CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

California Energy Commission

Clean Transportation Program

**FINAL PROJECT REPORT**

# Electric Vehicle Charging at County of Los Angeles South Vermont Street Location

**Prepared for: California Energy Commission**

**Prepared by: County of Los Angeles**


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# California Energy Commission

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The County is also grateful to Plug-in America for conducting a successful Ride-and-Drive event on March 20, 2019. The County and the author are grateful to the auto manufacturers (BMW, Mini, Honda, Mitsubishi, Nissan, and Toyota) and their dealerships who participated, as well as First City Credit Union, and Current electric vehicles (EV).

The County recognizes and is grateful for the commitment and vision of the property owner, the ICO Group, the efforts of its partner, EV Connect, and EV Connects electrical contractor, James Premus and his team, who worked tirelessly to complete this challenging installation.

At the County level, this project had many partners including Chief Executive Officer (CEO) Real Estate, the Department of Human Resources' Workplace Programs, and the Departments of Children and Family Services, Children Support Services, Mental Health, Public Social Services, and Internal Services.

This project was truly a "team lift" and the author is grateful for the help and support from all those involved.

# PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program. The statute authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the Clean Transportation Program through January 1, 2024, and specifies that the CEC allocate up to $20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The Clean Transportation Program has an annual budget of about $100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance, and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and nonroad vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce-training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

To be eligible for funding under the Clean Transportation Program, a project must be consistent with the CEC's annual Clean Transportation Program Investment Plan Update. The CEC issued PON-13-606 to fund electric vehicle charging infrastructure for the County of Los Angeles South Vermont Street Location. In response to PON-13-606, the recipient submitted an application which was proposed for funding in the CEC's notice of proposed awards July 3, 2014 and the agreement was executed as ARV-14-031 on June 15, 2016.

# ABSTRACT

The installation of 16, level 2 Electric Vehicle Supply Equipment in a 900-vehicle parking structure at a County Service Center at 8300 S. Vermont Avenue in South Central Los Angeles, a community of color in the 85th percentile as a disadvantaged community, was a bold move. When this project was approved, there were on two public level 2 Electric Vehicle Supply Equipment within a four-mile radius of the site and only two or three employees drove plug-in vehicles. The project's goal was to install Electric Vehicle Supply Equipment at scale to enable and accelerate the adoption of plug-in vehicles and provide public access for the secondary (used) car market.

Several obstacles were encountered not the least of which was the re-location of most of the Electric Vehicle Supply Equipment to the employee area and the consequent impact on project funding. There were significant installation issues and delays. But in the end, the installation was completed, and its utilization is growing exponentially.

Major findings are that many (contractors, Building and Safety staff and field inspectors) are not familiar enough with various Electric Vehicle Supply Equipment requirements especially around Americans with Disability Act issues and parking counts. Rebates from utilities can have requirements and it is up to the incumbent to read and understand them.

But the most important finding and/or conclusion is that if you build it, it will be used. People will not purchase or lease a vehicle if they are unable to charge it. Charging infrastructure is critical. Coworkers and colleagues are a trusted source of information.

Major recommendations are:

- Applicants shall provide documentation as to whether Americans with Disabilities Act applies to an installation and if it does, how Americans with Disabilities Act and parking counts will be addressed.
- Applicants shall provide documentation as to how they will comply with the Air Resources Board's new requirements for Electric Vehicle Supply Equipment (SB 454).

**Keywords**: Americans with Disabilities Act (ADA) County of Los Angeles, Department of Children and Family Services (DCFS), plug-in vehicles (PEVs), South Vermont Street, Plug-in America

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# EXECUTIVE SUMMARY

The County of Los Angeles covers an area of more than 4,060 square miles, and 110,000 county employees provide services to over 10 million residents within that area. A majority of County employees use their personal vehicles to conduct County business and are reimbursed for their mileage. The County's Department of Children and Family Services is an example. Of the more than 3,000 social workers, more than 2,400 have about 31 cases, which means each social worker must make at least 31 work trips to visit children each month. Department of Children and Family Services is the primary tenant at the County's Service Center located at 8300 South Vermont Street in Los Angeles. The property is managed by the County's Chief Executive Officer Real Estate Division, the County's leasing agent, and leased by the County from the ICO Group of Companies. The property houses Department of Children and Family Services, Department of Child Support Services, and Department of Public Social Services. Currently, more than 800 County employees work at this site, more than 425 employees at the site work for Department of Children and Family Services. The Service Center is in, and provides services to, a disadvantaged community.

The California Communities Environmental Health Screening Tool which identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution, has identified that more than half of the 2000 disadvantaged communities in the state are located within this County. The County's Service Center located at 8300 South Vermont Street in Los Angeles is in one of these communities. So, in 2013, the ICO Group of Companies became aware of the California Energy Commission's grant funding electric vehicle charging stations and approached the County's CEO Real Estate Division about the potential to fund the installation of electric vehicle charging stations at the site. The CEO Real Estate Division reached out to the County's Internal Services Department's Environmental Initiatives Division for assistance in preparing an application for submittal to the Energy Commission's grant funding opportunity. The ICO Group of Companies and CEO Real Estate Division jointly submitted the application on behalf of Department of Children and Family Services.

The grant was approved, and the Electric Vehicle Charging Project was created. The primary goal of the Electric Vehicle Charging at County of Los Angeles South Vermont Street Location Project was to enable and accelerate the adoption of plug-in electric vehicles, decarbonize the commutes and work-related travel of Los Angeles County employees. Other objectives were to enable the County's use of electric vehicles, as well as offering public charging to visitors and clients at this County Facility.

Before this grant was applied for and received, there was little demand for electric vehicle charging stations in the county, only two public level 2 stations were located within a four-mile radius of this South Los Angeles site, and only two or three of the more than 800 on-site employees drove plug-in vehicles. The project's goal was to install electric vehicle supply equipment at scale to enable and accelerate the adoption of plug-in vehicles and provide public access for the secondary (used) car market.

This was a very price sensitive project. EV Connect (A Project Partner) had planned to use General Electric's electric vehicle supply equipment, as it had at its METRO installations. The equipment order was delayed until the County had approval to move forward and issued a Notice to Proceed for the project to install 20 instead of 16 electric vehicle charging stations.

This project has been far more challenging than any other County electric vehicle charging station installation. Installing 20 stations instead of 16 required a larger transformer and a larger panel. Each challenge was successfully dealt with and the system has been operational for more than nine months. Most important, usage continues to increase.

With the support and efforts of the Department of Water and Power and their contractor, Plug-in America, a successful Ride and Drive took place in March of 2019 to promote and introduce more than 85 of the on-site employees (more than 10 percent of the staff) to plug-in vehicles. Within ten months of commissioning, the number of unique drivers has grown from eight to more than 40 and usage continues to grow. Additional funding to expand the project was obtained through the Los Angeles Department of Water and Power's Charge Up LA! Rebate Program.

This project would not have happened without the CEC's funding opportunity. The installation of 16, then 20, level 2 electric vehicle charging stations in a 900-vehicle parking structure at a County Service Center at 8300 S. Vermont Avenue in South Central Los Angeles, a community of color in the 85th percentile as a disadvantaged community, was a great success.

# CHAPTER 1:
# Project Background and Approach

## Background

The County of Los Angeles covers an area of more than 4,060 square miles. The County's 110,000 employees provide a variety of services for its over 10 million residents, more than a quarter of California's population. The California Communities Environmental Health Screening Tool (CalEnviroScreen)[1] identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. Disadvantaged communities are defined as the top 25 percent scoring areas from CalEnviroScreen version 3.0 along with other areas with high amounts of pollution and low populations. Of the almost 2,000 disadvantaged communities statewide identified by CalEnviroScreen version 3.0, more than half are located within the County.

A majority of County employees use their personal vehicles to conduct County business and are reimbursed for their mileage. The County's DCFS is an example. Of the more than 3,000 social workers at DCFS, more than 2,400 have about 31 cases, which means each social worker must make at least 31 work trips to visit children each month. If those social workers were to use County vehicles, the County would need more vehicles, larger parking lots and parking structures.

DCFS is the primary tenant at the County's Service Center located at 8300 South Vermont Street in Los Angeles. The property is managed by the County's CEO Real Estate Division, the County's leasing agent, and leased by the County from the ICO Group of Companies[2]. The property houses DCFS, Department of Child Support Services, and Department of Public Social Services. Currently, more than 800 County employees work at this site, more than 425 employees at the site work for DCFS. The Service Center is located in, and provides services to, a disadvantaged community.

In 2013, the ICO Group of Companies became aware of the CEC'S grant funding opportunity in 2013 and approached the County's CEO Real Estate Division about the potential to fund the installation of EV charging stations at the site. The CEO Real Estate Division reached out to the County's Internal Services Department's Environmental Initiatives Division for assistance in preparing an application for submittal to the Energy Commission's grant funding opportunity. The ICO Group of Companies and CEO Real Estate Division jointly submitted the application on behalf of DCFS.

At the time of application submittal and as late as the summer of 2017, the County Service Center was in the middle of a virtual EV charging desert. There were only two publicly available level 2 chargers available within a four-mile radius of this office in South Central Los Angeles. While that number has increased slightly, it hasn't really "move the needle" for public charging infrastructure.

Public infrastructure is especially critical for the development of a robust secondary market the used car market. More than 45 percent of the County's 3.4 million households live in multi-

[1] California Office of Environmental Health Hazard Assessment Website https://oehha.ca.gov/calenviroscreen
[2] ICO Group of Companies Website https://www.icogroupofcompanies.com/about/

family housing with limited or no access to charging. Charging infrastructure is also critical to the transition of the County's Fleet vehicles. There are a limited number of County vehicles at this facility. Most are passenger vans.

## Goals and Objectives of the Project

The primary goal of this project was to enable and accelerate the adoption of PEVs and decarbonize the commutes and work-related travel of County employees. Other objectives were to enable the County's use of EV, as well as offering public charging to visitors and clients at this County Facility.

## Project Partners

### ICO Group of Companies

The ICO Group of Companies is a real estate development, investment and management company headquartered in Downtown, Los Angeles. Established in 1966, the ICO Group of Companies has successfully established itself as a premier real estate development and management company. Its portfolio contains over 3,000,000 square feet of residential, office, retail, and industrial properties owned and managed throughout California and the southwest.

The ICO Group of Companies owns the property at 8300 South Vermont Street in Los Angeles. The County's lease of this property extends through September 2037.

### EV Connect, Inc.

EV Connect, Inc. is a California corporation headquartered in El Segundo, California that provides EV charging solutions for commercial, enterprise, hospitality, university, and government facilities. The company operates a cloud-based platform for the management of charging stations and the drivers that use them.

The ICO Group subcontracted with EV Connect for the installation of the EV chargers for this project. AGJ Electrical, EV Connects C-10 electrical contractor, installed the transformer, panels and the equipment for this project.

### Chief Executive Office - Real Estate Division

The CEO Real Estate Division is the County's leasing agent for all County departments. All tenant requests for improvements or alterations must be requested through the CEO Real Estate Division.

### Department of Children and Family Services

DCFS is the primary tenant at the County's Service Center located at 8300 South Vermont Street in Los Angeles. Four County departments with more than 800 County employees are co-located at this Service Center. DCFS is lead tenant with more than 425 employees at this site. Other departments collocated at this site include the Departments of Child Support Services, Mental Health, and Public Social Services.

### Internal Services Department Environmental Initiatives Division

The County's Internal Services Department's Environmental Initiatives Division has been actively involved in the deployment, maintenance, and operations of the County's fledging EV charging infrastructure. Currently, the County has more than 350 ports at 70 sites. More than 150 ports are planned this calendar year at eight additional County sites.

### Department of Human Resources Workplace Programs

The Department of Human Resources' Workplace Programs oversees the County's commuter, ride share, and active transportation programs and actively promotes zero emission vehicles.

Workplace Programs controls the County's portion of Assembly Bill 2766 funding (funds to implement programs that reduce air pollution from motor vehicles) which provided the County's matching funds.

## Los Angeles Department of Water and Power

The Los Angeles Department of Water and Power (LADWP), the largest municipal water and power utility in the nation, was established more than 100 years ago to deliver reliable, safe water and electricity to 4 million residents and businesses in Los Angeles.

LADWP has their "Charge Up LA!"[3] program that offers residential and commercial customers rebates to help deploy EV charging infrastructure at homes, businesses, including workplaces, multi-unit dwellings, and public parking lots. The property owner, the ICO Group, applied for rebates through LADWP to be applied to this project. LADWP also sponsored the Ride and Drive event held on March 20, 2019. LADWP's partner, Plug-in America, planned the event.

[3] Charge Up Los Angeles Program Website https://semaconnect.com/semaconnect-home/lp/charge-up-la/

# CHAPTER 2:
# Project Approach

This project has been far more challenging than any other County electric vehicle supply equipment (EVSE) installation. Each challenge was successfully dealt with and the system has been operational for more than nine months. Most important, usage continues to increase.

Some of the early challenges included the location of the EVSE. EV Connect prepared the application for the ICO Group. Unknown to the County, one of EV Connects staff had assured the ICO Group that there would be no cost to the ICO Group for this project.

After the kickoff meeting, there was an on-site meeting with the ICO Group, EV Connect, DCFS, and Internal Services Department. The parking structure has approximately 900 parking spaces. There were 120 public spaces on the ground level. The remaining spaces on the upper levels, were restricted to County employees and a few County vehicles. DCFS was adamant that the majority of the EVSE be placed on the upper (employee only) levels. This impacted funding. If the sixteen EVSE were placed in a public area, CEC funding would reimburse 75 percent of the project costs, not to exceed $96,306. But for workplace (restricted) EVSE, the CEC reimbursement was limited to 50 percent of the project costs not to exceed $96,306.

About this time, LADWP was revising its Charge Up LA! rebate program, increasing the rebate to up to $4,000 per plug for single EVSE up to a maximum of 20 plugs per site, or $80,000. The County received permission from the CEC to install 20 level 2 EVSE two public access EVSE on the ground level and 18 EVSE for employees only on the restricted upper levels.

## Equipment Procurement

This was a very price sensitive project. EV Connect had planned to use General Electric's EVSE, as it had at its METRO installations. The EVSE order was delayed until the County had approval to move forward and issued a Notice to Proceed for the project to install 20 instead of 16 EVSE.

In late Spring of 2017, as EV Connect was about to place its order, General Electric withdrew from the EVSE market and sold its EVSE business to ChargePoint, an EV Connect competitor.

Based upon pricing considerations, EV Connect selected and ordered the base model EV Box EVSE. At the time, the EV Box EVSE were new to the US market and were not available locally. It was six weeks before the order was delivered. Almost all the original EV Box EVSE were damaged in shipment and EV Connect had to reorder. This caused an additional six-week delay.

The EV Box EVSE were delivered, configured, and installed. But the version of the EV Box selected was too large. The EV Box EVSE protruded three feet into the parking space. Because the EVSE were installed on both sides of two parking levels, losing three feet on each side of the aisle six feet total created "choke points" restricting traffic flow from two cars (one each way) to a single car. This was unacceptable. New, smaller EV Box EVSE with different mounting brackets were ordered and installed yet another delay. With the smaller EV Box EVSE the existing wheel stops did not have to be relocated and two cars (one in each direction) were able pass each other.

## Installation

In addition to the EVSE issues, there were numerous challenges during the installation. Installing 20 EVSE instead of 16 EVSE required a larger (225 kilowatts) transformer and a larger panel.

EV Connect applied for permits on behalf of the ICO Group. Because this site was not owned by the County, it did not go through the County's Public Works' Building and Safety for permitting. The County's Building and Safety is predictably strict. Items that slipped through the permitting process at this site by both Building and Safety plan check and by the building inspector included:

- Failure to include ADA requirements for both the public area EVSE and the restricted employee only area.
- Reduction in the total number of parking spaces loss of two spaces due to ADA van accessible requirements; and
- The additional panel and metering requirements for LADWP's Charge Up LA! program.

The County's' Internal Services Department's had reviewed and revised the original designs on both the ground floor and upper floor to address and comply with ADA requirements. Both areas are compliant.

LADWP's revised Charge Up LA! program was still a work in progress during this installation. For larger installations of ten or more EVSE, the Charge Up LA! program required an additional panel with a submeter. EV Connect, their contractor, as well as those doing the plan check and the building inspector were unaware of this requirement. The additional panel had to be ordered (a six-week delay) and installed. The additional panel also required some limited rework and added cost to the project.

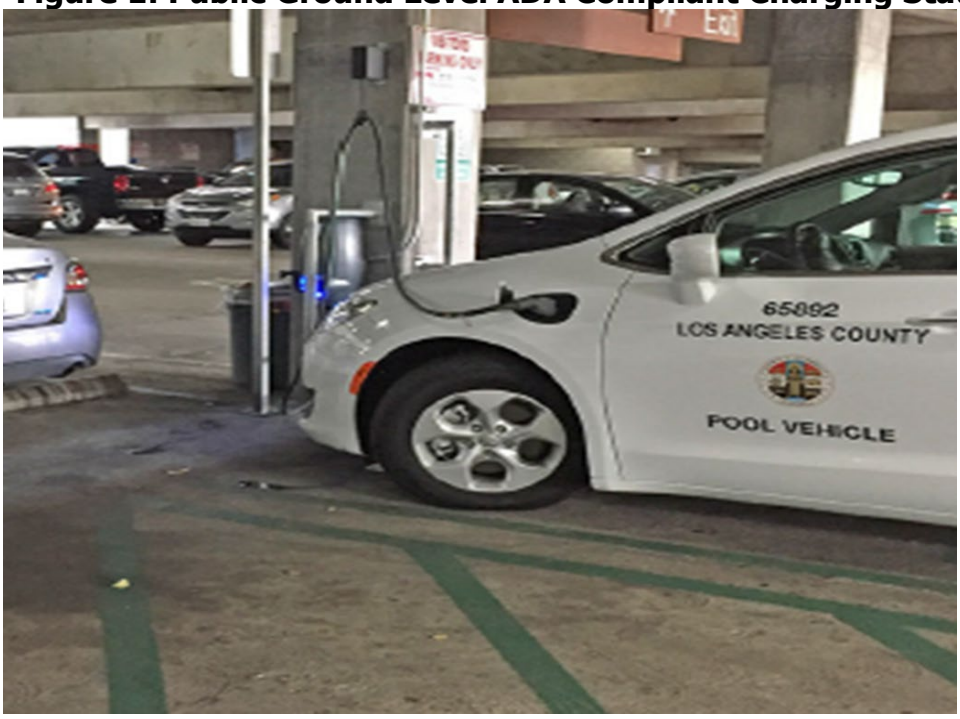
The City's building inspector (rightly) insisted that guards be installed to protect the EVSE from damage from larger/higher vehicles, such as sport utility vehicle, trucks, and vans. A prototype guard was made and installed. After the inspector approved, the other guards were ordered, manufactured, and installed.

Installation was completed in late May 2018 and the building inspector signed off on the project.

## Pictures and Photos

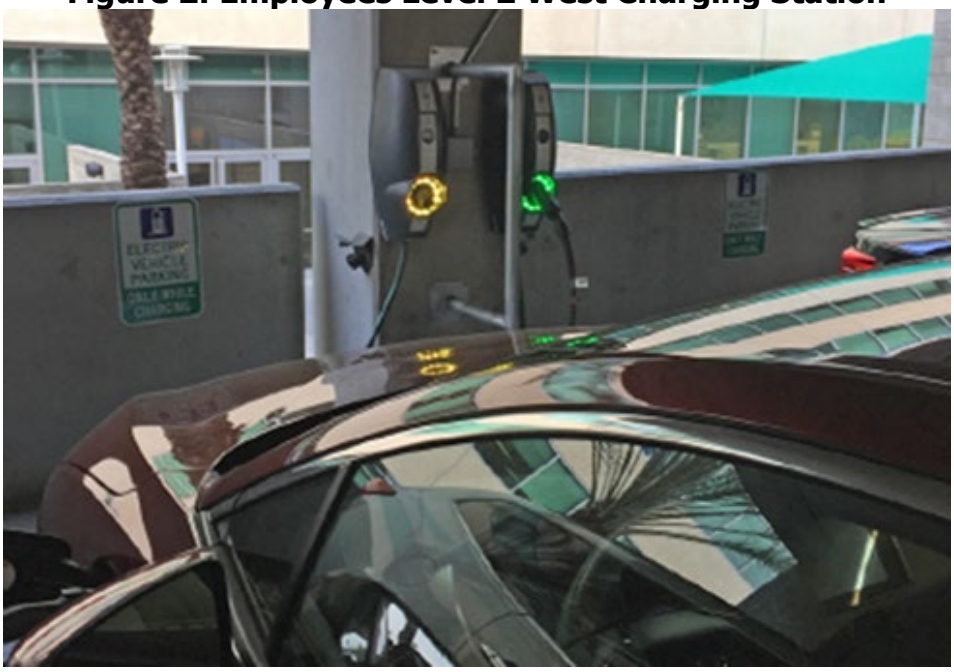
Figures 1 displays an ADA compliant public charging station on the ground level of the South Los Angeles office sites parking garage. Figure 2 shows an employee only charging station located on the second level.

**Figure 1: Public Ground Level ADA Compliant Charging Station**




Source: County of Los Angeles

**Figure 2: Employees Level 2 West Charging Station**



Source: County of Los Angeles

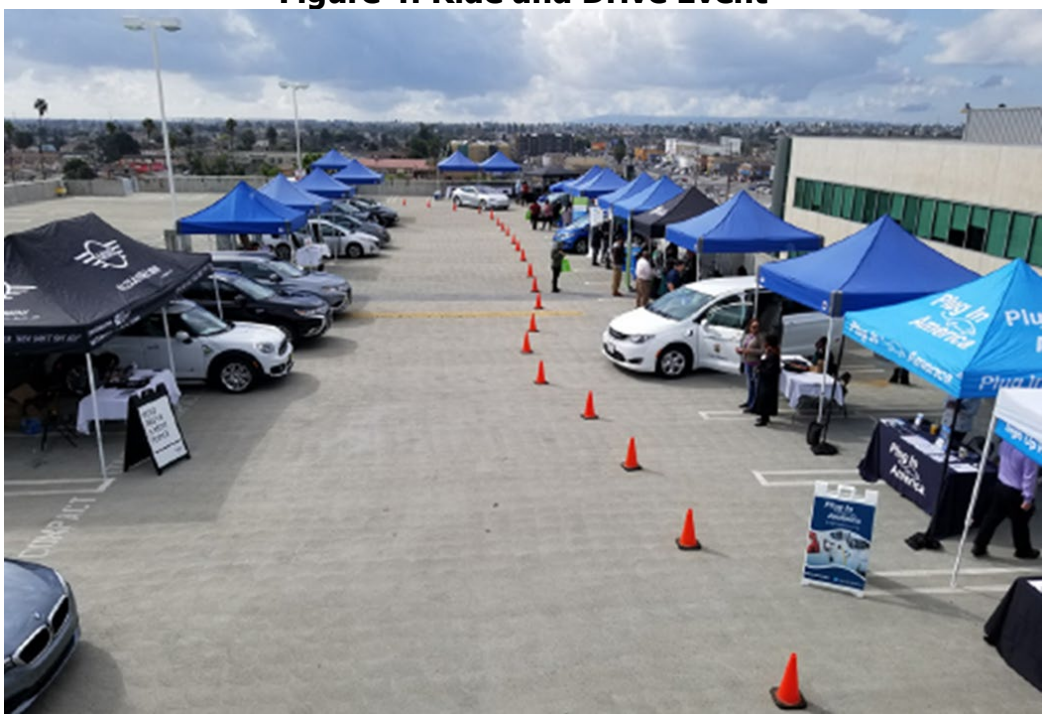
Additional pictures and photos of the installation can be found in Appendix A.

Figure 3 shows a copy of the Ride and Drive Event flyer used for the event. Figure 4 shows an ariel view of the vendors and vehicles participating in the Ride and Drive Event.

**Figure 3: Ride and Drive Event Flyer**


Source: County of Los Angeles

**Figure 4: Ride and Drive Event**



Source: County of Los Angeles

Additional pictures of the Ride and Drive Event can be found in Appendix C.

## Payment System Integration

The EV Connect system includes a payment system which has worked well for METRO. Payment is generally done through the EV Connect phone app or by an EV Connect key fob. Payment can also be processed by calling an 866-toll free number. Regular users will prefer creating an account and quickly and easily authorizing access/usage with the app or key fob.

Currently, the EVSE at this and other County sites are still free to use. Users at this site must have an account with EV Connect or call a toll-free number to access the EVSE.

The County's Internal Services Department anticipates going to the Board of Supervisors later this year to recommend a "Cost Recovery Plan." Only the Board of Supervisors can set pricing (as it does at various parking lots throughout the County). The EV Connect system is quite flexible and can be configured to charge by kilowatt-hour (kWh) (energy used) or by time spent charging.

When ISD has the Board's authority, EV Connects payment system will be integrated with the County's electronic payment system.

The State's Air Resources Board recently introduced regulations for EVSE. Existing EVSE sites, like this one, will NOT be grandfathered in and non-compliant EVSE will have to be upgraded by 2023 or no later than five years from their date of commissioning. For this site, that date would be by June 1, 2023. While this installation is largely compliant with the proposed regulations, there is one element that will require retrofitting if and/or when these regulations are adopted. The coming regulation sees the lack of a credit card reader as a barrier to PEV adoption. Therefore, sites will have to have credit card readers available either within the EVSE or at a kiosk. Kiosks would be required at multiple locations at this site.

## Public Outreach to Employees

The County partnered with the City's Department of Water and Power for a Ride and Drive to promote and introduce the employees at this site to electric drive vehicles.

The first discussion between the County, LADWP and their partner, Plug-in America, occurred in mid-September 2018 - after the installation was complete and EVSE were all operational. Dates in late January or February were discussed. January traditional is the wettest month of the year the month with the greatest rainfall in Los Angeles. After discussions with DCFS's Regional Administrator (who oversees the employees at this site), the date of Wednesday, March 20, 2019 was selected for a variety of reasons.

The Department of Water and Power contracted with Plug-in America's local team to plan the event. Plug-in America reached out to many manufacturers and worked with their local dealerships. BMW (and MINI), Honda, Mitsubishi, Nissan, Toyota, and Volkswagen responded, and corporate or local dealers agreed to provide vehicles for the Ride and Drive. Both Hyundai and Kia wanted to participate but the week of the event, they lacked local inventory to support the event. Tesla was focused on delivering every car possible by the end of the sales quarter March 31, 2019. Also present were Plug-in America, LADWP, Edison, the South Coast Air Quality Management District, EV Connect (the system provider), First City Credit Union (auto loans), Autoland and Current EV.

There were also several static display vehicles including a BMW i8, a Chevrolet Bolt EV, a County Chrysler Pacifica PHEV, and a Tesla Model S. DCFS has ordered two Pacifica PHEVs. The BMW i8 got a lot of attention.

The weekend before the event, weather had been good the first days in the 70's since December. But on Wednesday March 20th, a storm with powerful cells swept through the region. Some areas saw hail that looks like snow on the ground, while other areas, like this site, just got an occasional drizzle. The threatening weather limited the number of attendees. There were 85 employees who drove vehicles and about 40 more who "went along for the ride." This is between 10 percent and 15 percent of the total number of employees assigned to this site.

Many spoke of how surprised they were with the instant power and acceleration, the smoothness, and the lack of shift points. They also commented on how quiet the cars were and how well they rode and drove. Clearly, many had never ridden in an EV the perfect target audience.

# CHAPTER 3:
# Results

## Data Collection

The County found that EV Connects standard software package was adequate for the County's current needs.

Included with this report are 9 plus months of throughput, usage, and operations data for the project including:

- **Total charge sessions:** The total number of Charging Sessions has almost doubled, from 59 sessions in May to 111 in February.
- **Total power provided:** 4,058 kWh have been provided. Usage has steadily increased from 162 kWh to 806 kWh per month almost a fivefold increase.
- **Connected time:** During the nine-month period, connected time has almost tripled, from 13,080 minutes to 35,711 minutes.
- **Charging time:** During the nine-month period, actual charging time has more than tripled from 5,232 minutes to almost 16,000 minutes.
- **Unique drivers:** In the first nine months, the number of unique drivers has increased from 8 per month to 38, a 475 percent increase.
- **Revenue collected:** No Revenue has been collected.
- **Total Miles:** 4,058 kWh have been provided. At 4 miles per kWh, that is 16,232 miles.
- **Greenhouse gas (GHG) emission reductions:** About 12,750 pounds. of carbon dioxide
- **Equivalent gallons of gasoline displacement:** 657 gallons of gasoline

### Monthly Usage Reports:

The supporting six Monthly Usage Reports are found in **Appendix B**.

### Operational issues (e.g. station downtime) during the collection period and how the issues were resolved.

The EV Box EVSE lights change color Green, indicates that the EVSE is available, Blue, indicates the vehicle is Charging, and Yellow that the vehicle has almost finished charging. Red indicates a fault. During the nine-month period, two of the EVSE experienced failures. Both had logic boards fail. Each time, it took about a month to obtain replacement parts and get the units operational. Considering that these units are currently not heavily used, it is not a good omen that two units (10 percent) have failed and that each time, it took a month to obtain parts and make repairs. See Table 1 on the next page for data.

**Table 1: Ten Months of Utilization Data**

| Dates | Total Charge Sessions | Unique Drivers | Total Power Provided per kWh | Sum of Connected Duration per minute | Sum of Charge Duration per minute |
|---|---|---|---|---|---|
| June 2018 | 59 | 8 | 162 | 13,080 | 5,232 |
| July 2018 | 73 | 9 | 287 | 19,303 | 8,127 |
| August 2018 | 87 | 15 | 408 | 23,290 | 11,371 |
| Sept. 2018 | 94 | 21 | 443 | 27,824 | 11,765 |
| October 2018 | 93 | 27 | 442 | 28,447 | 11,533 |
| Nov 2018 | 79 | 26 | 449 | 23,234 | 10,269 |
| Dec. 2018 | 72 | 31 | 420 | 22,272 | 9,722 |
| January 2019 | 87 | 30 | 641 | 28,804 | 13,667 |
| February 2019 | 111 | 38 | 806 | 35,711 | 15,943 |
| March 2019 (partial) | 140 | 44 | 1,040 | 36,740 | 20,113 |

Source: County of Los Angeles

## Lessons Learned

- The agency's Project Manager must be as, or more knowledgeable as the EVSE provider's Project Manager.
- The agency's Project Manager must be party to all conversations between the local site manager and the firm providing the installation and equipment there should not be any side conversations between the property owner and the EVSE provider's Project Manager.
- A summary of all conversations should be documented.

The County has many leased facilities. Many sites, like this site, have long term lease agreements. This Project Manager is familiar with local requirements and regulations because of installations of EVSE at 50 County-owned campuses. This was his first EVSE installation at a leased facility. The property owner, the ICO Group, was a willing partner.

During the process, the EVSE provider's Project Manager failed to exercise good judgement in selecting equipment, was unaware of ADA requirements, as well as the process and requirements for eligibility for the LADWP revised Charge UP! Rebate. Additionally, the Project Manager misinformed the property owner concerning the payment process advising him that the County, rather than the property owner, would pay his firm directly. This led to a lot of unnecessary friction between the County and the property owner. The County had not issued a purchase order to the equipment/ system provider there was no mechanism for the County to direct pay the vendor.

Plans were drawn and submitted to Building and Safety on behalf of the property owner. The County required provisions for ADA van accessible spaces on both the Ground Floor, (Public)

and the Second Floor (Employees only area). Had the ADA not been included, it could have opened the property owner, the County, and the EVSE firm to future liability.

The EVSE firm selected the initial EVSE without realizing that they were too large for the site. The original EVSE would have required that the wheel stops to be relocated by three feet for each space, creating a choke point in the aisle where cars could only pass one at a time. Smaller EVSE were ordered. The building inspector rightly required guards to protect the EVSE.

The revised LADWP Charge Up! Program had just relaunched. Eligibility required a sub-panel and installation of a special sub-meter. The EVSE firm's project manager knew that LADWP had a generous Rebate program, but he had not looked into its requirements.

## Recommendations

For future projects and improvements to the Clean Transportation Program, it is recommended that:

- The CEC should alert applicants and encourage them to incorporate the Air Resources Board's coming EV Charging requirements which can be found at California Air Resources Board www.ww2.arb.ca.gov.
- The CEC should alert applicants (and provide a link to) ADA requirements for workplace and/or public charging installations. Installations may lead to the loss of one or more parking spaces. This may create issues. Many applicants will rely on vendors to ensure compliance and this may not be prudent.
- The CEC should have applicants identify whether the proposed site will require a "Change of Use." Some local authorities view charging infrastructure akin to siting a gasoline station on a property and require a Change of Use which may or may not be approved.

# GLOSSARY

AMERICANS WITH DISABILITIES ACT (ADA)—One of the most significant federal laws governing discrimination against persons with disabilities, passed in 1990. Prohibits discrimination against individuals with disabilities in employment, housing, education, and access to public services. The ADA defines a disability as any of the following: 1. "a physical or mental impairment that substantially limits one or more of the major life activities of the individual." 2. "a record of such impairment." or 3. "being regarded as having such an impairment."

CALIFORNIA ENERGY COMMISSION (CEC)—The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The Energy Commission's five major areas of responsibilities are:

1. Forecasting future statewide energy needs
2. Licensing power plants sufficient to meet those needs
3. Promoting energy conservation and efficiency measures
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels
5. Planning for and directing state response to energy emergencies.

CHIEF FINANCIAL OFFICER (CEO)—is the highest-ranking executive in a company, whose primary responsibilities include making major corporate decisions, managing the overall operations and resources of a company, acting as the main point of communication between the board of directors (the board) and corporate operations and being the public face of the company. A CEO is elected by the board and its shareholders.

DEPARTMENT OF CHILDREN AND FAMILY SERVICES (DCFS)—is a State program for children with certain diseases or health problems. Through this program, children up to 21 years old can get the health care and services they need.[4]

ELECTRIC VEHICLE (EV)—A broad category that includes all vehicles that are fully powered by electricity or an electric motor.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)—Infrastructure designed to supply power to EVs. EVSE can charge a wide variety of EVs, including BEVs and PHEVs.

GREENHOUSE GAS (GHG)—Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (NOx), halogenated fluorocarbons (HCFCs), ozone (O3), per fluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).

KILOWATT-HOUR (kWh)—The most commonly used unit of measure telling the amount of electricity consumed over time, means one kilowatt of electricity supplied for one hour. In 1989, a typical California household consumed 534 kWh in an average month.

[4] Department of Children and Family Services https://www.dhcs.ca.gov/Services/CCS

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP)— Providing clean, reliable water and power and excellent customer service in a safe, environmentally responsible, and cost-effective manner.[5]

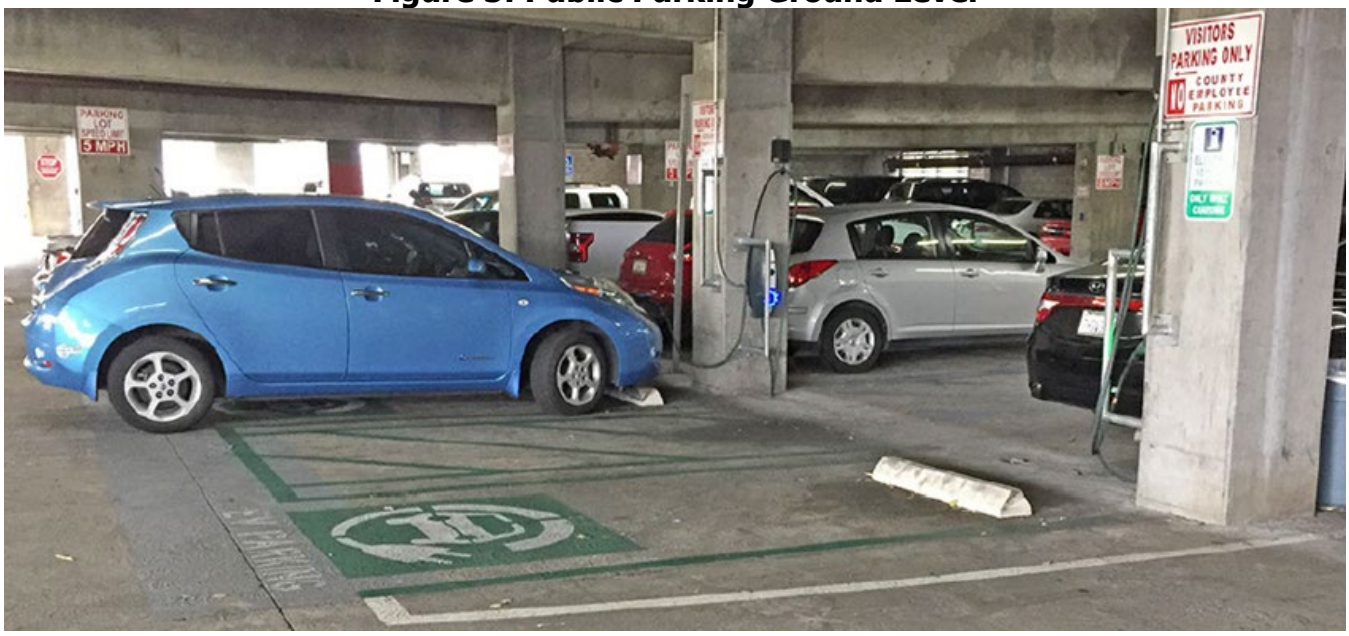
PLUG-IN ELECTRIC VEHICLE (PEV)—A general term for any car that runs at least partially on battery power and is recharged from the electricity grid. There are two different types of PEVs to choose from—pure battery electric and plug-in hybrid vehicles.

[5] Los Angeles Department of Water and Power https://www.ladwp.com

# APPENDIX A:
# Photos of the Installation

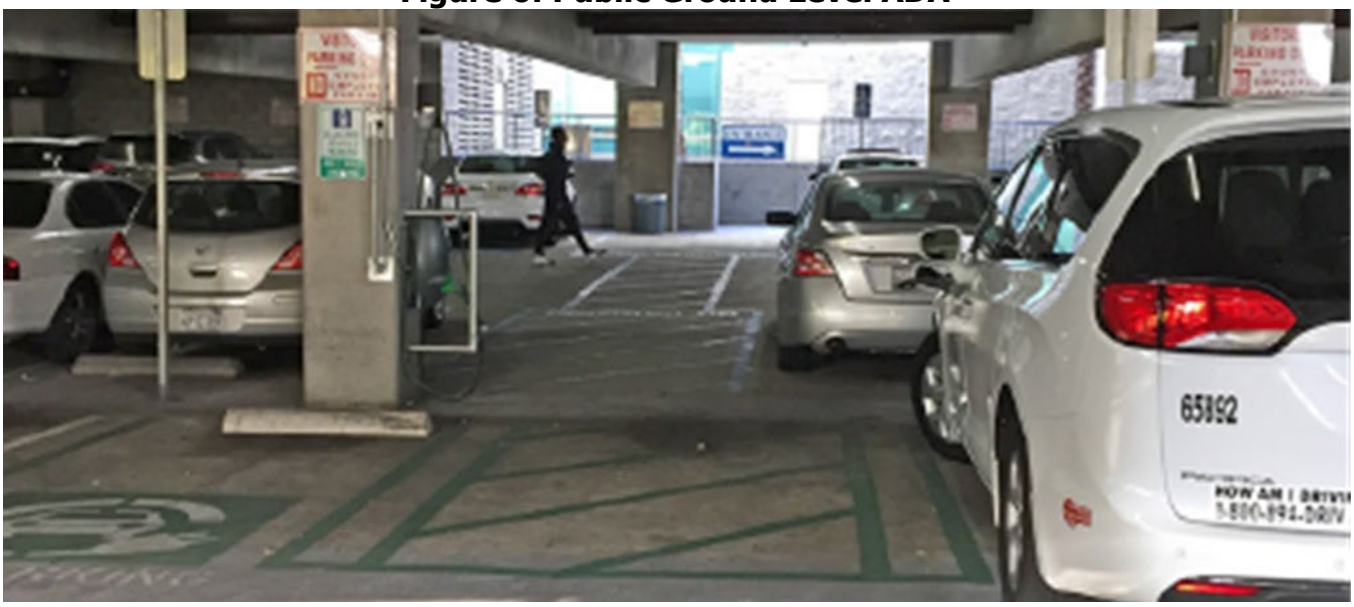
Figures 5-12 show the various charging stations that have been installed on different levels of the parking garage located at the South Los Angeles office site.

**Figure 5: Public Parking Ground Level**



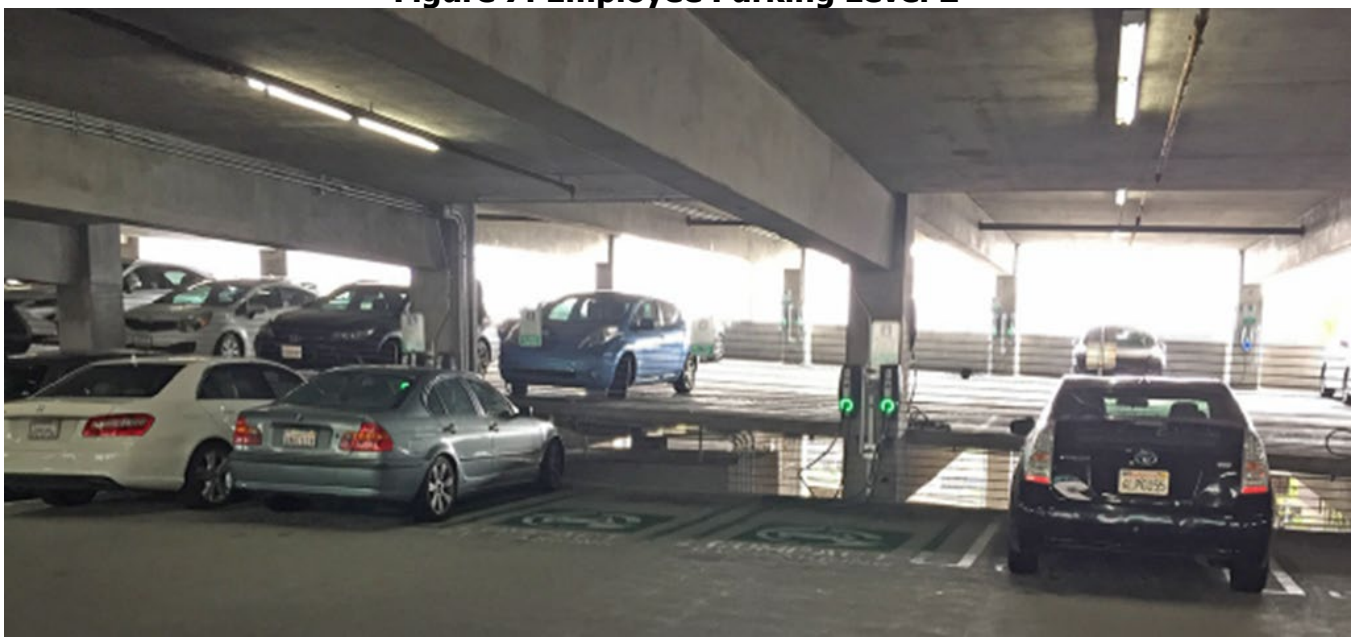

Source: County of Los Angeles

**Figure 6: Public Ground Level ADA**




Source: County of Los Angeles

**Figure 7: Employee Parking Level 2**

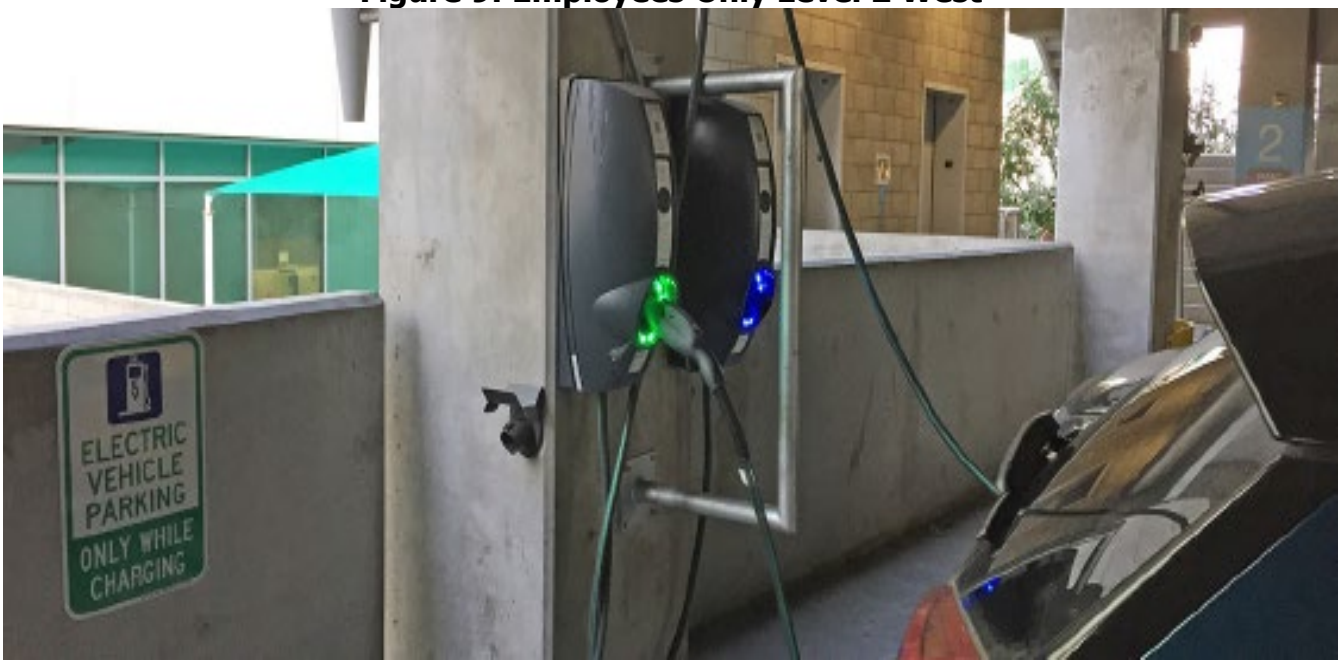


Source: County of Los Angeles

**Figure 8: Employees Only Level 2**

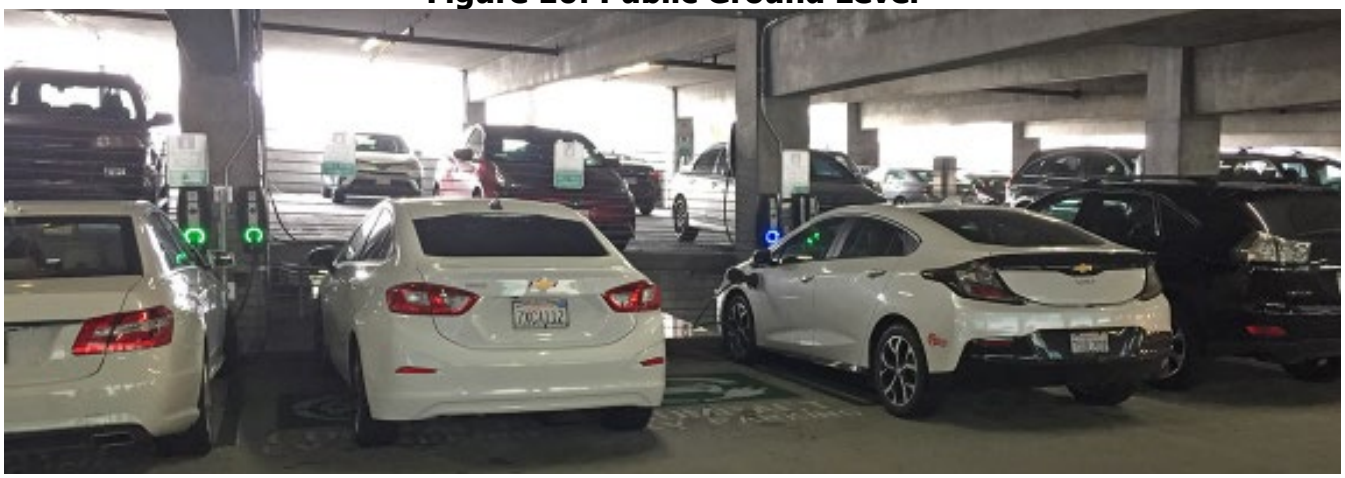

Source: County of Los Angeles

**Figure 9: Employees Only Level 2 West**




Source: County of Los Angeles

**Figure 10: Public Ground Level**

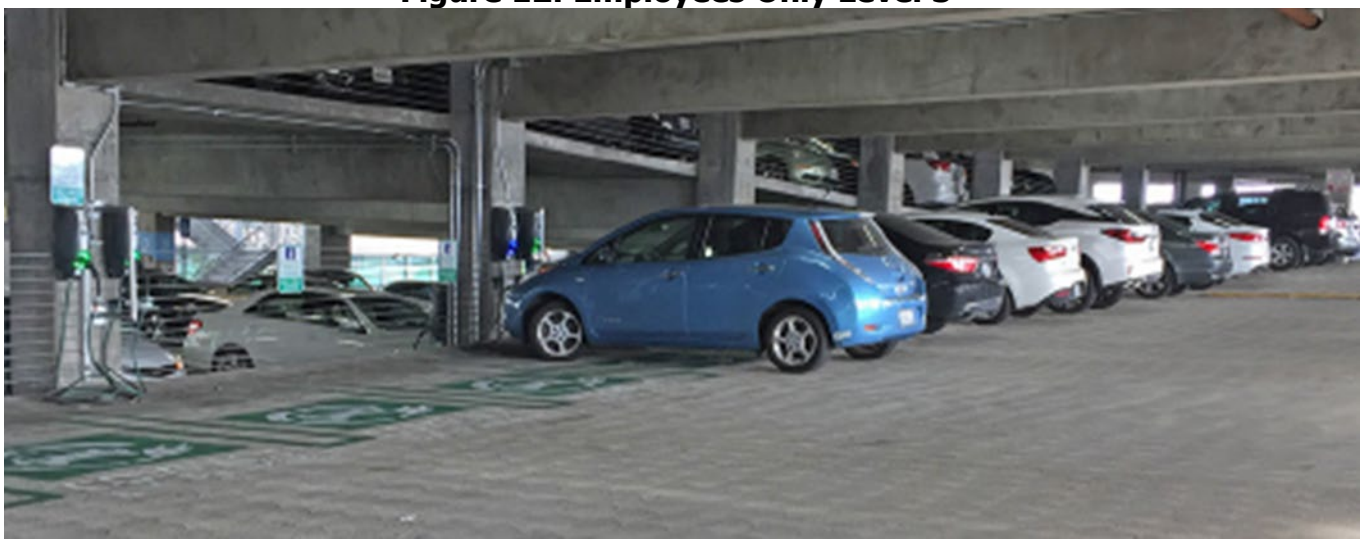


Source: County of Los Angeles

**Figure 11: Employees Only Level 3 East**


Source: County of Los Angeles

**Figure 12: Employees Only Level 3**



Source: County of Los Angeles

# APPENDIX B:
# Monthly Usage Reports

Tables 2-7 represent 6 months (June 2018-November 2018) of charging usage data.

**Table 2: June 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | e-Miles added |
|---|---|---|---|---|---|---|---|
| 1-Jun-18 | 1 | 114.6 | 162.2 | 4.6 | 0 | 0.3 | 14 |
| 4-Jun-18 | 2 | 190.4 | 445.6 | 6.7 | 0 | 0.5 | 20.4 |
| 6-Jun-18 | 1 | 143.3 | 273.7 | 2.2 | 0 | 0.2 | 6.8 |
| 8-Jun-18 | 3 | 262.6 | 498.4 | 9.7 | 0 | 0.7 | 29.7 |
| 9-Jun-18 | 2 | 65.7 | 149.6 | 2.3 | 0 | 0.2 | 6.9 |
| 11-Jun-18 | 3 | 316.6 | 720.6 | 10.5 | 0 | 0.8 | 32.2 |
| 12-Jun-18 | 3 | 265.5 | 525.4 | 8.4 | 0 | 0.6 | 25.7 |
| 13-Jun-18 | 3 | 243.6 | 792.4 | 8 | 0 | 0.6 | 24.6 |
| 14-Jun-18 | 3 | 274.8 | 816.9 | 7.5 | 0 | 0.6 | 23 |
| 15-Jun-18 | 3 | 318.2 | 448 | 8.6 | 0 | 0.6 | 26.4 |
| 18-Jun-18 | 2 | 187.5 | 491 | 5.4 | 0 | 0.4 | 16.6 |
| 19-Jun-18 | 1 | 97.1 | 302.1 | 2.2 | 0 | 0.2 | 6.8 |
| 20-Jun-18 | 2 | 209.1 | 509.1 | 4.4 | 0 | 0.3 | 13.4 |
| 21-Jun-18 | 3 | 256.5 | 761.1 | 8.2 | 0 | 0.6 | 25 |
| 22-Jun-18 | 2 | 172.7 | 491.3 | 4.8 | 0 | 0.4 | 14.7 |
| 25-Jun-18 | 4 | 377.1 | 1,143.30 | 12.6 | 0 | 0.9 | 38.4 |
| 26-Jun-18 | 8 | 458.9 | 1,333.50 | 12.3 | 0 | 0.9 | 37.6 |
| 27-Jun-18 | 5 | 425.7 | 1,051.80 | 17.4 | 0 | 1.3 | 53.2 |
| 28-Jun-18 | 4 | 401.3 | 1,110.90 | 14.2 | 0 | 1 | 43.6 |
| 29-Jun-18 | 4 | 451.6 | 1,053.30 | 11.6 | 0 | 0.9 | 35.5 |
| Total | 59 | 5,232.50 | 13,080.10 | 161.6 | 0 | 11.9 | 494.5 |

Source: County of Los Angeles

**Table 3: July 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 2-Jul-18 | 2 | 318.4 | 525 | 9 | 0 | 0.7 | 27.5 |
| 3-Jul-18 | 5 | 643.6 | 1,096.40 | 30.6 | 0 | 2.2 | 93.5 |
| 5-Jul-18 | 2 | 214.5 | 573.9 | 6.3 | 0 | 0.5 | 19.2 |
| 6-Jul-18 | 4 | 481.2 | 1,041.90 | 20.7 | 0 | 1.5 | 63.3 |
| 9-Jul-18 | 3 | 404.3 | 1,008.60 | 11.4 | 0 | 0.8 | 34.7 |
| 10-Jul-18 | 9 | 135.1 | 330.2 | 2.8 | 0 | 0.2 | 8.6 |
| 11-Jul-18 | 3 | 343.2 | 768.1 | 10.5 | 0 | 0.8 | 32.2 |
| 12-Jul-18 | 4 | 615.5 | 1,310.00 | 13.5 | 0 | 1 | 41.3 |
| 13-Jul-18 | 4 | 387.2 | 1,291.50 | 12.4 | 0 | 0.9 | 37.8 |
| 16-Jul-18 | 4 | 439.8 | 1,094.20 | 13.4 | 0 | 1 | 41 |
| 17-Jul-18 | 3 | 416.9 | 1,074.50 | 11.1 | 0 | 0.8 | 33.9 |
| 18-Jul-18 | 2 | 304.6 | 589.7 | 8.7 | 0 | 0.6 | 26.7 |
| 19-Jul-18 | 3 | 350.6 | 959.1 | 10.5 | 0 | 0.8 | 32.1 |
| 20-Jul-18 | 2 | 149.3 | 500.4 | 5.2 | 0 | 0.4 | 15.9 |
| 23-Jul-18 | 3 | 376.9 | 881.6 | 11.4 | 0 | 0.8 | 34.8 |
| 24-Jul-18 | 3 | 489.7 | 1,172.90 | 28 | 0 | 2.1 | 85.7 |
| 25-Jul-18 | 3 | 310.7 | 823.7 | 10.2 | 0 | 0.8 | 31.3 |
| 26-Jul-18 | 5 | 577.5 | 1,463.80 | 20.7 | 0 | 1.5 | 63.5 |
| 27-Jul-18 | 4 | 453.9 | 852.9 | 16.4 | 0 | 1.2 | 50.1 |
| 30-Jul-18 | 3 | 400.4 | 954.2 | 21.3 | 0 | 1.6 | 65.3 |
| 31-Jul-18 | 2 | 314 | 990.2 | 13.5 | 0 | 1 | 41.2 |
| Total | 73 | 8,127.20 | 19,302.60 | 287.4 | | 21.2 | 879.6 |

Source: County of Los Angeles

**Table 4: August 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 1-Aug-18 | 3 | 743.1 | 1,044.20 | 11 | 0 | 0.8 | 33.8 |
| 2-Aug-18 | 3 | 350.2 | 627.5 | 11 | 0 | 0.8 | 33.7 |
| 3-Aug-18 | 4 | 478 | 885 | 21.6 | 0 | 1.6 | 66 |
| 6-Aug-18 | 4 | 583 | 872.3 | 32.9 | 0 | 2.4 | 100.7 |
| 7-Aug-18 | 4 | 422.3 | 1,211.10 | 13.1 | 0 | 1 | 40.2 |
| 8-Aug-18 | 2 | 244.3 | 539.6 | 6.6 | 0 | 0.5 | 20.1 |
| 10-Aug-18 | 2 | 229.7 | 246.1 | 6.7 | 0 | 0.5 | 20.6 |
| 15-Aug-18 | 7 | 899.S | 1,545.40 | 47 | 0 | 3.5 | 143.7 |
| 16-Aug-18 | 1 | 154.7 | 325.5 | 2.3 | 0 | 0.2 | 6.9 |
| 17-Aug-18 | 4 | 553.3 | 864.7 | 21.7 | 0 | 1.6 | 66.4 |
| 20-Aug-18 | 4 | 628.2 | 933.8 | 19.8 | 0 | 1.5 | 60.5 |
| 21-Aug-18 | 4 | 630 | 1,010.80 | 21 | 0 | 1.5 | 64.2 |
| 22-Aug-18 | 7 | 716 | 1,873.40 | 26.8 | 0 | 2 | 82.2 |
| 23-Aug-18 | 6 | 670.2 | 1,480.90 | 19 | 0 | 1.4 | 58.2 |
| 24-Aug-18 | 6 | 688.9 | 1,304.00 | 21.8 | 0 | 1.6 | 66.8 |
| 27-Aug-18 | 5 | 722.6 | 1,123.50 | 37.5 | 0 | 2.8 | 114.7 |
| 28-Aug-18 | 5 | 664.2 | 1,495.50 | 26.4 | 0 | 1.9 | 80.7 |
| 29-Aug-18 | 6 | 959.4 | 2,115.60 | 27.2 | 0 | 2 | 83.2 |
| 30-Aug-18 | 6 | 594 | 2,454.20 | 18.5 | 0 | 1.4 | 56.6 |
| 31-Aug-18 | 4 | 439.9 | 1,337.70 | 16.4 | 0 | 1.2 | 50.1 |
| Total | 87 | 11,371.30 | 23,290.50 | 408.2 | | 30 | 1,249.10 |

Source: County of Los Angeles

**Table 5: September 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 4-Sep-18 | 4 | 393 | 1,365.20 | 10.1 | 0 | 0.7 | 31 |

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 5-Sep-18 | 7 | 925.7 | 1,707.80 | 34.4 | 0 | 2.5 | 105.2 |
| 6-Sep-18 | 5 | 543.4 | 1,700.30 | 17.3 | 0 | 1.3 | 53 |
| 7-Sep-18 | 2 | 307.2 | 826 | 7.4 | 0 | 0.5 | 22.7 |
| 10-Sep-18 | 1 | 111 | 327.1 | 2.2 | 0 | 0.2 | 6.8 |
| 11-Sep-18 | 4 | 864.7 | 1,486.80 | 42.4 | 0 | 3.1 | 129.7 |
| 12-Sep-18 | 6 | 617.3 | 1,973.10 | 21.3 | 0 | 1.6 | 65.2 |
| 13-Sep-18 | 5 | 688.8 | 1,625.70 | 27.4 | 0 | 2 | 83.8 |
| 14-Sep-18 | 3 | 331.2 | 382.4 | 15.1 | 0 | 1.1 | 46.3 |
| 17-Sep-18 | 6 | 679.7 | 1,527.50 | 23.5 | 0 | 1.7 | 72 |
| 18-Sep-18 | 5 | 460.8 | 1,412.60 | 13.8 | 0 | 1 | 42.1 |
| 19-Sep-18 | 8 | 1,109.40 | 2,239.70 | 49.2 | 0 | 3.6 | 150.6 |
| 20-Sep-18 | 8 | 1,033.60 | 2,647.80 | 39.1 | 0 | 2.9 | 119.6 |
| 21-Sep-18 | 5 | 520.5 | 1,123.10 | 16.8 | 0 | 1.2 | 51.5 |
| 24-Sep-18 | 5 | 552 | 1,351.10 | 21.7 | 0 | 1.6 | 66.3 |
| 25-Sep-18 | 3 | 338.3 | 1,055.50 | 10.2 | 0 | 0.7 | 31.2 |
| 26-Sep-18 | 5 | 584 | 2,004.00 | 15.2 | 0 | 1.1 | 46.3 |
| 27-Sep-18 | 6 | 1,008.10 | 1,522.60 | 49 | 0 | 3.6 | 150 |
| 28-Sep-18 | 6 | 696.4 | 1,546.40 | 27.4 | 0 | 2 | 83.7 |
| Total | 94 | 11,765.10 | 27,824.40 | 443.4 | | 32.6 | 1,357.00 |

Source: County of Los Angeles

**Table 6: October 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 1-Oct-18 | 7 | 759.6 | 1,130.80 | 37.6 | 0 | 2.8 | 115 |
| 2-Oct-18 | 2 | 225.8 | 393.4 | 10.8 | 0 | 0.8 | 33 |
| 3-Oct-18 | 6 | 632.7 | 1,825.60 | 24.6 | 0 | 1.8 | 75.40 |
| 4-Oct-18 | 3 | 447.6 | 1,367.80 | 11.1 | 0 | 0.8 | 34 |
| 5-Oct-18 | 2 | 242.8 | 835 | 7.3 | 0 | 0.5 | 22.4 |
| 9-Oct-18 | 3 | 287.6 | 936.8 | 7.5 | 0 | 0.6 | 23 |
| 10-Oct-18 | 5 | 472.7 | 1,931.20 | 14.3 | 0 | 1.1 | 43.7 |
| 11-Oct-18 | 3 | 410.1 | 551.5 | 14.4 | 0 | 1.1 | 44.1 |
| 12-Oct-18 | 5 | 542.4 | 1,500.80 | 22 | 0 | 1.6 | 67.3 |
| 15-Oct-18 | 7 | 1,083.10 | 2,057.70 | 60.3 | 0 | 4.4 | 184.4 |
| 16-Oct-18 | 6 | 482.1 | 966.5 | 13.3 | 0 | 1 | 40.7 |
| 17-Oct-18 | 4 | 449.6 | 1,423.50 | 12.5 | 0 | 0.9 | 38.4 |
| 18-Oct-18 | 4 | 480.4 | 1,232.40 | 12.2 | 0 | 0.9 | 37.3 |
| 19-Oct-18 | 4 | 426.8 | 1,261.00 | 12.7 | 0 | 0.9 | 39 |
| 22-Oct-18 | 5 | 674 | 1,473.90 | 34.8 | 0 | 2.6 | 106.6 |
| 23-Oct-18 | 4 | 455.1 | 1,200.20 | 23.9 | 0 | 1.8 | 73.1 |
| 24-Oct-18 | 3 | 411.1 | 1,210.60 | 11.7 | 0 | 0.9 | 35.9 |
| 25-Oct-18 | 5 | 794.1 | 1,949.20 | 19.7 | 0 | 1.4 | 60.2 |
| 26-Oct-18 | 3 | 521 | 1,180.10 | 26.3 | 0 | 1.9 | 80.5 |
| 29-Oct-18 | 5 | 554.4 | 1,291.20 | 16.8 | 0 | 1.2 | 51.5 |
| 30-Oct-18 | 2 | 310.8 | 933.4 | 7.8 | 0 | 0.6 | 23.8 |
| 31-Oct-18 | 5 | 869.3 | 1,794.60 | 40.7 | 0 | 3 | 124.5 |
| Total | 93 | 11,532.90 | 28,446.90 | 442.4 | | 32.6 | 1,353.80 |

Source: County of Los Angeles

**Table 7: November 2018 Usage Data**

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 1-Nov-18 | 8 | 820.6 | 1,653.00 | 32.8 | 0 | 2.4 | 100.3 |
| 2-Nov-18 | 3 | 408.4 | 1,113.80 | 12.4 | 0 | 0.9 | 37.8 |
| 5-Nov-18 | 5 | 453.9 | 1,045.30 | 14.7 | 0 | 1.1 | 45 |
| 6-Nov-18 | 7 | 573.1 | 1,265.00 | 21.7 | 0 | 1.6 | 66.3 |
| 7-Nov-18 | 4 | 499.3 | 1,021.20 | 29.6 | 0 | 2.2 | 90.7 |
| 8-Nov-18 | 4 | 699.3 | 1,003.30 | 39.5 | 0 | 2.9 | 120.8 |
| 9-Nov-18 | 4 | 550.6 | 1,322.00 | 20.1 | 0 | 1.5 | 61.4 |
| 13-Nov-18 | 3 | 599.9 | 1,024.60 | 38.7 | 0 | 2.8 | 118.3 |
| 14-Nov-18 | 3 | 374 | 1,138.50 | 12.4 | 0 | 0.9 | 38 |
| 15-Nov-18 | 5 | 558.1 | 1,855.90 | 18.5 | 0 | 1.4 | 56.5 |
| 16-Nov-18 | 3 | 406.2 | 1,497.10 | 13.3 | 0 | 1 | 40.7 |
| 19-Nov-18 | 2 | 205 | 456.2 | 10.5 | 0 | 0.8 | 32.1 |
| 20-Nov-18 | 4 | 676 | 1,328.60 | 43.7 | 0 | 3.2 | 133.8 |
| 21-Nov-18 | 2 | 281.8 | 874.5 | 7.7 | 0 | 0.6 | 23.6 |
| 26-Nov-18 | 5 | 643.4 | 1,100.20 | 19.8 | 0 | 1.5 | 60.4 |

| Date | Charge Sessions | Charge Duration per min | Connected Duration per min | Energy Provided per kWh | Emissions Savings of GHG | Gas Savings per gallon | E-Miles added |
|---|---|---|---|---|---|---|---|
| 27-Nov-18 | 4 | 505 | 1,228.40 | 18.7 | 0 | 1.4 | 57.2 |
| 28-Nov-18 | 5 | 823.1 | 1,832.90 | 44.2 | 0 | 3.3 | 135.3 |
| 29-Nov-18 | 5 | 804.3 | 1,400.50 | 39.6 | 0 | 2.9 | 121.1 |
| 30-Nov-18 | 3 | 387 | 1,072.70 | 11.2 | 0 | 0.8 | 34.2 |
| Total | 79 | 10,268.80 | 23,233.60 | 448.9 | | 33 | 1,373.50 |

Source: County of Los Angeles

# APPENDIX C:
# Photos of the Ride and Drive

Table 8 below represents the 2019 Los Angeles County Ride and Drive Event Statistics. The Ride and Drive occurred in South Los Angeles on March 20, 2019, there were 200 attendees, 85 waivers/unique users, 65 emails received, and 93 total Ride and Drives.

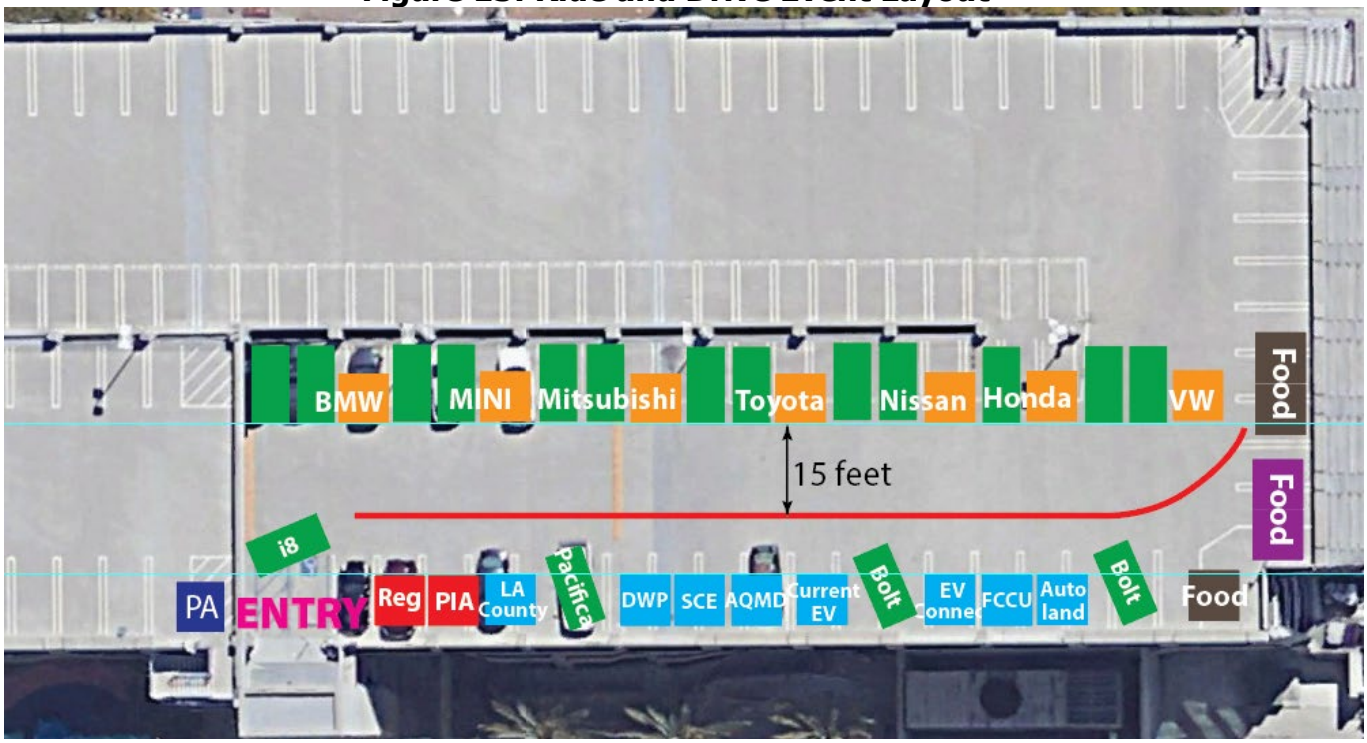
**Table 8: Ride and Drive Counts**

| Vehicle | Drives | Rides |
|---|---|---|
| BMW i3 | 3 | 2 |
| BMW 530e | 8 | 7 |
| Honda Clarity | 7 | 6 |
| MINI Cooper Countryman 1 | 6 | 1 |
| MINI Cooper Countryman 2 | 6 | 3 |
| Mitsubishi Outlander 1 | 5 | 5 |
| Mitsubishi Outlander 2 | 1 | 0 |
| Nissan LEAF 1 | 3 | 1 |
| Nissan LEAF 2 | 2 | 3 |
| Toyota Prius Prime 1 | 6 | 3 |
| Toyota Prius Prime 2 | 4 | 1 |
| Volkswagen e-Golf | 5 | 5 |
| TOTAL | 56 | 37 |

Source: County of Los Angeles

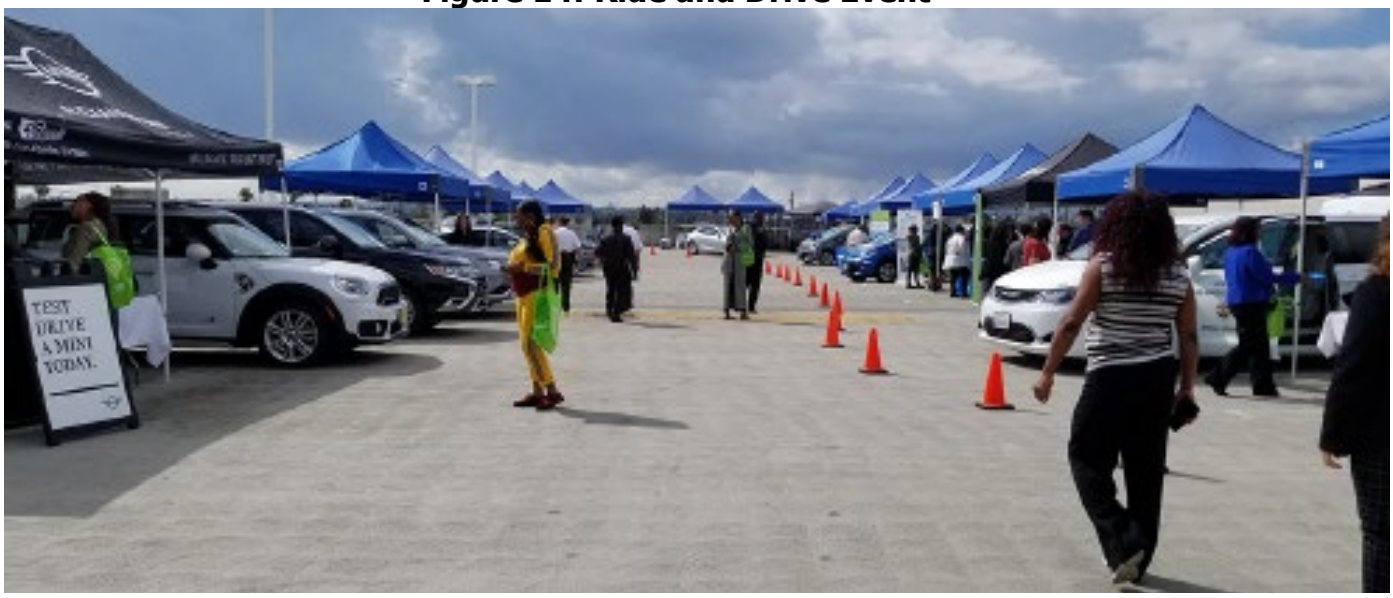
Figures 13-31 represent the 2019 Ride and Drive Event, and they show the multitude of people that showed up for the event. These figures also show the different vendors and their booths, as well as the varieties of vehicles that were showcased at the event.

**Figure 13: Ride and Drive Event Layout**




Source: County of Los Angeles

**Figure 14: Ride and Drive Event**




Source: County of Los Angeles

**Figure 15: Ride and Drive Event**

Source: County of Los Angeles

**Figure 16: Ride and Drive Event**


Source: County of Los Angeles

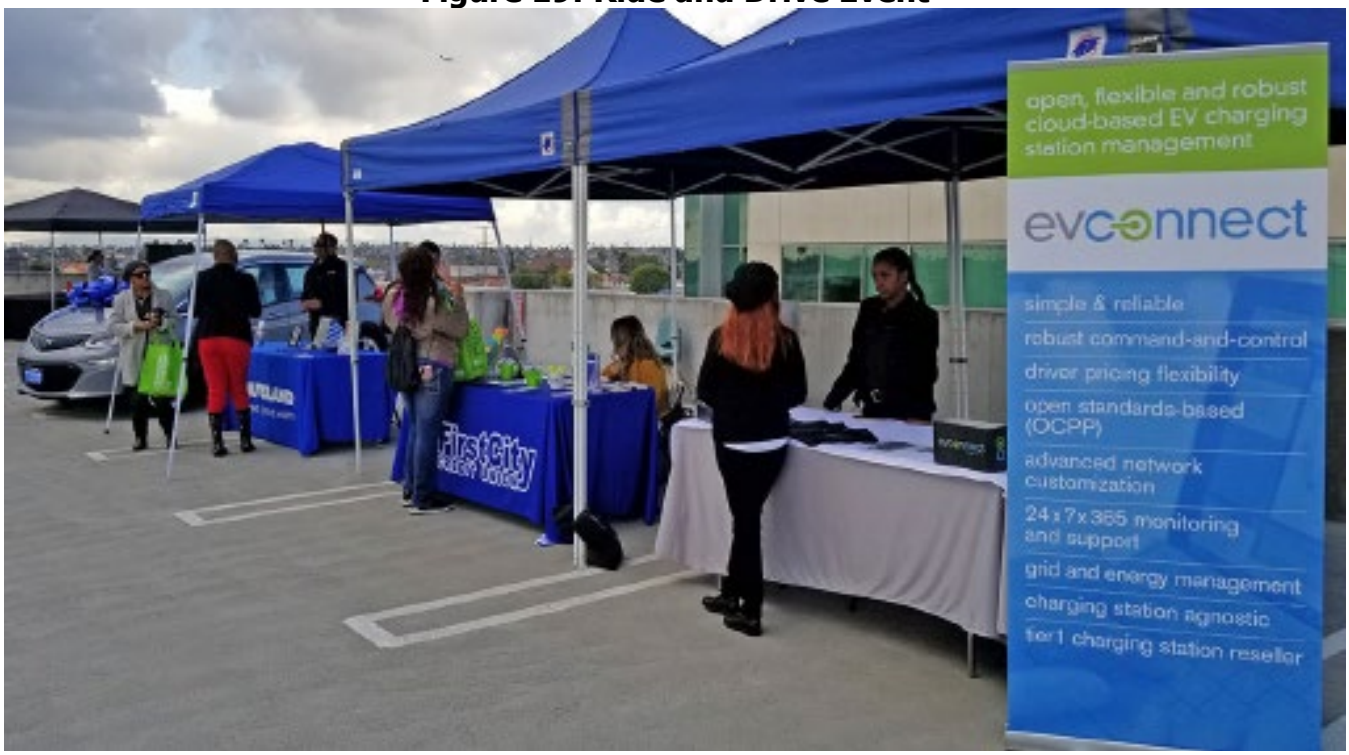
**Figure 17: Ride and Drive Event**

Source: County of Los Angeles

**Figure 18: Ride and Drive Event**

Source: County of Los Angeles

**Figure 19: Ride and Drive Event**




Source: County of Los Angeles

**Figure 20: Ride and Drive Event**

Source: County of Los Angeles

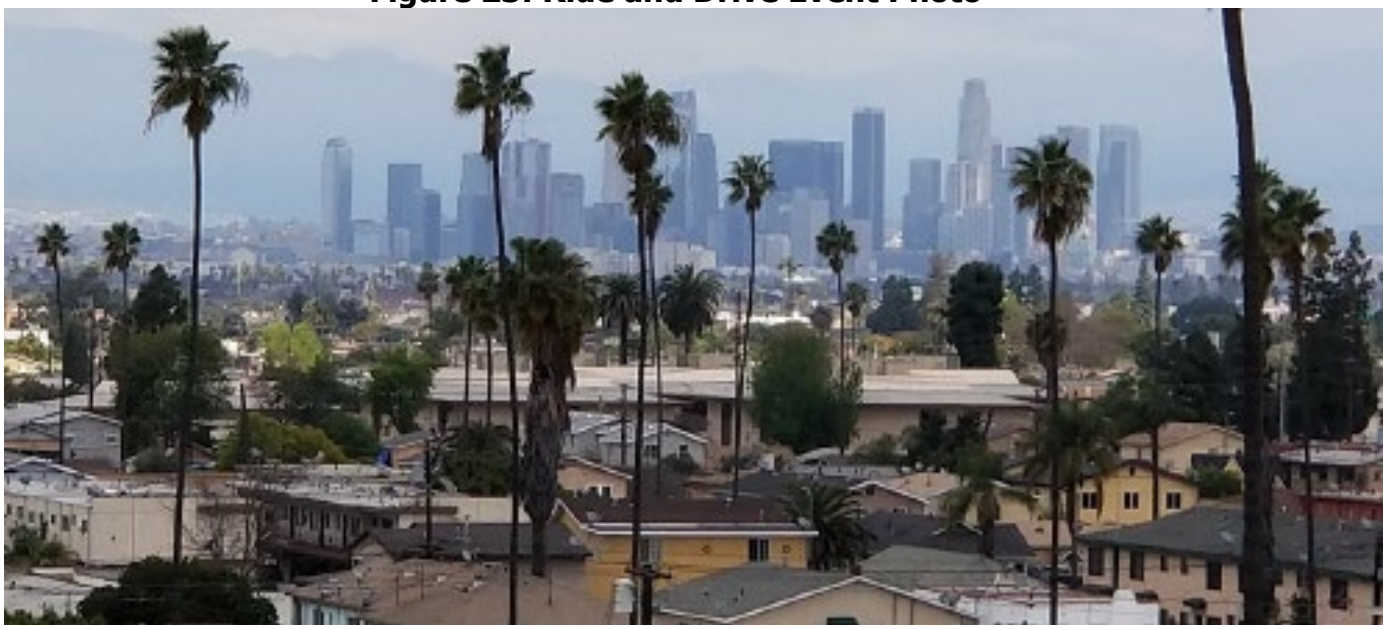
**Figure 21: Ride and Drive Event**

Source: County of Los Angeles

**Figure 22: Ride and Drive Event**


Source: County of Los Angeles

**Figure 23: Ride and Drive Event Photo**



Source: County of Los Angeles

**Figure 24: Ride and Drive Event**


Source: County of Los Angeles

**Figure 25: Ride and Drive Event**


Source: County of Los Angeles

**Figure 26: Ride and Drive Event**

Source: County of Los Angeles

**Figure 27: Ride and Drive Event**

Source: County of Los Angeles

**Figure 28: Ride and Drive Event**

Source: County of Los Angeles

**Figure 29: Ride and Drive Event**


Source: County of Los Angeles

**Figure 30: Ride and Drive Event**

Source: County of Los Angeles

**Figure 31: Ride and Drive Event**


Source: County of Los Angeles