

# BEST PRACTICES FOR WORKPLACE CHARGING PROGRAMS



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# 1. Why Electric Vehicles

With transportation now the [largest contributor to greenhouse gas emissions](#) in the United States,<sup>1</sup> the country must rapidly scale adoption of electric vehicles (EVs) in order to meet national and international climate goals. In fact, increased adoption of electric vehicles is critical to support the U.S. goal of zero carbon emissions by 2050.<sup>2</sup> Without continued aggressive action, this problem will only get worse: by 2050, global demand for freight transportation will nearly triple, and demand for passenger transport is expected to double.<sup>3</sup> In order to curb the worst impacts of climate change, improve public health and increase energy security, the rapid electrification of the transportation sector is critical.

The significant and rapid growth in EVs has the potential to bring substantial benefits to the entire country. EVs can provide clean, reliable, affordable transportation that saves families thousands of dollars—especially as more models (including more used electric cars) become available. All people, regardless of where they live, should have the opportunity to benefit from the lower operating costs, reduced maintenance needs and improved performance of EVs.

## Why Invest in Charging

This transition requires combined investments in both EVs and electric vehicle supply equipment (EVSE) to meet charging infrastructure needs that take EVs to scale. The deployment of EV charging infrastructure thus far, however, has remained far below what is necessary. This is partly due to the demographics and charging habits of early EV adopters, who tend to be wealthier and have access to at-home charging. The ultimate goal is to make charging stations as ubiquitous as gas stations.









A recent analysis by Atlas Public Policy<sup>4</sup> found over \$87 billion in charging infrastructure investment will be needed in the U.S. over the next decade, including \$39 billion for publicly accessible charging. In 2018, there were over one million passenger EVs on U.S. roads. By 2030, that number is expected to be 18.7 million. Powering those vehicles requires an estimated 9.6 million charging stations.<sup>5</sup>

Much of the investment in charging will be paid for by individual drivers through use fees over time or recovered through electric utility rates. However, private, and public investment is essential to jump-start the charging network, particularly until there is a critical mass of electric vehicles using this infrastructure. The U.S. Infrastructure Investment and Jobs Act (also known as the Bipartisan Infrastructure Law) includes \$7.5 billion over five years in funding for electric vehicle charging infrastructure. This includes \$2.5 billion for competitive grants through the Charging and Fueling Infrastructure Discretionary Grant Program (CFI Program).<sup>6</sup>

State and local governments, utilities, tribes and others must now consider how to best serve EV drivers in their communities and how to access charging infrastructure funds to meet these needs. This white paper summarizes years of experience and best practices to help these public and private leaders design programs, specifically for workplaces, that will ensure federal funds are spent efficiently, effectively and in ways that center equity. Other papers in this series address other key use cases for charging and best practices for addressing those needs.

## 2. Types of Charging

There are several common types of chargers, charging station models and network technologies that can also be combined to meet the needs of specific sites and drivers.

Slowest		Fastest	
Level	Level 1	Level 2	DC Fast Charging
Use Case	Home	Home/Work/Public	Public
Power	<2 kW <i>(Usually 1.2 kW)</i>	2.4 - 19.2 kW <i>(Usually 6.7 kW)</i>	25 - 350 kW <i>(Usually 150, 50, or 250 kW respectively)</i>
Plug Shape (Into Vehicle)	 J1772	 J1772	 CCS  CHAdeMO  Tesla
Outlet Shape	 120 V	 240 V	Electric Vehicle Supply Equipment (EVSE) 
Cost	\$	\$\$	\$\$\$\$

## 3. Current State of Workplace Charging

The U.S. Census Bureau estimated in 2019 that there were 6.1 million employers in the United States.<sup>7</sup> However, as of early 2021, there were estimated to be less than 10,000 chargers at workplaces.<sup>8</sup> The vast majority of these employee designated workplace chargers, nearly 95%, were Level 2; Level 1 chargers accounted for about 4% and DC fast chargers accounted for less than 1%.<sup>9</sup> To support a projected electric vehicle stock of 26 million in the United States in 2030 the number of workplace chargers needs to increase dramatically, to 1.3 million.<sup>10</sup>

## 4. Why Workplace Charging is Important

Being able to charge at work is a valuable employee benefit that makes it easier for people to trade in their gas-powered cars for electric and plug-in hybrid vehicles. Current EV drivers, mostly charge at home, where it is cheap and convenient. However, approximately 20% of Americans, and an even higher percentage of low-and moderate-income drivers, live in buildings that do not have access to off-street parking to charge an EV.<sup>11</sup> Overall, approximately 30% of all EV drivers do not have access to home charging.<sup>12</sup>

More than 90% of employees in the United States commute less than 35 miles. Access to Level 1 charging at home and Level 2 charging at work could meet the changing needs of over 92% of U.S. drivers' workday travel.<sup>13</sup> Workplace charging also supports longer-range travel and those with limited or no access to home charging.

Employees also benefit from owning EVs, including lower fuel and maintenance costs, HOV highway lane access, improved driver experience with a smoother and quieter ride and environmental benefits due to lower emissions.

Workplace charging can also play a key role in driving EV sales, both by making it easier to charge and by normalizing EV commuting. When employees see peers driving electric, they are more likely to drive electric themselves. In fact, a USDOE research shows that employees who can charge at work are 6x more likely to purchase an EV.<sup>14</sup>

## Benefits to Employers

Providing workplace charging can also have several benefits for employers. They can

- **attract and retain employees with a low-cost, high-impact benefit.** 52% of employees believe their employers should do more for the environment.<sup>15</sup> Most of the largest metropolitan areas have less than 16% of the necessary workplace charging infrastructure, so workplaces will play an important role in filling a critical gap in charging infrastructure
- **build company reputation as a sustainability leader.** [69% of consumers](#)<sup>16</sup> say they care whether a company has a socially responsible business model. Implementing workplace charging enables organizations to lower their carbon footprint by encouraging employees to drive electric, thereby reducing emissions from employee commute<sup>17</sup>
- **earn points toward LEED and other sustainability certifications by contributing to a greener commute.** Companies with onsite charging stations and employees who commute by electric vehicle can earn up to 2 LEED certification points. Other sustainability certification programs award points for workplace charging programs.<sup>18</sup>

## Workplace Charging and Historically Underserved Communities

Fossil fuel powered cars, trucks and buses emit harmful air pollutants significantly impact public health, particularly residents of low-income and Black, Indigenous and People of Color (BIPOC) communities who often face disproportionate exposures to harmful pollution. Equity is often a driver for workplace charging given that people with low incomes are more likely to live in apartments and don't have easy access to home charging. This means they are less likely to see EVs as a viable transportation option.

Access to transportation is a lifeline for people with low-incomes and affects their ability to get to work and obtain health care and other services. People with low incomes have an undue transportation burden, spending an average of 17.4% of their income on transportation.<sup>19</sup> Additionally, home values near public transportation are up to 24% higher than in other areas meaning that low-income earners typically live further from public transport.<sup>20</sup> In fact, [commute time is the single greatest predictor of escaping poverty](#), and in most affordable neighborhoods in America, unfortunately, the fastest

commute is a car commute. Millions of families depend on unreliable vehicles that are expensive to maintain and fuel to get to work.

For all these reasons, providing access to affordable charging that brings the benefits of EVs to people with low incomes is critical. Centering equity is also a priority for federal funding as it aligns with the federal Justice40 Initiative, which aims to deliver 40% of the overall benefits of federal investments in clean transportation to disadvantaged communities. However, due to the barriers and costs outlined below, early adopters of workplace charging have tended to be white collar employers, such as technology companies, hospitals and educational institutions.

## 5. Challenges in Workplace Charging

There are several challenges to consider when it comes to charging in workplaces:

**Information and Motivation:** Employers generally have limited information about EVs and charging, and often do not see charging as a problem they need to solve. They may fall back on unhelpful analogies (“we don’t provide gasoline, why should we provide charging?”) rather than helpful ones (“we provide bike racks and lockers to support cyclists, of course we should provide charging to support EV drivers!”) There is often no third-party organization tasked with overcoming these barriers. Many regions have employer trip reduction requirements designed to improve air quality by reducing drive-alone commuting, but these programs seldom encourage the use of clean EVs by drivers.

**Stakeholder Complexity:** It is often unclear who would be a logical champion to support workplace charging within companies. Human resources or benefits managers may have little motivation to provide charging, particularly since regional trip reduction programs do not require or incentivize charging. Sustainability managers and marketing teams may have little influence over commuting programs. In addition to internal stakeholders, charging may require approval from external stakeholders and partners including local governments, electric utilities and private charging partners. Driving this process to a successful conclusion often takes high level executive leadership, which is a limited resource.

**Technical Complexity:** Because every site is different, electrical infrastructure capacity and layout varies significantly from building to building. The cost of installing charging can also vary substantially based on the specific location, the amount of trenching or conduit required and other site-specific factors.

**Parking Logistics:** Parking management varies by building. Parking may be assigned or first-come first-serve and may be bundled with rent or billed separately. All these factors impact the design and management of charging at a particular building. When employers are renting space from a commercial property manager, the incentives are split, and employers may have little leverage with property managers except during lease renewals. Employers must also manage the use of charging as it becomes more popular - for example, by using pricing or requirements to move/unplug vehicles.

**Cost:** Workplace Level 2 charging unit installations tend to be less expensive than the average public Level 2 charger, since they are more controlled environments.<sup>21</sup> However, the upfront cost of charging equipment can still be daunting to employers. Furthermore, if the first few chargers installed use up

existing panel capacity, upgrading transformers and adding more panels may add significant expense, or power management solutions may be needed.

## 6. Stakeholders for Workplace Charging Program

The following individuals will likely be involved with the design and installation of workplace charging:

- **Employers** will likely be the project drivers, pushing to support their employees in choosing a cleaner commute. High level leadership within the employer is most helpful.
- **Community associations**, such as employer associations and culturally specific business organizations can help spread the word about charging and supportive programs.
- **Property owners/managers** are the site hosts and key decision makers and must support each step of the project.
- **Electric utilities** may support the project financially or in kind through investment in EVSE. Utilities may offer incentives and technical assistance as well.
- **Charging companies** may own and/or operate the chargers and be involved with the technology design and installation. These companies have different business models that must be the right fit for project needs.
- **Electricians/contractors** bring skills and experience installing chargers or will be responsible for implementing the final designs and possibly permitting and approvals. Early involvement is essential for managing costs.
- **Public sector/permitting authorities** will support and ultimately approve the project for installation.
- **Drivers** are the users who will ultimately make the project successful and include employees who are transitioning to electric transportation.
- **Transportation Management Associations or other outreach partners** may be helpful in educating employers about the benefits of workplace charging and support for providing charging.

## 7. Components of a Successful Workplace Charging Model

Based on Forth's national program experience and evaluation of best practice studies, we have learned that the following factors support successful workplace charging projects:

### Center Equity

The first step in developing a successful workplace charging program is to center people, not technology. Projects that start with the goal of providing affordable access to charging for historically underserved drivers lead to better outcomes for everyone. The most impactful workplace charging programs will center and focus on employers with primarily low/moderate wage employees that face long commutes and have limited access to transit service. Ideally, the program should also prioritize communities and neighborhoods that don't have much existing public charging infrastructure. Even in the cases where employees have access to public charging infrastructure, it is still likely to be less

convenient and more expensive than workplace charging.

Designing for and with these historically underserved drivers generally involves 1) a robust engagement with employers and employees to determine their needs and build support; 2) hands-on outreach and technical assistance focused on historically underserved employers and those who employ many historically underserved workers; 3) supportive programs that provide information, test drives and incentives to help employees access electric vehicles; and 4) affordable charging rates.

### **Ensure the Community Benefits**

The federal government's Justice40 Initiative aims to deliver 40% of the overall benefits of federal investments in clean transportation to disadvantaged communities. However, simply placing 40% of charging hardware at workplaces in such communities will not meet this goal. Charging programs should ensure disadvantaged communities and drivers will benefit in ways that are meaningful to them.

Examples may include:

- Subsidizing electric vehicles for Minority, Women or Disadvantaged Business Enterprise (MWDBE) businesses for their business use
- Providing employee outreach and education, including "ride and drive" events, to help workers learn more about affordable electric vehicles and charging
- Offering financial incentives to workers to reduce the cost of purchasing and charging EVs
- Including electric bikes as well as electric cars and trucks in charging, education and incentive programs
- Supporting related infrastructure investments during charging installation, such as improved landscaping, walkways, lighting, signage, etc.
- Strengthening business resilience with the installation of solar and energy storage
- Creating job or training opportunities for local community members
- Improving local air quality and public health.

Partners may wish to consider memorializing these benefits in a [community benefit agreement](#), which is a contract between a project developer and community-based organizations. The agreement spells out the benefits the community will receive in return for supporting the project.

### **Build Regional Alignment on Goals, Roles and Processes**

The most successful programs will be part of a regional strategy in which local governments, electric utilities, business associations and other key stakeholders are all aligned on the goals and approach. The broader goals will likely be to reduce employee commuting costs while improving air quality and reducing greenhouse gas emissions. Specific goals are to provide accessible charging stations to meet the needs of employees, with focus on those employees in the community that do not have access to home charging. Proactive outreach and community engagement is critical in this regional strategy. It is also critical to define partner roles early in program design and refine them through the planning phases. Partners should consider creating an advisory committee that draws on the stakeholder list in the previous section. Each partner should have clearly defined metrics for success before the program launches.

### **Provide Proactive Hands-on Support**

Many workplace charging programs simply offer rebates or incentives that employers must apply for. These programs can work well for those who are well-informed, technically capable and relatively affluent. They do not work well, or scale for historically underserved communities or MWDBE employers. Instead, successful programs will provide proactive outreach to help employers understand why and how they can provide charging, walk them through the process, help them identify solutions and support them with funding incentives as needed. The program should include support for high level needs assessment, site-specific technical assessments and hands-on work with employers.

Every workplace is slightly different and will require a slightly different approach. Key factors include 1) a building's architectural design and ownership; 2) parking layout and location (underground, structured, or street level; gated or not); 3) how parking spaces are allocated and the related ownership model (assigned, deeded or shared); and 4) the electrical capacity of existing panels, where power is routed, and whether utilities are bundled with rent or not. It is helpful to offer templates for a few different models based on the most common conditions in the community. However, programs need to provide skilled advisors to help property managers find the right solution to fit their needs and need flexibility to fund the right solution.

### **Specify Appropriate Chargers**

To help decide if Level 1, Level 2, Level 3/DC Fast Charger or a mix of each is the best solution for workplace charging, employers should consider the site's overall electricity consumption, electrical capacity and ownership structure of the parking lot. This includes factoring in whether the parking lot is open to the public, number of EVs likely to charge there, whether the chargers need to serve both employees and the public and whether any fleet vehicles will use these chargers.

This is also the right time to consider how best to support charging for electric bikes in bicycle parking areas. Employers should also think about whether they want to require payment to offset costs and/or manage demand.

The right fit for most employers is likely Level 2 chargers because they are more affordable and reduce pressure on the grid. They also offer flexible options for power management and ability to manage use. When selecting chargers, consider: 1) how drivers are likely to use the chargers; 2) how host sites will manage control, payments and reservations; 3) anticipated energy demand profile based on whether demand will be steady throughout the day, or see peaks in demand at certain times of day; 4) site conditions such as installation limitations, connectivity (Wi-Fi, ethernet, cellular) and space restrictions; 5) networked capabilities and whether the chargers will be listed publicly in an online platform that improves the regional charging network and allows EV drivers to find stations through a mobile app (if so, accessibility in terms of physical location is key); and 6) costs. Additional considerations may include interoperability of hardware; scalability; manufacturing location; warranty structure of charging equipment; maintenance programs offered; and familiarity of local electricians with the chargers.

### **Work with Trusted Partners**

Outreach and technical assistance are generally most effective when it comes through trusted partners. They may be staff at an electric utility, a federal clean cities coalition, an employer association or chamber of commerce or a local transportation management association that has relationships with



community members. In many cases a combination of partners can be most effective, with one acting as a lead but tapping other organizations based on who is most trusted by a particular area or audience. For example, culturally specific business organizations may be an excellent avenue to reach specific employer groups. These trusted partners will help develop key messaging, talking points and other resources to support engagement. This outreach informs EVSE design and programmatic elements and makes prospective users aware of the chargers.

Outreach will enable the project to address diverse employee needs and support fair access to EV charging and related benefits and meet overall goals of transportation decision making. Stakeholder outreach that begins early and continues through EVSE operations helps ensure the people who have the most to gain from the chargers inform decision making at every step of the process. The outreach will be unique to the needs, culture and characteristics of each workplace.

### **Leverage Multiple Funding Sources**

Most successful programs will draw on multiple funding sources that may include federal, state or city grants, utility investment and philanthropic funding. While grants or tax credits may be available to help cover the cost of charging equipment and installation<sup>22</sup>, but other sources of funding will often be needed to support electric vehicles, mobility services, community engagement, workforce development or other efforts.

When developing a project operating budget, program managers should consider a user fee structure that will cover energy usage, network costs and maintenance costs. Some employers may wish to provide free charging to employees, though modest user fees can be an efficient way to manage demand and ensure employees are only using the charging if needed. Some charging providers can also offer variable fees for fleet vehicles, employees, customers and the general public.

### **Evaluate and Improve**

Prepare a plan to collect, analyze and report data from charging stations for the duration of use, as well as feedback from employers and other program participants. In the first year, it's particularly important to regularly evaluate what works and what does not and to adjust operations and/or outreach accordingly. Incremental improvement will be necessary to support high utilization especially for historically underserved communities.

## **8. Charge@Work**

Forth and its partners have developed a national workplace charging program, Charge@Work<sup>23</sup>, with funding and support from the U.S. Department of Energy. Communities developing a workplace charging program are strongly encouraged to plug into this national effort, which is designed to allow local governments, utilities and other partner organizations to offer the program on a “private label” basis with their own branding. Charge@Work also includes the Electric Vehicle Adoption Leadership (EVAL) certification program<sup>24</sup> which recognizes employers for supporting their employees in choosing a clean commute. Taken altogether, these platforms provide tools and resources designed to overcome the barriers identified in this paper, including:

- A Workplace Charging Resource Center with a variety of tools, such as self-assessments and employee surveys, to help organizations with their planning, implementation and next steps to promote the benefits of driving electric to employees
- Information on financial incentives, state and utility rebates and incentive programs to help employers
- A certification and recognition program that highlights employers who are leading the way in supporting clean electric commutes
- Access to expert support from Forth and other partners

## 9. Additional Workplace Charging Considerations

While not the focus of this paper, there are several other approaches to workplace charging that bear consideration.

**Building Codes.** One of the policy levers to increase charging is an updated building code that requires “EV ready” construction. This can be helpful in the long run, but requirements typically focus first on new buildings, making this a longer-term strategy. Overall, this is an important long-term tool, but not the focus of this paper.

**Level 1 Charging.** A less common charging solution, that offers several benefits, is Level 1 charging at all or many parking spaces. This offers a cheap and potentially easy solution with simple 120-volt outlets. This option can make it challenging to measure usage precisely and manage billing, but given the low power costs, this may not be an issue. A more serious issue is that Level 1 charging solutions generally do not qualify for third party funding from utilities or government incentive programs.

**Public Fast Charging.** An alternative solution may be groups of Level 3/DCFC chargers that provide fast charging very close to, but not collocated at, the multifamily property. Many workers who cannot charge at home are likely to depend on public fast charging initially. These are typically third party owned and managed. This would generally be less convenient for workers, however, and public fast charging is usually the most expensive form of charging. In fact, it may be more expensive than the equivalent price of gasoline. However, one creative approach could be to negotiate with charging providers to offer affordable or discounted charging fees, potentially as a monthly subscription, for local employees.

## Conclusion

Many workers live in apartments, with limited or no access to charging. Employers have a critical role to play in providing low or no cost charging infrastructure to employees, particularly low-income employees, to encourage adoption of EVs to support the electrification of the transportation sector. Employers that invest in workplace charging will benefit from improved attraction and retention of employees, reduced emissions from commuting and an enhanced reputation as a sustainability leader.

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## References

- <sup>1</sup>EPA [Sources of Greenhouse Gas Emissions](#), 2023.
- <sup>2</sup> [Electric Vehicle Charging Action Plan](#), White House Briefing.
- <sup>3</sup> Green Car Congress (2021). ITF: worldwide transport activity to double by 2050, emissions to rise 16% compared to 2015. <https://www.greencarcongress.com/2021/05/20210519-itf.html>
- <sup>4</sup> L. McKenzie, N. Nigro, [U.S. Passenger Vehicle Electrification Infrastructure Assessment](#), Atlas Public Policy, April 28, 2021.
- <sup>5</sup> [Right-of-Way Charging, How Cities Can Lead the Way](#) Report.
- <sup>6</sup> <https://www.fhwa.dot.gov/environment/cfi/>
- <sup>7</sup> <https://sbecouncil.org/about-us/facts-and-data/>
- <sup>8</sup> Source: NREL Report [EV Charging Trends](#)
- <sup>9</sup> Source: NREL Report [EV Charging Trends](#)
- <sup>10</sup> Source: International Council on Clean Transportation, [Charging Up America White Paper](#)
- <sup>11</sup> Meeting of The Minds Report, Feb 17, 2020, <https://meetingoftheminds.org/why-cities-should-support-right-of-way-charging-33209>, accessed on 2023-03-20.
- <sup>12</sup> Source: EVGo: [U.S. EV Charging System a Priority Under Biden](#), News Article
- <sup>13</sup> Source: Department of Energy, [Level 1 Electric Vehicle Charging Stations at the Workplace](#)
- <sup>14</sup> <https://www.energy.gov/eere/vehicles/articles/workplace-charging-challenge-2016-progress-update>
- <sup>15</sup> Source: Plug In America, [Workplace Charging](#)
- <sup>16</sup> Source: Plug In America, [Workplace Charging](#)
- <sup>17</sup> Source: [Forth Workplace Charging](#)
- <sup>18</sup> Source: U.S. Green Building Council, [Electric Vehicles](#). Other programs include [Leadership in Energy & Environmental Design \(LEED\)](#), [Green Globes](#), [ENERGY STAR® for Buildings and Plants](#), and [Sustainability Tracking, Assessment & Rating Systems \(STARS\)](#) for college and university employers.
- <sup>19</sup> U.S. Department of Transportation, [Transportation Economic Trends](#).
- <sup>20</sup> American Public Transport Association, [Study Links Real Estate Values To Public Transportation Access](#).
- <sup>21</sup> Source: [Plugged In Report](#), Idaho National Labs
- <sup>22</sup> The U.S. Department of Energy's Alternative Fuels Data Center, <https://afdc.energy.gov/fuels/laws/ELEC?state=US> lists possible incentives to help offset the cost of EV chargers.
- <sup>23</sup> [Charge@Work](#)
- <sup>24</sup> [Electric Vehicle Adoption Leadership Program](#)