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Los Angeles, Fully Charged

If anyone is still trying to kill the electric car, they don't live in Los Angeles. Thanks to a 360-degree commitment from public officials and carmakers alike, the city leads the US in EV sales. What does this mean for the built environment?

By Matt Alderton

It may be the City of Angels, but on most mornings in the 1960s, Los Angeles didn't look so heavenly. Instead, it looked like its namesake angels had taken God's car for a joyride down an old dirt road. A hazy blanket of brown over the city's skyline, the smog was so bad some days that it made Angelenos cough and cry.

Today, the view is clearer because the air is cleaner. In fact, the average number of high ozone days in Los Angeles fell by more than half from 2000 to 2009—from 189.5 to 91.5, respectively—even though the number of people and cars in the city has tripled.

Top 5 US Cities for New Electric-Vehicle Sales

1. Los Angeles (1,330)
2. San Francisco (1,253)
3. Seattle (556)
4. San Diego (389)
5. Portland, OR (269)

Source: R.L. Polk, 2012

Top 5 Best-selling Plug-In Vehicles

1. Chevrolet Volt (14,994)
2. Nissan Leaf (14,123) pictured
3. Tesla Model S (10,750)
4. Toyota Prius Plug-In (5,031)
5. Ford C-Max Energi (2,915)

Source: Inside EVs, "Monthly Plug-In Sales Scorecard," 8/2013 YTD

Despite improvements, however, Los Angeles still has the worst air in the nation according to the American Lung Association, which gave the city an 'F' in its 2013 "State of the Air" report. The culprit: the 16.6 million motor vehicles that are registered in the greater Los Angeles five-county region—the largest amount of any metropolitan area in the United States. Clearly, Los Angeles has a problem too big for clean-air regulations alone to solve. That's why the city and its residents are embracing a new solution to their decades-old problem: electric vehicles.

EV ORIGINS

Electric vehicles (EVs) aren't a new solution at all. In 1989, the South Coast Air Quality Management District submitted its first "Air Quality Management Plan," which called for wide use of EVs across the Southland. A year later, in 1990, California passed a law requiring automakers to sell zero-emission vehicles (ZEV) in order to do business there. Although most major automakers introduced a car in response, they ultimately defeated the regulation and abandoned EV production until their resurgence in 2010, when Los Angeles quickly emerged as a hotbed of EV activity. "The environment overall in Los Angeles is ripe for EV adoption," explains Brendan Jones, director of electric vehicle infrastructure strategy for Nissan North America, whose all-electric car—the Nissan Leaf—averages approximately 2,000 sales per month nationwide.

But what makes Los Angeles such a good market for EVs? For one, the city is famous for its car culture. There are 2.5 million vehicles registered in just the City of Los Angeles—a half million more than New York City, which has nearly 4.5 million more people. Two, Californians tend to be more environmentally conscious than other Americans. "People are appreciative of California's natural beauty; they realize that we have a very precious environment, and that we should all be doing our part to take care of it," says architect Gwynne Pugh, principal of Gwynne Pugh Urban Studio in Santa Monica, California, whose previous firm—Pugh + Scarpa—designed a six-car, solar-powered EV charging station in front of Santa Monica City Hall in 1997. "When you look, in particular, at the Los Angeles Basin in the '60s, '70s, and '80s, the smog conditions were very, very severe. That made a lot of Southern Californians sensitive to the consequences of a petrochemical-driven society."

Then there's infrastructure. Although California's ZEV mandate failed to kick-start an EV movement in the '90s, it gave California a running start on building EV infrastructure, including residential, commercial, and public charging stations. "In the '90s, hundreds of publicly available charging stations were installed throughout Southern California," says Alexander Pugh, who is a senior project manager for policy and project management at Southern California Edison, and who also happens to be Gwynne Pugh's son. "So, we have a good infrastructure backbone with a lot of prime sites already having charging stations installed."

LEADING BY EXAMPLE

Utilities have played a large role in promoting EV adoption in and around Los Angeles. Southern California Edison, for instance—whose customers represent 10 percent of national EV sales—has an EV microsite dedicated to consumer education as well as a team of "Home Fuel Advisors" who work with EV customers to develop a customized EV power plan. The company also offers discounted rates to EV owners to make home charging more affordable.



The Los Angeles Department of Water and Power (LADWP), the City of Los Angeles' municipal utility, offers similar discounts, as well as rebates to help customers with the cost of installing EV chargers in their homes and businesses, which can run anywhere from \$500 to \$2,000. "LADWP has a history [of supporting EV adoption] that goes back to the beginning of the EV movement," Jones says. "Its progressive nature makes installing EV infrastructure very, very easy."

In Los Angeles, that infrastructure is growing quickly thanks to the combined efforts of government and industry. As of August 2013, there were 350 public EV charging sites in Los Angeles, including the city's first DC fast charger, which was installed in 2012 and can charge an EV to 80 percent full in 30 minutes, compared to six to eight hours for the Level 2 chargers that constitute the rest of the city's public chargers.

Meanwhile, automakers such as Nissan also are installing charging stations. "We just completed a

process to install 20 DC fast chargers at California [Nissan] dealerships—many of which are in the Los Angeles area," says Jones, who adds that there are currently more than 300 DC fast chargers nationwide, mostly on the West Coast. More public charging stations in Los Angeles and elsewhere means more "range confidence"—confidence that an EV will go an adequate distance without losing its charge—which in turn will increase EV adoption.

Still, for the majority of drivers, charging is taking place mostly at home and at work, and so improving access where people live and work will have the most direct benefit to EV drivers. With that in mind, cities should work to streamline charging-station installation permitting for residential and commercial sites. In fact, one of the most important things Los Angeles has done for EVs concerns building codes. As of 2011, the city requires EV readiness for all residential and commercial new construction. "Because retrofitting can be expensive, getting new construction to be EV-ready from the outset really helps the industry in the long term," Alexander Pugh says.

THE WAY FORWARD

EVs are still far from mainstream, but their rapid growth in Los Angeles makes the city a national model for EV adoption. Although challenges remain—multifamily housing, for instance, raises numerous questions about shared charging—the model illustrates the ability to solve them by forging strong partnerships between municipal government and private industry, both of which must rely on architects and designers to seamlessly integrate EV infrastructure into built environments.

"How the urban design environment is developed is tremendously important," concludes Gwynne Pugh, who says architects are critical to EV adoption in Los Angeles and elsewhere for their role in optimizing infrastructure function, aesthetics, convenience, and safety. "As architects, we think of sustainability as being as obvious and necessary as structure. ... Maybe Los Angeles was a bit late in coming to this realization, but it has been very active and proactive about addressing it in the past 10 to 15 years, and it will be better for it in the long term."

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