2028 Green Jobs Roadmap

Transportation Electrification

Green Jobs Regional Partnership

GJRP Leadership Group

Contents

> Los Angeles has a tremendous opportunity to build on its existing resources and be a global model for a thriving, equitable green workforce.

I express my support of the Green Jobs Regional Partnership and the strategies outlined in this roadmap, that supports the transition to a more sustainable and prosperous economy focused on empowering workforce participants from across the City. As a leader in innovation, Los Angeles has a tremendous opportunity to build on its existing resources and be a global model for a thriving, equitable green workforce. As electric vehicles become more common on our roads, and with the City's charging infrastructure growing over 50% and counting since I assumed office in 2022, we need qualified technicians to rapidly install and repair the growing demand of charging stations across our City. To address this need, we must ensure that these opportunities are accessible for all Angelenos, including underrepresented populations, by creating pathways for diverse talent to thrive in this vital field. The Green Jobs Regional Partnership is building a network of stakeholders needed to build awareness, conduct training, and place workforce participants in high-demand, good-paying green jobs. I encourage others in the region to engage in this partnership to work together with government leaders, utilities, and private sector companies to meet the needs of the growing green workforce.

Mayor Karen Bass

> Together, we will expand a workforce that is diverse in composition and nimble in its ability to meet current and future needs of the growing green economy.

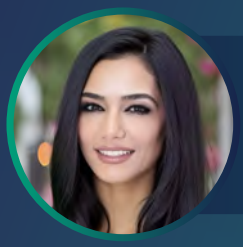
To reach our ambitious regional sustainability goals for 2028 and beyond, we need to grow the green workforce. We have long recognized this fundamental truth at LACI, and our workforce development program has now trained more than 500 participants for careers in the growing green economy.

Through our Green Jobs Regional Partnership, we convene key stakeholders from across Greater Los Angeles around the solutions needed to effectively expand the green workforce at scale. Now, with this new roadmap, we have identified specific targets, strategies, and actions to build a more inclusive workforce development ecosystem, backed by the support of dedicated partners who have aligned around the road ahead.

Together, we will expand a workforce that is diverse in composition and nimble in its ability to meet current and future needs of the growing green economy. We can and will facilitate the transition to a more prosperous economy fueled by electric transportation, all while ensuring that our local workforce receives the quality training needed to begin their careers or start anew with good-paying jobs.

I am proud of the work this committed team has put into creating this timely and relevant roadmap, which will serve as a useful resource for government and industry leaders looking to expand electrification in our communities–leading up to the 2028 Olympic and Paralympic Games, and long after. In addition to aligning with the 2028 targets previously outlined by LACI's public-private Transportation Electrification Partnership, this roadmap sets an expansive vision for long-term growth, with green job targets as distant as 2050. And amid a growing need for qualified green workforce participants, we know there's no time to waste. We are always looking for more partners to join the effort, so if you believe in building career pathways, advancing equity and inclusion, and spurring the investments needed to grow green jobs, then we want to hear from you!

Matt Petersen
CEO, Los Angeles Cleantech Incubator



> GJRP is a vital to linking public and private stakeholders in a shared commitment to equity, innovation, and economic mobility.

At the Los Angeles Regional Consortium, we believe that every individual in our community deserves the opportunity to grow, thrive, and contribute meaningfully to LA's evolving economy. This roadmap offers both an inspiring vision of what's ahead and a practical framework for how we can collectively get there.

Raising awareness is a critical first step and our community colleges serve as powerful platforms for introducing students to emerging green career pathways. Whether someone is entering the workforce for the first time or reimagining their career, we want them to see a future for themselves in the green economy.

By closing the awareness gap and aligning training programs with industry needs, we can empower our students and graduates to take confident steps forward. At the same time, we must champion work-based learning opportunities that spark interest, build experience, and connect learners with the real-world application of their studies.

LARC is proud to foster meaningful collaboration among our 19 community colleges, and we see the Green Jobs Regional Partnership as a vital extension of this work, linking public and private stakeholders in a shared commitment to equity, innovation, and economic mobility. I look forward to contributing to this important effort and helping our communities transition into a greener, more inclusive future.

Dr. Narineh Makijan,
Chair/Assistant Vice President,
Los Angeles Regional Consortium (LARC)

Green Jobs Regional Partnership 2028 Roadmap: At a Glance

The Green Jobs Regional Partnership (GJRP) is a bold, cross-sector partnership born out of a clear and immediate need for regional coordination around the growing green jobs sector. A responsive workforce ecosystem will be critical in ensuring that the Los Angeles County (LA County) region continues progress towards meeting its bold climate targets, including reaching 600,000 green jobs countywide by 2050, and does so in a manner that creates a more just and inclusive economy. Further, with the approach of the 2028 Olympic and Paralympic Games (2028 Games), a tremendous opportunity exists to use the games as a catalyst for economic growth and green workforce development.

The Green Jobs 2028 Roadmap (Roadmap) lays out the priority actions the LA region should take between 2025 and 2028 to ensure LA County has a sufficient pipeline of skilled workers to meet the region's demand for green jobs in transportation electrification.

How to Read the Roadmap

The Green Jobs Regional Roadmap (Roadmap) sets forth a pathway to build a more aligned and inclusive green workforce development ecosystem. There are four components to the Roadmap's structure:

Principles: What are the principles and values that will inform and guide the development of the Roadmap?

Strategies: What approaches will allow the Partnership and the wider green jobs ecosystem to achieve the targets and advance the Roadmap's underlying principles?

Goal & Targets: What is the overarching workforce development and job placement goal to achieve through 2028 for EV and EVSE jobs in LA County? What are the priority occupations and targets that help realize the Roadmap's goal?

Actions: What specific work can the Partnership undertake to follow these strategies relative to the larger green jobs ecosystem? These actions include specific, clear roles & responsibilities, prioritization, and identified funding & resources

The Partnership has identified an overarching goal and series of targets for the EV and EVSE industries across LA County focused on job placement and equity and inclusion. Achieving them will require work on behalf of GJRP members as well as other industry partners and will be critical in realizing other countywide goals, such as those enumerated in Transportation Electrification Partnership's Zero Emission 2028 Roadmap

Targets

New Jobs

1,000 electricians (residential), 260 EVITP certified electricians (commercial); 1,500 full-time EVSE maintenance jobs

Upskilling

4,400 ASE-EV certified technicians for light-duty EVs, 450 EV bus technicians

Equity

Industry and training representation for race/ethnicity and gender that mirrors the demographics of LA County (i.e., 50% held by women, 8% held by Black individuals, 15% held by Asian individuals)

Goal:
Prepare and place 7,610 people in high-road EV and EVSE jobs by 2028, with a focus on equitable, inclusive, and aligned green career pathways.

Roadmap Principles

These principles are the foundation of all Roadmap goals, targets, and strategies. Underlying all actions for the Roadmap is a focus on equity and inclusion.

1. **Increase awareness** of green career pathways among LA County students, workers, educators, and employers.
2. **Serve the diverse needs of trainees,** including both new entrants and incumbent workers.
3. **Embed equity and inclusion** in strategies that focus on the needs of underrepresented groups in EV and EVSE occupations, including women and Black residents.
4. **Coordinate** with other local and state green jobs and sustainability initiatives to create lasting impacts for under-resourced or otherwise disadvantaged communities (DACs).
5. **Advocate** for green businesses to develop high-road jobs that pay a living wage and are accessible to individuals without a college degree.
6. **Leverage GJRP** as a bench of public and private entities to share and collaborate on funding and grant opportunities.

Roadmap Strategies and Actions

Strategy 1

Expand availability of training programs for the EV and EVSE industries.

1.1 **Integrate EV curriculum** into existing automotive technician training programs to ensure new technicians are trained on EVs (secondary and post-secondary).

1.2 **Build formal partnerships** between EV and EVSE employers and workforce training organizations to ensure a steady pipeline of qualified candidates to secure open positions.

1.3 **Initiate pilot programs** to introduce training to underrepresented communities through existing workforce development ecosystem partners.

1.4 **Create dedicated reskilling programs** for auto mechanics interested in EVs.

Strategy 2

Enhance and diversify workforce training programs and business support services.

2.1 **Recruit current internal combustion engine (ICE) automotive technicians** to join EV technician programs.

2.2 **Establish Green Jobs Training and Career Fairs** that bring together community colleges, adult education, apprenticeships, labor, nonprofit training programs and green business serving underrepresented communities.

2.3 **Establish an entrepreneurship program and small, minority-owned business incubator program** to provide avenues for trained individuals to create their own EV and EVSE maintenance businesses, particularly in the residential sector (e.g., become independent contractors).

2.4 **Enhance existing and future training programs** with instruction on soft skills, digital literacy, and wraparound services.

2.5 **Integrate industry recognized certifications** into existing and newly developed EV and EVSE programs.

Strategy 3

Enhance awareness of careers in the transportation electrification industry.

3.1 **Establish partnerships with local schools and districts** for green career education, program outreach and work-based learning opportunities.

3.2 **Conduct targeted outreach to underrepresented and displaced workers** to offer reskilling programs for transitioning into the EV and EVSE industries.

3.3 **Hold general education training** on green industries and careers for both employers and community members.

3.4 **Host a semi-annual GJRP employer and trainer summit** for ecosystem partners to ensure alignment as new technologies emerge, standards change and laws and regulations are implemented and ensure all workforce demand data aligns with the evolving needs of employers.

Roadmap Strategies and Actions

Strategy 4

Advocate for policies that enable the work of the Green Jobs Regional Partnership.

- **4.1** **Advocate for a statewide green jobs survey,** such as stipulated in AB-1224 (Asm. Bryan 2023), to gather data on regional and statewide industry strengths.
- **4.2** **Advocate for standardizing State California curriculum** in automotive technology to include EV curriculum.
- **4.3** **Advocate for California Jobs First funding** to prioritize GJRP initiatives.
- **4.4** **Formalize EVSE technician as a job classification** for public sector work.

Strategy 5

Develop resources and data collection processes that enable the work of the Green Jobs Regional Partnership.

- **5.1** **Conduct labor market analysis for EV and EVSE occupations,** including an evaluation of EV and EVSE job and skill demand analysis. This analysis should also include developing a formal evaluation with industry advisors and community colleges that uses job demand, outlook, and skill requirements to inform community college curriculum development.
- **5.2** **Collect anonymized wage and demographic data** from ecosystem members on priority occupations to build more accurate datasets to help standardize the industry.
- **5.3** **Create an interactive career mapping tool** for EV and EVSE job pathways.
- **5.4** **Collect data on graduates from EV and EVSE training programs to** track progress and assess demand.

Strategy 6

Pursue public and private funding that supports the work of the Green Jobs Regional Partnership.

- **6.1** **Identify grants to fund worker training** at startups and small businesses who cannot self-fund costs.
- **6.2** **Identify funding sources for undocumented workers,** who are ineligible for Federal workforce training dollars.
- **6.3** **Explore models for employers subsidizing training programs and apprenticeships** that directly benefit employers. These programs would provide a direct pipeline of trained professionals for employers.

Introduction

The Green Jobs Regional Partnership (GJRP) is a bold, cross-sector partnership born out of a clear and immediate need for regional coordination around the growing green jobs sector. As green industries and technologies have rapidly evolved, new jobs and training modules are emerging across the region in response to the market. There is a need for a coordinated effort to ensure the current and future workforce is inclusive, adaptable, and properly trained. A responsive workforce ecosystem will be critical in ensuring that the Los Angeles County (LA County) region continues progress towards meeting its bold climate targets, including reaching 600,000 green jobs countywide by 2050, and does so in a manner that creates a more just and inclusive economy. As a result, LACI has convened this first-of-its-kind partnership in LA County to ensure leaders in the public sector, green tech startups, training providers, the workforce, and employers have a platform to elevate their needs and begin a coordinated and accelerated path toward scaling quality green jobs in the region to meet the needs of a rapidly growing green sector.

With the approach of the 2028 Olympic and Paralympic Games (2028 Games), there is a tremendous opportunity for economic growth, particularly in the region's clean transportation sector, and with it an opportunity for the GJRP to lay the foundation for a new and sustainable workforce development model.

Green Jobs Regional Partnership Overview

What is the Green Jobs Regional Partnership?

The Los Angeles Cleantech Incubator (LACI) formed the Green Jobs Regional Partnership (GJRP or Partnership) to guide goals and strategies to prepare the LA County workforce for the green jobs of the future. The impetus for this work grew out of recommendations from the Green Jobs Study that was commissioned by LACI and undertaken by HR&A Advisors, Inc. (HR&A) in 2019 which quantified and characterized the green economy in LA County. LACI set a goal for the green job sector in the County of Los Angeles (LA County) to grow from 338,000 green jobs in 2018 to 600,000 green jobs by 2050[1] through targets ranging from decarbonizing buildings to improving climate resiliency to increasing the use of public transportation.

Who comprised the Partnership during its Research and Roadmap Development Phase?

The GJRP, convened by LACI, was initially composed of Honorary Co-Chairs, a Leadership Group, and Research Group. The Research Group was a temporary convening for the initial Research Phase of the Partnership; moving forward, the GJRP will have an additional Advisory Group and Working Groups.

The GJRP **Honorary Co-Chairs** include elected officials at the state, county, and local levels who serve to garner high-level support for the Partnership, and advocate to their respective government entities to uplift the policy priorities of the GJRP. This group will oversee the implementation of the Roadmap.

The **Leadership Group** is a cohort of regional leaders, from public sector workforce development programs to philanthropy. The Leadership Group was tasked with decision making for the strategies and actions underlying the Roadmap and ensuring alignment with state, county, and local visions.

The **Research Group (temporary)** was composed of representatives with technical expertise and lived experience. Their membership included Electric Vehicle (EV) and Electric Vehicle Supply Equipment (EVSE) startups, community colleges and job training programs, public sector representatives, and more. The Research Group was responsible for supporting research needs and shaping the Roadmap recommendations.

[1]HR&A Advisors and LACI (2020). Green Jobs in Los Angeles: Opportunities for Economic Recovery Through Equitable Workforce Training. https://laincubator.org/wp-content/uploads/LACI-GREEN-JOBS-REPORT.pdf

LACI and its consultant team, HR&A Advisors and CCM Consulting, served as the backbone infrastructure supporting the Partnership **(Backbone)**. The Backbone team convened each Partnership group, established effective internal governance structures and processes, and led on research, analysis, and initial Roadmap development.

Who will comprise the Partnership for the Roadmap Implementation Phase?

The GJRP Honorary Co-chairs and the Leadership Group will continue to meet to oversee the implementation of the Roadmap.

The **Advisory Group** is composed of private sector partners who contribute critical thought leadership and financial support to the Partnership. They are responsible for the financial sustainability of the Partnership and ensure alignment with industry practices and policies.

The **Working Groups** are responsible for the implementation of the Roadmap's strategies and actions. The groups are made up of Leadership Group and Advisory Group members who work alongside workforce development ecosystem partners key to ensuring we reach our target goals and regional impact.

Research Group Insight

> The workforce training ecosystem must keep pace with the rapid evolution of the EVSE industry. Today's trainings are often manufacturer-specific, creating challenges as companies come and go. Programs operate in silos, disconnected from vehicle-side education, leading to fragmented skillsets. Access to training is limited, hands-on opportunities are lacking, and meaningful partnerships with industry stakeholders are rare. To address these gaps, our former CEO launched an independent training firm — designed to deliver comprehensive, collaborative, and practical training solutions that meet the needs of today's EVSE workforce.
>
> **~ Laura Rivas, InCharge**

What is the Green Jobs 2028 Roadmap?

The Green Jobs 2028 Roadmap (Roadmap) lays out the priority actions the LA Region should take between 2025 and 2028 to ensure we have a sufficient pipeline of skilled workers to meet the region's demand for green jobs. Specifically, the GJRP has homed in on **transportation electrification** as the initial focus for this Roadmap to realize the county's transportation electrification goals, including those laid out in LACI's Transportation Electrification Partnership (TEP) Roadmap. The GJRP Roadmap is focusing on 2028 to leverage the 2028 Games as a regional catalyst for meeting bold electrification goals. This Roadmap aims to create a **plan for the green jobs and training needed to** 1) achieve TEP's goal of an additional 25 percent reduction in greenhouse gas emissions and air pollution by 2028, specifically through accelerating transportation electrification and 2) develop robust, "high-road" job opportunities for historically disinvested communities in LA County.

LACI's transportation electrification focus started back in 2018 with the creation of the Transportation Electrification Partnership, which published its Roadmap 1.0 with ambitious, but achievable commitments for Greater Los Angeles that were aligned with the State of California's climate change and air quality goals, along with the Paris Climate Agreement. These commitments, like those laid out in this Roadmap, were ambitious, yet necessary goals to move the Region toward an additional 25 percent reduction in greenhouse gas emissions and air pollution by the time the 2028 Games arrive in LA.

Defining Transportation Electrification

For the purposes of the Roadmap, transportation electrification encompasses two distinct industries: Electric Vehicles and Electric Vehicle Supply Equipment.

The Electric Vehicle (EV) industry encompasses all stages of on road transportation electrification, from the engineering, manufacturing, and supply chain of EVs and their parts to operations and management of EV fleets, to the maintenance of EVs, and the eventual recycling of EVs at the end of their life cycles. Electric vehicles include:

- Micromobility EVs
- Light-duty, private and shared vehicles
- Medium-duty delivery vehicles
- Heavy-duty vehicles for short and long-haul goods movement
- Buses for public transit and schools

The Electric Vehicle Supply Equipment (EVSE) industry accounts for all support equipment required to sustain an electric vehicle ecosystem, including EV chargers and charging stations, batteries, and electric grids.

In addition to manufacturing and supply chain occupations, the EV and EVSE industries include occupations such as urban planners and engineers, software developers, construction laborers, EVITP certified electricians for EVSE installation, as well as technicians for maintenance and repair.

Working with the Leadership Group and Research Group, the Partnership identified **three near-term priority occupations (i.e., EVITP certified electricians, EVSE technicians, EV technicians)** critical to unlocking the growth in these industries. These priority occupations were selected using the criteria below:

1. Occupation is **present in LA County**
2. Occupation is **in demand**
3. Occupation is **accessible** to workers without a Bachelor's degree
4. Occupation meets some of the definitions of '**good jobs**'[2]
5. Occupation has a significant **gap in training**
6. Occupation has a notable **gap between the demand & the current workforce**

Additionally, the Partnership identified two other occupations that met the prioritization criteria and should be the focus of initiatives, particularly after 2028: fleet managers and production line workers. While not tied to specific targets for the Roadmap,these occupations are important parts of the broader EV and EVSE workforce in LA County. Fleet managers in particular, represent a potential career pathway for more experienced workers, and benefit from the skills and knowledge gained through other priority occupations (i.e., EVSE technicians, EV technicians). More details on these occupations can be found in the Workforce Needs Assessment and Training Landscape report detailed in the next section.

[2] "Good Jobs Champions Statement," an initiative of the Families and Workers Fund and the Aspen Institute Economic Opportunities Program.

Priority Occupations by Prioritization Criteria

	Electricians	EVSE Technicians	EV Technicians
LA County	✓	✓	✓
Demand	✓	✓	✓
Accessible	High school diploma or equivalent No Prior Experience + Apprenticeships	High school diploma or equivalent No Prior Experience + On-the-Job Training	Postsecondary nondegree award No Prior Experience + Short-Term On-the-Job Training
Average pay (per hour)	$35.02*	$25.00 - $35.00**	$26.48
'Good Jobs'	✓	✓	✓
Gap in training	✓	✓	✓
Gap between demand and current workforce	✓	✓	✓

* Average pay varies between residential and commercial work, with residential workers earning nearly 33% less than commercial workers in other building trades.

**Not enough information to establish an occupational average. Job posting looked at for EVSE technician positions ranged between $25.00 and $35.00.

Leadership Group Insight

Small, minority-owned businesses in the EV and EVSE industries that are under-resourced may struggle to train and hire new employees, or pay their employees competitive wages. The public workforce system in LA County can help fill the gaps in training and hiring, uplifting both businesses and job seekers.

~ Sarah Fisher, LA County Department of Economic Opportunity

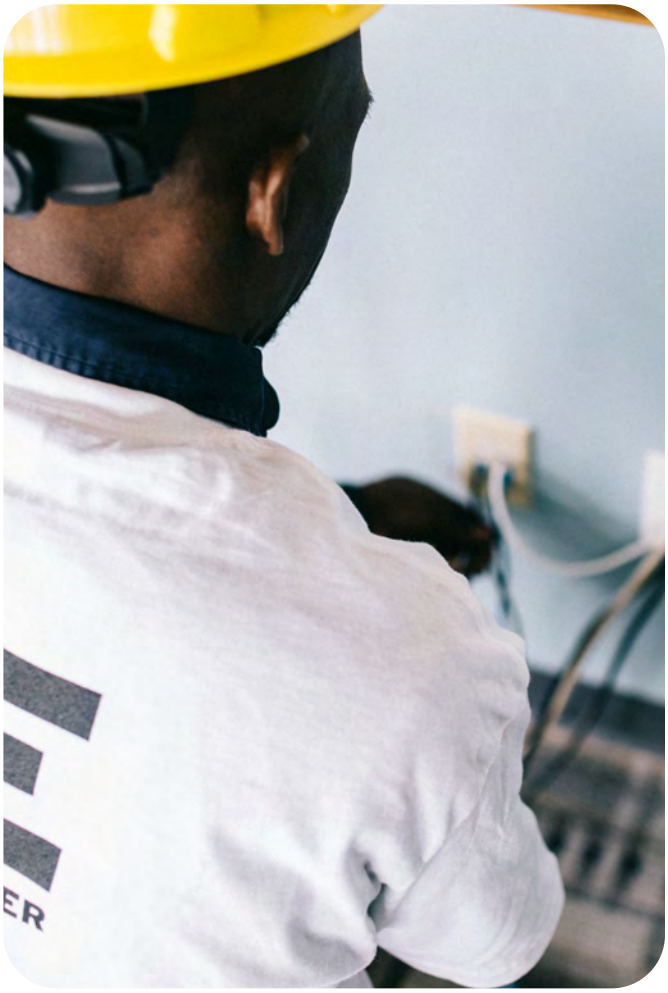
Workforce Demand and Needs

To provide an informed foundation for the GJRP Roadmap's targets and strategies, LACI retained HR&A Advisors to assess the current landscape of EV and EVSE occupations and training opportunities in LA County. The resultant Workforce Needs Assessment and Training Landscape report builds on existing LACI studies and incorporates both quantitative data and qualitative data sourced from the GJRP Research Group members. The research is also based on job targets informed by LACI's Transportation Electrification Partnership (TEP) goals for 2028.

The final Workforce Needs Assessment and Training Landscape report outlines the job demand needed to meet the TEP's 2028 transportation electrification targets for light-duty EVs (LDEVs) and public bus fleets in LA County, laid out in their Zero Emission 2028 Roadmap. The assessment also discusses the occupational gaps and needs in LA County to meet demand, and characterizes EV and EVSE priority occupations and skillsets to inform the training requirements and qualifications needed to train and employ the EV and EVSE workforce. The report concludes with a training landscape assessment that details the existing training programs, gaps, and opportunities for EV and EVSE job training in LA County.[3] Key highlights from the report are shared below.

Workforce Needs Assessment

Based on the regional transportation electrification targets for LA County, there is a strong need to rapidly train, upskill, and hire residential electricians, EVSE technicians, and EV technicians to meet the growing need for EVs and their supportive equipment. For instance, the TEP Roadmap has set a goal for 30% of light-duty private vehicles to be electrified by 2028, meaning LA County residents must adopt **1.7 million new EVs** by 2028 and LA County must have the supportive charging infrastructure necessary to sustain those vehicles.



Workforce Demand

The table below demonstrates the current workforce size and projected need by 2028 for each of the priority occupations (electricians, EVSE technicians, and EV technicians). A series of statewide policies aim to increase EV and EVSE uptake may help unlock and accelerate this workforce demand (see Needs Assessment for more details).

[3]Per data collected through September 2024. More recent data may have emerged since this research was completed due to the rapidly evolving nature of the industry.

Occupation	Current workforce in LA County	Projected need to meet TEP goals by 2028	Impact/Takeaway
Electricians	**15,000** electricians	**1,000** residential electricians **260** EVITP certified commercial electricians	There is an overarching shortage of electricians in LA County compared to national averages.* Electricians will face greater demand pressures as other industries electrify, meaning the workforce must expand to accommodate electrification needs, including those of the EV and EVSE industries.
EVSE Technicians	**N/A** - Lack of accurate data on current workforce size	**1,500** EVSE technicians to support public and private chargers	This is an emerging occupation and will require significant investment to build up a new workforce.
EV Technicians	**80-460** ASE-EV certified technicians **16,400** general automotive service technicians	**4,850** ASE-EV certified technicians (for light-duty vehicles and buses)	As more EVs enter the market and LA County implements policies to increase the uptake and sharing of EVs, more auto service technicians and mechanics will need to learn how to operate on EVs.

*LA County currently has a shortage of 7,200 electricians to meet the national ratio of electricians to households of 6.6 electricians per 1,000 households.In speaking with industry experts, there are enough commercial electricians to meet demand from current union contracts, however, there is a shortage of electricians for non-unionized and residential work. In the long-term, the region will need to increase the workforce for both types of electricians to meet its ambitious electrification goals.

Electricians

To meet the demand for public, Level 2 and DC Fast Charging (DCFC) chargers needed by 2028, LA County will need an estimated **260 EVITP certified commercial electricians***, in addition to other related jobs. To meet demand for private, Level 2 chargers, LA County will need an estimated **1,000 residential electricians.**

With 15,000 certified electricians currently in LA County, there may appear to be enough electricians to meet demand base EVSE installation needs. However, LA County must ensure the current and incoming electricians have EVSE installation expertise, requiring potential upskilling or additional training for both residential and commercial electricians in how to install Level 2 chargers (residential and commercial) and DCFC chargers (commercial). Moreover, as more industries electrify as well, there will be increasing competing demands for electricians across other clean energy jobs, further emphasizing the need to expand the electrician workforce.

EVSE Technicians

To meet the demand for EVSE maintenance and repair by 2028, LA County will need approximately **1,500 full-time, ongoing EVSE maintenance jobs.** According to industry stakeholders, over 95% of EVSE maintenance needs are not electrical, meaning an EVSE technician, rather than an electrician, can be called to fix EVSE issues. EVSE technicians help maintain EV chargers and can, on average, maintain around 200 chargers per year. As EVSE is an emerging and evolving industry with little standardized nomenclature and data, most EVSE technicians will be new to the workforce or transitioning from other technical industries. Whether these jobs are filled by electricians, who already face competing demands, or emerging EVSE technicians will depend upon support for startups, standardization of training, and inclusion of EVSE technicians as an option in maintenance contracts for newly installed public and privately-shared chargers**.

* According to IBEW Local 11 there are enough EVITP certified electricians to meet demands through 2030.
**IBEW Local 11 strongly believes that any work involving line voltage on EVSE must be completed by a licensed electrician to ensure safety and quality.

EV Technicians

LA County has over 16,000 automotive service technicians and mechanics, however few have certifications like the ASE-EV certification to maintain electric vehicles. While EVs have fewer parts and generally require less maintenance than internal combustion engine (ICE) vehicles, as more residents of LA County drive EVs, the demand for mechanics and technicians with EV maintenance skills has grown exponentially. LA County's strong presence of existing, traditional mechanics with transferable skills suggests a strong case for upskilling the existing automotive technician and mechanic occupation workforce to meet the need for EV maintenance. Overall, to meet both current need and future EV maintenance needs by 2028, LA County will need approximately **4,400 additional EV-certified technicians for light-duty EVs,** and an additional **450 electric bus technicians.** LA County will also need additional EV technicians to service non-bus medium-duty and heavy-duty vehicles. As of 2023, there were only 310 such vehicles in LA County, compared to nearly 400,000 light-duty EVs.[4] Given this small EV fleet size and an anticipated slower EV adoption rate, there is likely minimal additional demand from these vehicles in the short-term through 2028.

Skillset Demand

Most EV and EVSE occupations and their associated career pathways are quickly evolving as the industry grows. Job training that is industry-driven and primarily skill-based, rather than specific to occupational titles, will best cater to an adapting market. To further guide the current and future EV and EVSE job training needs, the needs assessment compiled the most common and relevant skills associated with EVSE maintenance, EV maintenance, and Electrician job postings.

The **specialized skills** in highest demand among Electrician, EVSE maintenance, and EV maintenance occupations in LA County included:

Electric Vehicle Skills[5]	Electric Vehicle Charger Installation[6]	Field Service Management
OSHA and other safety standard trainings	High Voltage Systems	Electromechanics and Electrical Systems
Electrical Wiring and Electrical Equipment	Low Voltage Systems	Hand Tools

[4]Data for light-duty and medium - and heavy-duty zero emissions vehicle counts from the California Energy Commission as of 2023 for LA County.

[5]Includes understanding the unique components and systems that power EVs, such as the motor, battery, and charging system (Lightcast).

[6]Encompasses knowledge of electrical systems, safety protocols, and compliance with local regulations to ensure proper functionality and safety of the installation.

The **common skills** in highest demand among Electrician, EVSE maintenance, and EV maintenance occupations in LA County included:

Communication	Customer service	Operations
Management	Problem Solving/Troubleshooting	Physical Lifting Ability
Good Driving Record	Computer Literacy	

The **qualifications** in highest demand among Electrician, EVSE maintenance, and EV maintenance occupations in LA County included:

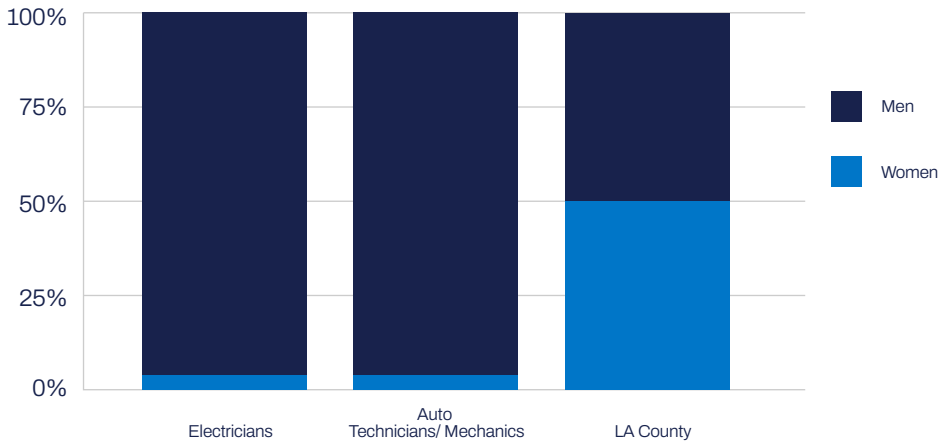
Valid Driver's License	Automotive Service Excellence (ASE) Certification	Electric Vehicle Infrastructure Training Program (EVITP) certification
Commercial Driver's Licenses (Class C or A)	CPR Certification	Forklift Certification

Key Findings

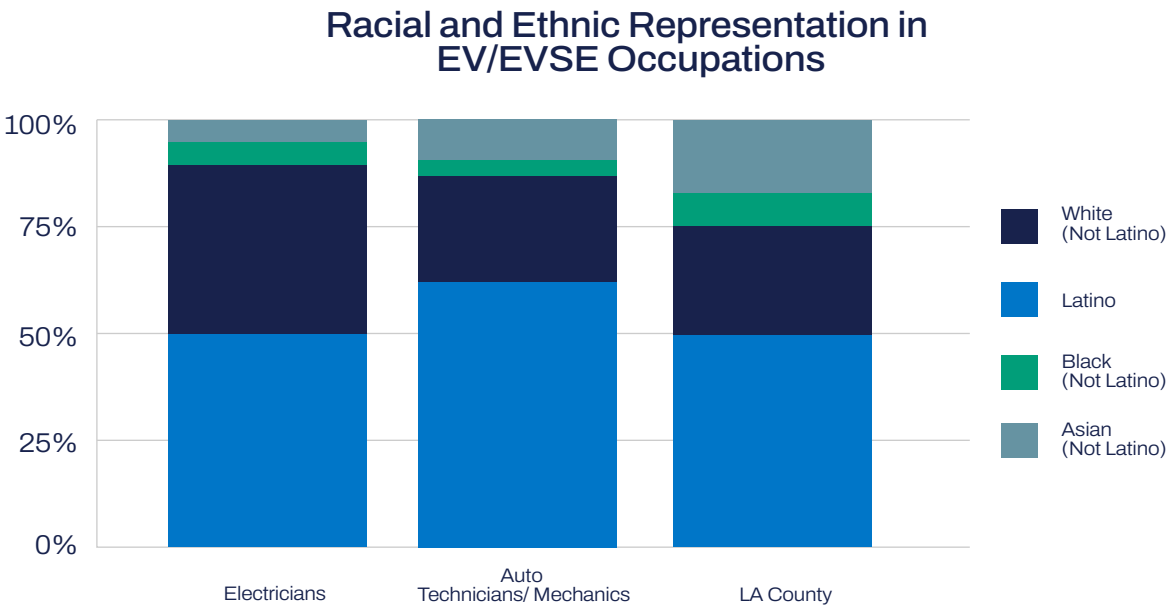
Representation and Inclusion of EV and EVSE Occupations

EV and EVSE jobs in LA County are primarily held by white and Latino men. Women, Black and Asian residents are severely underrepresented in these occupations. Though there is no existing data on the demographics of EVSE technicians in particular, local partners have noted anecdotally an underrepresentation of women and Black residents in the workforce. The GJRP Roadmap aims to explicitly address this disparity through its guiding principles, as well as through setting targets for increased equity and inclusivity in EV and EVSE occupations. The Roadmap also names strategies and actions to achieve these goals and ensure that the EV and EVSE industries are representative of and actively supporting Black workers and women in these industries across LA County.

Gender and Gender Representation in EV and EVSE Priority Occupations[7]



[7]These figures do not include EVSE technicians since it is an emerging occupation without uniform reporting.



Residential Charger Installation

While the greatest number of installations are expected for residential or at-home chargers, the occupational need is relatively straightforward and quick, only requiring an electrician to oversee the installation of the charger and potentially undertake electrical panel upgrades. On the other hand, public charger installation is more complex with installation of multiple charging units and higher voltage needs. This work often requires the coordination of multiple occupations, including electricians, planners, contractors, utilities workers, and permitting administrators.

Though there is the greatest need for residential installations, the residential sector has lower-paying jobs and less job security and protections and, as a result, is generally less attractive to electricians. Specific data on the difference in wages between residential and commercial electricians was not available, but, in other building trades such as construction, residential workers earn on average 33 percent less than non-residential workers.[8]

[8]Littlehale, S. (2019). Rebuilding California: The Golden State's Housing Workforce Reckoning. Smart Cities Prevail. https://www.smartcitiesprevail.org/wp-content/uploads/2019/01/SCP_HousingReport.0118_2.pdf

Upskilling vs. New Training

The current automotive technician and electrician workforces are sizable and have many existing skills needed to transition to EV maintenance and EVSE installation respectively, meaning much of the workforce for these occupations can come from retraining and upskilling.

As EVs become ubiquitous in LA County, automotive technicians will need to learn EV maintenance skills to adapt to a changing market. If LA County focuses its efforts on retraining and upskilling for these occupations, the region will be able to meet a significant amount of its demand by 2028.

EVSE technicians, unlike EV technicians and electricians, may require hiring a new workforce because the occupation is emerging. Many other occupations with technical and mechanical skills may have transferable skills for EVSE technicians. However the county will require significant investment in training new EVSE technicians. EV and EVSE maintenance training should also be standardized to ensure the incoming workforce can be efficiently trained and to ease the burden on employers to provide additional, specialized training based on the EV or EVSE manufacturer.

Naming and Data Tracking

This research has highlighted the imperfect and speculative nature of EV and EVSE industry data. To improve data collection and tracking of the industry's needs and growth moving forward, the EV and EVSE industries should develop:

1. Shared language and definitions for EV and EVSE occupations, including job titles and standard qualifications and certifications required for each role.

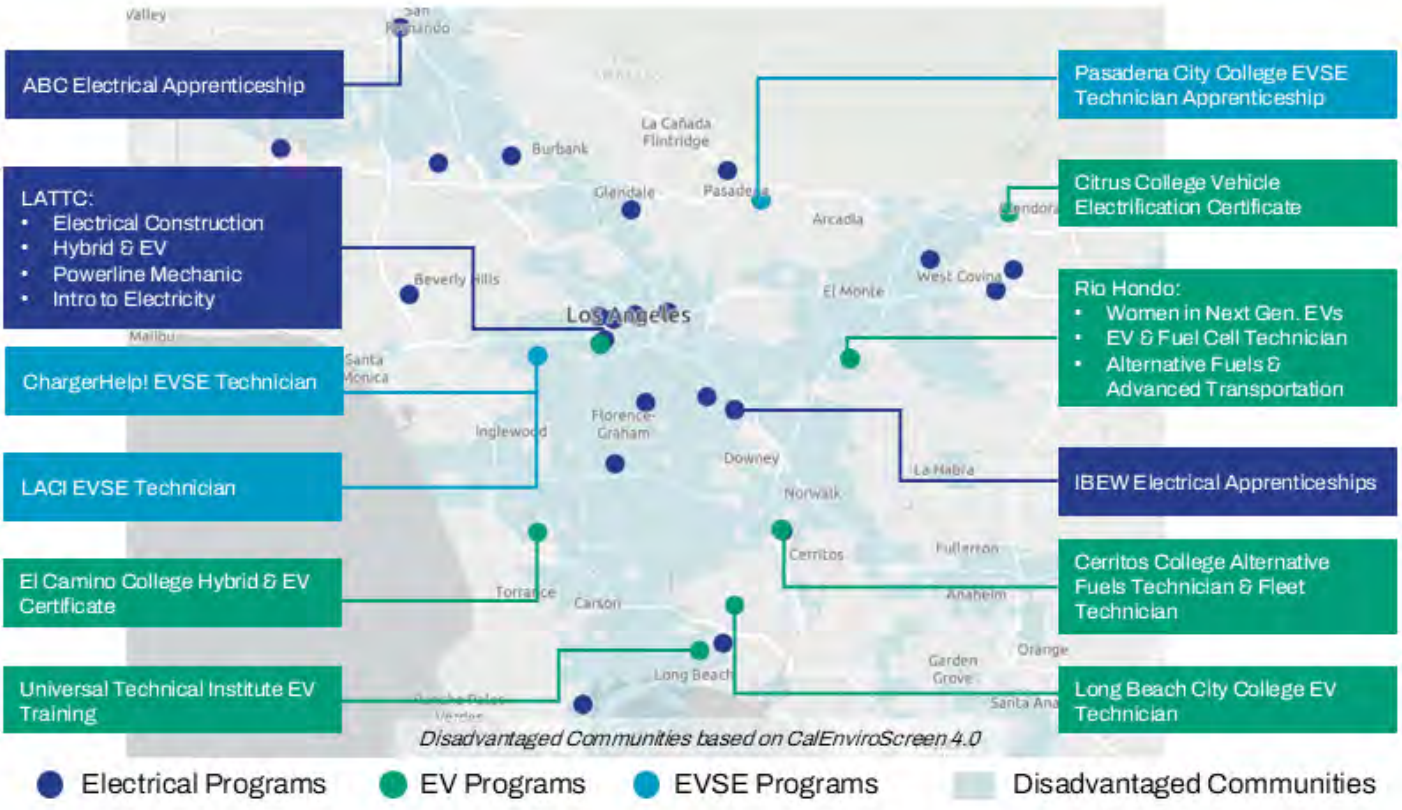
2. A unique and recognized set of SOC or O*NET codes specific to EV and EVSE occupations to ensure these occupations can be separated out in data analysis from larger codes that may encompass all electricians or all mechanics.

Research Group Insight

> For an EVSE technician to touch any charger, they are required to have multiple baseline trainings, in addition to manufacturer-specific trainings. Trainees are often required to pay for other OEM trainings as well. The lack of standardized trainings becomes a significant barrier to EVSE technicians being able to service a wide range of EV chargers, particularly with the rapidly evolving nature of the industry.
>
> **~ Kianna Scott, ChargerHelp!**

Training Landscape

As established in the Workforce Needs Assessment, meeting LA County's transportation electrification goals will require an increase in the supply of skilled workers. The projected demand for priority occupations exceeds the current workforce, indicating a need to both train new workers and upskill or reskill existing workers. The Training Landscape maps existing programs for priority occupations in transportation electrification (EV and EVSE), and identifies gaps based on the projected demand in the Workforce Needs Assessment.



LACI Alumni Spotlight

Alexis Gallardo

Born and raised in East Los Angeles, Alexis is a dedicated and driven individual currently pursuing a Bachelor's degree in Mechanical Engineering at Cal State LA. Passionate about cars, sustainability, and the outdoors, Alexis participated in LACI's Youth EVSE Maintenance Fellowship, gaining technical skills and important certifications in safety (OSHA 10, NFPA 70E), along with crucial soft skills training in networking and communication. With LACI's support, Alexis secured a role at Tesla as a Service Technician Trainee where she expanded her technical expertise by diagnosing vehicle issues and performing essential maintenance. Alexis credits LACI's comprehensive workforce development program and dedicated mentorship with significantly advancing her professional growth. Looking forward, Alexis aims to graduate as an engineer, explore solar technology, fulfill a passion for Formula 1 racing, travel with loved ones, and ultimately pursue opportunities abroad in Europe.

Electrical Training Programs

The primary electrician training programs in the county are run through the International Brotherhood of Electrical Workers (IBEW) and the Associated Builders and Contractors (ABC), supplemented by programs at the Los Angeles Trade Technical College, LAUSD's Division of Adult and Career Education, and other school districts and community colleges throughout the region.

Training Gaps and Challenges:

Scale: unlike other EV and EVSE occupations, electricians are a well-established trade with several apprenticeship programs throughout the County. Even so, the majority of current programs are not operating at a large enough scale to meet projected demand.

Specialization: Electricians who work on EVSE need additional specialization (e.g. EVITP and others mentioned above). The number of residential electricians trained to work on EVSE projects will need to be scaled dramatically across the county.

EVSE Technician Training Programs

EVSE Technicians are responsible for the diagnosis and repair of non-electrical problems on EV Chargers, which make up more than 95% of charger errors.[9] EVSE Technician programs are in short supply: only four exist across LA County, limiting geographic coverage and proximity to lower-income and under-resourced communities. Some employers may offer on-the-job training, but these positions tend to require a baseline of experience that makes them less accessible to workers looking to enter the EVSE workforce for the first time. Successful programs from LACI and LACI alumna company ChargerHelp! should be scaled across the county to meet demand.

Training Gaps and Challenges:

Lack of standardization: Program participants receive basic training applicable to all or most chargers, but after completing basic training students must still receive manufacturer-specific training for each company whose chargers they service. Increasing standardization across manufacturers would increase the efficiency of programs (and the resulting workforce).

Digital literacy: Workers who enter training programs without basic computer literacy skills must first make up that knowledge before they can be trained on the specifics of charging stations. Digital literacy skills gaps disproportionately impact students of color.

EV Technician Training Programs

Electric Vehicle technician programs are prevalent throughout the county, typically as part of "alternative fuels" programs that focus on a combination of hybrid, electric, and other non-ICE vehicles. Many offer options for either a certificate or an associate degree, maximizing accessibility for workers. Many programs are on the edge of lower-income and under-resourced communities, but the core of communities are not well served, as explained below.[10]

Training Gaps and Challenges:

Re-Skilling: Los Angeles has an existing network of mechanics who service ICE and Hybrid vehicles. These workers have a strong base of knowledge and could easily service EVs with the proper training, but most existing training programs are geared towards new workers rather than re-skilling. New programs may be needed that are more tailored to this population.

Hands-On Training: Current training programs provide a strong base of knowledge, and many offer hands-on training. However, employers reported that new employees are often lacking both knowledge and confidence in technical skills. Finding opportunities for programs to partner with employers could allow for additional hands-on training.

[9]HR&A Interview with ChargerHelp! on September 6, 2024

[10]Within California, "lower-income" and "under-resourced" communities are often referred to as Disadvantaged communities (DACs) as established by SB 535. DACs in California are specifically targeted for investment of proceeds from the state's Cap-and-Trade Program aimed at improving public health, quality of life and economic opportunity in California's most burdened communities, and at the same time, reducing pollution that causes climate change. SB 535 Disadvantaged Communities

Other Training Programs

Other training programs relevant to EV and EVSE but not neatly contained within the preceding categories include building trades pre-apprenticeship programs, BYD's apprenticeship program, and a Fleet Technician program at Cerritos College. Additionally, career technical education (CTE) and vocational schools provide exposure to electrician careers and exposure to basic skills that can serve as a foundation for electrician training programs.

Additional Gaps and Challenges

- **New and Incumbent Workers:** Existing training programs for EV and EVSE roles are primarily geared towards new workers, but one of the largest needs is retraining existing mechanics to work on electric vehicles. Stakeholders identified a need for two changes: 1) dedicated reskilling programs for auto mechanics interested in working on EVs, and 2) greening existing ICE programs to train future mechanics to work on EVs.

- **Quality of Programs:** Ensuring alignment between training programs and employer needs is difficult in an industry changing as rapidly as transportation electrification. Stakeholders noted some gaps in alignment, particularly when it comes to hands-on learning. Defining a common baseline for entering the field would help ensure a high standard of training across programs.

- **Funding and Policy:** Training is expensive and can be cost-prohibitive both for workers and for employers. Grant funding could help fill this gap, offering funding to employers to provide meaningful on-the-job training for new or re-skilled workers. Wraparound services are also critical and should be treated as a necessity for any training program. Lastly, many stakeholders noted that undocumented workers cannot be the beneficiaries of federal workforce development funding, creating a significant challenge in a county like Los Angeles with a large undocumented population.

- **Outreach and Recruitment:** Many occupations in the EV and EVSE industry do not reflect the diversity of LA County, particularly for Black residents and women. Exposure programs and pre-apprenticeship programs can help increase representation by broadening the audience of people who are aware of new and emerging jobs.

- **Timing of Job Creation:** The timing of demand for emerging industries is often unclear, and employers and training partners can end up training workers for jobs that are not yet available. Training programs should emphasize transferable skills that are not isolated to one role, creating a more resilient workforce that can adapt to the changing needs of the industry.

LACI Alumni Spotlight

Marshawn Porter

Marshawn worked in facilities maintenance and as a freelance graphic designer before pivoting into the green economy. He participated in ChargerHelp!'s EVSE maintenance technician program, where he developed both soft and technical skills, earned certifications in electrical safety and EVSE maintenance, and became one of ChargerHelp!'s first technicians. LACI's Green Job Gazette newsletter provided Marshawn with the support necessary to gain familiarity with industry standards and trends, including referencing salaries to negotiate competitive pay. With additional experience, Marshawn transitioned from technician to trainer, where he now focuses on supporting career transitions in the EVSE space.

Workforce Barriers to Overcome

Based on the findings from the Workforce Needs Assessment and Training Landscape key barriers emerged that must be addressed to ensure the LA County's workforce is effectively and equitably prepared for emerging careers in EV and EVSE industries. Addressing these barriers is a central focus of the Roadmap.

Program Development

- Few EVSE training programs, trainers, and facilities/equipment for training
- Few EV retraining programs for ICE mechanics
- Lack of open source curriculum
- Constant evolution of new technologies; training is developed after new technologies emerge rather than concurrently
- Lack of awareness and inequitable access to high-road green jobs
- Lack of representation of women, and Black and Asian residents in EV and EVSE training and trades
- Perceived and real gender barriers
- Inconsistent provision of support services
- Supports are not catered to individual needs
- No standardized training for emerging technology with multiple OEMs
- Lack of awareness of necessary skillsets
- Lack of awareness of skill transferability for those entering the green economy
- Businesses often disagree on skillsets, certifications, and degrees critical for middle-skill occupations

Advocacy and Policy

- Lower job quality for manufacturing jobs and residential electrician work
- Undefined sector and career pathways
- Low representation of women and Black workers
- Lack of statewide data collection to track green jobs
- Under-resourced small, minority and women-owned businesses that cannot afford to train and hire new employees or pay higher wages

LACI Alumni Spotlight

Esmerelda Casteneda

Esmerelda pivoted into the electrical field from another industry, first enrolling in the Los Angeles Trade-Technical College's electricians program. Seeking additional support to refine her skills, Esmerelda enrolled in ChargerHelp!'s all-Women EVSE Maintenance Technician program, which she found through social media. Prior to this program, Esmerelda had never even been inside an electric vehicle. After the program, she came away with in-depth knowledge of the different types of chargers, speeds of charging, connections, and the communication involved between the car and the charger. The community aspect of the program was a critical part to her career journey since the program's conclusion–the network she has maintained from the program has made the job placement process easier. After the program, Esmerelda secured an internship with the County and worked at ReJoule, a company that creates technology to provide fast and accurate measurements of batteries' state of health.

Funding

- Lack of Federal funding for undocumented workers
- Lack of financial resources for local businesses to be profitable and contribute to high quality green jobs in California
- Lack of funding around recruitment, training, and placement

Resources and Data

- Lack of labor market information
- Siloed workforce development ecosystem
- Inability to track placements of EV and EVSE jobs
- Lack of standardized job descriptions and identified career pathways

LACI Alumni Spotlight

Lee Salazar Chavez

Lee Salazar Chavez, originally from Los Angeles and later Portland, Oregon, has worn many hats as a dedicated single parent, activist, interpreter, and educator with a strong passion for inclusivity and multicultural education. Returning to LA in 2018 due to health challenges, Lee transitioned into technology, enrolling as a CIS student at LA Trade Tech, and subsequently joining LACI's IT Support Fellowship. Through LACI's intensive training bootcamp, Lee developed valuable technical expertise in computer troubleshooting, network setups, and data security, earning certifications including ITIL4 and advancing toward CompTIA A+ certification. Lee further applied these newfound skills through an internship with SEED, tackling diverse projects from researching community-aligned initiatives to developing app mockups and exploring workflow platforms. Grateful for LACI's comprehensive professional development and career coaching, Lee now plans to deepen their tech skills, pursue personal coding projects, and actively seek opportunities in clean technology, while maintaining their lifelong commitments to activism, gardening, and community engagement.

Where we are headed 2025 - 2028

Over the next year the Green Jobs Regional Partnership will build out **Advisory** and **Working Groups** with key transportation electrification employers, education and training providers, public agencies, local governments, labor, CBOs, Funders and others key to the implementation of Roadmap strategies and actions. As a group we will identify specific actions to implement within the Roadmap to help reach our collective goal of preparing and placing 7,610 people in high-road EV and EVSE jobs by 2028. Once actions are identified, we will work collectively to create, implement and track our progress with relevant data-driven metrics that align with Roadmap targets.

New GJRP Partnership Structure

As a reminder, our 2028 Roadmap Strategies are as follows:

Strategy 1	Expand availability of training programs for the EV and EVSE industries.
Strategy 2	Enhance and diversity workforce training programs and business support services.
Strategy 3	Enhance awareness of careers in the transportation electrification industry.
Strategy 4	Advocate for policies that enable the work of the Green Jobs Regional Partnership.
Strategy 5	Develop resources and data collection processes that enable the work of the Green Jobs Regional Partnership.
Strategy 6	Pursue public and private funding that supports the work of the Green Jobs Regional Partnership.

Preliminary solutions GJRP is working on:

GJRP has already begun the work. We've identified pilot projects and funding sources, developed strategic partnerships and created resources to begin implementation of Roadmap strategies and actions. GJRP has already secured funding for a **Labor Market Analysis and Employer Survey** from the Families and Workers Fund for EV and EVSE occupations and will start that work Q2 2025.

Strategy 5 Develop resources and data collection processes that enable the work of the Green Jobs Regional Partnership.

5.1 **Conduct labor market analysis for EV and EVSE occupations,** including an evaluation of EV adn EVSE job and skill demand analysis. This analysis should also include developing a formal evaluation with industry advisors and community colleges that uses job demand, outlook, and skill requirements to inform community college curriculum development.

Additionally, GJRP has already invited people into the Program Development working group, including CBOs, EVSE-employers, training providers and public agencies to help scale ChargerHelp!'s EVSE Operation and Maintenance Technician Training to LAUSD's Harbor Occupational Center and LA Harbor College.

Strategy 1 Expand availability of training programs for the EV and EVSE industries.

1.3 **Initiate pilot programs to introduce training** to underrepresented communities through existing workforce development ecosystem partners.

Research Group Insight

> Many EV technician trainees bring valuable theoretical knowledge from trade-tech programs, and with additional hands-on training and real-world experience over time, they continue developing into fully prepared professionals. Gaining practical experience plays a key role in enhancing their employability.
>
> **~ Andrew Pontius, Evolectric**

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