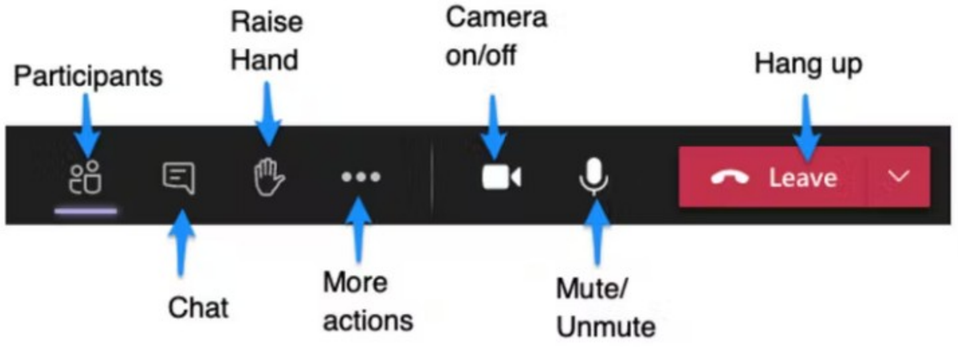
Planning for EVs in Kentucky

Kentucky's Electric Vehicle Infrastructure Deployment Plan

Welcome to the Meeting!

- We will have a short presentation followed by an opportunity to address questions
- We are using live polling tools to get your feedback
- Use the meeting chat for:
  - Asking questions
  - Adding comments
- This meeting is being recorded



Mentimeter Instructions

Instructions

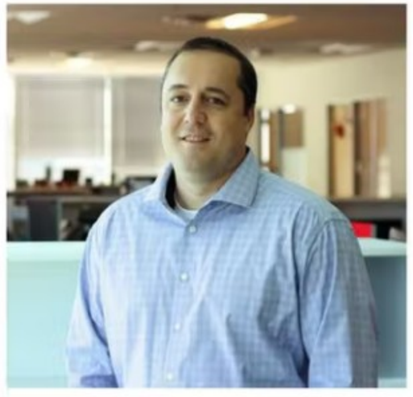
Task Leads

John Moore
Cabinet Lead

Justin Harrod
Planning Lead

Robert Frazier
Project Manager

Ameerah Palacios
Stakeholder Outreach and Branding



Thomas Stout
EV/EVSE Analysis
and Locations

Justin Robbins
Policy and Implementation

Let us know where in the Commonwealth you are from and what organization you represent!

Please provide your city, zip code, and organization represented.

Where in the commonwealth are you from and what organization do you represent?

EVOLVEKY

Bowling Green MPO 42104

Frankfort, 40601, KYTC

Louisville, 40299, KIPDA

ky office of energy policy

Lexington 40514Kentucky transportation center

Frankfort, KY 40601 KYTC

Goshen, 40026, Kentucky Clean Fuels Coalition

PeADD Hopkinsville KY 42240

Where in the commonwealth are you from and what organization do you represent?

Florence, 41042, NKADD

Louisville, 40299, KIPDA

Nashville, TN 37214 - Tennessee Valley Authority Electric Vehicle Team

Huntington, 25701, KYOVA Interstate Planning Commission

Louisville, 40202, Louisville Metro Government

Frankfort, KY 40601; Frankfort Plant Board

Louisville KY 40241 Evolve KY

LG&E and KU, Louisville KY.

KYTC Frankfort, 40601

Where in the commonwealth are you from and what organization do you represent?

Lexington 40507 Lexington Area MPO

Frankfort, 40622, KYTC

Frankfort, 40601 Kentucky Engineering Center (ACEC-KY / NSPE-KY)

Lexington, KY - Kentucky Petroleum Marketers Association

Frankfort, KY

Louisville Metro Government

Tulsa 74105, Francis Energy

Frankfort, 40601, Finance and Administration Cabinet

Maysville, 41056, BTADD

Where in the commonwealth are you from and what organization do you represent?

Louisville, 40202, Louisville Metro Government

Frankfort, KY 40601KY Transportation Cabinet

40507, Thoroughbred Engineering

University of Louisville, 40223

Lexington, KY 40517 - Bluegrass ADD.

Lane Boldman, Frankfort, 40602, representing Kentucky Conservation Committee

Frankfort Kentucky, 40601 Kentucky Municipal Utilities Association

Georgetown KY 40324 Toyota Motor North America

Missoula, MT 59803. HDR Engineering

Where in the commonwealth are you from and what organization do you represent?

Kentucky Office of Energy Policy

Frankfort, KY 40601, FHWA-KY

Bowling Green, 42101, City County Planning Commission of Warren County / Bowling Green Warren County MPO

Jeff Thelen, Florence Kentucky 41042 NKADD

Barbourville 40906 Barbourville Utility Commission

Cincinnati, 45202, OKI Regional Council of Governments

Glasgow Electric Plant Board (GEPB) 42141

CED Frankfort, KY 40601

Prestonsburg, KY 41653/ Big Sandy ADD

Where in the commonwealth are you from and what organization do you represent?

Frankfort, KY 40601, Frankfort Plant Board (municipal utility)

Evolve KY Board member, Louisville,KY 40222

Kentucky Association of Counties, Frankfort 40601

Frankfort, Ky 40601Finance and Administration Cabinet

Lexington 40513 Goss Samford PLLC And KY Petroleum Marketers

TEKSystemsLouisville, 40222 Lexington 40509

East Kentucky Power, Winchester 40392

Frankfort, 40601, Kentucky Association of Counties

Finance, Real Properties located in Frankfort

Where in the commonwealth are you from and what organization do you represent?

FHWA KY, Frankfort

KIPDA (Louisville MPO)

Ky Retail Federation Frankfort 40601

Frankfort 40601 LG&E Kentucky Utilities

Huntington, 25701, KYOVA Interstate Planning Commission

Frankfort, KYTC 40622

Frankfort, KYAPI

Frankfort, FHWA

FIVCO Area Development District Grayson, KY. 41143

Where in the commonwealth are you from and what organization do you represent?

Matt Alford, Tallahassee, 32303, EY. Loved the work y'all did in Florida

40601

Frankfort40601API

40299, KIPDA

Frankfort, Ky 40601 Kentucky State Parks

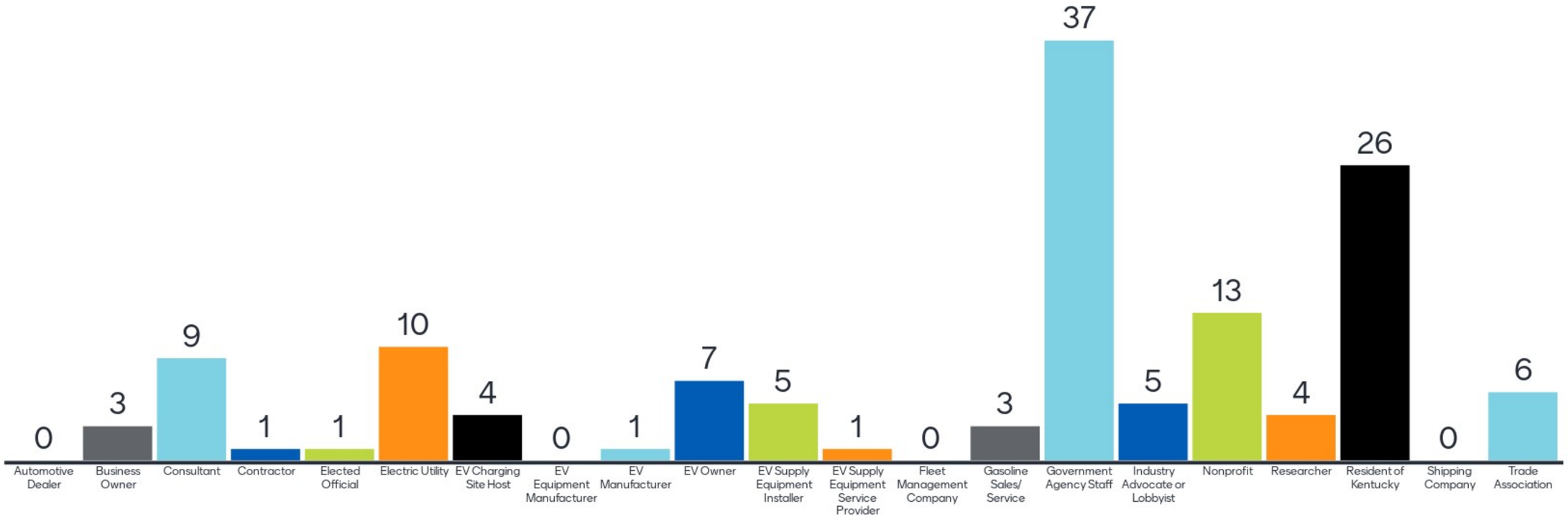
Kentucky State Parks

Louisville, 40299, KIPDA

Central City 42330City of Central City

Who do you represent, out of the following categories?

Which of these categories best describe you? (select all that apply)



Today's Agenda

- Electric Vehicle (EV) and EV Infrastructure Fast Facts
- Barriers to EV Adoption and EV Infrastructure Deployment
- EV Sales and Registration Trends and Projections
- Federal Funding
- Alternative Fuel Corridors
- EV Infrastructure Deployment Plan
- How you can be Involved
- Schedule

Electric Vehicle (EV) Types

Battery Electric Vehicle (BEV)

- Battery Power Only
- Typical Battery Range 150-400 miles

Plug-In Hybrid Electric Vehicle (PHEV)

- Battery Power and Internal Combustion Engine (ICE)
- Typical Battery Range 20-40 miles

Hybrid Electric Vehicle (HEV)

- Internal Combustion Engine (ICE) Only
- Battery Charges by Regenerative Braking or Using Engine as a Generator
- Battery Allows for Smaller Engine, Powers Auxiliary Loads, and Reduces idling

Image Source: Drive Electric MN.org

Battery Electric Vehicles (BEV)

- Must Charge to Operate
- Most models: $20,000 to $70,000[1]
- Example operating cost:[2]
  - EV Bolt – $0.21/mi; Trailblazer - $0.31/mi
- Typical Battery Range: 150-400 miles

[1] *Price has been reduced by the $7,500 Federal tax credit, except for Teslas which are no longer eligible (source: insideevs.com; 2/7/22)*
[2] *Alternative Fuels Data Center example using a Chevy Bolt EUV and Chevy Trailblazer FWD https://afdc.energy.gov/calc/*

Image Source: Drive Electric MN.org

BEV Benefits

- Improved air quality, no tailpipe emissions
- Vehicle efficiency, lower fuel costs
- Fewer moving parts = less maintenance
- Reduction in noise pollution
- Energy diversity; use of renewables

Image Source: Drive Electric MN.org

EV Charging Stations

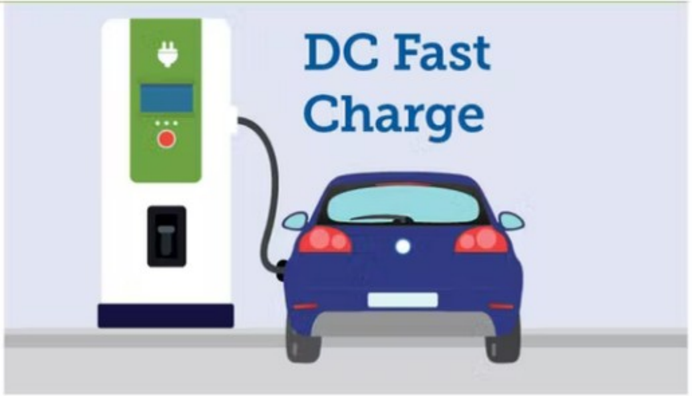
Level 1

- Standard Outlet
- Slowest Charging
- 250 miles in 48-72 hrs
  (~5 miles/hr of charge)

Level 2

- “Dryer Outlet”
- Slow Charging
- 250 miles in 10 hours

Level 3



- Direct Current Fast Charging (DCFC)
- Fastest Charging
- 250 miles in 30 minutes

Image Source: www.carolinacountry.com

EV Charging Stations

Level 1

Level 2

Level 3

Note: The size of the pool depends on the vehicle.

What is your EV ownership status?

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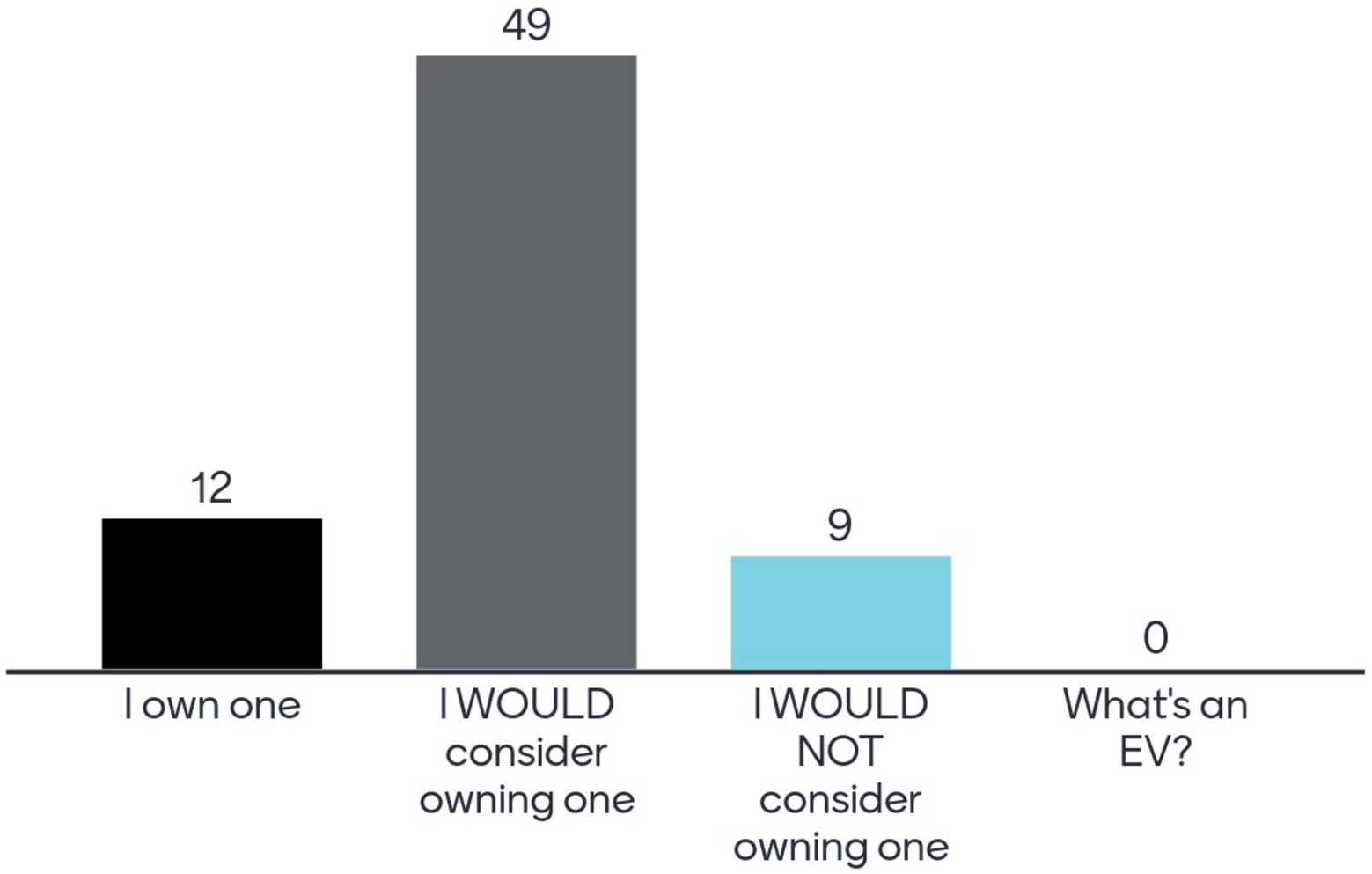


If you own an EV or are considering an EV, what do you see as the barriers?

Or if you would never consider one, why is that?

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Lack of dcfc's	cost	Price
Cost	Public resistance	Cost
Lack of infrastructure; cost	DCFC Installs	range and charge time

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Cost and poor performance	Range	Range
Cost	costs	Distance travel vs charge availability
Cost and range concerns.	Cost	Cost

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Range anxiety

Lack of charging stations

No garage and no ability to charge at home

setup at home. infrastructure in general

Location of charging stations

Cost

Current charging locations

Cost of purchase and availability and convenience of EV charging stations

Upfront cost, dangers with lithium ion battery fires.

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Availability of fast chargers

Cost

Public resistance

I can't afford a new car.

preferred vehicle style not available yet -- and the price point may be an issue when they are...

price of vehicle

Cost

no recycling option for the batteries. Battery supply chain vulnerabilities

Planning ahead to make sure it's charged before driving

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Battery life and access to a charging station

Infrastructure and demands on raw materials

cost and access to chargers

Range

too expensive

Infrastructure to support use, still evolving tech

Electric grid, charging infrastructure, charging time, battery fires.

Confusion about how to charge

cost

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Cost. New technology

Charging speed

Cost

Available tax credits

barrier is to find a place to charge for distance travel.

Cost

Limited charging locations

Range, supply chain, cost,

range

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Cost

Electric grid limitsRange

Education of public

Going long distances - which is why we have a hybrid. We would have gone all EV otherwise

Barriers are charging infrastructure buildout, accommodations for apartment for charging

Range

Charging time. Range.

range anxiety

We have a hybrid and are excited to buy a full EVWould love one that was hearty enough to tow our camper

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Time

range, cost, time

Range. I can travel 9 or 10hrs In a car currently.

Range, battery life and battery replacement cost.

Charging infrastructure gaps and cost of EV

No barriers for those who have level two in their home address. Maintenance is minimal so no costly repairs.

Concern about travel distance and availability of charging stations.

cost

Too much thinking

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Not convenient for long trips

The cost of the vehicle - the availability of charging stations and the range

Speed of charging

Towing

Recharging availability

Where to service the vehicleRange anxiety

Lack of education

We live in a historic neighborhood without off-street parking, so at-home level 1 or 2 charging not an option.

Long range travel limitations

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

It's the best vehicle decision I've ever made and, God willing, I will never go back to IC. It's a better way to travel

Environmental impact to battery creation

Travel , charging station and charging time

More chargers and no garage for many.

Charging stations in rural areas

Available used cars since many people can't afford a new car

no charging stations for renters

No garage for many

I-64

If you own an EV or are considering an EV, what do you see as the barriers? Or if you would never consider one, why is that?

Major rural highways

Parkways to give east/west connections.

All interstates, then US highways

I-64

Wherever the VMT exist

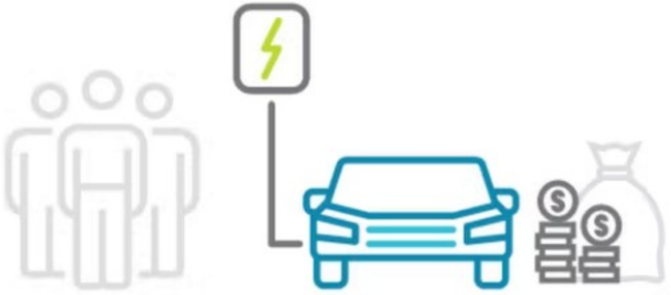
Chase the future demand, guide the EV future demand

Interstates then Parkways

Distance I drive every day.

Barriers to EV Adoption

Higher Vehicle Cost



Lack of Awareness/
Inertia

Limited Model Types

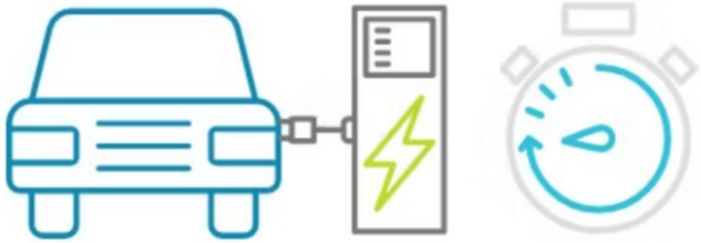
Lack of Dealer Knowledge

Limited Used
Vehicle Options

Barriers to EV Adoption

Lack of Charging Infrastructure

Range Anxiety for Long Trips



Long Recharging Times

Barriers to EV Infrastructure Deployment

Low Customer Base

Awareness of Charging Locations

EV Charging Speed

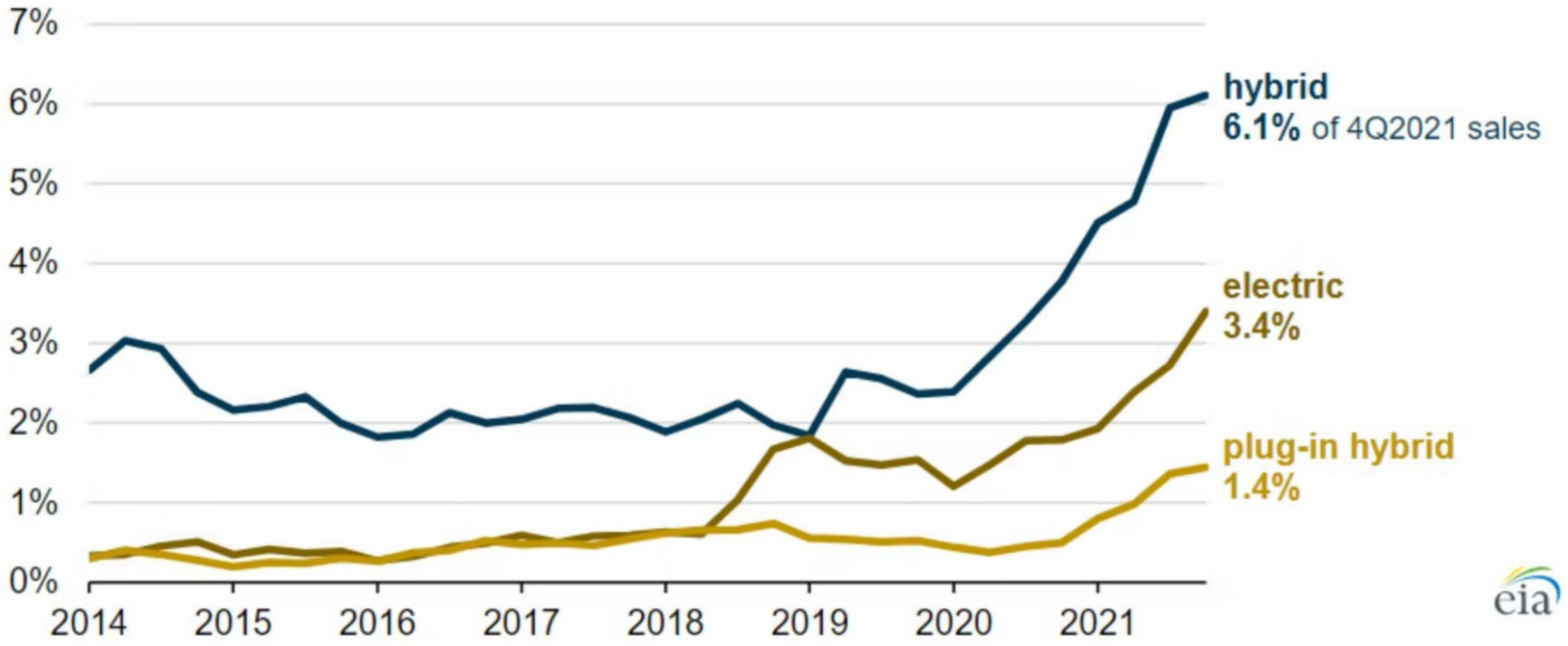
Lack of Utility Infrastructure

Utility Demand Charges

Rural/Underserved Infrastructure Gaps

National EV Trends

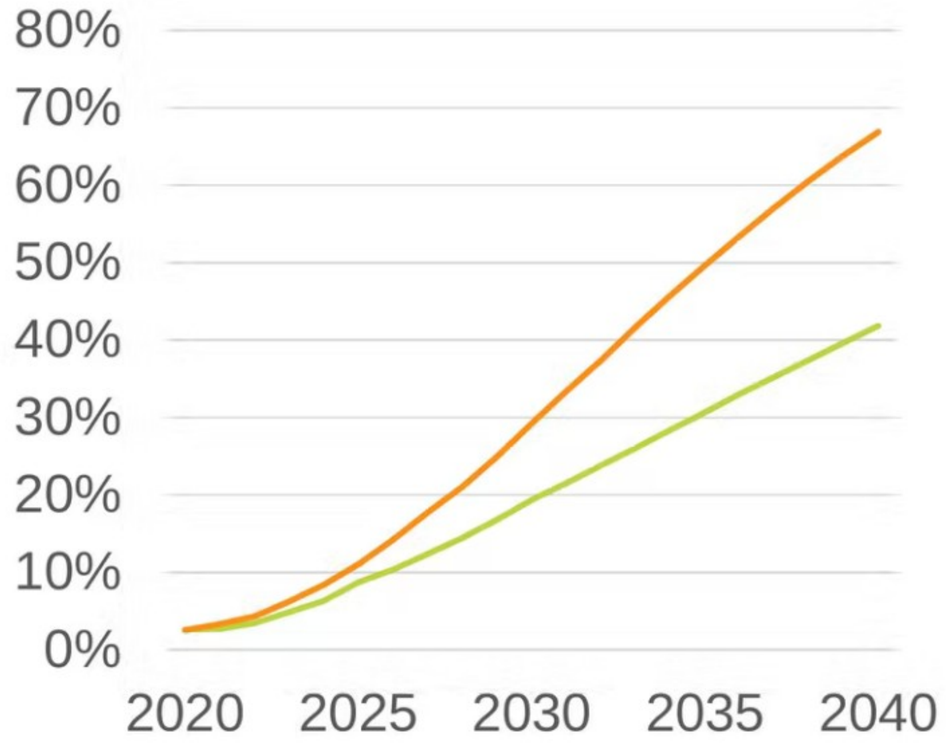
Quarterly Light-Duty Vehicle Sales by Powertrain (2014-2021)



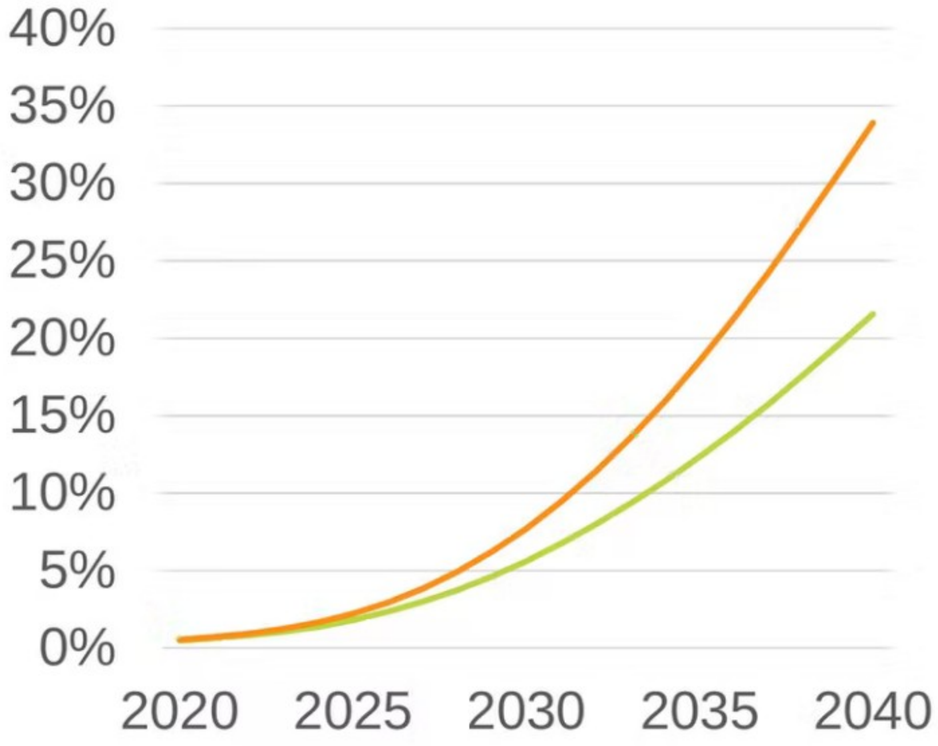
Data Source: Energy Information Administration

Possible EV Market Projections

EV Sales



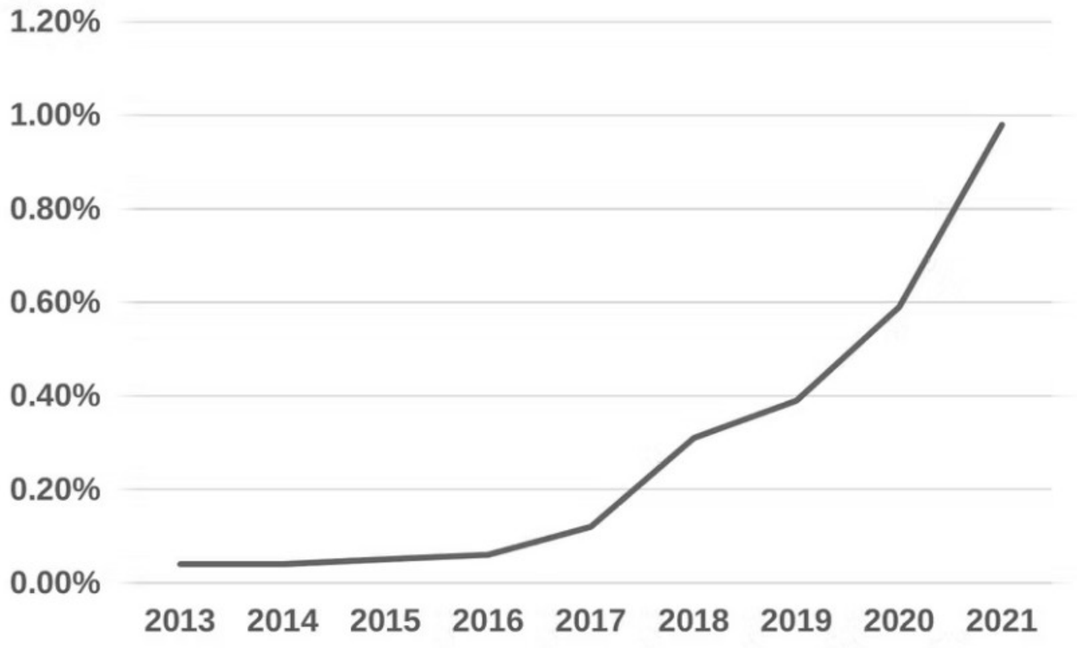
EV Registrations



Data Source: Florida EVMP

Current Light-Duty EVs in Kentucky

Battery Electric Vehicle (BEV) Sales in Kentucky



Light-Duty Vehicles Registered by Type

BEV	PHEV/ HEV	Gasoline	Other	Total
3,618	44,440	3,257,913	1,062	3,307,033
0.11%	1.34%	98.51%	0.03%	

As of December 2021

It can take 20 years for 90% of a vehicle fleet to turn over

Data Sources: Alliance for Automotive Innovation
Environmental Research Letters, Volume 14, Number 2
KYTC

Federal Funds for EV Infrastructure

2021 Infrastructure Investment and Jobs Act (IIJA)

- **$7.5B** for EV infrastructure
  - **$5.0B** in National Electric Vehicle Infrastructure (NEVI) formula funds
  - **$2.5B** in discretionary funds (competitive grants)

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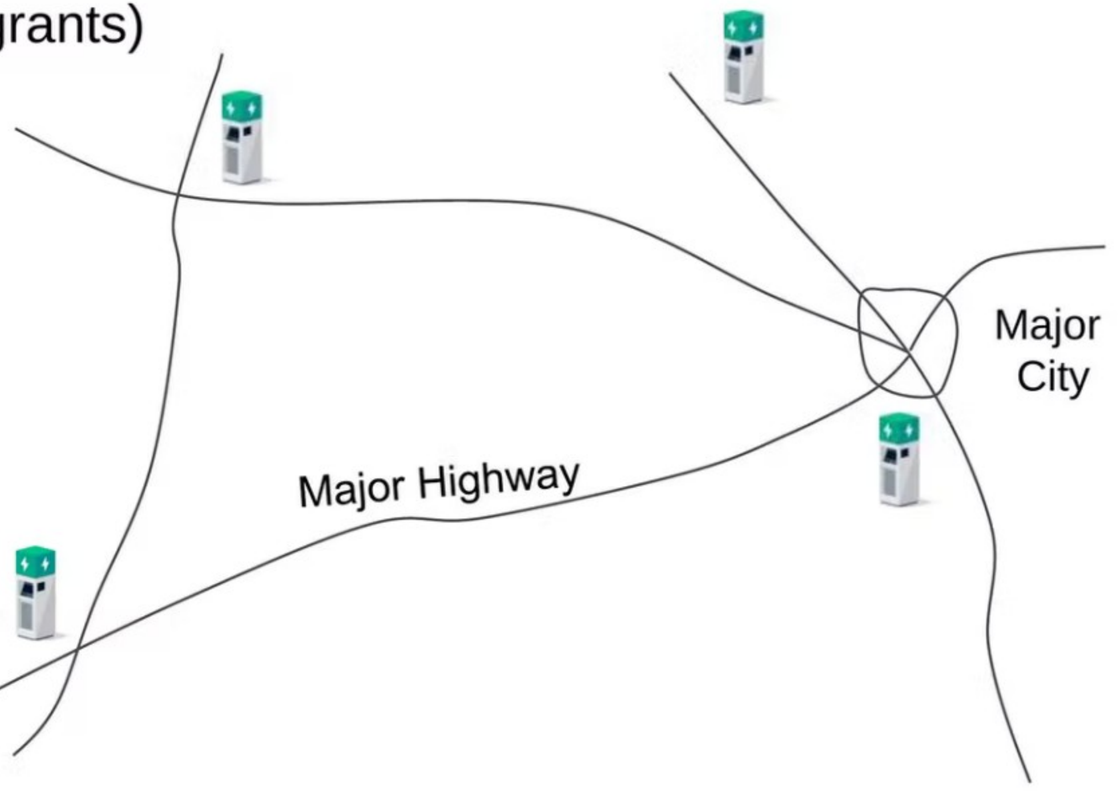
Purpose of NEVI Formula Program

- National network of fast chargers
- Designed to support travel on major corridors
- Focused on Alternative Fuel Corridors



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Purpose of Competitive Grant Funding

- ***Guidance coming out later in 2022***
- Community charging stations are expected to be eligible
- Can be used for other fuel types

Kentucky's NEVI Formula Funds

$69M for EV charging infrastructure over 5 years

$10M in Fiscal Year 2022

$10-$15M per year in four following years

Federal funding requirements

- EV Infrastructure Deployment Plan
- Due to the Joint Office by **August 1**

Formula funds intended for **Alternative Fuel Corridors**

Alternative Fuel Corridors (AFCs)

USDOT designates AFCs based on state nominations

- Four fuel types: electric, hydrogen, propane, and natural gas

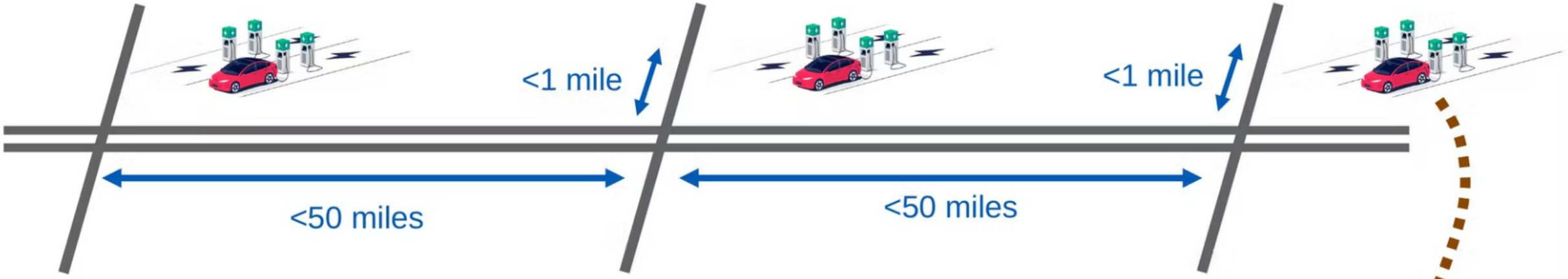
New round of nominations **due May 13, 2022**

Current emphasis on EV charging corridors

USDOT prioritized Interstates

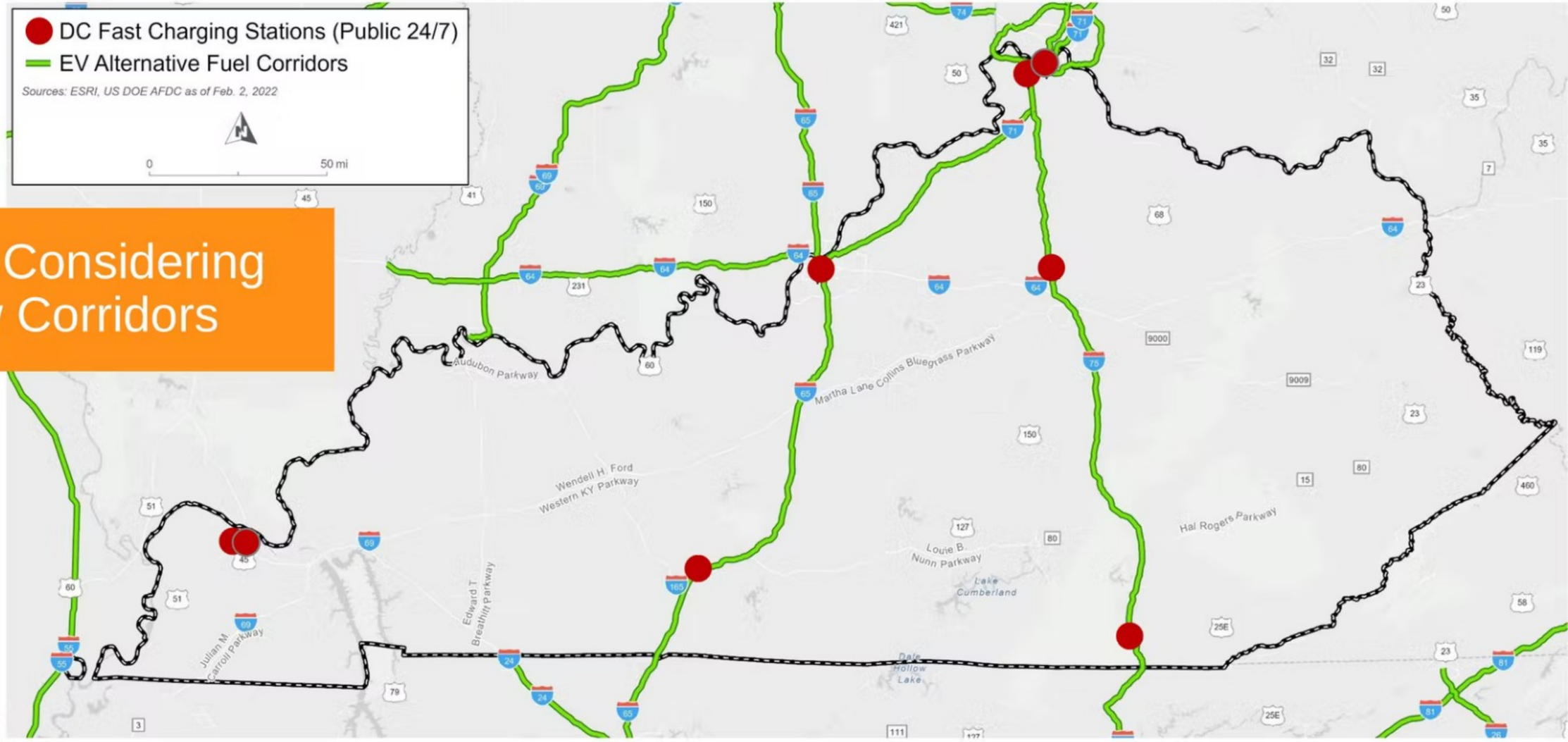
Other highways are allowed

DCFC Stations on Alt Fuel Corridors



- **Along Alternative Fuel Corridors**
  - **<50 mile spacing; <1 mile away**
- **At least four 150 kW DC Fast Charging ports**
- **Open to general public (not proprietary)**
- **Need to build out corridors before going off-corridor**

NEVI Funds to Fill in the Gaps First



KYTC Considering New Corridors

The plan will focus on charging infrastructure on main highway corridors first.

After that, where?

The plan will focus on charging infrastructure on main highway corridors first. After that, where?

rest areas	Parkway System	Populated areas next
Parkways!	Look to traffic counts to determine that	Parkways.
eastern KY	Parkways	All US state maintained highways.

The plan will focus on charging infrastructure on main highway corridors first. After that, where?

land between the lanes, Hucks WKY Parkway

Main ky highways.

Need along I-64 between Lexington and Ashland/WV State Line

Eastern Kentucky corridors- Hal Rogers Parkway, Mountain Parkway

State Parks, Universities

highways through town

Parkways

population centers

Parkways

The plan will focus on charging infrastructure on main highway corridors first. After that, where?

City centers

urban areas

I-64, I-71, I-264, I-265 in Louisville

secondary corridors, regions not served by these corridors.

MSAs of certain population or more

Bardstown Road, Dixie Highway and Shelbyville Road

major parkways

Parkways

high-density populated areas

The plan will focus on charging infrastructure on main highway corridors first. After that, where?

All state maintained roads

Major tourism destinations

Western Ky Parkway Exit 58

Major world connector highways

Private Sector will cover big cities

Downtown commercial districts - fleets

Rest Areas

Parkways

Dollar generals - you'll definitely be able to serve the rural population

The plan will focus on charging infrastructure on main highway corridors first. After that, where?

Focus where the EVs in KY are currently registered.

Park systems

Parkways

Our non-profit Evolve KY places destination chargers in communities. Over 90 Level 2 chargers to date. We want to partner to do more.

Bardstown Rd, Shelbyville Rd

Parkways then in rural areas heavy traffic roads to connect state up

Community roads, downtowns

Eastern Kentucky!

interstates first, then intrastate, then down the chain

What are the most important characteristics for Level 3 (DCFC) Charging Sites?

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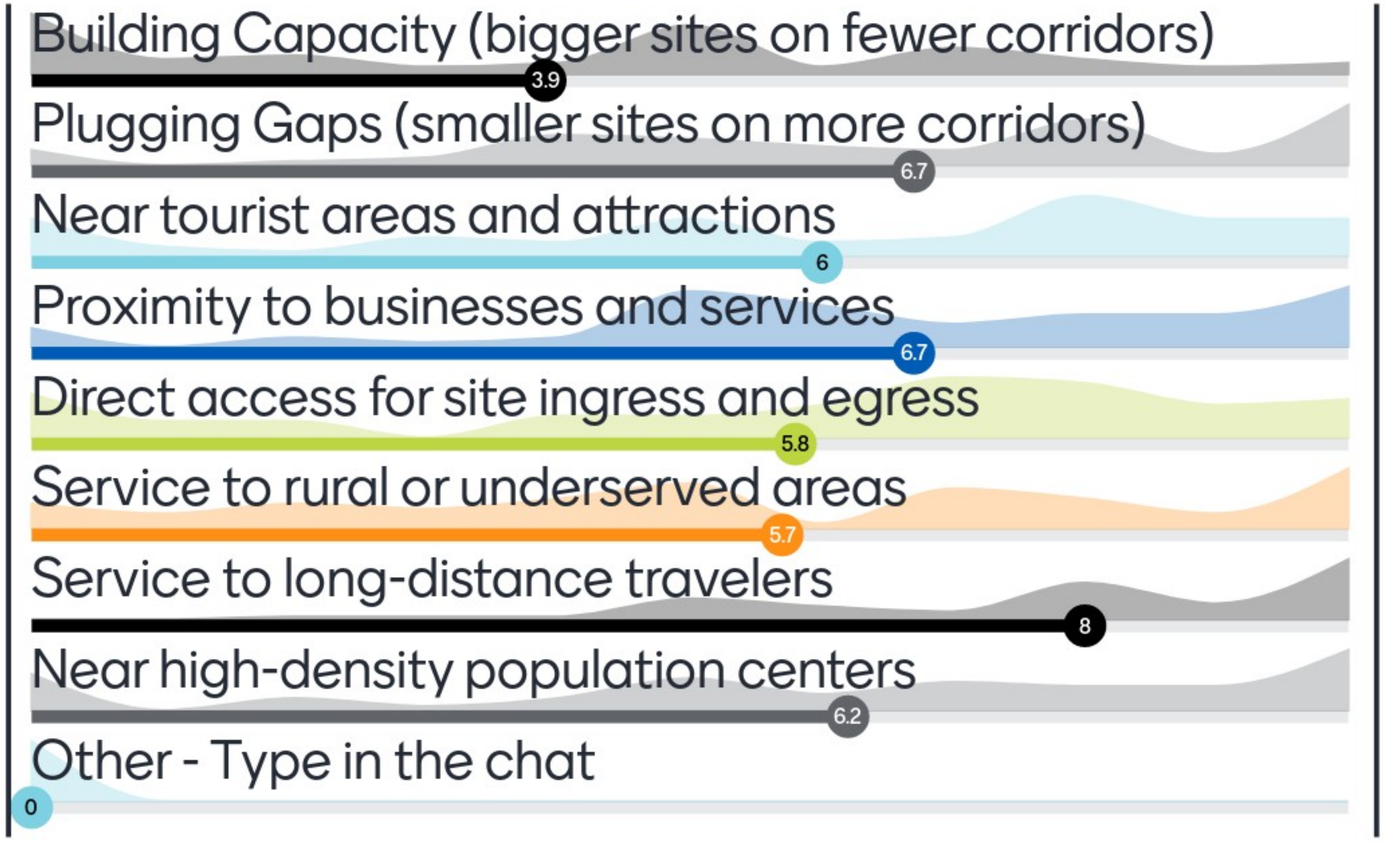

What are strategies the state should consider for overcoming barriers to charger infrastructure in rural areas?

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

electric grid

state funding

Working with the rural electric cooperatives on sites

education, access

P3 with some gas station company

Utility capacity

Electric grid

Grid capacity

education

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

Build out network first

Work with the communities to gauge their needs.

education and economic incentives

Funding and local input

working with small businesses

Capitalism and less government.

Leverage tourist areas, state-owned or local government properties

Put, at least, one charging station in each regular gas station in the rural areas.

Access points

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

State funding and electric grid capacity

home charging

Work with utilities

Partnerships with energy coops and power companies for revenue share

Electric grid

Funding to upgrade infrastructure will be required in some areas

There will be lower usage on these stations which will increase the payback period

Electric grid

Filling in at State Parks

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

Partnering with dollar general. Every rural county has a dollar general.

NEVI presents Kentucky with a golden opportunity to deploy an essential network of charging stations that won't compete with the private charging market. Utilization is the key to profitability - more chargers = more evs = higher utilization

Infrastructure gaps, phase 3 power capabilities,

actual adoption rates

Utility coordination.Possible fewer chargers active to balance needs and cost

Enlisting rural utilities. Promoting development of "gas station" model charging centers.

Charger stations near small cities - where most folks from rural areas shop, see the doctor, etc would be helpful - small cities are the economic engines in this state

Amenities (restaurants, shopping, attractions)

Fewer EV corridors more flexibility for single sites elsewhere

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

Good participation in the grant program in the second half of the infrastructure proposal

Electric grid availability

Funding

Federal funding

Good luck overcoming the mindset to burn fossil fuels

Solicit community input first & foremost.

Supplier cost effectivness.

Partner with existing traditional fuel infrastructure Electric utilities Policy on how it will work for any fees or costs

EV Car Share

What strategies should the state consider for overcoming barriers to charger infrastructure in rural areas?

Location of the station in areas where they will receive little usage could be difficult

Local government sponsored charging centers.

EV costs

Education

Public buses and bus routes

Coordination with local utilities

Fee free Level 2s should be welcomed where it makes sense in underserved communities.

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

affordability of electric vehicles

Electric grid availability

provide rental EVs

Cost of vehicles and education

Lower EV car prices to begin with

education, EV access

EVs in public parks/libraries

Poor perception

Provide incentives for the vehicles in those areas.

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

Be huge participants in the second set of funds coming in the infrastructure plan

working with small businesses

funding for grid updates

Funding

Grid availability

Engage the communities more to convince them of the need

Work with utilities

Subsidy to assist with capital cost?

Set criteria for certain minimums for underserved communities.

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

Partner with ride share companies and other partners with the existing brand awareness, real estate footprint and capital to invest in deployments as a value-add

Amenities (shopping, restaurants, etc)

People in "underserved" communities most likely won't own EV's so I wouldnt prioritize this

Charging stations at libraries and other public resources

Require new developerments to have ev infrastructure, especially multi family

Funding

education

education, access

Working with utilities

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

Supply costs for low demand areas

Encourage EV adoption in those areas

Provide incentives for vehicles in those areas.

Assure coordination with small businesses and existing traditional fuel infrastructure Improve electric utility services and upgrades assure affordability of electricity

PPP grants for businesses to invest in charging stations

Leverage informed sources to identify underserved

working with small local businesses

More stations on smaller roads and sites - More publicity about the availability of sites and where they are

EV chargers in areas commonly accessed by low-income communities, such as public libraries and parks.

What are some strategies for overcoming barriers to charger infrastructure in underserved communities?

Wait for EV used car market to mature

State EV Plan Requirements

- USDOT issued guidance on **February 10, 2022**
- USDOT and USDOE formed a Joint Office for EV Infrastructure Deployment
- Plans to be submitted to Joint Office by **August 1, 2022**
  - Kentucky is planning to submit in **mid-July**

State EV Plan Requirements

- USDOT guidance addresses:
  - Federal share and match requirements
  - Funding requirements
  - Project eligibility
  - Deployment / Siting Considerations

State EV Plan Requirements

Key Takeaways

- **Maximum 80% Federal Share**
- **20% or Greater Matching Funds**
  - Source can be Private, Local, and/or State Funds
- **<50 mile spacing, <1 mile from AFC, Four 150kW ports (600 kW total)**
- **Private Entities can be Involved**
  - Construction, Operations and Ownership
- **Many Deployment Costs are Eligible**
- **Guidance Outlines Many Siting Considerations**
  - Examples: electric grid, nearby services, rural/underserved community needs

How Can You Be Involved?

- **Participate** in Stakeholder Meetings – Today is 1 of 3
- **Respond to any surveys** or requests for feedback
- **Reach out** with any questions or comments you have

Plan Schedule

Deliverable	Month
Stakeholder Meetings	March/April
Stakeholder Meetings	Early May
Alternative Fuel Corridor Nominations to USDOT	*May 13, 2022*
Stakeholder Meetings	June
Final Plan	July
EV Infrastructure Deployment Plan to USDOT	Prior to August 1, 2022

We Need Your Input!

- Next Stakeholder Meeting - May
  - Look for the invite in mid-April
  - Digital Survey
- Transportation.ky.gov/Planning/Pages/EVPlan.aspx

Plan Contact Email:
EVPlan@ky.gov

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EVPlan@ky.gov

Questions?