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Equity and the National Electric Vehicle Infrastructure (NEVI) Program

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Contents

Introduction

Starting with the Justice40 Initiative established during their first week in office, the Biden administration has been expanding the ways environmental justice is considered and measured through federal programs and certain workforce and training investments.

This comes at a time when businesses, researchers, and local and regional governments have taken on the broader responsibility of evaluating the intended and unintended consequences of projects that allow all members of the public to meaningfully benefit. The 2021 Infrastructure Investment and Jobs Act (IIJA) and the 2022 Inflation Reduction Act (IRA) expressly address previous policy and funding shortcomings regarding infrastructure, climate, and equity, through both the application of Justice40 and directly.[1] On August 18, 2022, the White House announced the US Department of Transportation's (USDOT) official Justice40 covered programs list, which includes the IIJA-funded National Electric Vehicle Investment (NEVI) program.[2]

The NEVI program equips states and the District of Columbia and Puerto Rico with the opportunity to lay the foundation for decarbonization of the transportation sector by constructing an interconnected network of electric charging infrastructure nationwide. At the same time, it also asks recipients to devise approaches that comply with Justice40 initiative tenets that require 40% of the investments in certain covered programs, including NEVI, to benefit disadvantaged communities (DACs). The types of investment that can be counted toward this goal include but are not limited to "climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, [and] remediation and reduction of legacy pollution." [3] Implementing the Justice40 goals broadly, and specifically on the NEVI program, immediately poses two key issues: 1) how to identify and count "benefits" and "burdens" and 2) how to determine the factors that characterize a "disadvantaged community."

$5 billion in funding will be allocated to states and eligible recipients for electric vehicle charging along highways, followed by a second discretionary pool of $2.5 billion that will be awarded to states for in-fill charging.

There is significant funding for the NEVI program consistent with the urgency with which the federal government is addressing climate change. Thus, $5 billion in funding will be allocated to states and eligible recipients according to a formula devised by the Federal Highway Administration (FHWA),[4] to be followed by a second discretionary wave of federal money ($2.5 billion) that will be awarded to states for in-fill charging.[5] Both the formula and competitive programs will be implemented under this new focus, even as questions remain about the best practices that exist to help all communities experience the benefits of such an investment while, at the same time, the burdens are identified and reduced to the maximum extent possible. This paper explores how states are navigating the following topics:

- The economic benefit of the electrification program, or value capture, induced by the investment in charging networks
- The relative health and financial benefits to low-income, disadvantaged, and otherwise underserved communities of the increase in electric charging and associated development
- The opportunity for private sector development of new businesses that leverage the new electrified network of infrastructure
- The potential for workforce development

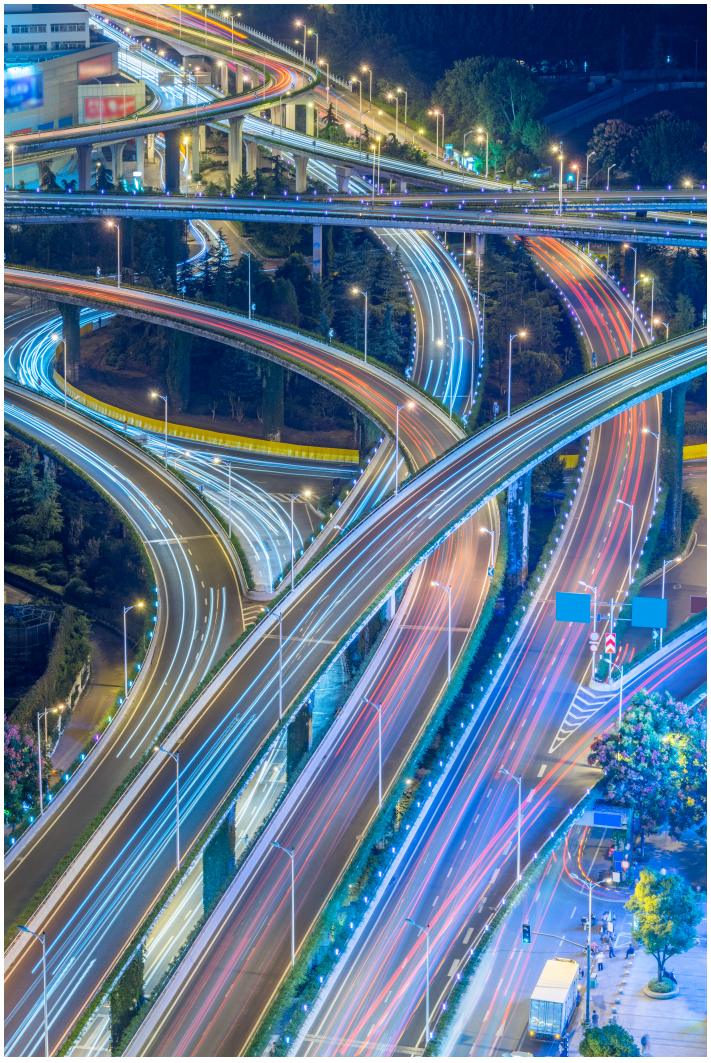
Prior to receiving funds, states and eligible recipients were required to submit NEVI plans to FHWA for approval. Each planlays out how the recipient will comply with all the requirements of the program, including Justice40. The remainder of this paper looks at the state NEVI plans that were submitted and highlights the wide variety of approaches and considerations that were presented to address equity through the lens of Justice40 as one component of each individual recipient's overall NEVI program.

Highlights of the NEVI plans submitted to FHWA

All states plus Puerto Rico and the District of Columbia submitted NEVI plans to FHWA. The plans identified several common challenges:

- The relatively low utilization of some stations due to the 50-mile spacing stipulated in the NEVI guidelines when coupled with the low market penetration of EVs and the need to reach rural populations
- The relatively high cost to equip each station with up to 600 kW of electricity and the high utility demand charge
- The long-term viability of under-utilized stations with poor economics (for the reasons stated above as well as others)
- The historic high up-front cost of acquiring an EV, even with tax credits, that may keep vehicles out of reach of the communities that can most benefit from them
- The ultimate reduction in the amount of fuel excise tax collected, thus requiring a more rapid shift to road user charges to fund road maintenance and other activity, and the associated challenges surrounding such a shift

Virtually all the plans acknowledged the imperative and the inevitability of EVs and presented thoughtful, well-considered ideas and approaches to achieve the goals of the NEVI program. Every state recognized the criticality of workforce transformation and the potential for economic development. As contrasted with solar or wind resource development, which have more variation in geographic applicability, every state has a significant EV impact and potential.



EV deployment in Justice40 communities across state plans

Reviewing all the submitted plans revealed the great demographic variety in the United States. The contrast between urban and rural communities was particularly apparent, each with equity issues, albeit different ones.

Many states, such as Colorado, noted the challenges of EV ownership "for those who do not own their own home or who reside in multifamily housing, since these individuals are less likely to have a dedicated parking space or access to shared EV charging equipment."[6] While the NEVI program is critically needed to counter range anxiety along the Alternative Fuel Corridors (AFCs), today most charging is still being done at home.[7] This trend is forecast to change as EV ownership grows; an Oregon study found that the "need for public charging grows exponentially from 2020 to 2035."[8]

An important equity consideration is the cost of at-home charging versus public charging, as noted by several states.

- Vermont states, "Given the cheaper relative cost of at-home charging, particularly when taking advantage of time-of-use rates offered by utilities, public chargers will be more expensive to construct, own, and operate."[9] Going further, Vermont will introduce plans to develop new multifamily building codes that require charging for EVs and, starting in 2022, a grant program to subsidize charging in multifamily buildings and prioritize affordable housing.[10,11]
- In Utah, Rocky Mountain Power offers a discount for its customers when using its public charging stations. Non-RMP customers pay $0.45 per kWh for DC fast charging, while customers pay $0.27 per kWh. For level 2 charging at RMP-operated stations, both pay only $0.08 per kWh.[12]

NEVI plans illustrated how to extend AFCs to rural communities, as well as best practices to engage them in the process. Ohio proposed a robust process for engaging with rural stakeholders. DriveOhio, a unit of the Ohio Department of Transportation that promotes smart mobility, held listening sessions in rural northeast Ohio and in Appalachia.[13] Oklahoma "intends for there to be a strategic focus on disadvantaged communities, tribal communities, and rural communities."[14] Oklahoma particularly identified community-based organizations for rural engagement: Oklahoma Native Assets Coalition Inc., Bartlesville Regional United Way, Grand Nation Inc., Oklahoma Sustainability Network, Norman Pride Inc., Up With Trees Inc., Compatible Lands Foundation Inc., Guymon Community Enrichment Foundation, and Chahta Foundation. Oregon, as part of its Transportation Electrification Infrastructure Needs Analysis conducted in 2021, held regional workshops, as did many states.[15]

Some AFC corridors don't serve rural populations well. Alabama, for instance, is "... prioritizing [fill-in] projects funded through its state-based program to support direct current fast charge (DCFC) and level 2 projects outside NEVI's strict eligibility criteria."[16] Some states will find it relatively easier to meet the needs of rural communities, such as West Virginia, where "... 72% of the population lives in a census tract designated as a Justice40 community," and 43% of West Virginia's population is within a Justice40-designated community and along an AFC.[17]

Georgia identified that building out rural charging can help justify grid strengthening that will enhance resilience. Nebraska notes that the NEVI program will "direct initial funding to rural areas of the state, which is consistent with NEVI program efforts."[18] Similarly, the Utah Department of Transportation planned to use NEVI grants to "focus on the needs of rural communities."[19] By contrast, Texas is "... equitably planning for EV charging capabilities between our rural and urban areas."[20]

Public charging could be a loss leader initially, especially in very remote areas. Governments should seek the subsidization needed or, perhaps, consider whether utilities could spread station costs across ratepayers.

Every state recognized the criticality of workforce transformation and the potential for economic development.

Defining and mandating benefits across state plans

Most states plan to track benefits according to USDOT categories and interim Justice40 guidance, identifying benefits such as improvement in EV transportation and accessibility, reliability, and options (USDOT Categories: 1, 5, 6) and the number of new electric vehicle supply equipment (EVSE) installed in DAC-defined census tracts and tribal lands and data sources that are not now identified by the USDOT as measures of disadvantage. While the improvement in those scores can be tracked, it is unclear 1) how total benefits will be quantified across the 22 categories of measurement and 2) how benefits will be tracked and allocated across DACs and non-DACs.

Missouri most clearly identified the benefits calculation challenge: "Currently benefits beyond geographic location can only be discussed qualitatively, as tools do not yet exist to measure other expected benefits."[21] Similarly, Nebraska contends that "[m]easuring the degree of benefit is not likely to be required in the first few years due to the complexity and lack of specific guidance at this time."[22] Rhode Island stated that the main benefit of the NEVI program will be the direct spending in DACs associated with it.[23]

Colorado was the most developed in distinguishing direct and indirect benefits: "direct benefits, such as the number and dollar value of infrastructure projects located within Justice40 boundaries, as well as indirect benefits, such as clean energy job creation related to infrastructure installation and maintenance."[24]

All state plans cited reducing tailpipe emissions from buses and commercial transportation, which disproportionately impacts low-income and disadvantaged communities.

An indirect but important benefit of transportation electrification that was cited by all plans was reducing tailpipe emissions from buses and commercial transportation, which disproportionately impacts low-income and disadvantaged communities.[25] Some states decided to increase Justice40's criteria of 40%, including:

- California, which stipulated that "50% of the NEVI funding will be utilized for projects within California designated disadvantaged communities and/or low-income communities."
- Nevada-based NV Energy's Economic Recovery Transportation Electrification Plan, which plans "51% of program dollars to historically underserved communities."[26]

New Hampshire and 18 other states acknowledged resilience as a benefit of EVs.[27] This is especially timely noting the precipitous rise in gas prices in the summer of 2022. New Jersey and eight other states noted that a benefit of NEVI is that it can help "minimize gentrification-induced displacement."[28] Wyoming eschewed complex multidimensional measurements of benefits, instead contending that "keeping the station operable and solvent are the most measurable benefits regardless of location."[29]

Though some states addressed vehicle affordability as a dimension of equity, the IIJA-created NEVI program focuses on charging infrastructure, not vehicle acquisition, so the complementary IRA focus on EV ownership and new and used vehicle tax credits should also be considered when evaluating the overall benefits and burdens of decarbonization for DACs.

The NEVI program builds up charging infrastructure, not vehicle acquisition. The complementary IRA legislation passed in 2022 focuses on EV ownership.

Private sector involvement across state plans

Utilities, vehicle manufacturers, and charging companies recognize that EV stations can catalyze economic development and remediate historic inequalities. In Nevada, "Electrify America has expanded its efforts to increase EV adoption by under-represented communities through a partnership with EVNoire's "Drive the Future" campaign, aimed at educating Black Americans on the benefits of EV adoption and providing communities with financial assistance and other support." [30] Other states working with EVNoire are Oregon (EV Hybrid Noire) and Virginia. Likewise, Alabama, Connecticut, Indiana, Michigan, and Oklahoma all cite partnerships with the private sector to develop an EV workforce.

The private sector appears ready to step up as evidenced by automakers, battery makers, utilities, charging companies, convenience retailers, unions, and other companies partnering with state governments and NGOs to address DAC concerns, and they may be a key to unlocking NEVI grant funds when an exception seems unavoidable. The NEVI program guidelines establish significant incentives to mobilize private sector investment in the EV space. Some of the significant projects announced to date include:

- Kansas, where Panasonic announced a $4 billion battery plant and an anticipated 4,000 new jobs.[31]
- North Carolina, which measures 73% of its population as living in DACs and where Toyota Battery Manufacturing, North Carolina will invest $2.5 billion to expand its operation.[32]
- Tennessee, where "Ford Motor Company and SK Innovation announced plans to build Blue Oval City in West Tennessee. ... The project, which is projected to directly employ 5,800 Tennesseans, is expected to cost $5.6 billion."[33]
- Michigan, where "General Motors is investing $7 billion into its EV development and manufacturing facilities, which will create 4,000 new jobs and retain 1,000 others ... [and] ... 2,200 jobs at its Hamtramck EV manufacturing facility."[34]

The economics surrounding charging station deployment vary across plans. Florida identified that low-cost financing for charging stations in DACs should be made available based on future EV adoption rather than current market conditions.

The private sector appears ready to step up as evidenced by automakers, battery makers, utilities, charging companies, convenience retailers, unions, and other companies partnering with state governments and NGOs.

Pennsylvania identified that some DAC residents would need "payment options to accommodate drivers that do not have access to a personal banking account, credit cards, and other cashless options (e.g., offering a pre-paid card to charge EVs)."[35]

Some states noted that while charging stations may be sited in DACs, this may be a burden, not a benefit, as the stations may first serve mainly non-residents and thereby bring "unintended" traffic. Most states recognized non-local charging as an economic development opportunity, like Missouri, which envisioned "enhancing the business economy in these [DAC] areas while EV owners are charging."[36] Virginia notes, "Indirect benefits may include a higher incidence of business formation near charging sites."[37]

Historically, utilities have been key stakeholders in economic development and are represented in the plans, as well. In June 2021, Nevada passed SB 448, which directed NV Energy to invest in the charging stations as per the NEVI plan. A spokesperson for NV Energy said the bill "will transform Nevada's clean-energy landscape, create thousands of good paying jobs, and ensure Nevada's underserved and low-income communities benefit from this energy transformation."[38]

The Pennsylvania Department of Transportation "is planning to include an equity dashboard that tracks the number and the amount of investment to DACs and to small and disadvantaged businesses."[39]

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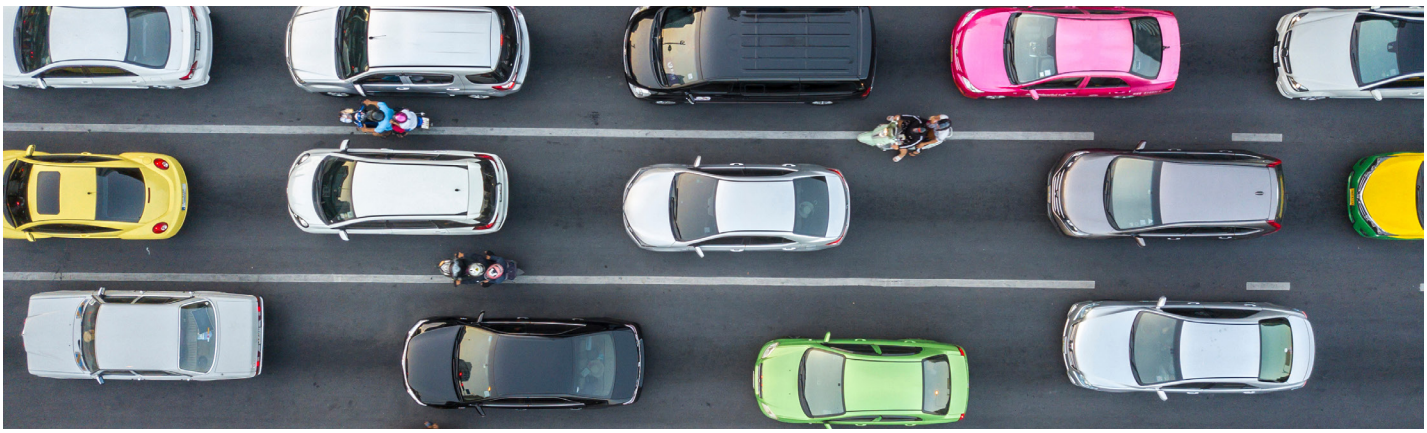

Workforce considerations across state plans

All states identified the need to train a new workforce skilled in the construction, operation, and maintenance of charging infrastructure. All states identified the Electric Vehicle Infrastructure Training Program (EVITP) for the certification of technicians. EVITP is a collaboration of industry stakeholders, including automakers, EVSE manufacturers, educational institutions, utility companies, electrical industry professionals, and key EV industry stakeholders.[40] Utilities are also strong supporters of workforce training programs; as an example, in Oregon, Portland General Electric has offered support to several community colleges for EV and EV charging infrastructure-related programs.

Many NEVI plans incorporated academic research and the establishment of partnerships with universities, colleges, high schools, and prison education programs in their workforce development plans. Some examples of these varied workforce development approaches include:

- Community and technical college programs like the "Louisiana Community and Technical College System … that expressed great interest in developing curricula at community and technical colleges in the state to develop a workforce specifically targeted at the care and maintenance of charging stations and alternative-fuel vehicles."[41]

  High school programs like one in Iowa, where they reached down to the high school level, promoting pre-apprenticeship programs that will feed into their already existing Registered Apprentice Program.[42]

- Prison education programs like one in Illinois, where they innovated a thoughtful and targeted approach incorporating recidivism: "The Restore, Reinvest, and Renew program, managed by the Illinois Criminal Justice Information Authority, provides funding to support community organizations that serve neighborhoods most impacted by economic disinvestment, violence, and the war on drugs."[43]

While EVs are projected to ultimately be cheaper to maintain than gas-fueled vehicles,[44] only a few states identified a potential reduction in the automobile maintenance labor force as the transition to EVs takes place.[45] New York conducted a study finding that "… conventional fueling stations (gas stations) account for more than one-third to almost one-half of all displaced jobs … as more drivers shift to lower-cost charging of electric vehicles."[46] Anticipating this shift, Georgia noted that skilled incumbent workers need retraining and is offering a state tax credit of up $1,250 per employee.[47]

Kentucky recognized that the increase in EVs will create an opportunity for power generation and power distribution utilities to strengthen their workforces.[48] Distributed generation also creates job opportunities within DACs; Illinois' Solar for All Project "helps make solar installations more affordable for income-eligible households and organizations through state incentives."[49] New Mexico highlighted an innovative program: "MICROGrid Center … an interdisciplinary project that is pursuing research and workforce training for next-generation electric power production and delivery, including power delivery via EV infrastructure."[50]

Many NEVI plans incorporated academic research, and the establishment of partnerships with universities, colleges, high schools, and prison education programs in their workforce development plans.

Unlocking NEVI as a catalyst for a green economy for all

The NEVI program serves as a catalyst for a green economy and must be planned with the benefit of hindsight to avoid unintended burdens from the necessary expansion of green-energy production and storage needed to address climate change. Local low-income and disadvantaged communities cannot shoulder all the burdens of the installation of wind and solar farms or the mining of nickel and lithium for batteries,[51] for instance, which, while serving the greater good, could have deleterious effects on their quality of life, health, and well-being. Further, we cannot price local low-income and disadvantaged communities out of key mitigations for climate change. Currently, many roof-top solar and EV technologies are offered at a price point exclusive to all but the most affluent customers—those who then can experience reductions in future expenditures on energy simply because they can afford the initial investment.

One of the unintended consequences of the national highway system, which provided greater access, connectivity, and economic opportunity for most, was that it excessively burdened disadvantaged communities, who often hosted the corridor but could only look on as the economic benefits escaped them. Research has shown that lower-wage workers generally have longer commutes to employment, which is the greatest irony of the highway-building era that placed roads through the middle of these communities, ultimately providing the route by which the jobs moved out of them.[52] Therefore, while the data from the US Environmental Protection Agency reveals that the largest share of greenhouse gas (GHG) emissions within the transportation sector are "light-duty vehicles (including passenger cars and light-duty trucks) [that] represented 58% of CO2 emissions from fossil fuel combustion," the fact that these are precisely the vehicles relied upon by transportation-burdened communities for their livelihood is worth noting.[53] Fortunately, the power sector has made progress in recent decades in increasing wind and solar power production such that by 2020, GHG emissions from transportation (27%) exceeded those from the power sector (25%) in the United States. However, the corresponding need to increase energy production and transmission to support transportation should also be evaluated as part of the overall equation regarding long-term EV adoption and use.[54]

We should plan with the benefit of hindsight that disadvantaged communities avoid unintended burdens from the necessary expansion of green-energy production and storage.

Conclusion

The benefits to disadvantaged communities from the NEVI program will not necessarily directly correlate to the number of chargers installed in the community. Rather, the benefits should be counted in terms of jobs, economic development, improved transportation, healthier air, and many other dimensions. The plans demonstrate the widely varied circumstances that face each state and highlight the fact that there is no single clear definition or methodology for how to ultimately count benefits to consistently report on the 40% threshold across the country. Further, they help clarify that one size will not fit all and that building flexibility into the Justice40 guidelines will help to track meaningful benefits across all locations. Fortunately, there is already evidence of the following:

- The private sector appears ready to step up as evidenced by automakers, battery makers, utilities, charging companies, convenience retailers, unions, and other companies partnering with state governments and NGOs to address DAC concerns and may be a key to unlocking NEVI grant funds when an exception seems unavoidable.
- State laws and programs that preceded the federal Justice40 Initiative and IIJA legislation are now being further aligned in their pursuit of climate and equity goals. Even at the city level, there have been EV and equity programs preceding federal activity.
- Federal, state, and local governments should continue to work together to further define burdens and benefits and devise ways to include community input in the definitions in order to report authentic, trusted information on the NEVI program to the public.
- Going one step further, regional or even national technology-enabled systems should be developed to support collaboration and provide clear, reliable information on benefits and burdens, and consideration should be given to how to make such systems equally available to all jurisdictions, big and small, urban and rural.

There also seems to be a strong possibility that public charging could be a loss leader initially, especially in very remote areas. State and local governments should seek the subsidization needed or, perhaps, consider whether utilities could spread station costs across ratepayers. There is also enough information in the plans to support the need to relax the NEVI station location standards (50 miles) in selected cases where the requirement may discourage private investment or introduce other, unintended consequences that could be considered burdens to DACs.

While some states addressed vehicle affordability as a dimension of equity, the IIJA-created NEVI program focuses on charging, not vehicle acquisition. Therefore, the complementary IRA focus on EV ownership and new and used vehicle tax credits should also be considered when evaluating the overall benefits and burdens of decarbonization for DACs, and a more intentional approach that considers both charging and vehicle ownership programs will likely yield the greatest benefits for DACs.

Regional or even national smart technology-enabled systems could support collaboration and provide clear, reliable information on benefits and burdens if they were equally available to all jurisdictions, big and small, urban and rural.

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