



RFI Outcomes Report

Development of Guidance for
National Electric Vehicle Infrastructure (NEVI)
Formula Program Deployment

Full Report

—

May 2022

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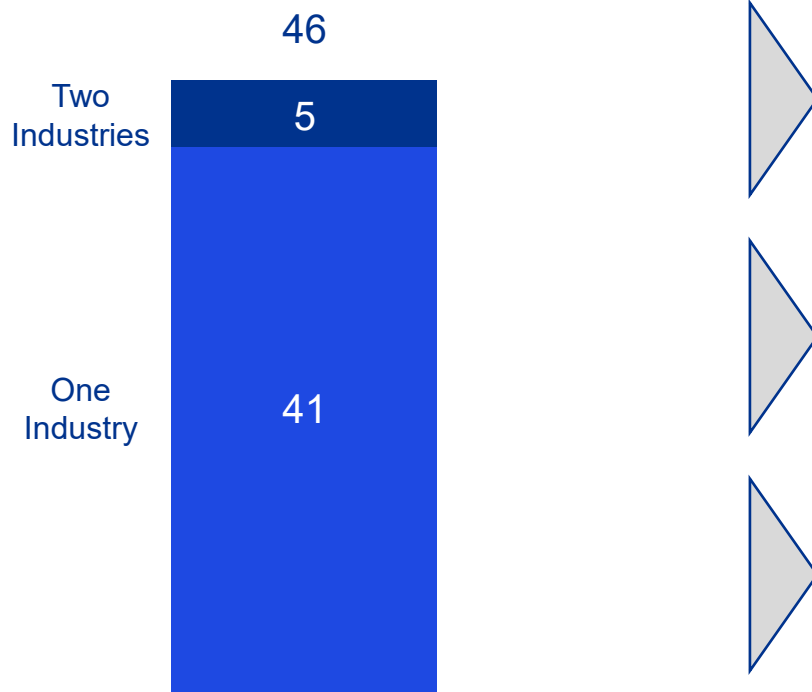
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01

Respondent Profile

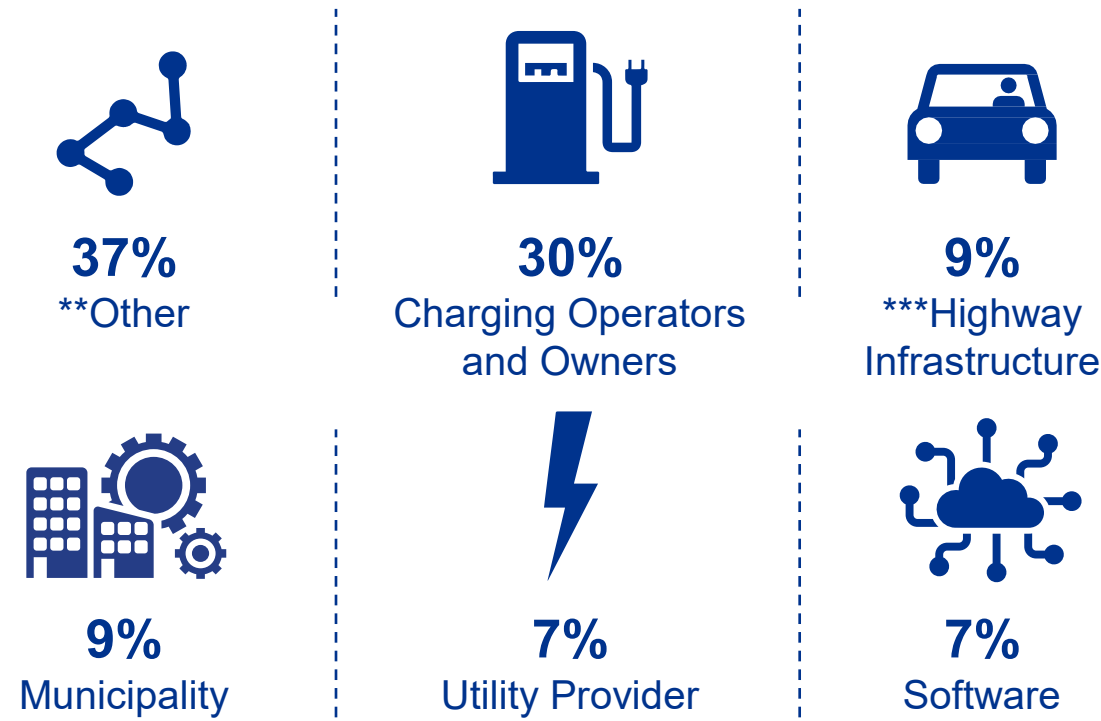
The 46 respondents to this RFI vary greatly by industry with several associating with multiple industries

Number of Industry Type(s) per Respondent



Single vs. Multiple Industries

Top 6 Industries Represented as a Percent of Respondents* (More than one selection possible)



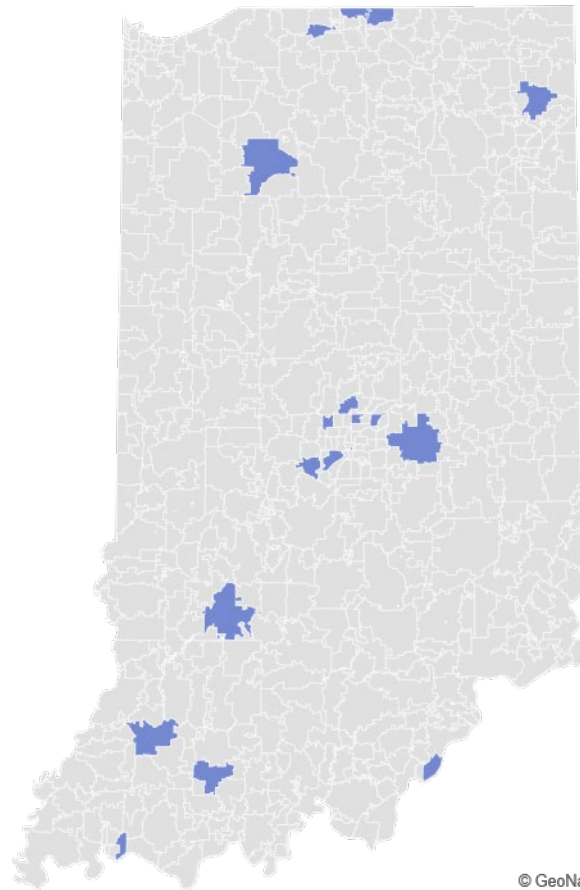
*Remaining respondent types include (1) OEM/Energy Infrastructure, (2) Member of Indiana MPO and IARC and (3) Retail Fueling Stations

**Includes but is not limited to business associations, education centers and consulting firms

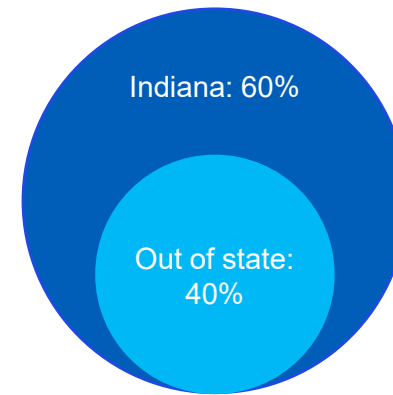
***Includes but is not limited engineering firms and concessionaires

RFI respondents are primarily headquartered within Indiana, though spread across the state; most are project sponsors and/or owner operators

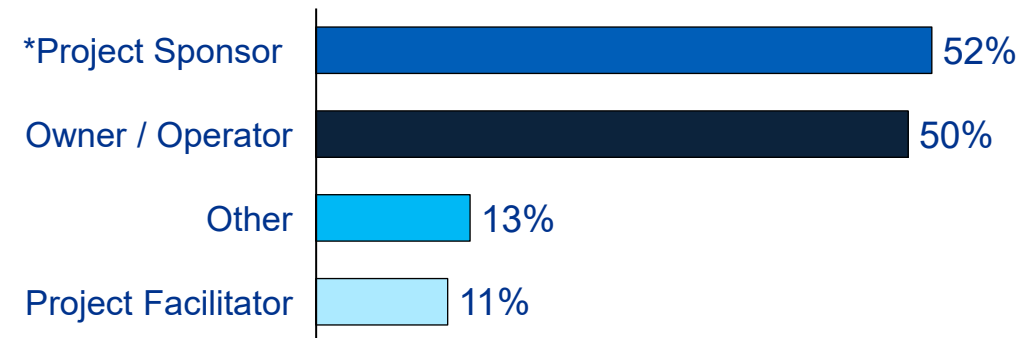
Concentration of 25 Indiana respondents based on HQ zip codes



Where are respondents headquartered?



What role(s) do respondents have in building EV infrastructure? (More than one selection possible)



**Provides direct investments / financing into EV infrastructure*

02

Executive Summary

Based on responses, 5 overarching themes emerged

01

Federal funding, sustainability / decarbonization initiatives and OEM production are the key drivers to respondent interest in EV adoption; for their part, Indiana municipalities wish to leverage EV charging as an economic enabler. Utilities will be pressed to consider impacts to physical infrastructure as early as **2025-2027**.

02

There is an **emphasis on fast charging for light duty vehicles**, with a focus on developing DCFC's along highway corridors for public charging; Level 2 chargers affiliated with residential and commercial space are a secondary focus given the availability of federal funds

03

Responses highlight a **need for the public sector to target rural and urban disadvantaged areas**, citing these areas will be inadequately serviced by private sector due to high costs, uncertain utilization and lack of policies to mandate charging build-out

04

The majority of respondents aim to access NEVI federal funding directly or through partnering with INDOT; others indicated an interest in indirect involvement (e.g., support organizations by facilitating NEVI applications)



05

Respondents indicated a lack of clarity and a desire for central coordination on topics such as available funding and monetary incentives, legislation on EV charging (HB1221), project opportunities, current consumer demand/ utilization and mitigating EVSE supply chain issues





03

General Response

This RFI was structured into 7 sections that addressed several objectives and topical areas (1/2)

	Section	Key Objective(s)	Topics
	(1) Market Motivations	Gain insight into market motivations from various stakeholders that drive investment and activity in EV charging	<ul style="list-style-type: none"> EV adoption forecasts and market inflection points Summary of existing EV charging market activity and deployment targets High priority segments for charging Expected time horizons for returns Preferred cost-sharing and partnership agreements
	(2) Federal Funding	Gauge level of interest and need for Bipartisan Infrastructure Law (BIL) funding opportunities, participation and engagement with other federal funding resources	<ul style="list-style-type: none"> Opportunity areas and stakeholders Federal funding application requirements Management of funds and monitoring the effectiveness of dollars invested
	(3) EV Charging Build-out Planning Considerations	Identify key planning considerations for EV charging build-out	<ul style="list-style-type: none"> Target population / users Charging hardware mix and optimal locations Potential for innovative charging technologies (wireless charging, inductive road charging, etc.)

This RFI was structured into 7 sections that addressed several objectives and topical areas (2/2)

	Section	Key Objective(s)	Topics
	(4) Servicing Specific Communities	Determine level of interest in servicing specific communities and gauging which communities are likely to be underserved	<ul style="list-style-type: none"> ▪ Rural areas of Indiana ▪ Other areas that may lag in EV adoption ▪ Underserved communities
	(5) Delivery Readiness	Gain insight into delivery readiness to successfully implement EV charging programs	<ul style="list-style-type: none"> ▪ Methods in meeting legislative requirements (e.g., Buy America, MBE / WBE charge station buyers) ▪ Initiatives to upskill or build-out required workforce
	(6) Operations and Performance Monitoring	Gain insight into metrics and performance monitoring techniques that determine successful EV charging programs	<ul style="list-style-type: none"> ▪ Metrics that demonstrate commercial success (e.g., target utilization / uptime) ▪ Metrics and methods that demonstrate social and environmental benefits ▪ Reporting methods, frequency and audience
	(7) Working with INDOT	Obtain an in-depth understanding on how INDOT can directly support implementation for various respondents	<ul style="list-style-type: none"> ▪ Federal and state funds in sponsorship role ▪ Direct expertise (as a project advisor) or indirect (as a facilitator) ▪ Traffic or road user data as a participant

Section Specific Summaries: (1) Market Motivations

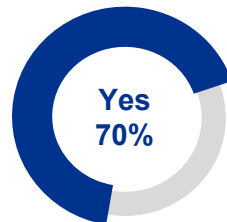


Market Motivations

Respondents indicated federal funding, sustainability / decarbonization goals and OEM production are driving their interest in EV adoption, DC Fast Chargers and development of EVSE in rural and underserved areas

Yes / No Questions (n = 46)

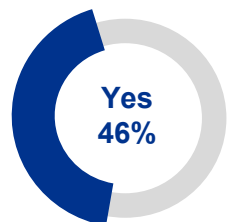
Market Motivations, Q4: Are you interested in making direct investment into EV charging infrastructure?



Select Industry Types



Market Motivations Q5: Has your organization engaged in cost/revenue sharing models in the operation of EV charging infrastructure?



Select Industry Types



Key Takeaways

- Respondents indicated **grant programs and government funding are crucial to developing EV infrastructure**, particularly in areas where it is not currently profitable
- **Generally, organizations are linking EV initiatives to broader sustainability** or supply chain plans (e.g., solar panel installations)
- Rural municipalities noted they fear range anxiety will **decrease ‘daytrippers’ and other forms of tourism** if EV infrastructure is not developed in their areas
- DC Fast Chargers were noted as previously being cost prohibitive, but with the aid of government funding, these may become economical
- Utility providers indicated concern about **the grid keeping up with demand boosts** caused by DCFC’s and rapid EV adoption
- **Leases tend to be the most common delivery model** for respondents with current agreements with charging companies, but a variety of alternative delivery models exist

“
Electrification of transportation now seems inevitable with commitments made by automotive original equipment manufacturers (OEMs) to manufacture more electric vehicles (EV), federal funding opportunities and market interest in electric vehicles from a sustainability perspective.
”

“
Grant programs play an important role in expanding the availability of charging, because they can act as a market stimulant to incent credible charging companies to extend their infrastructure footprints ahead of when they otherwise might.
”

Section Specific Summaries: (2) Federal Funding

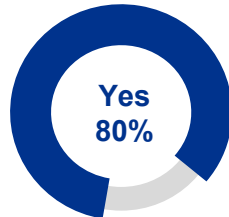


Federal Funding

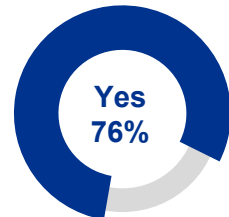
NEVI funding was overwhelmingly cited by respondents as a key accelerator to EV adoption though respondents were less clear on who they intend to partner with to access funds – many stated INDOT while others are exploring other options

Yes / No Questions (n = 46)

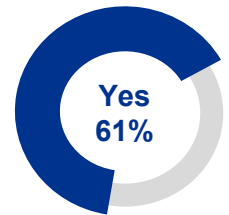
Federal Funding, Q1: Does your company have any plans to access federal funding related to Electric Vehicles and Electric Vehicle infrastructure (e.g., NEVI or other discretionary federal funds)?



Federal Funding, Q2: Does your organization plan to partner with any state or private entities to make use of federal funds for Electric Vehicles and Electric Vehicle infrastructure?



Federal Funding, Q3: Is your organization planning to apply for competitive/discretionary grant funding under for EV charging infrastructure under the Bipartisan Infrastructure Law?



Key Takeaways

- The majority of respondents expressed an interest in **partnering with INDOT to access funds** while others are focused solely on **providing NEVI funding application support**. Support types include:
 - Financial – 20% match for NEVI funding
 - Planning and Development – Identification and installation of highway / public charging sites
 - Application – INDOT application assistance
- Non-charging operator/owners in both the public and private sectors expressed intentions to **invest directly into EV infrastructure**, including utilities who will play a role in shaping the utility infrastructure supporting charge stations and may have insights into overall electrical network needs
- Many respondents seek clearer guidance on total federal and state funding options and requirements**, alongside rebates, tax benefits and other incentives provided by utilities and agencies

“ We have the goal of providing EV charging access to every community and intends to seek discretionary federal funding to build charging infrastructure in rural, tribal, under served and economically disadvantaged communities. We feel that most EV charging infrastructure companies will overlook these communities and if the electrification of transportation is to be successful, then everyone will need ready access to public charging infrastructure. ”

“ Due to the exorbitant upfront costs of the fast charging stations, federal assistance with funding will be greatly desired. ”

Section Specific Summaries: (3) EV Charging Build-out Planning Considerations (1/2)



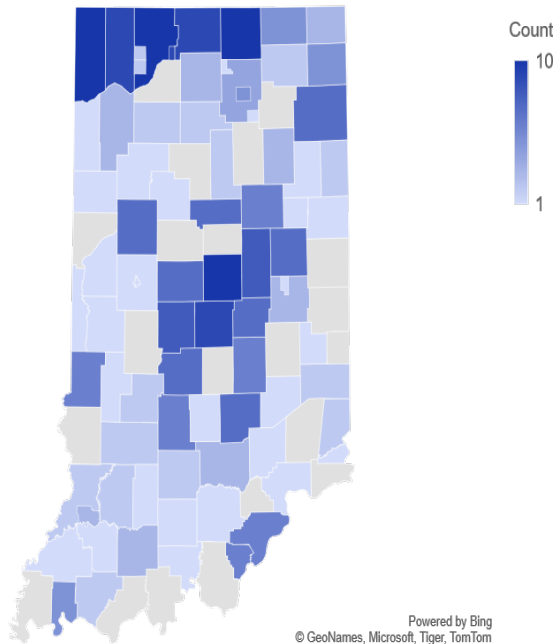
EV Charging Build-out Planning Considerations

Respondents expressed an interest in prioritizing EV build-out at locations and counties with higher EV adoption and areas adjacent to designated alternative fuel corridors

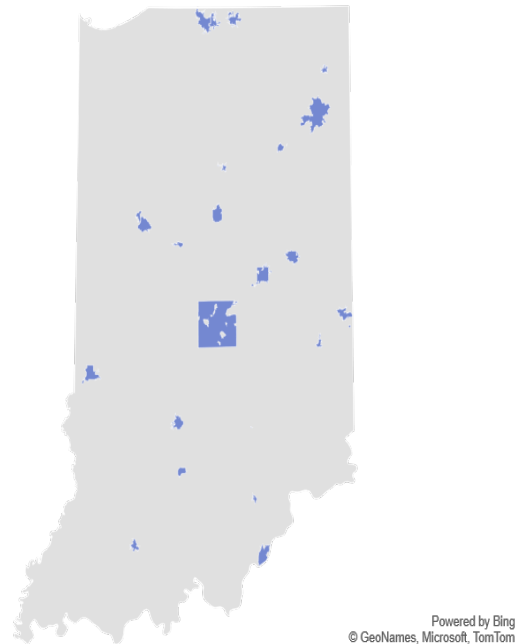
Target Geographic Segment

EV Charging Build-out Planning Considerations, Q3: Please identify specific geographical segments (if applicable, please reference individual counties or metropolitan areas below) within Indiana that are of interest for your organization's EV charging programs.

Respondents are interested in the following counties

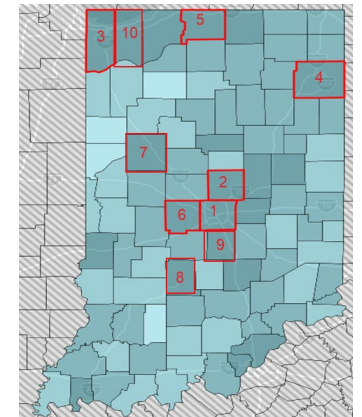


Respondents are interested in the following MSA areas



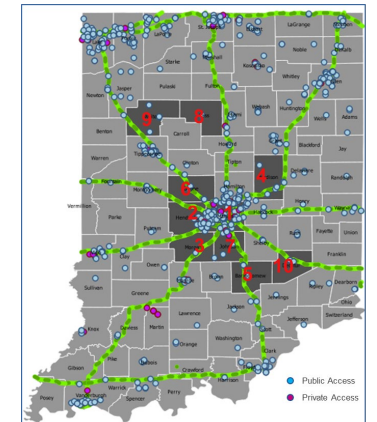
Current EV Adoption and Infrastructure

EV adoption is concentrated in counties that have high population density, (e.g. Marion, Hamilton) that are primarily urban areas



Population per sq. mile (2010) 1.2 - 34.9 39.9 - 77.1 87.1 - 168.4 174.8 - 411.2 460.8 - 9,856.5

Designated Alternative Fuel Corridors (in green) are currently aligned to the routes / trips / counties where there is immediate charging need, based on expected rate of EV trip failures in 2025



Section Specific Summaries: (3) EV Charging Build-out Planning Considerations (2/2)



EV Charging Build-out Planning Considerations

Infrastructure for DC fast and ultra fast chargers along highways is most desired by respondents; to avoid building stranded assets and effectively facilitate future charging expansion, respondents seek improved coordination among participants

Key Takeaways

- Respondents desire a **focused EV build-out for DC fast and ultra fast chargers along highways for light duty vehicles** with the exception of some municipalities citing a need locally for their bus fleets; an interest in developing Level 2 chargers at residential and workplace locations was also noted
- Considerations shared to identify suitable charger locations include: (1) Current electric vehicles penetration and traffic patterns; (2) Expected utilization of stations (charging standards may be a factor of this); (3) Utility readiness / utility investment costs; (4) Station durability / resilience and (5) EV ambitions from community leaders
- Cited planning risks include: (1) Stranded assets; (2) Inability to expand network due to physical and design constraints; (3) Supply chain issues; (4) Insufficient power and (5) Resilience to weather and grid events
- **Respondents seek a coordinated site planning effort with utilities to reserve conduits and real estate for future expansion, as well as work with utilities** to implement innovative solutions that ease peak load and offset necessary upgrades and demand fees. Solutions cited by respondents including battery integration and solar power microgrids
- **Ongoing data sharing on current and planned sites, as well as utilization and regional demand** was stated by respondents to mitigate the risk of stranded assets
- Charging owner / operator respondents also cited the risk of supply chain shortages for future expansion and are working with suppliers on sourcing materials and/or directly investing in US-based manufacturing

“

Our sites are designed with future upgrades and expansion in mind; for instance, our 150 kW and 350 kW dispensers are the same piece of equipment and can be upgraded by increasing the power supply on the equipment pad with no need for trenching or replacing dispenser equipment.

”

“

Our target customers/users are the rural EV drivers that live in our communities along with travelers that visit...We believe that DCFCs are an immediate need...Big EV truck depots and fleet charging will be important as well but isn't as immediate as public DCFCs.

”

Section Specific Summaries: (4) Servicing Specific Communities

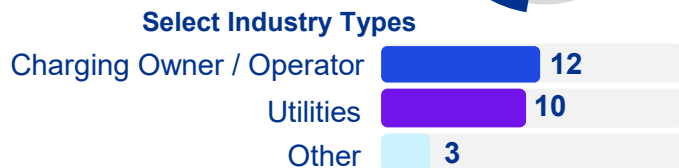
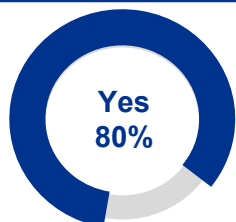


Servicing Specific Communities

Respondents relayed the need for the public sector to support scaling charging infrastructure for rural and underserved locations through planning guidance and funding

Yes / No Questions (n = 46)

Specific Communities, Q1: Are you interested in making direct investment into EV charging infrastructure?



Key Takeaways

- Most respondents have a desire to service rural, underserved, or disadvantaged communities, but require **the State to provide clear guidance for addressing deployment challenges**, lead project prioritization efforts and supply funds to scale existing efforts
- Rural areas and disadvantaged urban segments** (multi-unit dwellings) were identified as key segments for targeting EV build-out; communities that suffer from elevated pollution levels were also cited
- For rural areas with uncertain utilization, operational assistance provided through **federal funding and additional subsidies will be required to combat expected high costs**, which come from high demand charges from utilities and high maintenance costs
- Needs outside of NEVI’s scope include a desire to incentivize homeowners to install charging and to implement low-cost community fast-charging programs at multi-unit homes / rental properties in urban areas

“ One location is planned along the contracted portion of the East End Crossing. Ideally we would have DC Fast charging but will be considering Level 2 charging as an option or fall back. ”

“ Pike County is part of the area's that is a coal community that is looking for redevelopment uses outlined in Biden's plan. ”

Section Specific Summaries: (5) Delivery Readiness



Delivery Readiness

Respondents indicated that data gaps and supply chain issues would be the biggest challenges facing delivery readiness

Key Takeaways

- **Government transparency and public datasets on EV charging progress across the state and program selection is highly desired**
- Most significant data gaps cited are: 1) Ongoing updates for DC Fast Charging locations within Indiana (including those that are still undergoing approval; and 2) Best practices and standards related to operating hardware and software
- There is some evidence of specific retail site charging interest and use cases from key respondents (Tesco, Good Oil, J Kruse, Leo's, etc.)
- No significant workforce gaps were noted, with most charging operators stating that the talent base and skill sets are increasing on par with growth of charging demand
- **All respondents cite issues with scaling up 'Buy America' EV charging hardware** due to supply chain issues (lead times of over 30+ weeks) and 2-3 years was cited as the required time to stand up US-based production lines
- Respondents are pursuing the following solutions in response to supply chain issues:
 - Monitoring regulatory developments to remain compliant
 - Working with subcomponent suppliers to increase their US manufacturing capabilities
 - Establishing a US manufacturing site
 - Establishing new relationships with DC manufacturers that anticipate meeting Buy America requirements
 - Seeking a waiver from Buy America requirements for immediate EVSE deployment over the next few years

“
The most significant data need facing our organization will be the ongoing update of information regarding DC Fast Charging Infrastructure locations in current operation as well as those that have been approved or are in the approval process.
”

“
We strongly recommend that INDOT provide a grace period of no less than three years...This finite period, coupled with effective industrial policies...will help to better catalyze industrial growth in Indiana.
”

Section Specific Summaries: (6) Operational and Performance Metrics



Operational and Performance Metrics

Respondents are increasingly incorporating environmental and social metrics into measuring effectiveness of EV charging infrastructure, tying program performance to increases in EV adoption across different communities

Key Takeaways

- A large number of respondents **tied effective charging infrastructure program performance to increases in EV adoption** (e.g., measured by EV tolling relative to ICE tolling, number of EVs increasing in a specific neighborhood)
- **Measuring uptime, utilization, number of vehicles charged, amount of time each vehicle charged, amount of power used** has supported existing charging operators in assessing effectiveness of charger placement within communities
- **Federal tools such as the US EPA EJ Screen tool are cited as a key driver for network planning** as well as environmental justice indicators
- Environmental metrics are being increasingly tied to financial or commercial metrics and are related to tracking greenhouse gas associated with the charging network and the impact of reduced fossil fuel use
- Beyond environmental metrics, **social metrics are increasingly being adopted as a part of planning and design but are generally considered through a ‘top-down’ lens** (meaning they are often considered through a portfolio lens rather than by individual program). Examples include:
 - Utilization of EV charging locations in low-income and disadvantaged communities relative to state average
 - Percent of investment in low-income and disadvantaged communities
 - Percent of investment in rural versus urban areas
 - GHG reductions in low-income and disadvantaged communities relative to state average
 - Growth in EVs registered and growth in eVMT relative to state average

“ [Newburgh] is located in the Ohio valley and power is provided by predominately by coal fired fossil fuel power plants that result in poor air quality. EVs coupled with green sources of power should provide an opportunity for future generations to live in a less polluted environment. ”

“ Utilization and average charge time are what we mainly focus on when determining the social benefit from our chargers. The higher the utilization and growth seen over a period of time, the better insight we have on adoption of EV transport in a specific area. ”

Section Specific Summaries: (7) Working with INDOT

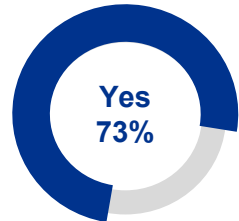


Working with INDOT

Respondents expressed a desire for INDOT to provide information on suitable locations and partners, NEVI fulfillment requirements and data on locations for existing and planned DC Fast infrastructure

Yes / No Questions (n = 46)

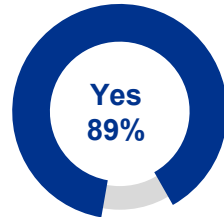
Working with INDOT, Q2: Please elaborate if you would like to work with INDOT to apply for NEVI formula funds and what factors would drive your interest?



Select Industry Types



Working with INDOT, Q4: Does your organization believe there is scope for data sharing between your organization and INDOT in order to make decisions on planning or delivering EV charging programs?



Select Industry Types



Key Takeaways

- Overall, respondents were enthusiastic about INDOT taking the lead to coordinate among charging operators, major retailers and municipal governments for the purpose of DCFC development through informal or formal channels (e.g., forums) with the goal of providing integrated seamless charging to drivers
- Most respondents cited an interest to work with INDOT in fund-matching (20%); many also expressed a desire for INDOT to take a proactive role in marketing and signaling potential project opportunities
- A significant number of respondents advocated for rural, disadvantaged, or underserved locations as priority candidates for fund-matching opportunities
- Other areas for INDOT support include:
 - Adoption of statewide signage along corridors
 - Coordination with utilities, including creating a forum for partnerships between governments, major retailers and charging deployment entities

“The infrastructure to support the new technology will be taken over by the private sector when EV's become mainstream...This initial effort will require good communication [from the state], data sharing and innovative thinking to launch successful program.”

“ITRCC is looking for support from INDOT to find the best possible EV infrastructure solutions... specifically, information regarding the availability of EV charging infrastructure solutions for both LV and HV charging, potential funding partnerships and sources.”

Section Specific Summaries: Additional Considerations



Additional Considerations

Respondents highlighted that EV charging can be used as an economic enabler to local communities; they separately shared “best practices” for deploying EV chargers, such as developing partnerships, utilizing solar energy and mobile charging rigs

Key Takeaways

- Respondents believe creating EV infrastructure **will boost local economic development**. For example, one shared that providing appropriately located destinations to charge in **small communities** will boost local business traffic
- Battery storage and solar onsite are cited as providing multiple benefits including:
 - Electric grid resiliency
 - Demand response
 - Additional revenue generation
 - Load-sharing to minimize grid impact
 - Promotion of green and sustainable power
 - Storage battery integration for “peak-shaving” in an effort to reduce demand fees
- One respondent indicated they possess a **mobile charging station** that can be used for short-term events or for locations interested in testing an EV charger

Potential Agency Partners Cited



“The actual construction of a charging station takes just 4-8 weeks, but the entire process to bring a fast charger online—from site host engagement through utility engagement and permitting to utility interconnection—currently takes an average of 18 months.”

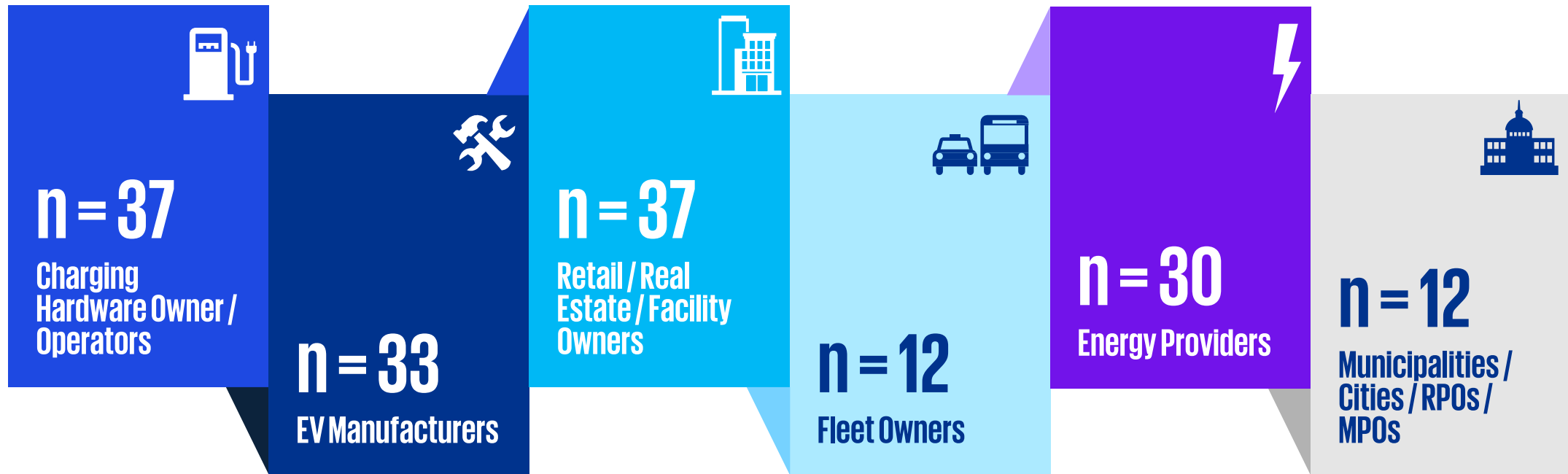
“To energize charging stations within six months of obligating funding, a goal set in the NEVI guidance, stakeholders in the EV charging ecosystem should work together to address the bottlenecks in third-party charger deployment.”

04

Participant Type Response

Beyond the general responses received, respondents provided information based on their participant type within the EV value chain

Respondents were able to select multiple participant options when selecting participant types*

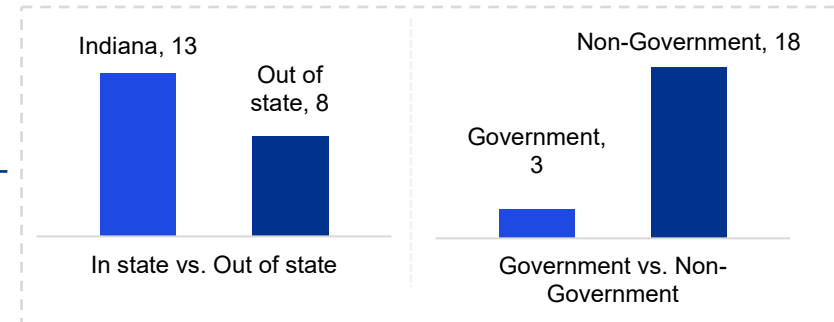
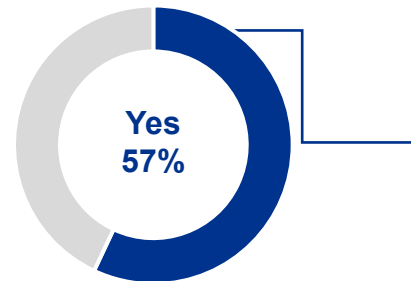


*n represents the highest respondent number to a question within a given participant type

Participant Type Observations – Charging Hardware Owner/ Operators

Q1: Do you have any plans to work with public / private sector entities to support scaling your operations? Please be specific on what types of entities and what type of support.

n = 37; Yes = 21

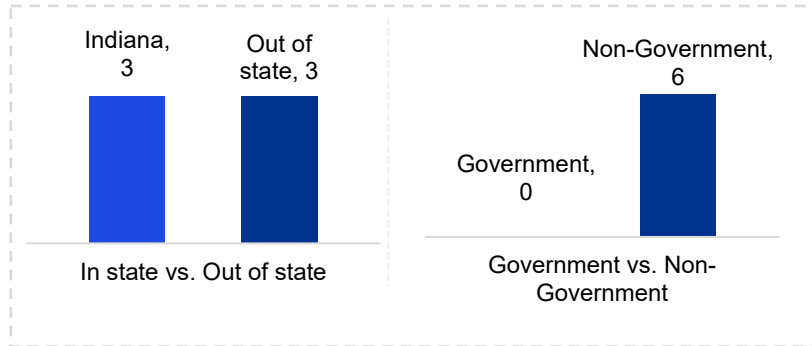
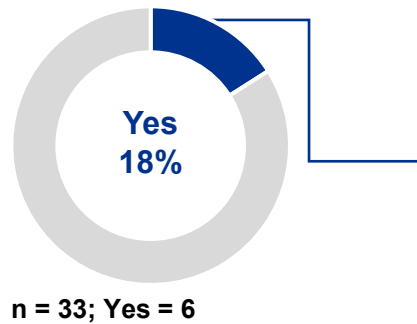


Key takeaways

- Respondents believe that revenue/cost sharing agreements and/or P3s offer the ability to quickly respond to the market and evolving EV needs of a public partner. They also offer shared risk of capital investment, inclusive business relationships, reduced cost burden and acceleration of EV infrastructure in areas of high demand
- Participants shared that they are most interested in P3s related to research, innovation or IP for future expansion
- There are diverse perspectives on charging rates / fee structure. Some participants noted that varying customer charging rates by time of day penalizes those who have no access to home charging and rely on public charging as their primary means of fueling and runs counter to the equity objectives of the program. Alternatively, other participants stated that fee structures based on usage - either time or energy - drive utilization by incentivizing customers to charge more (not waiting for full charge)
- For rural sites, NEVI will need to expand the cost sharing beyond capital contributions (typically seen in public funding programs) by including operations and maintenance funding to make them commercially viable in preparation for future demand
- Reliability is a priority and operators are committed to a high percentage uptime across the network and invest accordingly to ensure demand is met
 - NEVI guidance should address uptime as a critical priority and ensure private sector contracts are structured to align these incentives
- Technology obsolescence risk is high for short-term agreements and participants seek clear value proposition for technologies in preparation for major maintenance / replacement needs after 5 years

Participant Type Observations – EV Manufacturers

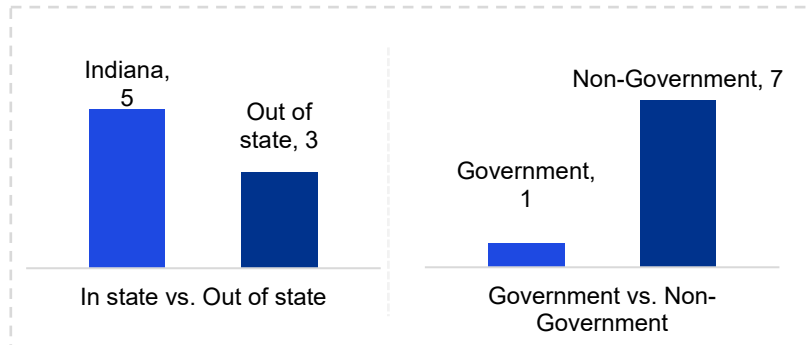
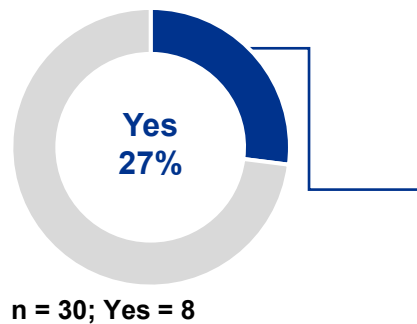
Q1: Do you have any plans of direct investment into scaling private networks? If yes, please expand and specify the nature of your involvement (partnership, direct owner/operator) and key decision factors. If yes, please expand and specify the nature of your involvement (partnership, direct owner/operator) and key decision factors.



Key takeaways

- Respondents stated that **EVs are still in their infancy and as a result, continue to evaluate and assess the best options** for this type of investment (note two respondents provided detailed responses)

Q2: Do you have any plans of direct investment into scaling public charging networks? If yes, please expand and specify the nature of your involvement (partnership, direct owner/operator) and key decision factors).



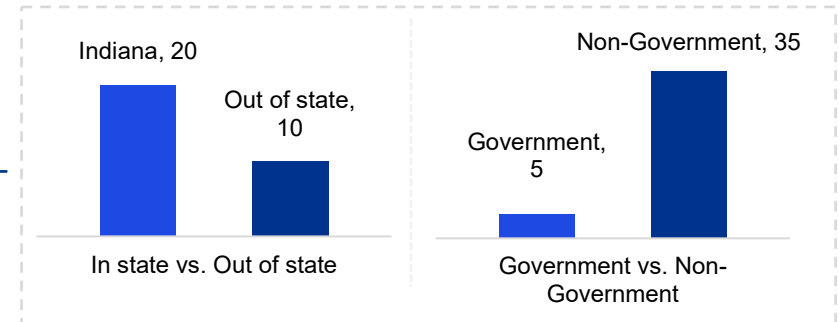
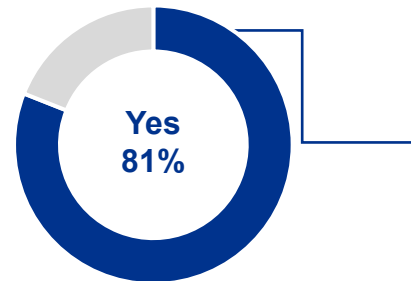
Key takeaways

- Similar to the above, two detailed responses were received, with one respondent stating that scaling public charging networks is currently being explored but “timing is everything”
- Additionally, respondents shared that “creative business model[s] are needed for wide adoption of EV charging infrastructure” (similar to a P3 model)

Participant Type Observations – Retail/ Real Estate / Facility Owners (1/2)

Q1: Have you considered building EV charging stations for customer-use at your locations? If yes, please detail any key planning considerations.

n = 37; Yes = 30



Key takeaways

- Respondents vary in terms of if and how they are considering building EV stations for customer use onsite, but broadly fall into three categories:
 - Planning to build EV chargers** - The majority of respondents stated that they are considering specific sites / areas for charging including along Indiana Toll Road, US 231, I-64, city owned land and commercial facilities
 - Built conduits or other precursors to EV chargers** - Some respondents have installed EV charging conduits for future addition of chargers at parking lots or are evaluating how to best to facilitate future EV charging features during facility construction and remodeling
 - Built EV chargers** - Respondents shared that they have onsite EV charging capabilities at their private offices or facilities

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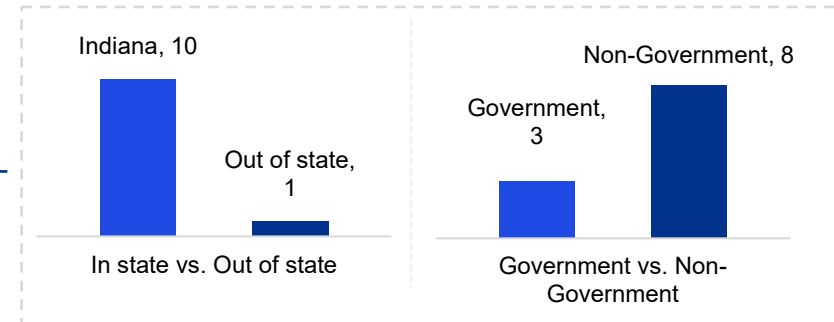
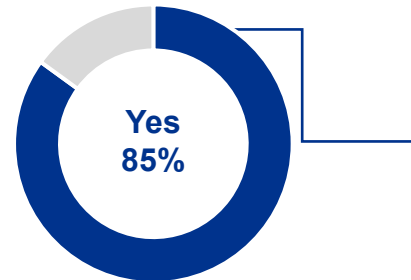
Super chargers were too expensive to get a payback on so we installed conduits for future addition at parking lots.

”

Participant Type Observations – Retail/ Real Estate / Facility Owners (2/2)

Q2: Have you considered leasing and/or revenue sharing agreements to allow EV charging station owners/operators to offer EV charging stations for customer-use at your locations? What about adjacent services or concessions?

n = 13; Yes = 11



Key takeaways

- Some respondents are considering agreements but stated they need to learn more about these agreement types. **The majority of respondents made clear that leasing and revenue sharing agreements were only being contemplated with little to no pursuit of this arrangement type given either a lack of understanding or waiting for precedent.**
- Others stated they are very interested or already have these agreements in place. **Several organizations expressed an interest to explore this option and other financing citing specifically INDOT and the State of Indiana as partners and noting the importance of NEVI federal funds for Level 3 charges.** One example of a lease agreement was provided which outlined the following: Tesla leases parking spaces from an owner for 5 years; Tesla installs, owns and operates super chargers and pays utility provider directly and as part of this arrangement, is responsible for charger maintenance. At the end of 5 years, lessor can purchase the chargers or extend lease with Tesla

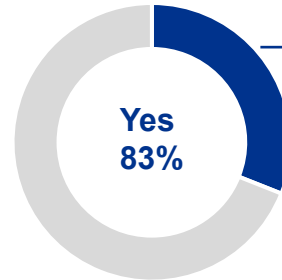
Participant Type Observations – Fleet Owners

Q1: What initiatives, products, or services have you considered to lower the cost of charging your vehicles? How does this align with the way you expect your fleet to charge?

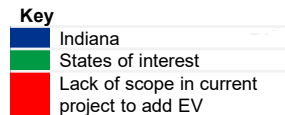
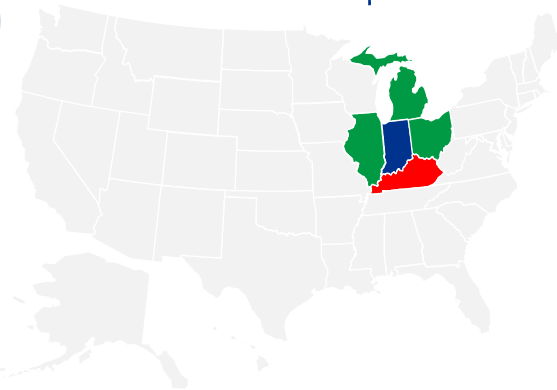
Key takeaways

- Respondents collectively reiterated several items, specifically:
 - Off peak charging
 - Infrastructure partnerships
 - Owning and operating EV charging infrastructure to reduce operating costs
 - Assistance from federal and other funding sources
 - Microgrid solutions including such as energy storage, wind and solar

Q2: Are you interested in plans that cross state borders



n = 12; Yes = 10

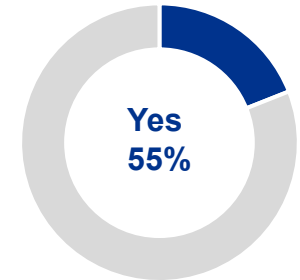


Key takeaways

- Detailed responses cited 3 states of interest Michigan, IL, OH, specifically because Indiana Toll Road crosses into each
- One respondent stated an interest across all of North America given the company's presence throughout

Q3: Have you pursued active partnerships to date to deliver on EV-related initiatives? If yes, please provide general detail on the partnership.

n = 11; Yes = 6



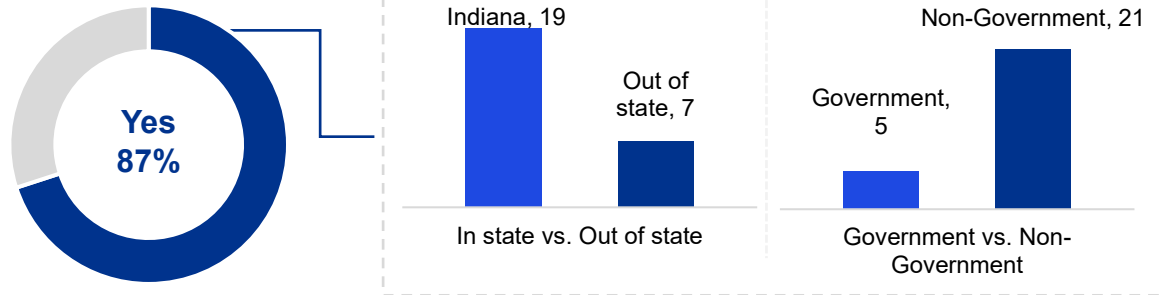
Key takeaways

- Respondents cited several partnership types including:
 - Supply mobility products to major autos and commercial OEMs
 - Supporting green fleet members in applying for vehicle replacement or infrastructure funding
 - Partnering with private companies, municipal governments or economic development corporations
 - Hosting EV expos to expose residents to EV opportunities

Participant Type Observations – Energy providers

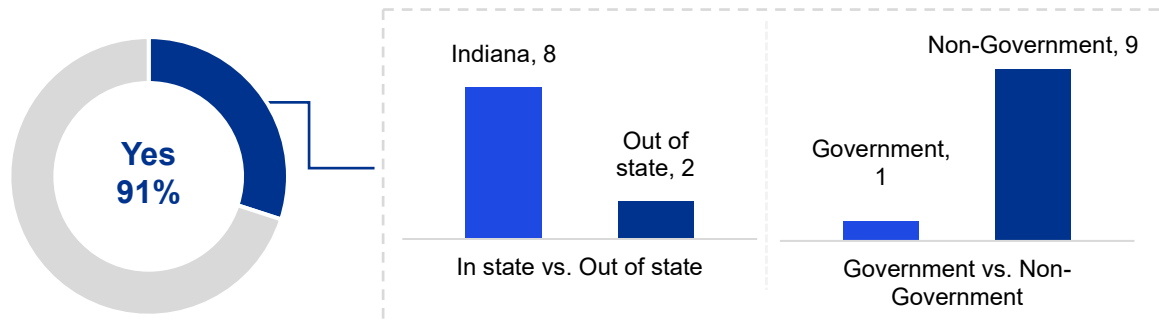
Q4: Is your organization interested in ownership of EV charging infrastructure, including the station, plugs and other associated infrastructure?

n = 30; Yes = 26



Q5: Is your organization considering preparing for future innovations?

n = 11; Yes = 10



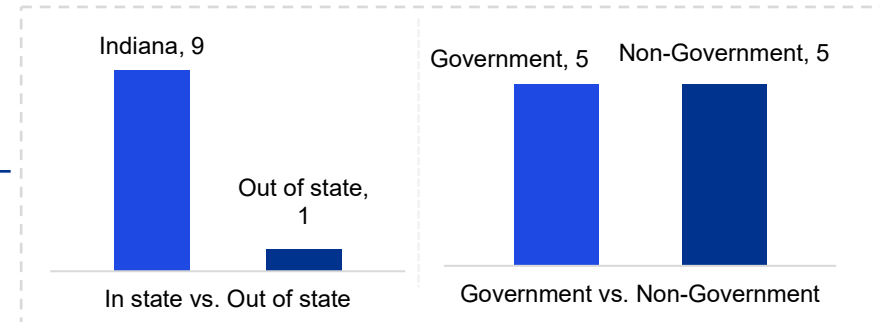
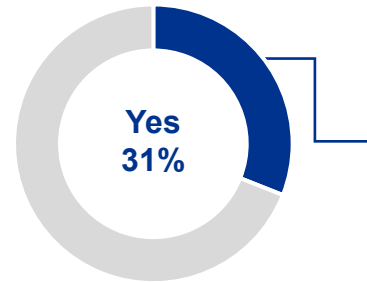
Key takeaways

- Several participants noted that, while they are well-versed in system capability and community needs, **statewide studies have not been carried out to determine charging network capacity**
 - Traditionally, these **studies are highly location-dependent** to assess the nature of service, available hosting capacity and any necessary upgrades to the utility-side distribution infrastructure
 - Participants are working to **develop an adequate process to assess statewide needs in order to scale with the NEVI effort**
- Participants **recommend INDOT be prepared to share preferred locations where DCFC is desired** (e.g., addresses, interstate exits, etc.) and site hosts have shown interest
- Participants noted a need to accelerate EV infrastructure development this year but anticipate the **greatest impact to EV adoption is likely to occur from 2025-2027**
- Vehicle-Grid Integration (**VGI**) **technology has not yet been proven commercially viable at scale** and few hardware and software combinations exist
- Utility interconnection agreements need to evolve** as more is understood about VGI and V2X, more broadly
- Managed charging and battery storage** will both be critical for optimizing the utility grid. Notably, neither managed charging nor battery storage are truly 'future state' technologies; while neither is yet ubiquitous, both are viable and in use today

Participant Type Observations – Municipalities / Cities / RPOs / MPOs

Q3: Do you have interest in applying for discretionary funding from the NEVI program?

n = 12; Yes = 10



Key takeaways

- **Local governments expressed an interest to help convene relevant agencies, EV drivers, working groups** to provide input or assist with connecting local governments to technical assistance or facility workshops on site identification and permitting / inspections for EVSE
- MPOs were cited as helpful for regional coordination to ensure the EV charging network meets best practices
- The **City of South Bend and City of Jefferson currently work closely with their RPOs to understand best practices on EV deployment and engagement with stakeholders** across municipalities
- Some charging OEMs also cited an exchange of best practice documentation and data would facilitate this process, including items such as optimal distance between stations, suitability of different sites and eligible site criteria
- Participants noted that it would be helpful to inform planning by others if reports could be provided by station owners with data such as the number of unique drivers, charging durations, session time of day, max kW delivered (i.e., to what extent are vehicles visiting capable of using ultra-fast charging), etc.

05

Appendix

Appendix – Table of Contents

A

Observations and Takeaways to Section II – Questions for All Respondents

B

Observations and Takeaways to Section III – Implementation Questions by Participant Type

A

**Observations and
Takeaways
Section II – Questions for
All Respondents**

01

Market Motivations

Q1: Please elaborate how electrification of transport has affected your short-term and long-term organizational priorities. Be specific on certain market inflection points, years, or forecasts that may drive your organization's thinking.

Total responses = 43, No response or N/A = 3

Majority of respondents experienced rapid shift in focus on EV infrastructure and decarbonization over the last few years. Many believe there will be a ramp up to mass adoption by 2030, with certain market players feeling the effects as early as 2024.



Utilities are the respondents most immediately concerned with grid developments keeping pace with electrification and believe this will become an issue by 2025

- Early data shows demand for electricity growing 30% per EV or 12 MWh/year of new electric load
- Efforts focused on planning and education around cost/load-saving energy techniques across the consumer base is needed to avoid upward pressure on electricity rates
- Providing physical grid resiliency to enable sufficient capacity will be required once the Indiana EV market has reached critical mass



All private sector respondents, including charging owner/operators, believe government funding will be the primary catalyst in the short-term, although anything beyond the five-year funding horizon is more uncertain

- In particular, government leadership will be critical for rural and underserved areas as the adoption is not there yet to support private-investment



State governments and private sector players are adopting decarbonization goals providing a critical driver outside of consumer demand or economics

- Respondents cited a clear supply-side commitment from automobile manufacturers to switch to EVs to fulfill EV mandates, which will increase the variety of choice for consumers and have a material impact in the mid-2020s
- Internal carbon neutral or decarbonization initiatives are driving interest in EVs within public sector



M&M Mid-Valley Supply: Over the past 3 years the environmental side of our business has really grown because of the federal/state grant money & rebates that have become available. Also, with all of the auto manufacturers (current & emerging) that are standing behind electrification.

Duke Energy: Electrification of transportation now seems inevitable with commitments made by automotive original equipment manufacturers (OEMs) to manufacture more electric vehicles (EV), federal funding opportunities and market interest in electric vehicles from a sustainability perspective.

Pike County: We have to prepare for the future and that includes EV chargers for personal vehicles and semi trucks as they "fuel up" or charge up in the future.



Q2: Please summarize any current or planned organizational activities within Indiana and out of state that may be classified as purchasing, sponsoring, facilitating, or directly operating EV charging infrastructure.

Total responses = 43, No response or N/A = 3



Regional coalitions are willing to assist extensively with planning/procurement, but did not speak on directly constructing or maintaining EV infrastructure



DC Fast Chargers were noted by respondents as previously being cost prohibitive to pursue, but with the aid of government funding, there is a surge of interest.

- Many respondents indicated Level 2 chargers were the focus of their organization prior to the NEVI funding



Many respondents have noted purchasing and installing EVSE infrastructure through IDEM and the Volkswagen Environmental Mitigation Trust



ITR Concession is currently leasing parking spaces to Tesla and will lease to Indiana Utility providers to be used for EV charging infrastructure

- Retailers hope to add charging capacity to their locations



ITRCC: In partnership with Tesla, ITRCC has leased Tesla eight parking spaces at the east- and west-bound Portage, IN travel plaza to Tesla for five years so that Tesla can install, own and operate a total of sixteen Superchargers at these two locations for use by the general public on our roadway.

AES Indiana: AES Indiana is part of a consortium of Indiana utilities who were awarded \$5.5M from the Volkswagen Diesel Emissions Environmental Mitigation Trust. These dollars will in part fund AES Indiana's commitment to install, own and operate DCFC at eight (8) locations along interstate highways in central Indiana, making it easier for residents and visitors to quickly and conveniently charge while on the go.



Q3: Which customer segments (demographic, geographic, powertrains, driving use cases) are of most interest to your organization. Why?

Total responses = 43, No response or N/A = 3



Most use cases of interest from respondents were for light-duty passenger car highway or public charging, as a result of direct correlation to NEVI funding criteria but also market demand

- As new, more affordable passenger cars enter the market over the next few years, light-duty vans/trucks alternatives may remain several additional years out
- One respondent indicated demographic studies show widespread interest, from the majority of millennials but also for Indiana residents that are 60 years or older



Utility providers indicated interest in home charging / transient charging for Indiana residents, but were concerned about their ability to keep up with grid impacts caused by DC Fast Charging and rapid EV adoption

- Residential at home charging should be promoted and supported to help avoid large load centers



Several respondents indicated an interest in targeting segments that will meet the Justice40 initiatives as outlined in the NEVI guidance

- Additional interest was indicated for low income housing, multifamily dwellings, and rural areas



Rural municipalities focused on their own geographies as priority consumer segments, noting that lack of EV infrastructure in their areas would trigger range anxiety and decrease 'daytrippers' and other forms of tourism if EVs are adopted

- The traveling public, whether 'daytrippers' or destination travelers, are the folks that are willing spend money at downtown restaurants and patronize the area businesses.

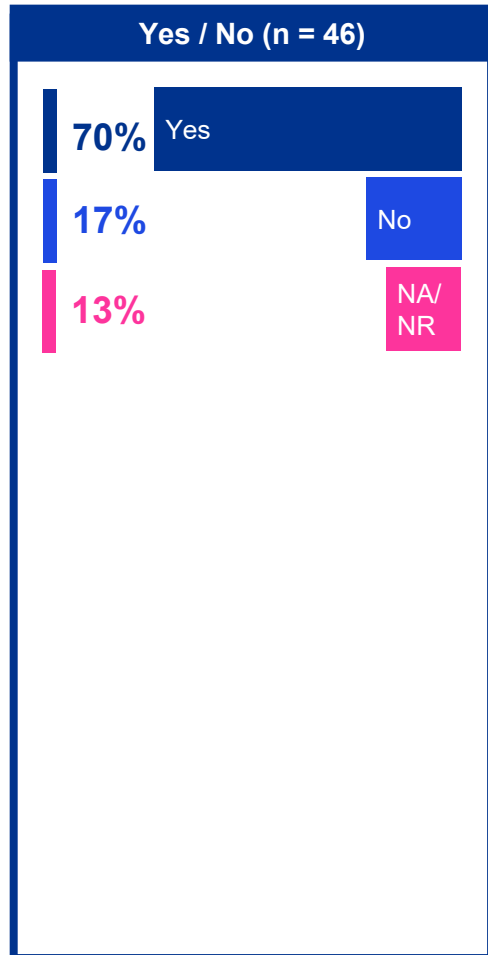


Duke Energy: All Hoosiers deserve access to electric vehicles and zero tailpipe emissions regardless of income level, population density or existing grid conditions.

Traffic Control Corporation: Regarding the demographics: We are seeing studies showing 78% of Millennials are interested in driving electric cars. On top of that, 70% of GenX people are interested in driving EV's. That same study shows that 66% of Baby Boomers would also like to own and drive electric. Surprisingly, 58% of the traditionalists (or silent generation) are enthusiastic about owning an electric vehicle.



Q4: Are you interested in making direct investment into EV charging infrastructure? Please include any details on how you determine the rate of return and time horizon on investments.



Total detailed responses = 38

The majority of respondents were interested in making direct investment into EV charging infrastructure



Respondents indicated rate of return as a key factor, with key variables impacting different rates identified as cost of purchasing charging hardware, electricity rates, software expense and durability, and other EPC costs required like 4G/5G connectivity



Respondents indicated available grant programs and government funding are crucial toward supporting the rate of return, particularly for areas where it is not currently profitable to develop EV infrastructure



Some public sector respondents indicated that ROI is less of a factor when considering direct investments into EV charging and they view providing EV chargers as an amenity for their community

- This is particularly true when aiming to keep the cost of charging low for certain communities and charging rates close to typical retail electricity rates



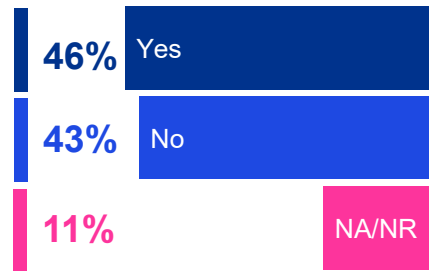
EVgo: Grant programs play an important role expanding the availability of charging, because they can act as a market stimulant to incent credible charging companies to extend their infrastructure footprints ahead of when they otherwise might if based on EV sales alone. Public/private partnerships like NEVI with cost share requirements ensure that private companies have the capacity to deliver on the projects for which they receive government support.

City of Jeffersonville: The City views (EV chargers) as an amenity to the local community, as well as for visitors to the area. The City's intent is to charge only for the cost of the electricity to charge vehicles. This will not be a revenue generating amenity and will depreciate as a City asset.



Q5: Has your organization engaged in cost/revenue sharing models in the operation of EV charging infrastructure? Please provide details on the terms of the partnership.

Yes / No (n = 46)



Total detailed responses = 33



Charging OEM respondents indicated a variety of delivery models available, ranging from “turnkey” models to lease agreements

- Turnkey model with installation, operation and maintenance
- Installation with no operations or maintenance
- P3 partnerships where the charging OEM takes on all operational costs and some portion of capital expenditure
- Lease agreement



Cost/revenue sharing models are an area of uncertainty and inexperience for many respondents

- This is because there are many parties involved, revenue is uncertain, and generally no guidance on best practices that have resulted in higher likelihood of commercial success
- Revenue share ranged from 5% to 85% or more depending on the delivery model



Of respondents who have current agreements with charging companies, leases tend to be the most common delivery model

- This is due to the tendency of fixed payments associated with leases, which are highly preferable compared to revenue sharing models that are pegged to more variable or uncertain demand



EVgo: In EVgo's experience partnering with a variety of site hosts for EV charging, we find that hosts (especially public hosts) prefer a fixed license or lease payment to highly variable revenue sharing.

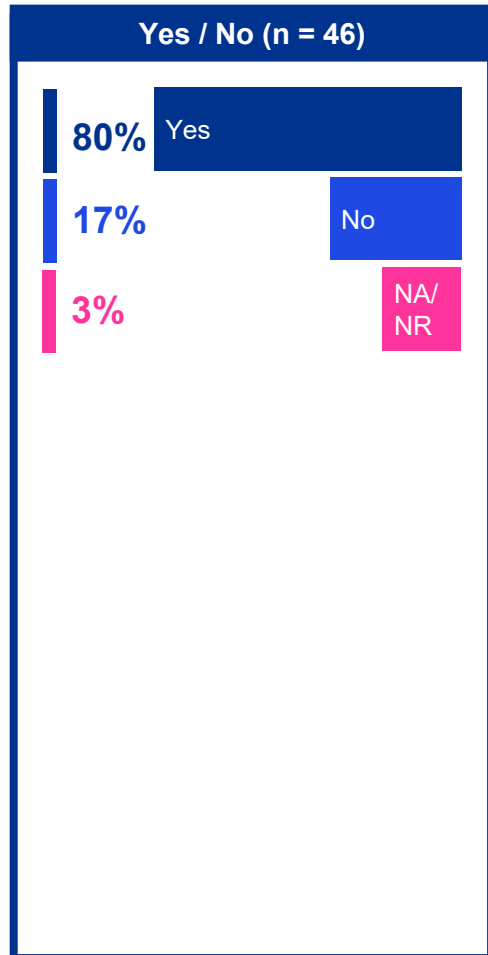
Electrify America: Electrify America typically obtains a lease or license for a small parcel of land in the parking lot of an existing site host and pays a fee for the space. Electrify America then handles all costs associated with the development, operations and maintenance of the site and collects revenue from EV charging customers. Because Electrify America makes the entire investment in these circumstances, we do not share revenue.



02

Federal Funding

Q1: Does your company have any plans to access federal funding related to Electric Vehicles and Electric Vehicle infrastructure? If yes, please detail which federal funding programs.



Total detailed responses = 35

57% Of “yes” respondents specifically indicated they intend to utilize the NEVI formula funding program



Other funding opportunities that were interested included:

- Surface Transportation Block Grant Program (STBG)
- Congestion Mitigation & Air Quality Improvement Program (CMAQ)
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE)
- Discretionary Grant Program for Charging and Fueling Infrastructure

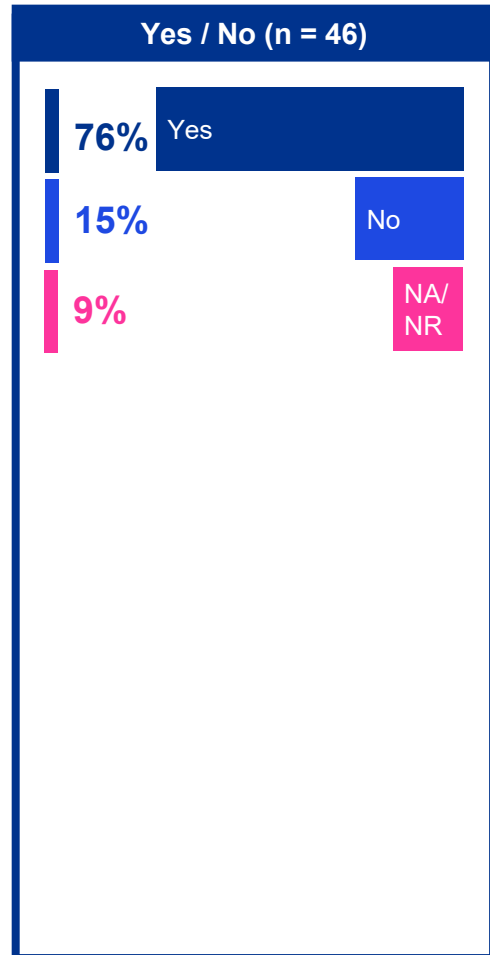


City of Jeffersonville: The City of Jeffersonville has an ardent interest in installing EV charging stations in the City for public use. Due to the exorbitant upfront costs of the fast charging stations, federal assistance with funding will be greatly desired in order to accomplish the City's goals.

Michiana Area Council of Governments: MACOG could consider locally-sponsored EVSE projects for federal CMAQ funding for Level 2 projects. However, CMAQ funding is programmed out for several years, likely could not support DCFC projects in the next 5 years and could not be used as a match against federal NEVI funds. MACOG has not made any determinations to pursue it at this time.



Q2: Does your organization plan to partner with any state or private entities to make use of federal funds for Electric Vehicles and Electric Vehicle infrastructure?



Total detailed responses = 31



In general, respondents want to make use of federal funds, but at this point aren't sure who their partners would be

- Many respondents seek clearer guidance on total federal and state funding options and requirements, alongside rebates, tax benefits and other incentives provided by utilities and agencies



Majority of respondents expressed an interest in partnering with INDOT to access funds. Others focused solely on providing NEVI funding application support, including:

- 20% match for NEVI funding
- Identification and development of highway and other public charging sites
- Supporting INDOT with the application process itself (although very few respondents mentioned this)



Some respondents indicated they are not seeking partnerships as they have proprietary investment models that they will rely on instead of partners

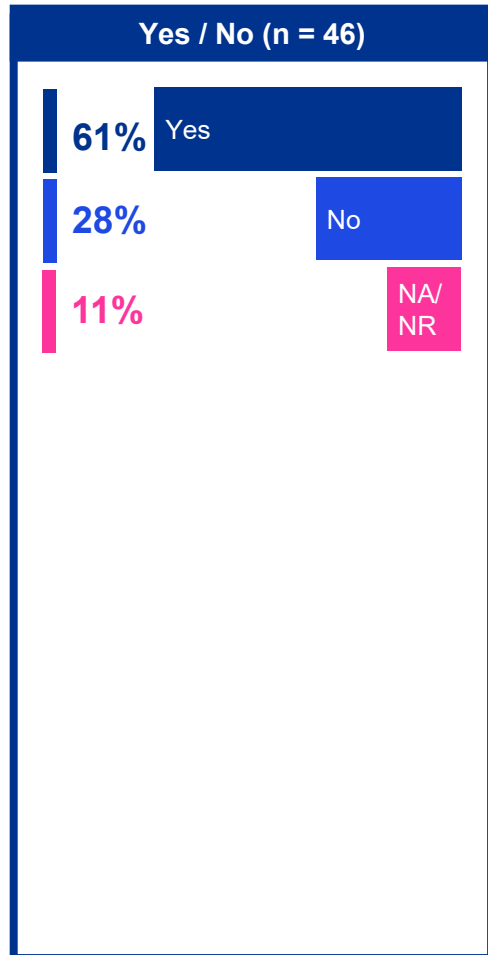


Duke Energy: As a major stakeholder, we welcome the opportunity - especially as the state's goals and guiding principles for NEVI and related funding are formed - to provide further input into INDOT's plan before it is submitted to FHWA in August.

Electrify America: Electrify America has experience partnering with both private and public site hosts for our owned locations as well as public and private equipment owners through Electrify Commercial. Private entities include a range of retail outlets, shopping centers, grocery stores, fuel retailers and independent businesses. We have also partnered with utilities, transit agencies and freight logistics companies.



Q3: Is your organization planning to apply for competitive/discretionary grant funding for EV charging infrastructure under the Bipartisan Infrastructure Law? If so, what type of communities would you want to submit an application for?



Total detailed responses = 27

Many respondents reflected a desire to apply for community grant funding. Communities cited include:

- 1) Economically distressed communities
- 2) Location near an Alternative Fuel Corridor
- 3) Rural communities
- 4) Underserved transportation communities
- 5) High-density destinations

Indiana Electric Cooperatives: Yes, while our 38 Indiana electric cooperatives serve both urban and rural areas, our primary objective is providing EV charging access to rural communities across the entire state of Indiana. We see our non-profit status, core competency in distributing energy in rural Indiana, member-consumer (local) relationships and being geographically located in rural Indiana as key to our success in doing this.

03




**EV Charging Build-out
Planning
Considerations**

Q1: Please elaborate who your target customers / target users are OR describe specific charging scenarios that your organization is prioritizing. If applicable, please specify what charging mix will be used to service these target customers / target users. Please include any timing considerations

Total responses = 40, No response or N/A = 6

All EV charging operators / OEMs that responded are expected to roll-out Level 3 DC Fast charging solutions; almost half of charging owner/operator respondents said they were ONLY interested in Level 3 DC Fast Charging or Ultra-fast charging and have excluded Level 2 completely.

– Respondents identified the following target customers and charging scenarios:

Charging speed (in order of identified priority)	Identified charging user / charging scenarios
DC Fast – 60kW - 150 kW 	Public charging – ALL geographies but an immediate need in rural areas Highway charging rest stops / transient Truck charging depots (medium- heavy duty vehicles) Government fleets Corporate fleets
Ultrafast - 350 kW 	Long-distance highway use Fleet charging – specified vehicles or routes (e.g. airport shuttles)
Level 2 	Single-family home Workplace Destinations (where high dwell time is expected, e.g. shopping malls) Community use – low/medium income areas Multi-unit homes - Street / curbside parking Rural / smaller towns – Street / curbside parking only Fleet (light-duty vehicles only)

Factors that will impact charging mix over time:

- **Increase in vehicle capabilities / voltage architecture:** Very few EVs available currently in the US can take more than 150kW of power and the charge curves vary widely, but speed anxiety is catching up to design
- **Growth of smarter grids and smarter charging station design:** This can effectively deploy power through power sharing and power routing can help protect against changing dynamics.

“
Electrify America: Ultra-fast charging is critical to serving long-distance corridor travel and 350 kW charging. As an example of how needs have changed over time, the average charging speed of new EV models increased from 50 kW to 150 kW between 2016 and 2021 and is now 200 kW as of model year 2022.
Indiana Electric Cooperatives: Our target customers/users are the rural EV drivers that live in our communities along with travelers that visit local amenities...We believe that DCFCs are an immediate need for our rural communities...Big EV truck depots and fleet charging will be important as well but isn't as immediate as public DCFCs.
 ”

Q2: How does your organization identify optimal locations for charging? Please provide all factors used for consideration and how your organization evaluates

Total responses = 39, No response or N/A = 7



Many organizations are using holistic methods that triangulate expected traffic patterns with multiple macroeconomic factors (e.g. socioeconomic indicators) into identifying optimal locations. Methods used to identify optimal locations for charging are listed below, with highest mentions upfront:

- Distance between DC Fast Chargers
- Analysis of traffic, gas station density, existing DCFC density and other factors
- Environmental justice factors to ensure investment into areas that may otherwise be undesirable to private entities (Economic Disadvantage Communities - federal Opportunity Zone status and/or Justice40
- Underserved Transportation Communities - communities with high populations and/or other notable amenities but who do not have appropriate EV charging infrastructure relative to their population.



Respondents were specific about additional site level considerations that are relevant to their deployment strategy and, in some cases, the nuances around their products. These include:

- Proximity to a major roadway or highway (Most respondents)
- Proximity to densely populated areas (Most respondents)
- Areas with high number of electric vehicles (Most respondents)
- Sufficient existing electrical infrastructure capacity (Most respondents)
- Demand from a specific target user segment (1-2 respondents)
- Overlap with existing / planned construction activities (1-2 respondents)
- Direct funding support from government or private entities (Most respondents)
- Proximity to other charging stations (and level of charge) (1-2 respondents)
- Average dwell time (to determine charging speeds) (1-2 respondents)



EVgo: In EVgo's experience, the most successful grant programs do not seek to plug in holes on a map, but use a holistic, GIS-based and comprehensive view that combines distance between publicly accessible chargers with other important siting factors like battery electric vehicle (BEV) vehicles in operation density, proximity to retail or other amenities, traffic patterns and population.

Xcharge USA: Given the nuance of our technology, we do not need to focus on sufficient existing electrical infrastructure capacity outside of ensuring sites have a safe enough load...we are focused on finding areas where charging will be accessible and convenient to EV drivers. Unlike gas stations, charging does not necessarily need dedicated sites...so we look for locations where people will normally spend this amount of time during day to day transit... coffee shops, restaurants along highway corridors are a great focus area for us.



Q3: Please identify specific geographical segments (if applicable, please reference individual counties or metropolitan areas below) within Indiana that are of interest for your organization's EV charging programs. (2/2)

Respondent Geographic Segment Count by County

County	Count
Marion County	9
Floyd County	6
Clark County	6
Johnson Township	9
Harrison Township	3
Lake	10
Hamilton County	10
Hendricks	8
Vanderburgh	5
Bartholomew	7
Shelby County	6
Knox	2
Daviess	2
Greene	2
Vermillion County	1
Tippecanoe County	7
LaPorte	10
Porter County	9
St. Joseph	9
Elkhart	10
LaGrange	5
Steuben County	3
Boone	7
Madison County	8
Monroe	6
Delaware	7
Vigo	6

County	Count
Howard	7
Hancock County	7
Morgan	7
Kosciusko County	4
Marshall	3
Warrick	2
Grant County	6
DeKalb	5
Jackson County	3
Huntington County	3
Wells County	1
Washington	1
Scott Township	1
Crawfordsville	1
Adams	2
Dearborn	2
Dubois County	3
Henry County	3
Jackson Township	1
Lawrence County	2
Noble	2
Owen County	2
Cass Township	2
Miami	2
Jefferson Township	1
Pike County	1
Jasper	3

County	Count
Pulaski	2
Fulton	2
White County	1
Benton	1
Blackford	1
Brown	1
Carroll	1
Clay	1
Crawford County	1
Decatur	1
Fayette	1
Fountain County	1
Gibson	1
Jay	1
Jefferson	1
Jennings	1
Martin	1
Montgomery	1
Newton County	1
Ohio County	1
Orange	1
Parke	1
Wayne Township	5
Allen	7
Franklin	2
Clinton Township	2

Q4: If applicable, please elaborate any planning factors that are considered towards the aim of minimizing any future risks

Total responses = 38, No response or N/A = 8

Identified risks	Identified solutions or planning factors
Stranded assets	<ul style="list-style-type: none"> – Data could be requested from DCFC owner / operators (e.g. Electrify America) – Ongoing monitoring of trends in applicable metrics such as traffic and population so that tomorrow's needs are anticipated in today's designs.
Inability to expand network	<ul style="list-style-type: none"> – A future-proof design that includes underground conduits and real estate reserved for an additional 600 kW so that the cost with expansion are minimized later without overbuilding infrastructure today – Anticipate operational scenarios after the funding from IJJA has sunset and ensure all parties have flexibility in contractual mechanisms and hardware/software sourcing – Creation of partnerships with rideshare companies to provide increased charger utilization and predictable revenues to support a sustainable business model
Supply chain issues	<ul style="list-style-type: none"> – Work with partners or manufacturing sites to locally source materials
Asset breakdown/ poor maintenance	<ul style="list-style-type: none"> – System to report issues with our Level 2 stations through the City's 311 station, but we need adequate signage so users know where to report issues and how to identify the problem. – adequately resource for managing the assets throughout the entire infrastructure lifecycle, including but not limited to performance/status monitoring and future CAPEX and OPEX planning.
Availability of sufficient power on site / necessary electrical power upgrades	<ul style="list-style-type: none"> – Currently we work with partners that offer innovative solutions with minimal infrastructure upgrades (ultimately less pull from the electrical grid) – Battery integration to offset demand fees, to support a sustainable economic business model – Planning for implementation of solar augmentation to ease electric load and potential site energy warehousing to allow later utilization of supply from off peak periods.
Resilience to weather and grid events	<ul style="list-style-type: none"> – Rank the locations based on “reliability” risk and identify locations that need to build in resiliency infrastructure including solar generation and battery backup.



Electrify America: We have built thousands of chargers at hundreds of sites nationally, including through some of the nation's most rural areas, with very rare instances of requiring significant electrical upgrades. Our sites are designed with future upgrades and expansion in mind; for instance, our 150 kW and 350 kW dispensers are the same piece of equipment and can be upgraded by increasing the power supply on the equipment pad with no need for trenching or replacing dispenser equipment.

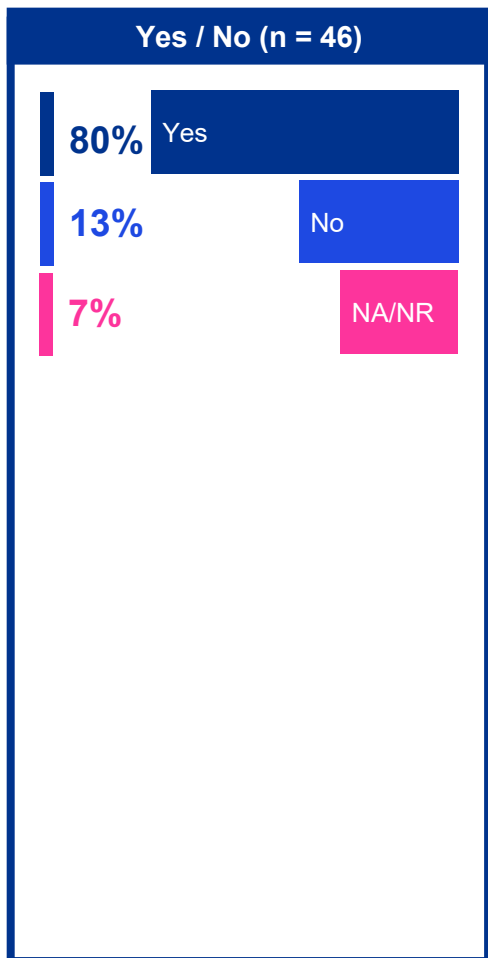
Xcharge USA: We have announced a energy storage and grid stabilization product line called the Net Zero Series (NZS), which is aimed to reducing the electrical risk impact associated with higher electricity usage. The NZS is a line of battery back up and charging products which are designed to be easy to install, easy to scale and low input in terms of maintenance.




04

Specific Communities

Q1: Does your organization plan to deliver charging programs for rural, underserved, or disadvantaged communities? If yes, please elaborate whether these plans are contingent on receiving funding from federal programs.




Total detailed responses = 34




75% of respondents indicate that access to federal funding would support either existing plans or incentivize plans to operate areas where there is expected low utilization but need for costly DC fast installments

- Respondents that already operate in rural areas, such as Electrify America and Powerflex (charging operators) as well as ITRCC, would benefit especially from additional operational expenditure support that would allow them to scale current into areas that are not directly covered or adjacent to their operations



72% of public sector respondents have existing plans and funds to service disadvantaged or underserved communities but believe that federal funds and explicit guidance from the state to achieve Justice40 goals are critical to deliver the right impact at scale



Entities that are not expected to deliver, own or operate charging infrastructure believe that tracking demand within these areas through data and community-based coordination are essential to planning and delivering charging programs

ITRCC: If ITRCC were to receive additional funding we are open to installing additional EV infrastructure beyond just the travel plazas and expand the network of chargers at additional access points along the toll road, such as commuter parking lots.

M&M Mid-Valley Supply: We will help whoever is interested in the [NEVI] application & justification process with [site-level] infrastructure requirements and installation needs.

Center for Sustainable Energy: [We] can assist with the planning for or delivering programs to underserved communities...our team incorporates the latest census data and uses any other DAC or LMI schema available...and [coordinates] with regional community-based organizations to grasp the community's needs.

Q2: If yes, please describe any key planning considerations used for delivering charging programs to rural, underserved, or disadvantaged communities

of no responses: 46



82% of respondents stated that investments made into designated alternative fuel corridors would be an incomplete solution for all EV drivers across all demographics

- The following underserved segments have been identified by all respondents as key: 1) rural areas and 2) multi-unit dwellings in urban areas



Under Rural, the following planning considerations were cited as important to deployment:

- Operational assistance and subsidies to combat low utilization (Johnson Controls cited 3% as an industry average), high demand charges and high maintenance costs
- Whether an area is near a designated corridor
- Any policies, incentives and direct solutions (e.g. battery storage) to offset high demand charges from utilities and improve grid resilience
- Attractions in the vicinity, which can provide dual benefit of mitigating low utilization and generating new revenue streams



Under Multi-unit dwellings / rental properties, the following planning considerations were cited as critical:

- Degree of homeowner owner incentives to install charging amenities, including potential revenue streams
- Expected community charging demand and optimum charging mix (DC Fast or Level 2) where home charging installations are not possible for EV drivers
- Equitably priced community charging (especially for DCFC), compared to retail electricity rates
 - DCFC installations for communities without private home charging would need subsidies to cover the 20% match or price guardrails to ensure that prices were reasonable



Michiana Area Council of Governments (MACOG):

We encourage INDOT's plan to provide a basic level of DCFC access throughout the state along non-designated corridors in the National Highway System rather than exclusively scaling up DCFC in population centers (i.e. central Indiana).

EVgo: We recommend that all sites [with a population below 500,000] be eligible for operational assistance equal to 80% of the demand portion of energy and maintenance costs for five years. This will financially incentivize applicants to minimize these costs, especially if applications are scored on a \$/kW basis.

Duke Energy: Utility rates that reduce demand charges for EV charging are the most effective tool for promoting EV charging installations. The IURC is required to consider new rate designs and should act quickly to fulfill this obligation and establish rates that promote charging in rural and underserved communities.



Q3: How does your organization plan to meet social equity and/or justice requirements for its charging programs? Please include details such as location identification and site selection considerations.

Total responses = 34, No response or N/A = 12



Federal and other public tools have been cited as helpful in network planning and scoring location candidates (e.g. EJ screen, to identify communities disproportionately impacted by certain air pollution)



Several respondents engaged communities early on and were able to vet areas least likely to receive private investment and collect relevant data-sets to refine deployment plans



Several respondents noted the importance of considering several factors simultaneously . A triangulation of efforts to identify rural locations, identify underserved demand and pinpoint communities that suffer from elevated pollution levels can provide a clear prioritization of location candidates. Several examples include:

- Columbus (IN) as a result of high utilization of existing Level 2 chargers and close proximity to Indianapolis and the I-65
- Evansville, as a result of the combination of having the worst air quality in the state, being close to the I-69 (a major trucking route) and limited DC fast chargers for a population of 120,000
- Portions of Allen, Howard and Lake counties that are in close proximity to EV pending/ready corridors and within communities identified by Justice 40 as disadvantaged



One respondent noted that equity criteria should be embedded into charging infrastructure scenario modeling and KPI measurement from the start. From there, critical data points should be identified to validate these scenarios and collection methods can be designed, with the support of various partners.



City of South Bend: We plan to do community engagement (public survey, public meetings and focus groups) to identify the areas that are underserved and that are least likely to receive private investment in charging infrastructure.

EXP: Social equity and justice achievements require early and durable engagement with and planning ownership by the communities most affected by a project's outcomes. Consistent and accessible communication pathways are essential.

Advanced Energy Economy: Because underserved populations often live closest to major roadways, highways and interstates and suffer from associated elevated air pollution levels and health impacts, placing chargers in these communities can achieve health and environmental benefits, while also increasing the viability of electric and plug-in hybrid vehicles in those communities and building out AFCs.



05

Delivery Readiness

Q1: Please elaborate on any data gaps that your organization has identified that may impact delivery of future charging programs. How does your organization plan to address these gaps? Can you outline any data sharing agreements with other organizations?

Total responses = 5, No response or N/A = 41

91% of respondents reported no perceived data gaps

- Several data / technology respondents expressed desire for further transparency and an ongoing update of current and planned DC Fast Charging locations, including those pending approval
- Beyond locational and prospective locational data, technical data related to industry hardware, industry software, other technology and best practices was seen as critical

1 utility respondent outlined experience with data sharing agreements with software and/or professional services as part of charging offering to consumers, which includes payment services and performance dashboards to monitor charging station status.



Ozone: The most significant data need facing our organization will be the ongoing update of information regarding DC Fast Charging Infrastructure locations in current operation as well as those that have been approved or are in the approval process. This will necessitate transparency on the part of government and other funding sponsors to their potential investor base with respect to known or pending location additions to the nation's infrastructure on a real time basis as these do become available.



Q2: What workforce capability gaps exist to deliver future charging programs? How does your organization plan to develop your workforce to address these gaps?

Total responses = 4, No response or N/A = 42



93% of respondents reported no perceived workforce gaps

- Several respondents acknowledged that the industry, its technology and infrastructure funding are developing at extremely fast pace but have scaled workforce either organically or through acquisition



Ozone: Where necessary and/or beneficial, we will sponsor company paid trainings for our vendors and proprietary personnel in latest EV charging technologies...and will commit organization leadership manpower and resources to stay abreast of these developments. We will assess further planning on regular intervals.

Blink: Blink has experienced significant growth over the past 2 years and will continue to increase total employees from 200 to 300 employees organically and via acquisition of other similar companies. Blink will continue to use both internal and external resources in order to meet our needs for charging infrastructure development and deployment.



Q3: Please elaborate your how organization plans to meet the following legislative requirements — Buy America

Total responses = 31, No response or N/A = 15



All OEM respondents cite issues with scaling up 'Buy America' EV charging hardware due to supply chain issues (lead times of over 30+ weeks) and that most EVSE hardware manufacturing centers are located outside of the US

- 2-3 years was cited as the required time to stand up US-based production lines that meet NEVI requirements (Blink, X-change, Ozone, Advanced Energy Economy)



The following solutions are being undertaken in response:

- Monitoring regulatory developments to remain complaint (EVgo)
- Working with subcomponent suppliers to increase their US manufacturing capabilities (EVgo, Blink, Mid-Valley)
- Establishing a US manufacturing site directly (Blink, Xchange)
- Establishing new relationships with DC manufacturers that anticipate meeting Buy America requirements (Blink)
- Seeking a waiver from Buy America requirements for immediate EVSE deployment over the next few years (Duke, Blink, Ozone, X-Change, Advanced Energy Economy)



While some public sector and non-OEMs are submitting bids that outline 'Buy America' requirements, many are requesting a Buy America 'grace period' when applying for NEVI funding to ensure timely delivery of required charging infrastructure

- Many do not have direct control and are relying on OEMs to deliver compliant equipment



Electrify America: Electrify America is not aware of any volume production of Buy America-compliant equipment that meets NEVI minimum requirements. Our suppliers are actively working to stand up U.S. production lines to meet Buy America requirements, but we believe up to a 2-year transition period is necessary

Advanced Energy Economy: We strongly recommend that INDOT provide a grace period of no less than three years...the state would relax content standards and provide waivers to the charging industry to facilitate swift and cost-effective deployment. This finite period, coupled with effective industrial policies...will help to better catalyze industrial growth in Indiana.

Xchange: We are in the process of establishing a US manufacturing site to meet the needs of buy America quotas. Our systems were initially designed in China and our manufacturing site will meet the necessary requirements for Buy America. This is expected to operational by end of 2023.



Q4: Please elaborate how your organization plans to meet the following legislative requirements – CFR Title 23 on Disadvantaged Business Enterprise (DBE), Women Business Enterprise (WBE), or Minority Business Enterprise (MBE) requirements

Total responses = 24, No response or N/A = 22



Public sector respondents are building DBE / WBE / MBE requirements into majority of EV charging infrastructure plans and bids



90% of private sector respondents do not classify themselves as DBE/WBE/MBE, but have advocated for partnership and subcontractor agreements with DBE/WBE/MBE organizations to comply



It is unclear how many respondents already have requirements in place beyond minimum standards from bids; only 2 respondents that were not charging OEMS or utilities provided insight into that.



EVgo: EVgo plans to carefully review minimum standards guidance from US DOT in May to ensure our potential NEVI sites comply with all legislative and regulatory requirements.

Ozone: In the absence of RFP requirements, we support a model of subcontracting target minimums based on federal small business contracting goals, which are currently are follows: 5% of contract dollar value to Women-owned small businesses; 5% of contract dollar value to small disadvantaged businesses; 3% of contract dollar value to service-disabled veteran-owned small businesses; and 3% to small businesses in a HUBZone. These targets will be adapted to the applicable DBE/WBE/MBE categories.



06

Operations and Performance Monitoring

Q1: Please outline what metrics your organization uses to determine commercial or economic benefit.

Total responses = 37, No response or N/A = 9



Charging OEMs listed several key factors used to determine commercial benefits:

- Number of stations
- Total charge events and/or unique visitors
- Charger usage and average charger session use – by kWh used and revenue
- Utilization; e.g. Johnson Controls assumes industry standard of 3% until EVs grow
- Uptime – typically measured at the device level but at a network level as well, e.g. EVgo is committed 98% uptime as a target across all locations
- Peak charger utilization times



Utilities listed additional key factors to determine system health of charging projects:

- Incremental sales increases – and any subsequent downward pressure on utility rates
- kWh dispensed and the ratio of kWh to kW (load factor)
- Number of different users - if available - to indicate how many drivers are served per charger
- Home address of users - if available - to understand how networks are supporting EV travel
- Future network expansion potential in installed location
- Hardware, installation, networking, maintenance and electricity costs, respectively.
- User ratings – to understand price and convenience ratings for charging locations



1-2 private sector respondents are also keeping track of charging impacts to total costs of operations (“TCO”) for drivers to understand whether Evs currently provide an economic benefit to drivers over ICE vehicles



EVgo: In addition to considerations like corridor coverage or reaching underserved areas, EVgo strives to site chargers at convenient locations with amenities so drivers can grocery shop or visit a park while they charge. Locations that are more convenient for drivers can increase utilization.

AES: With current gas prices, average drivers could save 1-2 thousand dollars annually in gasoline costs by driving an electric vehicle, which can be increased further through Managed Charging or Rate EVX offered by AES Indiana.

TTI Air Vac: Utilization data collected from the EV charging network should be used to create charger use profiles that guide future deployment. These profiles should be updated throughout the program as data is collected.



Q2: Please outline what metrics your organization uses to measure social or environmental benefit from EV charging networks

Total responses = 35, No response or N/A = 11



Environmental metrics are being increasingly tied to financial or commercial metrics and included in several respondents' annual reports. Many are related to tracking greenhouse gas associated with the charging network and the impact of reduced fossil fuel use (Which creates avoided emissions). Examples include:

- Greenhouse gas emissions of the charging network (including efforts to move to renewables)
- Greenhouse gas emissions avoided through ICE vehicle displacement
- Estimated eVMT displacing fossil fuel VMT
- Increased electric vehicle sales



Social metrics are increasingly being adopted as a part of planning and design but are general considered through a 'top-down' lens. This means social factors are often considered through a portfolio lens rather than by individual program, examples including:

- Utilization of EV charging locations in low-income and disadvantaged communities relative to state average
- Percent of investment in low-income and disadvantaged communities
- Percent of investment in rural versus urban areas
- Investment per capita in rural versus urban areas and estimated GHG reductions, estimated eVMT and by estimating the impact on future EV sales
- Federal tools, e.g. US EPA EJ Screen tool, has been cited as a key driver for network planning and to follow environmental justice indicators – in order to enable equal access to clean infrastructure within disadvantaged communities. 1 respondent uses the tool outputs as part of its site prioritization and selection process



MACOG: Actual usage of DCFC may be a very small portion of the total kWh used by EV drivers and is not the totality of emissions avoided by encouraging the adoption of that EV by making long-distance travel possible (increasing range confidence, even if only needed occasionally).

XCharge: Utilization and average charge time are what we mainly focus on when determining the social benefit from our chargers. The higher the utilization and growth seen over a period of time, the better insight we have on adoption of EV transport in a specific area. Charge time also allows us to see how much charge is being distributed over a period of time, which is crucial for us to understand the convenience of our units.



07

Working with INDOT

Q1: Please describe how best INDOT can support you in deploying EV charging programs? (i.e. contributing matching funds, operational partnership, leveraging INDOT data for decision making, etc.)

Total responses = 41, No response or N/A = 5



Overall, all respondents were enthusiastic about INDOT taking a coordination role in pulling together charging operators, major retailers and municipal governments within the state of Indiana for the purpose of DCFC development through informal or formal channels (e.g. forums), with the goal of providing integrated seamless charging offering for drivers



The following were cited as ways INDOT can support EV programs, in order of number of mentions:

- Matching funds for the cost of DCFC Corridor projects, with majority of respondents willing to support 20% of total costs
- Matching funds for rural/disadvantaged areas where utilization might be low and private interest in operating DCFC (and providing the 20% local match) is lower
- Collecting and providing public data early-on to developers around: EV adoption, traffic patterns, consumer driving behavior patterns, existing and planned EV programs, projected underserved areas, utilization rates across different locations, electrical upgrade needs and new technology solutions for charging (e.g. L3)
- Acting as a direct operational partner for EV infrastructure developers throughout the end-to-end implementation process, including location/site selection, permitting assistance with local governments, operational assistance (and NEVI federal funding), provision of land and signage
- Providing clear program parameters and a transparent scoring process for evaluating proposed projects, aligned to NEVI requirements
- Regulating software developments and standards



Indiana Electric Cooperatives:

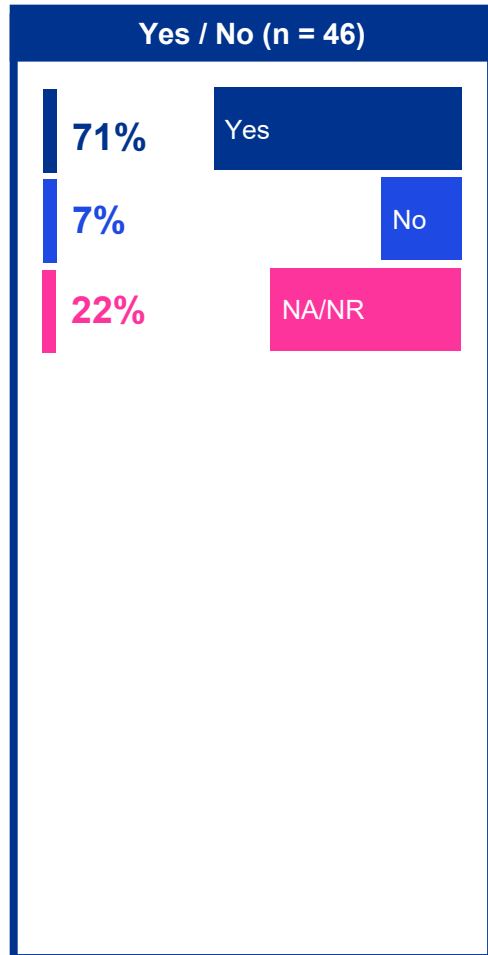
Assuring that all electrical distribution upgrades and make-ready costs for electrical service is considered for funding, matching funds will be extremely important to the co-ops and the rural communities we serve. Any data in regards to traffic patterns would be greatly appreciated so our charger deployments will target the most utilized exits first.

ITRCC: ITRCC is looking for support from INDOT to find the best possible EV charging infrastructure solutions for the Indiana Toll Road. Specifically, ITRCC is looking for information regarding the availability of EV charging infrastructure solutions for both LV and HV charging, as well as information on potential funding partnerships and sources.

E4 Charging Group: We would like to know if INDOT will determine the exact location for each charging station site, or if it will be up to the owner of the chargers to find a willing participant host.



Q2: Would you be willing to match the 20% funding requirement as outlined in NEVI guidance? Please elaborate if you would like to work with INDOT to apply for NEVI formula funds and what factors would drive your interest



Total detailed responses = 35



Factors driving respondent willingness to fund-match 20% include:

- Broader interest in promoting fast or ultra-fast charging EV infrastructure across the state due to alignment with core organizational goals
- The organization is already working with a broad base of deployment partners and there is a clear business case to use NEVI funds to scale
- The organization is adjacent or involved with AFC development
- Communities looking for cleaner alternatives to infrastructure and improve environmental health (e.g. renewable energy development)
 - **Town of Newburgh:** “The town is located in the Ohio valley and power is provided by predominately by coal fired fossil fuel power plants that result in poor air quality. The EV coupled with green sources of power should provide an opportunity for future generations to live in a less polluted environment.”



Reasons for no interest include:

- Limited funds to match 20% (MACOG, M&M Mid-Valley)
- No strategic interest to pursue competitive funds directly (Duke Energy)



Ozone: We identify a need for EV charging within 1-mile of secondary US and state highways that are...assumed to be included in the near-term expansion to the Alternative Fuel Corridors. Real time updates related to proposed expansions to the Alternative Fuel Corridors, along with the approval timeline and approval status...will be highly important.

ITRCC We are currently working with Tesla, NIPSCO and IMP to build-out EV infrastructure along the toll road, but support from INDOT and the NEVI fund could quickly...make the toll road an Alternative Fuels Corridor.

Indiana Electric Cooperative: Our 38, non-profit, electric cooperatives in Indiana would be very interested in working with INDOT to deploy EV charging across Indiana. While our co-ops are not opposed to matching 20%, this requirement may limit certain areas where the investment will not be earned back.

Q3: How would you like to see INDOT support the build-out of EV charging network beyond funding?

Total responses = 40, No response or N/A = 6

The following were cited as ways INDOT can support EV programs beyond funding, in order of number of mentions:



- Bridge any funding or regulatory requirements for such businesses to ensure that the geographic locations that require fast chargers can do so with minimal barriers and obstructions, including the:

- **Updating of design codes and building codes to require EV charging**



- Provide data and data-sharing requirements for charging vendors



- Funding and opening up the opportunity to upgrade electrical distribution systems to serve EV load at INDOT rest stops



- Supporting access to EVs through creative incentives and policies at the state level, including EV-readiness mandates and supportive policies around co-located EVSE and renewable energy generation
- Own/operate DCFC at INDOT rest areas, particularly areas that are not attractive to the private market (rural, disadvantaged, low VMT, low EV adoption)
- Partnering with stakeholders willing to test and deploy emerging vehicle technology infrastructure similar to the wireless electric vehicle charging solution pilot
- Convening meetings and creating materials to disseminate best practice in building out the EV Charging network

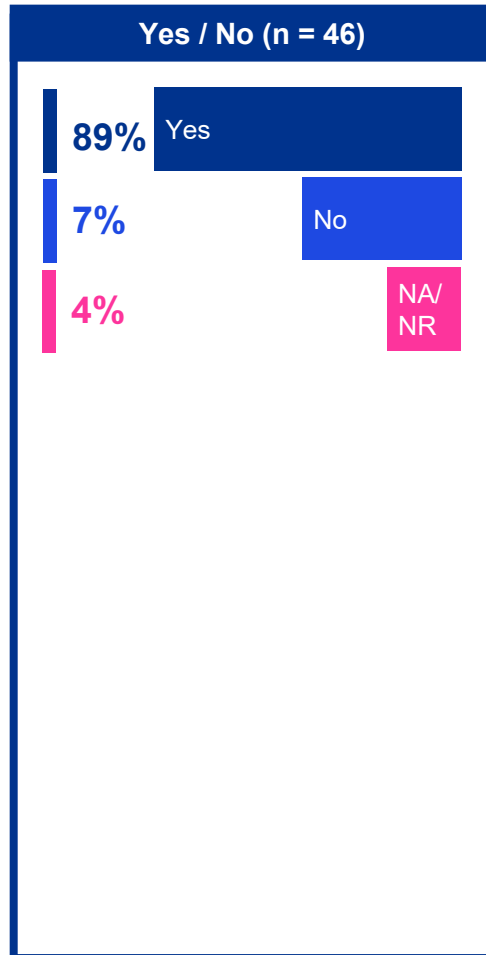


Town of Newburgh: The infrastructure to support the new technology will be taken over by the private sector when EV's become mainstream. This is a stepping stone to get the technology from concept to acceptance by the general public. This initial effort will require good communication, data sharing and innovative thinking to launch successful program.

Center for Sustainable Energy: Data can be used for evaluating and forecasting the future needs for charging stations based on their location, equipment type and usage profile as above. [INDOT] reviewing this data annually will be increasingly important with the continual advancement of technologies such as higher capacity batteries, faster-charging equipment, grid integration of renewable energy and the use of Vehicle to Grid (V2G).



Q4: Does your organization believe there is scope for data sharing between your organization and INDOT in order to make decisions on planning or delivering EV charging programs? If yes, please detail what kind of data would be useful for INDOT to provide to your organization and what data your organization has access to that could be useful



Total detailed responses = 39



Respondents almost unanimously expressed desire for better data sharing and for INDOT to be a central node between different market participants



- **Data points that were cited as useful for INDOT to provide to others include:** EV registrations, traffic data, specific traffic and EV demographics *(see right) EV charging demand gaps, current and planned charging locations, capacity planning, consolidated and aggregated data from various market participants to support creation of utility programs and expansion of charging networks, best practices in deployment from other orgs



- **Charging OEMs cited the following data points as useful to share with INDOT:** Requisite operational data to manage charging programs (charging locations, charge session data and aggregated user data (e.g. utilization, total kWh)

- **Energy providers cited the following data points to share with INDOT:** System capacity data, kWh dispensed



- **MPOs / Municipalities / Counties cited the following data points to share with INDOT:** EV counts and traffic data by county/MPO, EV charging installations



Reasons for citing 'No' are primarily related to economic and research organizations not requiring INDOT's support in conducting macro-level analysis



EVgo: As with any other emerging industry, data is highly sensitive. Further, it is relatively easy to synthesize charging session data to inadvertently violate consumer privacy by releasing personally identifiable information...protect individual session data and report out to the public only state or regional level aggregates.

Ozone: We would find it useful for INDOT to provide data for EV traffic patterns with a specific neighborhood or region, as follows:

- 1) at-home charging capability vs. no at-home charging capability
- 3) fleet users
- 4) visitor from outside Indiana vs inside
- 5) EV vehicle type and brand



Q5: How can INDOT/State Government support you in deploying EV infrastructure in rural and historically disadvantaged communities?

Total responses = 36, No response or N/A = 10



A significant number of participants cited funding through NEVI or helping to source new pools of funding would be directly beneficial and primary form of assistance from INDOT



The following were cited as additional ways INDOT can support rural EV programs:

- Ongoing operational support to stations in utility service territories with onerous demand charges, as well as low forecasted utilization, to ensure that these stations can be economically sustainable over their lifetime
- Direct support in identifying and selecting suitable location
- Communicating to rural residents on benefits of charging and proactively providing visibility of charging options
- Supporting policies that allow for EVSE to be co-located with solar, without it impacting the pricing structure/fee, to mitigate high demand charges from utilities



The following were cited as ways INDOT can support EV programs in historically disadvantaged areas:

- Incentives for business owners, or government sponsored and operated locations within counties
- Supporting local governments to reduce cost of community EV fast-charging through data-driven charging management and regulating charge prices
- Engaging with State/Local agencies to foster the coordinated development of policies, programs and standards to synchronize Level 1/2 (residential) with Level 3 (DCFC) charging network development; State agencies, in turn, could establish focused tax credits, rebates or other incentives
- Assist with identifying and mandating landowners in target communities to host charging infrastructure



E4 Charging Solutions: There are a number of sites eligible for NEVI funds that are also in rural or disadvantage communities. For instance, Kokomo, which is about equidistant between South Bend and Indianapolis on U.S. 31, is an EV-pending corridor that currently has very few (if any) charging stations.

The stretch of I-69 between Indianapolis and Bloomington is also light on charging infrastructure and includes rural and disadvantage communities where the chargers could be placed, according to NEVI requirements.



08

Additional Considerations

Q1: Please elaborate any other factors your organization has considered for deploying EV charging

Total responses = 30, No response or N/A = 16



Battery storage and solar on site can provide multiple benefits including:

- Electric grid resiliency
- Demand Response
- Additional revenue generation



One respondent indicated that although construction of a charging station typically takes from 4-8 weeks, the entire process takes on average 18 months



One respondent indicated they possess a mobile charging station that can be used for short-term events or for locations interested in testing an EV charger



Blink Charging: Blink currently incorporates battery storage and solar on site providing multiple benefits including: - Electric grid resiliency - Demand Response - Additional revenue generation - Promotion of green and sustainable power - Load-sharing to minimize grid impact - Storage battery integration for "Peak-Shaving" in an effort to reduce demand fees.

EVgo: The actual construction of a charging station takes just 4-8 weeks, but the entire process to bring a fast charger online—from site host engagement through utility engagement and permitting to utility interconnection—currently takes an average of 18 months.



Q2: Are there other states, cities, or federal agencies who you are coordinating with on EV charging that INDOT should be aware of?

Total responses = 30, No response or N/A = 16



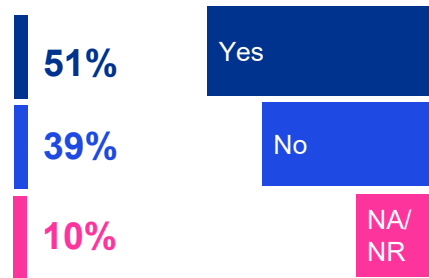
B
Observations and
Takeaways
Section III –
Implementation Questions
by Participant Type

01

Charging Hardware Owner / Operators

Q1: Do you have any plans to work with public / private sector entities to support scaling your operations? Please be specific on what types of entities and what type of support.

Yes / No (n = 41)



Participants are interested in both private and public partnerships related to research, innovation, or IP for future expansion.

Participants work closely with equipment suppliers, design-build firms, technology experts, EV technology consortiums, utility rate experts and others to help grow networks. Extensive networks of site host and commercial development partners are also common for potential host sites.

Total detailed responses = 22



Various public and private sector partnerships exist across industries, many of which are long-term agreements. Partnerships are focused on supporting EV charging on property and expanding charging network. Key industries include:

- Fleet and Rideshare Operators, Retail (hotels, shopping centers, gas stations, parking operators), Healthcare, Mixed Use/Real Estate, Education, OEMs, state energy and environmental agencies and utilities.



Utility partnerships support Charging Hardware Owners / Operators to secure cost-effective electric distribution system extensions and apply for charging rebates that support charging installations.



Charging Hardware Owners are focused on scaling partnerships with Operators for them to use their charging management system. Owners are also working to develop relationships with engineering firms and energy companies to serve as a provider of EV charging equipment.



Charging hardware owners and operators indicated a need to supplement current EV workforce (engineering, procurement, construction and ongoing maintenance vendors).

- Owners and operators also plan to work with third party property owners for site hosting future projects.
- State partnerships have focused on utilizing grant funding.



With 'pay to charge' station installation, Charging Hardware Owners are seeking public private partnership (P3) and long-term site host agreements to operate and maintain the equipment.

Q2: What are your current and planned fee structures (Time or energy usage, varied by charging speeds)?

Total detailed responses, n = 22

- Pricing offered on a dollar per minute basis. Pricing varies between Level 2 and DC fast charging stations but is consistent across the state.
- Currently piloting TOU pricing and other pricing structures; however, not currently offered in Indiana
- Pricing models shifting to adapt to higher speed chargers
- **Flat kWh fee for members and non-members; customer preference strongly favors kWh pricing**
- Fee structure depends on the location, level & length of charge, & also by state.
- Different requirements by state regarding kWh pricing, charge by parking space, etc.
- One utility has an approved tariff for Level 2 public charging for a flat fee. This utility is considering amending the tariff to align with current market practices (e.g. dwell time charges to promote turnover).
 - The utility does not yet have an approved tariff for DCFC.

Total detailed responses, n = 22

Q2b: Which of these have had success in driving utilization and why?

- Positive, predictable charging experience.
- Customers favor kWh flat fees.
- Participants recommended continual research and data collection to develop fee structures that work for the community
- Fee structures based on usage - either time or energy - will drive utilization by incentivizing customers to charge more (not waiting for full charge)

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Varying customer charging rates by time of day penalizes those who have no access to home charging and rely on public charging as their primary means of fueling and runs counter to the equity objectives of the program.

”

Q3: Have any revenue / cost sharing agreements had success and why?

Total detailed responses, n = 19

- Some participants indicated a preference for P3s over revenue / cost sharing agreements. P3s offer the ability to quickly respond to the market and evolving EV needs of the public partner.
- Some participants noted that revenue / cost sharing agreements do not support their bottom line, do not promote the values of the station owner, creates a burden for EV users with additional fees and reduces public partner autonomy regarding charging implementation.
- Several participants noted that revenue / cost sharing agreement types are not part of their current business model but would consider these agreement types.
- Participants have seen success with revenue / cost sharing agreements. Some benefits of these agreement types include shared risk of capital investment, inclusive business relationship with host partner, reduced cost burden on the host partner and acceleration of EV infrastructure in areas of high demand.
- **Specific models:**
 - Flat fee base rent per parking space plus percentage of revenue share
 - Fixed license or lease payments for site access



For rural sites, NEVI will need to expand the cost sharing beyond capital contributions (typically seen in public funding programs) by including operations and maintenance funding to make them commercially viable in preparation for future demand. Federal funding is critical to advance EV demand.



Q4: On average, how long does it take your company to install an EV charger?

Total detailed responses, n = 23

- Construction times will vary significantly depending on the unique site characteristics and type of equipment. Typical construction timelines are between 2-3 weeks after site plans are complete, permits are in place and all equipment is procured. With recent supply chain constraints, it is important to consider equipment lead times, which can vary significantly.
- Participants have experienced lead times as short as 4 weeks for equipment and as long as 52 weeks. **The average lead time for Level 2 is 2-4 months; however, Level 3 charging stations experienced longer lead times (4-7 months).**



The time between identifying and energizing a site varies widely due to several factors, such as funding, utility interconnection and local permitting timelines.

The actual construction of a charging station takes just 4-8 weeks, but the entire process to bring a fast charger online—from site host engagement through utility engagement and permitting to utility interconnection—currently takes an average of 18 months.



Total detailed responses, n = 22

Q4b: What if there are no existing connections to the grid?

- Installation lead time is extended if existing electrical infrastructure is not in place at the site
- Microgrid installation takes less than 3 months as these do not require grid interconnection

Q4c: Do you have experience working with utilities to connect EV infrastructure to the grid?

- Several participants have experience coordinating utility upgrades, integration and establishment of new and separate utility service for chargers.
- Local jurisdictions and utilities can reduce these timelines by implementing established best practices from national organizations.
- Supply chain disruptions in recent years have also resulted in longer lead times for critical equipment necessary to deploy 150kW+ charging, such as switchgear and utility transformers.
- These disruptions can further delay the timeline to complete the installation of 150kW+ charging stations.

Q5: How do approach short-term (5 years and less) and long-term (longer than 5 years) operations and maintenance of EV charging station infrastructure?

Business Model

- Several participants are focused on establishing short-term (5 year) maintenance agreements with the opportunity to extend in the future
- **Reliability is a priority and operators are committed to a high percentage uptime across the network and invest accordingly to ensure demand is met.**
- Participants advised that NEVI guidance should address uptime as a critical priority and ensure private sector contracts are structured to align these incentives.
- Underwriting assets is critical on a long-term basis.
- For long term agreements, participants seek a minimum 10-year investment commitment.

“

Maintenance agreements can be executed between the owner/operator and a local electrical contractor, a specialized EV hardware maintenance provider and/or accomplished in turnkey fashion through charger OEMs.

”

Technical Model

- For short and long term agreements, establish routine and major maintenance plans (and contingency plans) to ensure routine maintenance, repair sites and major maintenance / hardware replacement is met.
- For short term agreements, anticipate hardware/software upgrades and expansions that may be needed at established benchmarks. Participants recommended extended warranty agreements.
- Equipment maintenance should be independently contracted through a maintenance agreement.
- **Average lifecycle horizon on EV charging technologies is about 8-10 years**
- The use of software-based charging infrastructure (Over-the-Air Software Support for EV Charging Stations- OTA) for self-diagnostics can extend the product life greater than 10 years (with appropriate preventative maintenance). OTA runs 24/7 self-diagnostics via wireless transmission to interface with EV charging stations and detect malfunctions.
- Another solution to maintenance is to 'truck roll' for problem resolution, meaning a local contractor network will be established and included in the O&M agreement.
- For long term agreements, establish asset management plan (e.g. software and hardware reassessment).
- For short term agreements, core focus is on investment in technologies that do not require significant maintenance. Obsolescence risk is high for short-term agreements and participants seek clear value proposition for technologies in preparation for major maintenance / replacement needs after 5 years.
- **Investments in modular upgrades can result in extended equipment life of 10+ years.**

“

An optimal approach for short and long term O&M is through a trusted warranty. This allows real time station monitoring of maintenance needs, while also allowing networked stations to receive upgrades.

”

Supplemental Material Provided by Respondents: Participant Best Practice References

- INDOT may also consider allowing developers to start certain project development activities at their own financial risk as soon as the program begins accepting applications.
- If an application receives an award, expenses incurred between the application and award would be reimbursable.
- This best practice, called “build at risk”, is currently used in programs in Ohio, Texas and Florida.

Best Practices for Utility Program Design that identifies areas utilities can focus on to speed up infrastructure deployment

CONNECT THE WATTS
Best Practices for Charging Infrastructure Program Design
Utilities

Connecting EV fast chargers to the grid requires coordination with the local utility throughout the site design and installation process. There are many steps along the way, starting with work requests to access power, through collaborative design iterations, and culminating with scheduling of the utility-side construction and interconnection. Project timelines can be negatively impacted by long response times to requests, utility engineering cycle times, lead time for utility equipment (e.g. transformers), or lengthy scheduling processes for utility construction, outage timing, inclement weather, and interruptions to the utility workflow due to things like storm response obligations. Many of these challenges can be mitigated by utility incorporation of some field-tested best practices described below.

The Connect the Watts™ team, including utility representation and input, has identified 5 areas for utilities to focus on as they design and staff their EV charging project support processes: 1) Equipment Process Streamlining, 2) Utility Equipment Inventory Maintenance, 3) Design and Construction Staffing, 4) Study Phase Streamlining, and 5) Utility Design Approvals Streamlining.

Improve the Easement Process

- **Best Practices:**
 - Utilities should make easement language available to the public and should dedicate right of way resources to EV developers for work on public property.
 - To significantly reduce delays, utilities should model after FERC's lease language, which can be inserted in site host agreements instead of the easement process.
- **Challenges to Improve:**
 - The long turnaround time for initial easement documents, including templates and final documents, can create multi-month delays.
 - Other causes of delays include: refusal to allow for split design; language that includes permanent access rights, and long and/or complicated processes for negotiating easement document language.

Sample Language for Utility Adoption

Utility easements are a significant source of delays, adding approximately two months to a project schedule on average (1) takes three to four weeks for the utility to produce the easement and up to four months for the host to execute. Access agreements can eliminate the burden for utilities, site hosts and/or landlords, counties, electric vehicle service providers, etc.

EVGO PARTNERSHIPS

Source: [Link](#)

Build at Risk Best Practice:

Ohio

Ohio
Ohio Environmental Protection Agency

Diesel Mitigation Trust Fund (DMTF)

DC Fast Charging Grant Program Request for Applications
November 1, 2021
(Revised December 14, 2021)
(Revised January 14, 2022)

The State of Ohio Environmental Protection Agency (Ohio EPA) invites applicants for grants to install DC fast chargers to expand the state's electric vehicle charging infrastructure network along designated corridors in 26 priority counties in Ohio. This program is supported with funds from Ohio's allocation under the Volkswagen Mitigation Trust Fund.

Ohio EPA
Office of Environmental Education
50 W. Town St, Suite 700
Columbus, OH 43215
(614) 644-2673
Email: evcharging@epa.ohio.gov
Website: <https://epa.ohio.gov/portal/gov/epa/ohio/one-and-offices/environmental-education/grant-programs/vw-mitigation-grants>

Source: [Link](#)

Florida

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Request for Application (RFA)

For

Electric Vehicle Charging Infrastructure (EVCI) Phase 2

RFA No. EVCI-RFA-02

Department of Environmental Protection
Division of Air Resource Management
2000 Blair Stone Road
Tallahassee, Florida 32399
Email: 2000blairstone@dep.state.fl.us

Source: [Link](#)

02

Energy providers

Q1: What are the optimal highway locations to develop EV charging infrastructure based on the current location of existing grids? Please elaborate whether your organization has conducted an assessment on current electrical infrastructure capacity around Interstate Highway Systems or designated alternative fuel corridors or other locations that meet federal EV program delivery guidelines.

Total detailed responses, n = 11



Stations adjacent to interchanges / highway exits are ideal locations and a seemingly untapped market for EV charging to accommodate long distance travelers (e.g. I-65 and I-69)



Several participants noted that, while they are well-versed in system capability and community needs, statewide studies have not been carried out to determine charging network capacity.

- Traditionally, these studies are highly location-dependent to assess the nature of service, available hosting capacity and any necessary upgrades to the utility-side distribution infrastructure.
- Participants are working to develop an adequate process to assess statewide needs in order to scale with the NEVI effort.



Participants recommend INDOT be prepared to share preferred locations where DCFC is desired and site hosts surrounded by necessary amenities have shown interest.



Optimal EV charging infrastructure locations will likely closely mirror existing fueling station models. The need for additional amenities (food, convenience stores restroom facilities etc.) to ensure efficient charging stops will be much the same as current fueling stops. In general, charging stops will be several minutes longer than a typical fuel stop, emphasizing the need for additional amenities.



Q2: When do you think EV adoption will start to impact utility infrastructure (estimated year)?

Total detailed responses, n = 8

2025-2027

Participants noted a need to accelerate this development in the near-term (this year) but that the greatest impact to EV adoption is likely to occur in 3-5 years (2025-2027).

Q2b: When will your organization start to develop new infrastructure to support the increased charging demands? (e.g., circuit upgrades based on higher concentrations of EV adoption).

2024-2025

Participants anticipate developing new infrastructure and fleet adoption over the next 2 years (2024-2025) based off current climate of supply chain and EV conversion

2025-2027

Heavy adoption is likely to lead in 2025-2027

2030

Fleet EVs are on a minimum 18-month lead time and many fleet operators have carbon reduction goals of 2030

1-2 days

Each EV uses 1-2 days of electricity during a typical day

~1.5%

Currently, ~1.5% composition of EVs in the USA

10%-15%

By 2025, composition of EV in USA is expected to be 10%-15%. That's about 25,000,000 vehicles, with a combined electricity usage of potentially 50,000,000 homes. Considering there are around 130 million households in the US currently, that equates to almost 50% increase in electricity demand. As adoption increases, this usage will only increase further.

- Political pressure, gas price increases and rate structure developments could tip this market to move faster.
 - For DCFC, rural interstate exits could see capacity issues with execution phases of NEVI as early as 2023.
- Access to convenient power is important for DCFC deployment; however, DEI would advocate that this should not outweigh placing chargers in ideal locations for drivers.
 - Grid upgrades to support DCFC in less dense areas are a priority so over-reliance on convenient sourcing of power could be counter-productive.
- For community/residential charging, capacity issues will be more gradual. Residential charging management programs will be an impactful tool for deferring system investment.

Q3: What kind of other improvements or upgrades to the infrastructure may be required? Please provide a general cost estimate, if possible. If applicable, please also elaborate whether your organization would be interested in accessing federal funds to support grid expansion projects and which funds (e.g., Build a Better Grid).

Total detailed responses, n = 10

- Utilities will need more latitude to make upgrades in anticipation of new EV load (rather than reactive response to proven load and/or contracts with customers). Latitude may include:
 - Proactive upgrades for the area when the first large EV load is proposed, enabling the area to be upgraded one time
 - Leverage battery storage to help customers begin operations more quickly and to buffer the grid on a permanent basis from periods of high demand at specific sites
- Participants noted that more clarity is needed on the requirements of facilities moving forward to better prepare for upgrades.
- Participants will be reviewing other IIJA federal funding opportunities related to grid reliability and resilience and are highly interested in accessing federal funds to support grid expansion projects.

General cost estimate

\$6,000

The median Indiana co-op has \$6,000 in system value for each member

3%

EIA estimates show 3% of new car sales are EVs and if this rate grows 20% annually

10%

We would be looking at over 10% of the vehicles within IEC service territories as EVs by 2032.

\$7.8B

This would require the replacement of large portions of the existing system. Considering that collectively we serve 1.3 Million residents, we are looking at significant system upgrades at a cost around \$7.8B for infrastructure.

\$1.2B

AES Indiana investing \$1.2B in grid modernization upgrades to support future load growth and reliability. Additionally, distribution upgrades are treated on a location-by-location basis for new construction applications.

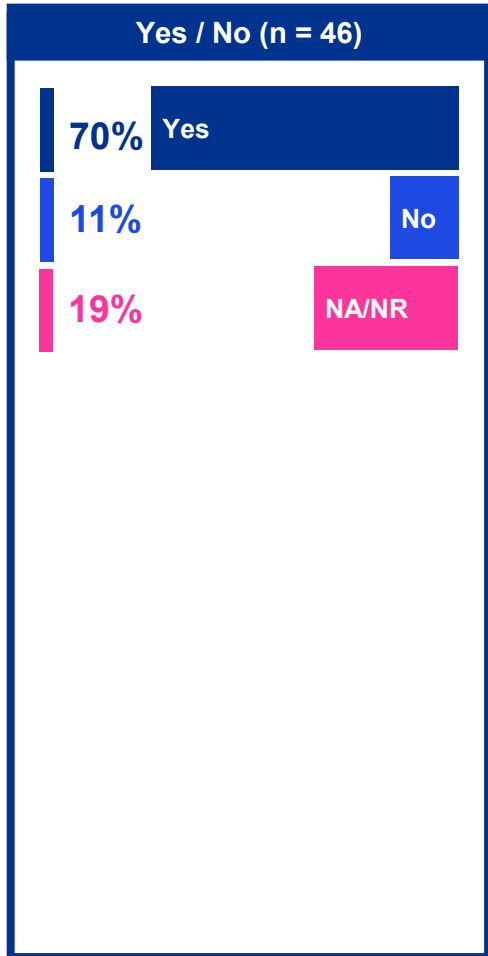
\$5,000-\$10,000

5,000-\$10,000 is required to install a unit, which is primarily designated to labor costs

\$15,000-\$40,000

DC charging stations cost \$15,000-\$40,000, excluding upgrades to service requirements

Q4: Is your organization interested in ownership of EV charging infrastructure, including the station, plugs and other associated infrastructure?



Total detailed responses, n = 12

Q4b: Please elaborate and specify if your organization has planned any pilots around new cost / fee / rate structures aimed to support EV infrastructure ownership.

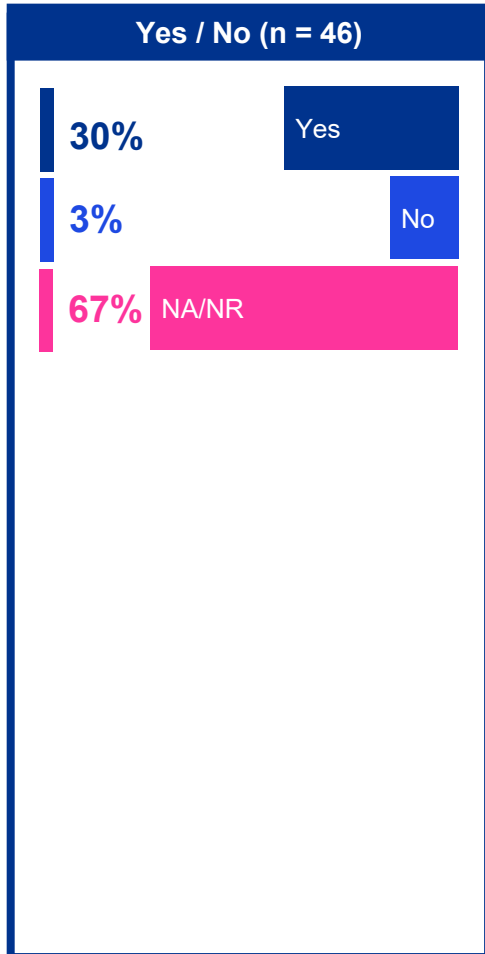
AES Indiana
 AES Indiana has an approved tariff for Level 2 public charging for a flat fee. This utility is considering amending the tariff to align with current market practices (e.g. dwell time charges to promote turnover). AES Indiana does not yet have an approved tariff for DCFC.

Indiana Electric Cooperatives
 Indiana Electric Cooperatives prioritizes ownership of EV charging infrastructure. Pilot projects are currently installed at several co-ops across the state and several more are in the process. IEC anticipates expansion of these programs in the coming years.

Duke Energy Indiana (DEI)

- DEI is in the process of deploying DCFC to 17 sites in conjunction with IUG.
- DEI has a DCFC rate pending before IURC. This rate, when approved, will enable DEI to dispense electricity for an approved fee at the DCFC dispenser ("at the pump").
- Additional enabling rates exist for DCFC operators that set their own rates.
 - DEI's commercial rate LLF can help manage demand charges at DCFC sites until DCFC utilization grows.
- DEI also anticipates deploying TOU rates built for EV charging and residential and fleet subscription rates that provide customer cost certainty while allowing the utility to manage loads such that system peaks are minimized.
- DEI has also proposed a program called EVSE tariff that allows customers of all classes to "rent" a charger from DEI for a fixed monthly cost and, typically, with no upfront cost.
 - DEI installs the charger hardware on the customers infrastructure, commissions the device onto the cloud network (if applicable) and provides maintenance.
 - The customer is free to operate the charger as desired.
 - In response to the FHWA RFI for NEVI, DEI suggested that this cost structure be eligible under IJJA.

Q5: Is your organization considering preparing for future innovations?



Total detailed responses, n = 12

Participants noted the following investments and upgrades in preparation for future demand:

Electric distribution / capacity upgrades

- AES Indiana is currently investing \$1.2B in grid modernization upgrades to support future load growth and reliability. Additionally, distribution upgrades are treated on a location by location basis for new construction applications.
- Several existing distributed energy resource management platforms are developing modules to interface with home chargers and control their timing and output to avoid peak related expenses.

Grid or utility-scale battery storage

- AES Indiana installed the first MISO sited utility scale battery storage system. The company and its affiliates (e.g., Fluence) have deep expertise in large scale battery storage which may in the future provide distribution side benefits when co-located with DCFC.
- Indiana Electric Cooperatives are also on the forefront of battery storage technology with two co-ops already having deployed projects.
- XCharge USA has announced products utilizing energy storage capabilities and AI to provide lower impact charging for EVs, as well as grid stability/sharing capability through stored energy and vehicle.

Vehicle Grid Integration (VGI) / Smart Charging

- VGI technology has not yet been proven commercially viable at scale and few hardware and software combinations exist.
- Utility interconnection agreements, additionally, need to evolve as more is understood about VGI and V2X, more broadly.
- Managed charging and battery storage will both be critical for optimizing the utility grid. Notably, neither managed charging nor battery storage are truly future state technologies. While neither is yet ubiquitous, both are viable and in use today.
- AES Indiana is part of a consortium of utilities working with vehicle OEMs on Vehicle Grid Integration (VGI) in the future. This initiative consider bi-directional capabilities of emerging vehicle makes and models.
- AES Indiana has experience with VGI and networked charging applications through its EV-specific time-of-use rate and Managed Charging offering. These efforts are live today.
- DEI is currently testing vehicle to grid (VGI) with Bartholomew Consolidated School Corporation with school bus and has a proposal pending at the IURC for 6 more school buses.

Additional improvements include:

- Electric upgrades with a new substation
- Solar arrays with battery storage
- Parking enforcement with systems in place to ensure operators are allowed to effectively manage spaces utilized for charging

03

**Municipalities / Cities
/ RPOs / MPOs**

Q1: How would you propose to work with other public / private entities to identify appropriate or optimal sites for charging? INDOT does not desire to act as a facilitator for these kinds of connections.

Total detailed responses, n = 12



Local governments reflected that they would help convene relevant agencies, EV drivers, working groups to provide input or assist with connecting local governments to technical assistance or facility workshops on site identification and permitting/inspections for EVSE



MPOs / RPOs were cited helpful for counties and cities for regional coordination to ensure the EV charging network meets best practices.

- The City of South Bend and City of Jefferson currently works closely their RPOs to understand best practices on EV deployment and engagement with stakeholders across municipalities
- Pike County EDC expressed willingness to be a facilitator; previous experience in this role as a data collector allowed a charging site to be deployed directly off of the I-69 interchange.



1 respondent who was a charging OEM also cited an exchange of best practice documentation from local governments would better facilitate the location selection process. Documentation would include items such as:

- Optimal distance between stations
- Suitability of different sites
- Eligible site criteria
- Available real estate



MACOG: MACOG also collaborates with the local EV drivers group who powers our EV education events and could distribute surveys or recruit volunteers for a focus group on the plan from concept to implementation. The local EV drivers group (Michiana Electric Vehicle Network) represents drivers/owners of over 80 electric vehicles and over 100 people in northern Indiana.

Ozone: Understanding where people are parking vehicles and for how long are parking vehicles is key for determining charger placement in our point of view. By understanding these trends through review of parking and traffic data, we can work with municipalities and other potential CPOs to optimize placement and scale out of charger facilities.



Q2: What is your proposed plan facilitating data sharing of charging equipment with partnering entities? How would municipalities be able to access information (e.g., on-line dashboard)? Should access to data be open-sourced?

Total detailed responses, n = 12

Respondents outlined several methods to facilitate data sharing:

- Develop agreements with the local governments that own/operate Level 2 EVSE
- Work with chargepoint operators to access charging utilization data – e.g. MACOG has an agreement with ChargePoint

Some respondents reported concerns with privacy regarding open-sourced data – for example, access to the complete dataset should not be open sourced without deleting the unique driver ID in order to anonymize individual charging behavior pattern

Respondents cited specific data points that could be provided by station owners and prove to be useful reports, including:

- Number of unique drivers
- Charging durations
- Session time of day
- Max kW delivered (i.e. to what extent are vehicles visiting capable of using ultra-fast charging)

Notable example:

The IMPO maintains many GIS dashboards and could consider, if feasible, creating a dashboard of EV infrastructure (planned and built) in the Indianapolis region so municipal and county agencies can coordinate on locations of EV charging sites.



MACOG: MACOG has agreements with the local governments that own/operate Level 2 EVSE as part of the Regional Cohort that MACOG can access the dashboard to view the data directly. For example, MACOG has access rights to log in directly to the ChargePoint dashboard for those with that product. MACOG needed that access to assist with reporting for the Volkswagen grant.

City of Jefferson: The City would be happy to engage in discussions on how best to share EV station data, whether that is a semi-regular export, or the open-sourcing of data.



Q3: Do you have interest in applying for discretionary funding?

Yes / No (n = 12)

83% Yes (excl. NRs)

Michiana Area Council of Governments
XCharge USA
Town of Newburgh
City of Jeffersonville
City of South Bend
Pike County Economic Development Corporation
Good Oil Company Inc
Telamon Corporation/Telamon Enterprise Ventures
Dubois County Airport Authority
East End Crossing Partners

17% No

Indianapolis Metropolitan Planning Organization
BorgWarner Inc.



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