

ELECTRIC VEHICLES AND CHARGING STATIONS: CONSIDERATIONS FOR CRE

A significant transportation shift toward electric vehicles is underway, along with the promise of a wide range of societal benefits. While the potential is real—and may soon be accelerated due to interest from the Biden Administration—the country as a whole is only at the beginning stages of this transition, and the ramifications for commercial real estate continue to shift. Even as electric vehicles increase in popularity, the infrastructure to support them—primarily in the form of charging stations—barely exists in many parts of the country, and the availability of the electricity to run them remains an open question. A push to install charging stations has not always been carefully considered, and the benefits and consequences are often uncertain. While commercial real estate can and will be part of a successful transition to electric vehicles, there needs to be careful discussion about short- and long-term consequences to ensure that decisions don't create more harm than good.

ELECTRIC VEHICLES



The electric vehicle (EV) revolution is underway, but the country is not yet prepared for it. The road ahead remains challenging, the issues are complicated, and some of the thorniest concerns have barely been considered. Demand for electric vehicles, however, cannot be questioned. While still a small percentage of total vehicles on the road, EV sales have been growing at a consistent rate of 50% per year since 2010. Projections vary, but some estimates suggest there will be one million electric vehicles travelling on North American roads by 2024, and nearly one-third of vehicles in North America will be electric by 2030.

The major automakers are finally opting to catch up to the high demand. All major auto manufacturers are making significant investments in the research and development of EV models. Recently, the industry has gone even further, as leading automakers including General Motors, Honda, Toyota and Volkswagen—and even luxury brands including Volvo and Jaguar—have all announced dates for the phaseout of production of vehicles with internal combustion engines. In yet another sign of where the market is, EV manufacturer Tesla is now a more valuable company than the next several car makers combined. An increase in mass manufacturing, along with advances in battery technology, will continue to drive down the vehicle cost and diminish price as a deterrent for many consumers.

The State of California—often a trend-setter on sustainability issues—has sent a very strong signal on EVs: by 2035, the state will outlaw the sale of new vehicles with internal combustion engines.

Whatever hurdles remain for electric vehicles, their future is undeniably bright. It's no surprise given the potential benefits, particularly as the public and private sectors increasingly focus on sustainability goals. Transportation is one of the country's largest source of greenhouse gas emissions, EVs run on electrically powered engines that have no tailpipe emissions. Traditional internal combustion engines that run on gasoline or diesel not only produce carbon emissions, but utilize non-renewable resources, while contributing to air pollution that has a direct effect on air quality and public health.

CHARGING STATIONS

Currently, there are three types of EV charging stations:

- **A Level 1 charger is 120 volts and equivalent to charging from a household outlet. While it may be simple to run an extension cord to a vehicle, it's the slowest to operate and is inconvenient outside of overnight home charging.**
- **A Level 2 charger is 240 volts, equivalent to what is required by appliances such as ovens, water heaters or HVAC systems. While installed relatively easily, charging still takes many hours, providing only nominal improvement over Level 1.**
- **Direct Current Fast Charging stations (DCFCs), convert AC (alternating current) to DC (direct current), and can provide a full charge to most EVs in about 30 minutes.**

Most EVs are "plug-in" models, meaning their batteries are recharged by plugging a charging cable into an external electric power source. Because EVs have limited range compared to traditional vehicles, they need to be recharged often, presenting a logistical challenge to drivers. Although the range of most EV models is improving, it can present challenges on longer drives as well as in colder weather, necessitating careful planning and additional stops.

Charging also takes time. While a traditional combustion vehicle can refuel in minutes, EVs must stay plugged into the charging stations, which can take anywhere from thirty minutes to twelve hours depending on the type of charging station. Compounding these hurdles, interoperability presents an additional challenge. Connectors on the fastest (DCFC) chargers are not compatible with all vehicles, so EV owners cannot simply find the closest charging station—they have to find the closest station that's compatible with their vehicle.

If EVs are going to continue to expand in popularity and usage, the charging technology is going to have to evolve and the number of available chargers is going to have to ramp up exponentially. One oft-cited estimate comes from the National Renewable Energy Laboratory in 2017, projecting that 600,000 Level 2 and 27,000 fast chargers will be needed by 2030. Regardless of the exact figure, the country will soon need to have a vast network of EV infrastructure in place that bears little resemblance to what currently exists on the ground.

EV CHARGING AND CRE

Because of the need for widespread charging infrastructure, some in the private and public sectors are pushing for the provision of EV offerings at commercial properties. In some commercial real estate settings this may be sensible, as tenants, employees, and consumers begin to factor the ability to charge their vehicles into decisions about where they work and shop.

The connection to retail is particularly persuasive—a customer might as well charge their car conveniently while shopping at a store or dining at a restaurant.

But many of the costs and benefits remain unclear. This hasn't stopped a growing cadre of EV-related companies from pushing their services on properties while some state and local governments have introduced ill-considered legislation and mandates. The attached spreadsheet captures a wide variety of state laws and incentives, representing a current snapshot in time. Action by the federal government on EV infrastructure could theoretically create a national, planned network of charging stations and relieve some of the pressure on commercial real estate (CRE); this may finally have momentum, as the Biden Administration's early focus on infrastructure included a proposal to build 500,000 new charging stations.

As the pros-and-cons list on the following two pages details, the decisions for CRE are far from obvious. There are many trade-offs to consider, and the purported benefits aren't always what they seem—at least not yet—either for society as a whole or for the CRE industry. The future of EVs is coming, but the necessary planning is barely in its first stages. As a country, the planning needs to be accelerated now so the long-term, sustainable future of transportation is assured.

For a variety of reasons, some CRE properties will determine that the installation of charging stations is the right move. In those cases, the resulting considerations can still be far from simple, from planning the installation to setting clear policies. Just as a few examples:

- **How will the project be paid for?**
- **What hardware and software vendors should be engaged?**
- **How will future scalability and technological changes be factored in?**
- **Can or should users be charged a fee for the electricity?**
- **Who gets to use the chargers and in what order?**
- **How can vehicle turnover at the charging stations be ensured?**
- **Should there be separate facilities for property or fleet vehicles?**

RESOURCE

For additional information, visit the U.S. Department of Energy at: <https://www.energy.gov/eere/vehicles/batteries-charging-and-electric-vehicles>

POSITIVES

CHARGING STATIONS AS AN AMENITY

All other issues aside, the provision of charging stations can be considered a building asset and a competitive advantage to attract tenants, customers, and employees. As EVs gain in popularity, the ability to charge vehicles conveniently could potentially act as a deciding factor for EV users concerned about their commute. Properties that offer charging at their facilities send the message that they are interested in providing solutions for their tenants' present and future needs.

PROMOTING SUSTAINABILITY

If your property is already focused on sustainability, charging stations provide another opportunity to send a message about your values and promote a positive image. Your leadership on sustainability will be visible and may also inspire others. Charging stations may also reduce a property's greenhouse gas emission totals, assist with sustainability goals, and potentially help to comply with any related state and local regulations on emissions.

SOCIETAL BENEFITS

Whether or not a property has sustainability goals to meet, there are benefits to encouraging EVs and participating in the societal transition away from nonrenewable fossil fuels. This includes reduced greenhouse gas emissions, improved air quality, improved public health, and an increase in local jobs. Additionally, while there are several energy-related concerns listed on the "negatives" page, a successful, widespread roll-out of EVs promises to provide some welcome stability to the energy market.

EV USERS SAVE MONEY

Under current conditions, EVs are saving their users money compared to gasoline-powered vehicles. No matter where in the country you are, filling up on electricity is cheaper than gasoline—the Union of Concerned Scientists (UCS) estimates a median savings of \$770 per year. Maintenance costs are also less, without the need for oil changes, spark plugs, timing belts, or much of the traditional routine maintenance—UCS estimates this to be another \$1,500 savings over the life of the vehicle.

FINANCIAL HELP IS AVAILABLE

Properties don't necessarily need to spend much of their own money to install charging stations. A variety of incentives, grants and rebates are available from governments and utilities. And a growing number of businesses will plan, install and launch systems customizable to your property. In some cases, these vendors can even eliminate installation and maintenance costs and provide some level of financial certainty.

NEGATIVES

MORE ELECTRICITY, SAME SOURCES

Absent other changes, widespread adoption of EVs would put a tremendous strain on the country's electrical grid, and the costs to make the necessary improvements would be astronomical. Just as importantly, the emissions benefits from EVs are questionable at best for a simple reason—the electricity predominantly comes from power plants that are reliant on coal or gas; while this may change in the long-term, nearly 80 percent of electricity in the United States currently comes from fossil fuels. Additionally, concerns have been raised about the methods used to mine the raw minerals needed to make EV batteries such as cobalt and lithium.

ENERGY USE AT PEAK TIMES

Arguments to promote charging stations at office buildings are undermined by the fact that the vast majority of workers work during daylight hours when energy usage peaks—the same time when additional energy use should be avoided. Offering charging services at work can further strain the electrical grid instead of encouraging EV users to charge at night and during off-peak periods. Mid-day workplace charging could potentially work in rare locations where solar energy can meet the extra need, but generally daytime charging is not what should be promoted.

HIGH AND HIDDEN COSTS

While financial arrangements can vary, there are many costs to be considered: upfront installation costs, ongoing maintenance, the opportunity costs of the utilized space, signage needs, etc. These costs can greatly escalate in existing buildings versus new construction. Additionally, the soft costs of installation can be significantly increased by permitting delays, inconsistent regulations and utility processes. As adoption becomes more widespread, improvements can be expected to streamline these processes and reduce bottlenecks, but that remains in the future.

CHANGING TECHNOLOGY

As with any newer technology, it's challenging to build out infrastructure while the technology and the preferences of users are still evolving. In the case of fast chargers, the lack of interoperability is a high hurdle. Investments need to be protected, flexibility needs to be assured, and scalability needs to be accommodated. Some of the uncertainty can be resolved through agreements with hardware or software providers, but future changes in the EV industry are a certainty.

UNFUNDED MANDATES

Mandates on the CRE sector are rarely a productive path forward, especially on an issue such as EVs where CRE can be a ready partner. As one example, BOMA Hawaii was reluctantly forced to oppose—with assistance from the BOMA Industry Defense Fund—two EV charging station mandate bills in the 2019 state legislature; the bills would have imposed extreme measures through building code changes, requiring 25% of parking spaces to be charging-station-ready. Both bills were narrowly defeated—the proponents then moved on to seek the same policies at Honolulu County.