AMERICAN PLANNING ASSOCIATION: PA CHAPTER
2022 ANNUAL CONFERENCE

PLANNING FOR A FUTURE WITH ELECTRIC VEHICLES

NATASHA FACKLER - pennsylvania DEPARTMENT OF TRANSPORTATION

DAN SZEKERES - Michael Baker INTERNATIONAL

SESSION TOPICS

- About Electric Vehicles
- Funding and Incentives
- Importance of Equity
- Brainstorming Roles for Planners
- Share Your Experiences & Ideas

WHY TALK ELECTRIC VEHICLES (EVs) NOW?

EVs More **Affordable** & More People Buying

New **Funding** for Public Charging

Need for More Community **Planning** & **Education**

Identify Key **Opportunities** & **Challenges**

Ensure EVs & Funding Benefit All Populations (**Equity**)

WHAT IS YOUR EXPERIENCE WITH EVs?

- Do you own an EV?
- Have EVs been discussed in your planning work?
- Have you encountered concerns about initiatives supporting EVs?

ABOUT ELECTRIC VEHICLES

ELECTRIC VEHICLE BENEFITS

Climate Change

- No direct greenhouse gas (GHG) emissions (tailpipe)
- 3x lower life-cycle emissions (vehicle production, fuel consumption)
- Opportunity to incorporate more renewable energy sources

Air Quality, Noise, Public Health and Equity

- Significantly reduce air and noise pollution
- Improves health outcomes for communities near roadways

Economy

- Save consumers money on fuel and life-cycle maintenance costs
- Electricity rates paid to electric utilities and generation companies stays in the local economy

Jobs

- Production of EVs and installation of EV charging infrastructure creates good-paying jobs in clean energy industries.

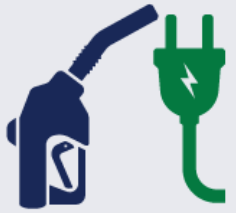
IS IT COST-EFFECTIVE TO OWN AN EV?

EVs, on average…

- Cost **$10k more to buy**
  - Gap closing as EVs become more affordable
  - Federal EV tax credit ($7,500) & other state/utility incentives
- Cost **60% less to fuel**, varying based on:
  - EV model efficiency (kWh/mi)
  - Home charging access & usage
  - Charging electricity costs (including when you charge and where you live)
- Cost **50% less to maintain**
  - No spark plugs, oil change, etc.

Source: Atlas Policy, 2022, https://atlaspolicy.com/wp-content/uploads/2022/01/Total-Cost-of-Ownership-Analysis.pdf

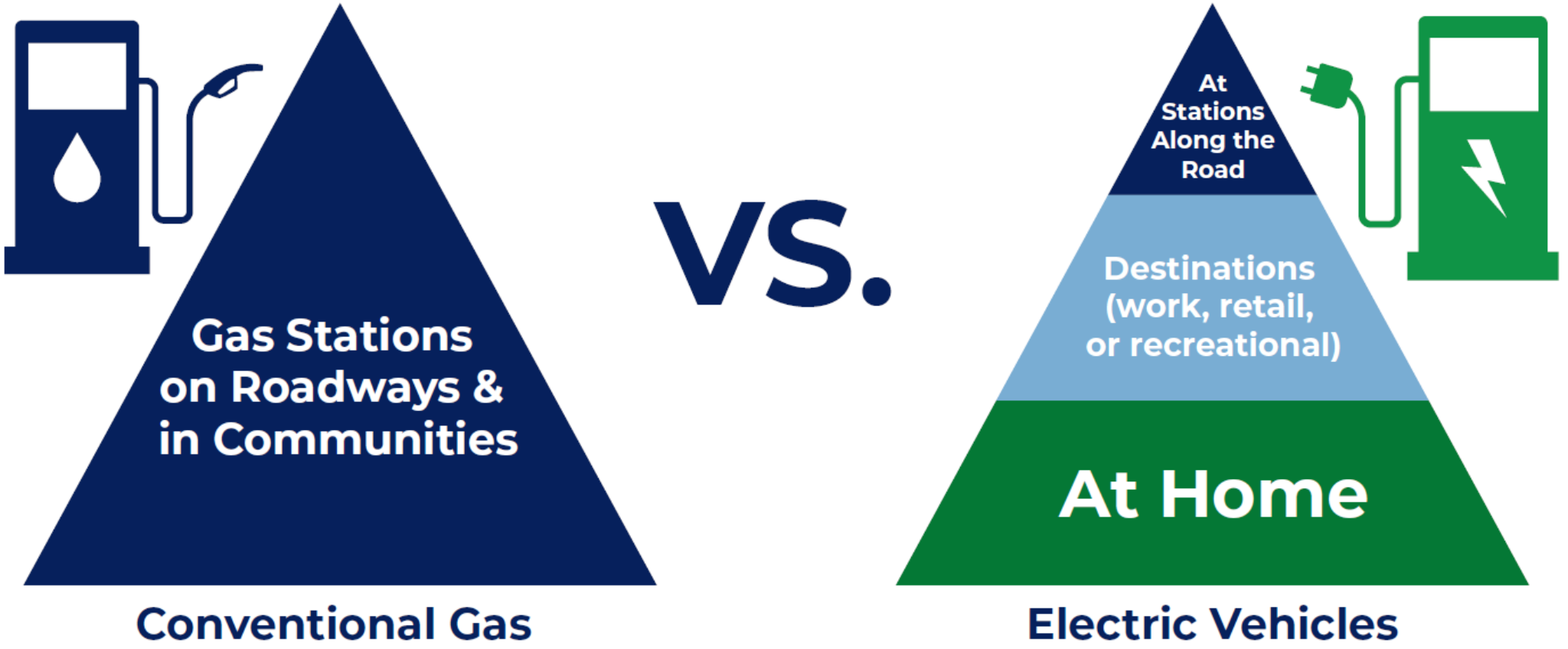
VEHICLE TYPES

	Conventional Gas	Hybrid Electric Vehicle (HEV)	Plug-in Electric Vehicle (PHEV)	Battery Electric Vehicle (BEV)
Power Source				
Fuel Type				
Emissions				

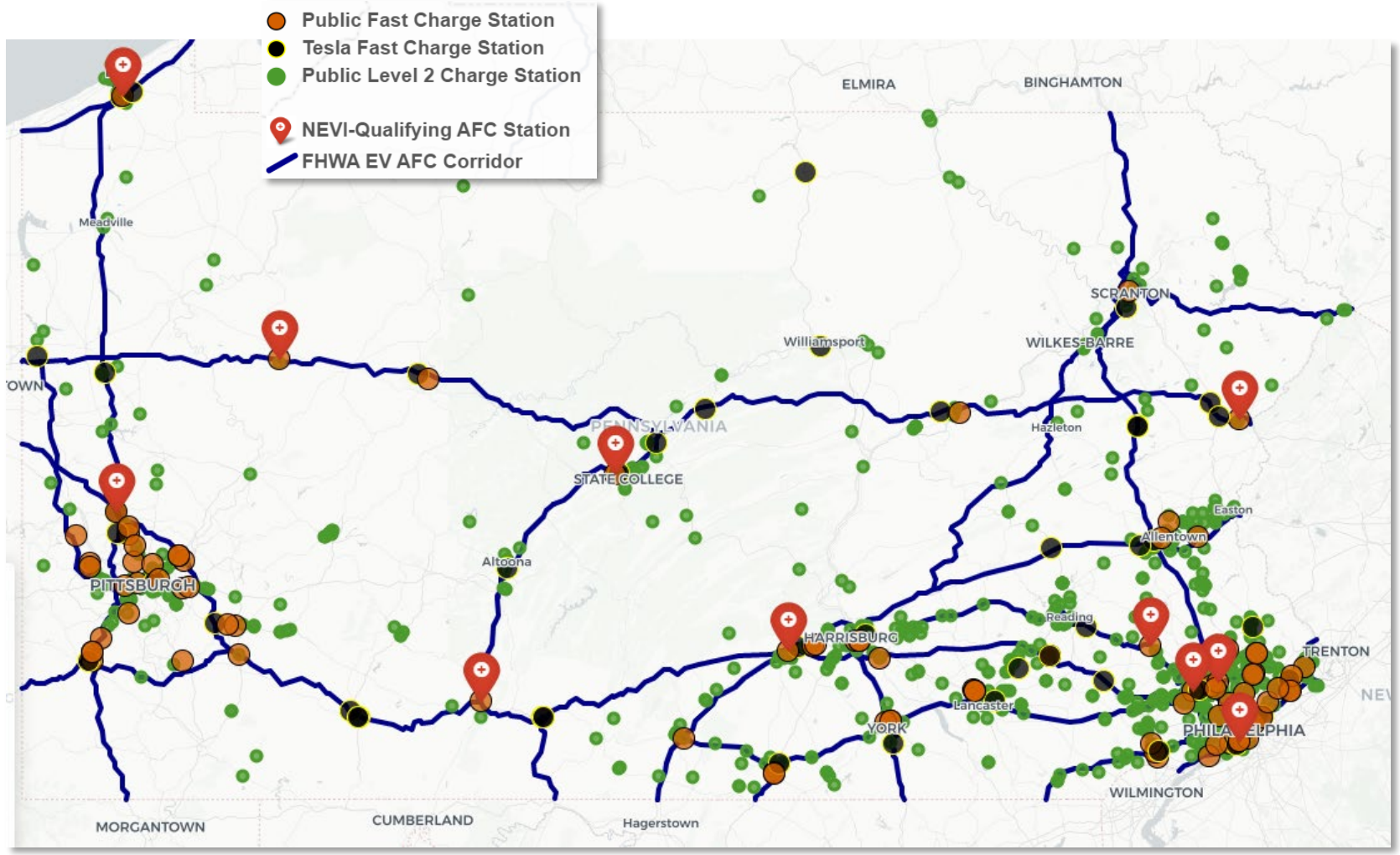
How to Charge Your EV

	Charge Time	Charging Locations	EV Plug Type	Power Source
Level 1	**3.5 - 6.5 miles** Per Hour	Residential, Workplace	J1772 Tesla	Standard Wall Outlet
Level 2	**14 - 35 Miles** Per Hour	Residential, Workplace, Destinations	J1772 Tesla	Heavy Duty Outlet (Dryer/Cooking Appliances)
DC Fast Charge	**200+ miles** Per Hour	Highways, Communities, Destinations	CCS CHAdeMO Tesla	Charging Station

HOW FUELING CARS IS CHANGING WITH ELECTRICITY



PUBLIC CHARGING STATIONS IN PA



- Websites
- Apps
- Trip Planners
- Resources:
  - 511PA
  - penndot.pa.gov/ev
  - Alternative Fuel Data Center (AFDC)
  - PlugShare
  - ChargeHub
  - In-car support

Over 2,800 public plugs at over 1,100 locations

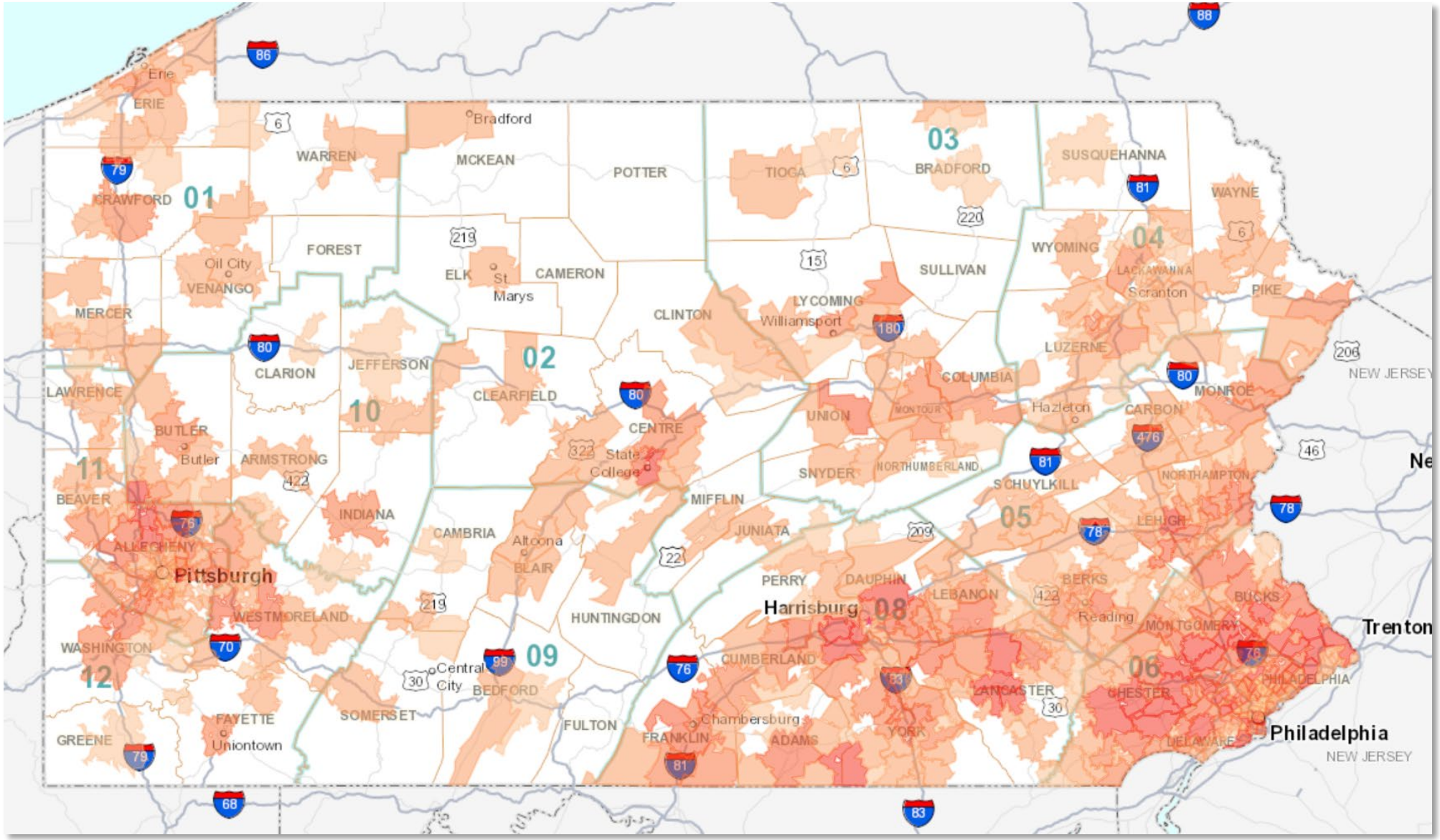
TOTAL EV REGISTRATIONS IN PA

	March 2019	March 2020	March 2021*	March 2022*	July 2022*
Electric	9,784	11,343	16,924	23,689	31,022
Hybrid	29,680	36,252	46,401	56,334	71,992
Other	5,432	6,510	4,159	2,573	5,549
Total	44,896	54,105	67,484	82,596	108,563

Source: PennDOT registration database

*Reporting class 1 vehicles numbers only

EV REGISTRATIONS IN PA BY ZIPCODE (JULY 2022)



PA EV Stations (tmp-map.s3.amazonaws.com)

WHAT KEY EV BASICS ARE WE MISSING?

- What else should planners be informing the public on regarding EVs?

FUNDING & INCENTIVES

WHY FUNDING & INCENTIVES FOR EV CHARGING?

Invest in strategies to **address climate change** and air quality

To spur future EV sales by ensuring that buyers feel **confident in travelling longer distances**

Create **good-paying job opportunities** across EV manufacturing, installation and operation

Help address EV charging **gaps and needs in disadvantaged and rural communities**

Catalyze private sector investments that support the build-out of a national EV charging network

RANGE OF GRANTS & INCENTIVES AVAILABLE

- Federal Tax Grants
- DEP Grants
- DOT Grants
- Utility Programs

DOT Funding and Financing Programs with EV Eligibilities*

	FY 2022[1] AMOUNT						
FORMULA PROGRAMS							
National Highway Performance Program (NHPP)	$28.4 B[2]	✓	✓				✓
Surface Transportation Block Grant Program (STBG)	$12.5 B[2,3]	✓	✓		✓	✓	✓
Congestion Mitigation & Air Quality Improvement Program (CMAQ)	$2.5 B[2]	✓	✓	✓		✓	✓
National Highway Freight Program (NHFP)	$1.4 B[2]			✓	✓	✓	
State Planning and Research (SPR)	$983.3 M[4]				✓		
Metropolitan Planning (PL)	$438.1 M[2]				✓		
Carbon Reduction Program	$1.2 B[2,5]	✓	✓	✓	✓	✓	✓
National Electric Vehicle (NEVI) Formula Program	$685 M[2,5,6]	✓	✓		✓	✓	✓
DISCRETIONARY PROGRAMS							
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) (formerly known as BUILD)	$1.5 B	✓			✓	✓	✓
Infrastructure for Rebuilding America (INFRA) Grant Program	$1.64 B[2,7]	✓			✓	✓	
Advanced Transportation and Technologies and Innovative Mobility Deployment	$60 M[2]	✓					✓
Discretionary Grant Program for Charging and Fueling Infrastructure	$300 M[2,5]	✓	✓		✓	✓	✓
Rural Surface Transportation Grant	$300 M[2,5]	✓	✓		✓	✓	✓

Construction and installation of EV charging infrastructure including parking facilities and utilities.	Workforce development and training related to EV infrastructure.	EV acquisitions and engine conversions - cars or trucks.	Planning for EV charging infrastructure and related projects.	Construction and installation of EV charging infrastructure to support operational, resiliency, national energy security, environmental, and community goals for freight transportation.	Installation of EV charging infrastructure as part of transit capital projects eligible under chapter 53 of title 49, United States Code.

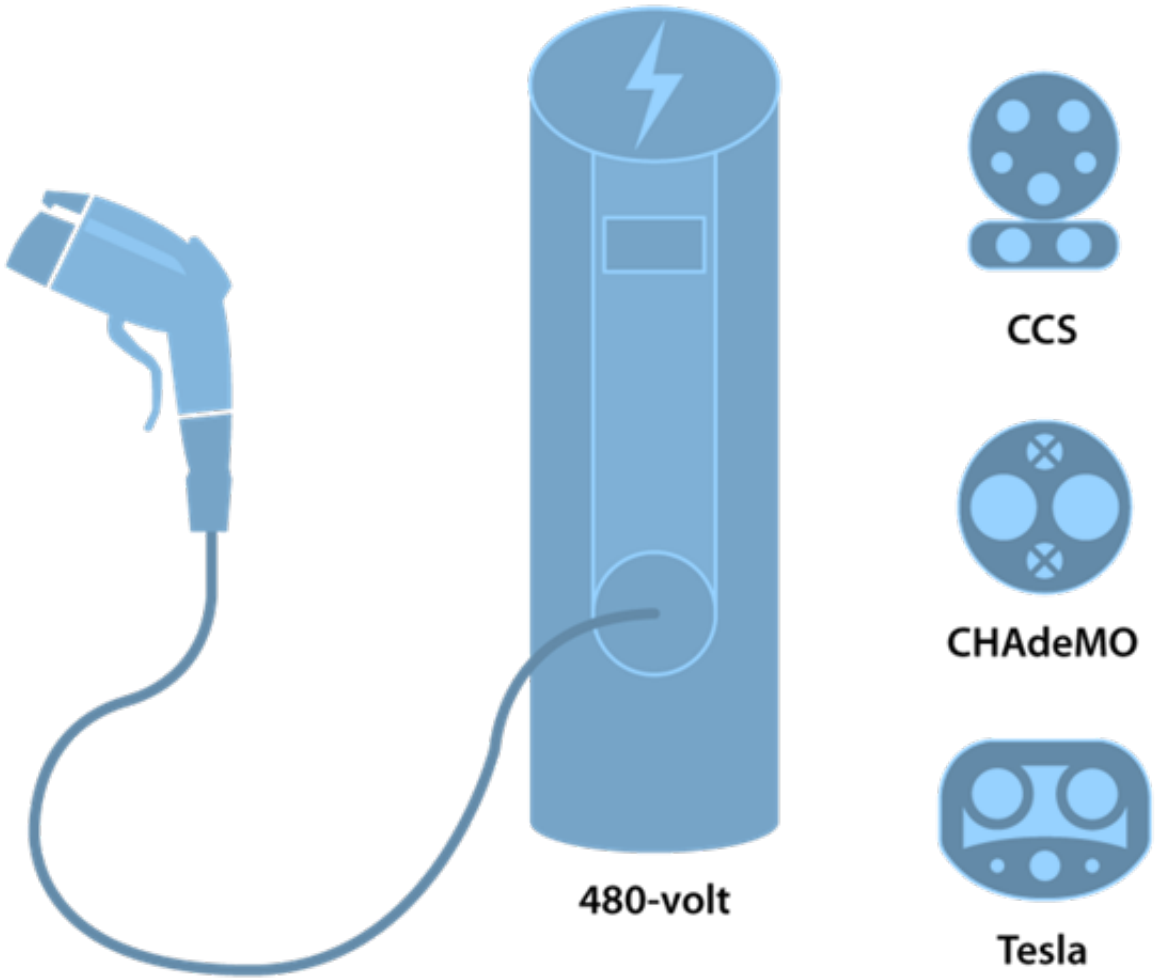
HIGHLIGHTS OF FEDERAL NEVI PROGRAM

National Electric Vehicle Infrastructure (NEVI) Program
Both Formula and Discretionary Programs

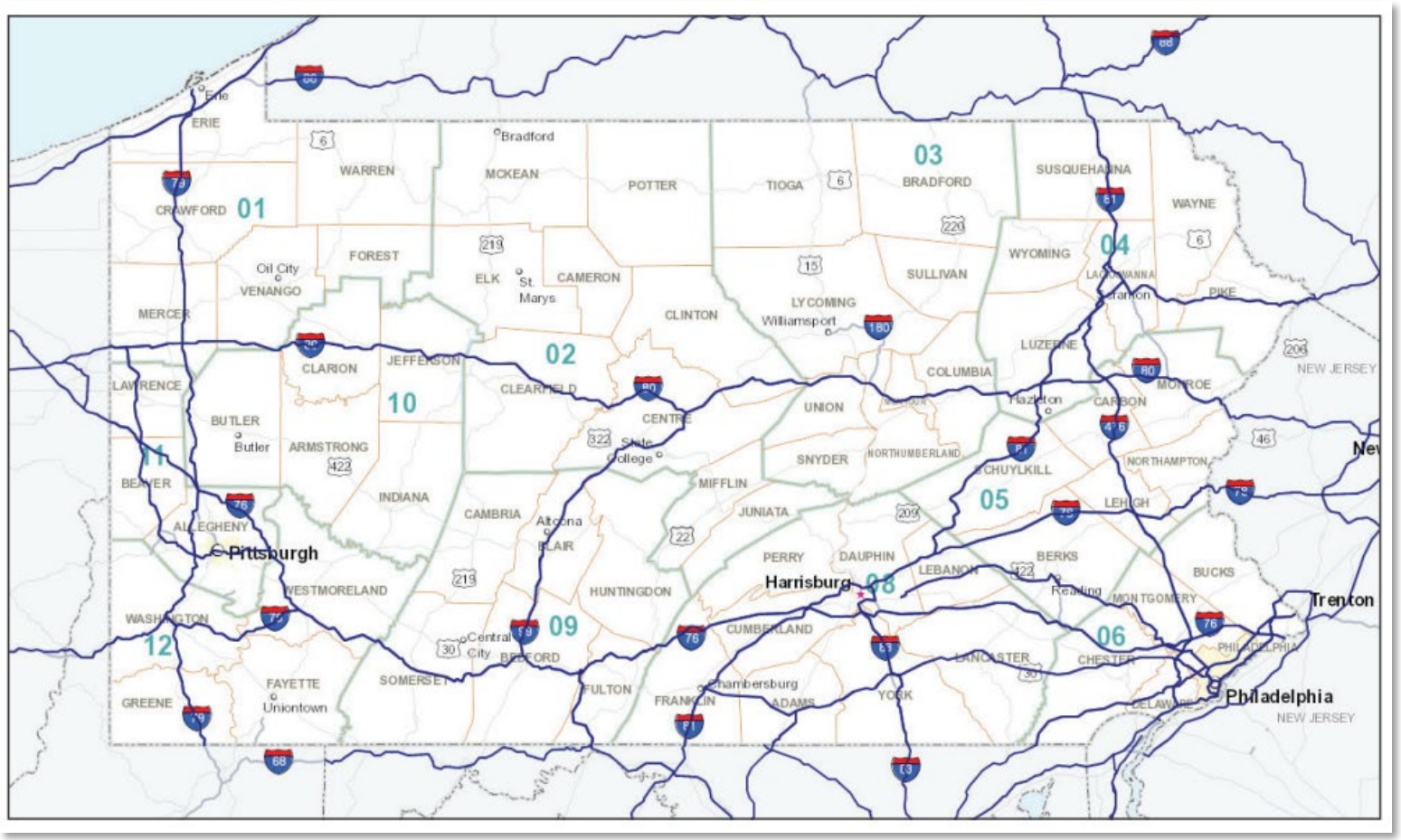
- Funded though the 2021 Bipartisan Infrastructure Law (BIL)
- Provides PA $171.5 million over next 5 years for EV infrastructure
- Program administered by PennDOT
- All states must submit a NEVI State Plan before funds can be used
- The plan is an evolving document updated annually
- Current plan supports allocation of federal funds for federal fiscal years (FFYs) 2022 and 2023

NEVI-QUALIFYING CHARGERS

- DC Fast Charging
- Public (Tesla doesn't count now)
- 4 ports
- CCS Connectors
- At least 150kw power per port (600kw total)
- Within 1-mile of highway, 50 miles of the next station

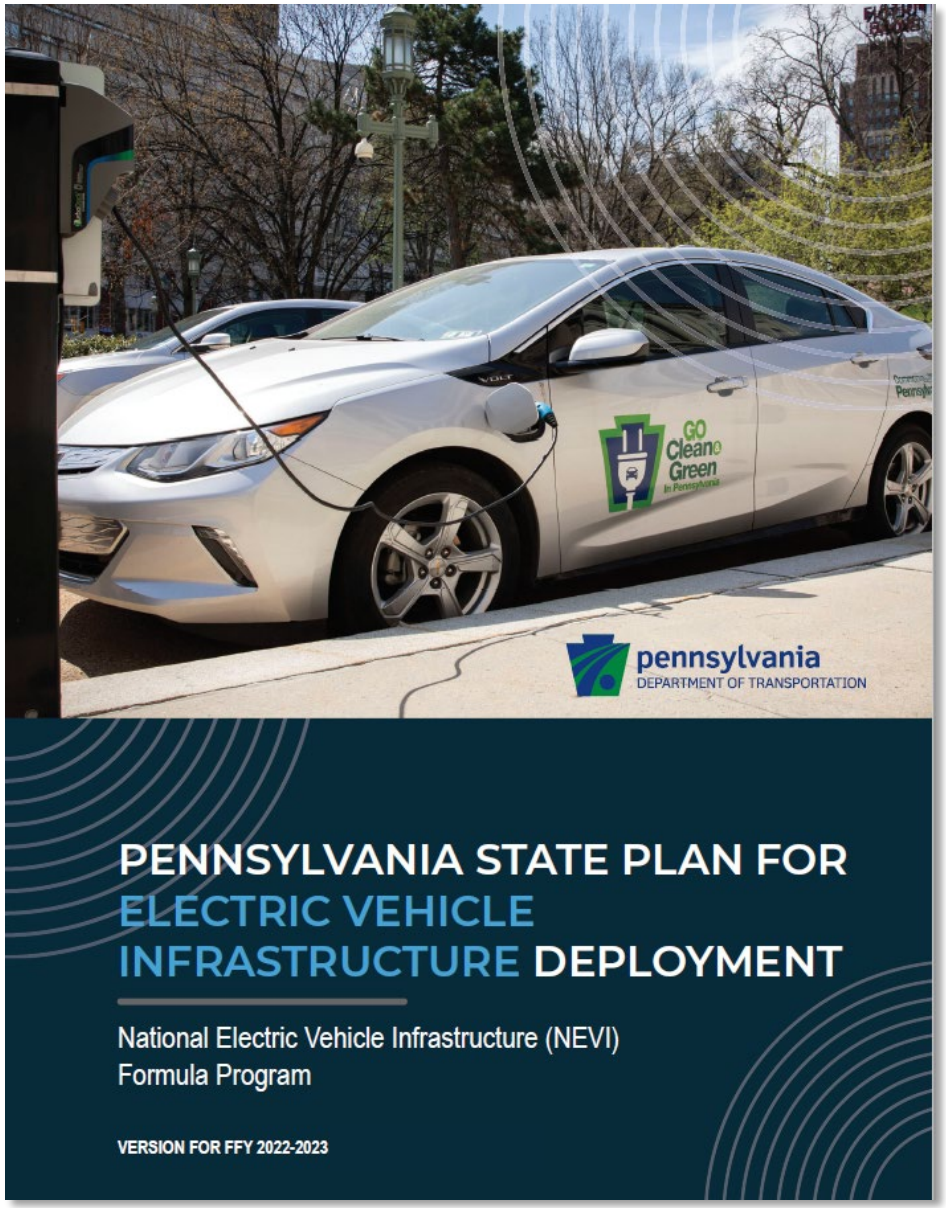


EV ALTERNATIVE FUEL CORRIDORS (AFC)



- PennDOT has nominated corridors over 6 rounds - includes interstates and portions of US 30, US 15, Route 1, and Route 422 - over 1,800 miles of roadway
- NEVI funding must be applied to AFCs until a "Build-Out" certification by FHWA

PENNDOT NEVI STATE PLAN

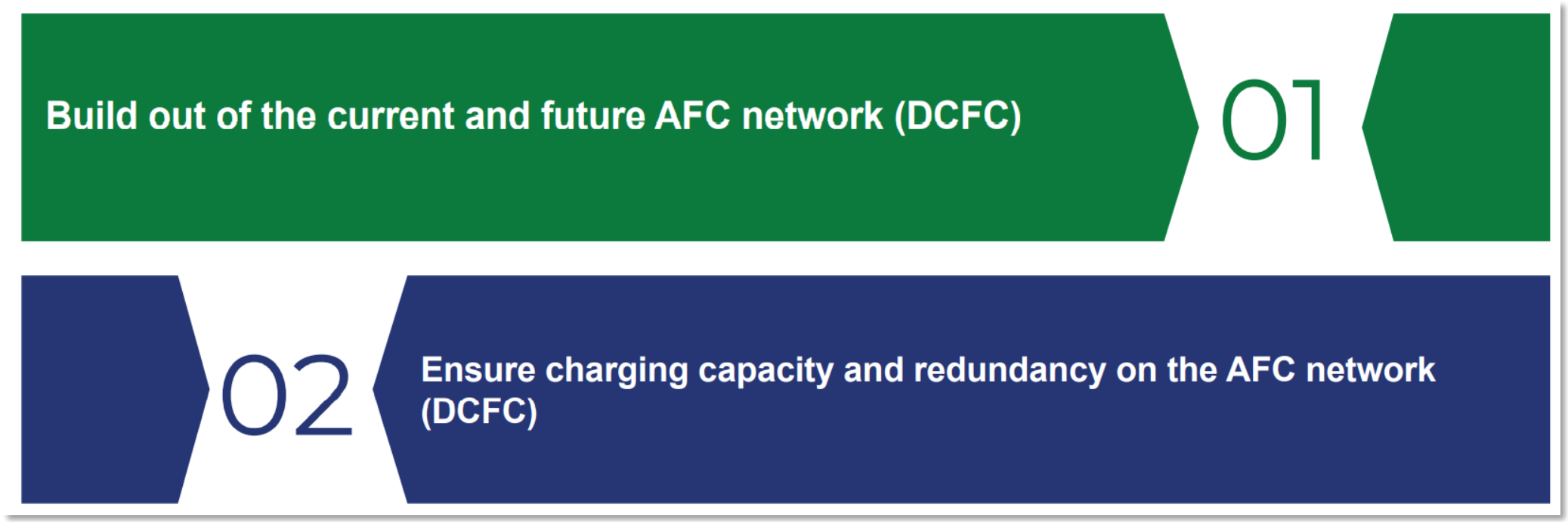


Approved by USDOT / On PennDOT's Website
Search for "*PennDOT NEVI State Plan*"

What's in the Plan?

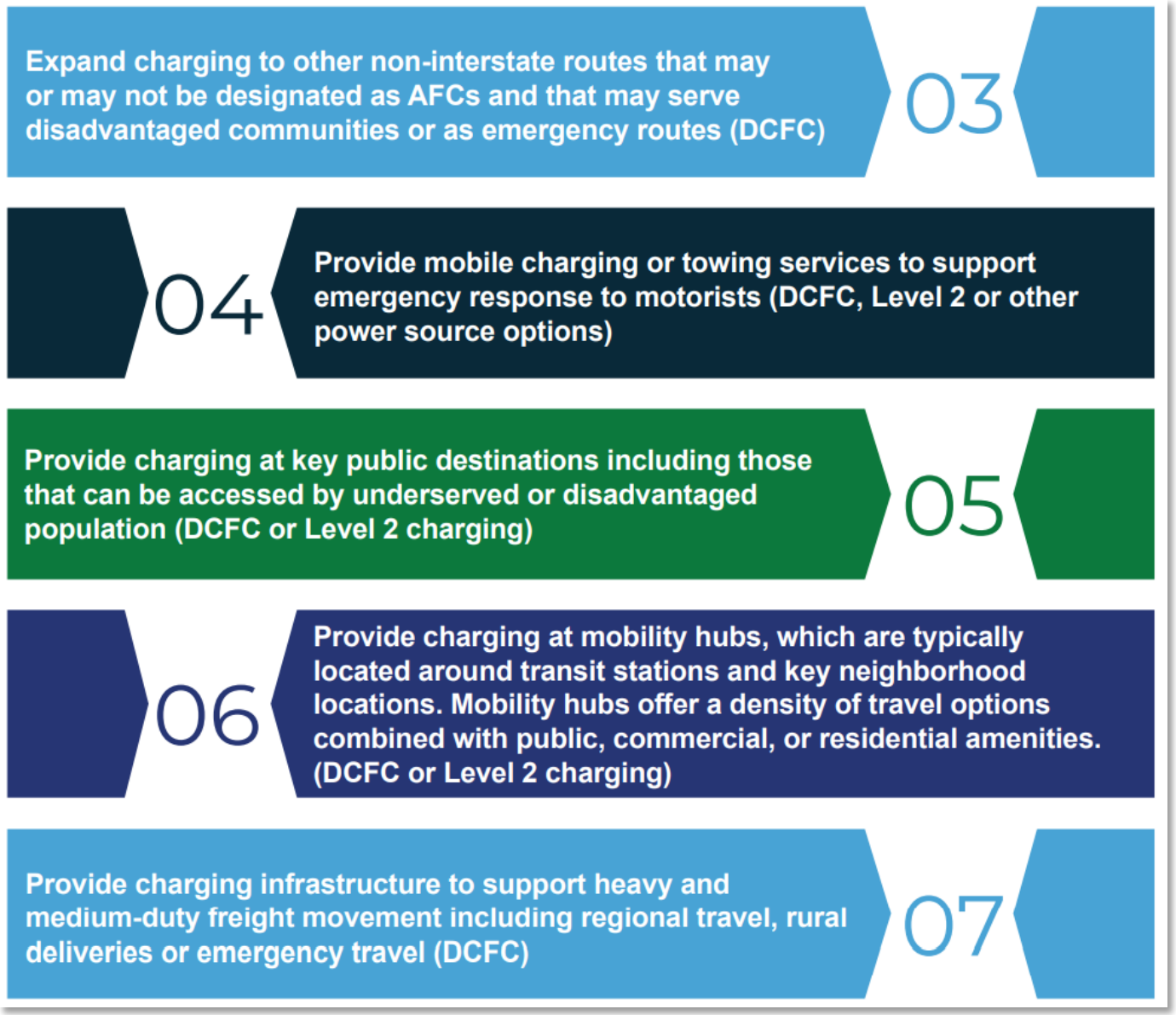
- Vision and goals for the NEVI program
- Focus areas for NEVI program spending
- Needs, gaps and opportunities
- Key challenges and risks
- Contracting framework (more to come)
- Labor and workforce needs and actions
- Engagement and equity priorities

PRIORITIES FOR NEVI FORMULA FUNDS



- Focus for initial years of NEVI Formula Program
- Focus on fast-chargers (DCFC) that meet program requirements
- Goal is to meet federal “build-out” criteria for Alternative Fuel Corridors (AFC)

OTHER PRIORITIES FOR NEVI FORMULA FUNDS



- Most will require formal federal designation of AFC "build-out" before funds can be applied
- More flexibility for application to Level 2 charging
- Final federal guidance needed to determine minimum standards for projects
- Will provide more opportunities to address equity needs

LABOR & WORKFORCE TO SUPPORT NEVI

- Funding available to grow & diversify local workforce for installation, operation, and maintenance of EV charging infrastructure.

PennDOT's NEVI Program to Include:

- Requirements for Qualified Technicians
- Engagement with Education Institutions
- Educational Workshops
- Support for Training Programs
- Equity Considerations
- First Responder Safety Training for EVs

FUTURE NEVI DISCRETIONARY GRANT PROGRAM

Discretionary Grant Program - **$2.5 billion for all alternative fuels** (EV, compressed natural gas, hydrogen, etc.).

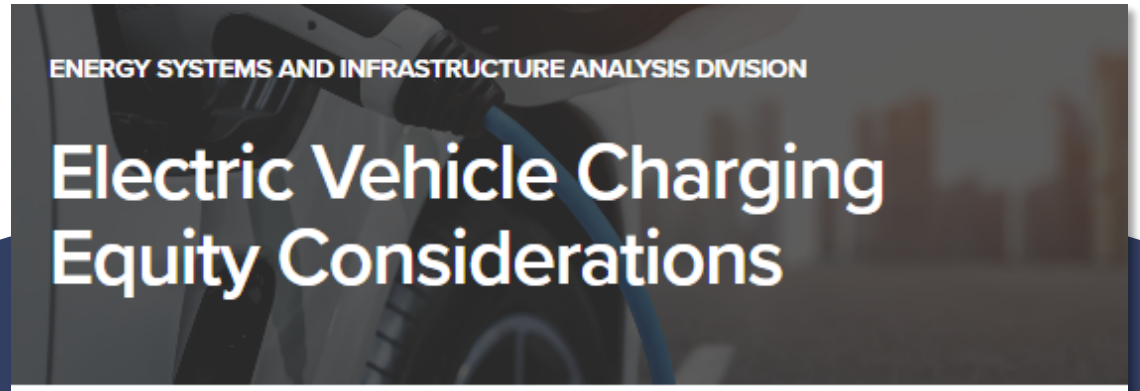
These funds **focus on AFC development and community alternative fueling projects**.

- **$1.25 billion** is for designated AFCs while the other half is for community funding. Eligible entities include States, Local governments, Planning Agencies (MPOs/RPOs), Transit and Port Authorities, and Tribal governments.
- **$1.25 billion** is designated for **Community fueling projects** must be on any public road or in other publicly accessible locations.

Priority will be given to projects in rural areas, low-to-moderate income neighborhoods, and communities with a low ratio of private parking spaces to households or a high ratio of multiunit dwellings to single family homes.

EQUITY

EMPHASIZING EQUITY IN EV PLANNING



Ensuring investments in electric vehicle charging benefit disadvantaged communities

Electric Vehicle Charging and the Justice40 Initiative

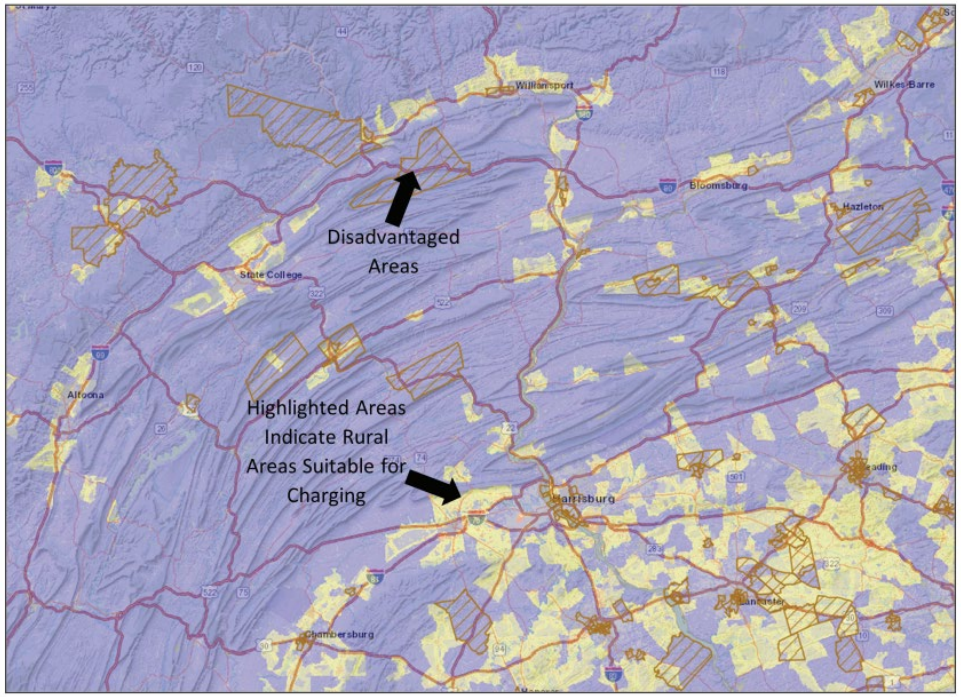
Many of the burdens from the transportation and energy systems have been historically and disproportionately borne by disadvantaged communities. Unequal distribution of benefits from the transportation and energy systems has prevented disadvantaged communities and minority-owned and women-owned businesses from realizing equitable benefits from these systems, while other historic barriers to transportation have made facilities inaccessible to individuals with disabilities. For these reasons, it is important to emphasize equity considerations when planning investments in electric vehicle charging stations and avoid exacerbating existing disparities in the transportation system.

NEVI PROGRAM STEPS TO ADDRESS EQUITY

1. DEVELOP AND MAINTAIN EV EQUITY PRINCIPLES TO INFORM AND GUIDE NEVI PROGRAM DECISIONS
2. COORDINATE WITH EQUITY AND ADVOCACY GROUPS FOR DEVELOPMENT OF THE NEVI STATE PLAN
3. IDENTIFY LOCAL DACS WITHIN PENNSYLVANIA AND INTEGRATE INFORMATION INTO PROGRAM PROCESSES
4. IDENTIFY AND TARGET INTERSTATE AND NON-INTERSTATE CORRIDORS OR DESTINATIONS THAT SERVE DACS
5. PROVIDE OPPORTUNITIES FOR FUNDING TO SMALL OR DISADVANTAGED BUSINESSES

DAC = Disadvantaged Communities

Figure 10: Example Application of EZMT Tool in Pennsylvania (Rural Suitability for Charging)



NEVI PROGRAM STEPS TO ADDRESS EQUITY

6 INTEGRATE EQUITY CRITERIA INTO THE PROJECT PRIORITIZATION AND SELECTION PROCESS

7 EXPAND ENGAGEMENT TO EQUITY GROUPS TO BETTER UNDERSTAND NEEDS AND OPPORTUNITIES AND BENEFITS RECEIVED FROM THE NEVI PROGRAM

8 DEVELOP A MONITORING DASHBOARD TO TRACK AND REPORT HOW NEVI INVESTMENTS ADDRESS DACS

9 SUPPORT WORKFORCE DEVELOPMENT FOR LOW-INCOME AND MINORITY WORKERS

10 ADDRESS TITLE VI, ADA AND SECTION 504 CONSIDERATIONS

Targeted Outreach to DACs to Evaluate Needs and Benefits of NEVI Program To Those Communities

BRAINSTORMING WAYS FOR LOCAL, REGIONAL AND STATE PLANNERS TO SUPPORT EVS

WAYS THAT PLANNERS CAN HELP

- Educate the Public and Businesses
- Identify Needs and Gaps
- Engage Disadvantaged Communities
- Share Funding Opportunities
- Support Grant Applications
- Coordination (utilities)
- Address Risks and Challenges

WAYS TO EDUCATE PUBLIC AND BUSINESSES

- Engage local governments
- Community outreach to educate public
- Community work sessions to evaluate needs and opportunities
- EV demonstrations
- Distribution of funding brochures to businesses
- Connecting interested businesses to Clean Cities and Network Companies
- Supporting EV infrastructure in new construction

pennsylvania
DEPARTMENT OF TRANSPORTATION

ELECTRIC VEHICLE FAST-CHARGING
FAQS & Funding Opportunities
What Businesses Need to Know

What is DC Fast Charging
Direct current (DC) fast chargers are game-changers for electric vehicles (EVs). While many EV owners rely on home-charging overnight, DC fast chargers can charge an EV in only 20 to 30 minutes. In PA, over 100 locations – most of them businesses – currently have at least one DC fast charger installed in their parking lots.

Is Pennsylvania Investing?
One challenge to more rapid adoption of EVs is the lack of public DC fast chargers. By providing funding for fast charge projects in strategic locations – such as along highways and in underserved metro areas – Pennsylvania aims to increase drivers' confidence in the availability of public EV chargers, slow down climate change, and improve public health.

Which Businesses Are the Best Locations?
The best types of businesses for hosting DC fast chargers are restaurants, gas/convenience stores, truck stops, grocery stores, shopping centers, or any interested business with available parking spaces where an EV driver could shop and use amenities during the 20-30 minutes needed for charge time. Businesses that are 24/7 and offer food and restrooms are ideal. The best locations for businesses interested in hosting fast chargers are near interstate exits along major travel corridors for commuter and recreational travel needs.

What Are the Benefits to Businesses?
- Attract customers looking to stop at a location that offers fast charging
- Increase customer spending at site amenities
- Minimize costs by choosing from a range of business models offered by EV charging hardware & network companies
- Gain customer recognition as a leader in reducing carbon emissions

YOUR BUSINESS MAY BE ELIGIBLE FOR GRANTS
National Electric Vehicle Infrastructure (NEVI) Formula Program

The NEVI Formula Program provides dedicated funding to Pennsylvania and other states to strategically deploy EV charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability. Program funding and eligibility details include:

- EV charging infrastructure is installed within 1 travel mile of the AFC
- EV charging infrastructure includes at least four 150kW Direct Current Fast Chargers (DCFCs) with Combined Charging System (CCS) ports capable of simultaneously DC charging four EVs
- EV charging infrastructure has minimum station power capability at or above 600kW and supports at least 150kW per port simultaneously across four ports for charging

Application Request Anticipated: Late 2022 – Early 2023
PennDOT NEVI Program

Is Your Business Located Near an Alternative Fuel Corridor?
The Pennsylvania Department of Transportation (PennDOT) is looking to facilitate the build-out of EV DC fast charging infrastructure across the Commonwealth, including on designated Alternative Fuel Corridors (AFCs), which include Pennsylvania's interstates and other select highways. If you are interested in a project consultation on fast-charging options and applying for competitive grant funding for a property located within 1-mile of any AFC corridor, please contact: RA-PDEVCorridors@pa.gov

Pennsylvania is Committed to Supporting Growth in EV Vehicles. See the Pennsylvania NEVI State Plan

8.2022

WHY DO A NEEDS ASSESSMENT?

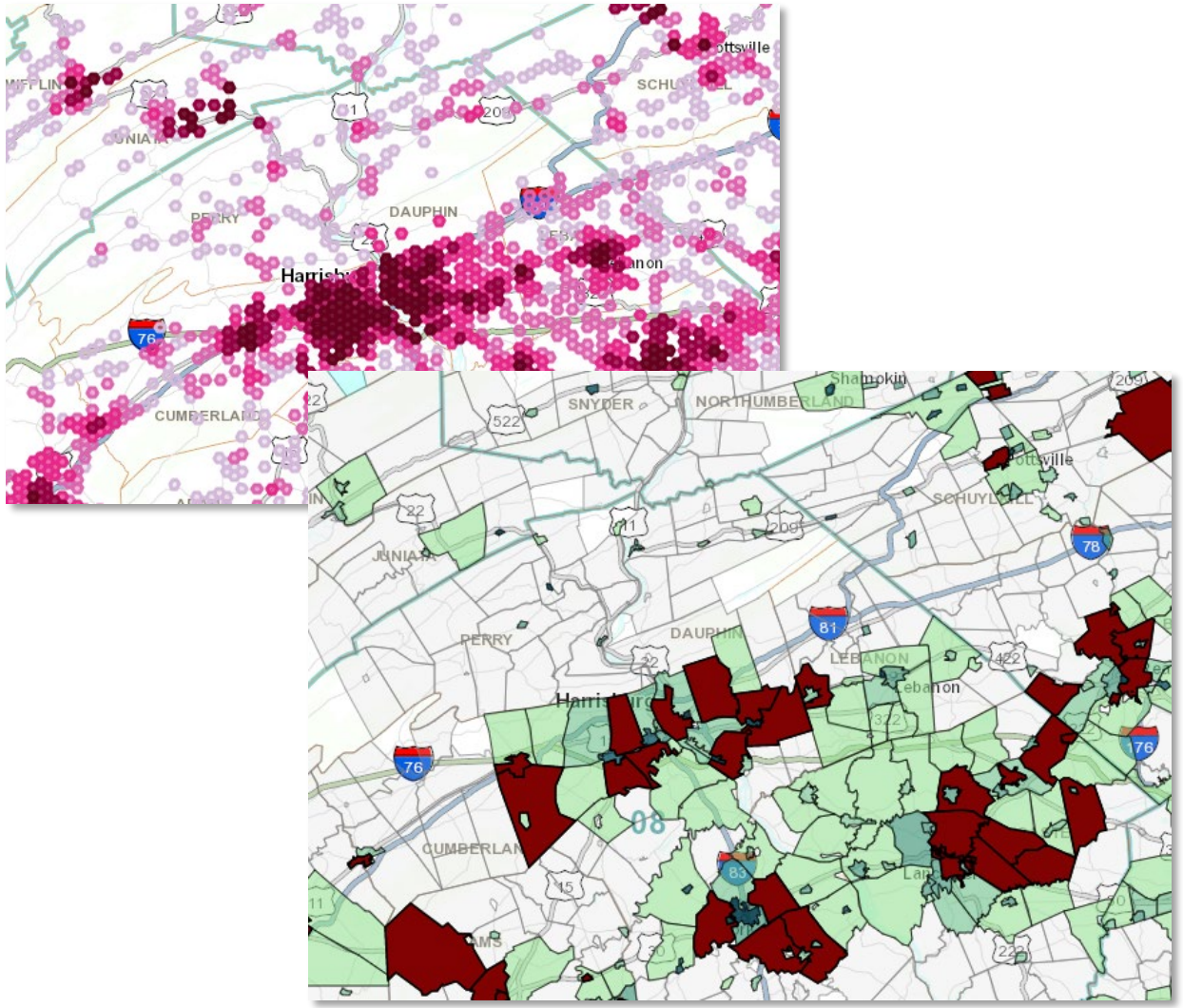
Prepare for Grant Applications	Identify Businesses for Hosting Public Charging Infrastructure	Provide Local Governments Ideas for Projects, Policies and Other Actions
• Grants are competitive – showing community support and a robust engagement and needs assessment will be valuable in winning grants	• Find business partners to work with and help them obtain grants and coordinate with charging companies • Private businesses will be needed to accomplish many charging needs and goals	• Evaluate ways to overcome challenges and barriers within the community • Local governments can work with regional and state partners to get projects funded

KEY STEPS IN A NEEDS ASSESSMENT

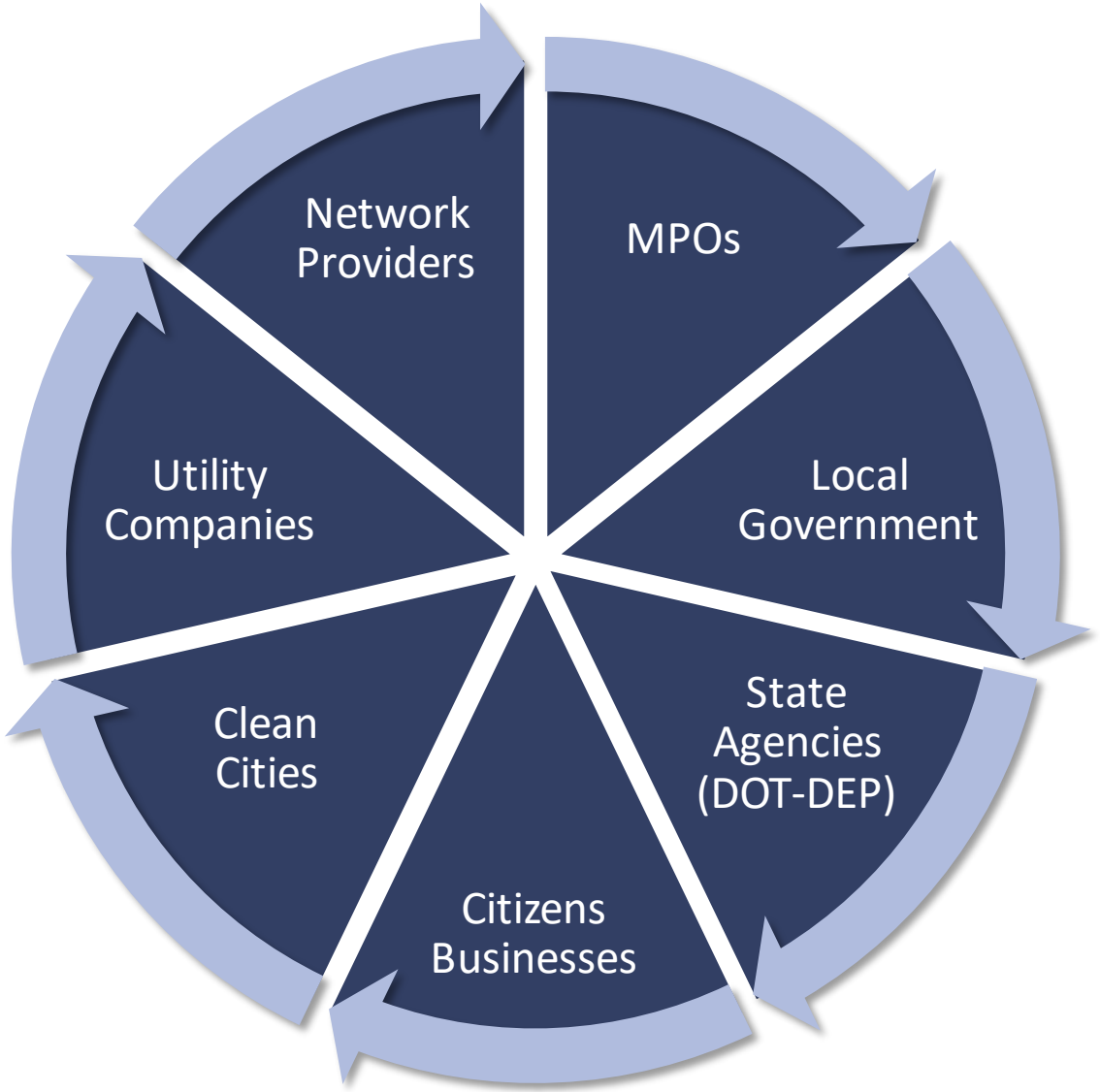
1. Evaluate existing locations of charging infrastructure (Level 2 vs DCFC)
2. Identify gaps and needs based on community input
3. Evaluate barriers to new infrastructure
4. Coordination with utilities and regional/state agencies to maximize funding opportunities
5. Engage your businesses on needs and help in grant applications
6. Educate your community and workforce (addressing disadvantaged communities)

ANALYTICAL EXAMPLES FOR NEEDS EVALUATIONS

- Suitability modeling to find best locations for community charging (e.g. Level 2)
- GIS evaluation
- Suitability based on:
  - Building footprint density
  - Distance to electric substations
  - Employment (by type)
  - Traffic volumes in vicinity
  - Equity areas
  - Key destinations
- Evaluate target areas for outreach
- Inform community needs and gap assessments



IMPORTANCE OF COORDINATION



Example:

DOT > Projects & Programs > Planning > Electric Vehicles and Alternative Fuels > EV Model Ordinance Toolkit

EV Model Ordinance Toolkit

Electric Vehicle Supply Equipment Development Guidebook for Pennsylvania Local Governments (PDF)

Note: This resource was developed by Temple University students.

- Equity and EVSE Development (PDF)
- Electric Vehicle Infrastructure Funding Opportunities (PDF)
- EV Charging Station Siting Guide (PDF)
- Future Proofing EVSE (PDF)
- Municipality Guide to Working with EV Charging Networks (PDF)
- Stakeholder Engagement Guide (PDF)

KEY RISKS AND CHALLENGES

- PROFITABILITY/SUSTAINABILITY OF INFRASTRUCTURE IN RURAL COMMUNITIES
- DISADVANTAGED AND UNDERSERVED POPULATIONS
- CAPACITY AND VEHICLE SIZE ACCOMMODATIONS
- UTILITY INFRASTRUCTURE
- COST TO CHARGE
- WORKFORCE

PennDOT recommending applicants address these or other identified challenges in their response to application requests for NEVI funding

- CHANGING CLIMATE
- EMERGENCY MANAGEMENT AND RESPONSE
- ACCESSIBILITY
- PUBLIC EDUCATION AND FAMILIARITY WITH EVS AND CHARGING
- OTHER NATIONAL ISSUES
- LAND USE

QUESTIONS?

OR

SHARE YOUR EXPERIENCES & IDEAS RELATED TO EVS

QUESTIONS FOR DISCUSSION

What other ways can planners support EV technology?

What are some of the challenges you have encountered?

What are your ideas to better integrate equity considerations?

How can we coordinate efforts between state, regional and local planners?

When and how should we involve our utility providers?

What other stakeholders need to be involved?

Do we need access to better tools, data and resources to support needs assessments?

Do we need a public engagement toolkit?

What locations are best for public charging and grant applications?

CONTACT INFORMATION

PENNDOT EV TEAM CONTACT: **RA-PDEVCORRIDORS@PA.GOV**

NATASHA FACKLER, PA DEPARTMENT OF TRANSPORTATION
Email: nfackler@pa.gov

DAN SZEKERES, MICHAEL BAKER INTERNATIONAL
Email: dszekeres@mbakerintl.com