Equitable Electric Mobility Playbook

February 2022

ENTERPRISE HOLDINGS

Acknowledgements

The Equitable Electric Mobility Playbook is a resource developed for the 2022 National League of Cities Capstone Challenge.

Partner Organizations

Consultant Team

Special thanks to Ameren Missouri and Dominion Energy for their insights on the role of utilities in delivering equitable electric mobility.

Cover Image Source: Sam Holt

Equitable Electric Mobility Playbook

A Playbook For Equitable Electric Mobility

Transportation is central to how people experience life in cities. It can pollute the air. It can consume large portion of a family's monthly budget. It can even determine job prospects. Big changes to the mobility landscape can profoundly impact how people get around, but also unlock entire neighborhood's ability to grow healthier, economically stronger, and more resilient.

Source: City of Boston

How can cities develop equitable electric vehicle policies, programs, and charging investment strategies that meet the mobility needs of their most disadvantaged communities?

Change is here. The rapid transition to an electric mobility system is underway. In addition to the rise of shared electric bikes, scooters, mopeds, microtransit, and buses, automakers are transitioning away from internal combustion engines and toward electric vehicles with dozens of new electric vehicle (EV) models on the market in the next five years. Cities are adding new charging infrastructure to support this transition. But is this a just and equitable transition? Are our historically marginalized communities—including low-income and Black, indigenous, and people of color (BIPOC)—reaping the benefits of this transition?

We as cities have an opportunity to get it right, and the time to partner and invest is now. We hope to realize a future where all mobility options are clean, affordable, and accessible. But more importantly, we hope the electric future is designed to meet the diverse mobility needs of cities while helping historically marginalized communities achieve their full potential.

Source: Brookings Institute

We've been down this road before...

This is a pattern, and we aim to break it. Whether it was bringing broadband to cities or making life-saving infrastructure changes to streets, major technology shifts have left our most vulnerable and disadvantaged communities behind time and time again.

Charting a course for equitable electric mobility

Inequitable access and investment in electric vehicle charging is happening now. Cities and their partners (community organizations, utilities, automakers, mobility providers) can re-set the playing field for a just and equitable transition to electric vehicle access and adoption. They just need a playbook to guide them.

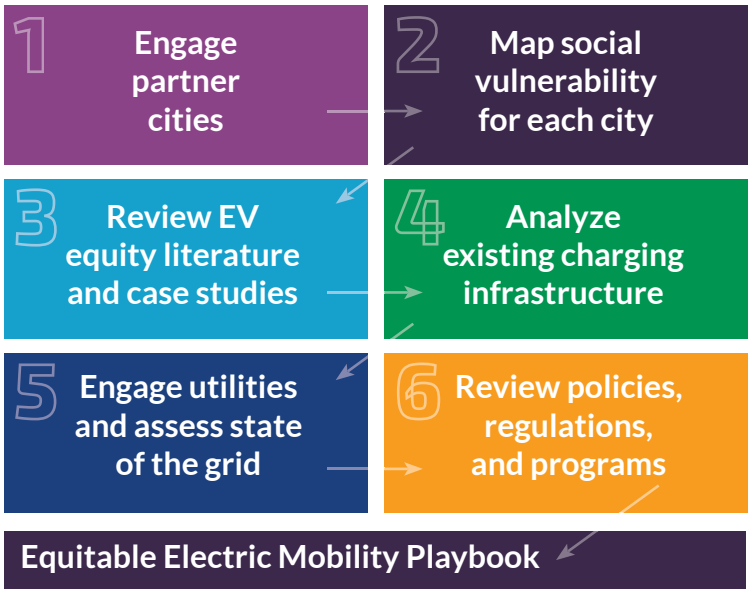
How did we get here?

The Playbook is the endpoint of a process to understand the current state of electric mobility investments, why it has led to inequity, what levers are available to today to center equity in the decision-making process, and how to course-correct.

The Equitable Electric Mobility Playbook:

- ***Presents the various barriers to when expanding access to electric mobility options;***
- ***Demonstrates the magnitude of the problem in three indicator cities—Columbia, SC, Houston, TX, and St. Louis, MO; and***
- ***Presents policy, programmatic, and investment solutions that support electric vehicle transition in historically marginalized communities in the three indicator cities and how they might be applied to similar cities across the country.***

Ultimately, this Playbook provides policymakers and their stakeholders with the basic tools to recognize how this inequitable landscape impacts historically marginalized communities and accelerate electric mobility adoption within these communities. While the Playbook references the connections to other forms of electric mobility, such as public transit, shared scooters and bikes, this Playbook focuses on removing barriers to accessing personally owned and shared electric vehicles and convenient public charging infrastructure.



Defining Equitable Electric Mobility

Equitable electric mobility enables a wide range of clean transportation options that are supported by fast and reliable public charging infrastructure. Whether personally owned or shared amongst the community, equitable electric mobility represents the range of clean and affordable transportation options. What makes electric mobility equitable is not just access to EVs; it requires listening to needs, noticing and addressing structural barriers, and ensuring that historically marginalized communities can reap the environmental, economic, and public health benefits of transportation electrification.

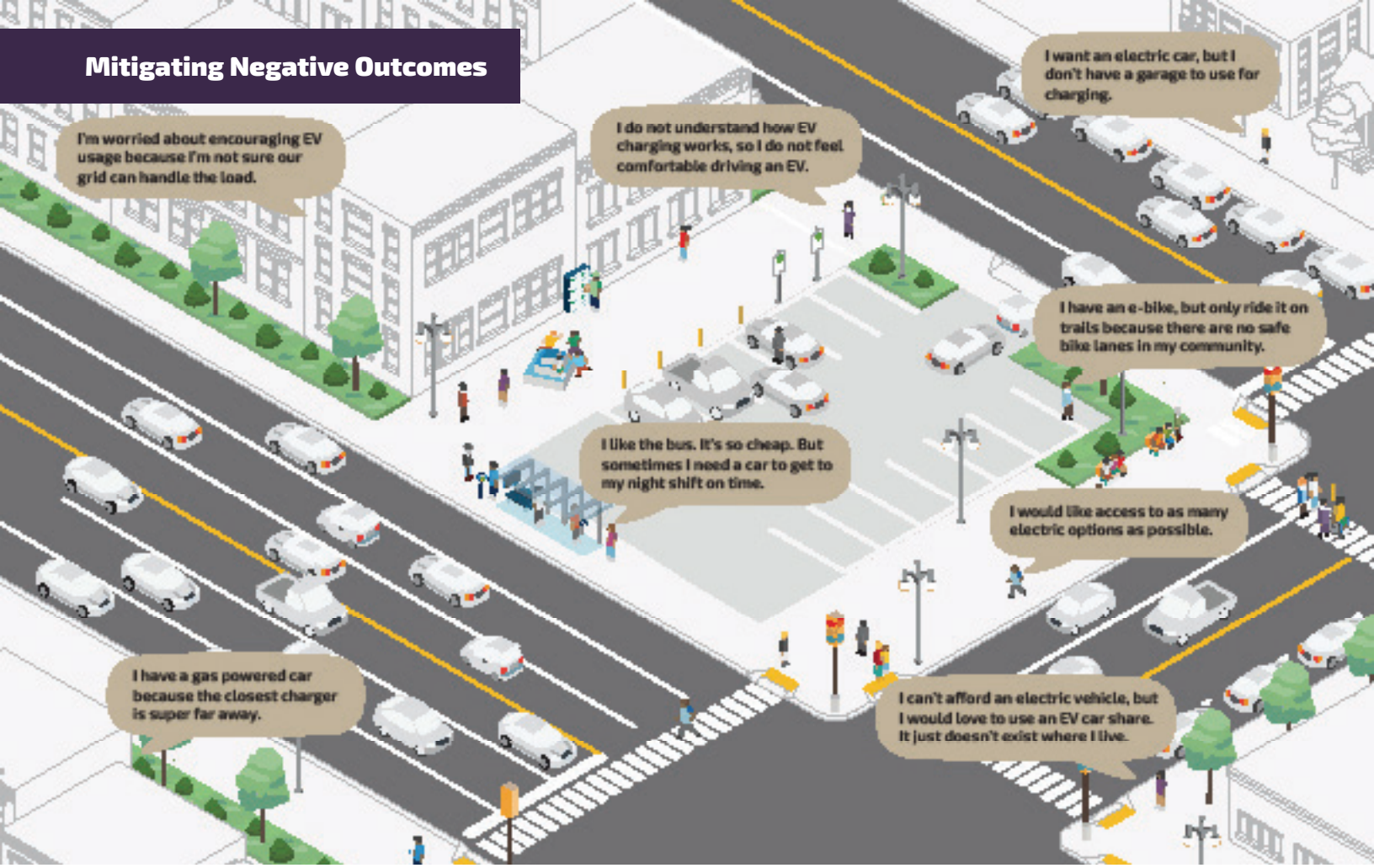
Recognizing the barriers to ownership, usage, and access to electric vehicles for BIPOC communities, equitable electric mobility focuses on mitigating those barriers to increase access and use of electric vehicles in historically marginalized communities. Cities should not only aim to mitigate access issues, but also intentionally capitalize on benefits and opportunities that electric vehicles can offer to BIPOC communities.

Local demographics, economic conditions, and other factors may shift priorities and needs for accessing equitable mobility. While one community may not have access to public charging stations, another may not be able to afford EVs at all. By working locally with community members, defining what equitable electric mobility means in the context of a city or region will ensure that the challenges and needs of all are addressed.

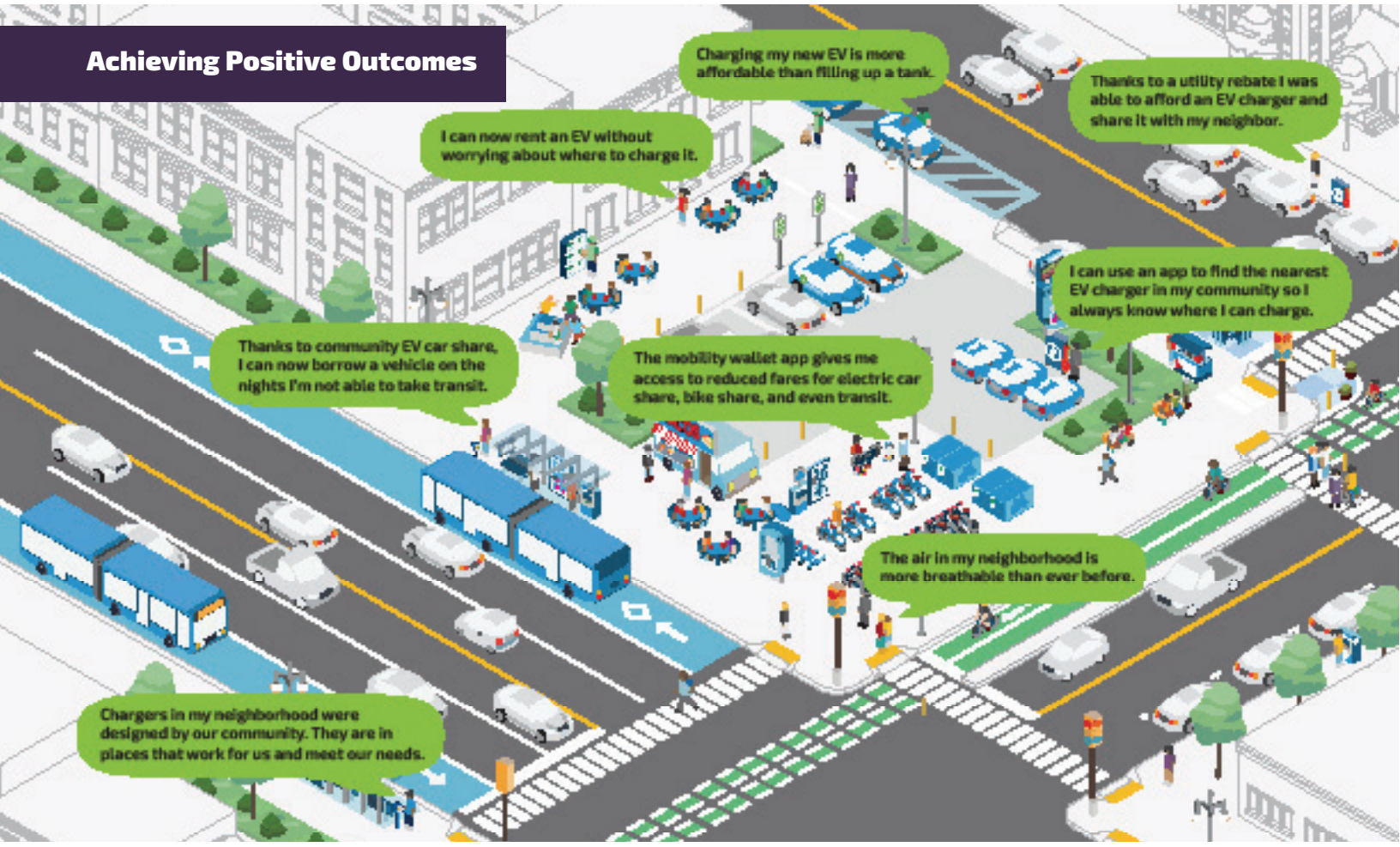
The definitions of equity and equitable electric mobility may vary from city to city.

Source: Local Government Commission

Mitigating Negative Outcomes



Achieving Positive Outcomes



Guiding Principles

Not every community will use this Playbook the same way. Each city has its unique access challenges, community needs, and adoption barriers. However, the following guiding principles will provide policymakers, their partners, and equitable mobility staff with clear guideposts for inclusive and just electric mobility action.

Center Community

For any plan or project to be equitable, the needs of the community it serves must be central to its design. Before determining solutions and actions, engaging historically marginalized communities in the decision making and investment processes will help build trust, a mutual understanding, and support to the proposed decisions. These communities are often left out of these processes, resulting in their lived experiences overlooked and projects created without serving their needs. Decision-makers should use local knowledge to understand the distinct needs and challenges and create solutions that will provide a real value to potential users in the community.

Provide Choice

While electrification of light duty cars and trucks is essential to greenhouse gas reduction and air quality goals, focusing on automobiles alone will not suffice to combat the ongoing climate crisis. Additionally, those who cannot or choose not to drive should not be left out of the potential benefits that come with electrification, as this can further create inequities in the system. Integrating electric vehicles as part of a mobility portfolio can improve equity by increasing clean mobility options for all users, regardless of their physical ability or economic status.

Be Holistic

Transportation—and specifically electric mobility—is a means to achieving broader community objectives. Thus, equitable electric mobility is not only a transportation issue. Advancing equity and realizing electric vehicle adoption will require understanding the connection between mobility, affordability, public health, housing instability, workforce and economic development, and many other components. Because inequity is structurally embedded across each component, equitable electric mobility requires intersectional solutions that will reflect the community's voice holistically.

Glossary of Terms

Some of the terms you will see in the Playbook will be new to you. Below are some of the more common terms that you should learn as you build pathways to an equitable electric mobility.

Environmental Justice Communities: Defined by US Environmental Protection Agency (USEPA), Environmental Justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Environmental Justice (EJ) Communities are those that are most impacted by environmental harms and risks. They are disproportionately exposed to environmental hazards and therefore overburdened by environmental harms than other communities.

Equity: Defined by PolicyLink, equity is "just and fair inclusion into a society in which all can participate, prosper, and reach their full potential. Unlocking the promise of the nation by unleashing the promise in us all." In addition, "equity is different from the formal legal equality conferred by landmark laws such as the Civil Rights Act. Equality gives everyone the right to ride on the bus, in any seat they choose. Equity ensures there are bus lines where people need them so they can get to school or the doctor or work."

EV: Electric vehicle, either personally owned or shared.

EV Adoption: EV adoption is transitioning away from traditional internal combustion gas-powered vehicles to electric vehicles and electric mobility options. This includes the installation of EV siting equipment (EVSE) and programs and policies to support the transition to EVs and the purchasing of EVs.

EVSE: Electric Vehicle Supply Equipment, also known as EV charging stations.

Garage Access: Availability of a private garage or parking lot that can be retrofitted with EVSE.

Grid: An interconnected network for delivering electricity from utilities companies to consumers.

ICE: Internal Combustion Engine. These are conventional gas-or diesel-powered vehicles.

Level 1 EV Charging: Level 1 EV chargers provide charging through a 120-volt AC (alternating current) plug. In general, Level 1 chargers provide up to 5 miles of range per 1 hour of charging.

Level 2 EV Charging: Level 2 chargers provide up to 25 miles of range per 1 hour of charging. Level 2 equipment can charge a typical EV battery overnight and is the common EV charger for at-home charging. Level 2 equipment is also commonly used for public and workplace charging.

Level 3 EV Charging: Also known as direct current (DC) fast charging, Level 3 equipment enables rapid charging. DC fast chargers provide 60 to 80 miles of range per 20 minutes of charging.

Shared Electric Mobility: Electrically propelled transportation services and resources that are shared among users or a community of users, either concurrently or one after another. Shared electric mobility includes modes like public transit; micromobility (bike sharing, scooter sharing); automobile-based modes (carsharing, rides on demand, and microtransit); and commute-based modes or ridesharing (carpooling and vanpooling).

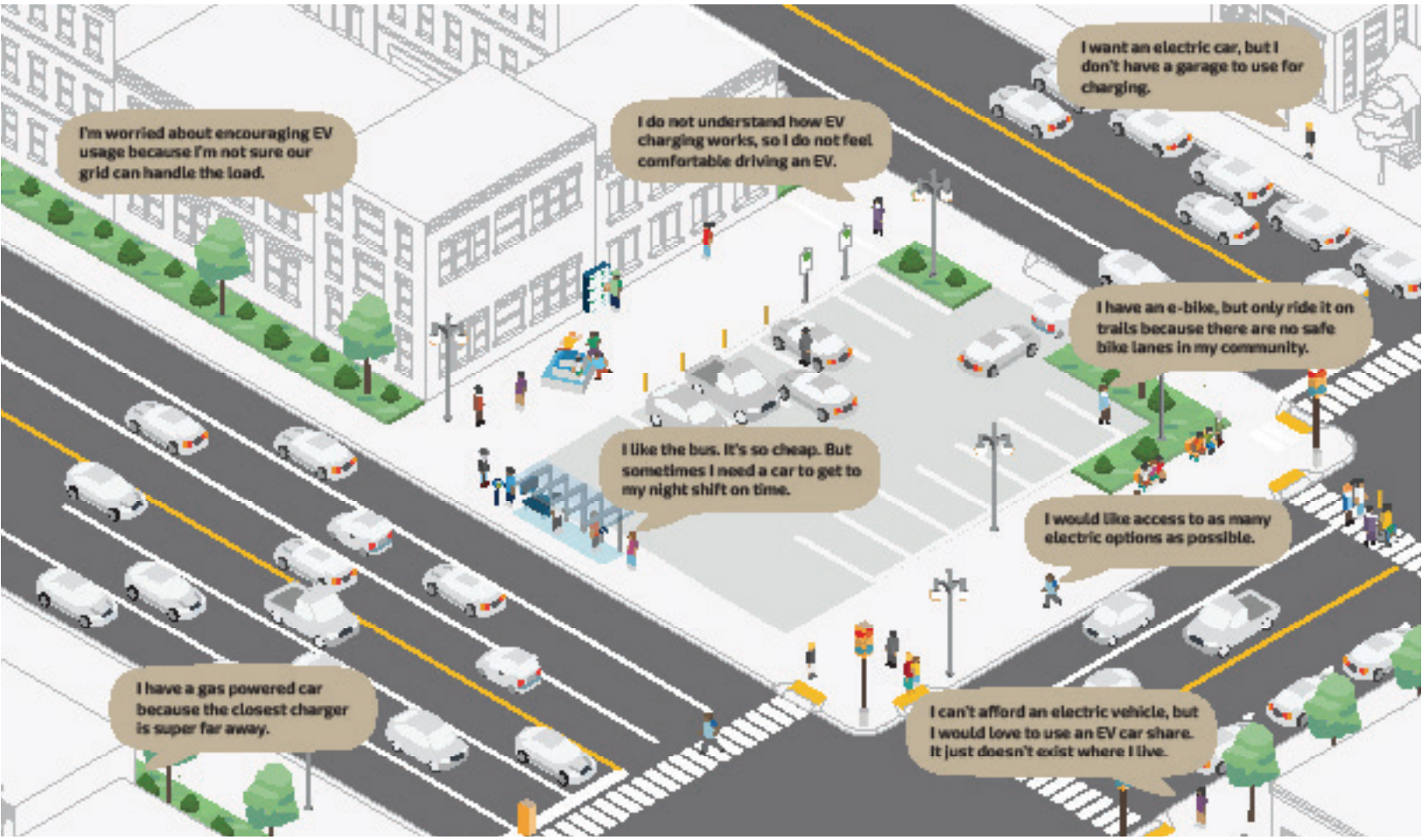
Status Quo

What is the state of equity in transportation electrification?

New infrastructure and mobility services have traditionally served whiter, more affluent neighborhoods at the expense of socially vulnerable communities. However, there are several best practice examples of partnerships and models that can give people access to shared equitable electric mobility. Cities around the United States are interested in transportation electrification as long as the service or technology serves their needs.

BARRIERS PREVENTING EV ADOPTION IN BIPOC COMMUNITIES

- *Lack of community-led ideas, needs, and priorities*
- *High cost for EVs (and ICE cars)*
- *No place to charge at home (e.g., no garage access)*
- *Lack of access to public chargers*
- *Lack of shared EV options*
- *Challenges accessing EV tax incentives*
- *Lack of information leading to misperceptions*



Key Trends

Through our research, several key trends and barriers have led to inequitable EV adoption and charger deployment.

What needs improvement?

Disproportionate adoption. EV adoption, purchase, and charger installation are slower in historically marginalized communities. Most early EV adoption has happened in relatively affluent households. Access to public charging near homes and workplaces is an opportunity area that needs policy nudges and investment.

Designing for marginalized communities. Transportation electrification could unlock important benefits for BIPOC and disadvantaged communities, ranging from reduced air pollution, improved mobility, and putting money in the pockets of people who need it most. These benefits are magnified in cities with less dense urban forms, where there is reduced transit access and residents are more car dependent. However, policy, infrastructure, and electric mobility programs are not designed specifically with and for historically marginalized communities.

Inequitable charger investments. Currently, private investment in EV charging infrastructure is disproportionally concentrated in wealthier and whiter neighborhoods. Public EV charging stations are inaccessible for most US households regardless of income, but disproportionality so for BIPOC and disadvantaged communities. Nevertheless, investment trends are pointing in the right direction. Investor-owned and public utilities across the country are prioritizing equity in investment decisions and program design. Utility investment in BIPOC and disadvantaged communities more than doubled in 2020.

Support from utilities. The three utilities serving Columbia, Houston, and St. Louis are at the precipice of broad EV and EVSE infrastructure programs, with *Ameren Missouri* leading the pack with its *Charge Ahead* EV and EVSE incentive program and efforts to define equitable access to EV technology. While *Dominion* Energy (SC) and *CenterPoint Energy* (TX) are in the early stages of developing EVSE programs, local EV incentives are currently not provided through the utility. Momentum is gaining, but more focus can be placed on centering equity and establishing clear definitions and metrics for equitable access to electric mobility.

What are encouraging signs?

One goal to rule them all. Sustainability goals shared across several city government departments are more effective than individual sustainability goals that differ across departments.

Equity first. Cities leading the way on EV adoption center equity in their strategies and pilots, with a focus on serving historically marginalized communities.

Going big on EV car share. Car ownership is not a viable or desirable path for all and providing alternatives such as EV car sharing for those who cannot or do not wish to own a vehicle allow increased access to cleaner transportation options. Electrifying shared mobility options can extend the beneficial impacts of EVs to communities with low car ownership rates. Despite access challenges, cities across the country are investing heavily in EV car sharing programs. Most programs have an equity component and try to center low-income communities/communities of color.

Engagement and campaigns. Public engagement campaigns can be used to increase consumer awareness of EVs. Campaigns should build partnerships with low-income communities and community-based organizations that promote the availability and benefits of electric vehicles. It should also inform about the available rebates and tax credits that can lessen the cost of EVs.

Leading by example. Cities like Seattle, Washington, Denver, Colorado, and Los Angeles have set ambitious goals to electrify their fleets to show commitment to reduce emissions, increase awareness of EVs, incentivize EV investments by private partners, and increase access to public charging.

Financial barriers. Cities are creating mechanisms to overcome what seems to be the biggest barrier to EV adoption – their purchase cost. Many EV and charger benefits/ tax incentives have been put in place, often with state and/or utility support. Financial incentives in the form of tax breaks or rebates are another key policy for encouraging EV adoption. As of July 2021, at least 47 US states and Washington, D.C. offer incentives to support EV or alternative fuel vehicle deployment.

Charging network growth. Most recent public charging investments are concentrated on the West Coast, but funding is increasingly being channeled to the Mid-Atlantic and Southeast region as well.

Who is Leading the Way?

Drive Clean Seattle – Seattle, WA

Drive Clean Seattle is a comprehensive strategy for transportation electrification across passenger vehicles, trucks, public transit, and maritime transportation. This project has an explicit equity and racial justice focus. This project includes a focus on human-centered design and placement of chargers. Drivers and community members were interviewed to understand the equity challenges that would have otherwise been missed in the project implementation.

Source: Seattle Department of Transportation

Source: Blink Mobility

BlueLA Program – Los Angeles, CA

BlueLA is a station-based e-carshare program that deploys in socially vulnerable communities. This project focused first on Disadvantaged Communities, defined as areas with most people who suffer from a combination of economic, health, and environmental burdens. The tiered pricing system, made possible by a California Air Resources Board (CARB) grant, kept the program affordable while signaling demand. However, an alternative funding source will be needed after the CARB grant. The project began as a city-led initiative and was later transferred to private sector leadership. The city assumed most of the risk at the beginning of the project.

CruSE Project – Hood River, OR

Forth Mobility and the City of Hood received a grant from the US Department of Energy for Advanced Vehicle Technologies Research in 2021 to provide electric vehicle carsharing to low-income residents and businesses in Hood River. Forth's Clean Rural Shared Electric Mobility (CruSE) Project is a three-year program intended to demonstrate a financially sustainable model for plug-in electric vehicle (PEV) carsharing in rural communities. This project, while still in the early stages of development, places EVs in affordable housing communities.

Source: Forth Mobility

Evie Carsharing and EV Spot Network – Minneapolis and St. Paul, MN

The Evie Carsharing program and EV spot charging network is designed to introduce residents to EVs, increase mobility in low-income and low car-ownership communities, and provide a public charging network. This is an excellent example of a public-private partnership. Minneapolis and St. Paul were able to leverage the expertise of Xcel Energy and HOURCAR. These partners were able to secure both federal and state-level funding, in addition to funding efforts by the city. The project has benefited from receiving early support from leaders and equity-focused organizations and initiatives, including the Minneapolis Climate Action Plan.

Source: StarTribune.com

Source: Miocar

Miocar – San Joaquin Valley, CA

In 2019, eight San Joaquin Valley metropolitan planning organizations partnered with mobility researchers at the University of California Davis to launch Míocar: an electric, rural, and affordable carsharing service with accompanying charging stations placed near low-income households. The project focused on offering clean transportation to disadvantaged residents. The public-private partnership supporting the project helped preserve low-cost operations and allowed the program to be a long-term solution.

Hacienda CDC Car Sharing Pilot – Portland, OR

Between March and December 2017, Hacienda Community Development Corporation (CDC), Pacific Power, the CarCharging group, and Forth Mobility worked together to pilot the first peer-to-peer EV car sharing program. This pilot is an excellent example of partnering with community-based organizations with deep neighborhood ties to ensure equitable deployment. Trusted organizations hosted informal public engagement and learning sessions, which increased the knowledge of EVs and the pilot program.

Source: Forth Mobility

Analyzing Access

Historically marginalized communities often lack access to home charging, which accounts for over 80% of charging activity in the U.S. The lack of private parking garage and lot access coupled with the high cost of installing a home charging system suggest that the availability of public charging and shared electric vehicles are vital tools to increasing equitable EV adoption. But what does public charging access look like now? And how do opportunities for future public charging and shared mobility services align with historically marginalized communities?

The experience in Houston, St. Louis, and Columbia is an indicator of EV inequities and needs in other parts of the country. Below is a comprehensive look at socially vulnerable communities—a metric used to identify historically marginalized communities—and their relationship to current public charging, the most viable opportunities for public charging expansion, and shared mobility propensity.

What Gaps and Opportunities Exist in Houston, St. Louis, and Columbia?

What parts of a city are more likely to be dependent on publicly accessible charging stations? This is a critical question to determine where to concentrate future EVSE investments and EV access programs within the context of broader equity, wealth building, and climate objectives. Depending on local conditions and program objectives, this process may vary slightly in different cities. As a baseline, identifying future public charging opportunities should:

1. Apply local definitions of equity and equitable electric mobility to define areas of need
2. Highlight areas where demand for publicly accessible charging has or will likely be met by the market
3. Incorporate the needs of various user groups, particularly those who use shared mobility devices

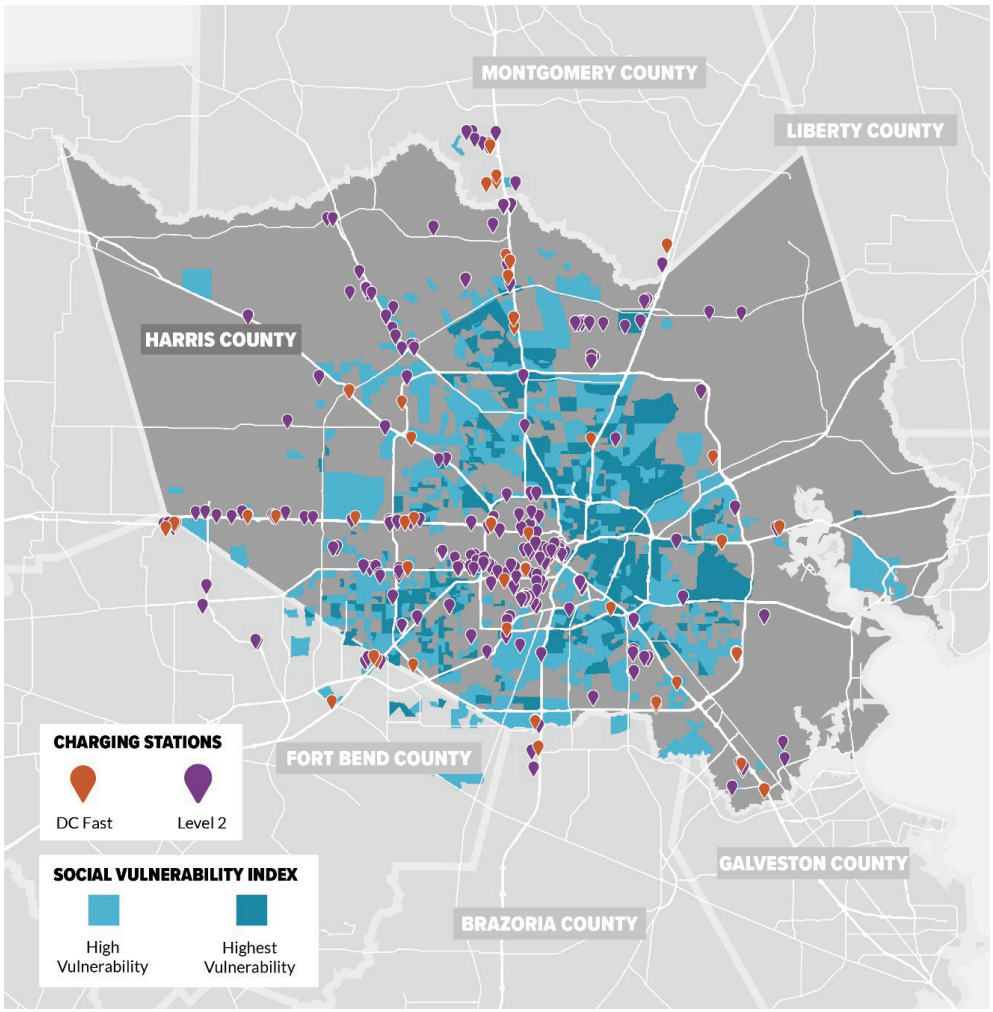
Source: Unsplash.com

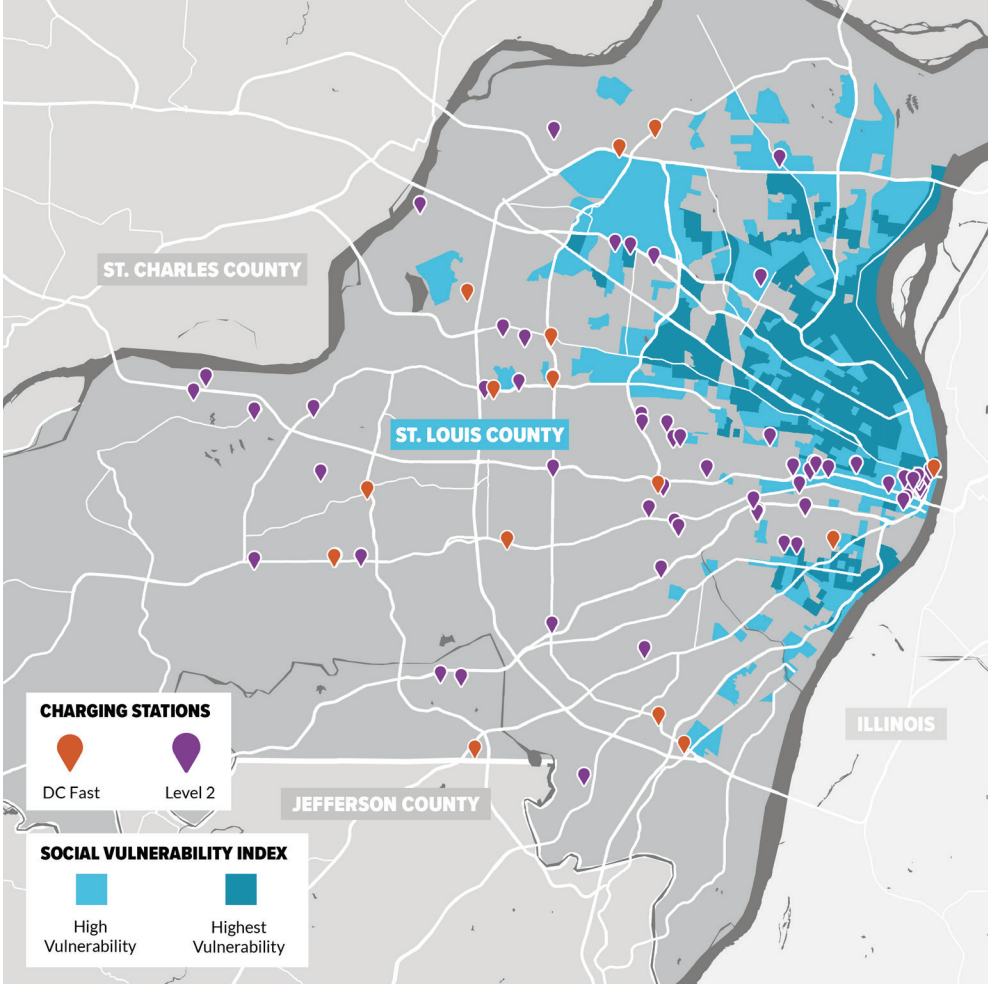
Defining the Need

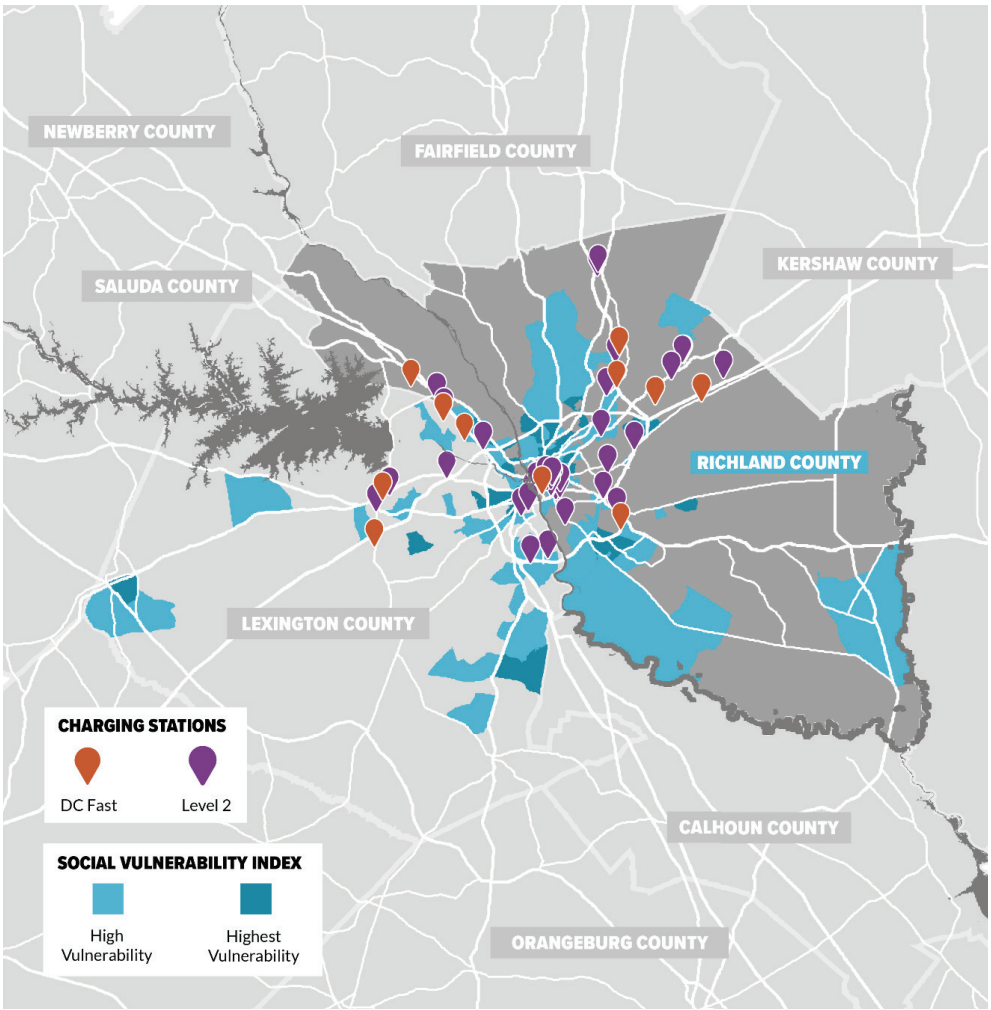
To understand the extent of transportation inequities in each of the case study cities, we developed a mapping methodology to identify Socially Vulnerable Communities (SVCs). This needs analysis relied on demographic, economic, and environmental data such as population of color, zero car households, housing and transportation costs, and pollution exposure; together, we formulated a Social Vulnerability Index. The higher the Social Vulnerability Index, the more challenged an area is expected to be in terms of mobility access and environmental burden. The maps below highlight the parts of Houston, St. Louis, and Columbia with high scoring SVCs. The darker the blue, the higher the need in a community.

In Houston, most SVCs are concentrated in the northern and eastern parts of the city; it begins in East Downtown and extends north and south to the I-610 loop. These are also areas that have shown significant low-income displacement in recent years. These SVCs would benefit from having increased access to clean transportation options to offset emissions from nearby manufacturing.

While some SVCs in St. Louis are located in the South City, most are overwhelmingly concentrated in the North City. The SVCs with the greatest need overlap with areas that have low Neighborhood Equity Scores (NESs), which is a metric developed by the City of St. Louis in 2018; the NES calculates place-based inequality, particularly how the housing and transportation systems determine access to opportunity and resources.







In Columbia, most SVCs are clustered in West Columbia and along the southern side of Interstate Highway 20. While there is evidence that SVCs are served by the existing charging infrastructure in Richland County, SCVs in Lexington County like Hamlet West, Batesburg-Leesville, and Gaston do not.

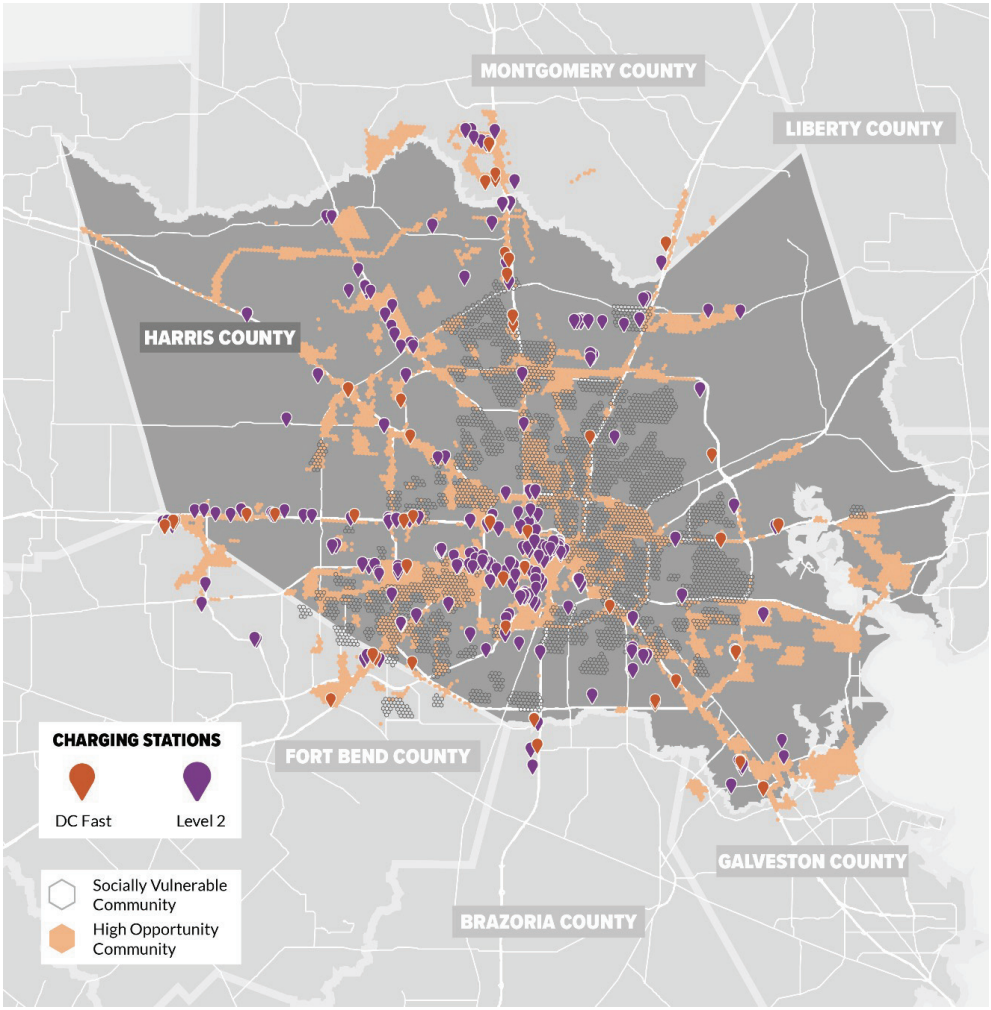
In all three cities, existing public charging facilities are generally concentrated outside of SVCs. In instances where the infrastructure and SVC overlap, they were not executed intentionally.

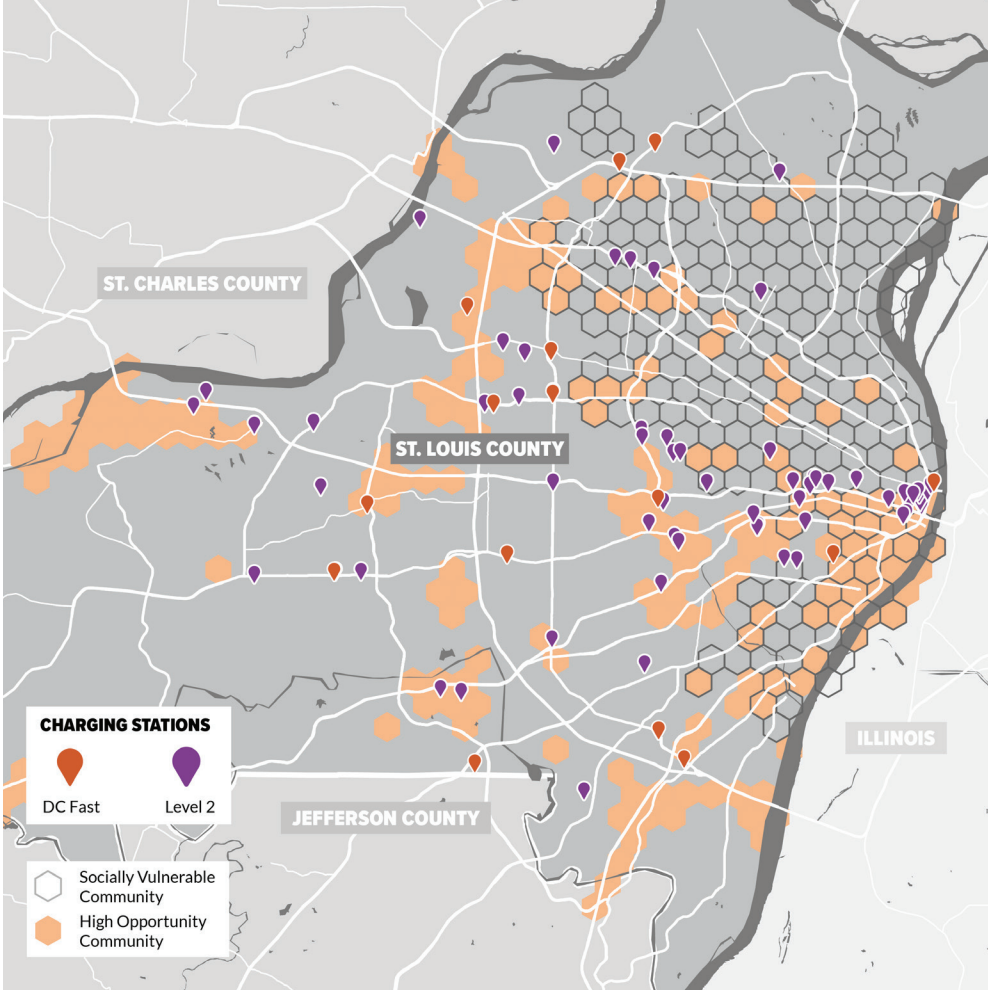
Highlighting Opportunity

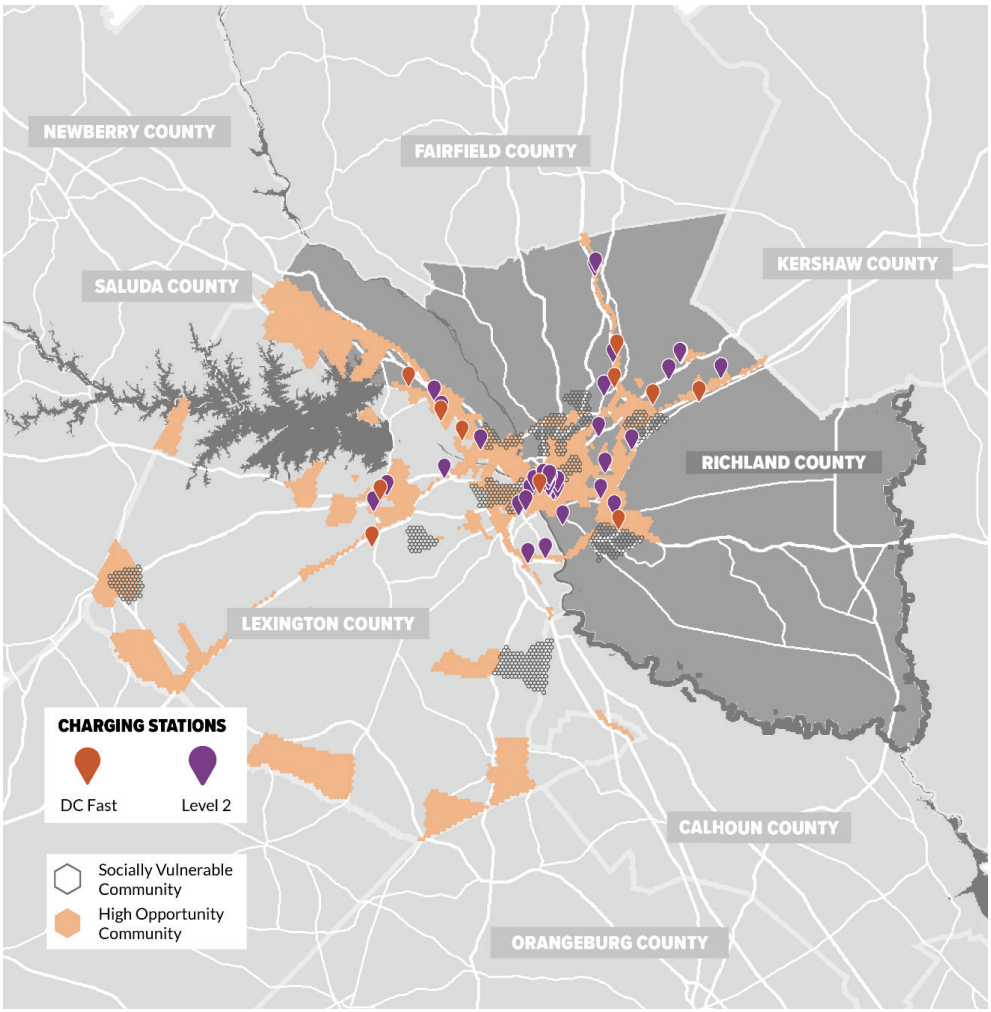
After we determined which areas in a city have the highest need for targeted transportation investments, we identified where the highest potential for public charging investment could be centered, according to traditional/market-led metrics. The opportunity analysis overlaid a set of EV suitability metrics across each city to highlight potential areas for market-led EV infrastructure investment within SVCs. Suitability metrics included areas with dense travel patterns, the presence of big trip generators and attractors like supermarkets and job centers, and high densities of multi-family dwelling units and retail outlets.

The opportunity analysis revealed what may seem obvious – most existing publicly accessible Level 2 and Level 3/DC past chargers are in areas with high opportunities and in communities with relatively high median incomes. We found that high opportunity areas – defined as areas that scored high suitable metrics – rarely overlapped with SVCs. This revealed the disconnect between what the market has provided so far and the areas that need public EV charging investment the most.

However, there were exceptions to the trend noted above. In Houston, for example, the analysis showed there were few to no EV charges in the western part of the city particularly along Westheimer Road, Westpark Toll Road and Beltway 8, where SVCs and high opportunity areas overlapped.







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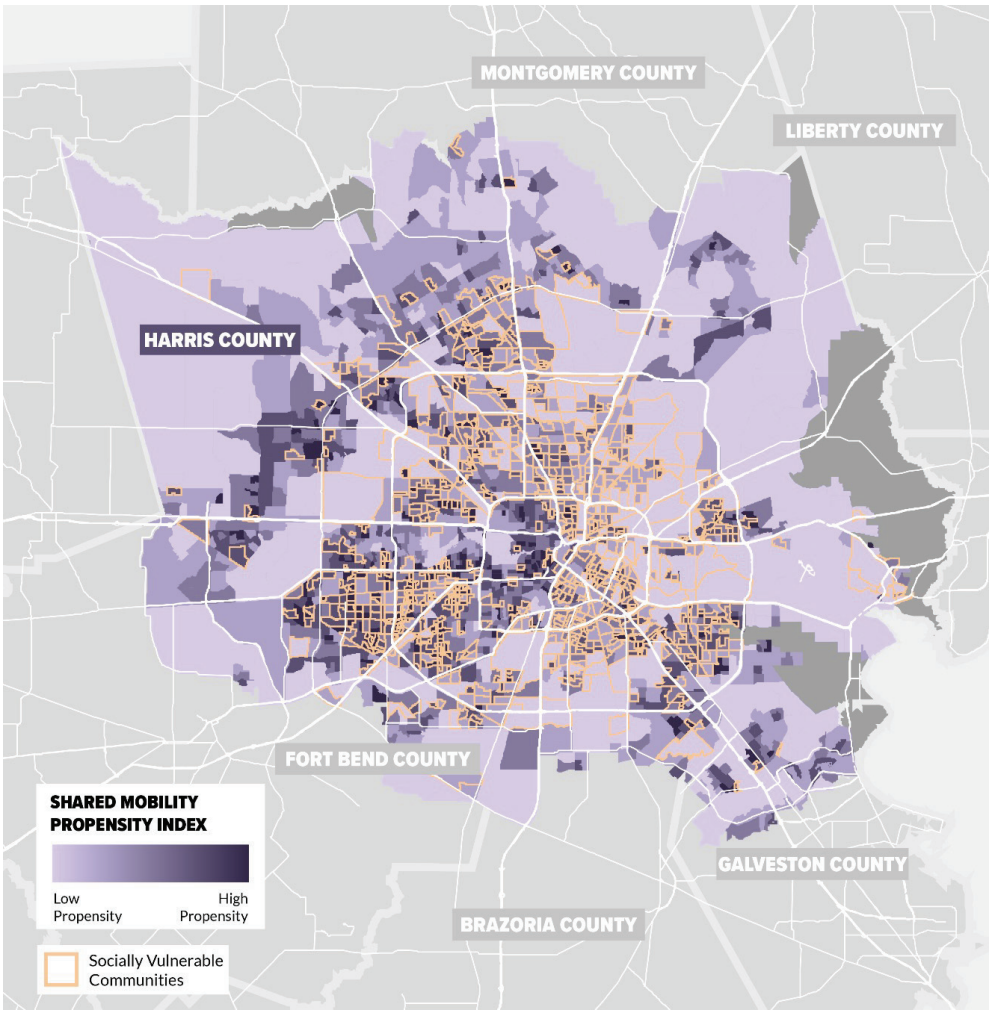
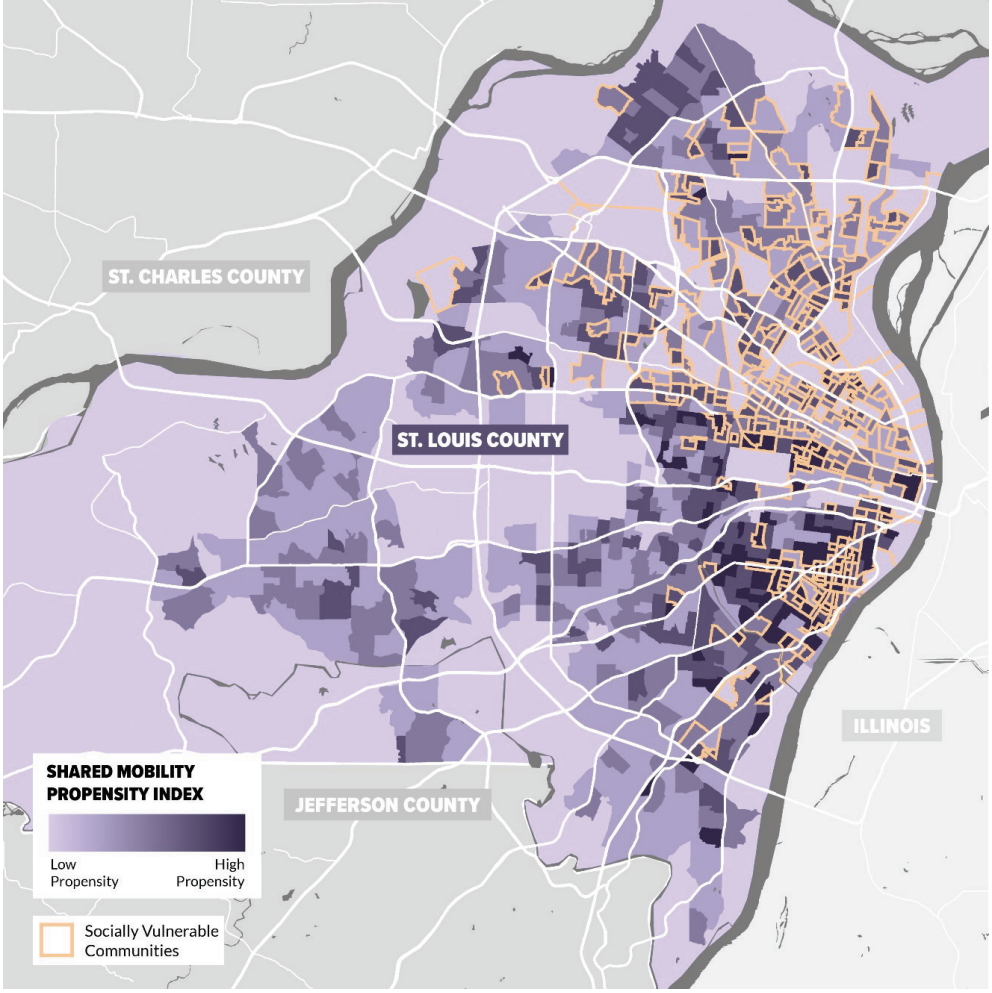
Reaching all Users

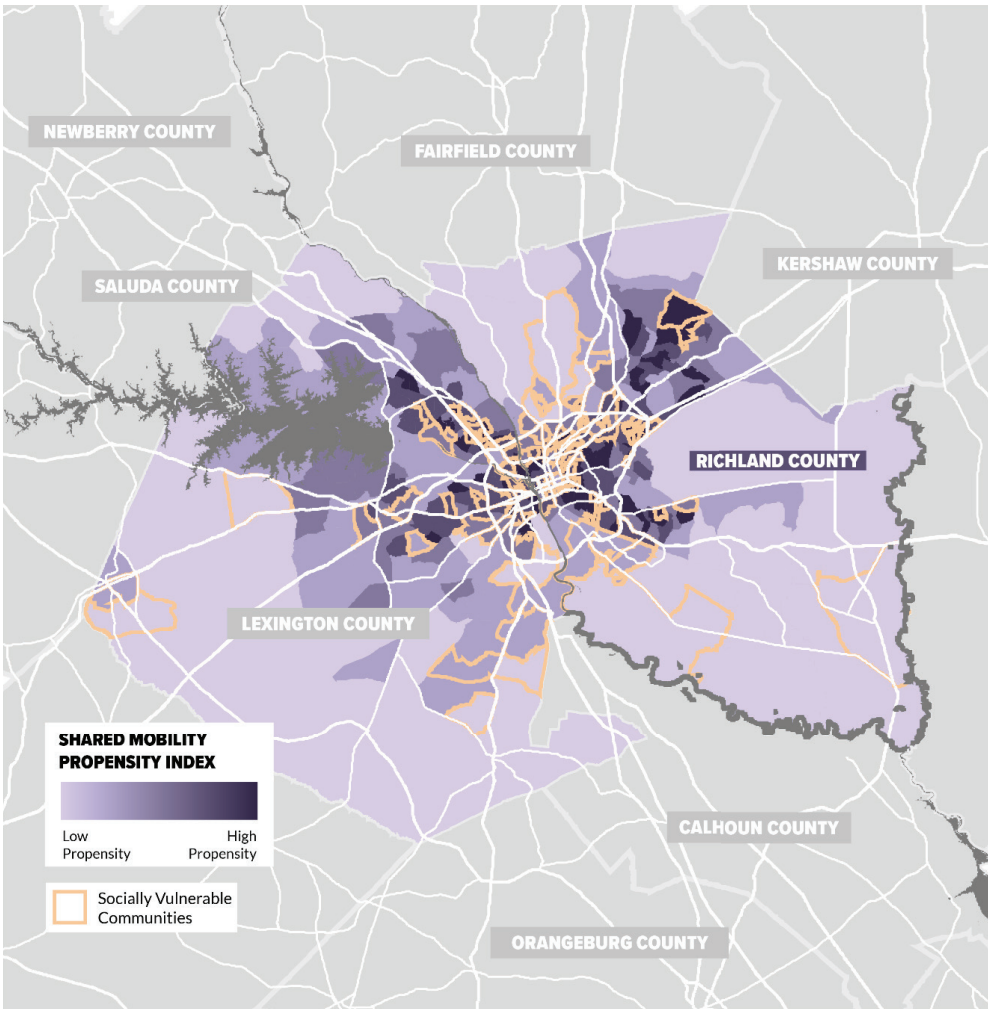
Combining the need and opportunity analysis helps cities narrow down areas with potential for short-term investment, public-private partnerships, or early-adoption pilot projects. The shared mobility propensity index is the final piece analysis that sought to understand how and where to provide public charging infrastructure alongside shared mobility services such as neighborhood shared vehicle charging depots, Uber and Lyft drivers (who are disproportionately BIPOC), car share services, and rental car services.

While still an emerging and constantly evolving area of demographic research, shared mobility propensity can help identify where EV charging stations could be marketable or viable across a region alongside shared vehicle services, which is a critical EV access strategy for historically marginalized communities. Electrifying shared mobility enables growing charging availability for high-utilization EVs, and centering better climate, air quality, and public health outcomes in these communities.

From an equity perspective, making public charging more convenient can help overcome the access barriers for shared mobility drivers, who are overwhelmingly members of the SVCs. Shared mobility services will also help close critical transit gaps and become a lifeline for households without a personal vehicle, which is often the case for households in SVCs.







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State of the Utilities

Perhaps the most important partner for overcoming the existing barriers to accessing charging are electric power providers. Whether publicly owned or investor owned, electric power providers play a unique role in guaranteeing equitable electrification outcomes.

EV Programs

In many states, utilities are required to offer programs that are designed to address low-income, racial equity, and environmental justice (EJ) considerations. Several utilities have successfully collaborated with communities to tailor their EVSE investments to the communities' specific needs, including Puget Sound Energy and Seattle City Light in Washington.

Houston, Columbia, and St. Louis are in different stages of utility collaboration. Out of the three utilities that operate in the case study cities – *Dominion* in Columbia, *Ameren Missouri* in St. Louis, and *CenterPoint Energy* in Houston – only *Ameren Missouri* has implemented EV and EVSE incentive programs. *Dominion* is planning an EVSE program and *CenterPoint* does not have one as EV incentives in Houston are currently provided through retail energy providers.

Charging Infrastructure Upgrades

Utilities can help ensure equitable access to charging infrastructure, especially by filling in gaps left by the private market and making the necessary grid updates to meet future charging demand. In the case of public charging infrastructure, utilities can work closely with other stakeholders, including representatives from SVCs and communities of color, to determine the most beneficial sites and uses for utility investment.

Utilities risk inequitable access to charging infrastructure for low-income and EJ communities without special considerations in their make-ready programs. As of 2021, none of the three utilities have publicly published clear definitions of Equitable Electric Mobility or Environmental Justice Communities – *Ameren Missouri* is working on a definition with *EVNoire*, a national non-profit that focuses on diversity, equity and inclusion in e-mobility efforts, while *Dominion* and *CenterPoint* have considered household income as a factor when developing incentive programs.

Another important factor is to assess upgrade requirements related to the electrical infrastructure needed for EV charging. Our high-level assessment shows that over 50,000 public

Source: Ameren Missouri

chargers may be required across the three cities by 2030. That amount of charging infrastructure is likely to trigger some upgrade requirements for the electrical grids in these cities. These upgrades could possibly result in significant utility investment at the distribution-level. With the infancy of the EV programs in the 3 cities, few detailed studies have been done on the possible grid impact of electrification on socially vulnerable communities.

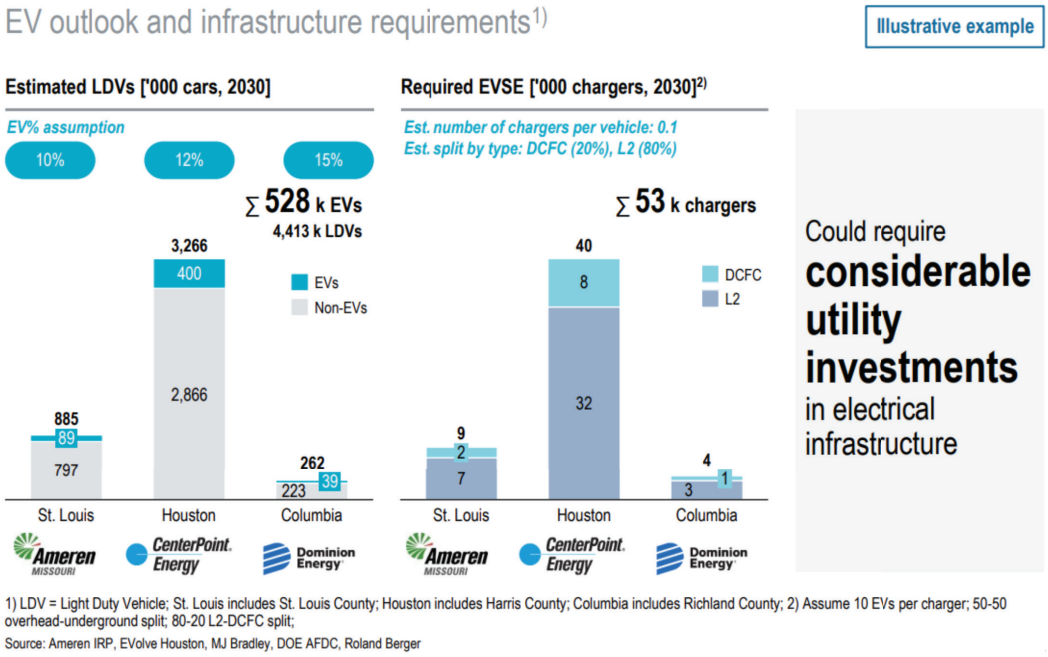
As part of the study, we conducted a high-level impact assessment of the distribution grid in SVC areas in St. Louis. Our analysis showed that there is adequate unused capacity ("headroom") in most substations to accommodate additional public EV chargers at a 10% EV penetration without the need for any additional substation investment. However, upgrades and grid investments are likely to be required as EV penetration grows to and past 20% (see appendix).

Policy and Legislation

St. Louis and Houston have more ongoing policy initiatives at the local level than Columbia. St. Louis passed two EV adoption bills, including a "Future-Proofing" program (building codes to include EV charging areas) and prioritization of low-emissions city fleet purchasing. Missouri does not have a state goal for EVs or transportation decarbonization, and its tax credit infrastructure program for alternative fuels expired in 2017.

Houston has not passed any EV/EVSE legislation yet, but it has a city goal of 30% EV share of new vehicle sales by 2030. The city also aims to convert the municipal fleet to 100% EV by 2030. Several private partnerships and programs are being developed in Texas, including two state-level incentive programs for EV purchasing/leasing and charging infrastructure.

South Carolina does not have a state-wide decarbonization policy and climate action plan with specific EV and infrastructure goals, but, according to public docket filings, is in the earliest stages of developing one (conducting "SC Electric Vehicle Stakeholder Initiative" workshops throughout 2021). Columbia included a goal to purchase more fuel efficient and low-emissions vehicles in its 2016 Climate Action Plan. However, no EV or charging infrastructure incentives are currently offered at the municipal level.



1) LDV = Light Duty Vehicle; St. Louis includes St. Louis County; Houston includes Harris County; Columbia includes Richland County; 2) Assume 10 EVs per charger; 50-50 overhead-underground split; 80-20 L2-DCFC split;

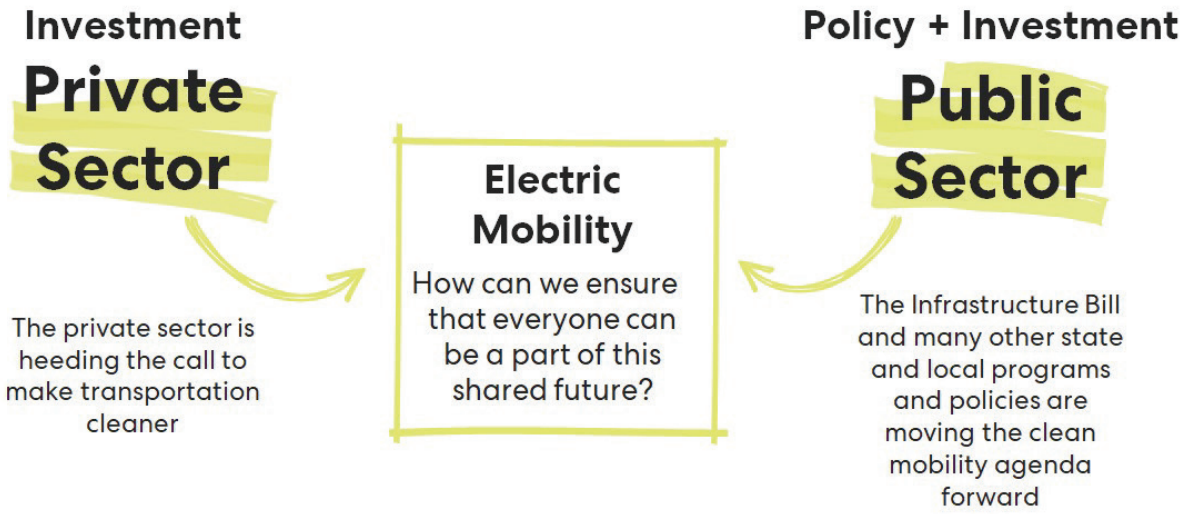
Source: Ameren IRP, EVolve Houston, MJ Bradley, DOE AFDC, Roland Berger

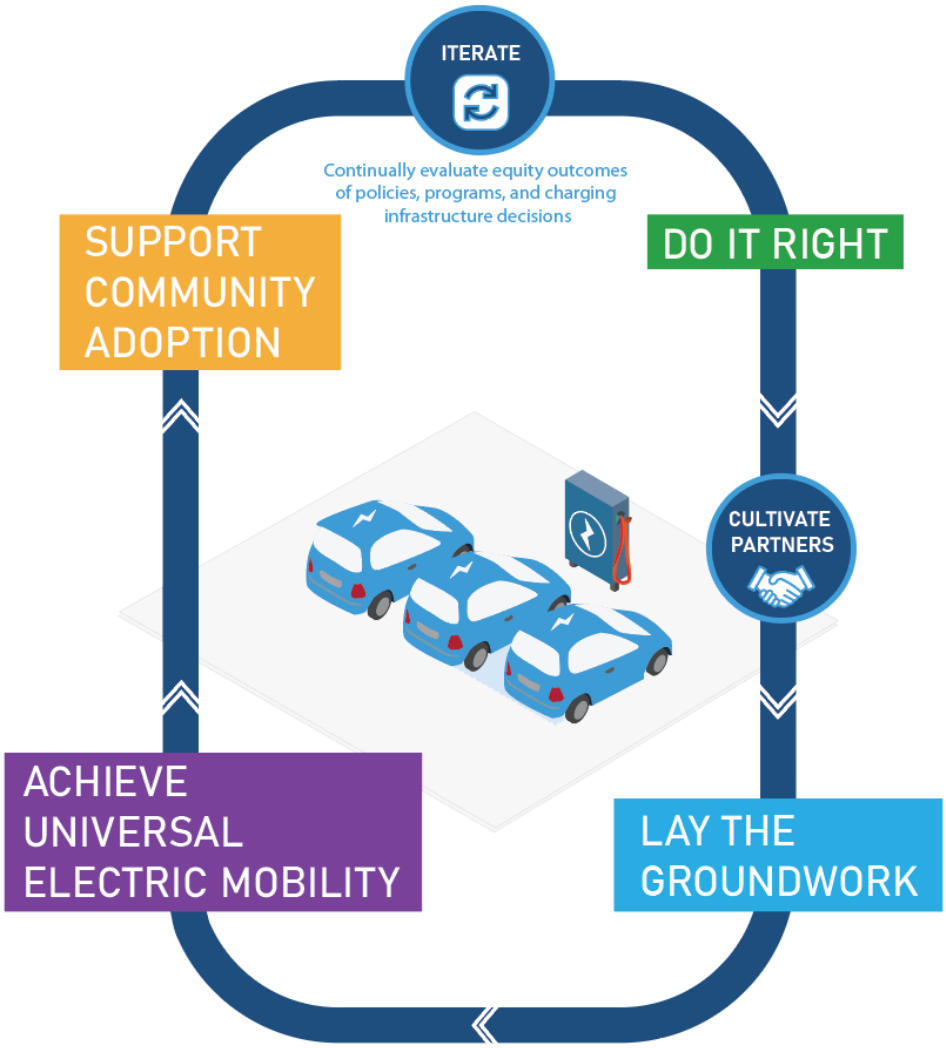
What Big Moves Can Boost Equitable Electric Mobility?

There is no one "right way" to equitably scale EV adoption and enhance access to public charging. Ultimately, cities and their partners must apply a human-centered and community-by-community approach to equitable electric mobility. This Playbook offers lessons learned, useful experiences, and helpful tools that can be leveraged to guide equitable public charging programs and policies.

How can the public and private sector develop equitable EV policies, programs, and charging investment strategies that meet the mobility needs of their most disadvantaged communities?

While each city that uses this Playbook should tailor its equity-centered electric mobility strategy to the needs and aspirations of the community it serves, the Playbook offers helpful guidance that will ensure that implementation is well-planned and consistent with other related EV and EVSE initiatives in their respective regions. The four "plays" in this Playbook represent steps, actions, or strategies that can move local electric mobility initiatives towards more equitable outcomes. Ultimately, these plays align with the guiding principles stated on page 8 and will help cities achieve sustainable mobility objectives and accrue benefits for the community.





Cities should aim to build a public charging network and supporting infrastructure but design them specifically for and by historically marginalized communities.

The actions in the first play, ***Do It Right***, include steps that cities can take on immediately to kickstart their transition towards equitable electric mobility adoption. Several of the actions precede the launch/funding of any EV/ EVSE program or strategy and are critical to align electric mobility to equitable outcomes.

The actions in the second play, ***Lay the Groundwork***, recognize that unlike many other emerging forms of mobility, transitioning to equitable electric mobility is a long-term game. As illustrated to the right, accelerating equitable electric mobility requires long-term planning, advocacy, and coordinated investment in charging infrastructure, legislation, and local capacity building. And the city's tools and strategies may change or iterate over time. On the other hand, many of the actions that focus on service provision, like community EV car share, fleet electrification, and even some forms of incentives and rebates can be rolled out in a pilot form and continue to evolve on as contexts and communities change. The last two plays, ***Achieve Universal Electric Mobility*** and ***Support Community Adoption***, include actions inspired by best practice cities like Seattle and Los Angeles that brought EV adoption and EVSE siting programs to the communities that needed them most.

Play 1:
Do It Right

From the Infrastructure Investment and Jobs Act to the EVs for Underserved Communities Act and other private initiatives, the ingredients are in place to see rapid acceleration of EV charger deployment and EV adoption. But how do we accelerate without leaving vulnerable communities behind? Or worse, harming communities that are already destabilized and experiencing displacement?

Arriving at an equitable electric mobility requires a collaborative and iterative process. The work starts and continues with community conversations. Cities, utilities, and other partners need to engage with historically marginalized communities to understand their challenges and needs. This collaboration will provide critical information to design targeted programs, equitably distribute benefits and mitigate disproportional harms.

Source: Pexels.com

Source: Forth Mobility

Action One:

Create a Local Definition of Equity and Equitable Electric Mobility

While this Playbook presents a vision for equitable electric mobility, this concept and equity itself might be defined differently in different cities. Cities should establish localized definitions of equity and equitable electric mobility, identify the metrics and processes to measure equity based on clear community goals and priorities. This definition should incorporate community and stakeholder input and be centered around local context. Ideally, this definition stems from work already done by the city and is consistently applied and measures across the city different programs.

IMPLEMENTATION CONCERNS

- The definitions process should directly tie into the engagement efforts (see Action 2 below).
- The definitions process should be convened by cities and/or utilities, but should include the community leaders/ stakeholders, and private sector interests.
- Definitions processes should be led by BIPOC facilitators with a strong understanding of electric mobility.

Type **Procedural**
Policy/Regulatory
Research

Principles Addressed

Problems Addressed

- *Lack of a framework to evaluate policies and programs consistently*
- *Lack of a framework to align priorities/goals across stakeholders*
- *Issues to identify key data/metrics that need tracking*
- *Incorporate local context, priorities, and community input in the electric mobility policy*

Cost **$**$$$$

Timeline Short-term

Source: Greenlining Institute

Action Two:

Authentically Engage Historically Marginalized Communities

From defining equity to piloting specific programs, effective implementation and adoption of electric mobility requires engagement with historically marginalized and underrepresented communities. This step is critical to get relevant information and community insights that influence the design of electric mobility and charging infrastructure programs. This qualitative data should inform the program's goals and priorities. Authentic engagement will also nuance strategies to fit the community's needs or re-tool those that will not.

Type
Procedural
Programmatic
Research

Principles Addressed

Problems Addressed

- *Siting EVSE without any community involvement may erode trust and can even be counterproductive to equity goals*
- *Electric mobility does not address the needs of socially vulnerable communities*
- *Lack of qualitative data, useful insights, and relevant information to make impactful decisions*

Cost **$**$$$

Timeline Short-term

IMPLEMENTATION CONCERNS

- Engagement efforts should be led by public agencies (including cities and utilities) and supported with facilitators that understand or are a part of the vulnerable community being engaged.
- Community stakeholders' time and insights have inherent valuable. Cities and private sector partners should pay representative organizations and community leaders to provide focused input on methods and tools as well as test methods and tools before deploying.
- Partners should engage communities with a mix of digital and analog engagement strategies and tools to maximize reach.
- Build trust by following up and creating continual communication with community stakeholders.

Source: Act-news.com

Action Three:

Measure and Mitigate Potential Disproportionate Harm and Benefit of Actions

Electric mobility programs must measure benefits and potential harm specific to socially vulnerable communities to incorporate equity effectively. Even when some solutions work citywide, the same solutions might harm vulnerable communities (e.g., gentrification and displacement). Conversely, benefits associated with electric mobility programs might not be accessible to vulnerable communities (e.g., new electric vehicles rebates). It is important to be intentional and explicitly evaluate the impacts on those communities to mitigate these risks. Couple with authentic engagement, initial and ongoing racial equity assessments will help cities design programs that better serve the needs of vulnerable communities.

IMPLEMENTATION CONCERNS

- Racial and social impact analyses should follow using the GARE methodology or other leading racial equity toolkits—including the toolkit developed and applied by the City of Seattle.
- Racial and social impact analyses should be led by the city or utility but include community stakeholders.
- Community engagement is a critical data point for the racial and social impact analysis process.

Type **Procedural**
Policy/Regulatory
Programmatic

Principles Addressed

Problems Addressed

- *Electric mobility can unintentionally harm socially vulnerable communities (e.g., gentrification)*
- *Benefits and promotion of electric mobility are not accessible to socially vulnerable communities*

Cost **$**$$$$

Timeline Short-term

Action Four:

Frame Electric Mobility to Maximize Community Value

Source: LA Incubator

Electric mobility is only a means to broader community ends. Equitable electric mobility is not solely about giving access to electric mobility options. Historically marginalized communities seek mobility strategies that solve bigger problems. Whether the need is to develop workforce skills related to EVs or to reduce asthma in a neighborhood, cities should design and evaluate electric mobility programs, policies, and investments to intersect with broader community objectives. Reflecting the community's needs and priorities in local electric mobility initiatives will ensure investments take root.

Type
Programmatic
Research
Community Investment

Principles Addressed

Problems Addressed

- *Inefficient applications of policies of programs*
- *Inefficient use of public/private resources to promote electric mobility*
- *Missed opportunities to harness synergies*
- *Investment in electric infrastructure can foster economic development disproportionally*
- *Missed opportunities to leverage electric infrastructure investment and create employment in targeted communities*

Cost **$**$$$$

Timeline Short-term

IMPLEMENTATION CONCERNS

- Understanding the market's characteristics (e.g., demographics, travel patterns, current infrastructure, etc.) is key to determining where electric mobility is suitable and can harness synergies with active transportation and public transit.
- Cities should evaluate the potential impacts of developing electric infrastructure on economic development, investment opportunities, job creation, and not exclusively on mobility itself.
- Economic and workforce development, and wealth building are important intersections for vulnerable communities. This is a central thread in St. Louis' electrification efforts.
- Public health benefits are another critical intersection. Vulnerable communities are statistically more likely to experience disproportionate air quality issues, cities should lean into potential health benefits of so equitable electric mobility.

Play 2:

Lay the Groundwork

Equitable electric mobility will not happen in cities overnight. Cities and regions need to lay the groundwork to ensure electric mobility meets the needs of cities most vulnerable and underserved. This groundwork takes the form of policy, regulations, digital and payment infrastructure, charging infrastructure, grid investments, and utility partnerships.

Source: Pexels.com

Source: City of Sacramento

Action One:

Create an Electric Mobility Roadmap

Centering equity in the adoption of electric mobility options requires long-game planning and a clear a roadmap that aligns with community outcomes. The starting point for any city is to document its electric mobility roadmap and build it with the community stakeholders they intend to benefit. Electric mobility roadmaps are visionary, but actionable policy documents that cities, counties, regions, or states can use to guide EV adoption and expansion of public charging.

Type
Procedural
Policy/Regulatory
Research

Principles Addressed

Problems Addressed

- *Lack of a framework to evaluate policies and programs consistently*
- *Lack of a framework to align priorities/goals across stakeholders*
- *Issues to identify key data/metrics that need tracking*
- *Incorporate local context, priorities, and community input in the electric mobility policy*

Cost **$$$$$**

Timeline Short term

IMPLEMENTATION CONCERNS

- A foundational element of an electric mobility roadmap is a determining a modal hierarchy of electric mobility investments and how they align with the needs of socially vulnerable communities
- Equitable electric mobility roadmaps should include a clear vision and articulation of goals, objectives, and measures of success, an implementation action plan for policies, programs, and charging infrastructure, and complement transit and other medium- and heavy-duty electrification plans.
- The successful roadmap delivery should include equitable electrification metrics, including a public EV charging access metric for L2 and L3 chargers.
- Socially vulnerable community stakeholders should play a key role in the planning process and have a seat at the decision-making table.
- Roadmaps can be led by a city, utility, or led by a regional consortium
- Partners can include city and county departments and staff, universities, state government offices, consulting partners, private mobility companies with electrification interests, automakers, and utilities.

Source: SemaConnect

Action Two:

Make Efficient Use of Private Property Parking for Electrification

In many cities, including St. Louis, Houston, and Columbia, one of the most dominant land uses is parking. Cities have an opportunity to capitalize on land efficiencies as they expand the public charging network. Existing parking should be retrofitted and "made ready" for EVSE, but also make-ready policies should support expanded transportation electrification in new building construction and at major employment destinations. Cities should also enable private property owners, including homeowners and multi-unit dwelling owners, to make parking available for public charging. This action helps cities and property owners prepare for increased transportation electrification. It also aligns with the EVs for Underserved Communities Act, which seeks to deploy up to 200,000 EV charging stations in underserved communities by focusing on multi-family housing units and major employment centers.

IMPLEMENTATION CONCERNS

- Adopt make ready policies. These policies include amending zoning and building codes to allow for EVSE and EVs.
- Enable peer-to-peer home charging
- Place EVSE in garages in SVCs to avoid costly EV charger retrofits down the line.
- A City Department of Planning, Sustainability, Land Use, or other department develops the policy or regulation
- If a code change is required, the city would need to amend or change the code.
- City councilmember, Mayor, or other local politician is needed to sponsor the bill

Type **Policy/Regulatory**

Principles Addressed

Problems Addressed

- *Zoning or building code barriers to EVSE or EVs*
- *Infrastructure and grid capacity issues*
- *Prevents retrofits*

Cost **$$$$**$

Timeline Short-term

Source: Envision Solar

Action Three:

Partner With State and Federal Agencies To Unlock Equity-Focused EV Funding & Legislation Programs

Funding and enabling legislation are key issues for EV adoption, charger deployment, and equitable electric mobility. The newly signed bipartisan Infrastructure Investment and Jobs Act includes $7.5 billion to help accelerate EV adoption and build a nationwide network of EV charging stations ($5 billion to be spent over the next five years). State departments of transportation (DOTs) will be tasked with spearheading these efforts to ensure that the funding is disseminated thoughtfully. Cities should partner with state DOTs and federal agencies to unlock new equity-focused EV funding and legislation programs, as well as influence policymaking.

Type **Policy/Regulatory**
Programmatic

Principles Addressed

Problems Addressed

- *Lack of funding for EV programs and EV equity programs*
- *Lack of enabling legislation to advance local electrification and EV adoption policy*

Cost **$**$$$

Timeline Short-term
(immediate legislation)

Long-term
(future programs and grants)

IMPLEMENTATION CONCERNS

- Cities/counties need to develop relationships with state and federal agencies to better position themselves to access programs and receive funding.
- State departments of transportation (DOTs) will be tasked with spearheading these efforts to ensure that the funding is disseminated thoughtfully.
- Cities may hire a consultant to identify funding sources.
- This should be part of a larger electric mobility strategy so funding can be directed to equitable EV projects in the city and used to support the city's EV vision.
- Engagement with the community is essential to ensuring proposed projects are aligned with identified needs in specific regions.
- A City Department of Planning, Sustainability, or Transportation should identify new and upcoming sources of funding from federal and state sources, as well as their individual criteria and requirements
- The department should then identify potential plans or projects that exist or are in scoping stages that may align with the funding programs
- The department should identify partners for each potential project or plan, and engage with them to scope the proposal tailored to each funding opportunity

Source: nahbow.com

Action Four:

Center New Public Charging Infrastructure in Socially Vulnerable Communities With Limited Garage Access

According to the US Department of Energy, over 80 percent of EV charging happens at home where EV owners have set up their own Level 1 or Level 2 charger. Dependence on public charging for regular charging needs is atypical, but only for people with access to home charging. Socially vulnerable communities have fewer opportunities for at-home charging and public charging infrastructure is needed to fill the charging gap. As EV adoption continues, cities should prioritize public charging infrastructure investments where charging can be shared across land uses—particularly in socially vulnerable communities with limited garage access.

IMPLEMENTATION CONCERNS

- Mobility hubs and charging depots for transit and shared mobility are key opportunities to support charging for people without garages.
- Cities, utilities, and private partners should co-locate public charging infrastructure with affordable/multi-family housing.
- Cities should consider whether public curbside charging is an optimal use of public right-of-way.
- Partners should bundle public charging facilities with complementary land uses (e.g., multi-family housing and commercial retail parking lots).
- Partners should prioritize infrastructure where people will see the greatest public health benefit
- If transit is city-run, the city is responsible for building charging depots for buses and transit or siting infrastructure in existing bus depots.
- If transit is run by a third-party operator, the city will have to work with the operator to require and build charging infrastructure.
- City will need to work with property owners if complementary land uses are not city-owned.

Type **Policy/Regulatory**
Infrastructure Investment

Principles Addressed


Problems Addressed

- *EV public transit*
- *Charging access for EV transit*
- *Lack of public charging*
- *Inequitable access to EV chargers*
- *Access to chargers in locations that do not have garages*
- *Local pollution tends to concentrate on specific areas (e.g., factories, ports, and highways) hence homogeneous policy misses to opportunity of targeted and more impactful interventions*

Cost **$$$$$**

Timeline Long-term

Source: Dominion Energy

Action Five:

Partner With Utilities to Remove Grid Barriers

Utilities have not expressed great concern about grid upgrade requirements, and utilities have indicated that new EV revenue may cover that investment. None of the utilities in St. Louis, Columbia, and Houston explicitly consider socially vulnerable communities in their EVSE plans, although those areas have less access to public charging. To allow for public charging and EVSE adoption, utilities need to evaluate grid barriers in SVCs and remove grid barriers, including electricity cost, limited access to public charging in SVCs, and grid upgrades to support rapid acceleration of EV adoption in historically marginalized communities.

Type Grid

Principles Addressed

Problems Addressed

- *Potential grid restrictions*
- *Costs of additional electricity use*

Cost $$$$$

Timeline Long-term

IMPLEMENTATION CONCERNS

- Utility companies should define environmental justice areas and SVCs and identify them in their service area.
- Utility companies should consider equitable installation and access to public charging stations.
- Utility companies should model pilot programs after programs like Sonoma Clean Power's EV program.
- Programs should offset the cost of electricity for charging for low-income communities
- Utility companies should upgrade the grid to prepare for charging depots, transit/freight charging, and supercharging stations.

Source: Blink Mobility

Action Six:

Remove Digital, Payment, and Language Barriers to Shared and Personal EV Access

Besides the availability and cost of EVs their charging infrastructure, historically marginalized communities experience many barriers to accessing shared and personal EVs. People in historically marginalized communities are more likely to be unbanked without access to a credit or debit card, limiting their ability to make web- and app-based payments for shared EV services. Additionally, some potential EV users may not have access to a smartphone or a device that can access shared mobility apps. Even language barriers can limit access. These digital, payment, and language barriers must be addressed to ensure equitable EV access.

IMPLEMENTATION CONCERNS

- Cities, utilities, and their private partners should ensure digital access to app-based mobility options and app-based shared EVs and ensure program access for residents who do not have a smartphone or other devices.
- Partners should develop unbanked access programs for SVCs – access for residents who are unbanked and/or do not have access to credit/debit cards, online banking, or non-cash payment options.
- Partners should reduce the cost of EV car sharing (e.g., membership fees and per minute fees) and other shared EV options.
- Partners should work with community leaders to overcome language and cultural barriers, and tailor their planning processes accordingly.
- Legal barriers (like lack of driver's licenses) should be addressed by creating easy pathways to overcome missing paperwork or other legal barriers.

Type
Community Investment
Mobility Investment
Infrastructure Investment

Principles Addressed

Problems Addressed

- *Inequitable access to digital technologies or smartphones*
- *Inequitable access to banking*
- *Higher rates of unbanked people in SVCs*

Cost **$$**$$$

Timeline Long-term

Play 3:
Achieve Universal Electric Mobility

For so long, historically marginalized communities have survived on scarcity—scarcity of resources, opportunities, and even mobility. BIPOC communities have diverse and complex transportation needs, and thus promoting one-dimensional electric mobility solutions will not meet their needs. Advancing electric mobility equitably is all about options—whether it is an electric car share, rental car, vanpool, bus, bike, or personally-owned vehicle—but also reflecting the lived experiences of these communities in policy, program, and charging infrastructure design. ***Ultimately, Columbia, Houston, St. Louis, and all cities should enable freedom of movement and diversity of mobility choice.***

Source: Pexels.com

Source: ECab North America

Action One:

Co-Locate Electric Mobility and Public Chargers With Transit

Public transit is a lifeline service in historically marginalized communities that connect people to jobs, food, family and friends, medical assistance, and more. For many, bus or rail will continue to be the best options for them. Cities and their transit partners should co-locate shared electric mobility options and public charging stations with public transit at mobility hubs to expand people's transportation options, but also to enhance their travel experience. Electric mobility options at transit might unlock new first- and last-mile connections, create more direct connections without transfers, reduce travel time when people need to quickly get to their destinations, and more.

IMPLEMENTATION CONCERNS

- Cities, utilities, and community stakeholders should identify mobility hub locations and thoughtfully integrate electric modes with public transit.
- This provides an opportunity to connect communities to electric shared micromobility.
- Co-located chargers should be supported by integrated payment and booking platforms.

Type

Programmatic
Community Investment
Mobility Investment
Infrastructure Investment

Principles Addressed

Problems Addressed

- *Lack of mobility choice*
- *Disconnect between neighborhoods and public transit*
- *Lack of dedicated space for modes that meet climate goals*

Cost **$$$**$$

Timeline Short-term

Action Two:

Invest in Community-Centered Electric Shared Mobility

Source: Sam Holt

Historically marginalized communities adopt electric mobility when services and the infrastructure that supports them meet the specific needs of their residents. Shared electric services—whether car share, vanpool, or even e-bike libraries—are well used if they are designed for and by the communities they aim to serve. Community shared mobility systems are shared vehicle services that are centered on a specific population and/or neighborhood. These systems are popping up in places like Los Angeles, Sacramento, and Buffalo. Electric car rentals can be coupled with community-driven systems for long-term clean vehicle access.

IMPLEMENTATION CONCERNS

- Community-centered shared mobility should offer app-based and/or analog reservations, depending on market access to smartphones.
- Car rental companies could play a significant role in providing access to electric mobility options, if they support public charging networks, offer reduced cost programs, and develop culturally appropriate marketing and booking options.Cities and utilities should facilitate conversations between private mobility/charging infrastructure partners and specific communities.
- Community-centered electric shared mobility works best with a well-established operator and turnkey services. Community operations should only be considered if supported with proper training and ongoing performance evaluation.
- These models enable potential workforce training and local hire opportunities within the vulnerable community.

Type
Programmatic
Community Investment
Mobility Investment
Infrastructure Investment

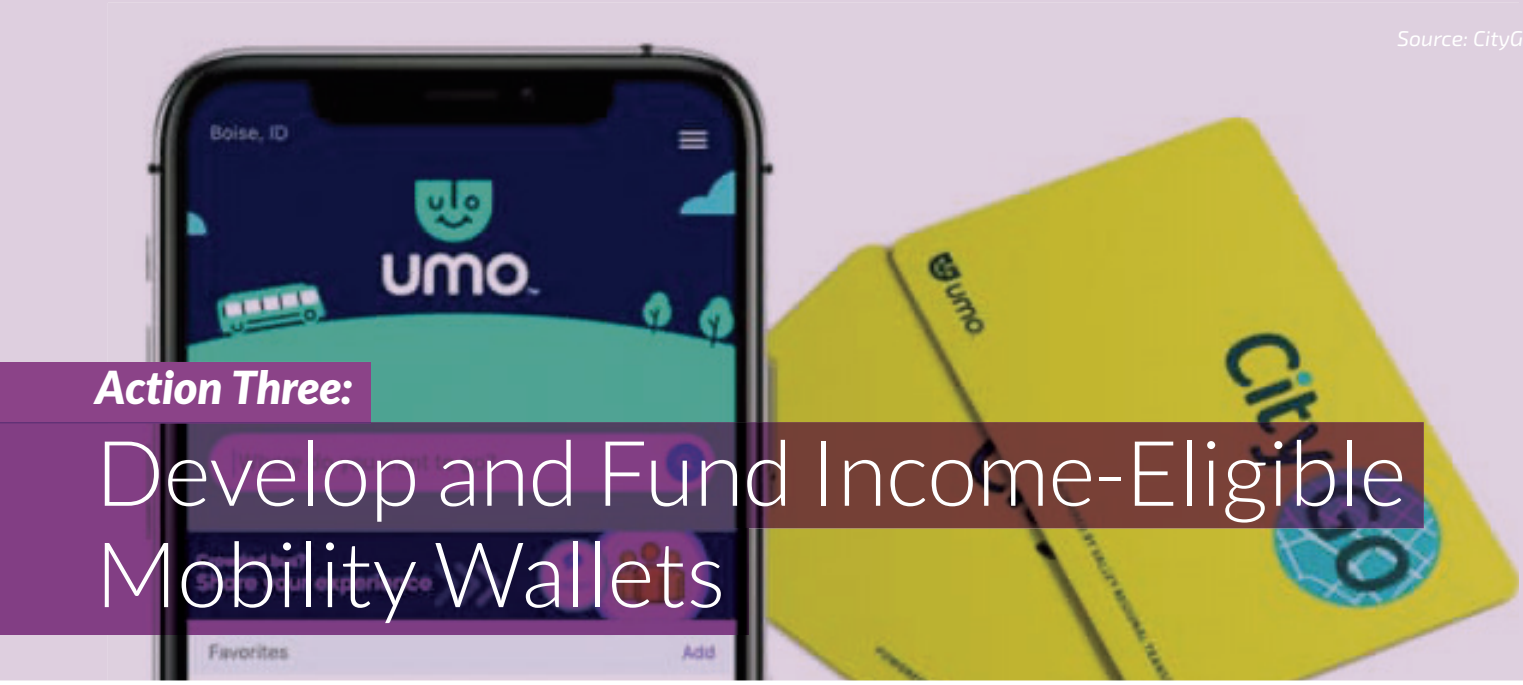
Principles Addressed

Problems Addressed

- *Lack of proximate access to shared mobility services*
- *Shared mobility services not responding to needs of SVCs*
- *Vehicle availability for specific communities*
- *Lack of community buy-in and ownership of shared mobility systems*

Cost **$$$$$**

Timeline Short-term



Source: CityGo

Action Three:

Develop and Fund Income-Eligible Mobility Wallets

Alongside a diverse set of electric mobility options, low-income and BIPOC communities should be able to pay for a range of transportation services at a discount through an integrated payment system. Cities should work with community partners, mobility services, and third-party payment services like PayNearMe to offer debit-style mobility wallets. A mobility wallet provides the flexibility to choose electric mobility services that people want to pay for given a monthly "allowance". Mobility wallets, or universal basic mobility, are being tested in Pittsburgh, Oakland, Portland, Boise, Los Angeles, and more.

IMPLEMENTATION CONCERNS

- Mobility wallets require partnership between public agencies (including cities, transit agencies, housing authorities, and more), private mobility providers, private apps/account-based systems, and community organizations.
- Community organizations are critical to market the mobility wallet, facilitate sign ups, and educate communities about their benefits.
- Mobility wallets can be available to the broader public but should include low-income or community-specific pricing for that make electric mobility options more affordable for historically marginalized communities.
- Mobility wallet should be offered in digital format but with options to make bookings and payments without a smartphone or credit card.
- Mobility wallets can be coupled with other forms of assistance, including utility discount programs.

Type **Programmatic**
Mobility Investment

Principles Addressed

Problems Addressed

- *Lack of mobility choice*
- *High-cost mobility*
- *Difficulty administering payments*

Cost **$$$**$$

Timeline Short-term

Play 4:

Support Community Adoption

Equitable electrification projects and programs rely on strong community relationships. Launching EV adoption projects without any community involvement may erode trust and be counterproductive to equity goals. Cities, utility providers, and private partner interesting in siting EV programs and infrastructure in SVCs should help build local capacity and ensure communities play a leadership role in the implementation of decisions.

Source: Unsplash.com

Source: MCE Clean Energy

Action One:

Work with Utility Companies to Develop Equity-based Requirements and Partnerships

Once cities and utilities have arrived at common definitions of equity and equitable electric mobility, it is time to put them into action. Cities should explore opportunities with utility providers to develop new or modify existing incentive programs that target the communities that need the most support. While incentives and rebates programs that are open for the population at large can certainly help push the needle forward, specific incentives for vulnerable communities will ensure programs reach their intended audience.

IMPLEMENTATION CONCERNS

- Jointly develop definition of equity and electric mobility equity
- Partner with utilities and representatives from SVCs to determine the most beneficial sites and uses for utility investment
- Partner with school boards for school bus electrification
- Cities can help facilitate the relationship between utility providers and SVCs
- Cities and utilities must agree on equitable electric mobility definitions
- Utilities must conduct community engagement with SVCs

Type **Policy/Regulatory** **Programmatic** **Community Investment**

Principles Addressed

Problems Addressed

- *Inequitable access to EVSE and EV/shared vehicle incentive programs*

Cost **$$**$$$

Timeline Short- and Long-term

Action Two:

Educate Community Partners About Equitable Electric Mobility

Source: Greenlining Institute

Cities, utilities, and their private partners have a core responsibility to educate communities on the basic principles of mobility equity, transportation burdens and benefits to promote informed community decision making and produce the most equitable outcomes. The partners should educate building managers, landlords, and developers on the benefits of EV charging and the logistics of installing EVSEs. Lack of awareness by building managers of the benefits of EV charging or how to pursue charging installations is a major barrier to EV charging adoption at multi-unit dwellings.

IMPLEMENTATION CONCERNS

- Cities should educate communities on the basic principles of equitable electric mobility and transportation burdens and benefits to promote informed community decision making and produce the most equitable outcomes.
- Lack of awareness by building managers of the benefits of EV charging or how to pursue charging installations is a major barrier to EV charging adoption at MUDs Consider conducting direct outreach to MUD owners or manages as part of MUD incentive programs to address this lack of awareness.

Type **Programmatic**

Principles Addressed

Problems Addressed

- *Lack of awareness of opportunities and incentives*
- *Misperceptions of electric mobility*

Cost **$**$$$$

Timeline Long-term

Source: Drive Oregon

Action Three:

Place Decision-Making Power in the Hands of the Local Community

Conducting meaningful community engagement and building relationships takes time and resources. The best way to ensure this investment is gratified is to provide opportunities for community leaders to participate in decision-making processes. This could take the form of participation on a policy board or a steering committee. This action is critical to ensure that representation aligns with ultimate policy, program, and infrastructure decisions. This will build trust with the community and build a foundation for community adoption of electric mobility.

IMPLEMENTATION CONCERNS

- Engage early in the planning process to start building community trust from the beginning.
- Provide the necessary resources to allow community members to fully collaborate, including financial compensation.
- Consider reaching out to community organizations that you do not normally work with to avoid perpetuating existing inequities.
- Throughout the outreach process, cultural sensitivities should be considered including literacy levels, difficulties participating due to work and childcare obligations, and language barriers.
- Community engagement best practices include running focus groups, doing surveys, working with community-based organizations, and participatory budgeting, MOUs with community-based organizations, community organizing, citizen advisory communities, open planning forums with citizen polling.
- Engagement processes can be conducted by utility providers or city departments, depending on the project or program being developed.
- Cities can act as mediators between utility providers and community groups.

Type Programmatic

Principles Addressed

Problems Addressed

- *Lack of community vetting*
- *Decisions do not reflect community ideas or priorities*

Cost $$$$$

Timeline Long-term

Cities have the tools necessary to get electric mobility right - by centering equity and building the policy, local programs, and infrastructure decisions around the needs of historically marginalized communities. It will take listening and learning first before you can build the foundations of universal electric mobility and widespread community adoption. True equitable electric mobility happens at the pace of community. Building trust now will accelerate adoption in the future.

Appendix

We teamed with *Ameren Missouri* to conducted a high-level impact assessment of their grid in SVC areas in St. Louis. Our analysis shows that by adding ~1,700 public chargers for light duty vehicles to serve a 10% EV penetration in the identified areas, an additional 42 MW of peak load might get added to the system (at 80% L2 and 20% DCFC). See Figure 1 below.

The SVC areas reviewed are served by 48 substations, most of which are located north of the city center in "Area 1" as depicted in Figure 1 below. Assuming EV penetration of 10%, only one substation is likely to require an upgrade. However, number of substation likely upgrades will grow exponentially as EV penetration reaches 20% and beyond, as illustrated in Figure 3.

We also identified numerous additional substations that are nearing capacity in these areas and could require upgrades earlier should transport electrification accelerate above expectation, or should it take different forms (e.g., greater emphasis on fleets or heavier duty vehicles) than anticipated. Out of the 48 substations, eight have a headroom of 5 MW or less (three in "Area 1", two in "Area 2" and three in "Area 3"), as illustrated in Figure 2.

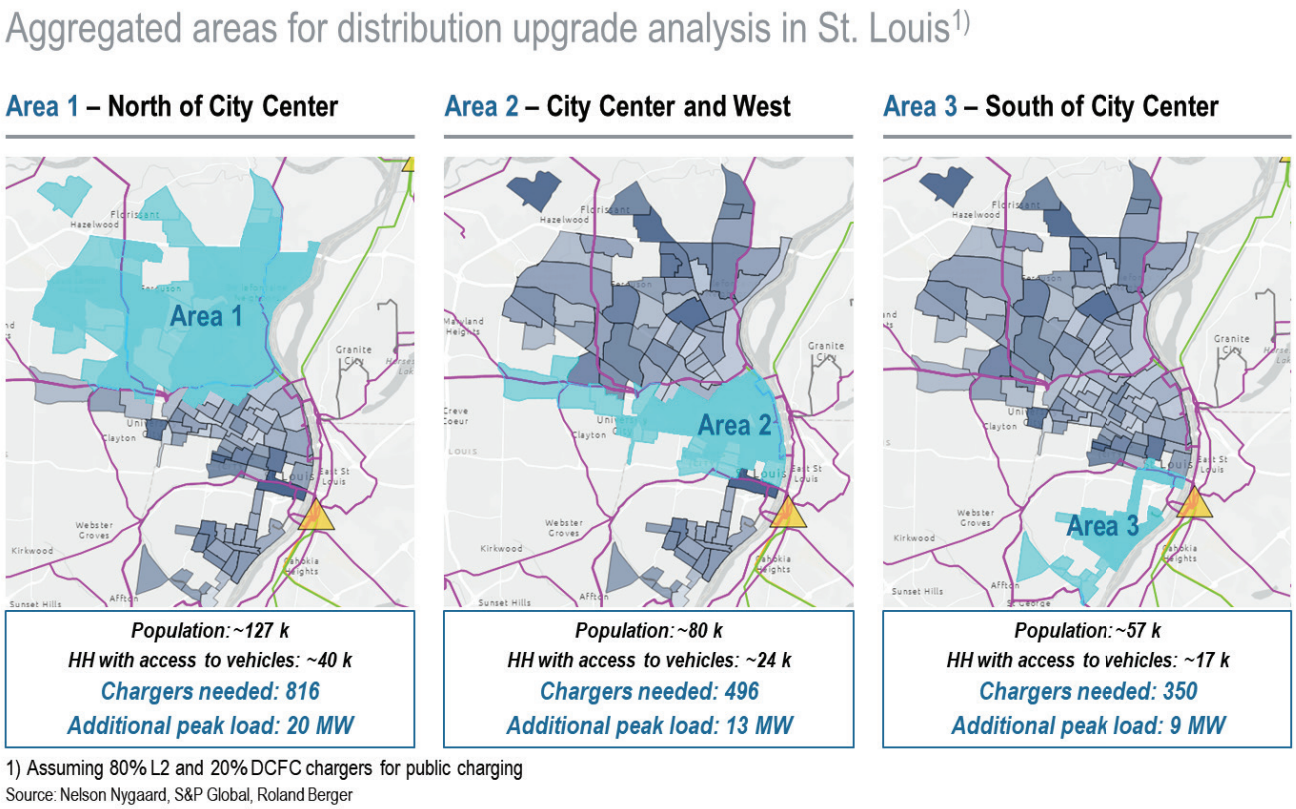
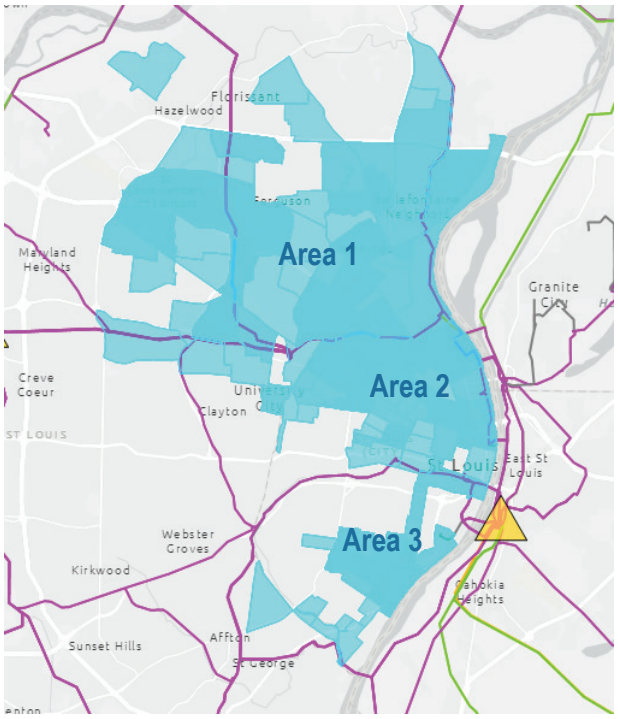
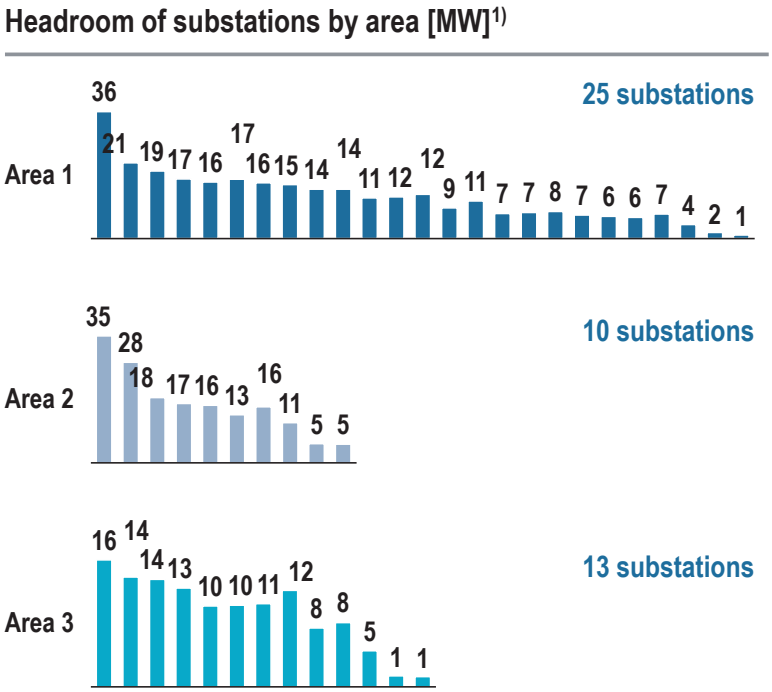


Figure 1: Identified SVC areas for distribution upgrade analysis in St. Louis.

Substations in vulnerable areas in St. Louis

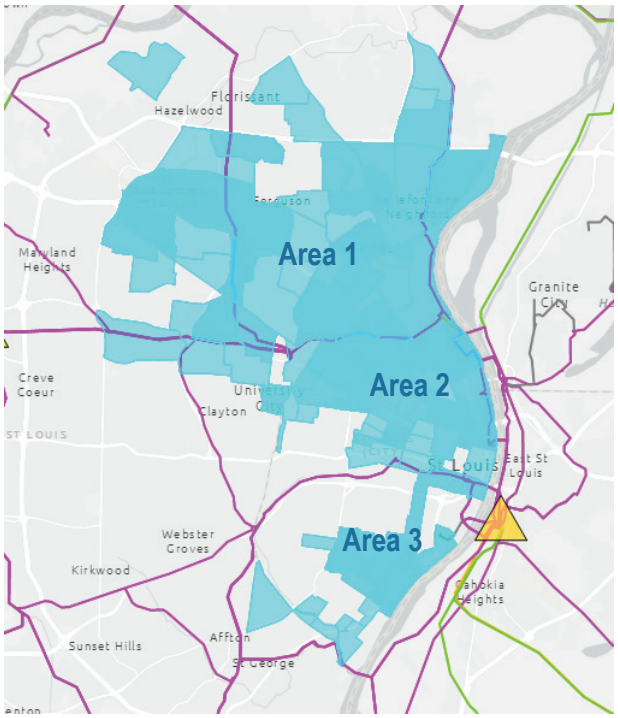


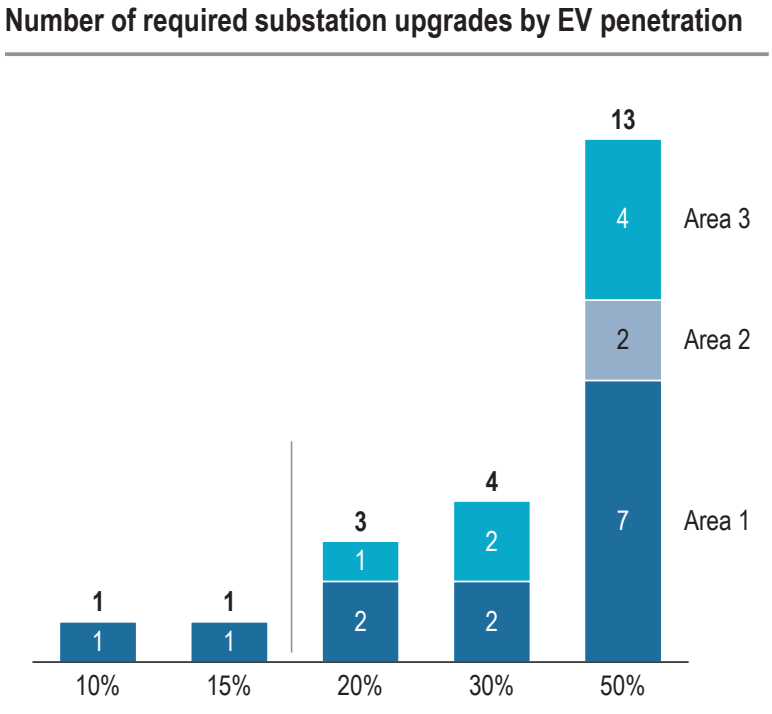


1) Headroom defined as rated capacity of substation less peak load 2021;
Source: Ameren Missouri Grid Analysis, Roland Berger

Figure 2: Current "headroom" of substations by area in SVC in St. Louis.

Number of required upgrades by area for a given EV penetration %





Source: Ameren Missouri Grid Analysis, Roland Berger

Figure 3: Forecasted number of upgrades required by area in SVC for a given EV penetration in St. Louis.

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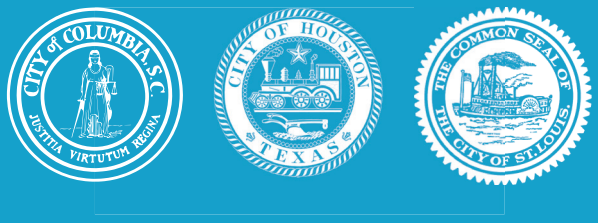
ENTERPRISE HOLDINGS



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