EV Planning Toolkit

Adam Beam

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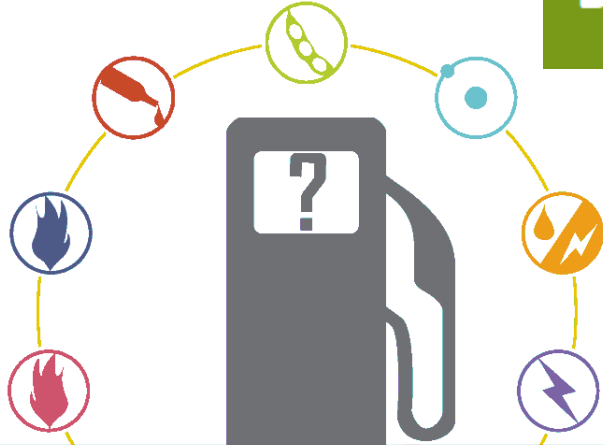
Delaware Valley Regional Planning Commission

The Delaware Valley Regional Planning Commission (DVRPC)

- **Metropolitan Planning Organization (MPO) for the Philadelphia region, created in 1965**

- **Bi-state (PA/NJ), nine counties**

- **Board made up of representatives of the counties, major cities, key state agencies, Governors' representatives**

- **Staff of over 120**

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Drive Electric Pennsylvania

electrify america

READY to ROLL!
Southeastern Pennsylvania's Regional Electric Vehicle Action Plan

Ready to Roll?
Overview of Challenges and Opportunities for Alternative Fuel Vehicles in the Delaware Valley

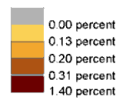Volume I: Planning and Policy Recommendations
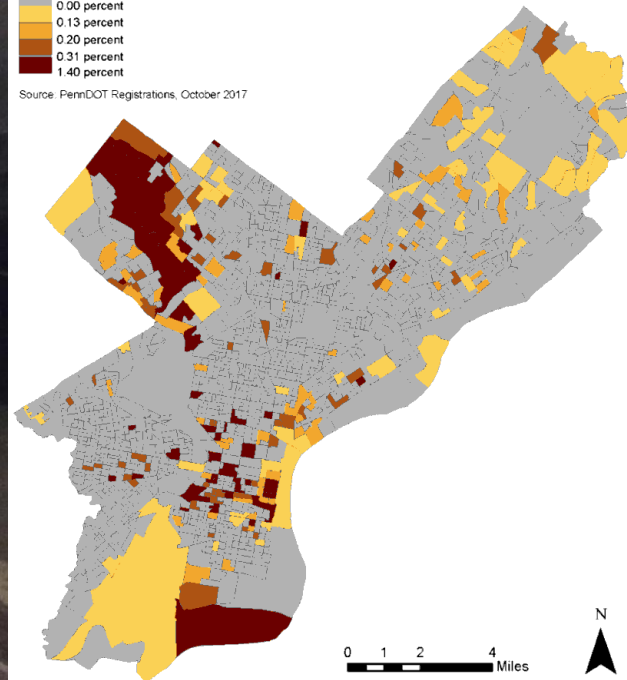June 2013

City of Philadelphia
Electric Vehicle Policy Task Force
Policy Recommendations
March 8, 2018

CITY OF PHILADELPHIA
otis
MANAGING DIRECTOR'S OFFICE OF TRANSPORTATION & INFRASTRUCTURE SYSTEMS

Percentage of PEVs in Philadelphia

Percentage PEV by Block Group
0.00 percent
0.13 percent
0.20 percent
0.31 percent
1.40 percent

Source: PennDOT Registrations, October 2017

0 1 2 4 Miles

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EV Planning Questions

- How do we address tomorrow's – not yesterday's – needs?

- How do we:

  - Know how much paid charging we need?

  - Know enough geographic detail of demand for wise electric distribution systems planning?

  - Make sure we install the right kind of EV charging infrastructure in the right places?

  - Provide infrastructure that people want to be there, but that they are likely to use only very rarely?

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Many Questions

- **Where will PEV owners live?**

- **Where will PEVs be charged?**

- **What is the expected demand for public and workplace charging?**

- **How does pricing charging to recover costs affect demand for public and workplace charging?**

- **What strategies are most effective to provide for charging?**

- **How do larger batteries and increased range affect behavior?**

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Source: UC Davis, 2017
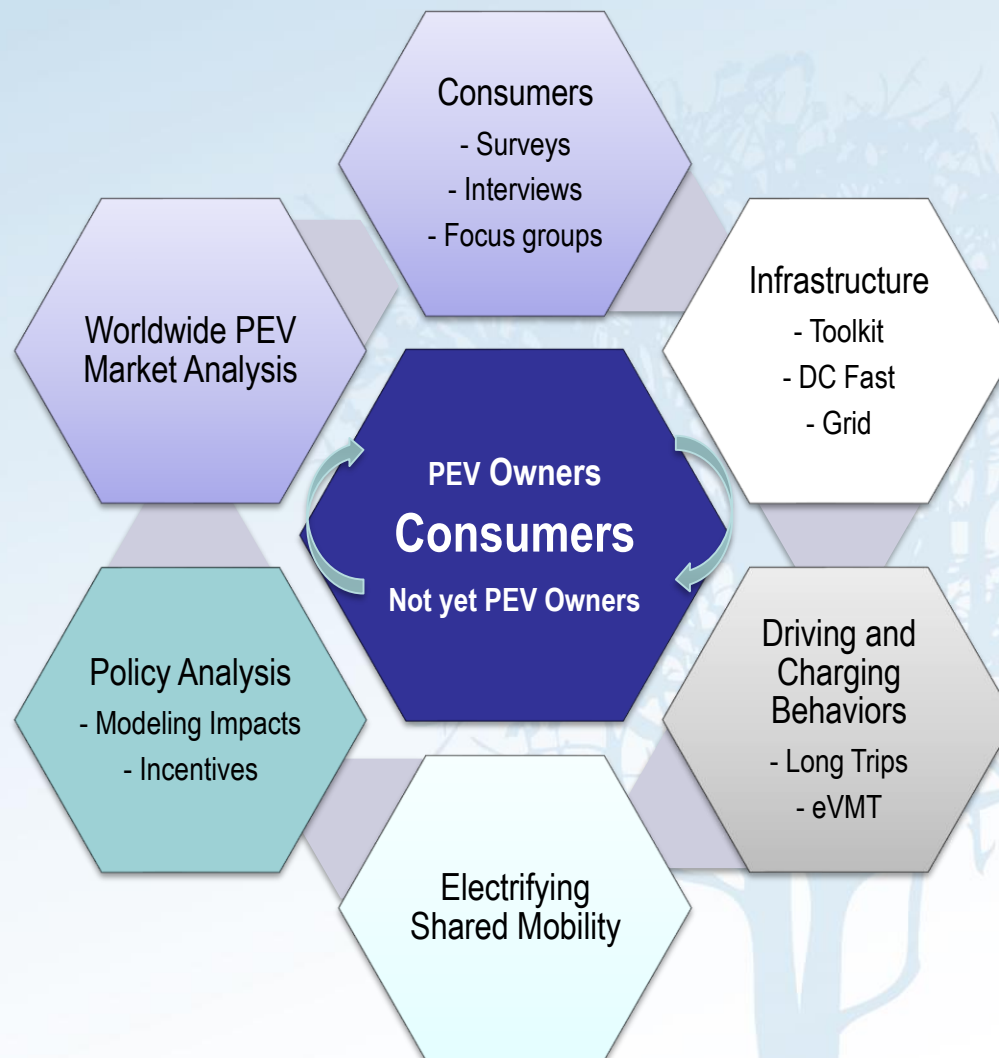
Market Forecast
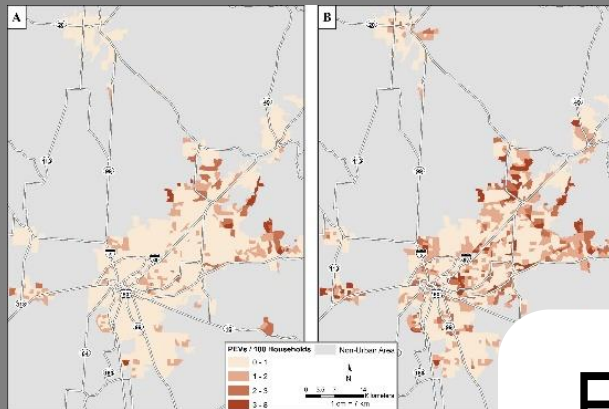
Workplace Charging
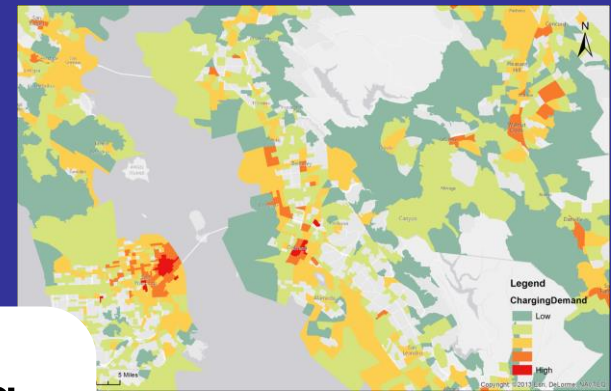
EV Planning Toolkit
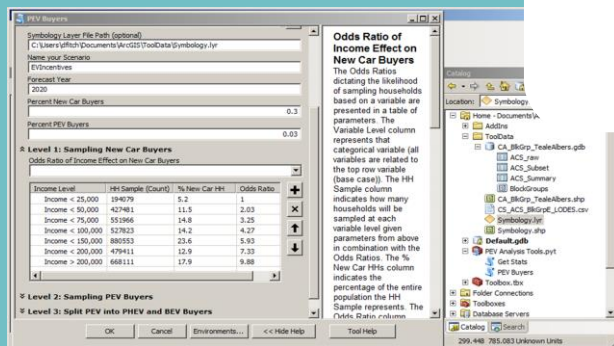
ArcGIS Interface Allows User to Test Scenarios
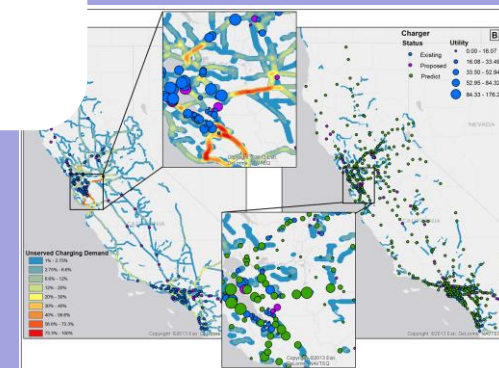
Fast Charging - Estimates Take into Account Existing Chargers

Source: UC Davis, 2017

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Tool Results

- **Three geographies**
  - **DVRPC Region**
  - **Commonwealth of Pennsylvania**
  - **State of New Jersey**
- **All results are available in an online, interactive map hosted on DVRPC's website.**
  - **https://tinyurl.com/DVRPC-EV-Toolkit**
  - **The data underlying the maps are also available for download at DVRPC's GIS Portal.**

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Planning for Electric Vehicles

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About | DVRPC Region — PEV Distribution | DVRPC Region — Workplace Charging | Pennsylvania — PEV Distribution | Pennsylvania — Workplace Charging

Planning for Electric Vehicles

Mapping Vehicle Distribution and Workplace Charging Demand

DVRPC in collaboration with the PH&EV Research Center at UC Davis | July 24, 2020

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About | DVRPC Region — PEV Distribution | DVRPC Region — Workplace Charging | Pennsylvania — PEV Distribution | Pennsylvania — Workplace Charging

Layer List

Layers

- ☑ State Boundary
- ☑ County Boundary
- ☑ Municipal Boundary (Zoom in to Display and Identify PEV Data)
- ☑ Block Group Boundary (Zoom in to Display and Identify)
- ☑ Current - Number of PEVs
- ☐ Projected - Number of PEVs
- ☐ Current - Percentage of Passenger Vehicles That Are PEVs
- ☐ Projected - Percentage of Passenger Vehicles That Are PEVs
- ☐ Current - PEVs per 100 People
- ☐ Projected - PEVs per 100 People

Plug-In Electric Vehicle (PEV) Distribution

Planning for Electric Vehicles

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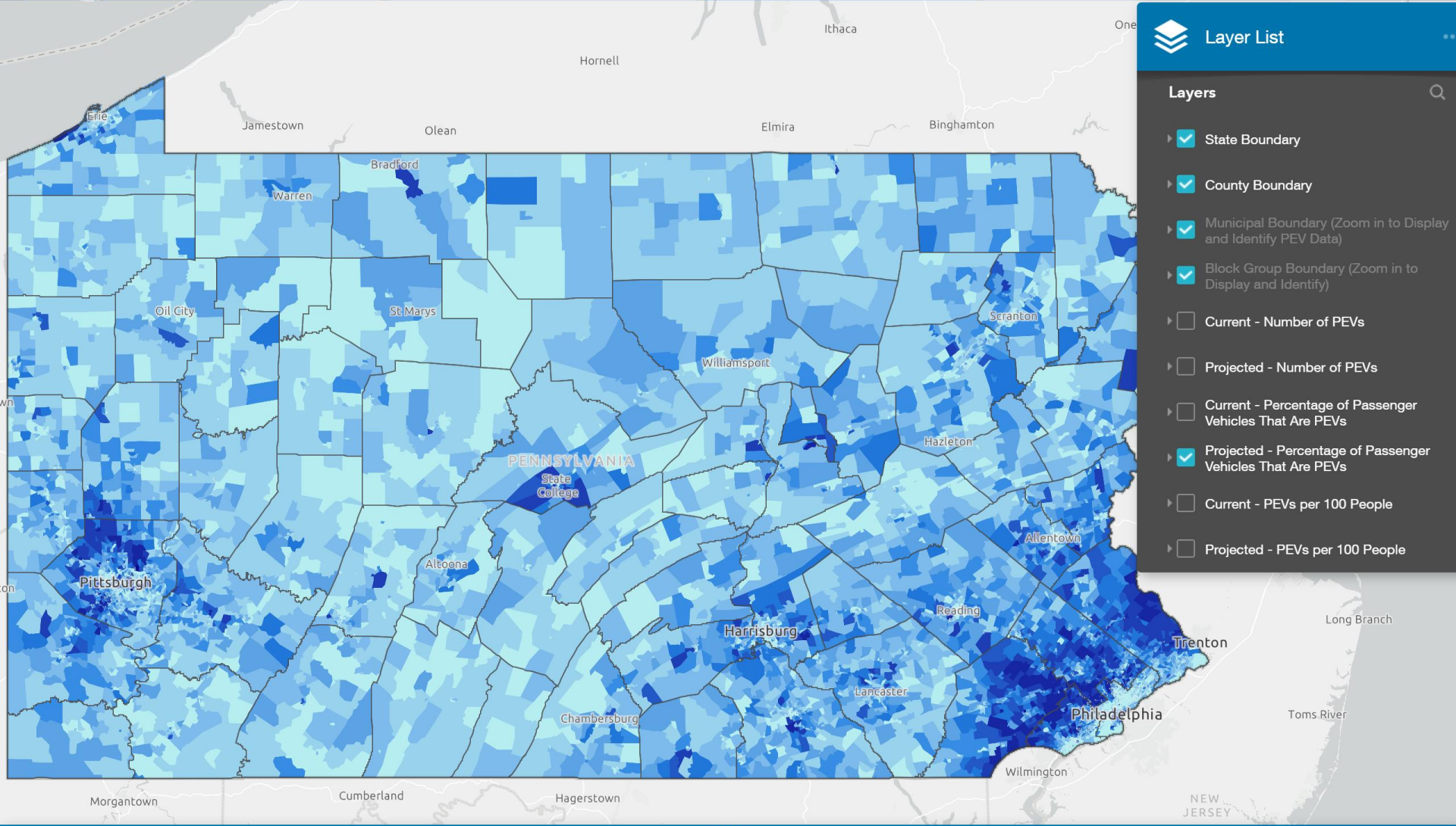- ☐ Projected - PEVs per 100 People
- ☐ Current - PEVs per 100 Housing Units
- ☐ Projected - PEVs per 100 Housing Units
- ☐ Current - PEVs per Sq. Mi.
- ☐ Projected - PEVs per Sq. Mi.

Planning for Electric Vehicles

About | DVRPC Region — PEV Distribution | DVRPC Region — Workplace Charging | Pennsylvania — PEV Distribution | Pennsylvania — Workplace Charging

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Plug-In Electric Vehicle (PEV) Distribution

Planning for Electric Vehicles

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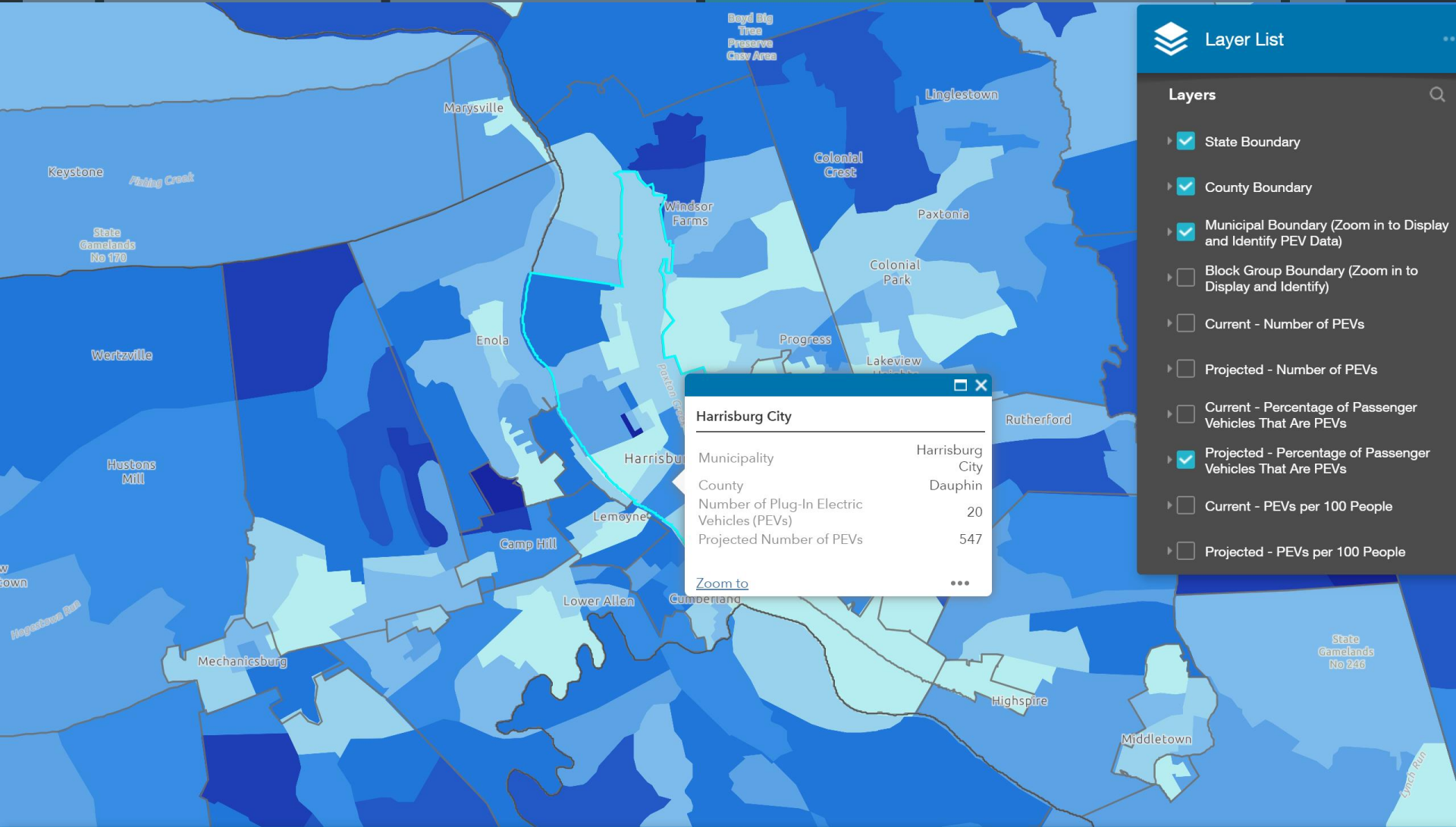- ☐ Current - Percentage of Passenger Vehicles That Are PEVs
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Harrisburg City

Municipality	Harrisburg City
County	Dauphin
Number of Plug-In Electric Vehicles (PEVs)	20
Projected Number of PEVs	547

Zoom to

Plug-In Electric Vehicle (PEV) Distribution

Planning for Electric Vehicles

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Map Legend

Percentage of Passenger Vehicles That Are PEVs
Scale applies to both 2017 and projected distribution at 5% PEV penetration.

0 — 100

Number of PEVs per 100 People
Scale applies to both 2017 and projected distribution at 5% PEV penetration.

0 — 32

(1 of 3)

Block Group: 420430219011

Municipality Containing This Block Group	Susquehanna Township
Municipality GEOID	4204375528
Square Miles	0.73
Population	1,433
Housing Units	673
Jobs	430
Number of Passenger Vehicles	1,300

Plug-In Electric Vehicle Distribution

Number of Plug-In Electric Vehicles (PEVs)	6
Projected Number of PEVs	220
Current (PA Only) - Percentage of Passenger Vehicles That Are PEVs	0.46%
Projected (PA Only) - Percentage of Passenger Vehicles That Are PEVs	14.53%

Zoom to

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Plug-In Electric Vehicle (PEV) Distribution

Planning for Electric Vehicles

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- About
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- DVRPC Region — Workplace Charging
- Pennsylvania — PEV Distribution
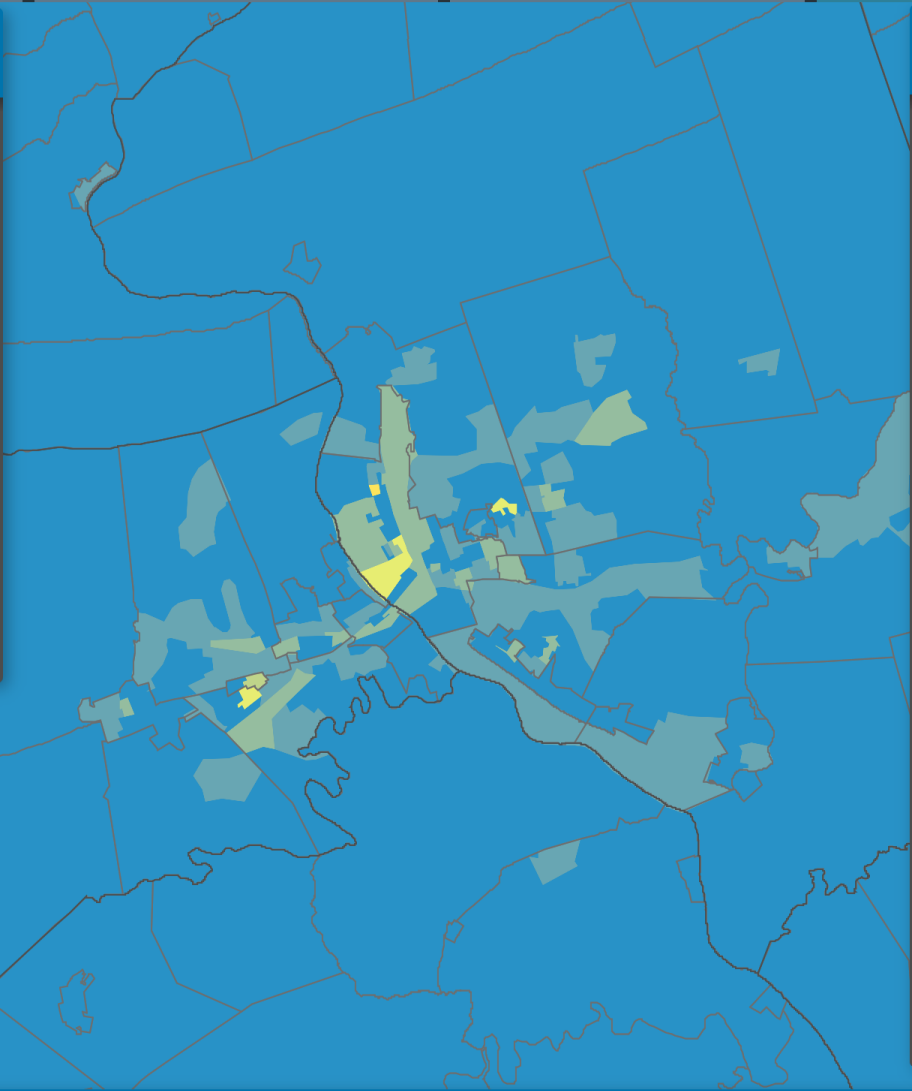- Pennsylvania — Workplace Charging

Map Legend

kWh of Workplace Charging Demand per Square Mile

Scales apply to all three charging scenarios: Free workplace charging, workplace charging costs the same as home charging, workplace charging costs twice as much as home charging.

0 — 334,713

Number of Workplace Charging Events per Job

Scales apply to all three charging scenarios: Free workplace charging, workplace charging costs the same as home charging, workplace charging costs twice as much as home charging.

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Workplace Charging Demand

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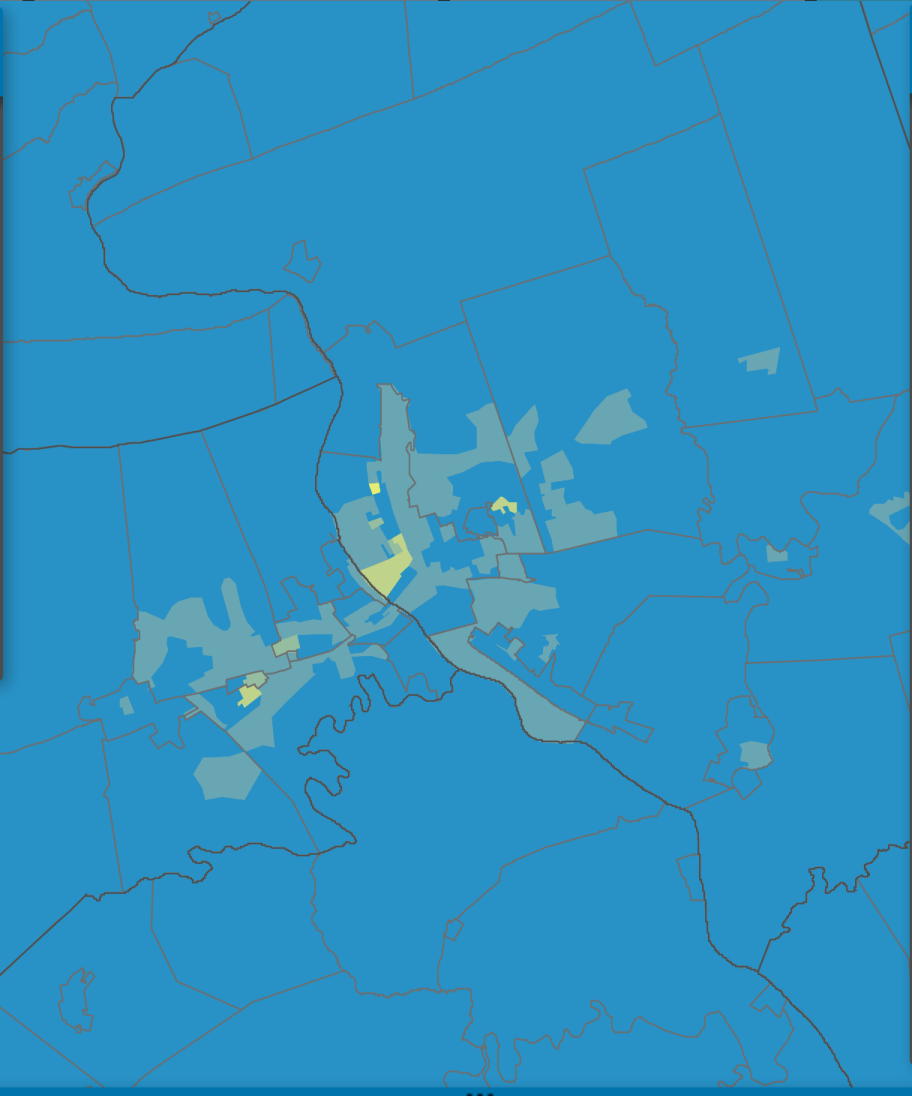
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Workplace Charging Demand

Planning for Electric Vehicles

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Workplace Charging Demand

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Opaque   Transparent

0%   50%   100%

- Zoom to
- Transparency
- Set visibility range
- Move up
- Move down
- Show item details

- ☐ Expensive Char... Sq. Mi.
- ☐ Free Charging -
- ☐ Cheap Charging Mi.
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Pennsylvania State Capitol

Strawberry Square

Harrisburg

Workplace Charging Demand

Fast Charging Analysis Tool

- **Evaluates demand for DC fast charging based on travel patterns and demand at existing and proposed sites**

- **Data inputs**
    - **Results of Market Tool**
    - **Long trip data**

- **Potential opportunity with INRIX data**
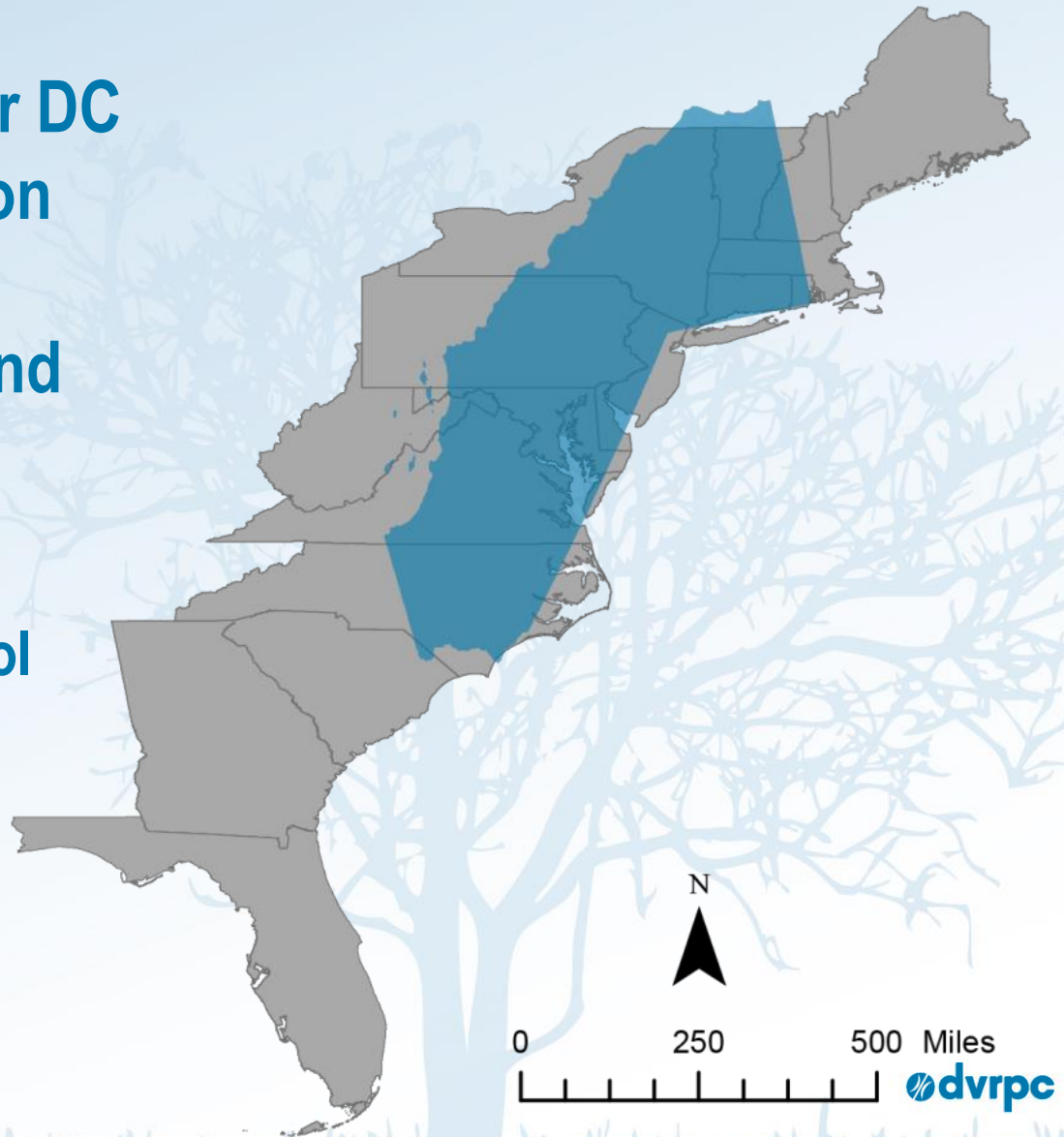
Next Steps

- **Update data to gauge progress**

- **Use to support partners and stakeholders**
  - **State governments**
  - **Regional planners**
  - **EDCs**
  - **Local governments**
  - **Businesses**
  - **Developers**
  - **EV charging companies**

- **Calibrate Fast Charging Tool for east coast**

- **Integrate into on-line EV resource kit**

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Thank you!

Questions/Comments/Discussion

Adam Beam

abeam@dvrpc.org

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