



FINAL REPORT

City of Pasadena's Maintenance Yards and Marengo Charging Plaza Charging Infrastructure Projects

June 15, 2020

**Prepared for the Mobile Source Air Pollution Review
Committee (MSRC) under the AB2766 Discretionary Fund
Work Program**

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City of Pasadena’s Maintenance Yards and Marengo Charging Plaza Charging Infrastructure Projects

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1. ACKNOWLEDGEMENTS

The Maintenance Yards Fleet Charging Project was completed in collaboration with staff from several city departments, including Information and Technology, Planning and Community Development, Human Services and Recreation, and Water and Power.

The Maintenance Yards Fleet Charging Project was completed in March 2019.

The Marengo Charging Plaza was completed in collaboration with Tesla Inc. and staff from several city departments including Transportation, Planning and Community Development, Public Works, City Attorney, City Manager, Human Services and Recreation, and Water and Power.

The Marengo Charging Plaza Project was completed in January 2020.

The Maintenance Yards and the Marengo Charging Plaza charging infrastructure projects were made possible by funding from CARB's Low Carbon Fuel Standards (LCFS) program <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>, and generous grants from the California Electric Vehicle Infrastructure Project (CALeVIP) <https://calevip.org/> and the Mobile Source Air Pollution Reduction Review Committee (MSRC) <http://www.cleantransportationfunding.org/>.



This report was submitted in fulfillment of AB 2766/MSRC Local Government Partnership Program Contract # ML 18079 and by the City of Pasadena under the partial sponsorship of the Mobile Source Air Pollution Reduction Review Committee (MSRC).

2. SCOPE OF WORK

The City of Pasadena is pursuing a coordinated citywide effort to encourage the adoption and use of plug-in electric vehicles (EV) by residents, businesses, employees in the community, and visitors. The goal is to reduce greenhouse gas (GHG) and other air emissions, consistent with the City's Climate Action Plan (CAP).

The City of Pasadena is also integrating EVs into the existing city's vehicle fleet. In support of the city environmental goals, Pasadena City Council leased 38 new electric vehicles in 2019. The new electric vehicles are driven by city staff to conduct day-to-day field activities such as code enforcement, inspections, parking enforcement, and other field operations.

The City of Pasadena currently operates a vehicle fleet of over 850 vehicles with an existing fleet of 15 electric vehicles. With the addition of 38 new EVs, the City of Pasadena now has 50 EVs on its vehicle fleet.

2.1 MAINTENANCE YARDS FLEET CHARGING PROJECT

Pasadena Water and Power (PWP) installed charging infrastructure to serve the city's electric fleet vehicles and municipal employees. The City of Pasadena Maintenance Yards located at 245 W. Mountain Street in Pasadena serves as the hub for most of all light-, medium- and heavy-duty vehicles used to conduct municipal operation.

The Maintenance Yards Fleet Charging Project includes fifty-five (55) Level 2 (L2) chargers and two (2) Direct Current Fast Chargers (DCFC) at a surface parking lot. Two new electrical services were brought to the lot to power both projects.



Concept Design of the Maintenance Yards Fleet Charging Project

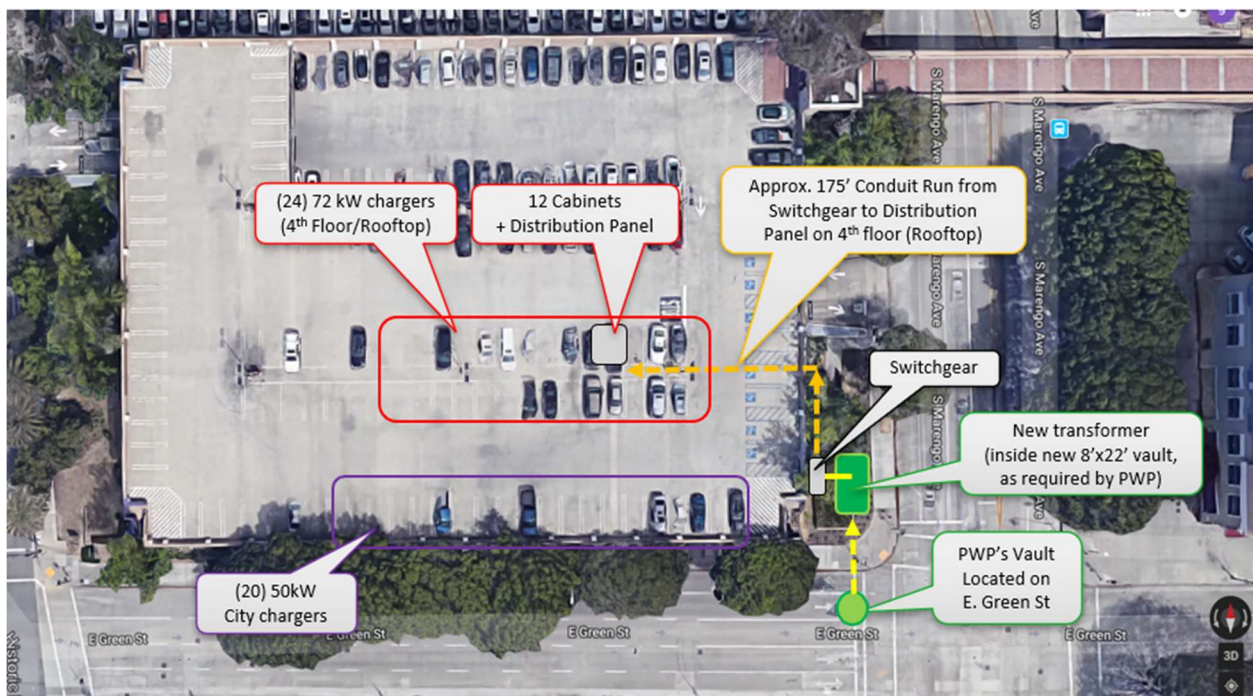
Charging infrastructure at the Maintenance Yards will provide charging to existing and future fleet electric vehicles as well as employees who currently drive an EV or plan to purchase or lease an EV for their personal use.

PWP will work with the Human Resources Department and its rideshare program (Prideshare) to develop initiatives for encouraging employees to purchase or lease EVs. EV drivers will enjoy several benefits including free charging and priority parking at the Maintenance Yards parking lot.

2.2 MARENGO CHARGING PLAZA

PWP is in the process of installing charging stations at city-owned garages in an effort to increase publicly accessible charging infrastructure and facilitate adoption of EVs by residents, employees, and visitors.

The City of Pasadena partnered with Tesla to build the largest public fast charging plaza in the nation, resulting in cost savings for both parties. The Marengo Charging Plaza was completed in early 2020 and it features a total of 44 EV fast chargers. Tesla installed 24 Superchargers for Tesla vehicles, while PWP installed 20 universal Direct Current Fast Chargers (DCFC) in the Marengo garage in Old Town Pasadena.



Concept Design of the Marengo Charging Plaza

3. PROJECT DESCRIPTION

This section provides descriptions and details of both projects: Maintenance Yards and Marengo Charging Plaza.

Although the scope of work of both projects involved the installation of charging stations for electric vehicles, each project was different in terms of planning, construction, workforce, equipment, and timeline.

The goal of Maintenance Yards project was to facilitate charging infrastructure to the city's existing fleet vehicles and promote workplace charging to field personnel who report to work at this location.

The Marengo Charging Plaza was built in partnership with Tesla at a multi-level parking structure in downtown Pasadena to provide abundant public charging for all electric vehicles, Tesla and non-Tesla, and promote businesses in the Paseo Colorado and Old-Town Pasadena.

3.1 MAINTENANCE YARDS FLEET CHARGING PROJECT

The project was completed using in-house city resources. The project was designed and managed by PWP's Electric Service Planning group, with the assistance of the civil engineering group.

For all civil construction including trenching and conduit installation, PWP utilized an existing contract with a general engineering contractor who normally works on electrical underground projects. PWP electrical crews performed all associated electrical work including but not limited to: switchgear installations, charger installation, cable pulling, grounding, etc.

PWP staff also coordinated very closely with the City's Information and Technology group to ensure the proper communication security was maintained and adequate bandwidth and service was provided to end users.

Staff from Human Services and Recreation assisted with accessibility regulations for electric vehicle charging stations under the California's Building Code ("CBC") and the American Disabilities Act ("ADA").

The Planning and Community Development Department was actively involved in the plan check and inspection processes to ensure proper compliance with all state and local building and electrical requirements.

Greenlots was selected as the vendor to provide back office including communications, user account management, data reporting, utility interface application, etc.

Since these chargers were intended to provide charging to city employees driving city or personal electric vehicles, there was not a need to activate a complex payment system.

It was also determined that “free charging” will be initially provided for all vehicles to promote EVs to employees and all city departments.

To allow city fleet vehicles to charge, a Radio Frequency Identification (“RFID”) card was programmed with the vehicle information and department responsible for the vehicle. The RFID card was placed with the keys of each city vehicle. Drivers needed only to tap the RFID card in front of the charger to activate charging.

For employees wishing to charge their personal vehicles, they need only to download the “Greenlots” app on their smart phones.

The Maintenance Yards Fleet Charging project was completed in approximately 12 months. The project took longer than anticipated mainly due to the large amount of trenching to accommodate new electrical services and conduit to reach all the chargers located in the perimeter of the parking lot.

3.1.1 PROBLEMS ENCOUNTERED AND LESSONS LEARNED

There were a few problems encountered at all phases of design, construction, and after the installation was completed.

One issue encountered during the design phase was the limited power availability at the site. The existing electrical infrastructure was not adequate to accommodate the new L2 and fast chargers. To overcome this, PWP installed two new electrical services to the site including new transformers and switchgear. Although the cost of the project increased by bringing two new electrical services, there is enough power capacity to charge vehicles at full capacity simultaneously and provides greater flexibility for expansion in the future.

Since chargers at this site were intended for fleet and workplace charging, accessibility requirements by the CBC didn’t apply; however, staff decided to include these requirements at this project to provide accessibility to charging for current and future employees with disabilities, and become familiar with CBC accessibility requirements.

Accessibility requirements from CBC required additional spaces for accessible charging and access aisles for people on wheelchairs. The existing parking lot needed to be restriped and additional signage was installed in order to accommodate these extra spaces. Additionally, the prefabricated posts needed to be modified in order to meet certain ADA requirements.

During the civil construction phase, there were delays due to existing concrete and shoring in the perimeter of the parking structure. Due to this, there needed to be many revisions and rerouting of conduits and equipment.

The delays caused by the earlier issues compounded when trying to schedule the field personnel for the electrical installation. It conflicted with their existing workload and caused additional delays in the installation.

Some units were not fully configured for use on the Greenlots system when they were shipped. This required additional coordination with Greenlots and the manufacturers in order to commission the systems.

Several chargers experienced communications problems after the chargers were put into operation.

3.2 MARENGO CHARGING PLAZA

The City of Pasadena partnered with Tesla to build the largest public fast charging plaza in the nation, resulting in cost savings for both parties. The Marengo Charging Plaza was completed in early 2020 and it features a total of 44 EV fast chargers.

The scope of work included two separate projects: Tesla installed 24 Superchargers for Tesla vehicles, while PWP installed 20 universal Direct Current Fast Chargers (DCFC).

The Tesla Supercharges were installed by the Tesla team and their contractors. PWP assisted the Tesla team in several phases of the project including project design and management, contract negotiation, interconnection, and approval by the city's Building and Safety section.

As part of the agreement between Tesla and the City of Pasadena, Tesla agreed to build and paid electrical infrastructure to accommodate the installation of 20 fast chargers that PWP owns and operates saving the utility \$140,000 in capital investment costs.

A new underground electrical vault was built by the Tesla team to feed two large electrical services at the existing garage. Power was routed from the electrical services below the surface on the perimeter of the parking structure and the conduits were brought up on the side wall of the garage to the rooftop. Electrical and communication equipment was installed inside of a fenced area on the rooftop of the garage.

A reinforcement compound was applied at the rooftop to support the additional weight of the electrical equipment.

Accessibility requirements required by the CBC for public charging were incorporated into both projects. Fast chargers were installed at a van-accessible ADA space and a regular standard accessible space. Signage and restriping to match existing signage was required.

Two bollards were installed in front of each charger for protection as the City of Pasadena do not allow wheel stops installed at public garages to prevent trip hazards.

PWP staff was responsible for managing and overseeing the PWP project while project design, construction, and network communication was subcontracted.

New interior wayfinding signage as well as two exterior monument signs, with Tesla and "PowerUp Pasadena" campaign logos, were installed at the garage.

The Marengo Charging Plaza took close to 2 years to get completed. While the actual construction and installation was completed in less than 6 months, the approval process and negotiation of the contract agreement between Tesla and the City of Pasadena took longer than anticipated.

3.2.1 PROBLEMS ENCOUNTERED AND LESSONS LEARNED

While the Marengo parking structure is owned by the City of Pasadena, buy-in and approval from the property management and businesses at Paseo Colorado Shopping Mall was required as the project would impact parking for their employees, customers, and visitors. Meetings and discussions with all stakeholders in the project added delays to the project.

A large tank was discovered when digging up the ground for the underground electrical vault, prompting work to be stopped to determine if toxic or chemical material had spilled in the ground. Fortunately, the tank was partially filled with rainwater and work resumed after couple of days.

Electrical conduits were designed to be buried underground from the switchgear to the south side of parking structure; however, existing concrete and shoring in the perimeter of the parking structure prevented this option. Conduits were rerouted above the ground on a small section and a concrete pad was built to cover the conduits. In addition, metal skate stops were installed on top of the concrete box to deter skateboarding on this area.

When the project was completed, the large number of metal conduits installed on the wall of the parking structure made the installation appears “too industrial” and potentially unsafe to the public. A nice coated-painted sheet metal laminate, matching the adjacent Tesla project, was installed to cover the conduits behind the chargers.

The structural engineering analysis report determined that additional reinforcement of the rooftop of the garage was needed to support the additional weight of the electrical equipment. A reinforcement compound was installed on the areas where electrical equipment was installed.

4. OUTREACH AND MARKETING

PWP launched a citywide PowerUp Pasadena campaign in August 2018. Information and education material were developed to educate customers (residents and businesses) of incentives available from PWP for purchasing/leasing of a new or used electric vehicle and installing EV chargers at home or place of businesses.

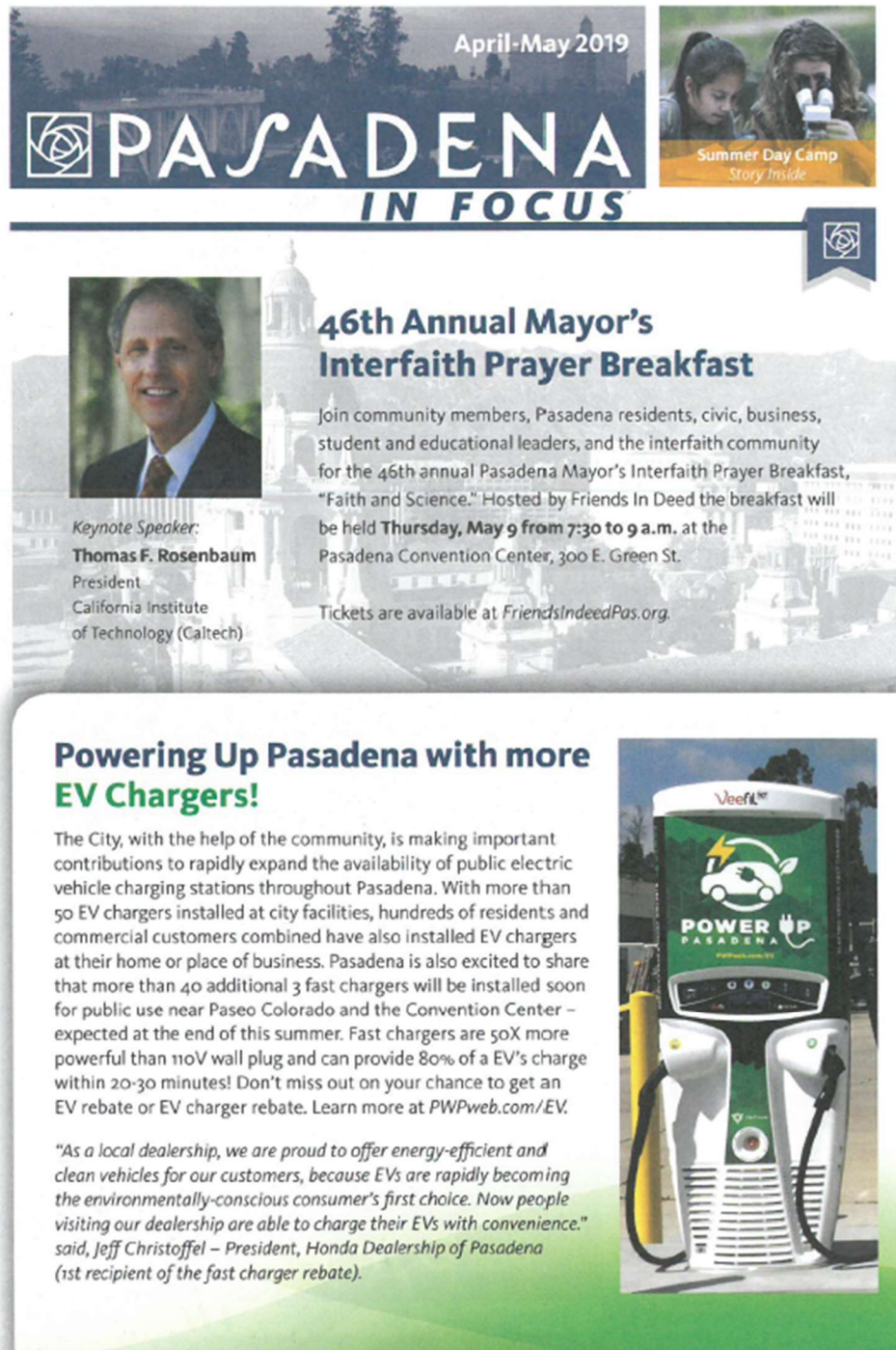
As part of the PowerUp Pasadena campaign, the PowerUp Pasadena logo was included on the design wrap of all EV charging stations and painted on all charging spaces at the Maintenance Yards and Marengo Charging Plaza.



PowerUp Pasadena Campaign

4.1 MAINTENANCE YARDS FLEET CHARGING PROJECT

The Maintenance Yards Fleet Charging Project was featured in the April-May 2019 issue of the Pasadena in-Focus. The Pasadena In-Focus newsletter is distributed to 62,000 households by bulk mail and is available electronically on the city website (<https://www.cityofpasadena.net/city-manager/pasadena-in-focus/>) and in Braille format



The image shows the cover of the Pasadena In-Focus newsletter for April-May 2019. The top left features the Pasadena logo and the title 'PASADENA IN FOCUS'. The top right has a photo of two children at a microscope with the text 'Summer Day Camp Story Inside'. The main section is titled '46th Annual Mayor's Interfaith Prayer Breakfast' and includes a photo of Thomas F. Rosenbaum, President of Caltech, as the keynote speaker. Below this is an advertisement for 'Powering Up Pasadena with more EV Chargers!' featuring a Veefit charging station and a quote from Jeff Christoffel, President of Honda Dealership of Pasadena.

April-May 2019

PASADENA
IN FOCUS

Summer Day Camp
Story Inside

46th Annual Mayor's Interfaith Prayer Breakfast

Join community members, Pasadena residents, civic, business, student and educational leaders, and the interfaith community for the 46th annual Pasadena Mayor's Interfaith Prayer Breakfast, "Faith and Science." Hosted by Friends In Deed the breakfast will be held **Thursday, May 9 from 7:30 to 9 a.m.** at the Pasadena Convention Center, 300 E. Green St.

Tickets are available at FriendsIndeedPas.org.

Keynote Speaker:
Thomas F. Rosenbaum
President
California Institute of Technology (Caltech)

Powering Up Pasadena with more EV Chargers!

The City, with the help of the community, is making important contributions to rapidly expand the availability of public electric vehicle charging stations throughout Pasadena. With more than 50 EV chargers installed at city facilities, hundreds of residents and commercial customers combined have also installed EV chargers at their home or place of business. Pasadena is also excited to share that more than 40 additional 3 fast chargers will be installed soon for public use near Paseo Colorado and the Convention Center – expected at the end of this summer. Fast chargers are 50X more powerful than 110V wall plug and can provide 80% of a EV's charge within 20-30 minutes! Don't miss out on your chance to get an EV rebate or EV charger rebate. Learn more at PWPweb.com/EV.

"As a local dealership, we are proud to offer energy-efficient and clean vehicles for our customers, because EVs are rapidly becoming the environmentally-conscious consumer's first choice. Now people visiting our dealership are able to charge their EVs with convenience." said, **Jeff Christoffel** – President, Honda Dealership of Pasadena (1st recipient of the fast charger rebate).

Veefit
POWER UP PASADENA
PWPweb.com/EV

Pasadena In-Focus Newsletter

4.2 MARENGO CHARGING PLAZA


4.2.1 Ribbon Cutting Event

The ribbon-cutting ceremony was planned for March 18, 2020. Representatives from Tesla as well as CA state officials and local government speakers were scheduled to speak at the event, including U.S. Congresswoman Judy Chu, California Air Resource Board's Chair Mary Nichols, California Energy Commissioner Patty Monahan, and Pasadena Vice Mayor Tyrone Hampton. Unfortunately, the event was cancelled due to the Covid-19 pandemic.



4.2.2 Press Release

The City of Pasadena issued a press release and YouTube video to promote and publicize the Marengo Charging Plaza in May 2020 as businesses in Pasadena started to reopen.



NEWS RELEASE

FOR IMMEDIATE RELEASE: May 27, 2020

NEWS MEDIA CONTACTS:
Lisa Derderian, Pasadena Public Information Officer, City Manager's Office (626) 744-4755, llderderian@cityofpasadena.net
Margie Otto, PR & Marketing Manager, Pasadena Water and Power (626) 993-7712, motto@cityofpasadena.net

PASADENA INSTALLS THE LARGEST PUBLIC ELECTRIC VEHICLE FAST-CHARGING PLAZA IN THE NATION

PASADENA, Calif. — The City of Pasadena is pleased to announce the opening of the Marengo Charging Plaza – 155 E. Green Street.

With a total of 44 chargers, 24 Superchargers installed by Tesla and 20 fast chargers installed by the City of Pasadena, the Marengo Charging Plaza is the largest public electric vehicle (EV) fast-charging plaza in the nation. Since the City launched the *PowerUp Pasadena* campaign in 2018, Pasadena has offered some of the most generous rebates to purchase/lease new or used- EVs throughout the state. The City's utility, Pasadena Water and Power (PWP) has more than doubled the installation of public EV charging infrastructure within the City in the past year and half, and received the distinction of having the highest percentage of EV drivers among all southern California electric utilities. The fast-chargers make it possible for EV drivers to charge up and add up to 100 miles in less than 30 minutes. Within its first months of operation the Plaza captured more than 7,000 charging sessions per month.

"Making chargers publicly available is exactly what EV drivers need, and will ultimately help advance EV adoption," said Jason Fudenberg, President of the Tesla Owner's Club of Los Angeles. "Being able to stop for a quick charge and grab a bite nearby makes road trips simple, and the cost to charge is a fraction of what I used to pay for gasoline."

The City is focused on placing EV chargers at central locations throughout the city's 23 square mile boundaries that will help drivers support their daily commute and extend their electric range to reach further destinations. "The installation of these 44 fast chargers was key to giving EV drivers the confidence they needed to see that regardless of the make and model of their EV, they now have a location they could easily access and receive a fast charge-up in minutes," said Steve Mermell, Pasadena City Manager.

The support of public-private partnerships was an effective way to advance EV infrastructure and provide the technology needed to benefit the community. With the help of grants from the California Energy Commission (CEC) and Southern California Air Quality Management District (SCAQMD), and revenues from the Low Carbon Fuel Standard program, the City was able to construct the entire project without the use of rate payer dollars.

To support the Grand Opening of the Plaza, there is currently no fee to charge on the City's 20 fast chargers and to support the take-out service of restaurants during the challenges surrounding COVID, the plaza is temporarily offering a 20-minute grace period.

Check out this video about the new Marengo Charging Plaza: <https://youtu.be/unwwrZEI3O4> or to view images, click here <https://www.flickr.com/photos/cityofpasadena/163773675@N03/18148g>.

Pasadena Water and Power offers rebates, incentives and resources for residents and businesses interested in electric vehicles, to learn more visit PWPweb.com/EV.

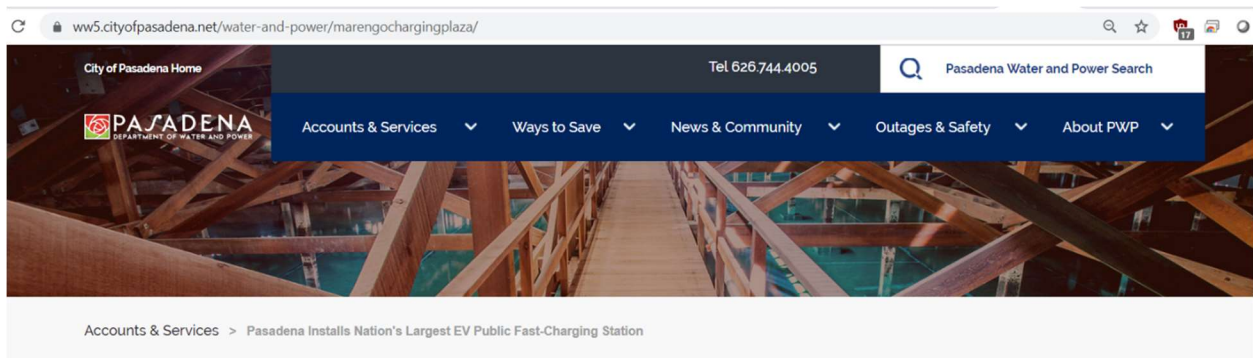
4.2.3 YouTube Video



The YouTube video can be viewed at <https://youtu.be/unwwrZEi3O4>

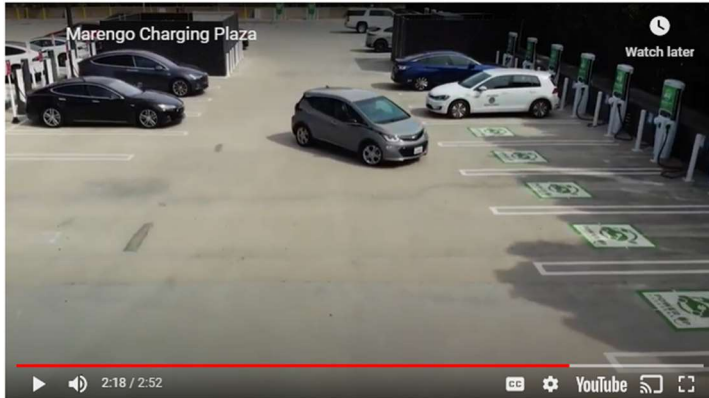
4.2.4 Project Webpage

A webpage for this project at www.PWPweb.com/Marengo was created to highlight the Marengo Charging Plaza and provide information including press release, YouTube video, project funding, and pictures.



The City is focused on placing EV chargers at central locations throughout the city's 23-square-mile boundaries that will help drivers support their daily commute and extend their electric range to reach further destinations. "The installation of these 44 fast chargers was key to giving EV drivers the confidence they needed to see that, regardless of the make and model of their EV, they now have a location they could easily access and receive a fast charge-up in minutes," said Steve Mermell, Pasadena city manager.

To promote the plaza's grand opening, there is currently no fee to charge on the City's 20 fast chargers, and to support restaurant takeout service during COVID-19 recovery, the plaza is temporarily offering a 20-minute grace period.



Pasadena Water and Power offers rebates, incentives and resources for residents and businesses interested in electric vehicles, to learn more visit PWPweb.com/EV.

Project Funding

The support of public-private partnerships was an effective way to advance EV infrastructure and provide the technology needed to benefit the community. The Marengo Charging Plaza project was made possible by funding from CARB's Low Carbon Fuel Standards (LCFS) program, and generous grants from the California Electric Vehicle Infrastructure Project (CALeVIP) and the Mobile Source Air Pollution Reduction Review Committee (MSRC).



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For Business Owners, The Conduit
Send us an email to subscribe

Contact Information

PWP Customer Service
626.744.4005
7:30 a.m. to 5:30 p.m. Mon-Fri
100 North Garfield Ave., Room N106
Pasadena, CA 91101

4.2.5 Marketing Material

This project was widely publicized on local and regional newspapers in English and Spanish languages, digital and social media, utility bill inserts, movie slides on local theaters, and trade magazines. Below are samples of marketing material used to promote the Marengo Charging Plaza



Digital Advertisement



Print Advertisement in English and Spanish



Utility Bill Insert

4.2.6 Media Coverage

The Marengo Charging Plaza received a lot of media attention in March 2020 after the ribbon-cutting event was cancelled, and in May 2020 when the press release and YouTube video were issued by the City of Pasadena. Below is a list of coverage by newspaper media and trade publications

<https://www.pasadenanow.com/main/city-installs-nations-public-electric-vehicle-fast-charging-plaza/>

<https://patch.com/california/pasadena-ca/pasadena-installs-nations-largest-public-ev-fast-charging-station>

<https://www.electrive.com/2020/05/28/pasadena-opens-fast-charging-plaza/>

<https://www.greencarcongress.com/2020/05/20200528-pasadena.html>

<https://informedinfrastructure.com/55531/southern-californias-marengo-charging-plaza-officially-opens-to-the-public/>

<https://www.autofutures.tv/2020/05/27/tritium-helps-pasadena-california-unveil-the-largest-public-dc-fast-charging-location-in-the-u-s/?amp>

<https://www.prnewswire.com/news-releases/tritium-helps-city-of-pasadena-california-unveil-the-largest-public-dc-fast-charging-location-in-the-us-301066342.html>

<https://www.pasadenastarnews.com/2019/03/07/tesla-pasadena-to-install-44-fast-chargers-for-electric-cars-atop-parking-garage-may-be-largest-charging-plaza-in-western-u-s/>

https://www.washingtonpost.com/national/la-suburb-in-deal-with-tesla-for-large-fast-charging-site/2019/03/13/06ad7816-45a6-11e9-94ab-d2dda3c0df52_story.html?utm_term=.f653ccdc87

<https://cleanpowerexchange.org/tesla-pasadena-will-cooperate-to-build-largest-fast-charging-facility-in-western-us/>

<https://www.coloradoboulevard.net/pasadenas-marengo-charging-plaza-is-open-today-with-free-ev-charging/>

https://www.reddit.com/r/electricvehicles/comments/ex9yxo/the_nations_largest_public_ev_fast_charging/

<https://www.csomagazine.com/sustainability/tesla-partners-city-pasadena-build-fast-charging-facility>

<https://www.smartenergydecisions.com/energy-management/2019/03/18/tesla-approved-to-build-largest-us-ev-charging-site-in-pasadena>

<https://insideevs.com/news/343359/tesla-teams-with-pasadena-to-build-huge-fast-charging-station/>

5. PHOTOGRAPHS



Fifty-five Level 2 chargers at the City Maintenance Yards



Two Fast Chargers at the City Maintenance Yards



Tesla and PWP Fast Chargers at the Marengo Charging Plaza



PWP Fast Chargers at the Marengo Charging Plaza

6. CONCLUSIONS

Access to electric charging has been identified as a key element to expansion and acceptance of electric transportation. After home charging, fleet and workplace charging is needed to support and accelerate the adoption of electric vehicles.

The City of Pasadena used the Maintenance Yards Fleet Charging Project to “Lead by Example” by installing charging infrastructure to support its growing fleet of electric vehicles and promote electric vehicles to all city employees.

The Marengo Charging Plaza Project provides abundance of public charging infrastructure for all types of electric vehicles in the market. The plaza will support EV drivers in the area who don’t have access to charging at home or work and drivers who need to recharge their vehicles in route to their final destinations.

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7. ATTACHMENTS

- a) Attachment A: Invoice Letter