Maryland High-Density Residential Electric Vehicle Charging Suitability Tool

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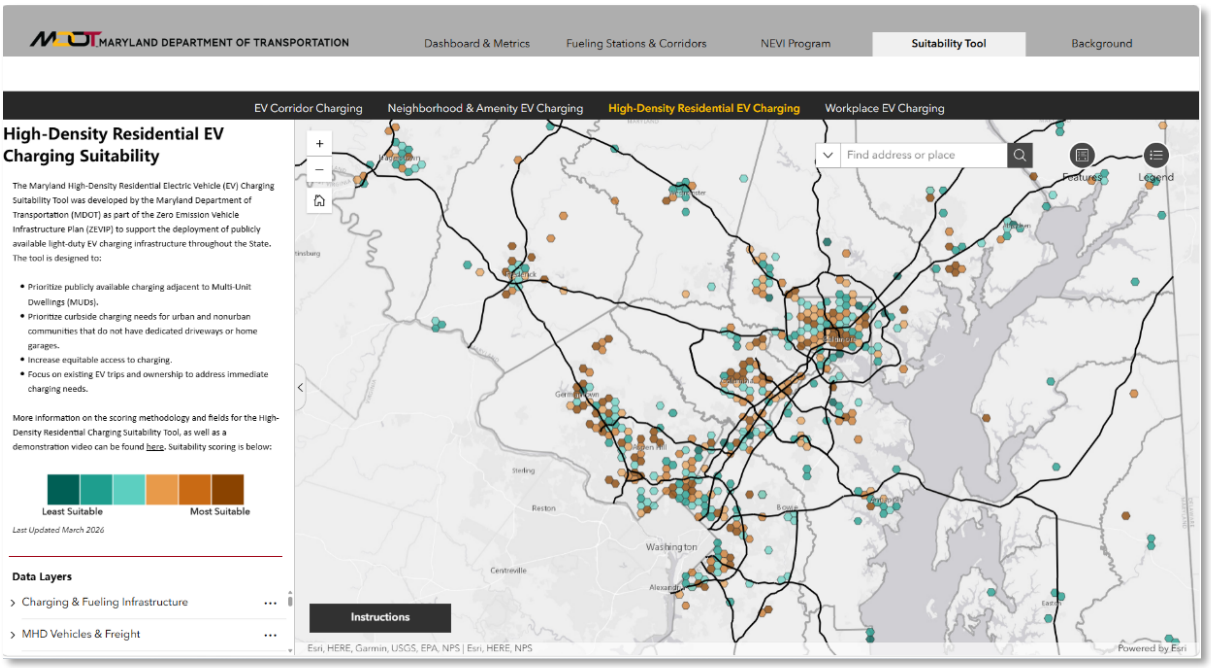

Background

The Maryland High-Density Residential Electric Vehicle (EV) Charging Suitability Tool was developed by the Maryland Department of Transportation (MDOT) as part of the Zero Emission Vehicle Infrastructure Plan (ZEVIP) to support the deployment of publicly available light-duty EV charging infrastructure throughout the State.

The tool is designed to:

- Prioritize publicly available charging adjacent to Multi-Unit Dwellings (MUDs).
- Prioritize curbside charging needs for urban and nonurban communities that do not have dedicated driveways or home garages.
- Increase equitable access to charging.
- Focus on existing EV trips and ownership to address immediate charging needs.

Where to Find the Tool

Use the web application here: View the High-Density Residential EV Charging Suitability Tool

Your Insights Help Us Improve

If you have feedback or questions related to the tool, please visit the Maryland Electric Vehicle Charging Suitability Tool Feedback and Questions Form

Target Audience

Stakeholders and communities interested in EV charger siting such as:

- Local governments
- Local businesses and non-profits
- EV charging industry
- Property developers
- Electric utilities

High-Density Residential Charging Suitability Analysis

This tool utilizes hexagonal binning ('hexbins') to divide Maryland into 12,773, 1-square mile units, allowing for consistent and equitable area comparisons, regardless of the disparities found in census tracts or zip codes. By ranking these hexbins based on weighted scores, the tool produces a clear visualization of the most suitable locations for installing high-density residential charging infrastructure. This approach enables stakeholders to prioritize investments in areas with the greatest potential impact, ensuring that Maryland's residents have broad and equitable access to EV charging as part of the state's broader zero- emission transportation goals.

The list of data layers incorporated into this High-Density Residential Charging Suitability Tool was developed, aggregated, and weighted based on Maryland's charging priorities and evolving local needs. The weighted scores were then combined to give an overall weighted score for each hexbin. Hexbins were then ranked on a scale from 1 to 6, 1 being the most suitable for EV charging infrastructure and 6 being the least suitable based on the overall weighted score.

Additional Information

To learn more about the benefits of high-density residential and multifamily housing EV charging, visit the Alternative Fuels Data Center: Electric Vehicle Charging for Multifamily Housing.

For supplemental data layers incorporated in the Maryland Suitability Analyses, see the Additional Suitability Layers User Guide.

Table 1: Layers Included in the High-Density Residential Charging Suitability Analysis

Layer Name	Definition	Methodology and Scoring	Weight	Source
MD Parcels Multi-Unit Dwellings	Apartments by Unit Count	Calculate the number of apartments by hexbin	5	https://data.imap.maryland.gov/datasets/maryland::maryland-property-data-parcel-points/about
MD Parcels Multi-Unit Dwellings	Residential Condo by Unit Count	Calculate the number of residential condos by hexbin	5	https://data.imap.maryland.gov/datasets/maryland::maryland-property-data-parcel-points/about
MD Multi-family Mapper	MUD Locations from MD Multi-family Mapper	Calculate the number of MUD locations by hexbin	5	https://portal.dhcd.state.md.us/GIS/multifamily/index.html
MD Parcels Multi-Unit Dwellings	Rowhomes by Unit Count	Calculate the number of rowhomes by hexbin	4	https://data.imap.maryland.gov/datasets/maryland::maryland-property-data-parcel-points/about
MD Parcels Multi-Unit Dwellings	Townhouses by Unit Count	Calculate the number of townhouses by hexbin	3	https://data.imap.maryland.gov/datasets/maryland::maryland-property-data-parcel-points/about

Layer Name	Definition	Methodology and Scoring	Weight	Source
EV Origin Trips	Trip count by hexbin - EVs only	Density of trip origin and trip destination	3	Replica
All Vehicles Origin Trips	Trip count by hexbin - All vehicles	Density of trip origin and trip destination	2	Replica
EVs Registrations by Zip Code	Electric or Plug-In Hybrid vehicle registrations by county with counts	Calculate the number of EVs registered within each hexbin.	2	MDOT/MVA Electric and Plug-in Hybrid Vehicle Registrations by County as of each month end from July 2020 to February 2026 | Open Data | opendata.maryland.gov
Existing Direct Current (DC) Fast Stations	Proximity to existing DC Fast stations	Calculate the number of existing EV charging ports that fall within a hexbin.	2	Michael Baker International, compiled from U.S. Department of Energy - National Renewable Energy Laboratory (NREL) / ArcGIS Living Atlas
Existing Level 2 Stations	Proximity to existing L2 charging	Calculate hexbins that are within 0.5 miles of existing charging stations. If within 0.5 mile = 0 and outside of 0.5 mile = 1.	2	Michael Baker International, compiled from U.S. Department of Energy - National Renewable Energy Laboratory (NREL) / ArcGIS Living Atlas

Layer Name	Definition	Methodology and Scoring	Weight	Source
MDE MDEnviroScreen	Identifies an area's environmental justice concern.	EnviroScreen Score = Intersection of the centroid of the hexbin with the EnviroScreen Score • Communities facing higher cumulative environmental burdens are prioritized in planning and resource allocation.	2	MDE MD EnviroScreen Tool

Methodology Updates

The methodology and data layers will be updated as necessary based on the needs and priorities of Maryland.

Additional Suitability Tools

In addition to EV high-density residential charging suitability, Maryland has developed other suitability tools that address publicly available corridor, workplace, and neighborhood and amenity charging for light-duty EVs. The following section illustrates the purpose and use of the Maryland Light-Duty EV Charging Suitability Suite of Tools.

Purpose of the Suitability Tools

The Suitability Tools are designed to:

- Help inform local/state-wide decisions for public light-duty EV charging siting.
- Consider different use cases for light-duty EV charging - corridor, workplace, high-density residential, and neighborhood and amenity.
- Identify EV charging gaps at a high level and areas for light-duty EV charging siting.

The Suitability Tools are not designed to:

- Act as an economic cost-benefit analysis tool.
- Provide exact locations for light-duty EV charging.
- Calculate GHG reductions or savings.
- Indicate the role of private vs public investments.
- Inform siting based on electric utility hosting capacity.