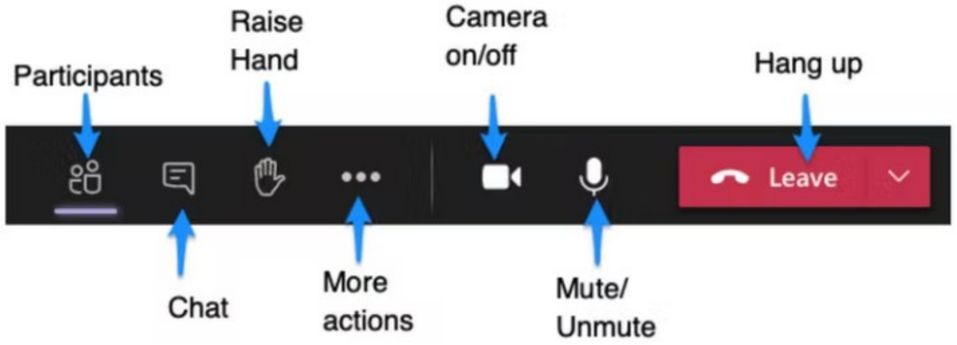
Planning for EVs in Kentucky

Kentucky's Electric Vehicle Infrastructure Deployment Plan

Welcome to the Meeting!

- We will have a **presentation** followed by **breakout groups** where you can discuss topics in a smaller group setting
- During the large group time use the meeting chat to
  - Ask questions
  - Provide comments
- We will also use live polling to get your feedback
- This meeting is being recorded



Agenda

- Welcome and Introductions
- Presentation
  - Electric Vehicle (EV) Overview
  - Alternative Fuel Corridor (AFC) Nominations
  - Phasing and Funding
  - Other High Priority EV Corridors
  - EV Infrastructure Plan and Criteria
  - Schedule
- Breakout Groups
- Main Meeting Report Outs
- Adjournment

Instructions

Please type in your name and organization or agency

(if others are with you, please add them too)

Please type in your name and organization or agency

John Moore, KYTC

Alex Posorske KIPDA

Andy Barber HDR

Alex Beaton, EVgo

Justin Harrod - KYTC

Andy Rush - KIPDA

Elizabeth Farc, KIPDA

KPMA, Brian Clark

Lane Boldman, Kentucky Conservation Committee

Please type in your name and organization or agency

Lindsay Pletch, A10 Associates

Chris Boehm - Tennessee Valley Authority

John-Mark Hack, Thoroughbred Engineering, Lexington, KY

Mikael Pelfrey, KYTC

LGE/KU

Chuck Wolfe, KYTC

Emily Carpenter - Kentucky Clean Fuels Coalition

Brent Clark

Kentucky Transportation Center

Please type in your name and organization or agency

Michael HardyHardy Oil Company

Andrew Byrne The State Group

Ben Peterson City County Planning Commission of Warren County, KY

Angela HerndonPennyrile Area Development District

Ben Robertson CMTA

HDR

Natalie Flores-Esquivel, Transportation Planner with Bluegrass ADD

Francis Energy

Chris Evilia Lexington Area MPO

Please type in your name and organization or agency

Christopher Snyder, Cabinet for Economic Development

Brent Sweger KYTC

Jason Sekhon - Toyota Motor North America

Max Hammond FIVCO

Nick Comer, East Kentucky Power Cooperative

Bo Martin, Lincoln Trail ADD

Chad LaRue-Kentucky Association of Highway Contractors.

Patrick Brumley - Beltline Electric

Vicki Mak-Romo, General Motors

Please type in your name and organization or agency

Doug Smith, WSP

Casey Durham, KYTC

Mike Proctor. EVOLVEKY

Brenna Garro | Idaho Governor's Office of Energy and Mineral Resources

Gay Dwyer, General Motors

Mark Day, LEX Blue Grass Airport

Bill Bell, ACEC-KY

Scott Crabtree, attorney for Key Oil Company

Travis McCullar, Frankfort Plant Board

Please type in your name and organization or agency

J.E.B. Pinney, KY PSC

Jeff Thelen Northern Ky Area Development Disctrict

Michael King. Louisville Metro Government

Jennifer Kirchner Kentuckians For Better Transportation

Jay Robertson, West Monroe Partners

John Callihan - Louisville Metro Government (AECOM)

McCarthy Strategic Solutions

Nick Jewell - LG&E and KU Emerging Tech Engineering

Ryan Griffith, KTC

Please type in your name and organization or agency

Greg Spencer, LG&E

Doug Pinkerton FIVCO Area Development District

Benjamin Hamm, Gateway Area Development District

Tom Lovett, Owensboro-Daviess County MPO

Rusty Cress, KLC, API

Justin Bencomo - LG&E and KU

Charles BushFinance Cabinet, Department of Facilities

Cory Gordon, Duke Energy

Chuck Wolfe, KYTC

Please type in your name and organization or agency

Stuart Ungar, Evolve KY

Fred with Evolve KY

Melanie Weiland - GM

Charles Key Key Oil Company

Stephanie Stumbo on behalf of KY Petroleum Marketers Assocation and NextEra Energy

Ben Robertson CMTA

Randall EmbryKIPDA Area Development District

Terri Sicking, KYOVA Interstate Planning Commission

David Shuey OKI Regional Council ofGovernments

Please type in your name and organization or agency

Randy Meredith-Kentucky Electric Cooperatives

Izzy HouseKYTC

Erica Albrecht HDR

Chuck Wolfe KYTC

Tom EvelandRocket Oil Company

Stuart Ungar Evolve KY

Randy Meredith-Kentucky Electric Cooperatives

Combo—traffic counts and EV registration

We hope that Ky may soon have it's first National Heritage Area: The Ky Wildlands and a National Heritage Trail. These projects will impact more than 40 eastern Ky counties. Economic growth will occur when we begin many more visitors to our region. W

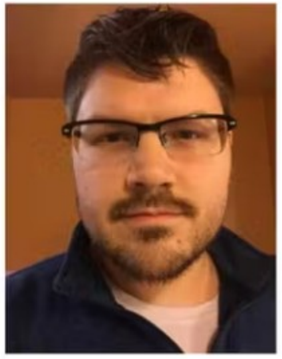
Please type in your name and organization or agency

Interstates highest then parkways then other corridors. Lowest community/ destination

The proposed National Heritage Trail, The Warriors' Path will serve almost 20 counties that are categorized as economically distressed by the Appalachian Regional Commission

Task Leads

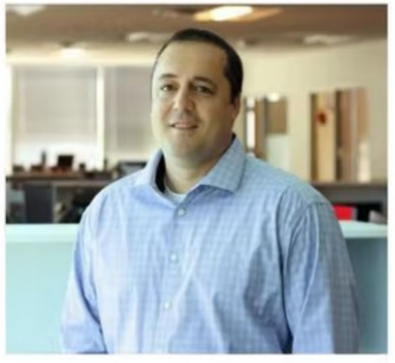
John Moore
Cabinet Lead



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

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

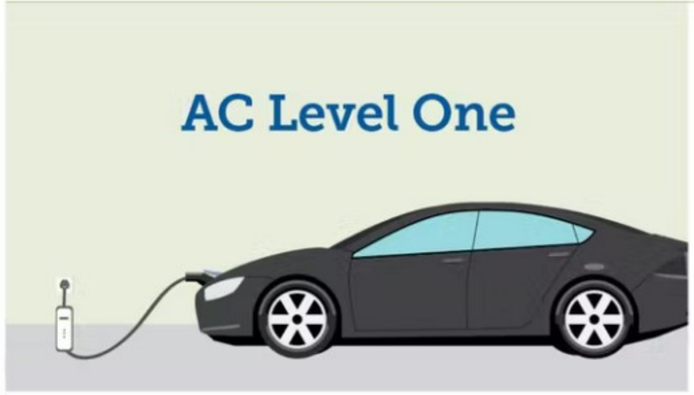
Hybrid Electric Vehicle (HEV)

- 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

EV Charging Stations

Level 1

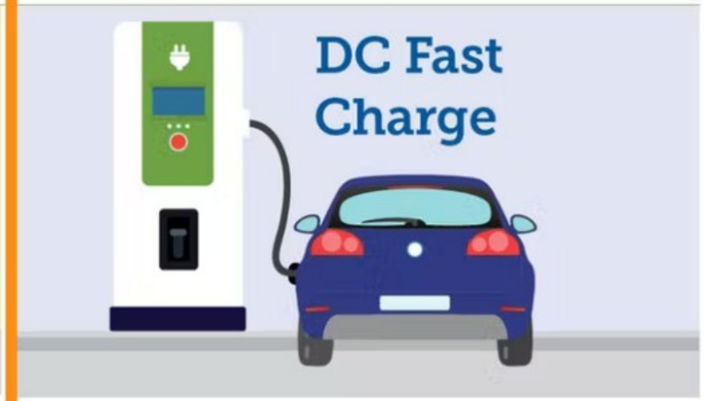


- Standard Outlet
- Slowest Charging
- 250 miles in 48-72 hrs
  (~5 miles/hr of charge)

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

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- “Dryer Outlet”
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- Direct Current Fast Charging (DCFC)
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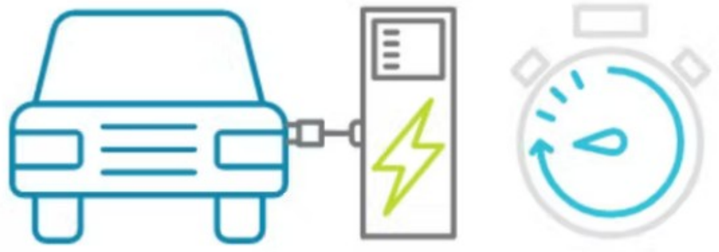
Image Source: www.carolinacountry.com

Barriers to EV Adoption

Charging Infrastructure

Range Anxiety



Recharging Times

Barriers to EV Infrastructure Deployment

Limited Utility Infrastructure

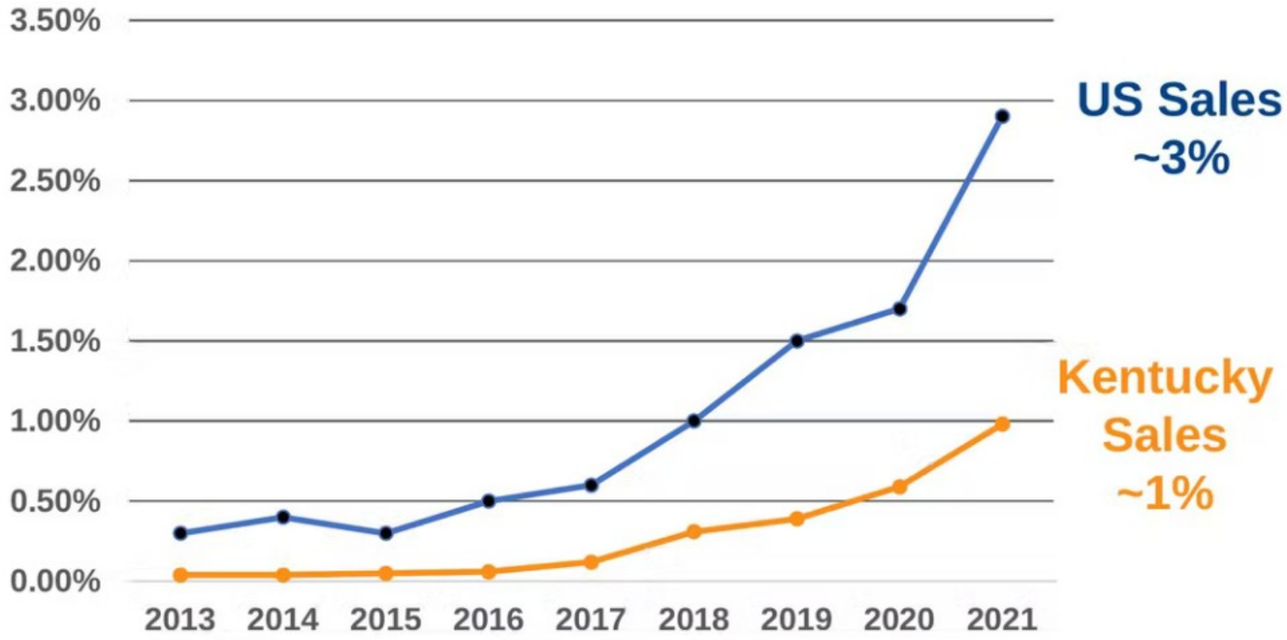
Utility Demand Charges

Rural/Underserved Infrastructure Gaps

Planning & Zoning
Building Codes
Other Regulations

Current Light-Duty EVs in Kentucky

Battery Electric Vehicle (BEV) Sales in the US and Kentucky



Light-Duty Vehicles Registered in Kentucky by Type

BEV	Gasoline	Other*	Total
3,618	3,257,913	45,502	3,307,033
0.11%	98.51%	1.37%	

- *Includes PHEV and HEV*
- *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
Energy Information Administration
KYTC

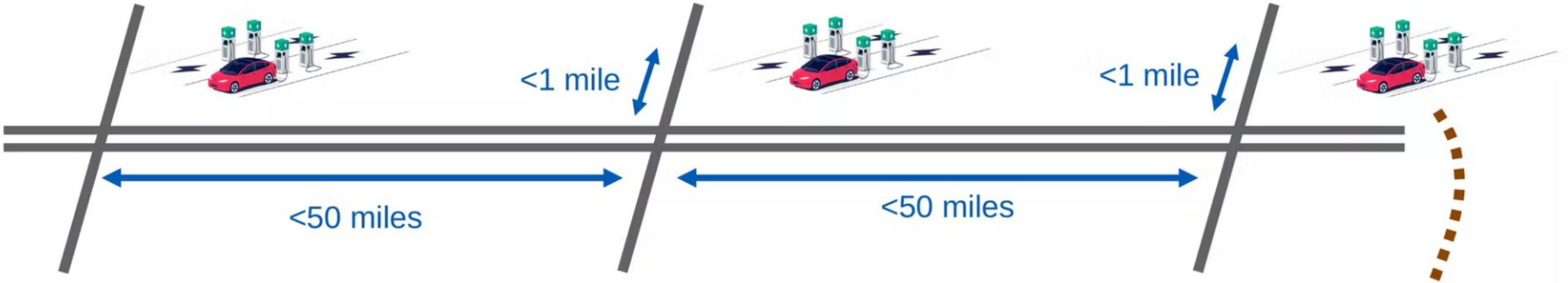
Other EV Charging Initiatives

- VW Settlement Funds (Energy and Environment Cabinet)
- Tennessee Valley Authority
- KY Clean Fuels Coalition
- Evolve KY
- Future NEVI (Federal) Competitive Grant Funding (Late 2022)

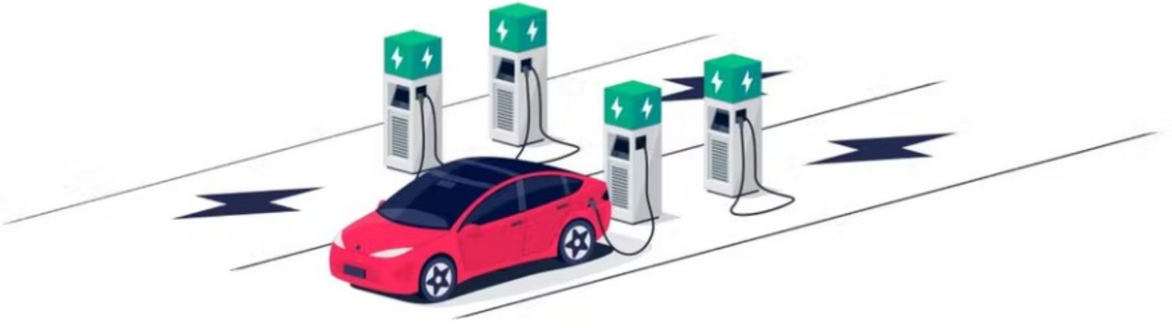
Alternative Fuel Corridors (AFCs)

- USDOT prioritized:
  - **EV charging corridors**
  - **Interstates**
- Other highways were allowed
- Kentucky submitted nominations on May 13, 2022
- NEVI Requires Build-Out of Alternative Fuel Corridors
- Build-Out Means NEVI Compliance (Station Size and Spacing)

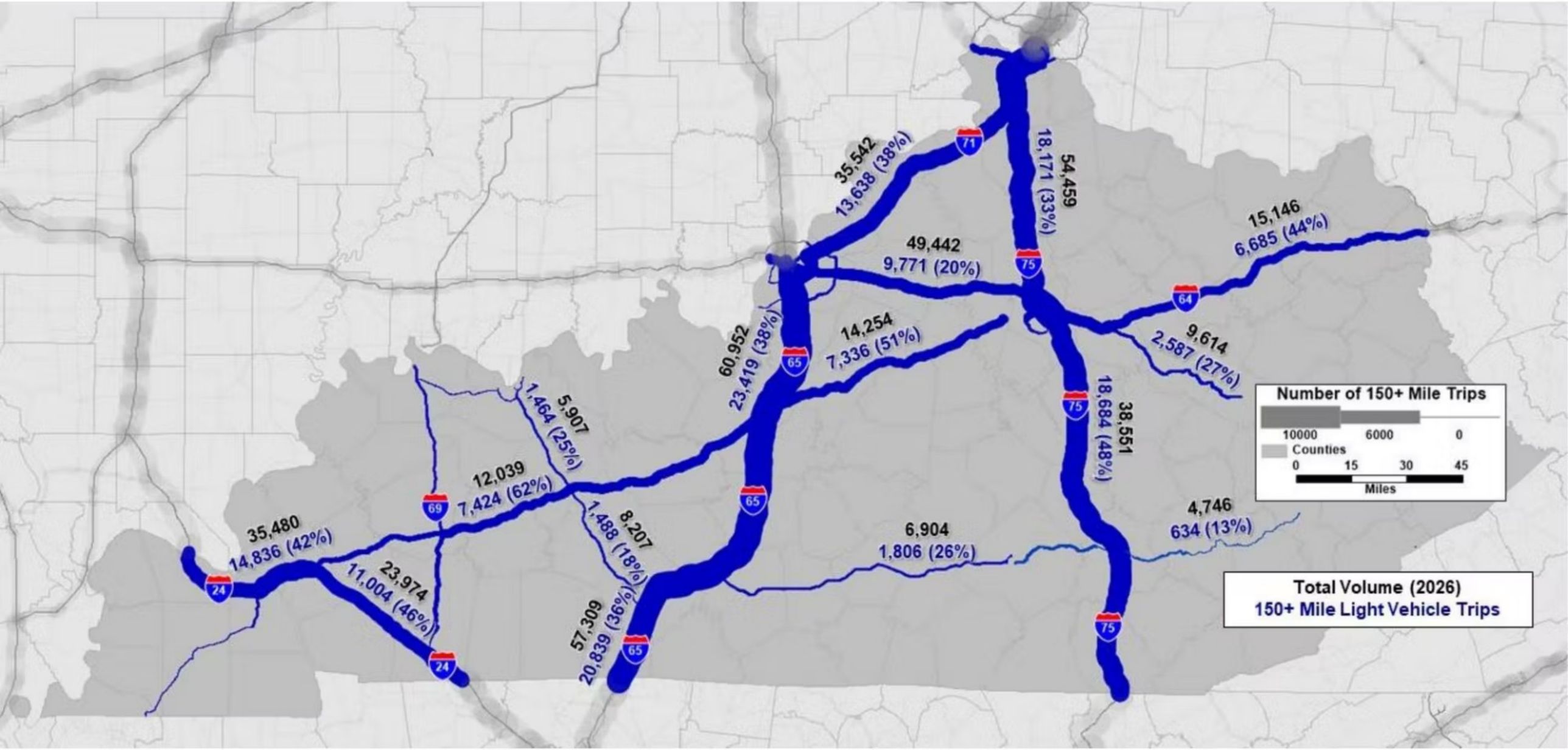
DCFC Stations on Alt Fuel Corridors

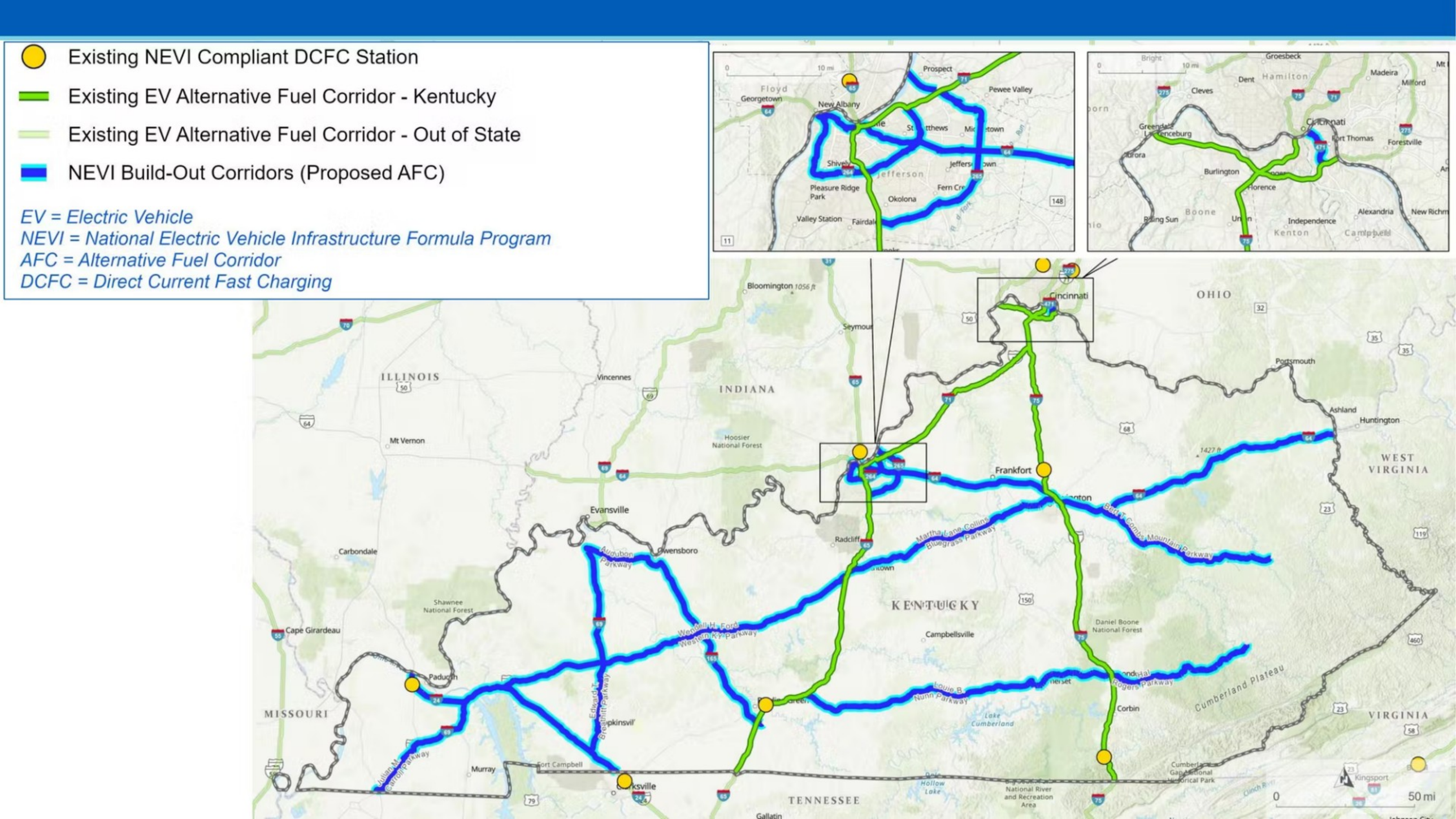


- <50 Mile Spacing; <1 Mile From Corridor
- At Least (4) 150 kW DC Fast Charging Ports (600kW Total)
- Open to General Public (Not Proprietary)
- Cost $800k to $1.2M; Considerable Lead Times
- Investigating Flexibility Based on Need



Long Distance Trips in Kentucky




Existing NEVI Compliant DCFC Station
Existing EV Alternative Fuel Corridor - Kentucky
Existing EV Alternative Fuel Corridor - Out of State
NEVI Build-Out Corridors (Proposed AFC)
EV = Electric Vehicle
NEVI = National Electric Vehicle Infrastructure Formula Program
AFC = Alternative Fuel Corridor
DCFC = Direct Current Fast Charging
Floyd
Georgetown
New Albany
Prospect
Pewee Valley
Shively
Pleasure Ridge Park
Okolona
Valley Station
Jefferson
Bright
Groesbeck
Dent
Hamilton
Madeira
Milford
Cleves
Greendale
Lawrenceburg
Aurora
Burlington
Florence
Fort Thomas
Forestville
Boone
Kenton
Campbell
Independence
Alexandria
Bloomington 1056 ft
Cincinnati
OHIO
Seymour
ILLINOIS
Vincennes
INDIANA
Mt Vernon
Hoosier National Forest
Portsmouth
Ashland
Huntington
WEST VIRGINIA
Frankfort
1427 ft
Evansville
Carbondale
Owensboro
Radcliff
Martha Lane Collins Bluegrass Parkway
Audubon Parkway
Shawnee National Forest
KENTUCKY
Cape Girardeau
Paducah
Western Ky Parkway
Campbellsville
Daniel Boone National Forest
Edward T. Breathitt Parkway
Louie B. Nunn Parkway
Rogers Parkway
Cumberland Plateau
Corbin
Lake Cumberland
MISSOURI
VIRGINIA
Murray
Fort Campbell
TENNESSEE
Dale Hollow Lake
National River and Recreation Area
Kingsport
0
50 mi

Criteria Used to Select Key EV Corridors

Interstates

*"States should prioritize ... the Interstate Highway System."**

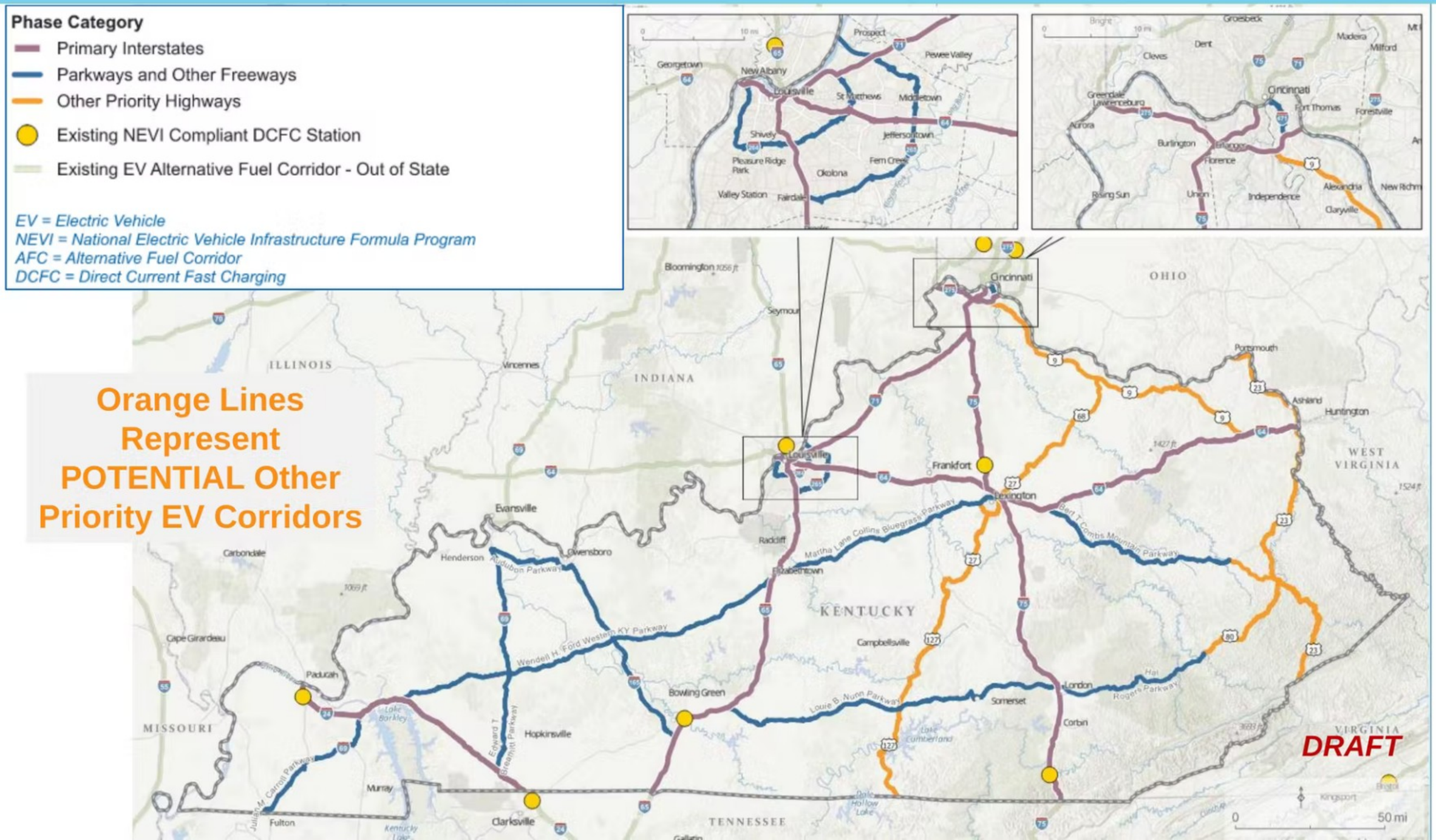
Long Distance Travel

*"... provide EV users with the confidence that they can travel long distances and expect reliable access to EV charging stations"**

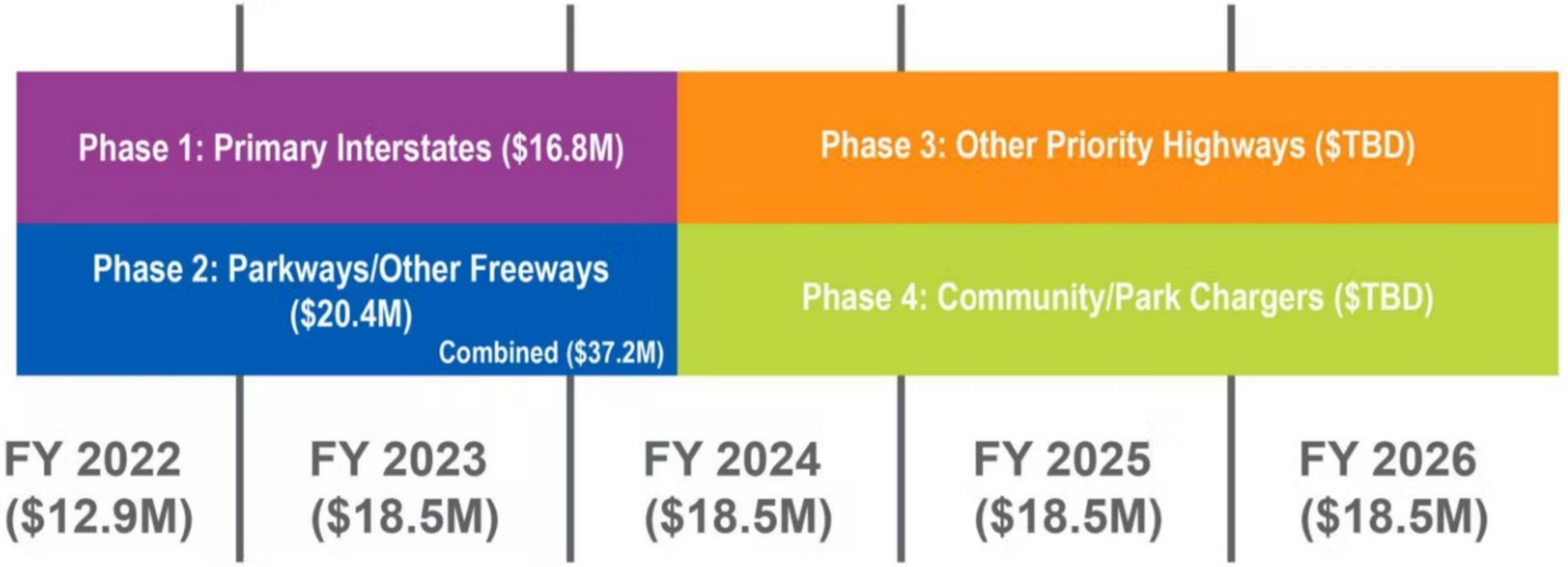
Connected National Network and Filling Gaps

*"fill gaps to provide a convenient, reliable, affordable, and equitable national EV charging network"**

* *All quotes from NEVI Formula Program Guidance issued February 10, 2022*


Phase Category
Primary Interstates
Parkways and Other Freeways
Other Priority Highways
Existing NEVI Compliant DCFC Station
Existing EV Alternative Fuel Corridor - Out of State
EV = Electric Vehicle
NEVI = National Electric Vehicle Infrastructure Formula Program
AFC = Alternative Fuel Corridor
DCFC = Direct Current Fast Charging
Orange Lines Represent POTENTIAL Other Priority EV Corridors
DRAFT
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
VIRGINIA
TENNESSEE
MISSOURI
Louisville
Cincinnati
Lexington
Frankfort
Bowling Green
Paducah
Evansville
Owensboro
Henderson
Hopkinsville
Campbellsville
Somerset
London
Corbin
Clarksville
Murray
Fulton
Portsmouth
Ashland
Huntington
Vincennes
Seymour
Bloomington
Elizabethtown
Radcliff
Carbondale
Cape Girardeau
Wendell H. Ford Western KY Parkway
Audubon Parkway
Martha Layne Collins Bluegrass Parkway
Louie B. Nunn Parkway
Edward T. Breathitt Parkway
Julian M. Carroll Parkway
Bert T. Combs Mountain Parkway
Hal Rogers Parkway
Lake Barkley
Kentucky Lake
Lake Cumberland
Dale Hollow Lake
Kingsport
Bristol
0
50 mi

Funding and Phasing



Total ($86.9M)

Federal $69.5M
Non-federal match $17.4M

In your opinion, what criteria should we use for the selection of other priority EV corridors?

You will have a chance to discuss this topic further in the breakout groups.

In your opinion, what criteria should we use for the selection of other priority EV corridors?

Density of potential users

EV registration density.

Traffic densities

the most traveled roadways.

EV registration by county

Disadvantaged communities

EV registrations

Population density

Regional Attractions

In your opinion, what criteria should we use for the selection of other priority EV corridors?

Population

Connect disadvantaged communities

Connectivity to the rest of the network

Average Annual Daily Traffic

Evaluation of long distance trips.

Traffic Counts

Major non interstate highways

Traffic data, current and expected EV registrations

Population density

In your opinion, what criteria should we use for the selection of other priority EV corridors?

Historically disadvantaged communities.

Lots of long distance travel

EV registrations.

Population growth by county

Traffic counts, key tourist destinations, especially those in under-served areas (like Red River Gorge)

VMT

Near multi-unit dwellings where people can't charge at home.

Distancing, the wilingness of businesses to participate, areas that are ripe for ec dev

Need to look at communities impacted by equity and justice needs

In your opinion, what criteria should we use for the selection of other priority EV corridors?

The best way to help as many people as possible

Regional Attractions

Proximity to grid and also number of drivers that pass each day

Proximity to Fleet operations; Job Hubs; AADT

Traffic volumes

Population density

Area in which EV's are being sold the most.

Disadvantaged Communities

Industrial/economic development activity in area

In your opinion, what criteria should we use for the selection of other priority EV corridors?

Electric grid capacity

Connectivity to other states

EV adoption propensity

Demand - where long distance trips occur

EV registration weight.

Population coverage within a X-mile radius

Grid capacity

Drivers on the corridors, access to population densities. If these EV corridors are being used in the states around KY.

Rural roads that serve as primary connectors

In your opinion, what criteria should we use for the selection of other priority EV corridors?

Availability of 3-phase power

population

Economic development (existing and future) opportunities

EV registrations

Look for gaps

highest rate of electric vehicle ownership

Assuring coverage across state to assure connectivity to include parkways, main roadways, destinations

Trip distances.

Tourist destinations

In your opinion, what criteria should we use for the selection of other priority EV corridors?

1 3 4 2

Connectivity to the entire network. Need full coverage. We have done over 5000 chargers across the country....may want to consider Level II and III at these locations vs all Level III. Helps to add functionality and allows you to do more with less

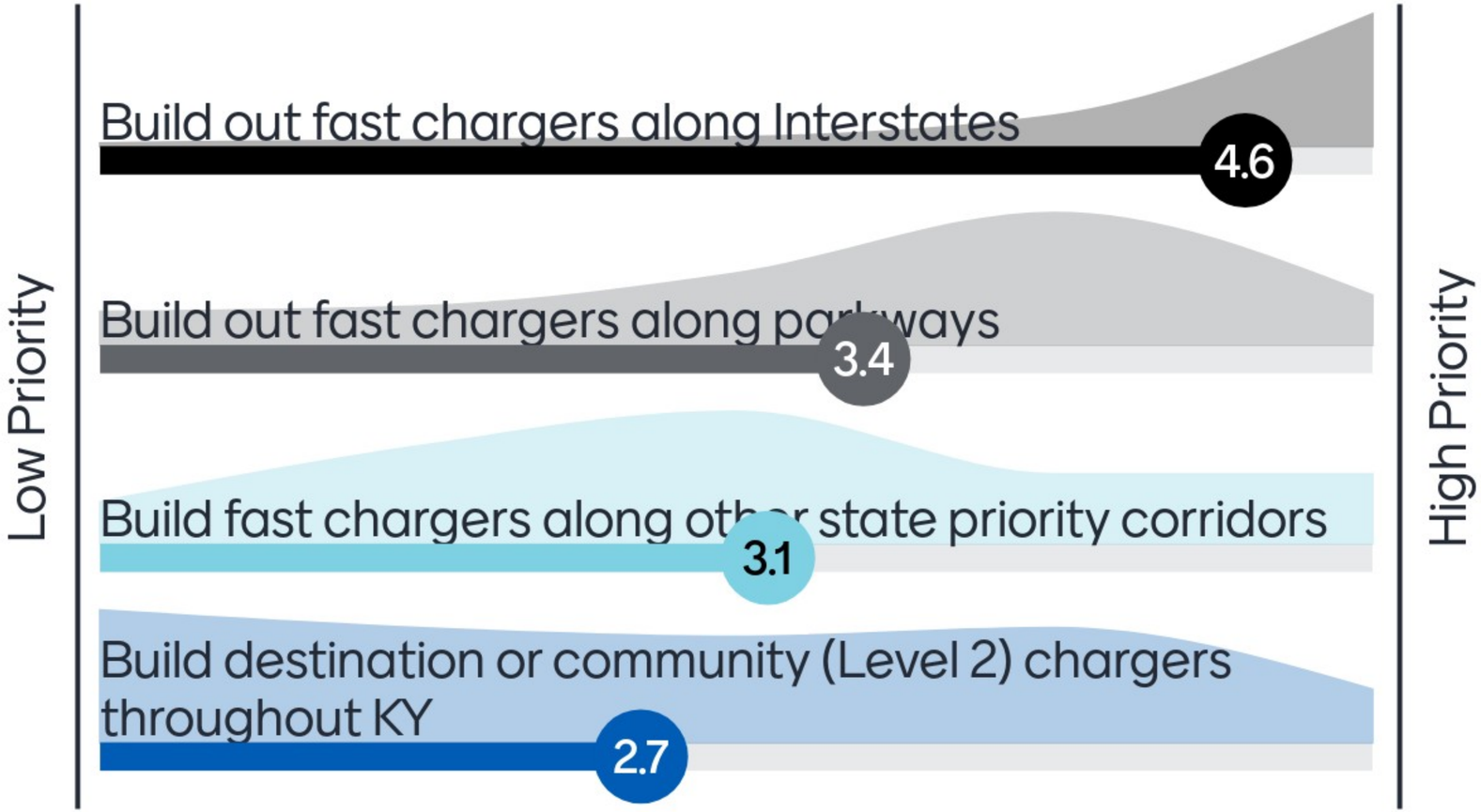
Easy ingress and egress (Time)

Help us prioritize the goals that can be met with KY's NEVI funding. Please rate the following:

1. Build out fast chargers along Interstates
2. Build out fast chargers along parkways
3. Build fast chargers along other state priority corridors
4. Build destination or community (level 2) chargers throughout KY

You will have a chance to discuss this topic further in the breakout groups.

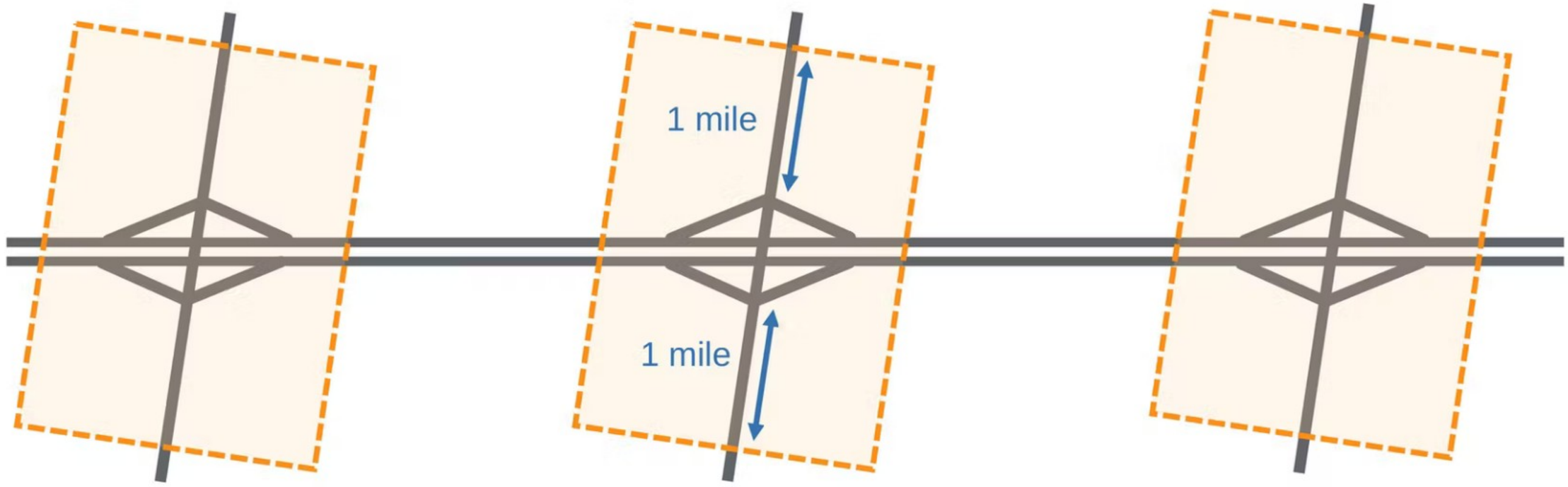
Help us prioritize the goals that can be met with KY's NEVI funding. Please rate the following:



State EV Infrastructure Deployment Plan Requirements

- Maximum 80% Federal Share
- Private Entities Can Be Involved
  - Construction, Operations and Ownership
- Federal Guidance Outlines Station Location Considerations, such as:
  1. Station Locations & Corridor Coverage
  2. Traffic Volumes; Long-Distance Traffic
  3. Power Availability and Reliability
  4. Amenities and Services
  5. Rural and Underserved Communities

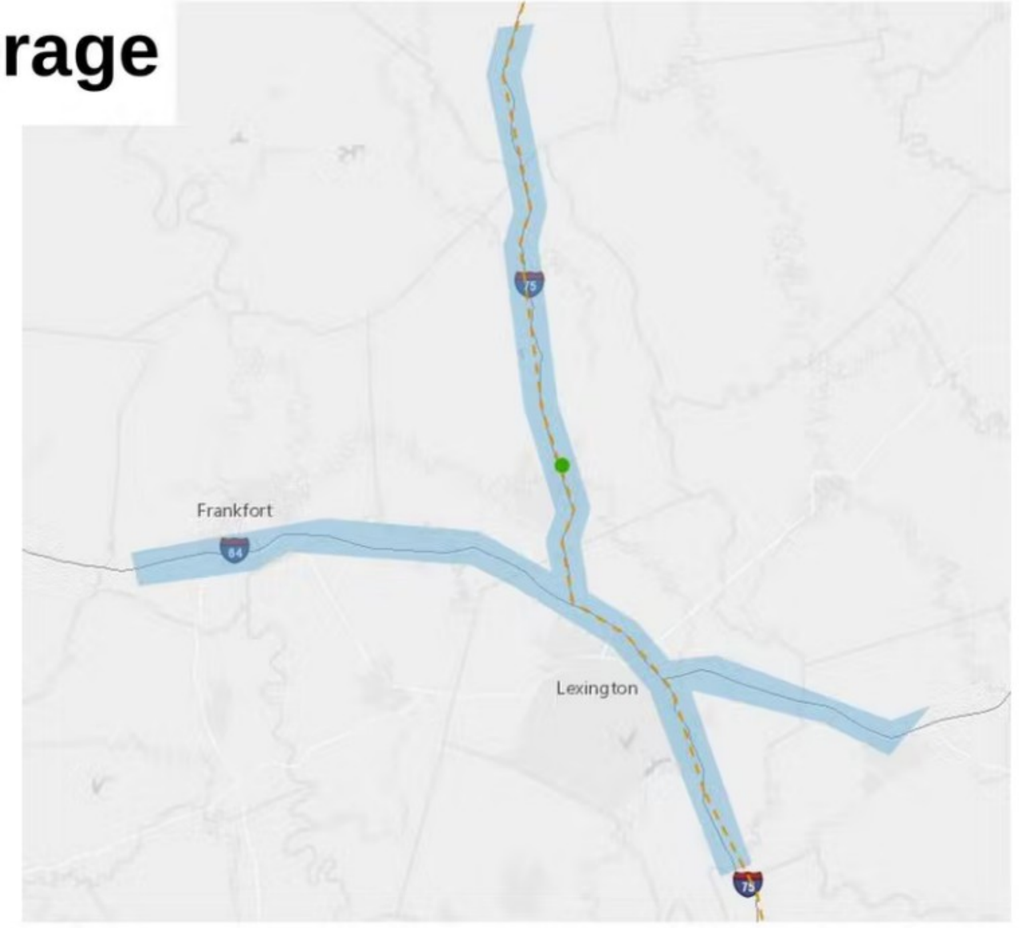
Plan is Evaluating Federally Defined Areas within 1 mile of a Corridor



The Plan is not examining specific sites.
The Plan is evaluating interchanges.

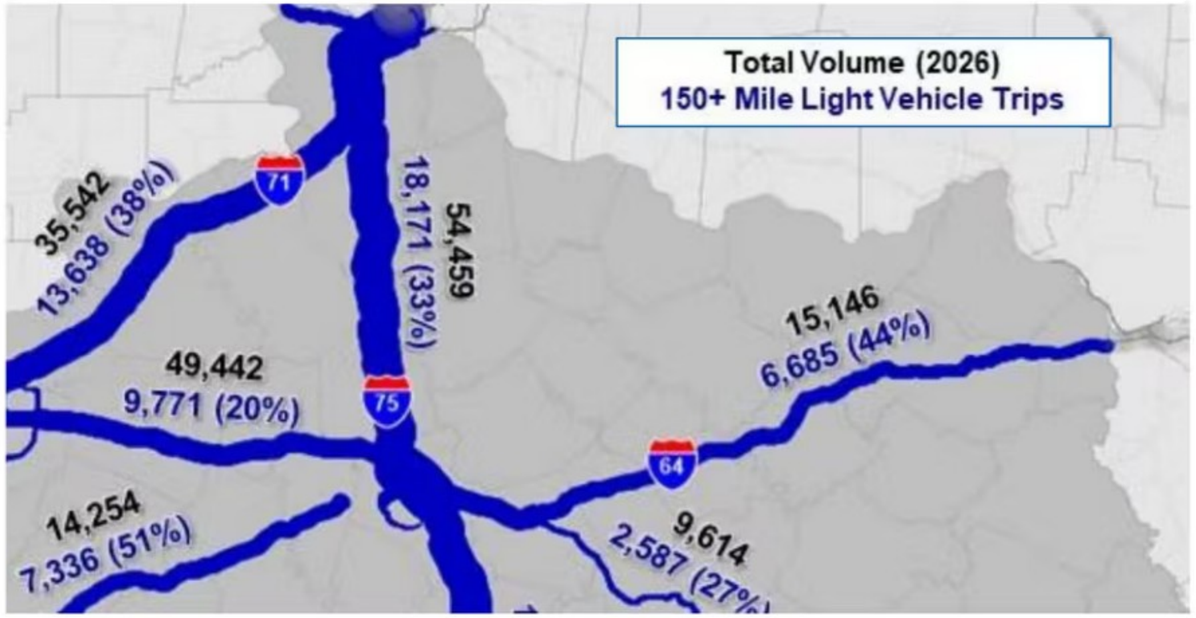
Interchange Evaluation Criteria

1. Station Locations & Corridor Coverage



Interchange Evaluation Criteria

1. Station Locations & Corridor Coverage
2. **Traffic Volumes; Long-Distance Traffic**



Interchange Evaluation Criteria

1. Station Locations & Corridor Coverage
2. Traffic Volumes; Long-Distance Traffic
3. **Power Availability and Reliability**

3-Phase Power Mapping and Substation Locations

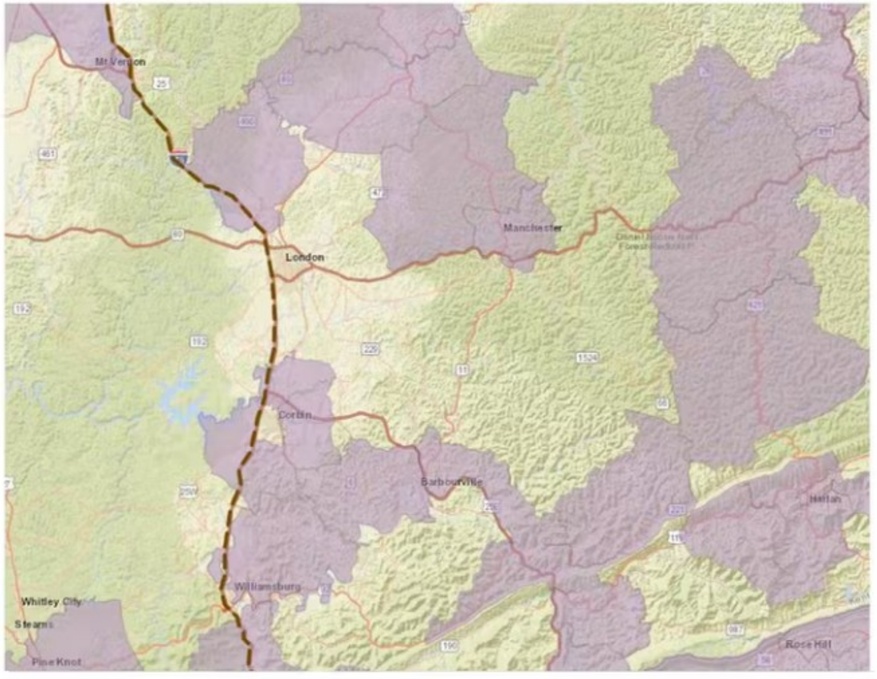
Interchange Evaluation Criteria

1. Station Locations & Corridor Coverage
2. Traffic Volumes; Long-Distance Traffic
3. Power Availability and Reliability
4. **Amenities and Services**

Interchange Evaluation Criteria

1. Station Locations & Corridor Coverage
2. Traffic Volumes; Long-Distance Traffic
3. Power Availability and Reliability
4. Amenities and Services
5. **Rural and Underserved Communities**

US DOT / US DOE
EV Charging Justice40 Map
(Disadvantaged Communities)



What other criteria should be considered for prioritizing interchanges for fast charging stations?

You will have a chance to discuss this topic further in the breakout groups.

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Population density

amenities

Major tourist destinations

Proximity to fleet operations

Traffic count

College campus.

security, accessibility, ease of entry/egress from location.

Willing business partners

community charging

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Ease of access

travel amenities

shopping centers

Specifically food amenities

Economic development opportunities

Security / visibility of site to mitigate opportunities for vandalism

Downtown locations when possible.

Look at where traditional stations are located and travelers are already accustomed to using and stopping at

Existing infrastructure locations should be considered

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Current electricity infrastructure on the ground now

Environmental justice communities

providing the fastest charging possible.

airports

Reducing range anxiety

destinations and areas of key economic development

amenities.

Population density

Publicly available at no cost 24/7

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Regional attractions

easily accessed

There has to be something for people to do while their vehicle is charging. Food, shopping, activity, etc...

Duplication with non-NEVI approved stations? e.g. location of Tesla Superchargers?

hospitals

Accessibility

Locations near interested fleet owning partners.

population density

Easy access

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Future development plans for the area.

Places to spend 30 minutes while the car gets juiced up

Shopping areas

What amenities are available within walking distance

I thought I heard 40% of funds should go to disadvantage locations is it's really part of your plan

We already have spaces on interstates where charging stations can be installed now. Rest areas!

Major tourist destinations.

24/7/365 nature of the amenities

Population density

What other criteria should be considered for prioritizing interchanges for fast charging stations?

Align locations with existing traveler habits

Plan Schedule

Meeting or Deliverable	Date
Large Group Stakeholder Meeting	March 23
Numerous Small Group Meetings/Events	*March – May*
Alternative Fuel Corridor Nominations to USDOT	*May 13, 2022*
Large Group Stakeholder Meeting	**May 18**
Small Group Stakeholder Meetings/Events	**May – June**
Large Group Stakeholder Meeting	**June**
Draft Final Plan	**End of June**
EV Infrastructure Deployment Plan to USDOT	**Prior to August 1, 2022**

Breakouts

Question 1: Additional criteria for high priority EV corridors

Question 2: Criteria for prioritizing interchanges for fast charging deployments

Question 3: Level 2 (Phase 4) compared to DCFC (Phase 1-3) on high priority corridors

Question 4: Thoughts on higher power levels and freight charging

Question 5: Other questions to bring back to the larger group

Question One

In your opinion, what criteria should we consider for selecting other priority EV corridors?

Question Two

Which criteria are most critical for prioritizing interchanges for fast charging deployments?

1. Station Locations & Corridor Coverage
2. Traffic Volumes; Long-Distance Traffic
3. Power Availability and Reliability
4. Amenities and Services
5. Rural and Underserved Communities

Are we missing any key considerations?

Question Three

Help us prioritize the goals that can be met with KY's NEVI funding.

How would you prioritize the four goals below and why?

1. Build out fast chargers along Interstates
2. Build out fast chargers along parkways
3. Build fast chargers along state priority corridors
4. Build destination or community (level 2) chargers throughout KY

Question Four

There has been discussion about the need for more power at charging stations as battery technology improves. There has also been discussion about the need to charge freight vehicles.

Do you have thoughts on either of these topics that we should consider as we develop Kentucky's Plan?

Question Five

What other questions do you have about Kentucky's EV Infrastructure Deployment Plan?

Main Meeting Report Outs

Kentucky's Electric Vehicle
Infrastructure Deployment Plan

Adjournment

KY EV Plan Contact Email:
EVPlan@ky.gov

Weblink to sign up for future emails:
Transportation.ky.gov/Planning/Pages/EVPlan.aspx