CALIFORNIA ENERGY COMMISSION

California Energy Commission

Clean Transportation Program

FINAL PROJECT REPORT

City of Corona Electric Vehicle Charging Infrastructure

Prepared for: California Energy Commission

Prepared by: City of Corona, Department of Water and Power

City of Corona, California

Gavin Newsom, Governor

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PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program, formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program. The statute authorizes the California Energy Commission (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. In response to PON-13-606, the recipient submitted an application for funding in the CEC's notice of proposed awards April 4, 2014, and the agreement was executed as ARV-14-001 on September 11, 2014.

ABSTRACT

This is the final report for Agreement ARV-14-001 between the CEC and the City of Corona to install nine electric vehicle-charging stations at four locations with funding from PON 13-606. The city applied for funding to expand its Plug-in Electric Vehicle charging infrastructure for the following reasons: 1) to efficiently and cost-effectively provide enough charging stations for electric vehicles in Corona, 2) to further the city's goals of being environmentally responsible while increasing energy independence, and 3) to encourage "green" thinking and policies among businesses and residents. This report discusses the project background and objectives, scope of work, problems encountered, usage trends, and project benefits, fulfilling the requirements of Agreement ARV-14-001.

Keywords: California Energy Commission, City of Corona, Department of Water and Power, Electric Vehicle Infrastructure

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EXECUTIVE SUMMARY

The City of Corona is dedicated to supporting clean air policies and infrastructure that will encourage residents to use modes of transportation that can reduce greenhouse gas emissions in Southern California. In 2004, the United States Environmental Protection Agency rated the Riverside-San Bernardino area (where Corona is located) as having the worst particulate air pollution in the United States (see *Plagued by Pollution: Unsafe Levels of Soot Pollution in 2004*. Environment California Research & Policy Center, 2016). Research has linked regulated air pollutants such as ozone and particulate matter to lung and heart disease and other health problems (see *epa.gov/air-research*). Increasing electric vehicle use is an important part of Corona's strategy to meet energy independence and positively affect the environment and health of its residents.

The city applied for funding from the CEC to augment its electric vehicle infrastructure. At the time the city submitted its application, the city was not able to meet the demands of the registered plug-in electric vehicle (PEV) drivers in the area. Additional stations were needed to accommodate existing PEV drivers as well as encourage an increased number of residents to purchase PEVs. The city's objective was to offer convenient charging at strategically placed stations throughout the city, eliminating competition at the existing charging stations and diminishing the "range anxiety" PEV drivers have when they have limited access to stations. The City of Corona received awards from the CEC and the South Coast Air Quality Management District, helping the city to continue its investment in alternative transportation infrastructure projects.

Installation of eight new charging stations through this project builds upon the city's dedication to air quality improvement and development of alternative fuel sources infrastructure. The city's Alternative Fuel Rebate Program provided $2,000 for Corona residents who bought new qualified alternative fuel vehicles (or $1,000 to residents who bought qualified used vehicles). The city rewarded residents for purchasing electric vehicles and has now provided easily accessible charging stations for those vehicles. All new stations are publicly accessible and available 24 hours a day, and the chargers at Corona Pointe and The Shops at Dos Lagos each have one American Disability Act (ADA accessible parking stall. Eight electric vehicle-charging stations were installed in Table 1 as follows:

Table 1: Electric Vehicle Charging Station Locations

General Location	Address	No. of Chargers	Type of Chargers	Station Activation Date
Dos Lagos	2750 Cabot Drive	3	Level 2	10/20/2017
Corona Pointe	1008 Montecito Drive	3	Level 2	10/20/2017
City Hall	386 S. Vicentia Avenue	1	Level 3	01/05/2018
Corporation Yard	717 Public Safety Way	1	Level 3	01/05/2018

Source: City of Corona, Department of Water and Power

Although the city encountered some unexpected delays with project execution, all stations were installed and operational by January 2018. Two sites were completed by October 2017, allowing for early data collection from six chargers. A table summarizing the average monthly

utilization of the charging stations is listed below (not including October 2017, which was a partial month):

Table 2: Average Monthly Utilization (charging hours/24x30 hours)

Month	Total Sessions Level 2	Average Utilization Level 2	Total Sessions Level 3	Average Utilization Level 3	Most Utilized Location
November 2017	65	2%	-	-	Corona Pointe
December 2017	115	5%	-	-	Corona Pointe
January 2018	120	6%	47	3%	Corona Pointe
February 2018	121	3%	79	5%	Corona Pointe
March 2018	130	4%	58	3%	Corona Pointe
April 2018	143	5%	25	1%	Corona Pointe

Source: City of Corona, Department of Water and Power

CHAPTER 1:
Project Background and Objectives

The City of Corona is in Riverside County, which consistently receives failing grades for excessively high ozone, the average daily presence of particle pollution, and long-term particle pollution levels by the American Lung Association[1]. The goal of the region's air quality "watchdog," the South Coast Air Quality Management District (SCAQMD), is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies.

Corona is committed to supporting activities that align with the SCAQMD's goals as well as the goals laid out in the Southern California Plug-in Electric Vehicle Readiness Plan (December 2012)[2], developed by the Southern California Association of Governments. The City applied for funding for this project to expand the City of Corona's plug-in electric vehicle infrastructure, to support the growing number of PEV drivers and help the region meet air quality goals and greenhouse gas (GHG) reductions goals, which in turn benefits the health of City residents.

The City of Corona Department of Water and Power chose strategic locations for the charging stations based on existing PEV infrastructure, proximity to destinations and workplaces, and whether the department provided electricity to each site through its municipally owned electric utility. Post award of funding, the city opted to abandon one of the sites and chose two alternate, more suitable sites for installing the stations. The reasons, discussed in the lessons learned section, dealt with issues that arose with the property owners.

To complement this project, the city applied for and was awarded another grant from the CEC to increase awareness of the availability, location, cost, and charging capabilities of the new charging stations, and to develop residential electric vehicle charging station installation processes and rate structures and analyze infrastructure readiness to support the growing demand ("PEV Readiness" project, agreement ARV-14-041). Together, these two CEC-funded projects are helping Corona further its goals to improve air quality by increasing its alternative fuel infrastructure.

[1] Riverside County Air Quality
(http://www.lung.org/our-initiatives/healthy-air/sota/cityrankings/states/california/riverside.html)

[2] UCLA PEV Readiness Plan
(https://www.scag.ca.gov/Documents/SCAG-Southern%20CA%20PEV%20Readiness%20Plan.pdf)

Chapter 2:
Scope of Work

Summary of Tasks Completed

Table 3 shows different administrative tasks, charging tasks, and their different status.

Table 3: Summary of Tasks Completed

TASK	STATUS
Task 1 ADMINISTRATION	
Task 1.1 Attend Kick-off Meeting	Held on December 2, 2014.
Task 1.2 Critical Project Review Meetings	None held/requested.
Task 1.3 Final Meeting	Not held yet.
Task 1.4 Monthly Progress Reports	Emailed to the CEC monthly from January 2016 through April 2018.
Task 1.5 Final Report	Provided to the CEC in June 2018.
Task 1.6 Identify and Obtain Matching Funds	Letter documenting match funds commitment submitted to the CEC on May 25, 2016.
Task 1.7 Identify and Obtain Required Permits	All required permits, including building permits and licensing agreements, were obtained and submitted to the CEC. Environmental Notices of Exemption for all project locations were filed with the county and forwarded to the CEC.
Task 1.8 Obtain and Execute Subcontracts	Contracts with all subcontractors were forwarded to the CEC. Major Subcontractors: • Clean Fuel Connection • Baker Electric Minor Subcontractors: • Blais & Associates • Padilla & Associates • Armstrong & Brooks • L.R. Landscaping • Pacific Utility

TASK	STATUS
Task 2 INSTALL EV CHARGING STATIONS	
Task 2.1 Equipment Procurement	Copies of equipment order forms, design plans, and installation schedules (including revisions) were submitted to the CEC.
Task 2.2 Installation of Charging Stations	All stations were installed, operational, and available to the public as of January 2018. Photographs of the stations were submitted to the CEC.
Task 2.3 Test Plan	A Test Results Report was submitted to the CEC with the January 2018 Progress Report. Documentation of city staff training was submitted with the October 2017 Progress Report.
Task 3 DATA COLLECTION & ANALYSIS	See Chapter 3.

Source: City of Corona, Department of Water and Power

Equipment Installed

The city selected and contracted with experienced vendors to procure and install eight (8) new electric vehicle-charging stations at the following four (4) central locations throughout the city:

- Corona Pointe: Three (3) ChargePoint CT4000 Level 2 chargers
- The Shops at Dos Lagos: Three (3) ChargePoint CT4000 Level 2 chargers
- City Hall: One (1) ChargePoint CPE200 Express/50 kW dual-port Level 3 charger with both CHAdeMO and SAE Combo connectors
- Corporation Yard: One (1) ChargePoint CPE200 Express/50 kW dual-port Level 3 charger with both CHAdeMO and SAE Combo connectors

All chargers are part of the ChargePoint network. By downloading the mobile app from ChargePoint's website, customers can:

- see which stations are available for charging
- start charging by holding the phone up to the card reader at the station
- receive notifications when the car is finished charging or when a station becomes available
- schedule charging, set reminders, get notifications and track usage
- alert ChargePoint when issues are encountered

City staff and its contractors, with the help of Southern California Edison performed all tasks required to complete installation of the stations, including:

- Obtaining all required permits for the work and follow-up maintenance

- Ensuring site design was specific to charger hardware and met necessary codes
- Evaluating enough capacity from the existing electrical system and meter location
- Obtaining necessary easements from private property owners
- Granting easements to Southern California Edison for electric equipment installation
- Working with vendors and on-site property managers/owners to minimize disruptions to normal customer and employee traffic
- Ensuring proper safety and ADA compliance measures were in place;
- Completing site work, and installing conduits, meters and other necessary hardware
- Installing chargers
- Training staff on charging station operation
- Repairing landscaping following station installation
- Testing all equipment and ensuring that it meets all permitting requirements and code compliance
- Taking photographs of completed stations (see Appendix A)
- Completing public outreach activities to advertise and promote the new stations.

Public Outreach

The city completed the following public outreach activities (see Appendix B):

- Posted *Inner Circle News* e-newsletter article titled "Coming Soon: Electric Vehicle Charging Stations & Bike Racks, Lockers!" in June 2016.
- Posted *Inner Circle News* e-newsletter article titled "New Electric Vehicle Charging Stations Installed with Grant Funds" in January 2018: https://www.coronaca.gov/Home/Components/News/News/2461/17.
- Worked with The Shops at Dos Lagos to advertise the installation of the new charging stations through Facebook.
- Added information about the new stations to the city's mobile application, including maps to locations.
- Added a link on the city's website (Services/EV Charging Stations) to the station locations on Google Maps: https://www.google.com/maps/search/electric+vehicle+charging+station/@33.8491426,-117.5824535,13.32z?hl=en.
- The city has and continues to bring its own electric vehicle, a Nissan Leaf, to many public outreach events, including its annual Garden Festival, to educate the public and encourage electric vehicle use.
- The city has plans to perform further outreach utilizing funds from a second grant from the CEC through ARV-14-041.

Problems Encountered

The installation of the charging stations encountered unanticipated delays, including staffing shortages in the city's Purchasing Department. The task of issuing the Request for Proposals for charging station installation at two of the four locations was delayed until November 2016, and a contract was not awarded until January 2017. After preliminary site work had been completed, the city's Building Department informed the project team that the ADA requires

one ADA space for every six EV charging spaces. To accommodate this requirement, the city needed to complete a striping design layout and issue a change order with the contractor to switch the locations of the current and future chargers (extra runs were installed at both Dos Lagos and Corona Pointe, so that in the future the city could expand and install additional EV stations).

The city also experienced delays with the work at the other two locations (City Hall and Corporation Yard). The city needed to complete the easement process with Southern California Edison for the City Hall and Corporation Yard sites, a process that involved City Council approval and filing the easements with the County of Riverside. The task of providing design plans for setting the meter pedestals by Edison took longer than expected, partly due to staffing changes within the utility. Edison also had to complete final meter installation for the chargers at these locations, which could not be scheduled until a month following the release by the City of Corona Building Department.

Due to the delays, the city requested and received two no-cost time extensions from the CEC to allow the city to complete four station site installations and collect at least six months of data from the project.

Chapter 3:
Data Collection and Analysis

Methods and Results

The city collected at least six months of throughput, usage, and operations data from the Level 2 chargers at Dos Lagos Shopping Center and Corona Pointe (six chargers total), beginning when these stations became operational in October 2017 through April 2018. The charging stations capture data on an ongoing basis, which can be accessed and customized depending on the desired parameters.

Between November 2017 and April 2018, an average of 76 unique drivers accessed the electric vehicle charging stations, with a high of 98 unique drivers in February 2018. The table below breaks down the unique users by charger type. The month of October 2017 was not included in the table below, because the chargers were not operational for the full month.

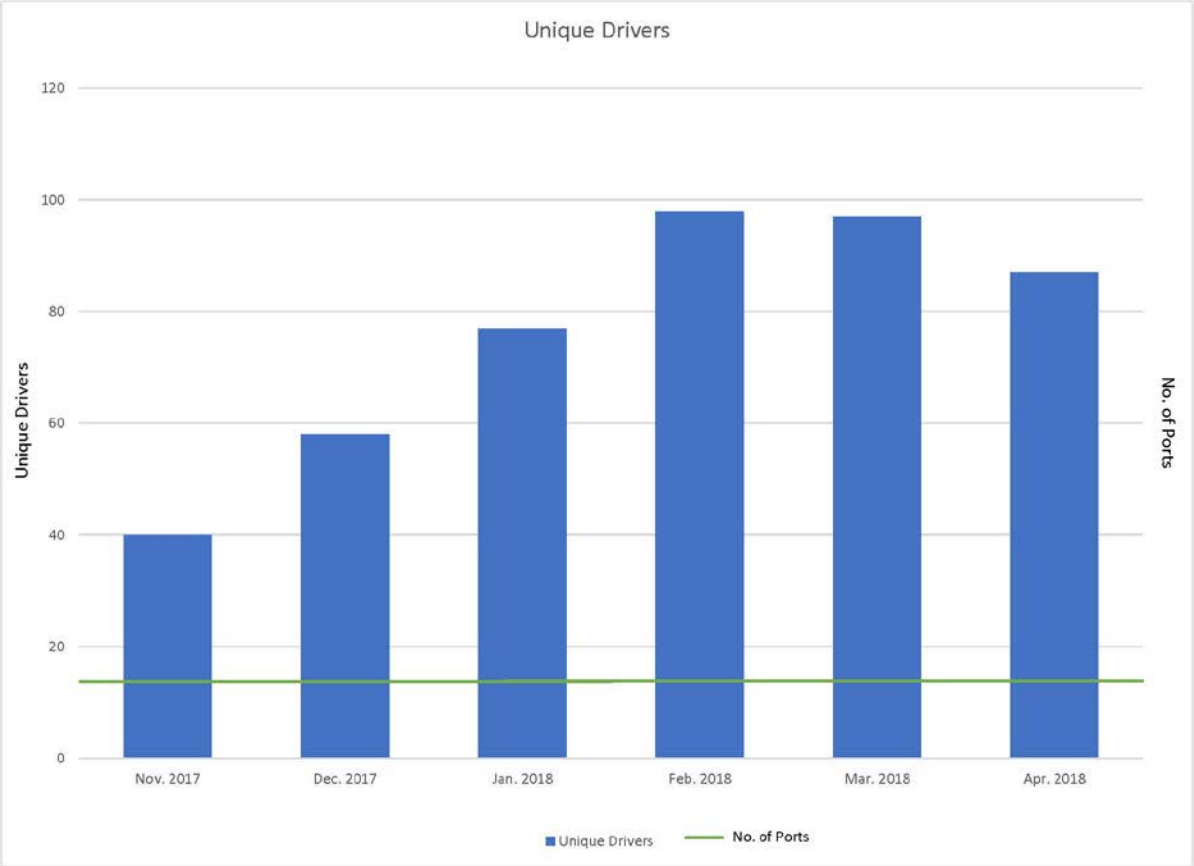
Table 4: Unique Drivers by Month

Month	Fast Chargers	Level 2 Chargers	Total Unique Drivers
November 2017	-	40	40
December 2017	-	58	58
January 2018	22	55	77
February 2018	28	70	98
March 2018	26	70	96
April 2018	17	70	87
Average:	**23**	**60**	**76**

Source: City of Corona, Department of Water and Power

Figure 1 shows the number of unique drivers by month in terms of the number of ports.

Figure 1: Unique Drivers by Month



Source: City of Corona, Department of Water and Power

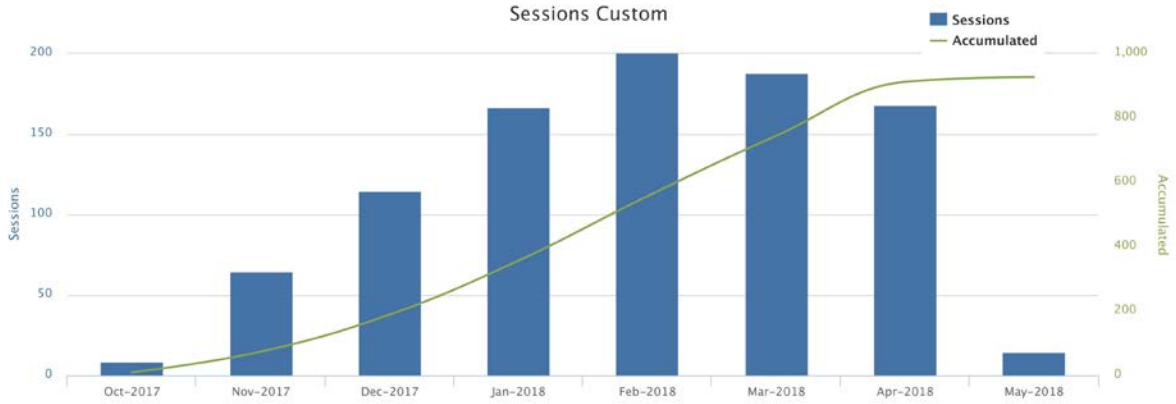
There has been 912 sessions for all 14 ports from October 2017 through April 30, 2018. This equates to an average of 130 charging sessions each month. These are shown by month in Table 5 and in Figure 2.

Table 5: Sessions

Month	No. of Sessions	Accumulated
November 2017	65	74
December 2017	115	189
January 2018	167	356
February 2018	200	556
March 2018	188	744
April 2018	168	912
Average:	**130**	**-**

Source: City of Corona, Department of Water and Power

Figure 2: Sessions



Source: City of Corona, Department of Water and Power

A vast majority of the sessions are for a period of three hours or less. Of the 912 sessions that occurred between October 2017 and April 2018, 748 sessions, or 82 percent, were for three hours or less. The remaining 164 sessions, or 18 percent, were over three hours in length, with the longest two sessions totaling 14 hours. Since October 2017, a total of 6,318-kilowatt hours (kWh) were used at all the stations combined at an average 902kWh per month. Table 6 shows the average and actual session lengths.

Table 6: Session Length

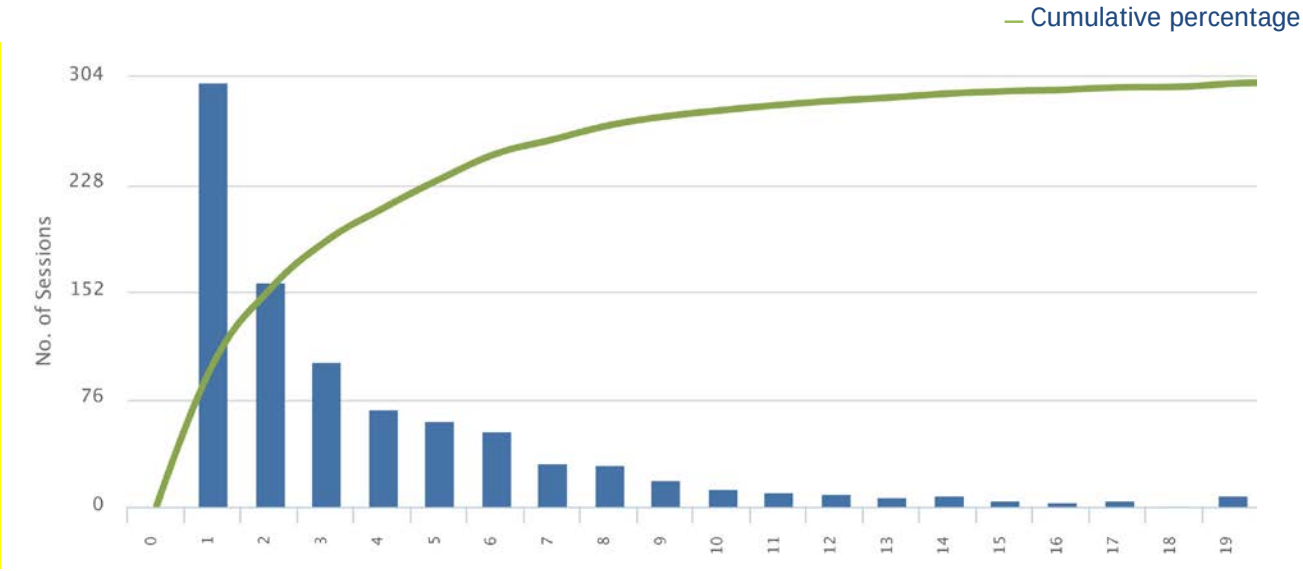
Session Length (hours: minutes)	Sessions	Cumulative %
0:00	0	0
0:30	301	33
1:00	159	50.44
1:30	103	61.73
2:00	70	69.41
2:30	61	76.1
3:00	54	82.02
3:30	31	85.42
4:00	30	88.71
4:30	19	90.79
5:00	13	92.21
5:30	11	93.42
6:00	9	94.41
6:30	7	95.18
7:00	8	96.05
7:30	5	96.6
8:00	3	96.93
8:30	5	97.48
9:00	1	97.59
9:30	8	98.46
10:00	4	98.9

Session Length (hours: minutes)	Sessions	Cumulative %
10:30	4	99.34
11:00	2	99.56
11:30	2	99.78
12:00	0	99.78
12:30	0	99.78
13:00	0	99.78
13:30	0	99.78
14:00	2	100
Total:	**912**	

Source: City of Corona, Department of Water and Power

Figure 3 and Table 7 depict session length and energy use among months and number of sessions.

Figure 3: Session Length Histogram (each 30-minute increments)



Source: City of Corona, Department of Water and Power

Table 7: Energy Use

Month	Energy (kWh)	Accumulated (MWh)
November 2017	306.473	0.342
December 2017	609.082	0.952
January 2018	1,216.396	2.168
February 2018	1,733.153	3.901
March 2018	1,339.998	5.241
April 2018	1,077.355	6.318
	Average: 1047.07 kWh/month	**Cumulative: 18.958 MWh**

Source: City of Corona, Department of Water and Power

The table below (Table 8) illustrates the average monthly utilization of the charging stations. The most utilized location has been the Corona Pointe station (Level 2 chargers). This primarily may be due to the type of location: Corona Pointe is a work place as opposed to the other locations that are retail centers (Dos Lagos) and municipal facilities (City Hall and Corporation Yard). Corona Pointe may be used more consistently by the same drivers by those who commute there. The other locations used by drivers that are stopping at the sites on their way to another destination; those drivers may not frequent the area on a regular basis.

The pricing structure was conducted under a PEV Readiness Grant from the CEC. Fast chargers are priced at a flat rate of $0.49/kWh, and the Level 2 chargers are $0.29/kWh. The city currently does not collect any additional revenues from ads. Even though the stations are available 24 hours a day, seven days a week, they are not being highly utilized. It is unclear why this is the case at this time; it may be a combination of factors such as price, demand, or public awareness of the stations.

Table 8: Average Monthly Utilization (hours)

Month	Corona Pointe (workplace L2)	Dos Lagos (public L2)	City Hall (public DC)	Corporation Yard (public DC)
Nov-17	10	8	-	-
Dec-17	28	9	-	-
Jan-18	39	18	14	14
Feb-18	21	15	33	8
Mar-18	22	19	21	8
Apr-18	35	18	4	4

Source: City of Corona, Department of Water and Power

Based upon the energy consumed from Corona's electric vehicle charging stations through April 30, 2018 (6,318.43 kWh), the City of Corona calculates that 187.49 gallons of gasoline have been displaced (6,318.43 kWh divided by 33.7 kWh/gallon of gasoline = 187.49 gallons). This is based upon the gasoline gallon equivalent of one kWh/mile being equal to 33.705 miles

per gasoline gallon equivalent[3]. Since October 2017, 2,653.74 kg of greenhouse gas emissions (GHG) have been avoided.

The City of Corona does not currently have plans for renewable energy use at these facilities. However, the city does have a Renewable Portfolio Plan. In addition, according to the city's 2016 Power Content Label, the city purchases 6 percent of its power from large hydroelectric facilities.

Table 9 and Figure 4 shows the cumulative GHG savings per month.

Table 9: GHG Savings

Month	GHG Savings (kg)	Accumulated (kg)
November 2017	128.719	143.828
December 2017	255.814	399.642
January 2018	510.886	910.528
February 2018	727.924	1,638.452
March 2018	562.799	2,201.251
April 2018	452.489	2,653.74
Average:	**379.106**	

Source: City of Corona, Department of Water and Power

Figure 4: GHG Savings

Source: City of Corona, Department of Water and Power

[3] KwH Conversion to Gallon Gasoline Equivalent (https://www.aqua-calc.com/convert/electric-car-energy-economy/kilowatt-hour-per-mile-to-miles-per-gallon-gasoline-equivalent).

While there was temporary job creation due to the installation of the charging stations, the city does not currently anticipate job creation, economic development, or increased state revenue because of the installation of these charging stations. Installing the stations are not considered significant job creation programs or economic development.

The grant application for the project estimated that 267.59 metric tons of CO_2 would be eliminated from California's environment per year. This is equivalent to 267,590 kg of CO_2. However, in the initial 7 months of the project, only 2,653.74 kg of CO_2 have been saved. If we average the last three months of usage and add that in to project savings for a full year, only around 6,000 kg of CO_2 will have been saved in the first year, which is roughly 2.26 percent of what was estimated. The assumptions in the grant application optimistically estimated that the stations would be utilized 80 percent of a regular workday, or approximately 7.2 hours per day. Originally, nine Level 2 chargers were to be installed at three charging station sites, but the project scope of work was amended and two Level 3 chargers at two sites replaced three Level 2 chargers at one site. However, based on information to date, the stations are only being utilized a fraction of the available time. This may be due to several reasons, including awareness of the station locations as well as the rates for the electric vehicle stations. The city has received a grant from the CEC to perform a rate study, which will help the city to set EV charging rates that are competitive yet still help to recover costs associated with electricity usage and station maintenance. The grant also includes funds to help make the public aware of the availability of the charging stations, which will help to increase the station utilization.

Trends and Observations

Based on the data collected to date, there was a dramatic increase in station usage between October 2017 and January 2018. This makes sense, as the stations were first installed and awareness of those frequenting the area increased. From November to December 2017, the number of charging sessions increased by 155 percent; there are corresponding increases in GHG savings and energy use as well during the same time period. Since then, there continues to be increases in sessions and usage, but not as dramatic.

Additionally, the number of unique drivers using the stations initially increased but has started to decline slightly in the last two months. The cause of this is unknown at this time, but as stated previously may be due to the costs that are being charged at the stations. The city is reviewing the rates as it undergoes its electric rate study. The city will continue to monitor this trend and hopes to see a bump in unique drivers and usage after regional promotion of the stations.

Projected Emissions and Economic Benefits

The city anticipated several economic benefits that would result from the installation of the electric vehicle charging stations. These benefits included increasing revenue for The Dos Lagos Shopping Center and promoting an environmentally responsible image for Corona Pointe, as well as providing some economic benefits to the retail establishments in Corona Pointe. The data has shown an increase in the number of different electric vehicle charging station users and volume of energy and hours consumed at the stations. This is positive as it indicates that the stations are attracting new and different EV users. However, it is difficult to quantify sales revenue increases currently, as the stations have only been in use for approximately seven months.

The city anticipates that revenue from the charging stations pay for the maintenance expenses that are involved in owning the charging stations. From installation through April 2018, a total net revenue of $1,522.87 has been received from ChargePoint. This amount is net of the service fees from ChargePoint, which total $168.99, or 10 percent of the gross revenues to date. A summary of the revenues to date are shown in the table and figure below:

Table 10: Revenue

Date	Revenue	Accumulated Gross Revenue	ChargePoint Service Fees	Net Revenue	Accumulated Net Revenue
October 2017	$9.59	$9.59	$0.95	$8.64	$8.64
November 2017	$87.65	$97.24	$8.75	$78.90	$87.54
December 2017	$176.58	$273.82	$17.62	$158.96	$246.50
January 2018	$200.44	$474.26	$19.99	$180.45	$426.95
February 2018	$388.32	$862.58	$38.79	$349.53	$776.48
March 2018	$477.47	$1,340.05	$47.75	$429.72	$1,206.20
April 2018	$351.81	$1,691.86	$35.14	$316.67	$1,522.87
Average:	**$241.69**			**$217.55**	

Source: City of Corona, Department of Water and Power

Figure 5: Revenue

Source: City of Corona, Department of Water and Power

While the first year of service is included with the purchase of the stations, support for each station is $4,200 per year per Level 3 charging station, according to a quote from ChargePoint. This would total approximately $33,000 per year for maintenance costs if the city opts to utilize the ChargePoint service. If that is the case, the current revenues will not be enough to recoup those costs. Additional revenues will need to be collected through increased use of the stations. Additionally, the City of Corona is currently conducting a rate study with another grant from the CEC. This study will help the city set the rates charged to electric vehicle charging station end users to properly makeup maintenance costs for the stations.

Chapter 4: Conclusion

Lessons Learned

The project has been a great learning experience for the City of Corona. The world of electric vehicles and their associated benefits and limitations pose both interesting challenges and opportunities. One of the first lessons that the city learned was there was a lack of a common charging standard from car manufacturers. This made the selection of a charging station a difficult decision. The city wanted some flexibility in adapters that are offered to its patrons, to avoid alienating electric vehicle drivers that may or may not have a compatible vehicle.

Another issue that was encountered during the project dealt with the placement, operation and ownership of the charging stations. Originally, there were going to be two workplace charging station sites; one at the current Corona Pointe site and the other at an office complex near The Shops at Dos Lagos. However, there was difficulty with the private property owners wanting to have more control over the operation of the stations than the city felt was necessary, including control over who would have access to charging at the station. They also did not want to allow public access to the stations 24 hours a day, seven days a week. These issues eventually lead to the city not using The Shops at Dos Lagos location and installing two charging stations at city facilities, where there was more flexibility.

Without the addition of grant funding, the city may not have been able to install the charging stations. Currently, revenues from the stations are not enough to make a business case for ownership based on electricity revenues alone.

Future Efforts

To inform future decisions regarding alternative fuel infrastructure, the city will perform market research on the rates it charges to ensure competitiveness. The city is also in the process of undergoing an electric rate study with the added component of evaluating the city's readiness for future anticipated electric vehicle use and its impacts to its electric system. The City of Corona is also a municipally owned electric utility, providing electricity to several distinct sections of the city. One of these areas, known as Dos Lagos, contains residential development. The city wants to encourage and be prepared for the proliferation of electric vehicles. As part of this process, the city will better understand and be able to set appropriate rates that both encourage electric vehicle use and provide for appropriate cost recovery.

In completing this project, city staff had the forethought to install extra runs at both Dos Lagos and Corona Pointe to allow for expansion of the charging station infrastructure at these two centrally located sites. The city will monitor current station usage to determine if/when those additional stations are needed. Future reductions in greenhouse gas emissions, traffic congestion, and noise pollution are expected through economies of scale from expansion of infrastructure that facilitates the use of alternative fuel and active modes of transportation.

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."

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), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).

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

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)—The air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino counties. This area of 10,740 square miles is home to over 17 million people—about half the population of the whole state of California. It is the second most populated urban area in the United States and one of the smoggiest. Its mission is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies.

APPENDIX A:
Photographs

Figure 6: Charging Station – City Hall

Source: City of Corona, Department of Water and Power

Figure 7: Charging Station – Corporation Yard

Source: City of Corona, Department of Water and Power

Figure 8: Charging Stations – Corona Pointe

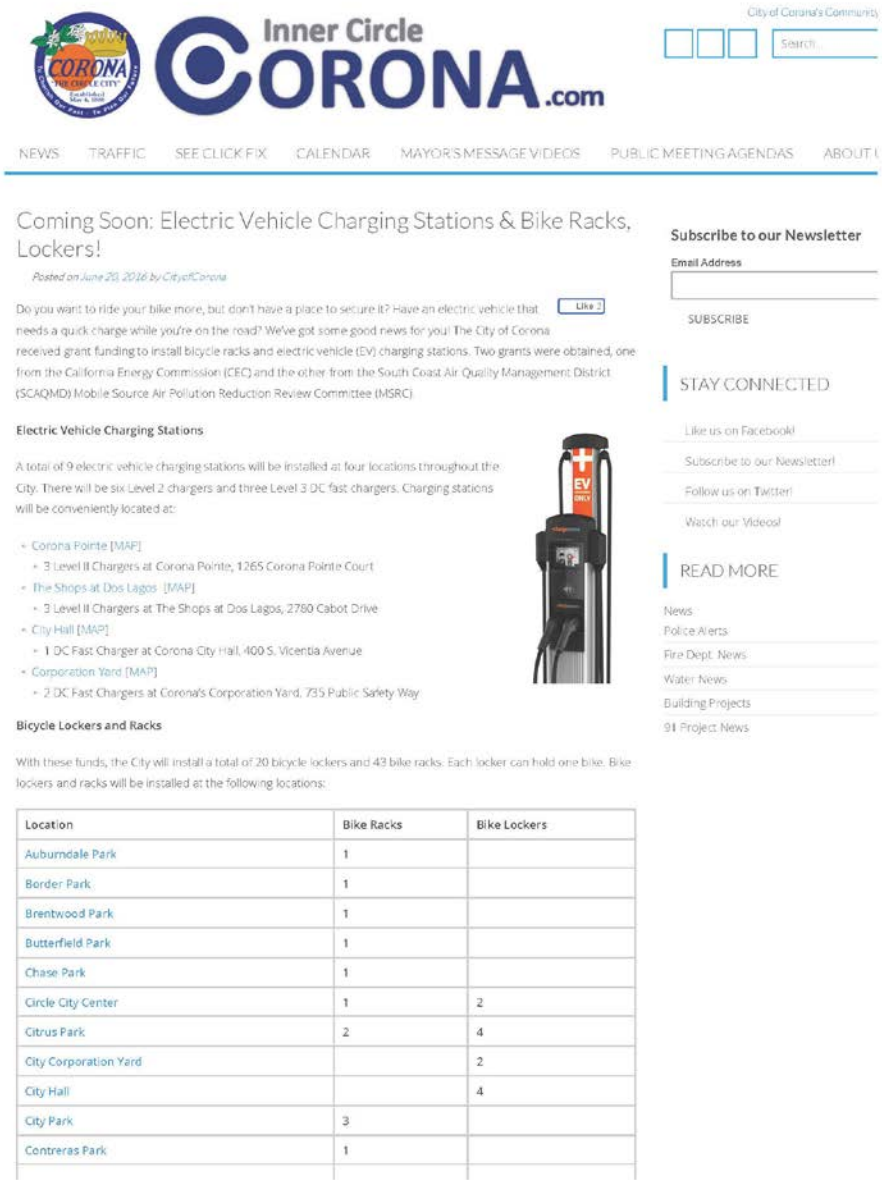
Source: City of Corona, Department of Water and Power

Figure 9: Charging Stations – Dos Lagos

Source: City of Corona, Department of Water and Power

APPENDIX B:
Public Outreach Materials

Figure 10: Media Outreach Efforts



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Coming Soon: Electric Vehicle Charging Stations & Bike Racks, Lockers!

Posted on June 20, 2016 by CityofCorona

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Do you want to ride your bike more, but don't have a place to secure it? Have an electric vehicle that needs a quick charge while you're on the road? We've got some good news for you! The City of Corona received grant funding to install bicycle racks and electric vehicle (EV) charging stations. Two grants were obtained, one from the California Energy Commission (CEC) and the other from the South Coast Air Quality Management District (SCAQMD) Mobile Source Air Pollution Reduction Review Committee (MSRC).

Electric Vehicle Charging Stations

A total of 9 electric vehicle charging stations will be installed at four locations throughout the City. There will be six Level 2 chargers and three Level 3 DC fast chargers. Charging stations will be conveniently located at:

- Corona Pointe [MAP]
  - 3 Level II Chargers at Corona Pointe, 1265 Corona Pointe Court
- The Shops at Dos Lagos [MAP]
  - 3 Level II Chargers at The Shops at Dos Lagos, 2780 Cabot Drive
- City Hall [MAP]
  - 1 DC Fast Charger at Corona City Hall, 400 S. Vicentia Avenue
- Corporation Yard [MAP]
  - 2 DC Fast Chargers at Corona's Corporation Yard, 735 Public Safety Way

Bicycle Lockers and Racks

With these funds, the City will install a total of 20 bicycle lockers and 43 bike racks. Each locker can hold one bike. Bike lockers and racks will be installed at the following locations:

Location	Bike Racks	Bike Lockers
Auburndale Park	1	
Border Park	1	
Brentwood Park	1	
Butterfield Park	1	
Chase Park	1	
Circle City Center	1	2
Citrus Park	2	4
City Corporation Yard		2
City Hall		4
City Park	3	
Contreras Park	1	

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Source: City of Corona, Department of Water and Power

Figure 11: Media Outreach Efforts

Corona Police Department	1	2
Creste Verde Park	1	
Department of Water and Power		2
Fairview Park	1	
Husted Park	1	
Jameson Park	1	
Joy Park	1	
Kellogg Park	1	
Lincoln Park	2	
Mangular Park	1	
Merrill Park	1	
Mountain Gate Park	2	
Ontario Park	1	
Parkview Park	1	
Promenade Park	3	
Ridgeline Park	1	
River Road Park	1	
Rock Vista Park	1	
Santana Park	4	4
Serfas Club Park	1	
Sheridan Park	1	
Spyglass Park	1	
Stagecoach Park	1	
Victoria Park	2	

Look for more announcements when these new facilities will be ready for use. For questions, please contact the City of Corona Department of Water and Power or Maintenance Services Department at 951-736-2234.

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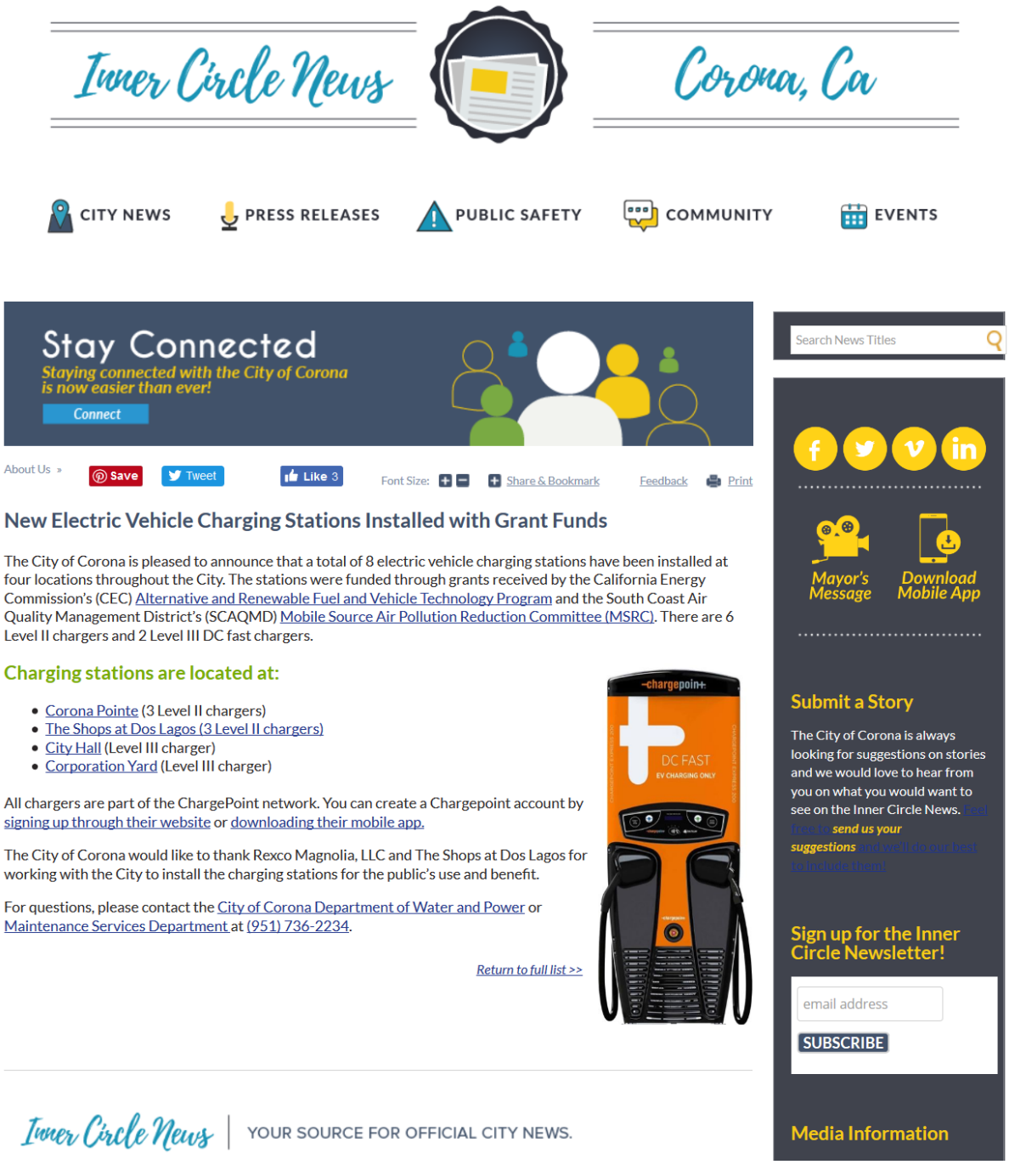
- EARLY BIRD: Inaugural Women's Leadership Conference! ()
- Economy Rolling in Corona! ()
- Beware: Water Insurance NOT Supported by Corona DWP ()

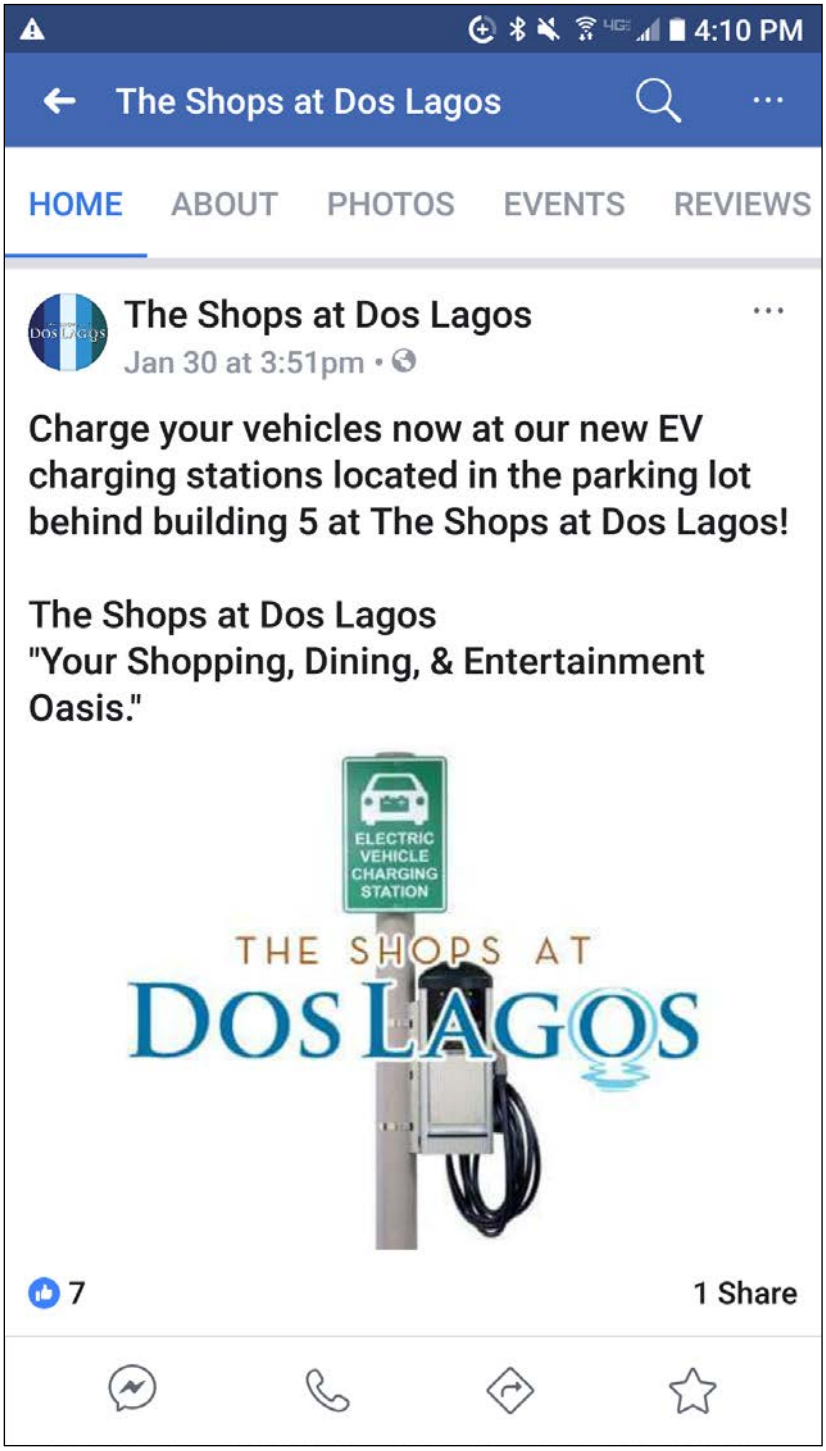
Source: City of Corona, Department of Water and Power

Figure 12: Media Outreach Efforts



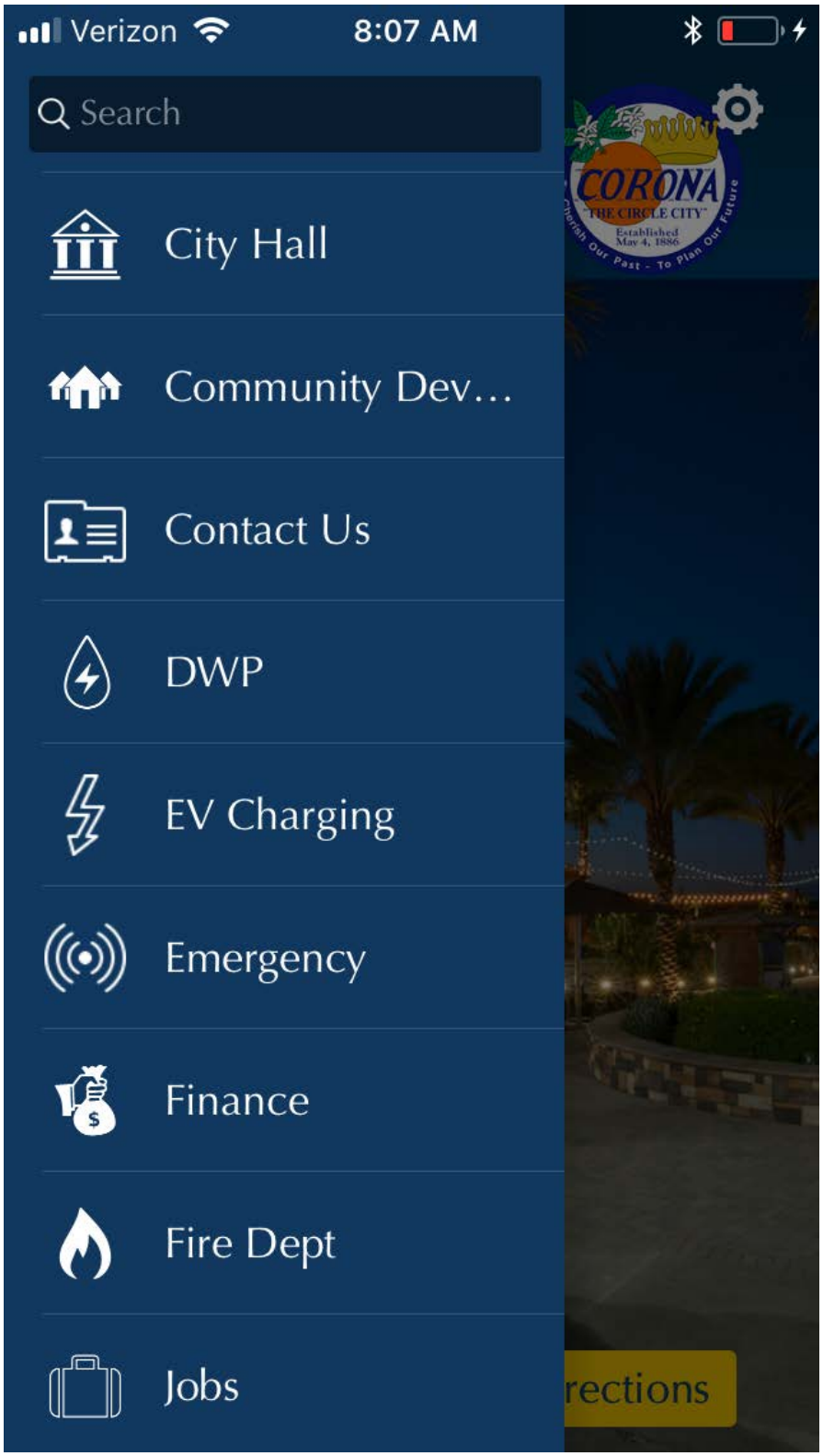
Source: City of Corona, Department of Water and Power

Figure 13: Screen Shot from The Shops at Dos Lagos Facebook Page



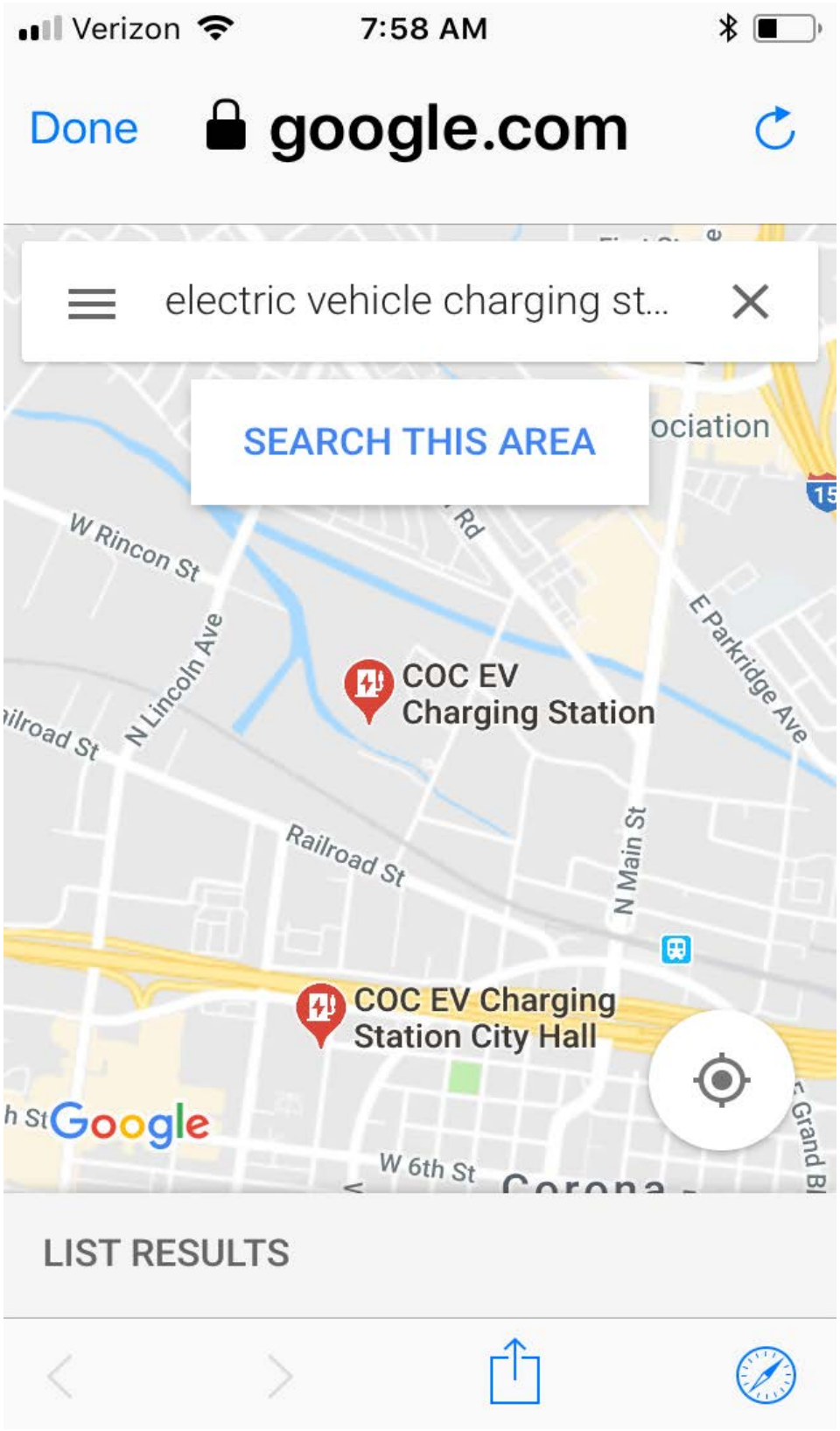
Source: City of Corona, Department of Water and Power (via Facebook.com)

Figure 14: Screen Shot from City of Corona Mobile App



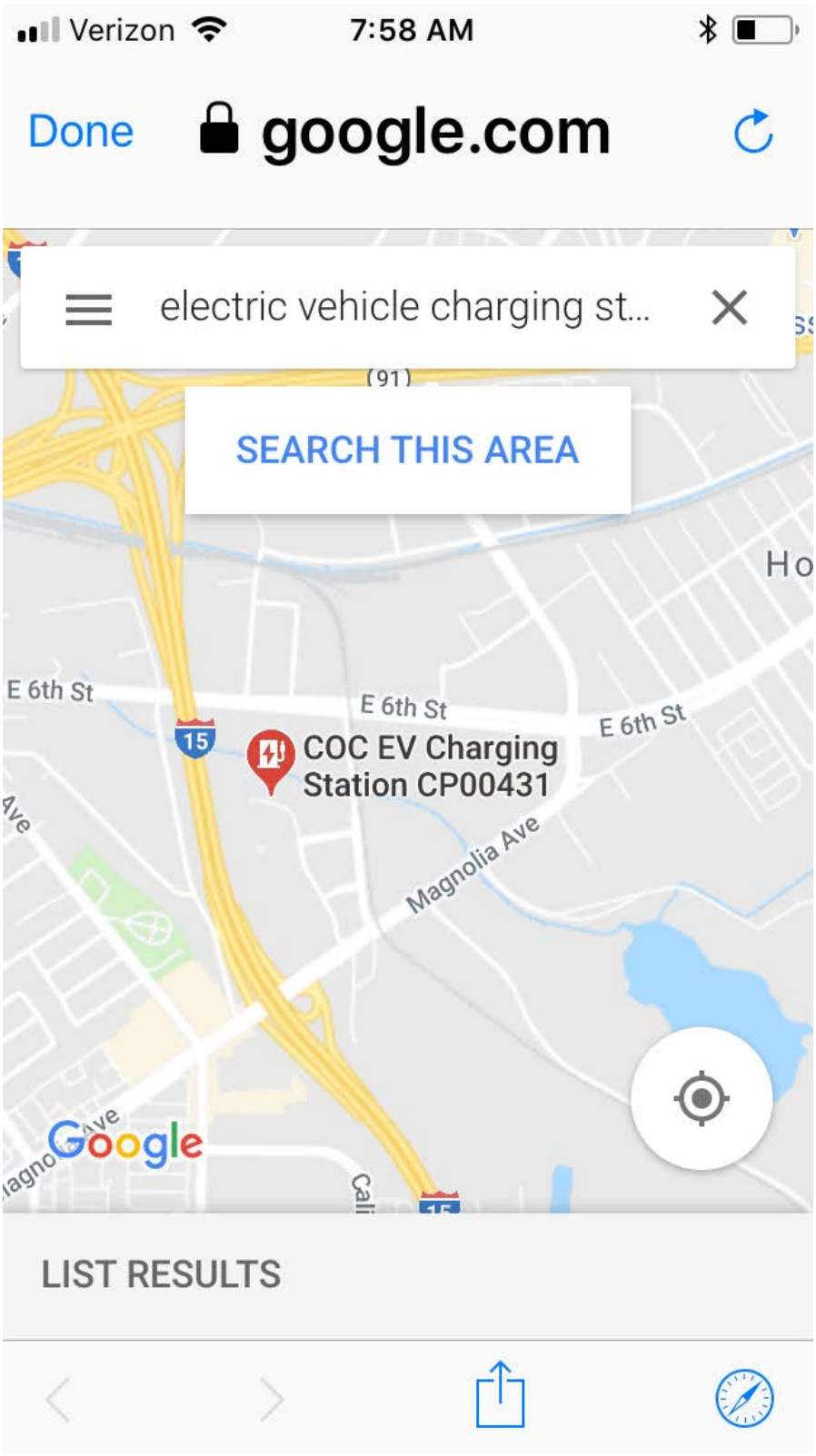
Source: City of Corona, Department of Water and Power

Figure 15: Screen Shot from City of Corona Mobile App



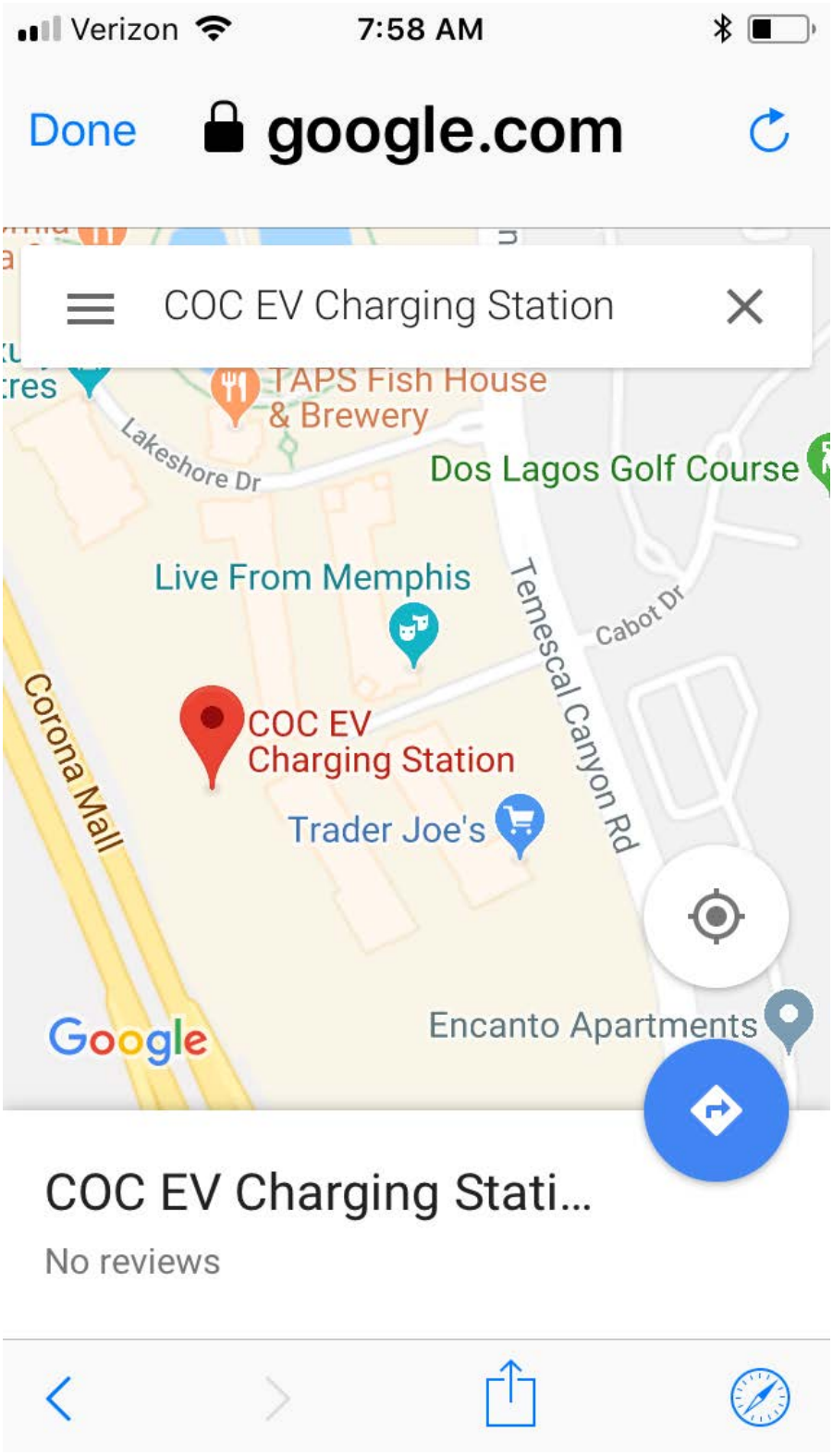
Source: City of Corona, Department of Water and Power, using Googlemaps.com

Figure 16: Screen Shot from City of Corona Mobile App



Source: City of Corona, Department of Water and Power, using Googlemaps.com

Figure 17: Screen Shot from City of Corona Mobile App



Source: City of Corona, Department of Water and Power, using Googlemaps.com