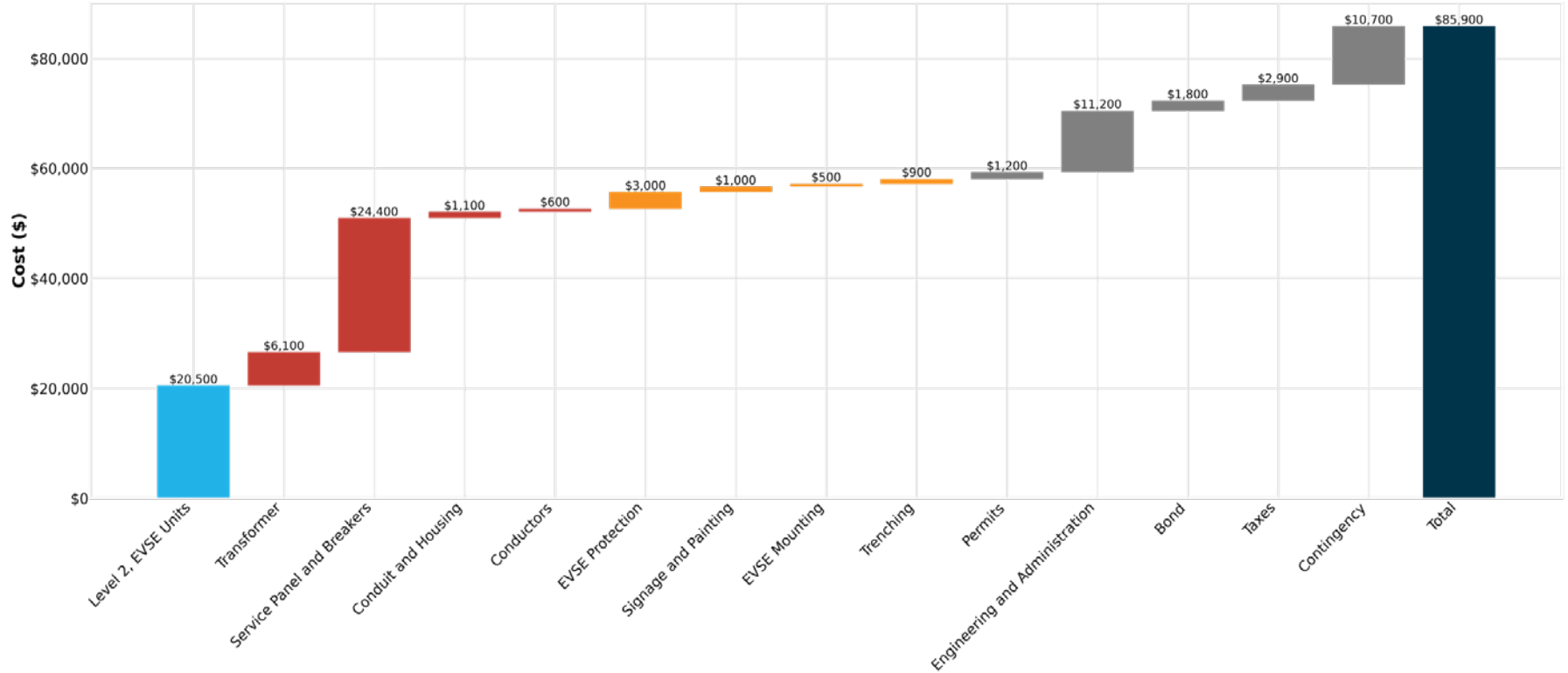
- Slider bars for project costs
- e.g., Feds may not need to pay taxes



The screenshot shows a dialog box titled "Edit Percentages" with a close button (X) in the top right corner. It contains six horizontal sliders, each with a blue dot indicating the current percentage value. The values are: State and Local Sales Tax Percent: 0%, Contractor Overhead Percent: 15%, Contractor Profit Percent: 10%, Bond Costs Percent: 2.5%, Permits and Zoning Percent: 2%, and Contingency Cost Percent: 20%. Below the sliders, there is a blue link that reads "Please include 'Agency Supervision, Inspection, and Overhead' costs along with 'Contingency Cost'". At the bottom right, there are two buttons: "Update" (in blue) and "Cancel" (in grey).

Category	Percentage
State and Local Sales Tax	0%
Contractor Overhead	15%
Contractor Profit	10%
Bond Costs	2.5%
Permits and Zoning	2%
Contingency Cost	20%

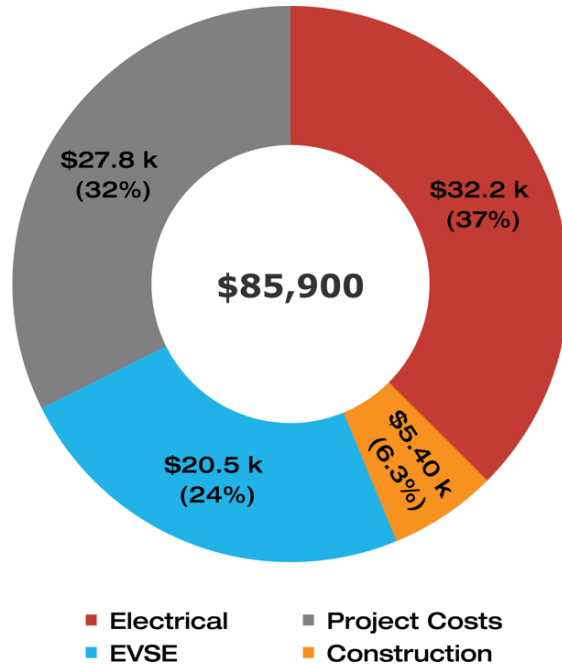
# Detailed Cost Estimates



Cost Components of EVSE Installations

# Higher Level Costs and List of Materials

Estimated Cost of EVSE Installation



Item	Quantity	Units
Level 2 Dual Port Pedestal Stations	5	each
Pad-Mounted Transformer	1	each
Service Panel for Indoor Parking	1	each
Main Circuit Breaker	1	each
Pull Boxes	2	each
Circuit Breakers	10	each
EMT-Electrical Metallic Tubing Conduit	195	L.F.
THWN Conductors	12	C.L.F.
Bollards	10	each
Wheel stops	10	each
Signage Posts	10	each
Painting	290	ft
Hardscape Trenching	150	L.F.

# EVI-LOCATE Benefits



Accelerate the site design process



Unify assumptions for cost calculations



Generate detailed estimates in 20 minutes



Organize EV charger planning throughout agency







[evi-locate@nrel.gov](mailto:evi-locate@nrel.gov)  
<https://evi-locate.nrel.gov>

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