



The 27th INTERNATIONAL  
ELECTRIC VEHICLE  
SYMPOSIUM & EXHIBITION

BARCELONA  
17th-20th November 2013

# Using GIS to Plan EVSE Networks

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EPRI

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## The Problem

- Large investments in national infrastructure deployment have not necessarily created the optimal location and distribution of charging stations
- EV Project alone: \$100 million
- EVSE installation across 11 cities

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- Geographic Information Systems (GIS) give a big picture view of travel patterns
- They do not give granular details on where cars are deployed, regional driving patterns, parking locations, etc.
- ... Best for large-scale regional planning

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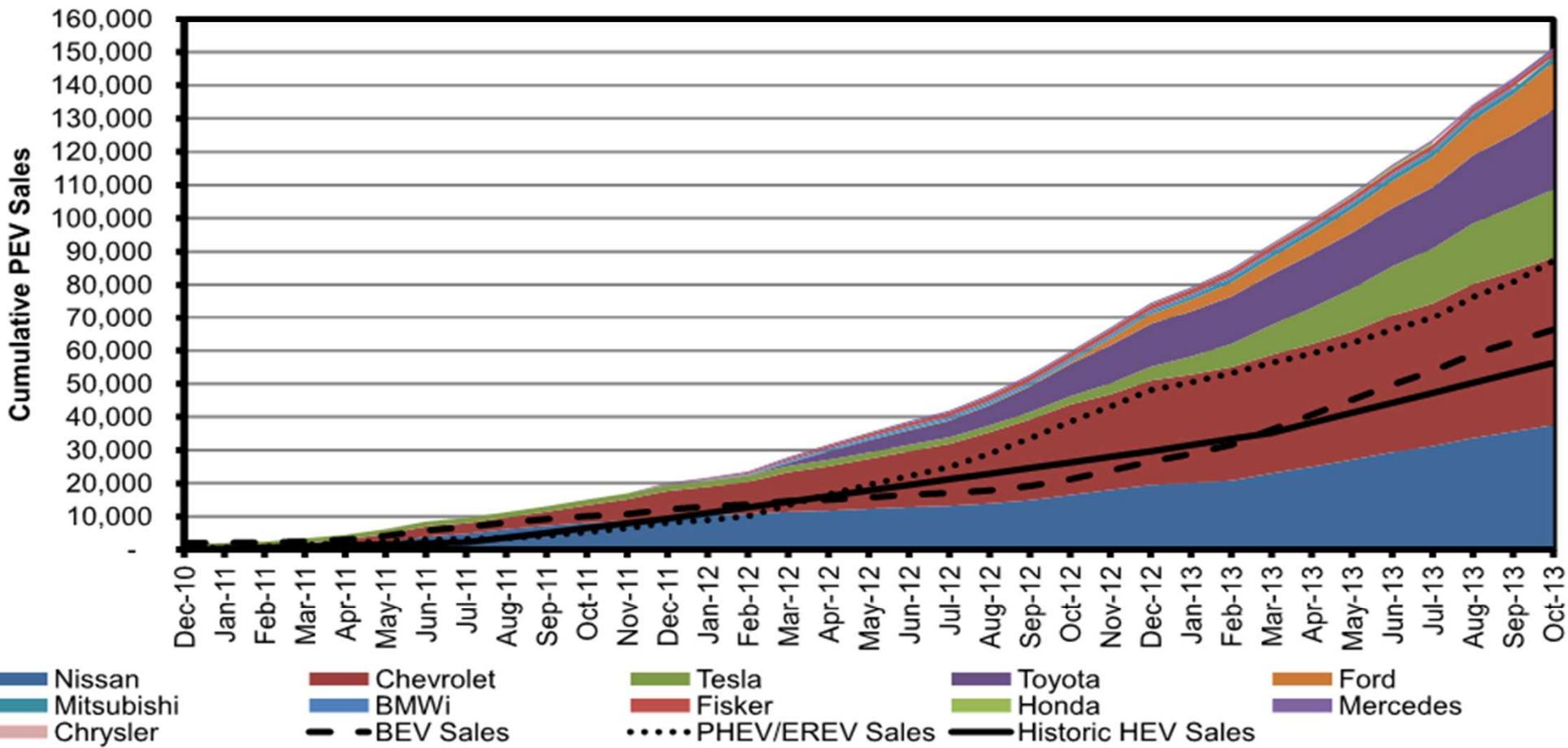
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## PEV Sales to Date



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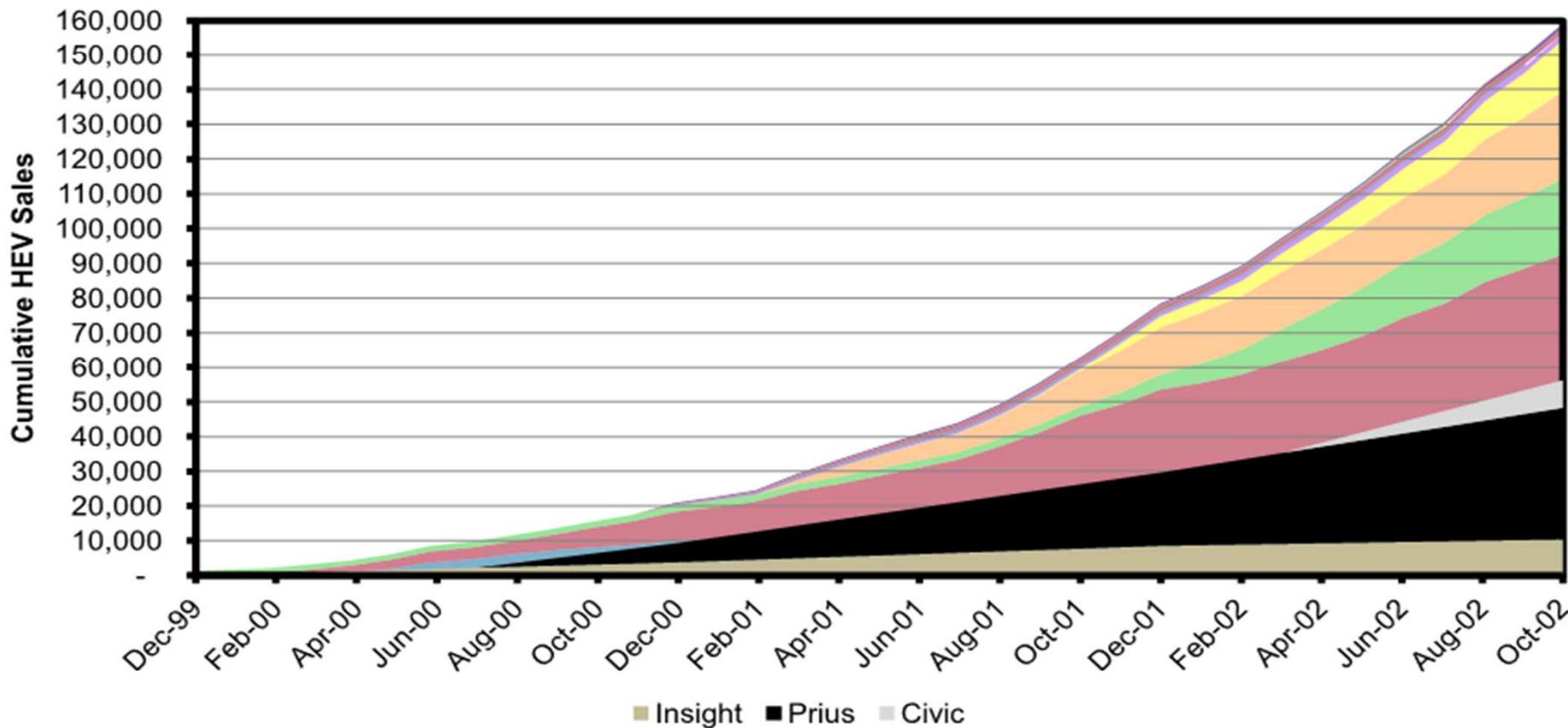
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## Compared to Previous HEV Sales



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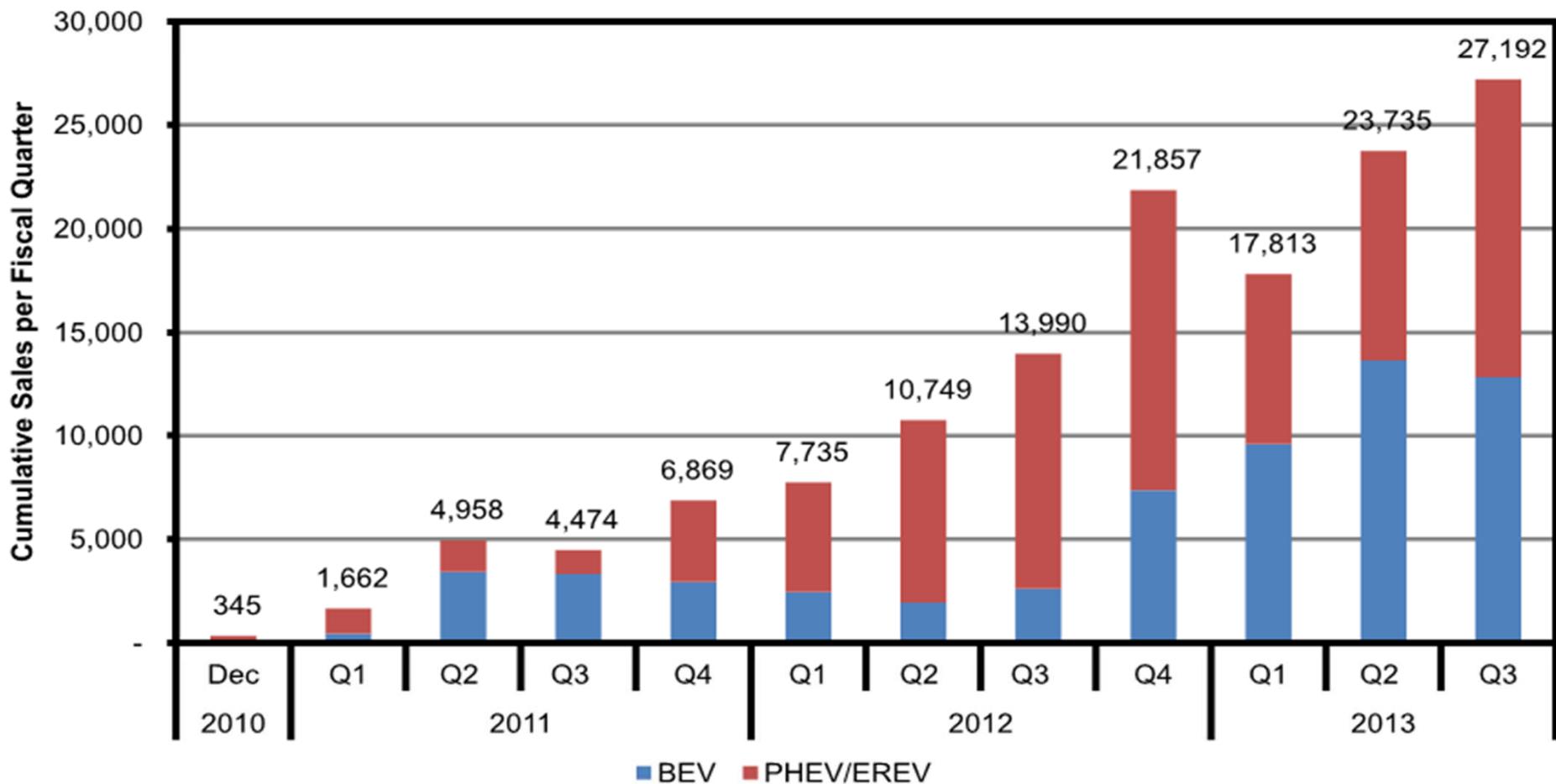
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## Sales by Quarter – up 94% over Q3 in 2012



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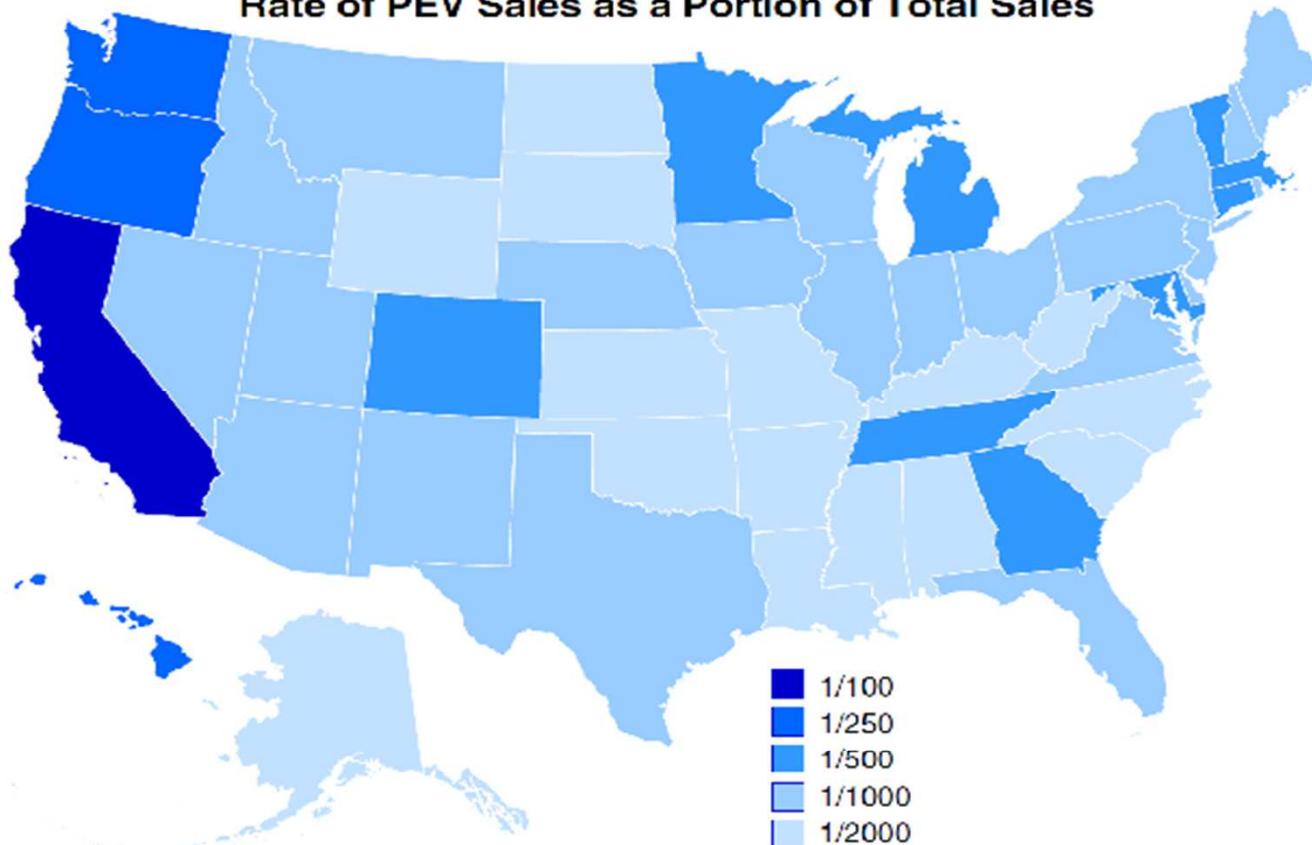


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## U.S. Vehicle Deployment has Been Growing

Rate of PEV Sales as a Portion of Total Sales



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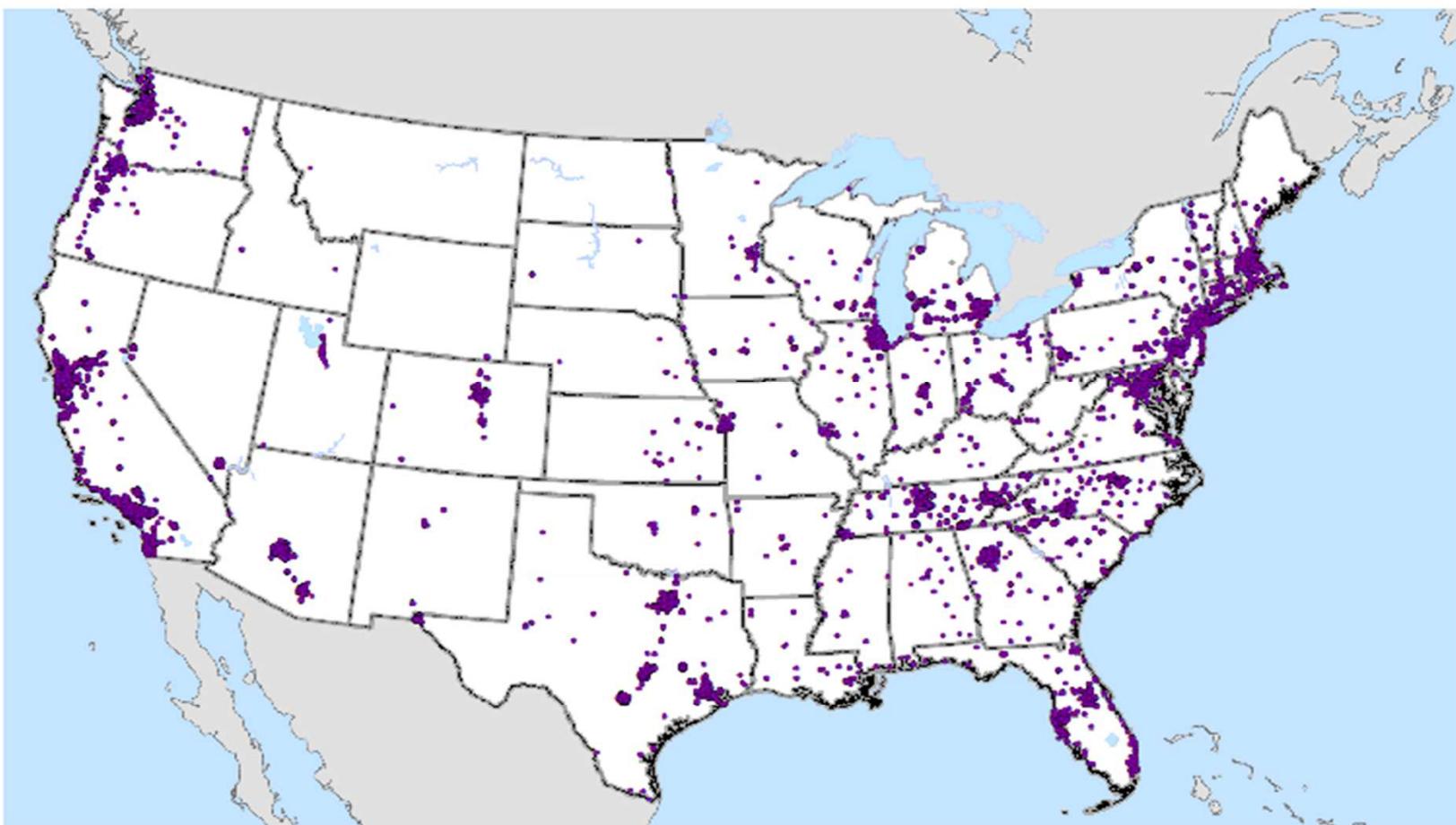
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## Current U.S. Infrastructure Investments – Level 2



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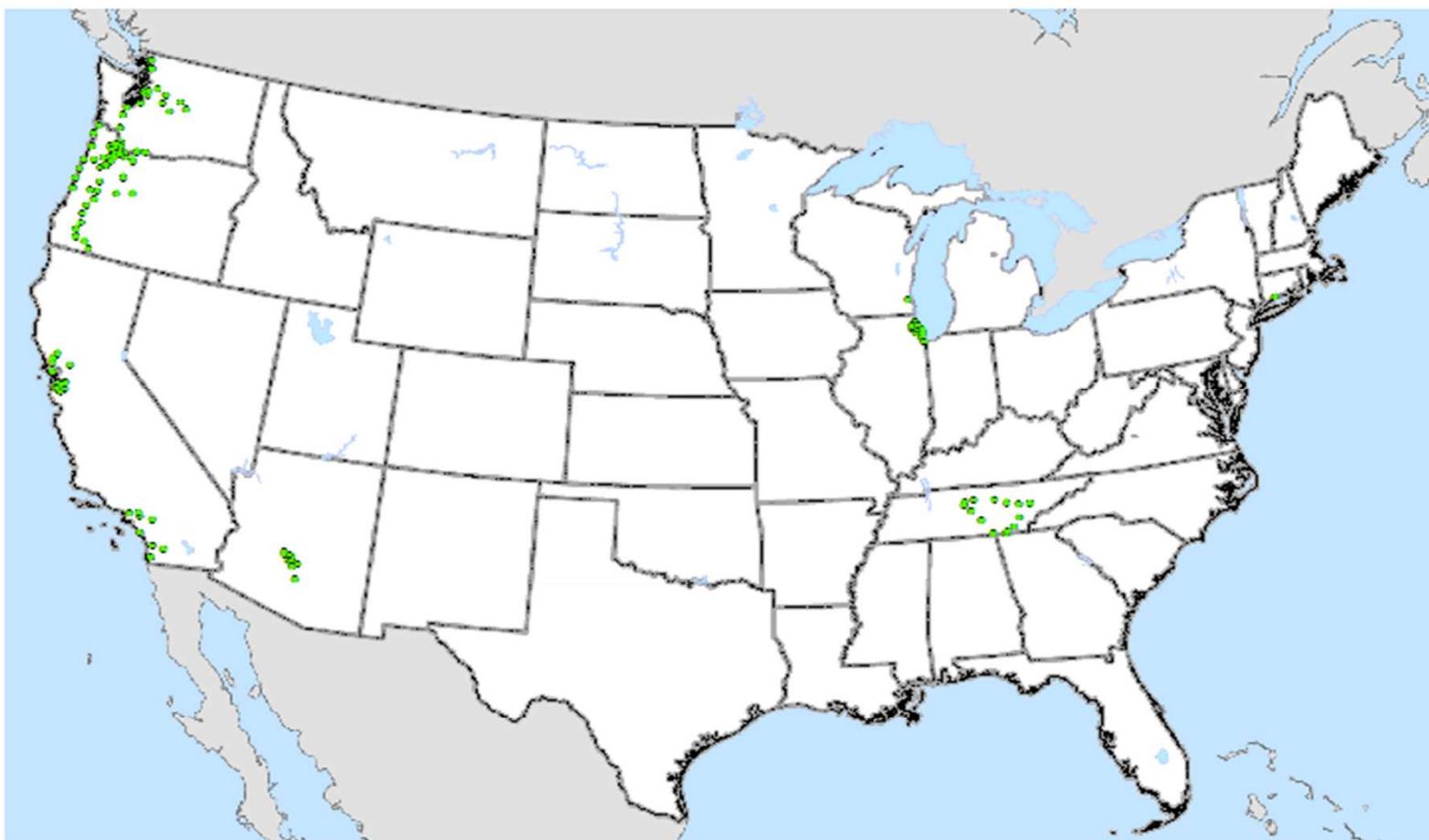
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# Current U.S. Infrastructure Investments – DC FC



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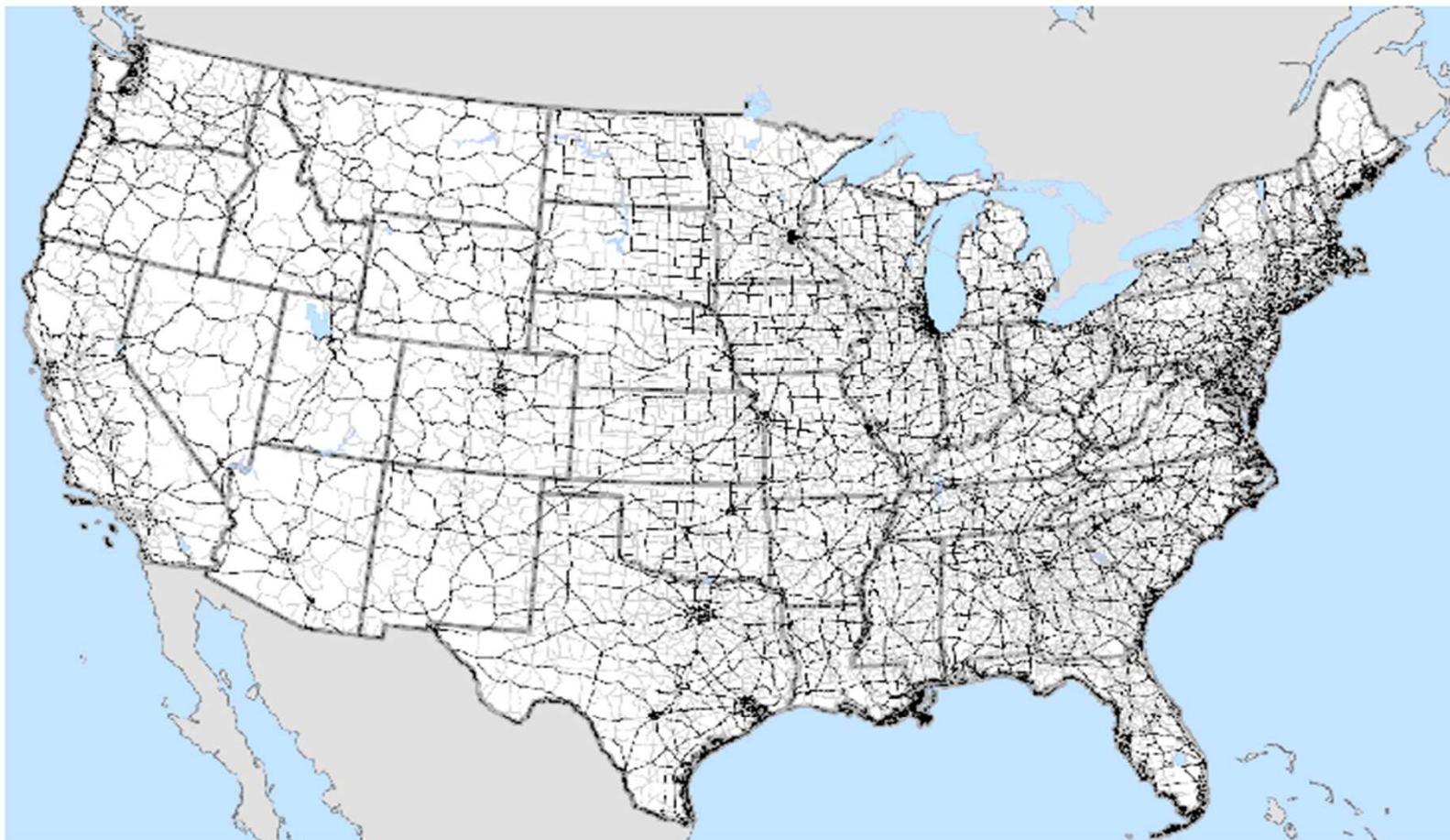




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# U.S. Highway Network is Expansive and Intricate



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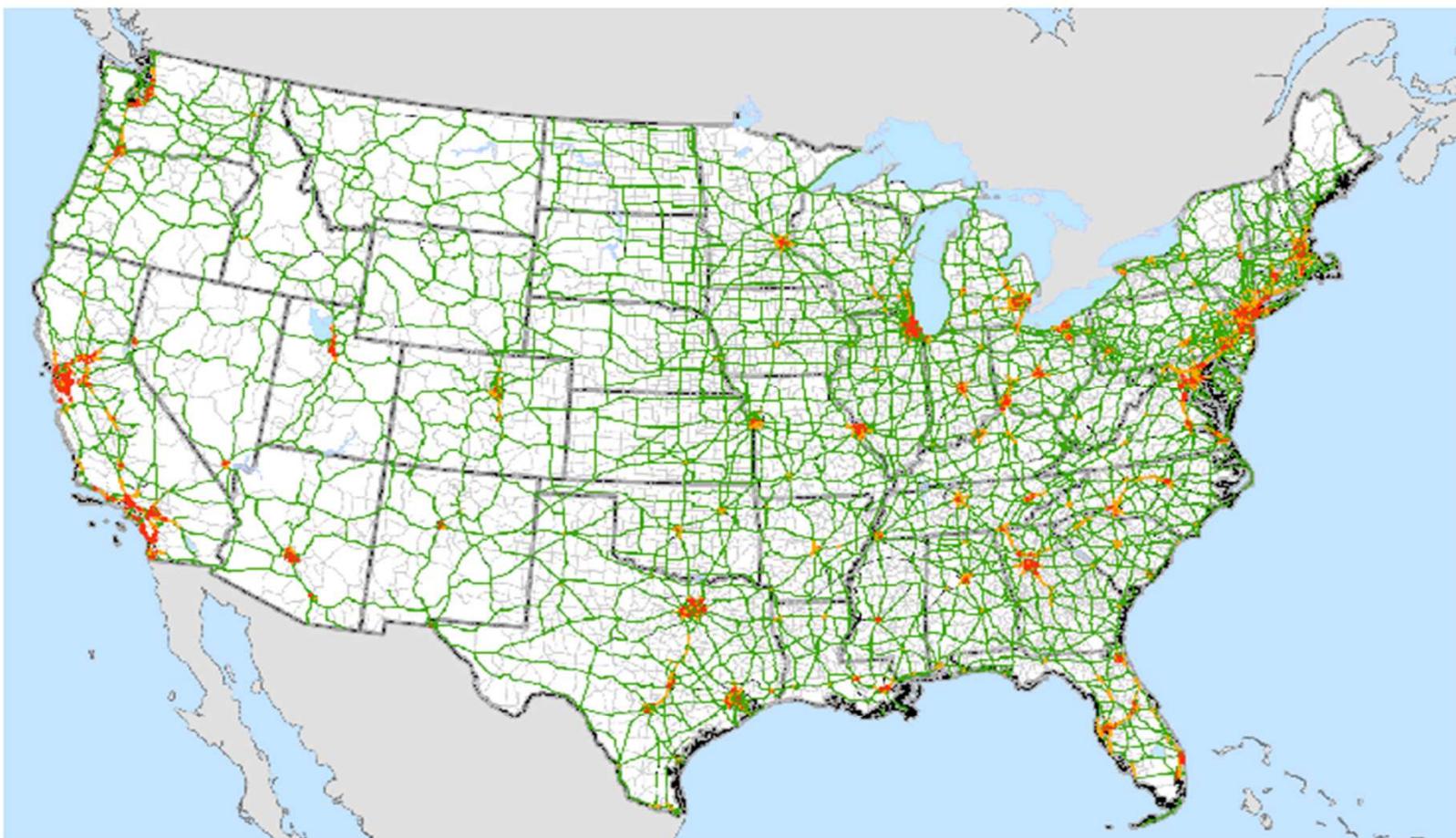




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... And Traffic in the U.S. is  
Heavily Dispersed



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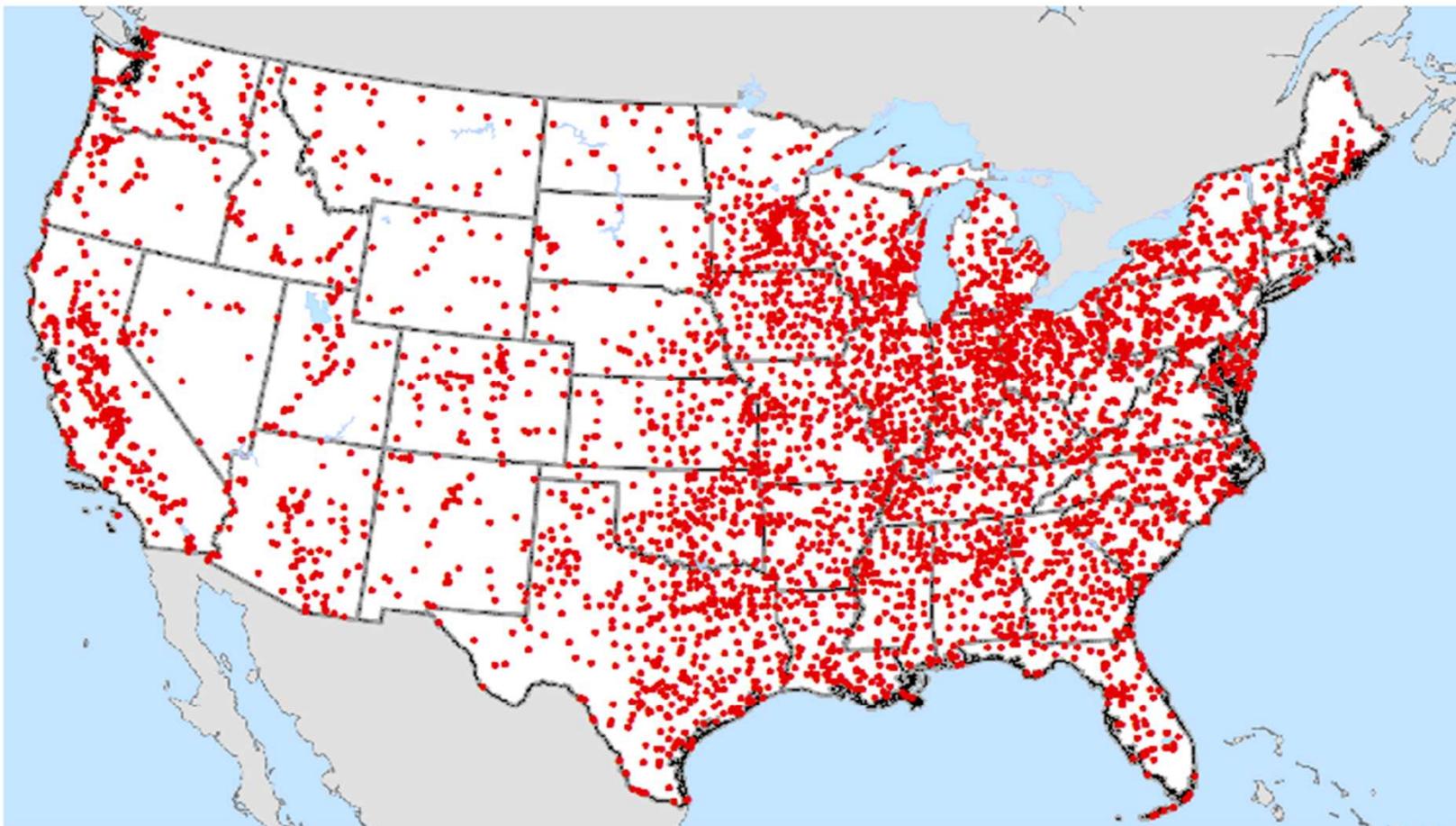
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# Methods for Using GIS – Town Locations for EVSE Planning



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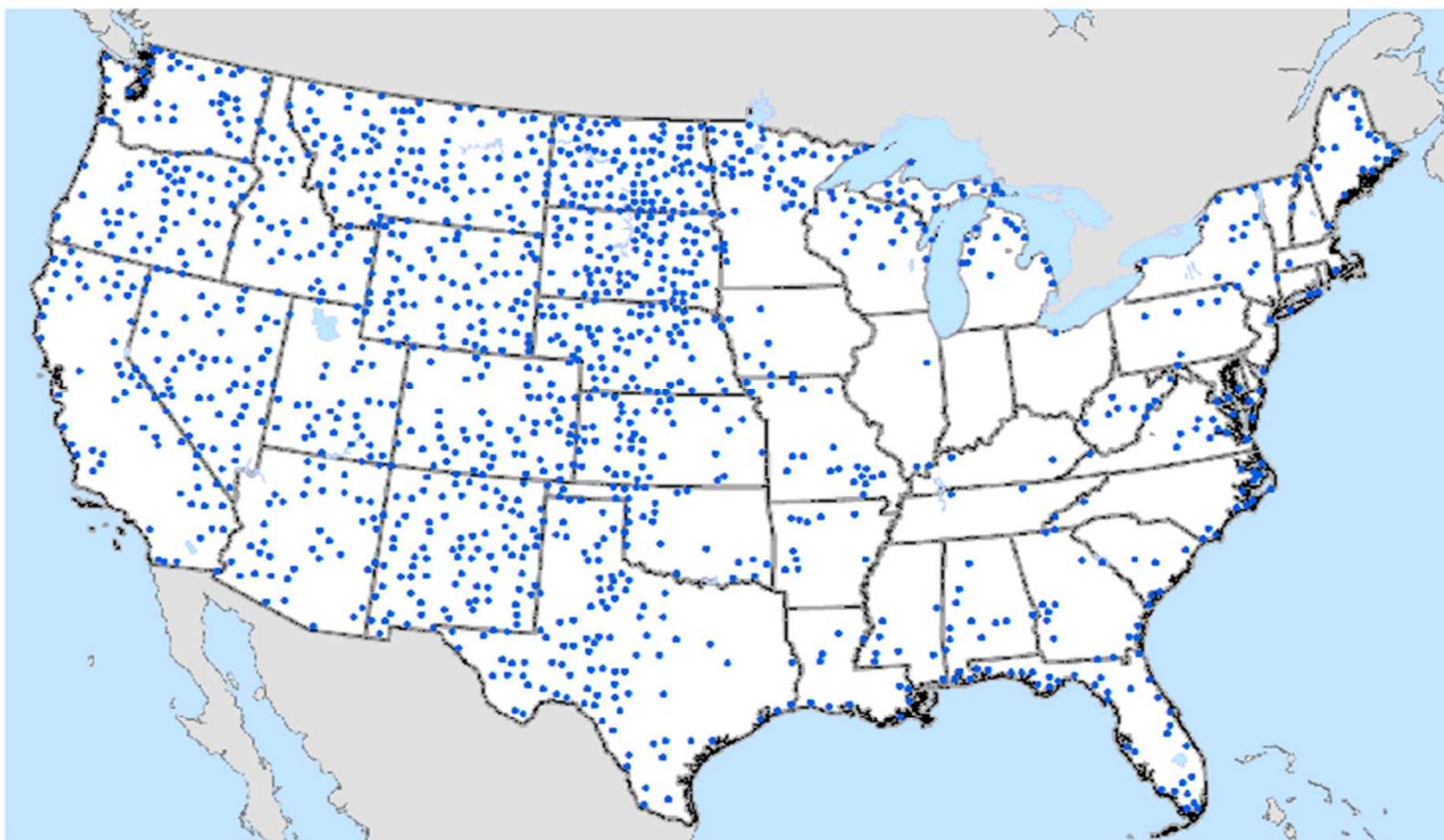
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# Methods for GIS – Safety Locations for EVSE Planning



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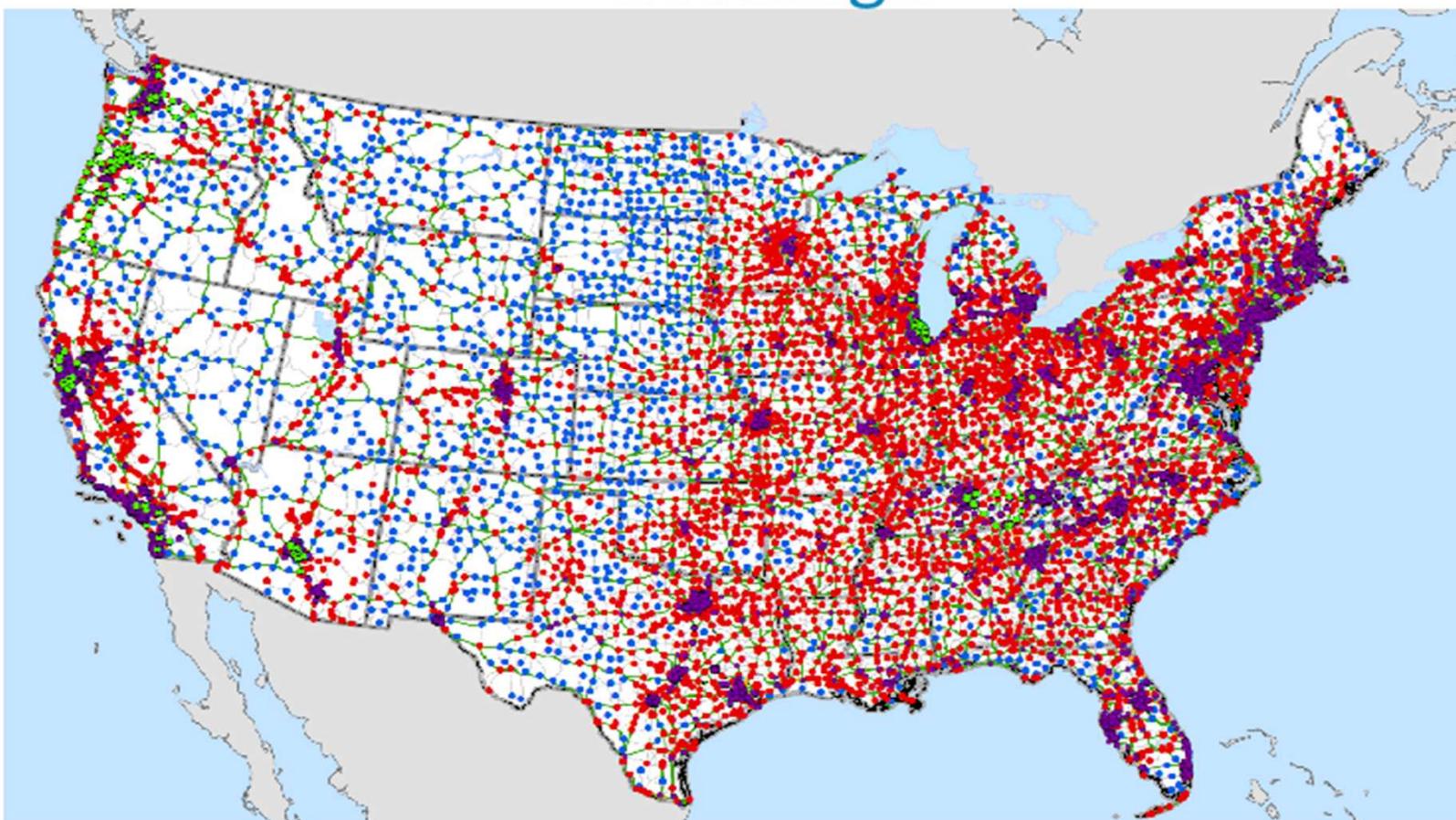
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# A National Network Requires Both Town & Safety for Coverage



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## Map of Spain



### Spain EVSE Network

- Town Locations (460)
- Safety Locations (6)

— Primary Highways

— Major Roadways

— Transmission Lines

Population Density (per sq km)

High : 16,000  
Low : 0

### Town Network Preliminary Selection Criteria:

- Populated places dataset within 1.5km of Hwy
- Clusters removed
- Not located within a major urban area

### Data source:

Digital Chart of the World, US Defense Mapping Agency / ESRI

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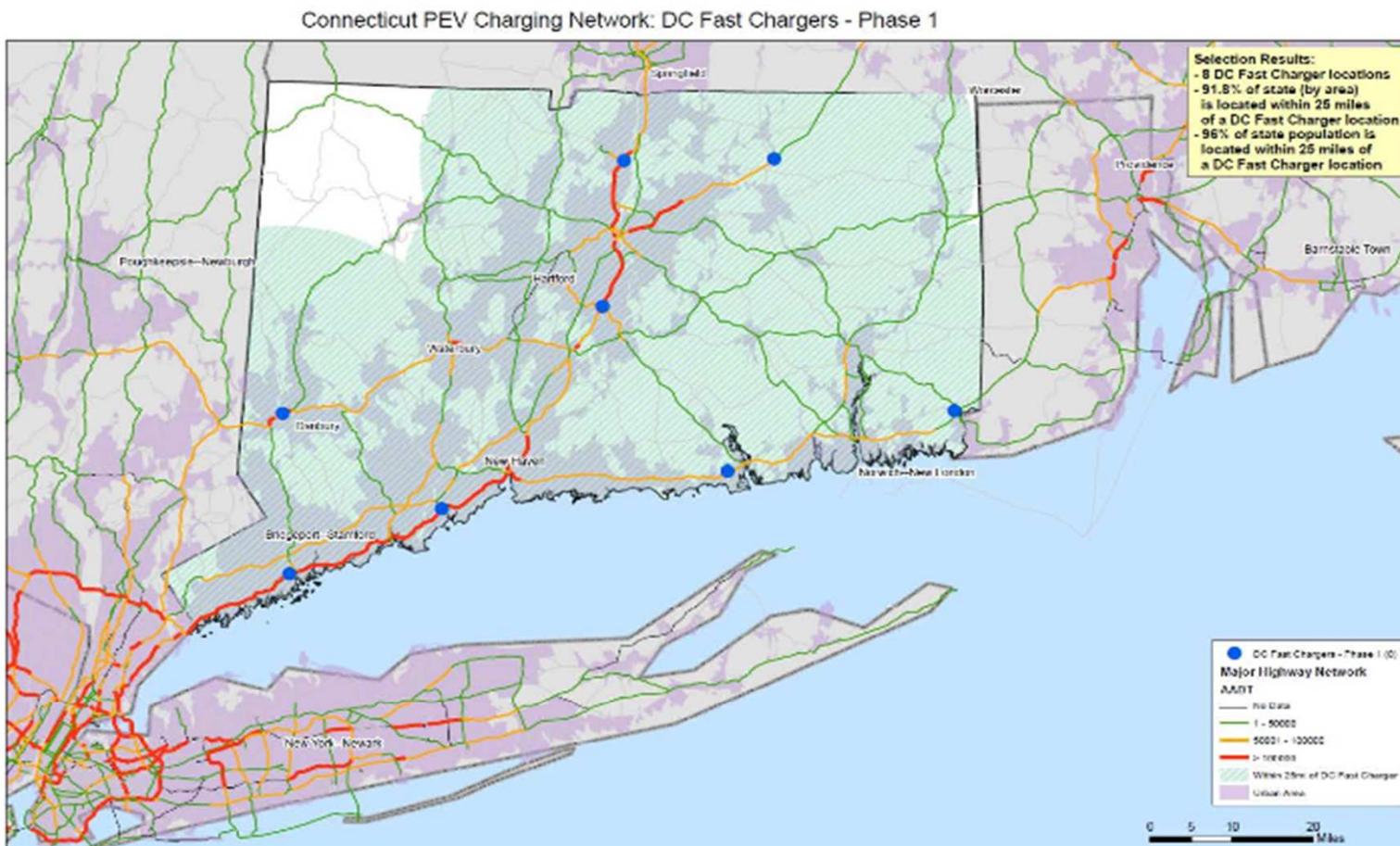
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## Using GIS for Smaller Scale Planning – CT Planning a DCFC Network



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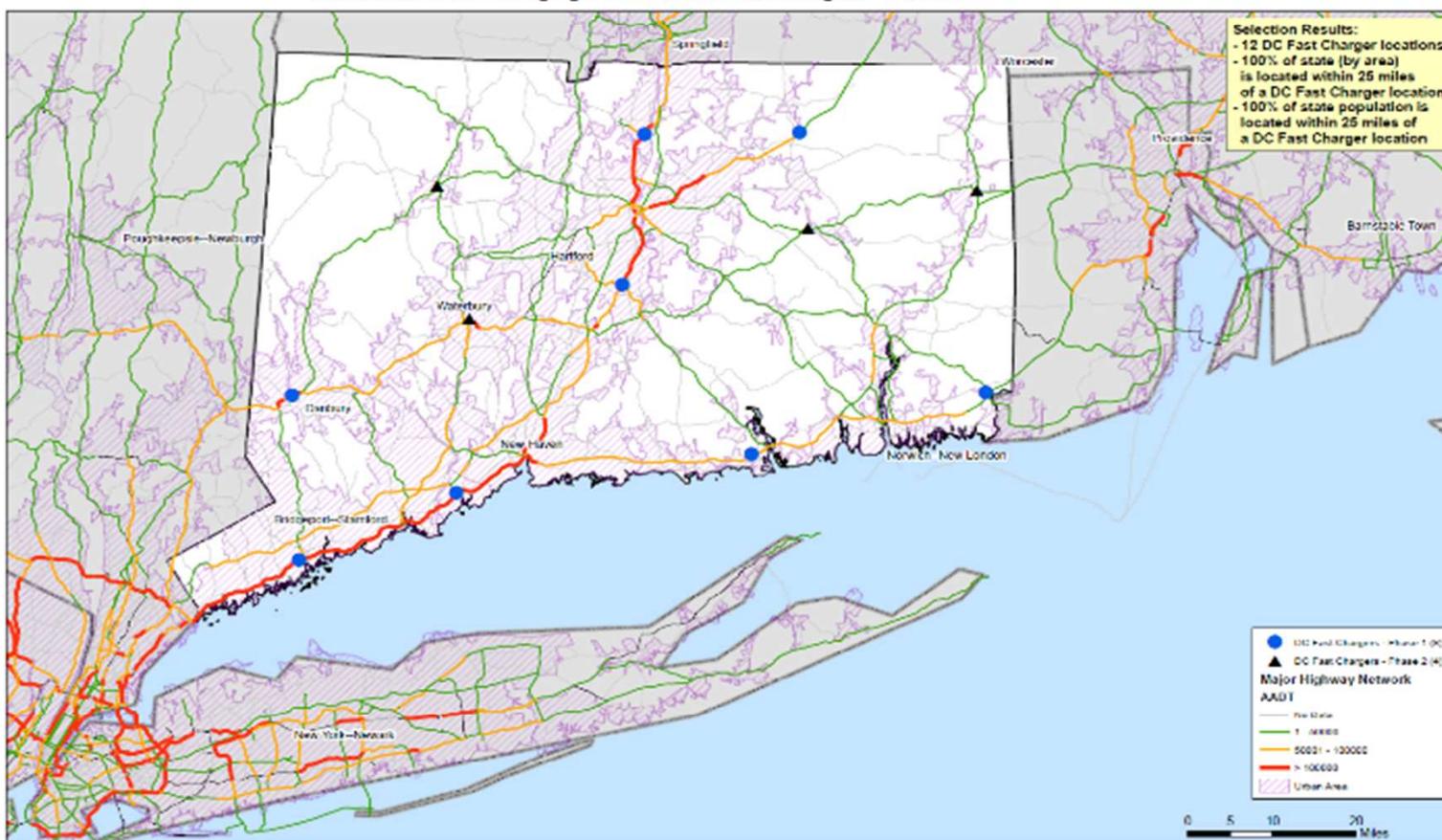
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Connecticut PEV Charging Network: DC Fast Chargers - Phase 2



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- GIS is easily transferrable
- Planning networks is about: SAFETY & COVERAGE
- GIS can be used to create more finely tuned networks and plan phases

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