HIGH ROAD TRAINING FOR LITHIUM VALLEY: Opportunities and challenges

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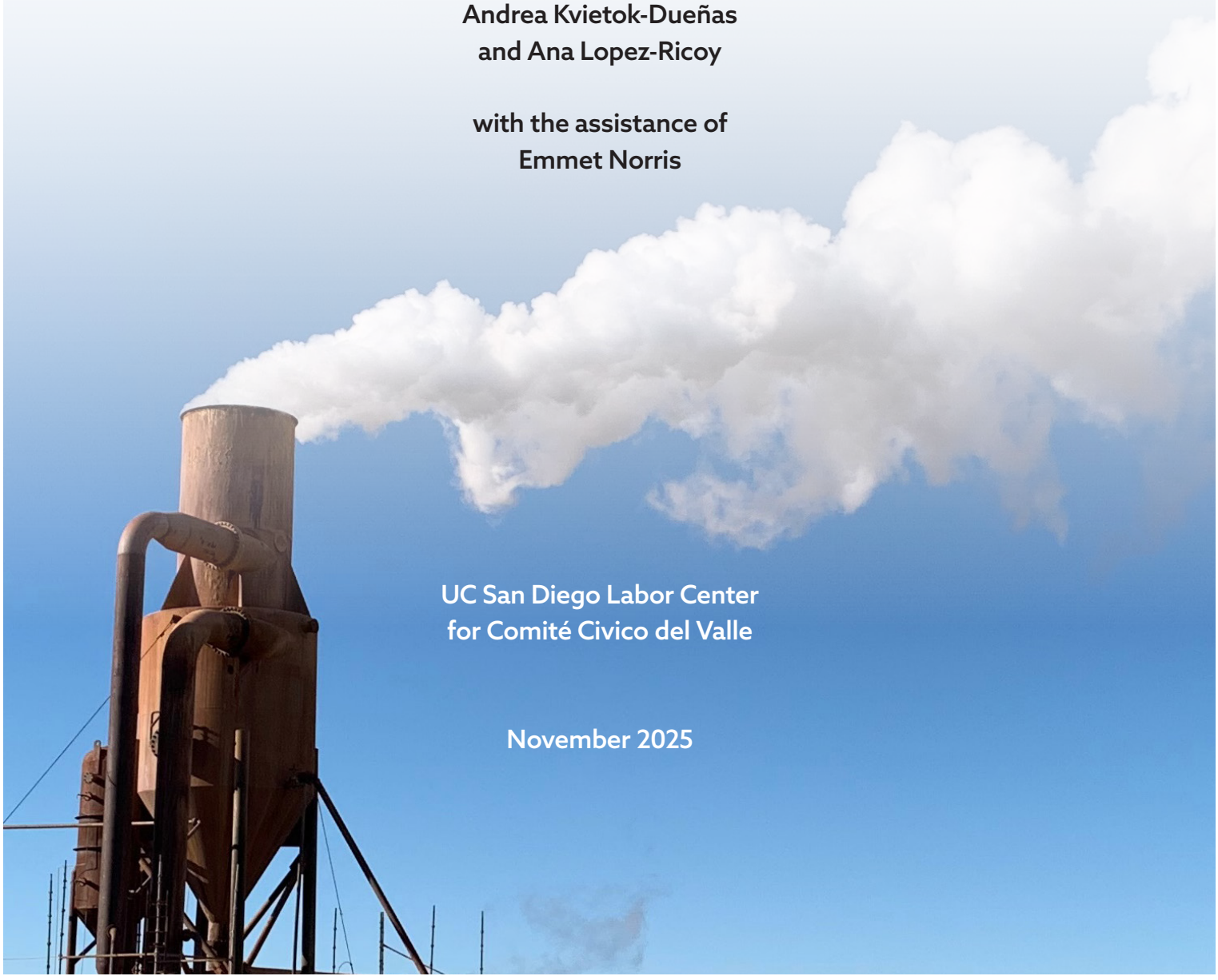

UC San Diego Labor Center
for Comité Civico del Valle

November 2025

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EXECUTIVE SUMMARY

Lithium Valley is the name policymakers have given to a vision of industrial development in the renewable energy storage and materials sector that could transform the Imperial Valley of California. Imperial County, where the valley is located, has the highest poverty rate in all of California and the highest unemployment rate in the entire United States, but it is rich in underground reserves of lithium, a mineral that is essential to the modern lithium-ion storage batteries that power the renewable energy transition. Three companies are developing local facilities in Imperial County for direct lithium extraction (DLE) from geothermal brines. The purpose of this report is to describe the opportunities for, and challenges to, developing a regional industry cluster, spanning the value chain from lithium extraction to battery manufacturing, that will increase economic opportunity for all of the residents of Imperial County.

Our key findings and recommendations are as follows.

1. Lithium Valley faces a choice between high-road and low-road development

There is an opportunity to turn the mineral reserves under the Salton Sea into a source of accessible, long-term, family-supporting employment for residents of Imperial County. We refer to this as the opportunity to create *high-road* employment, by which we mean employment that:

- Is accessible to workers who do not have a college degree;
- Provides the opportunity for long-term careers;
- Provides family-supporting wages and benefits;
- Has strong protections fo health and safety, and
- Provides for workers to have a voice on the job.

High-road development means development that creates high-road jobs. Stakeholders will have to choose high-road development and collaborate to make it possible. The alternative is *low road* development, in which companies extract lithium at a heavy cost to the environment and communities of Imperial County, and provide few good jobs in exchange.

2. Imperial County's workforce needs high-road development

Imperial County has a young and growing workforce for whom high-road employment could make a big difference. Most working-age residents have not attended or completed college. Many county residents are out of work. Single-earner families are the norm. Half of all working-age adults have related children in the household. The fastest-growing occupations pay minimum wage. The development of high-road employment in the County has the potential to transform the lives of tens of thousands of county residents.

3. High-road development will require expanded training capacity

The prospects for high-road development in Imperial County depend on whether Lithium Valley can bring more jobs than just the construction and operation of lithium extraction facilities.

- If investment in Lithium Valley brings 1,000 construction jobs, the County might see 538 potential high-road jobs created.
- If it brings 2,000 jobs in geothermal power and direct lithium extraction (DLE), the County might see 2,163 potential high-road jobs created, almost half of them plant operators.
- If it brings 7,000 jobs in battery manufacturing plus 2,000 jobs in geothermal power and DLE, the County could see 4,316 potential high-road jobs created.

One one hand, the greatest number of high-road jobs in the lithium battery supply chain are in manufacturing, and the prospects for high-road development of Imperial County therefore depend on from bringing battery manufacturing facilities to the Imperial Valley. On the other hand, highly-skilled jobs in battery manufacturing are different from the existing industrial base of Imperial County. The region will need to increase its training capacity to ensure that residents have the skills they need to take high-road jobs in battery manufacturing.

4. High-road jobs in Lithium Valley will require training

Virtually all of the high-road employment in the renewable energy storage and materials sector requires some postsecondary training, whether in the form of an apprenticeship or another industry certificate program. Our projections show that between 75% and 85%

of the potential high-road jobs in the Lithium Valley scenarios we consider are likely to be in *apprenticeship* occupations, in which a registered apprenticeship program could provide the best model of training. But in many cases, there may be too few jobs in a specific occupation to make it feasible to establish a stand-alone local apprenticeship program for that occupation. Local training providers do not yet have the capacity to meet the demand for skilled labor in the most expansive Lithium Valley scenarios.

5. Residents report many barriers to high-road employment

To identify additional barriers to high-road employment, our team of 25 interviewers surveyed 214 working-age residents of Imperial County, chosen to represent different geographic areas and to approximate the social and demographic characteristics of the workforce. The residents who spoke to us identified several different barriers and challenges, including all of the following.

Barriers to education and training. Residents told us that good jobs are only available to those with postsecondary education. Many residents found it hard to find affordable and accessible course offerings close to home. Many Spanish-speaking residents reported difficulty finding the English language instruction they needed to advance their careers.

Barriers to acquiring information about opportunities. Residents found few jobs posted online. Job postings rarely communicate what level of English proficiency is required. Some residents told us that employment centers referred them out of the County. Many residents told us that they had trouble finding opportunities because the labor market in Imperial County is too dependent on informal job referrals: describing their challenges finding employment, many residents repeated versions of the phrase, "It's not what you know, it's who you know."

Challenges with transportation. Residents told us that public transit in Imperial County is limited and unreliable. They also told us driving is expensive, and they expect the poor quality of the roads in the geothermal resource area to make commuting to employment in lithium extraction particularly costly. Some residents reported negative experiences with immigration enforcement while going to or from work. Respondents saw all of these as barriers to taking lithium-related jobs in northern Imperial County.

Challenges with child and dependent care. Many residents told us of challenges with the cost or schedule of childcare. Residents who were caregivers told us they need flexible work hours. Many residents report reliance on unpaid female family members to provide care.

Low levels of trust in employment promises. Many interviewees doubted that lithium extraction could bring good jobs for residents of the Imperial Valley. Some residents told us of potential labor and employment law violations on the job. Many residents said that they felt they had to put up with substandard employment conditions because better jobs are allocated unfairly and uncompetitively: in the words of one interviewee, "if you ain't family, you ain't hired." Many residents believe that new companies hire preferentially outside of Imperial County. Residents fear that any good jobs that come to Imperial County will be filled by outsiders, leaving them with no better opportunities than they had before.

6. Recommendations

6a. Plan for the high road in renewable energy storage and materials

The transition to renewable energy requires more than renewable energy generation. It also requires a large increase in the supply of lithium-ion batteries to store that energy when it is generated and release it when it is needed. Planning for the renewable energy transition therefore requires the State of California to plan for extraction of lithium and other critical minerals, and for the manufacturing of lithium-ion batteries. Planning for the Southern Border region should include plans to support the development of high-road employment in lithium extraction. Industrial policy should include the renewable energy storage and materials sector. In order to make workforce planning possible, employers and other stakeholders in these industries should make employment projections as specific and transparent as possible.

6b. Make high-road jobs accessible by planning to provide outreach, transportation, and child- and dependent-care

Lithium companies, and companies planning to develop battery manufacturing in Imperial County, should make specific commitments to hire locally and increase access for people not traditionally employed in high-road jobs, including but not limited to women and people of color. We recommend Community Benefits Agreements (CBAs) among employers, labor organizations, and community organizations, to provide for monitoring and transparency in local hiring commitments, and to assist with outreach to, and training of, community members for apprenticeship occupations.

Making high-road jobs accessible also requires overcoming barriers associated with transportation and dependent care. Stakeholders should look for opportunities to improve the infrastructure for transportation to work, and provide transportation subsidies for residents who need to commute to the geothermal resource area in northern Imperial County. Employers should consider scheduling policies that allow workers to combine high-

road jobs with dependent care responsibilities. Employers and other stakeholders should look for opportunities to provide child and dependent care where and when it is needed to help Imperial Valley workers succeed in high-road jobs.

6c. Expand access to training

The high-road vision of Lithium Valley requires more local training capacity. Employers, unions, and training providers should look for opportunities to collaborate in establishing apprenticeship programs that can allow Imperial County residents to earn a good wage while they learn a trade. They should also look for opportunities to share the administrative cost of smaller, occupation-specific training programs that might not be viable as standalone programs in Imperial County. Stakeholders should subsidize transportation and childcare for Imperial County residents who pursue apprenticeships or other postsecondary training that requires travel, so that residents can pursue training elsewhere and return to Imperial County to work in lithium extraction or battery manufacturing. Employers and training providers should with community partners to expand outreach.

6d. Formalize a long-term high-road training partnership

The development of Lithium Valley will take many years, and employers, unions, community organizations, and training providers should formalize partnership agreements to facilitate cooperation for the long term. Community Benefits Agreements (CBAs) provide a well-tested model for partnerships that can meet employers' needs for a skilled workforce, residents' need for access to high-road jobs, and workers' needs for training and family-supporting careers.

CHAPTER 1. LITHIUM VALLEY: HIGH ROAD OR LOW ROAD?

Lithium Valley is the name policymakers have given to a vision of industrial development in the renewable energy storage and materials sector that could transform the Imperial Valley of California. The Imperial Valley is rich in minerals and renewable energy but offers little in the way of economic opportunity for many of its existing residents. Imperial County, where the valley is located, has the highest poverty rate in all of California and the highest unemployment rate in the entire United States. Residents interviewed for this report believe that some employers take advantage of the high unemployment rate in Imperial County to pay low wages and impose unfair terms of employment on residents desperate for work. Lithium Valley offers the vision of a better future: the area's rich mineral reserves could alleviate poverty and improve the lives of everyone in the region by providing a source of accessible, long-term, family-supporting jobs in lithium extraction and the manufacturing of lithium-ion batteries.

This report describes opportunities for workforce development to support a vision of Lithium Valley that is both equitable and inclusive, and it describes barriers that will need to be overcome to realize that vision. It reports the characteristics of the current and future workforce of Imperial County, the characteristics of the jobs that might be expected from development of renewable energy and materials, and the training and support that workers and their communities will need to ensure that the development of Lithium Valley takes the high road of strong protections for workers, communities, and the environment. The alternative developmental path is a low road characterized by exploitation of both the area's mineral resources and the area's residents, with few good jobs, low environmental standards, and little regard for the needs of the communities and environments of Imperial County.

We recommend that policymakers and stakeholders to support long-term *high-road training partnerships* that can set development on the high road of strong protections for workers, communities, and the environment. These long-term partnerships can bring industry together with labor unions, training providers, and community residents to ensure that residents have the training and other resources they need to access the high-skilled jobs that can make Lithium Valley a success for all stakeholders.[1]

1 As this summary suggests, we use the name "Lithium Valley" to refer not to a place but to a potential regional cluster of businesses that span the lithium-ion battery value chain, from extraction of lithium ore to manufacturing, distribution, and sale of lithium-ion batteries. The focus of this report is on the opportunities for, and barriers to, high-road

The growing demand for domestically-sourced lithium

The transition from fossil fuels to renewable energy will increase the demand for the alkali metal lithium, an essential ingredient in most rechargeable storage batteries. Electric vehicles (EVs) run on lithium-ion batteries. Renewable energy sources, such as wind and solar power, are intermittent and the power grid therefore depends on lithium-ion batteries to store renewably-generated energy until it is needed. Many computers and other appliances also run on lithium-ion batteries. The International Clean Transportation Council projects that demand for lithium in the US alone could increase by roughly 5% per year through 2032. The McKinsey consulting group, with different assumptions, has projected that the global demand for lithium could increase by more than 25% per year through 2030.[2]

The federal government has made it a high priority to encourage the development of domestic lithium extraction and processing capacity. Most lithium in batteries today–and as much as 98% of all lithium mined in 2020–came from Australia, Chile, or China.[3] Traditional lithium mining takes one of two forms: open pit mining to extract lithium from ore or clay, or open-air evaporation of large brine pools to extract lithium salts from groundwater. Both forms of mining can be highly toxic to workers, nearby communities, and the natural environment. The federal government has identified domestic lithium production as a way to secure the supply of this critical mineral against military or geopolitical disruption, while also providing greater assurance that labor and environmental standards are met in the battery supply chain.[4]

The lithium under Imperial County is uniquely well-suited to meet this demand for domestic lithium in a way that "supports long-term US economic competitiveness and equitable job creation, enables decarbonization, advances social justice, and meets national security

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employment *in* Lithium Valley *for* the residents of Imperial County.

2 Shen, C., Slowik, P., & Beach, A. (2024), *Investigating the US Battery Supply Chain and Its Impact on Electric Vehicle Costs Through 2032*, International Council on Clean Transportation. <https://theicct.org/wp-content/uploads/2024/02/ID-85-%E2%80%93-EV-supply-chain-Report-Letter-70112-v3.pdf>; Acevedo, M., Baczyńska, M., Hoffman, K., & Krauze, A. (2022), *Lithium Mining: How New Production Technologies Could Fuel the Global EV Revolution*. McKinsey & Company. <https://www.mckinsey.com/industries/metals-and-mining/our-insights/lithium-mining-how-new-production-technologies-could-fuel-the-global-ev-revolution>

3 Acevedo et al. (2022); Tracy, B.S. (2022), Critical minerals in electric vehicle batteries, Congressional Research Service, Report R47227. <https://crsreports.congress.gov/product/pdf/R/R47227>

4 Federal Consortium on Advanced Batteries (FCAB) (2021), *National Blueprint for Lithium Batteries, 2021-2030: Executive Summary*, Department of Energy, DOE/EE-2348. <https://www.energy.gov/sites/default/files/2021-06/FCAB%20National%20Blueprint%20Lithium%20Batteries%200621_0.pdf>

requirements."[5] Geologists estimate that there are between 4 million and 18 million tons of lithium carbonate equivalent dissolved in geothermal brines in the porous rock under the Salton Sea.[6] This is not only one of the largest deposits of lithium in the US, it is also one of the most accessible, because the region's hot springs bring lithium to the surface already dissolved in water. Companies using new technologies called direct lithium extraction, or DLE, promise to recover lithium from geothermal brines without the same environmental costs as open-pit mines or open-air brine pools. Although DLE is not yet operating on a commercial scale, initial tests of the technology have shown that it can recover high-quality lithium with less water loss than other forms of mining, which is particularly important in light of California's chronic water shortages and the uncertain future of the Colorado River.[7] It may be especially cost-effective when combined with geothermal power generation. Lithium extraction companies describe their goal as a closed loop in which a combined lithium extraction/geothermal facility first uses superheated brine from the Earth to generate electricity by powering a steam turbine; then extracts lithium from the steam; and then reinjects the remaining water far beneath the earth's surface, where it will dissolve more lithium before returning to the surface as superheated brine once more.

From lithium to jobs in renewable energy storage and materials

Turning the lithium beneath Imperial County into batteries could yield tens of thousands of highly skilled, high-paying jobs. There are many steps involved in the process of taking lithium from the ground and turning it into batteries. They include extracting lithium, refining it, processing it with other compounds to produce cathode-active materials, assembling those materials with other components into battery cells, and assembling those cells into battery packs that can be used to power EVs or store electricity for other uses. For every job in lithium extraction and processing, there may be as many as four or more jobs created in battery manufacturing. In addition to the jobs created at every stage of this process, there are other jobs involved in building, servicing, and supplying both the geothermal plants that extract lithium and the manufacturing plants that use that lithium to produce lithium-ion batteries.[8]

To date, three companies, Berkshire Hathaway Energy Renewables (BHER), Controlled

5 This is the "Vision for the Lithium Battery Supply Chain" published by the Federal Consortium on Advanced Batteries, which includes the US Departments of Energy, Commerce, Defense, and State. See FCAB (2021), p. 5.

6 Dobson, P.; Araya, N.; Brounce, M.; Busse, M.; Camarillo, M.; English, L., et al. (2023), Characterizing the geothermal lithium resource at the Salton Sea, UC Davis, LBNL Report LBNL-2001557, <http://dx.doi.org/10.2172/2222403>

7 Vera, M.L., Torres, W.R., Galli, C.I., et al. (2023), Environmental impact of direct lithium extraction from brines, *Nature Reviews Earth & Environment, 4*, 149–165, <https://doi.org/10.1038/s43017-022-00387-5>

8 Benner, C., Jones, M., Lee, R., Mohanty, P., Slattery, M., Zabin, C., Dhar, V., & Hamilton, C. (2023), *Powering Prosperity: Building an Inclusive Lithium Supply Chain in California's Salton Sea Region*, New Energy Nexus, UC Santa

Thermal Resources (CTR), and EnergySource (ES), have invested in the development of direct lithium extraction (DLE) facilities joined with geothermal power generation in Imperial County. This report will refer to these three companies collectively as the *lithium extraction companies*. CTR has also announced the goal of developing a battery manufacturing campus, with manufacturing facilities to be operated by another company, on a site adjacent to its power plant and lithium extraction facility near Niland.[9] One battery manufacturing company, StateVolt, has also announced the acquisition of a site in the county for the development of a large electric vehicle (EV) battery factory, but there are few specifics available about its plans or the timeline for construction.[10]

How many jobs Lithium Valley will create in Imperial County is uncertain. There are many sources of this uncertainty. The specifics of the lithium companies' plans, including the number and timing of new jobs in lithium extraction, are subject to change. The price of lithium is volatile and many other lithium mines are under development in the US.[11] The future of battery manufacturing in this region is also uncertain, as manufacturers of EV batteries face increasing competition outside of California. The co-location of lithium extraction and geothermal power generation could make Imperial County an attractive location for battery manufacturing, but lithium comprises less than 10% of the materials in a typical lithium-ion battery by weight, so the advantage of reducing shipping costs by locating geographically close to a source of lithium may be outweighed by other factors in choosing where to locate a manufacturing plant.[12]

Lithium extraction alone will not catalyze equitable economic development of the region. The example of Silver Peak Mine in Esmeralda County, Nevada, illustrates that lithium extraction does not automatically attract high-wage manufacturing jobs. Silver Peak, the only operational lithium mine in the US, extracts lithium through brine evaporation, in which lithium-rich brine is dehydrated, leaving behind the lithium salts. Although the workers there earn more than the median income for Nevada, the mine employs only 80 people; experts say that automation allows such a mine to operate with a small, highly-skilled workforce. There is considerable battery manufacturing in Nevada, but the Silver Peak mine has not attracted high-road lithium processing or manufacturing development to Esmeralda County, where the median household income is lower than in Imperial County

Cruz Institute for Social Transformation, and UC Berkeley Goldman School of Public Policy, pp. 45-47.

9 Controlled Thermal Resources (2021), *CTR: Lithium + Renewable Energy Powerfully Combined*, <https://static1.squarespace.com/static/5bbc837993a6324308c97e9c/t/666b93cf230d4e6d0da3a851/1718326231007/CTR+Brochure_June_Website.pdf>

10 Statevolt. (2023), *Statevolt acquires land for 54 Gwh lithium-ion battery factory*. January 23. <https://statevolt.com/2023/01/24/statevolt-acquires-land-for-54-gwh-lithium-ion-battery-gigafactory/>

11 Shen, C., et al. (2024).

12 Benner, C., et al. (2023), pp. 54-55; on the lithium content of lithium-ion batteries, see, e.g., Pagliaro, M. & Meneguzzo, F. (2019), Lithium battery reusing and recycling: A circular economy insight, *Heliyon*, *5*, e01866.

and the poverty rate remains above the national average.[13]

In short: lithium extraction can be a part of a plan for the equitable and inclusive economic development of Imperial County, but realizing that plan will require policymakers and stakeholders to invest in bringing more of the lithium battery value chain to the region, and in ensuring that development takes the high road of accessible, family-supporting jobs.

The high road and the low road are both open

The name "Lithium Valley" evokes the hope that lithium-ion battery manufacturing could pave the way for economic development in Imperial County, much as microchip manufacturing paved the way to the development of Silicon Valley. Many stakeholders hope that this path could mark a *high road* in the renewable energy storage and materials sector: an approach that is better for the environment, workers, and communities than existing practices, and in which companies compete on the basis of their ability to improve product quality, rather than on the basis of their ability to cut costs and avoid regulation.

The metaphor of the high road is useful because it highlights that stakeholders in the regional economy have a choice. There is a low road to economic development in this sector, too. The low road is exemplified by policies and corporate strategies that encourage battery producers to compete primarily by cutting costs at the expense of workers and their communities: by extracting lithium at great environmental cost to neighboring communities, producing cathode-active materials in places with few labor or environmental protections, and manufacturing batteries where workers earn low wages and have little voice on the job.

Examples of the low road are not hard to find in the global battery supply chain. For example, lithium mines in the Atacama Desert of Chile supply minerals for the global battery market, including US automakers, but pay workers very low wages while exacerbating water scarcity and pollution in nearby communities; a 2016 investigative report in the *Washington Post* described "faraway companies profiting from mineral riches while the communities that own the land struggle to pay for sewage systems, drinking water, and heat for schools."[14] Many battery manufacturing jobs around the world also offer low pay and toxic

13 Domonoske, C. (2022), There's a lithium mining boom, but it's not a jobs bonanza, *NPR's All Things Considered*, December 8. <https://www.npr.org/2022/12/05/1140424922/theres-a-lithium-mining-boom-but-its-not-a-jobs-bonanza>; Romsaas, J. (2024), Silver Peak Mine the only source of lithium in the US *Mesabi Tribune*, March 28 <https://www.mesabitribune.com/mine/silver-peak-mine-the-only-source-of-lithium-in-u-s/article_dbffa8c4-a95a-11ed-82c1-1b0b7db2f567.html>; US Bureau of the Census (2024), Quick facts: Esmeralda County, Nevada, <https://www.census.gov/quickfacts/fact/table/esmeraldacountynevada/POP010210>

14 Frankel, T., & Whoriskey, P. (2016), Tossed aside in the 'white gold' rush, *Washington Post*, December 16, <https://

conditions. Even in the US, many EV battery manufacturing plants are being developed in low-wage jurisdictions that lack California's labor, health, safety and environmental protections.[15]

The difference between low-road and high-road development is a choice. The example of Lordstown, Ohio-based Ultium Cells, a joint venture of GM and the battery manufacturer LG Energy Solutions, illustrates the difference between low-road and high-road production in the renewable energy storage sector. When the plant opened in June 2022, it exemplified a low-road approach: starting pay was only $16.50 an hour, turnover was high, and many workers reported that they were exposed to hazardous chemicals, and to unknown, potentially hazardous chemicals that were not labeled at all. Workers at the plant voted overwhelmingly for union representation to address their concerns. After two years of negotiations, a collective bargaining agreement, signed by Ultium and the UAW in June 2024, provides for high-road employment, with a starting wage of $26.91 and increased protections for health and safety, including provision for full-time health and safety representatives to monitor conditions and give voice to workers' concerns about the plant and its operation.[16]

For the remainder of this report, we define *high-road development* as an approach to regional economic development that leads to high-road employment. We define *high-road employment* as employment that is accessible to workers who do not have formal degrees beyond high school and that provides them with all of the following:

- the opportunity for long-term careers,
- family-supporting wages and benefits,
- protections for health and safety, and
- worker voice on the job.

Although a comprehensive high-road approach to regional development also focuses on environmental sustainability, the balance between environmental benefits and harms in Lithium Valley development is beyond the scope of this report, which does not address environmental sustainability, beyond the potential climate-related benefits of development in the renewable energy storage and materials sector.

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www.washingtonpost.com/graphics/business/batteries/tossed-aside-in-the-lithium-rush/>

15 C. Benner et al. (2023), pp. 63-65.

16 United Auto Workers (UAW) (2022), High risk and low pay: Hazardous conditions show standards must be raised at battery plants getting billions in taxpayer dollars, <https://uaw.org/wp-content/uploads/2023/11/Ultium-White-Paper.pdf>; UAW (2024), Victory! What we won at Ultium. <https://uaw.org/wp-content/uploads/2024/06/Ulitum-Graphic-v3.pdf>; Reuters (2024), UAW members at GM's joint venture battery plant in Ohio approve contract, *Detroit Free Press*, June 17, <https://www.freep.com/story/money/cars/general-motors/2024/06/17/uaw-gm-ultium-cells-approve-contract-deal/74123719007/>

A road map of this report

The remaining chapters of this report describe the opportunities for high road development in Lithium Valley and some of the challenges and barriers standing in the way of that development.

Part I provides an overview of the opportunities for high-road development, including a young and growing workforce that is eager for high-road employment, a range of possible future scenarios that could bring thousands of new high-road jobs, and some existing workforce training institutions, to the County. This part of the report draws most heavily on analysis of state and federal data and on interviews with key representatives of labor unions, employers, community organizations, and training providers in Imperial County.

- Chapter 2 describes the Imperial County workforce, including an overview of workforce characteristics, past trends, and future projections.
- Chapter 3 reports projections of local high-road employment by occupation, to identify gaps in skills between the current workforce of Imperial County and the projected industry needs under three different scenarios for Lithium Valley development.
- Chapter 4 describes the training institutions in Imperial County that are preparing workers for the high road and identifies both strengths and weaknesses in the existing training landscape.

Part II describes challenges and barriers to high-road employment as they are perceived by residents of Imperial County. This part of the report draws most heavily on interviews with 214 county residents, recruited in partnership with Comité Civico del Valle, with the aim of interviewing residents with many different geographic, demographic, and social characteristics.

- Chapter 5 describes residents' challenges with transportation.
- Chapter 6 describes the barriers created by the lack of affordable child and dependent care for low-income workers in Imperial County.
- Chapter 7 describes residents' challenges accessing education and training.
- Chapter 8 describes the obstacles that keep residents from learning about job openings and educational opportunities.
- Chapter 9 describes mistrust of, and cynicism toward, outside employers.

Chapter 10 outlines our conclusions and recommendations; an appendix to the chapter describes our sources and methods.

PART I. THE OPPORTUNITY FOR HIGH ROAD DEVELOPMENT OF LITHIUM VALLEY

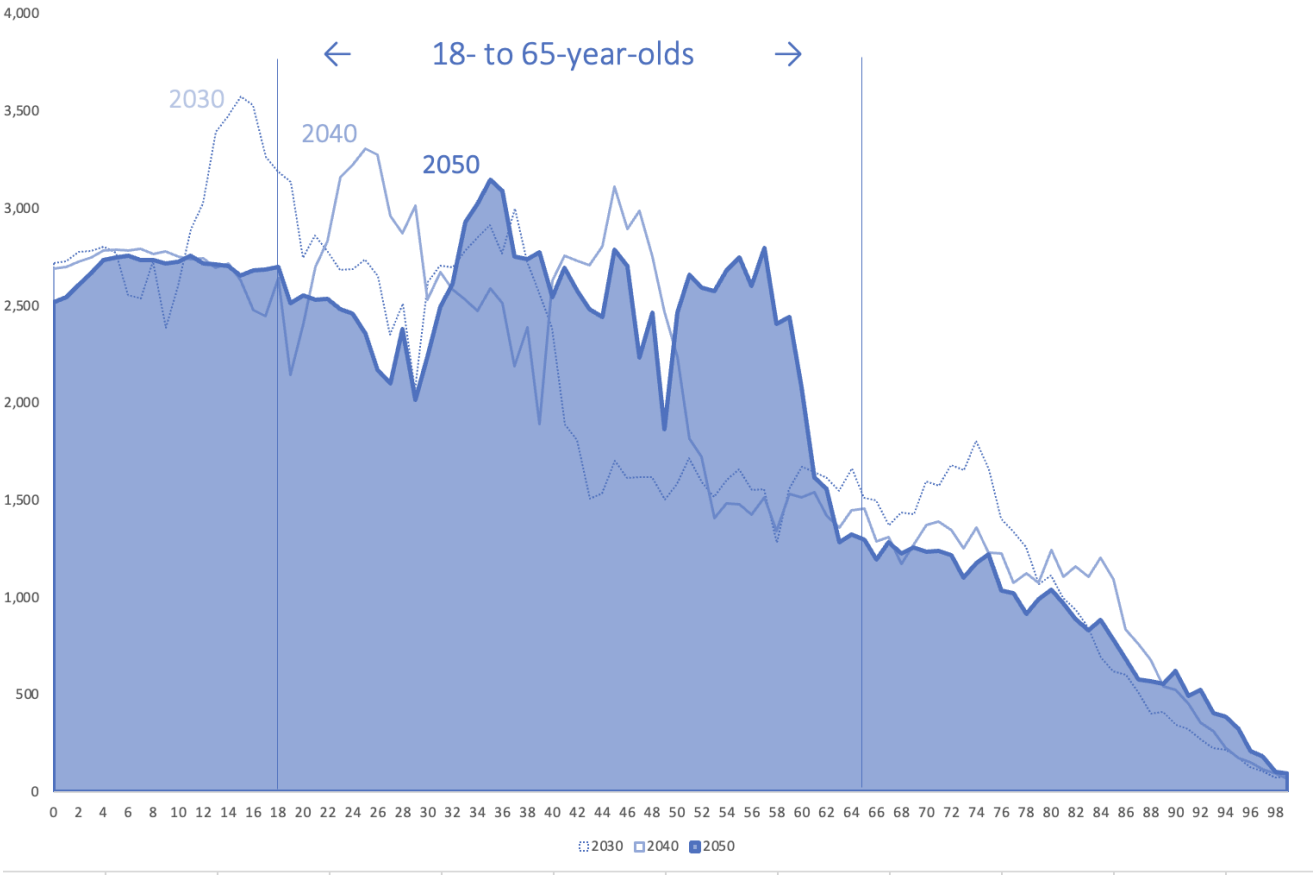
CHAPTER 2. THE PRESENT AND FUTURE IMPERIAL COUNTY WORKFORCE

This chapter describes the potential Lithium Valley workforce in Imperial County. The County is home to a growing number of young people for whom high-road jobs could make a big difference and who, with the right training and support, could meet the staffing needs of the companies developing Lithium Valley. Most of them are bilingual in English and Spanish and most have finished high school but not college. A large proportion of them are unemployed or out of the workforce, and many of those who are employed work in low-road occupations that do not provide family-supporting wages and benefits.

Unlike the rest of California, a young and growing workforce

Imperial County has almost 200,000 residents, of whom about half are between the ages of 18 and 65. In the rest of California, workers are aging out of the workforce faster than high school graduates are replacing them. Imperial County, in contrast, is about to enjoy a workforce boom, as a wave of young people born after 2010 enters the labor market. The graph in Figure 2-1 shows the age profile of the population at three future time points: 2030, 2040, and 2050. Superimposed on this moving snapshot is a window showing the age range from 18 to 65, making it possible to see how the workforce will grow as a large age cohort comes of working age. As this graph illustrates, the California Department of Finance projects that Imperial County's working-age population–the total number of people between the ages of 18 and 65–will continue to grow until the oldest members of this miniature baby boom generation (visible in the peaks shown in Figure 2-1) reach retirement age in the mid- to late 2050s.

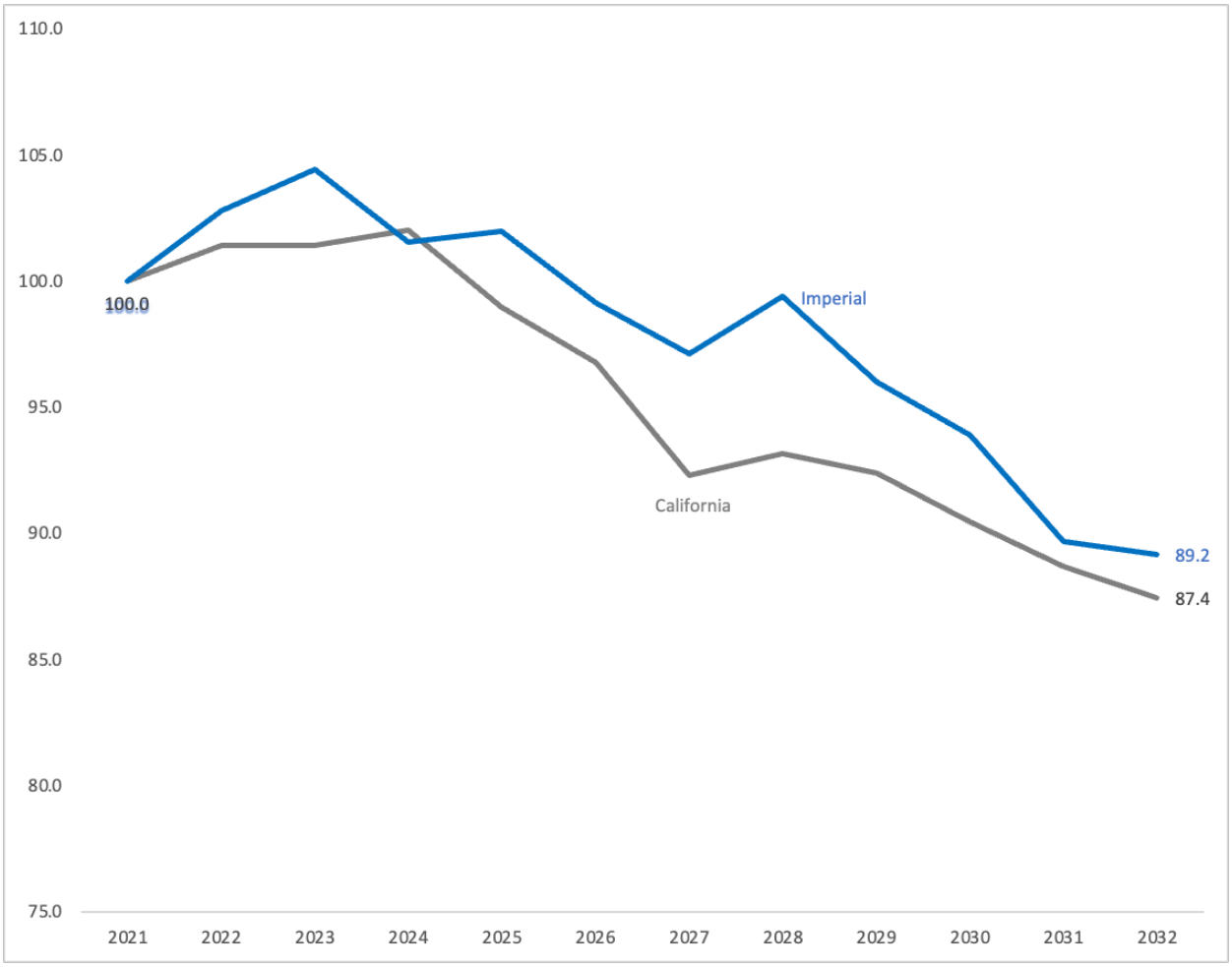
Figure 2-1. Projected number of Imperial County residents at each age, at three time points in the future (2030, 2040, and 2050)



Data source: California Department of Finance. Demographic Research Unit. Report P-2B: Population Projections by Individual Year of Age, California Counties, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. July 2023.

Part of this demographic wave is just now entering the workforce. According to demographic projections from the California Department of Finance, the annual number of high school graduates in Imperial County peaked in 2023 at a total of 2,708, and it is projected to decline slowly thereafter but more slowly in Imperial County than in the rest of California (see Figure 2-2). Those who graduated high school at the peak will remain in the workforce for decades. As greater proportions of young people in Imperial County graduate high school and join earlier graduates in the workforce, the total number of high school graduates in the workforce in Imperial County will continue to grow at a slower but steady pace.

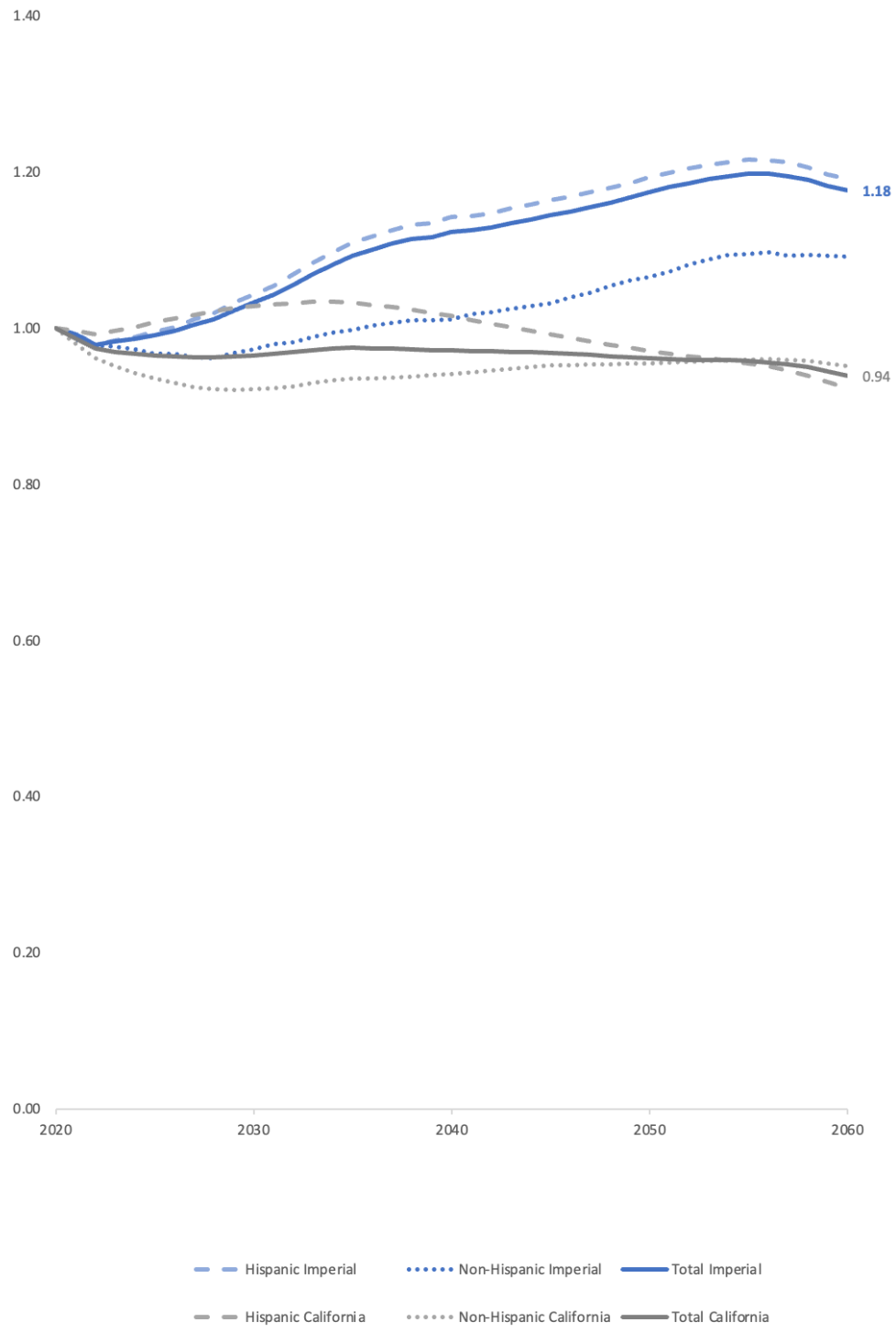
Figure 2-2. Projected number of people graduating high school as a percentage of 2021 graduates, by year, for Imperial County and California



Data source: California Department of Finance. Demographic Research Unit, California Public K–12 Graded Enrollment and High School Graduate Projections by County — 2022 Series. Sacramento: California. July 2023.

The total working-age population of Imperial County will keep growing for decades, even after the working-age population of the rest of California has begun to shrink. According to the California Department of Finance, the working-age population of Imperial County will increase by 18%, from 99,251 in 2020 to 116,471 in 2060. The working-age population of the State of California, in contrast, is expected to decrease by 6% over the same period (see Figure 2-3).

Figure 2-3. Projected working age population growth relative to 2020, total ( ) and separately by Hispanic (- - -) and non-Hispanic (···) ethnicity, for Imperial County and California



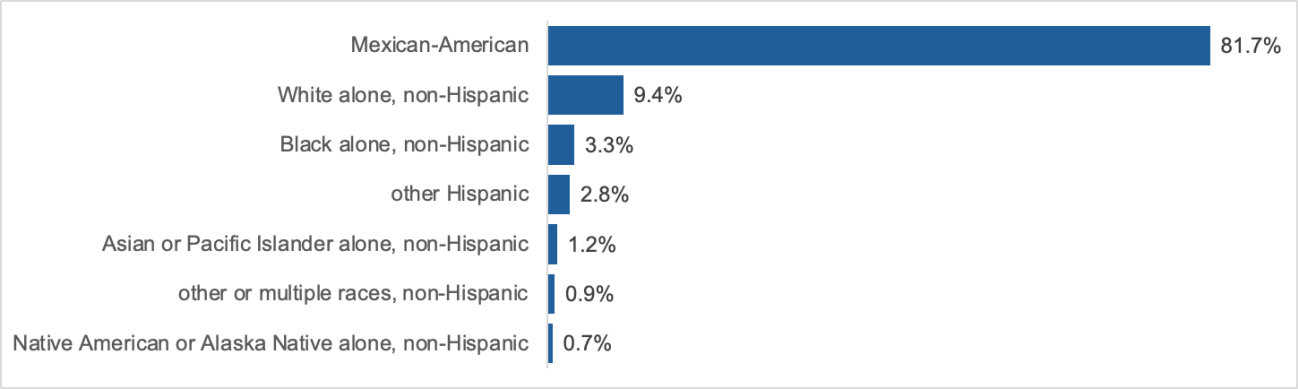
Data source: California Department of Finance. Demographic Research Unit, California Public K–12 Graded Enrollment and High School Graduate Projections by County — 2022 Series. Sacramento: California. July 2023.

These population trends mean that more working-age people will be in the workforce just as lithium operations are projected to scale up in Imperial County. In general, the people of Imperial County are going to make up a growing share of California's workers. It is a good time for the state to invest in providing them with skills and with access to high-road jobs. However, more than skills and high-road jobs are needed if Imperial County is to support California's economy in the future. The workers of Imperial County will also need adequate public transportation to and from their high-road jobs, affordable child and dependent care that will allow them to take those high-road jobs, education and training that make them qualified for the high-road jobs of the future, and the restoration of trust in outside employers after decades of exploitation by employers eager to take advantage of residents eager for work. These obstacles are the subject of Part II of our report.

A bilingual workforce

Who are these future workers of Imperial County? Most of the people of the county of working age (82%) are Mexican-American. People who report another Hispanic origin are another 3%. Most of the working-age non-Hispanic residents of the county identify as White. Relatively few working-age residents belong to other racial and ethnic groups (see Figure 2-4).

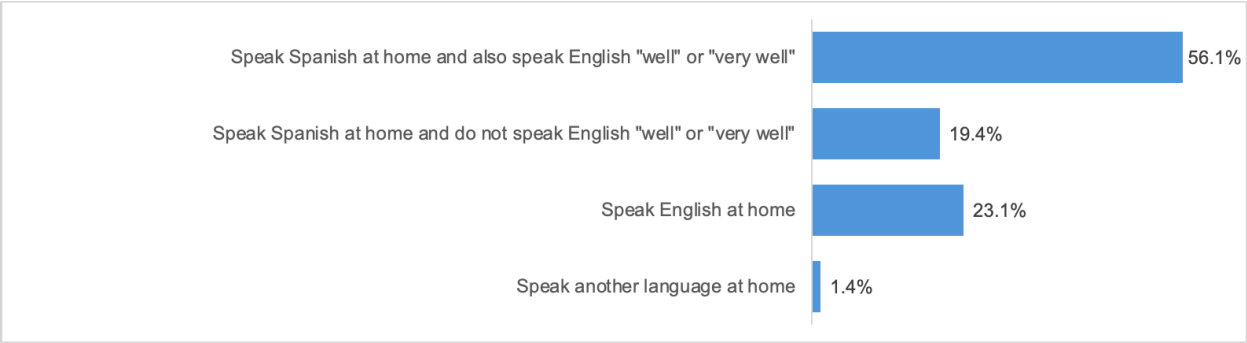
Figure 2-4. Share of the working-age population of Imperial County by race and ethnicity, 2018 to 2022



Data source: Analysis of American Community Survey 2022 5-year Public Use Microdata Sample

Most of the 18- to 65-year-olds in Imperial County are bilingual in Spanish and English. Three out of four speak Spanish at home, and most Spanish-speakers speak English well or very well (see Figure 2-5). Only about one out of every five working-age residents of Imperial County reports speaking only Spanish at home and does not speak English well.

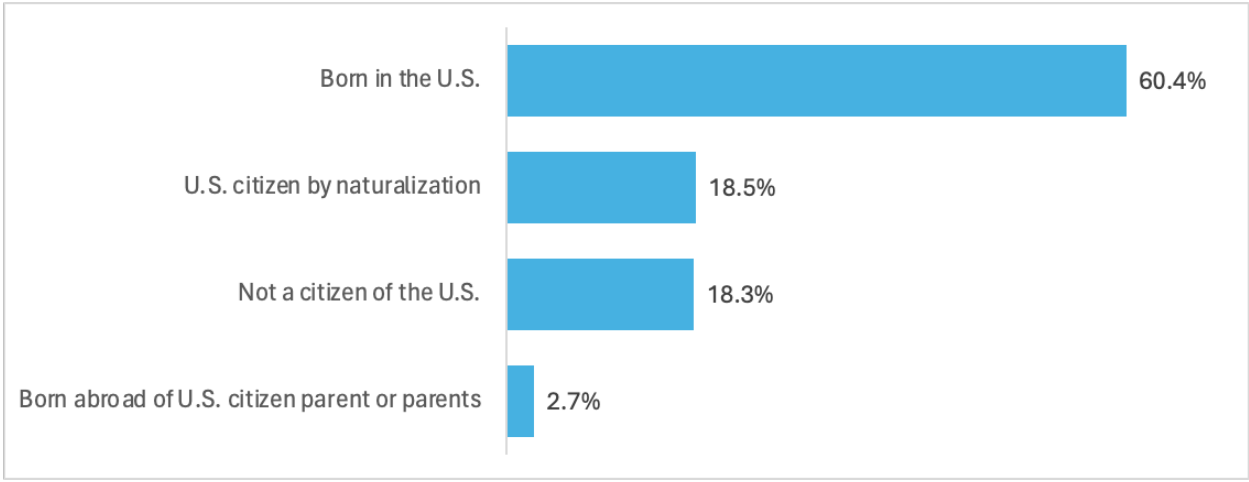
Figure 2-5. Share of the working-age population of Imperial County by the language spoken at home and ability to speak English, 2018 to 2022



Data source: Analysis of American Community Survey 2022 5-year Public Use Microdata Sample

Most of the working-age residents of Imperial County are US citizens. Approximately three out of five were born in the USA, and another one out of five is a naturalized citizen. Non-citizens are approximately one out of every five residents between the ages of 18 to 65 (see Figure 2-6). About half of these non-citizen residents are currently employed.[17]

Figure 2-6. Share of the working-age population of Imperial County by citizenship status, 2018 to 2022

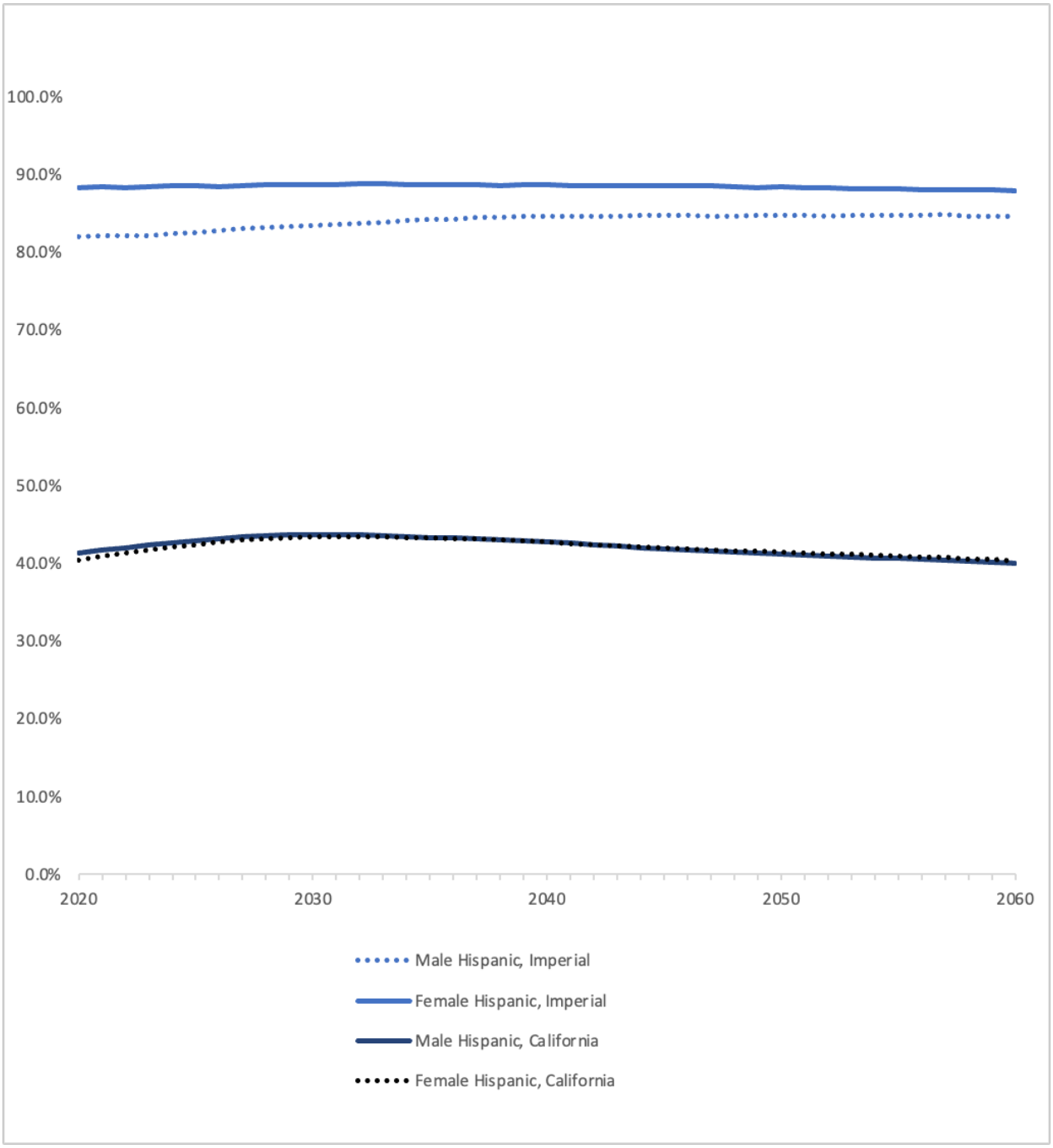


Data source: Analysis of American Community Survey 2022 5-year Public Use Microdata Sample

The California Department of Finance projects that the percentage of working-age residents of Imperial County who are Hispanic will remain approximately double the percentage of *all* working-age Californians who are Hispanic for the next several decades (see Figure 2-7).

17 From authors' analysis of the American Community Survey 2022 5-year Public Use Microdata Sample.

Figure 2-7. Projected Hispanic share of working-age population by sex, for Imperial County and California as a whole, 2020 to 2060



Data source: California Department of Finance. Demographic Research Unit. Report P-3: Population Projections, California, 2020-2060 (Baseline 2019 Population Projections; Vintage 2023 Release). Sacramento: California. July 2023.

It is likely that most of the workers of Imperial County for decades to come will be Mexican-American and bilingual.

More high-road jobs could make a big difference

Although Imperial County's workforce is growing, it is still small enough that even a few hundred high-road jobs could make a big difference. In Chapter 1 of this report, we defined high-road employment as employment that is accessible to workers who do not have formal degrees beyond high school and that provides them with all of the following:

- the opportunity for long-term careers;
- family-supporting wages and benefits;
- protections for health and safety; and
- worker voice on the job.

One reason that high-road jobs are especially important in Imperial County is that many county residents are out of work. The Bureau of Labor Statistics (BLS) estimates that Imperial County had an unemployment rate of 18.3% in December 2023–by far the highest unemployment rate of any metropolitan area in the US—at a time when the unemployment rate in the US as a whole was only 3.5%.[18] Because Imperial County has a large number of seasonal jobs in agriculture, this December statistic is not typical of the whole year: the unemployment rate fluctuates, and it is typically highest in December and January and lowest in the spring. But the rate of unemployment in the county is consistently the highest of any county or metropolitan area in the US, and by a very large margin. At the most recent peak of seasonal hiring in April 2023, for example, Imperial County (also known for statistical purposes as the El Centro Metropolitan Statistical Area [MSA]) had the highest unemployment rate of any county or MSA in the US, and it was the *only* MSA with a double-digit unemployment rate.[19] According to the BLS, there were 73,987 people in the Imperial County labor force in December 2023. That means that adding just 740 jobs could reduce the unemployment rate by one full percentage point.

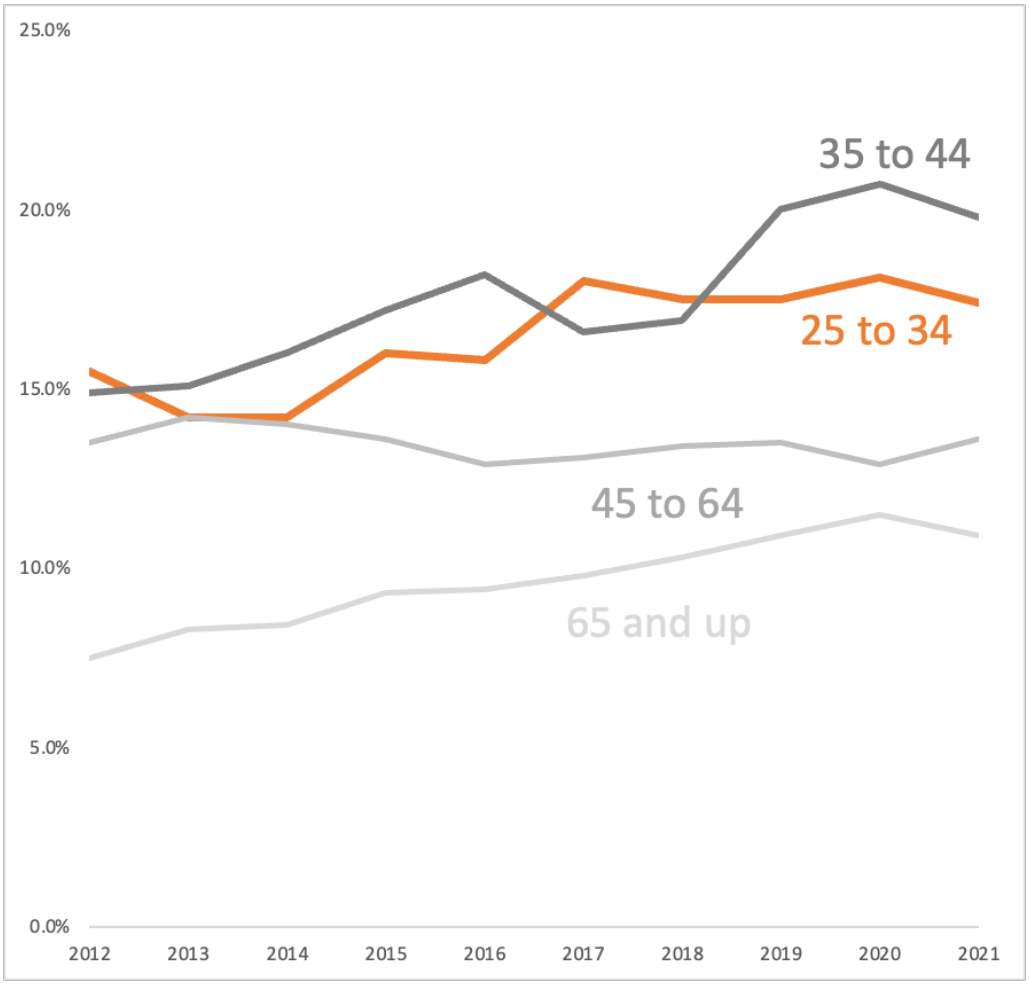
Another reason that high road jobs are especially important in Imperial County is that few adults in the county have attended, much less completed, college. Fewer than one in five Imperial County residents between the ages of 18 and 65 has earned a 4-year college degree. The percentage who completed a 4-year college degree has increased in the last decade, particularly among people aged 25 to 44, but even in this age group, the percentage is less than 20% (see Figure 2-8). As discussed in Part II of this report, the reasons

18 US Bureau of Labor Statistics. 2024. "Metropolitan Area Employment and Unemployment - December 2023." News release USDL-24-0190, dated February 6, 2024. Retrieved March 12, 2024 from <https://www.bls.gov/news.release/pdf/metro.pdf>.

19 US Bureau of Labor Statistics. 2023. "Metropolitan Area Employment and Unemployment - April 2023." News release USDL-23-1194, dated May 31, 2023. Retrieved March 12, 2024 from <https://www.bls.gov/news.release/pdf/metro.pdf>.

are myriad. There are only two degree-granting postsecondary institutions in the area: Imperial Valley College and San Diego State University (SDSU) Imperial Valley. The cost of classes can be prohibitive for many residents, and the times and places when courses are offered may often conflict with work or family responsibilities.

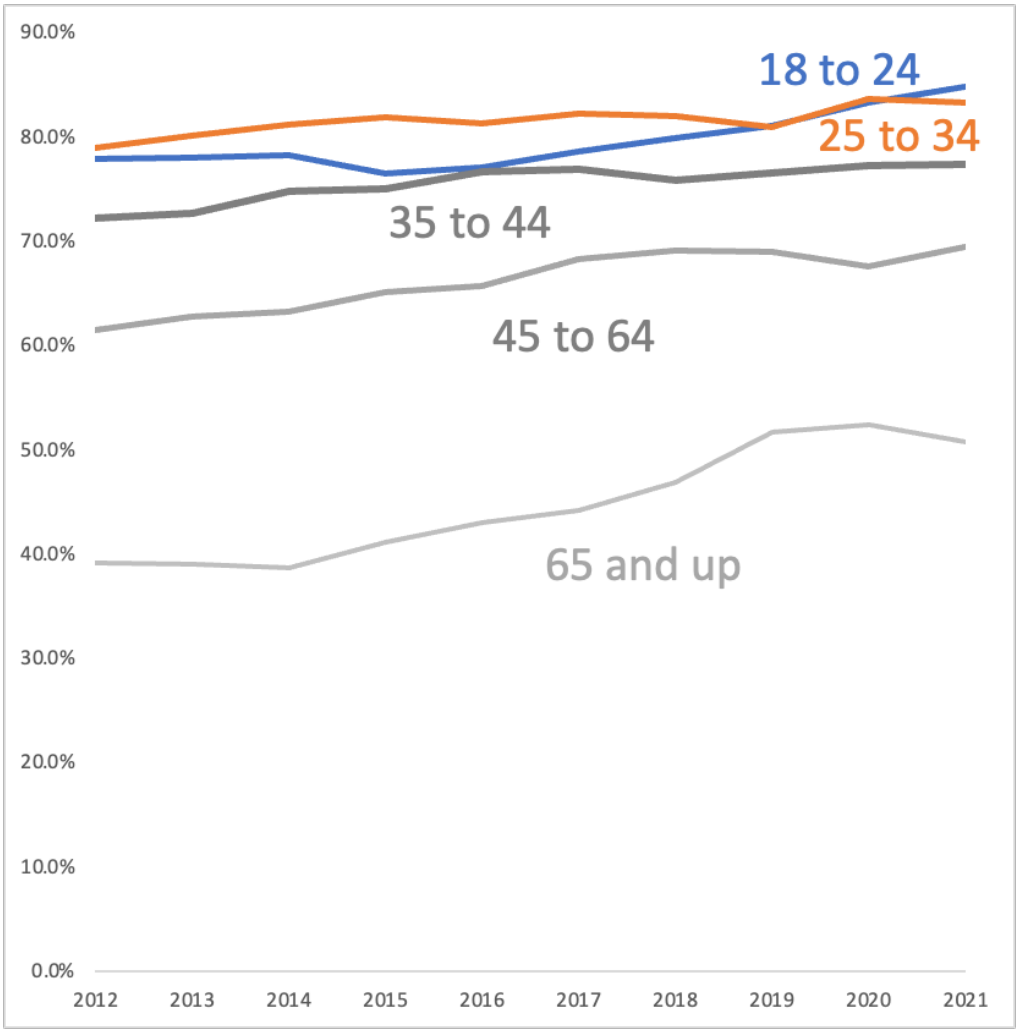
Figure 2-8. Recent growth in the share of working-age Imperial County residents with four-year college degrees, by age group



Data source: US Census Bureau, American Community Survey 5-year samples for periods ending 2012 through 2021, Tables S1501

The Imperial Valley needs career paths that are open to adults who enter the workforce with just a high school diploma, because they are the majority of workers. Most Imperial County residents between the ages of 18 and 65 have finished high school. The percentage who have finished high school is highest in the youngest cohorts (see Figure 2-9).

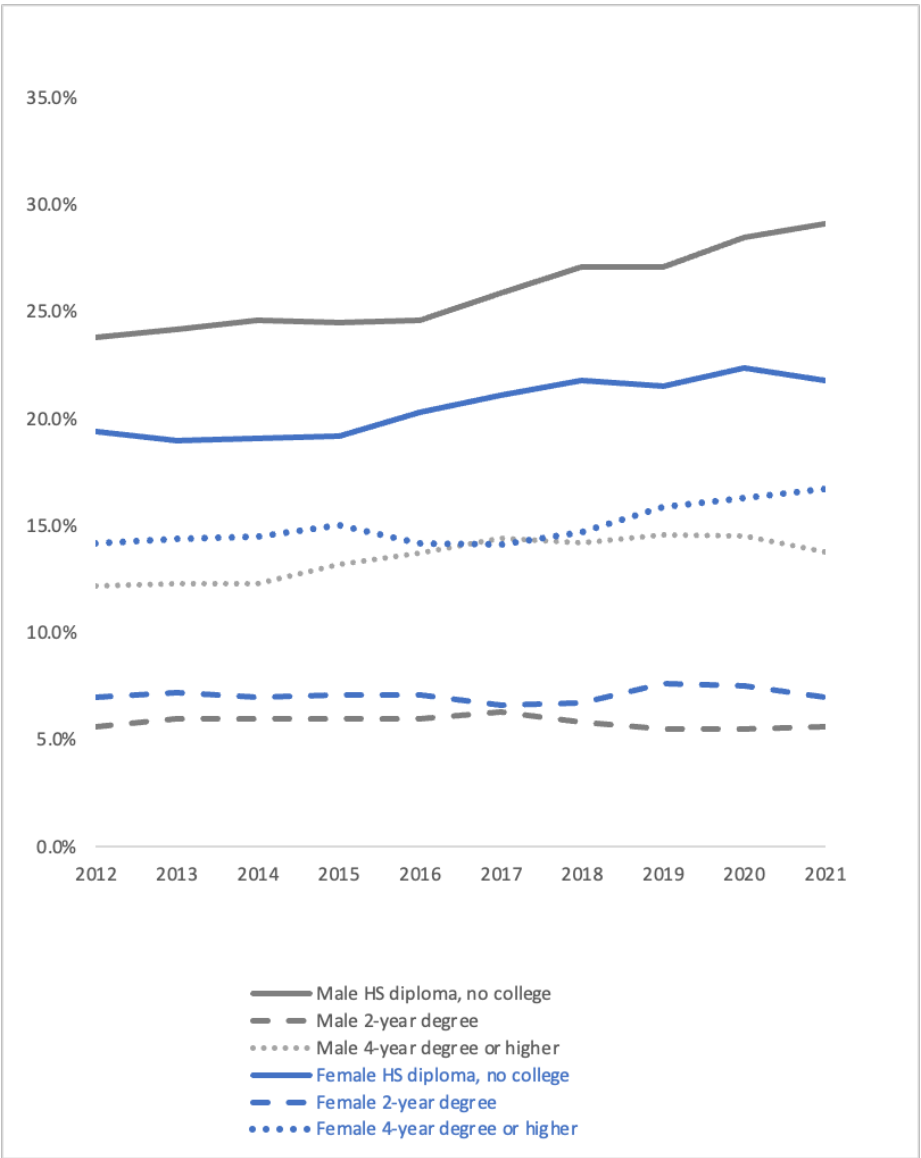
Figure 2-9. Recent growth in the share of working-age Imperial County residents who have completed high school, by age group



Data source: US Census Bureau, American Community Survey 5-year samples for periods ending 2012 through 2021, Tables S1501

There are important differences in educational attainment and labor market opportunities available to men and women in Imperial County. Men in Imperial County are more likely than women to have finished high school. Among those residents who finished high school, however, women are more likely to have gone on to college (see Figure 2-10). This difference in educational attainment may reflect a difference in the labor market opportunities available to men and women without a college degree. For example, as discussed in Chapters 4 and 5, women may have fewer opportunities in blue-collar occupations in the building and construction trades, which do not require postsecondary degrees.

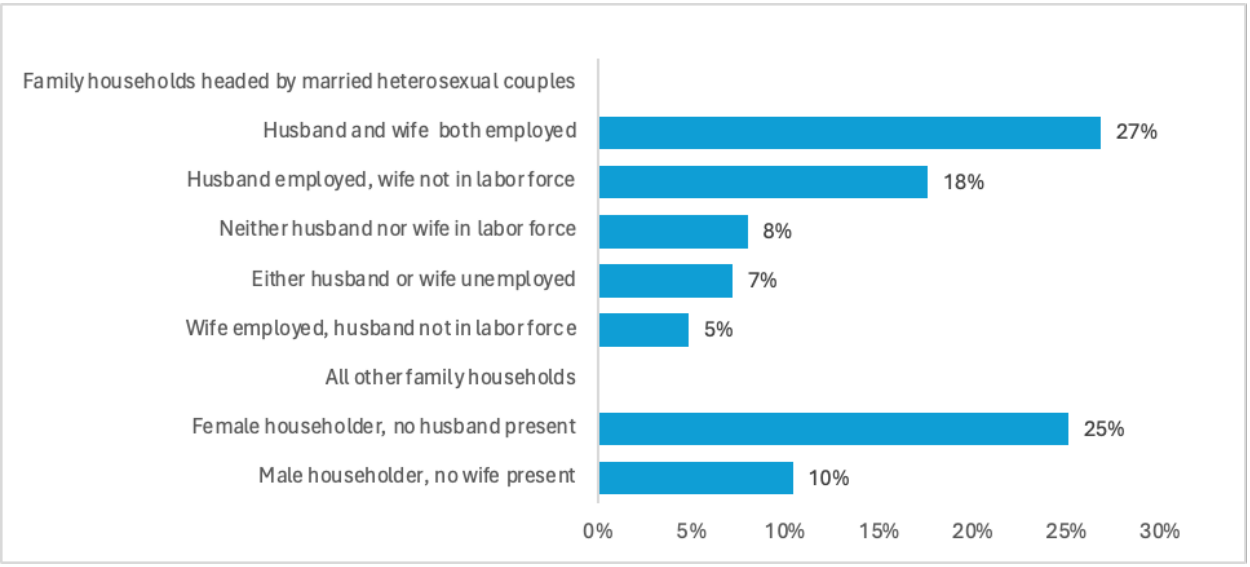
Figure 2-10. Educational attainment of Imperial County adults ages 25 and up, by gender, 2012 to 2021



Data source: US Census Bureau, American Community Survey 5-year samples for periods ending 2012 through 2021, Tables S1501

Family-supporting wages and benefits are also particularly important in Imperial County, where single-earner families are the norm among family households. Only 27% of the family households of working-age adults in Imperial County are headed by dual-earner couples. The next most common family household type is a household headed by a lone, employed woman with no husband present (25% of the total); after that is the married couple household in which only the husband is in the labor force (18% of the total) (see Figure 2-11).

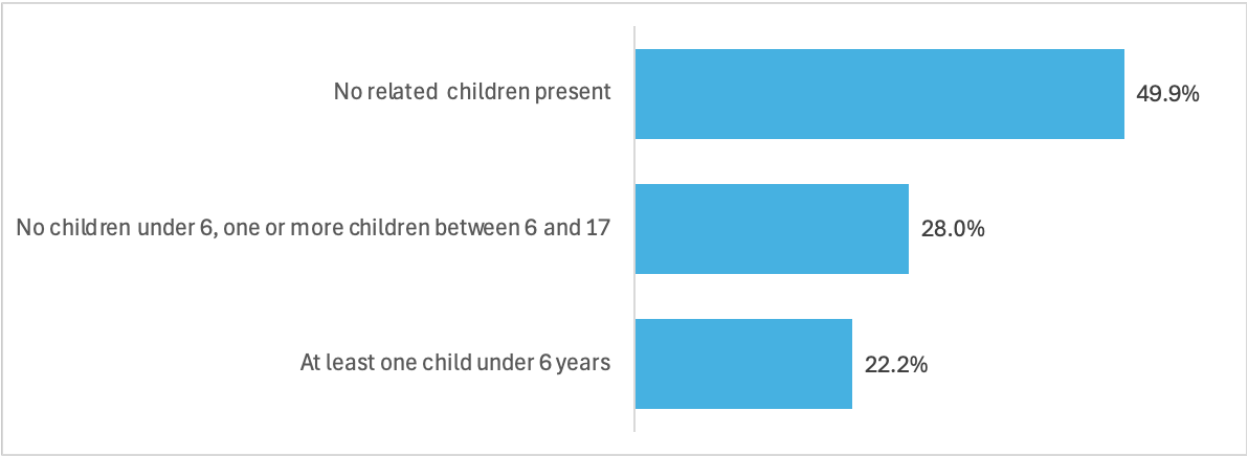
Figure 2-11 .Share of family households of working-age (18- to 65-year old) residents of Imperial County, California, by family and work status of householders



Data source: Analysis of American Community Survey 2022 5-year Public Use Microdata Sample

Moreover, most of the residents of the county between the ages of 18 and 65 are likely to have at least some family care responsibilities. For example, just over half of all working-age adults live with related minor children and 22% of working-age adults have at least one related child under age six in the household.

Figure 2-12. Share of working-age residents of Imperial County, California with and without related children in the household, by age of children



Data source: Analysis of American Community Survey 2022 5-year Public Use Microdata Sample

Many of these adults may also be responsible for caring for elders or for adults with disabilities who share their households. The Census Bureau's American Community Survey asks several respondents about whether any members of their household have difficulties with self-care, independent living, ambulation, or cognition. Of all working-age residents of Imperial County, 28% were in a household where at least one person has difficulty with one or more of these activities. That is a comparatively high percentage: among all people in California, only 21% shared a household with someone who had one or more of these difficulties.[20]

Residents also need family-supporting health benefits. Only 40% of working-age adults in Imperial County have health insurance through a job, whether their own or a family member's, and 11% have no health insurance at all (from analysis of the American Community Survey 2022 5-year Public Use Microdata Sample).

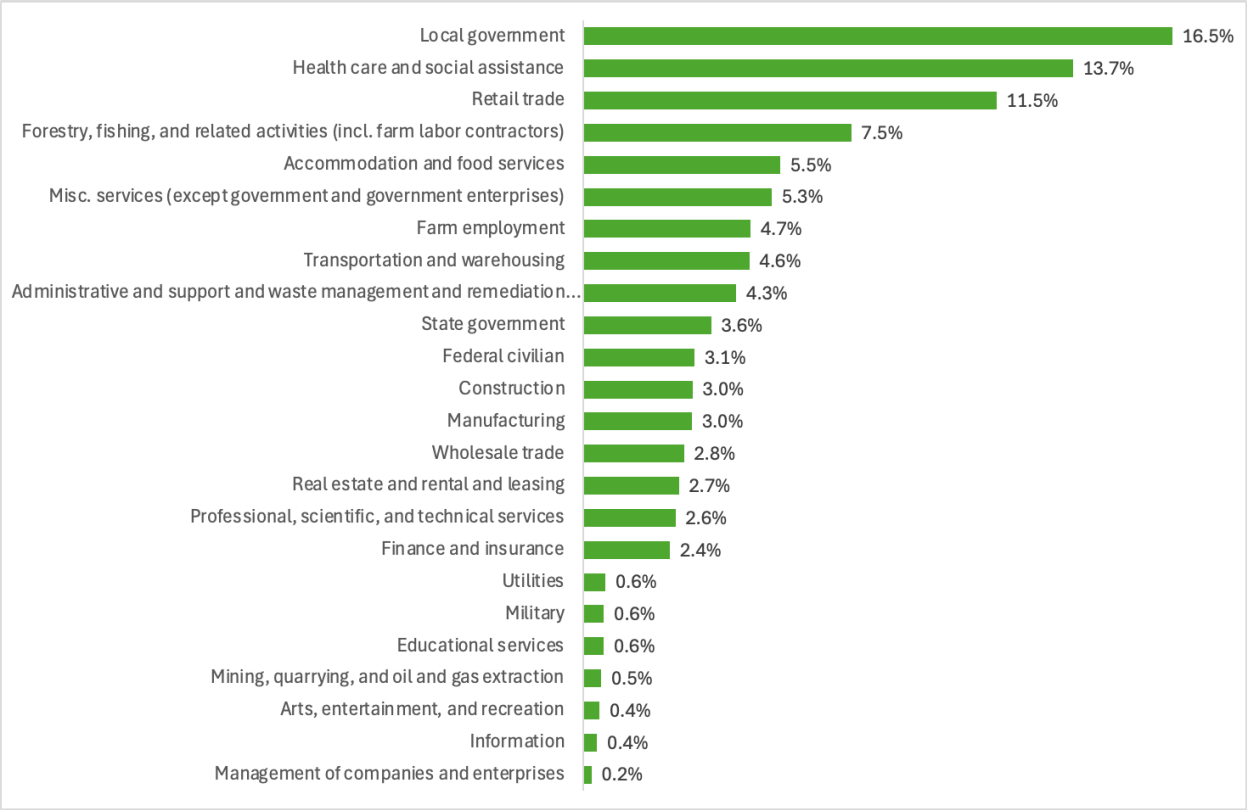
Economic development policy for Imperial County should place a high priority on the development of high-road jobs, because those are the jobs that residents need the most.

The low road is already here

At present, comparatively few of the available private-sector jobs in Imperial County are high-road jobs. Imperial County's industrial base is disproportionately agricultural. The graph in Figure 2-8 represents the share of all full-time and part-time jobs in Imperial County in each of 24 standard industry categories. The greatest share of employment is in local government, followed by health care, social services, and retail trade (see Figure 2-8). This graph shows which industries are most typical of Imperial County, but not which are most distinctive; local government, health care, and retail are all industries that employ a large share of the residents of most regions of the US.

20 Authors' analysis of the American Community Survey 2022 5-year Public Use Microdata Sample.

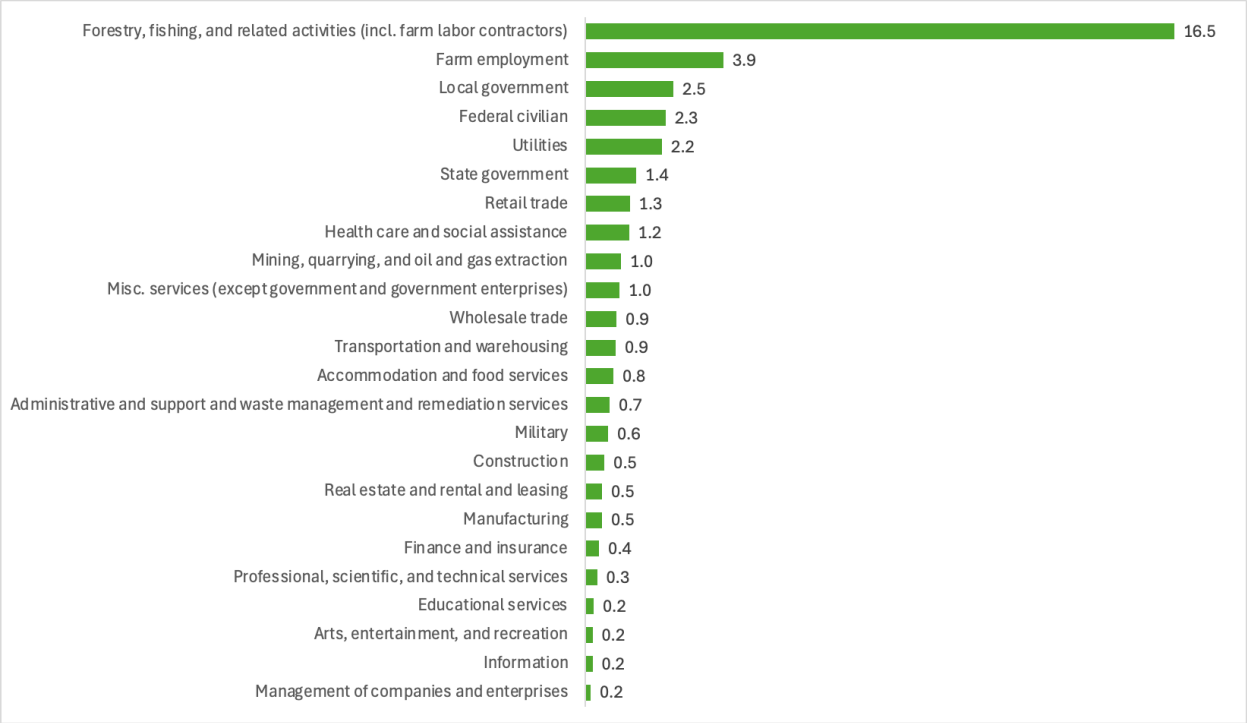
Figure 2-8. Total full-time and part-time jobs by industry in Imperial County, 2022



Source: US Bureau of Economic Analysis, Series *CAEMP25N: Total full-time and part-time employment by NAICS industry*; data last updated November 16, 2023

To highlight what is distinctive about the economy of Imperial County, the graph in Figure 2-9 measures how overrepresented or underrepresented each industry is, relative to the US labor market as a whole. Each bar represents a location quotient, which is the percentage of full- and part-time jobs in that industry in Imperial County, divided by the percentage of full- and part-time jobs in that industry in the economy of the US as a whole. Industries with location quotients greater than 1.0 are overrepresented in Imperial County, and those with location quotients less than 1.0 are underrepresented. As the graph illustrates, the two industries that are most overrepresented in Imperial County are "farm employment" and "forestry, fishing, and related activities," the latter a catch-all category that includes farm labor contractors, crew leaders, and farm management services (see Figure 2-9). Jobs in manufacturing and construction, in contrast–the categories that could include the most high-road jobs associated with Lithium Valley–are substantially underrepresented in Imperial County.

Figure 2-9. Location quotient of total employment by industry in Imperial County relative to the USA, 2022



Source: Analysis of data from US Bureau of Economic Analysis, Series CAEMP25N: Total full-time and part-time employment by NAICS industry; data last updated November 16, 2023

Unless there is a concerted effort to develop the high road, most new jobs in Imperial county are likely to be in low-wage occupations. The California Employment Development Department has identified the occupations with the most projected job openings in Imperial County from 2020 to 2030, in the absence of any new investment in Lithium Valley. The top five occupations, which together account for a third of all projected job openings, are farmworkers, home health aides, cashiers, retail salespersons, and fast food workers. All of these occupations had median wages in 2022 that were at or near California's minimum wage (see Table 2-1). In short, without high-road development of Lithium Valley, future employment in the County is unlikely to take the high road.

Table 2-1. Top ten occupations by projected job openings in Imperial County, 2020-2030, with hourly wages circa 2022

Occupation	Hourly wage	Total openings
Farmworkers and Laborers, Crop, Nursery, and	$15.00	11,460
Home Health and Personal Care Aides	$15.18	10,390
Cashiers	$15.00	3,880
Retail Salespersons	$15.00	3,560
Fast Food and Counter Workers	$15.00	3,260
Stockers and Order Fillers	$15.21	2,000
Farmers, Ranchers, and Other Agricultural Manag-	$35.27	1,730
Heavy and Tractor-Trailer Truck Drivers	$23.60	1,500
Office Clerks, General	$18.38	1,470
Janitors and Cleaners, Except Maids and House-	$15.71	1,430

Note: Minimum wage occupations are shaded. Data source: California Employment Development Department, 2020-2030 Occupations with the Most Job Openings, El Centro MSA (Imperial County), retrieved April 26, 2024 from <https://labormarketinfo.edd.ca.gov/data/employment-projections.html>

Many of these occupations are both low-paid and dangerous. According to the Bureau of Labor Statistics, for example, farmworkers sustain occupational injuries at a substantially higher rate (4.1 per 100 full-time equivalents [FTE]) than do other private sector workers (2.7 per 100 FTE). This high rate of injuries can be attributed to the repetitive motions and use of large industrial machines entailed in farm work.[21] In California, and especially in Imperial Valley, a particular concern is heat-related illness.[22] The California Division of Occupational Health and Safety (Cal/OSHA) has established a Heat Standard to protect workers from heat but a UC Merced study of California farmworkers found that employers' non-compliance with the California Heat Standard is commonplace and more than

21 Gorucu, S., Michael, J., & Chege, K. (2021), Nonfatal agricultural injuries treated in emergency departments: 2015-2019, *Journal of Agromedicine*, *27*(1), 41–50, <https://doi.org/10.1080/1059924X.2021.1913271>

22 Office of Environmental Health Hazard Assessment (OEHHA, 2022), *Indicators of Climate Change in California*, Fourth Edition, California Environmental Protection Agency, OEHHA, p. VI-14. <https://oehha.ca.gov/media/epic/downloads/05occheatillness.pdf>

one in ten workers lacked consistent access to clean drinking water while at work.[23] Home healthcare workers, too, face serious occupational safety risks. They must lift and move patients and heavy equipment without the benefit of equipment, such as bed lifts and transfer chairs, that is widely available in hospital settings. NIOSH has reported that the most common injuries among home healthcare workers are "sprains, strains, and other musculoskeletal injuries related to lifting and moving patients."[24] They are also exposed to blood, saliva, risks of needlestick injury, and sometimes violence at the hand of patients or family members.

The development of Lithium Valley will not reduce the demand for workers in low-road occupations. But development could help to provide the working people of Imperial County with more options, including opportunities for family-supporting wages and benefits, adequate health and safety protections, and a voice on the job.

One example of a local resident who could benefit from the high road is Bayron, a 43-year-old man who is living with and caring for an autistic son and a diabetic mother-in-law. Bayron used to commute to San Diego for a construction job that paid $25 per hour. He quit that job in favor of a job in Imperial County that paid just $16.50 per hour, because the shorter commute allows him more time at home to help his wife care for their children and for his mother-in-law. The high-road development of Lithium Valley could help families like Bayron's by providing them with family-supporting jobs closer to home.

23 Brown, P., Flores, E., & Padilla, A. (2022), *Farmworker Health in California: Health in a Time of Contagion, Drought, and Climate Change*, UC Merced Community and Labor Center, <https://clc.ucmerced.edu/sites/clc.ucmerced.edu/files/page/documents/fwhs_report_2.2.2383.pdf>

24 National Institute for Occupational Safety and Health (2010), *NIOSH Hazard Review: Occupational Hazards in Home Healthcare*, DHHS (NIOSH) Publication No. 2010–125, <https://www.cdc.gov/niosh/docs/2010-125/default.html>

CHAPTER 3. POTENTIAL HIGH-ROAD JOBS IN IMPERIAL COUNTY

Just how many high-road jobs could investment in Lithium Valley bring to Imperial County? Estimates vary widely. The Imperial Valley Economic Development Corporation has projected that lithium development at the Hell's Kitchen site alone could bring almost 8,000 total jobs to the region in the next decade.[25] A recent memorandum prepared for the Lithium Valley Specific Plan describes "the opportunity for tens of thousands of jobs both in the short and long term," and outlines land use scenarios that would permit between 17,000 and 22,000 blue-collar jobs in the Lithium Valley Specific Plan Area.[26] Even if the most optimistic projections come true, however, not all of those jobs will be high-road jobs.

This chapter reports estimates of the potential for Imperial County to develop high-road jobs in the Lithium Valley industry cluster. We report estimates of the number of potential high-road jobs that could be created, directly or indirectly, under different scenarios. We computed these estimates using the 2022 Imperial County IMPLAN model, which describes how spending by companies in each industry is arithmetically related to revenues in every other industry, and how the spending by each industry is arithmetically related to the wages and salaries paid to employees in every occupational category.[27] Like any projections, our models rely on untested as-

25 Imperial Valley Economic Development Corporation (2020), Hell's Kitchen lithium and power economic impact analysis. As cited in Controlled Thermal Resources (2021), *Lithium + renewable energy powerfully combined.* <https://static1.squarespace.com/static/5bbc837993a6324308c97e9c/t/666b93cf230d4e6d0da3a851/1718326231007/CTR+Brochure_June_Website.pdf>

26 Rick Planning + Design. (2023), *Lithium Valley specific plan land use alternatives memorandum*, October 27, pp. 2, 14.

27 Two sources of uncertainty in these projections, as in all projections, are the limitations of the data and the modeling assumptions. With respect to data limitations, IMPLAN data are based on federal employment statistics that lump DLE and battery manufacturing jobs together with jobs in other, similar industries, making industry employment statistics imprecise averages. Among the most important sources of uncertainty in this model are the facts that DLE is a new technology, and that very little lithium mining of any kind takes place in the US. For these reasons, the patterns of employment in the industry that is classified in North American Industry Classification System Code 212393 (which includes "lithium mineral mining and/or beneficiating" alongside mining and quarrying of more than 100 other mineral products) are most representative of traditional mining and quarrying of other minerals, and will be atypical of the employment patterns we might expect in Lithium Valley.

sumptions about the future, and one of the most important findings of our analysis is that small differences in these assumptions yield large differences in employment patterns.

For purposes of the economic projections in this chapter, we report the number of *potential* high-road jobs in Imperial County. We define **potential high-road jobs** as jobs that have the following characteristics:

- they can be, and often are, done by workers who do not have formal degrees beyond high school; and
- they pay above the median wage for the county.

Jobs that meet these criteria are high-wage blue-collar jobs. They have some of the characteristics of high-road employment as we defined it in Chapter 1. But we call them *potential* high-road jobs because they *might or might not* meet some of the other important criteria for high-road employment, such as providing the opportunity for long-term careers and providing opportunities for workers to have a voice on the job. Turning a potential high-road job into an actual high-road job requires more than just the investment in creating that job. It also requires people to work together, even after the job is created, to be sure that it connects to other jobs as part of a career ladder, so that it does not become a dead end. It requires that workers on the job have opportunities to organize and, if they wish, to bargain collectively. And it requires continued investment to be sure that health and safety standards remain high. We can use conventional input-output models to project how many *potential* high-road jobs might be created, but we can't project how many *actual* high-road jobs will be created, because it is only the ongoing relationships among employers, worker organizations, and government after the job is created that can determine whether it will remain a high-road job.

Box 3-1. Projecting potential high-road jobs

There were several steps in projecting how many potential high-road jobs might be created in Lithium Valley. **First**, we projected the occupational mix of jobs that would come with new investment in each of three key industries associated with Lithium Valley–namely, DLE, EV battery manufacturing, and construction. **Second**, we projected the spillover effects from new investment in these industries. For every 100 new jobs directly created in each industry, how many additional jobs are created *indirectly* in Imperial County firms that supply the inputs to that industry? How many additional jobs in Imperial County might be *induced* by workers spending their wages and salaries locally? **Third**, we projected the occupational mix of those jobs. For every 100 new jobs directly created in each industry, for example, how many of those jobs would we expect to be electricians? How many are expected to be customer service representatives? And so on. **Fourth**, we matched those occupations to information about their typical wages and their educational requirements, to determine which of them are likely to be high-wage, blue-collar jobs. **Fifth**, we added up the total number of high-wage, blue-collar jobs created under different assumptions about how much investment in DLE and battery manufacturing might come to Imperial County.

We begin with an industry-by-industry overview of potential high-road jobs.

What are the potential high-road jobs in Lithium Valley?

The industries directly involved in the lithium-ion battery supply chain include extraction, processing, manufacturing, and the ancillary construction of facilities for these industries. Because commercial-scale direct lithium extraction (DLE) in Imperial County would involve extraction of lithium from geothermal brines that can be used in power generation, the development of Lithium Valley also involves the geothermal power generation industry.

We distinguish between the potential high-road jobs that could be created *directly* in these industries in Imperial County; the potential high-road jobs that could be created *indirectly* in local firms that supply the inputs for these industries; and the additional, potential high-road job growth that could be *induced* by workers in these high-road jobs spending their wages and salaries in the local economy. We report how many out of 100 jobs created (directly or indirectly) or induced in these industries would be ***blue-collar*** jobs. Our criterion for identifying a blue-collar job is that the highest level of education completed by most workers in the same occupation, according to a federal survey conducted in 2022, was either (1) less than a high school diploma, (2) a high school diploma, or (3) a high

school diploma and a postsecondary certificate, but no college. We then report how many of these blue-collar jobs also would be ***high-wage*** jobs, meaning that they are in occupational categories whose projected average hourly wage would be greater than the median hourly wage in Imperial County. Jobs that meet both criteria–high-wage and blue-collar–are potential high-road jobs.[28]

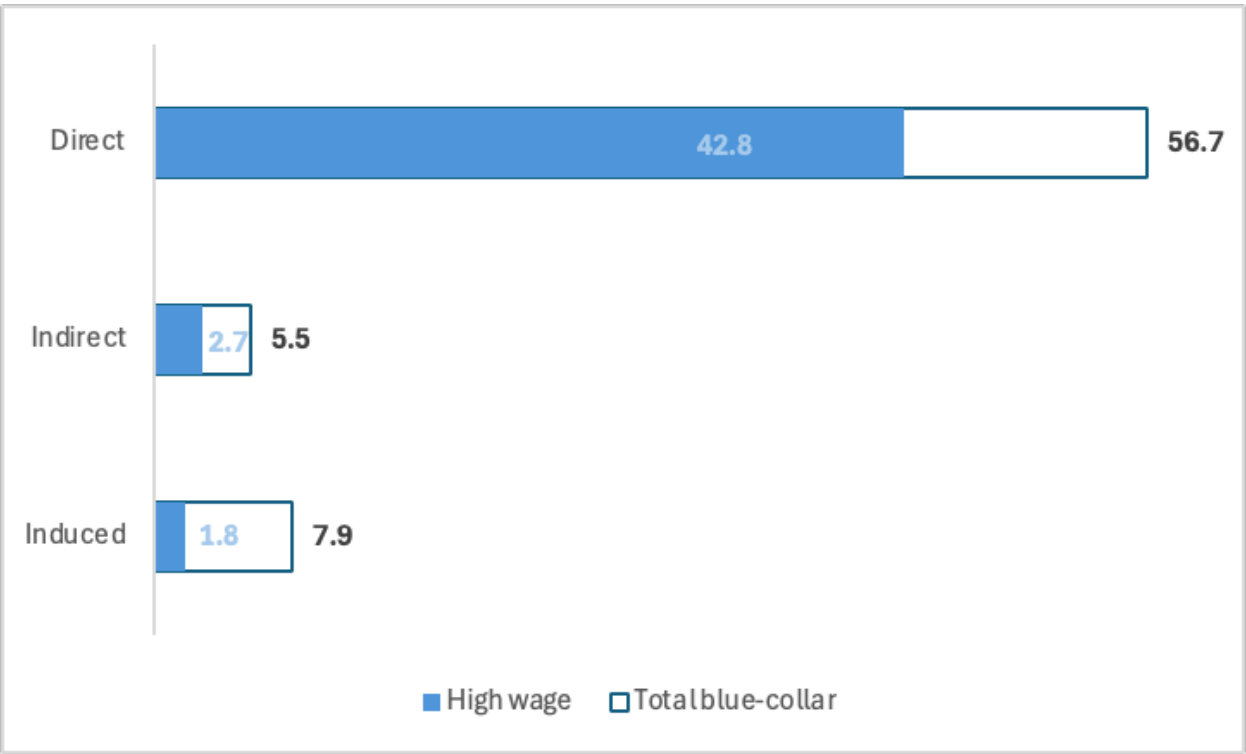
The potential for high-road construction jobs in building Lithium Valley

The first high-road jobs that may come to Lithium Valley are short-term jobs in construction. It will take many construction workers to build facilities for direct lithium extraction (DLE) and for battery manufacturing in Imperial County. The specific mix of construction jobs, and their potential as future high-road jobs, will depend on details of the facilities that are not public information, but we can make some estimates by examining existing data on the construction industry. We estimated the mix of construction jobs separately for DLE plants and for battery manufacturing plants.

Most of the construction jobs in building a new DLE facility would not be high-road, local jobs. To approximate the mix of construction jobs involved in building a new DLE facility, we used 2022 IMPLAN Data on Imperial County occupations in power plant construction. This approach assumes that the mix of construction jobs in building a future DLE plant would be the same as the average mix of construction jobs involved in building an existing geothermal power plant. For every 100 jobs in power plant construction in Imperial County, 56.9 are blue-collar jobs, and of those, only 42.8 would be expected to have wages above the county median (see Figure 3-1). Such occupations as electrical power-line installer; first-line supervisor of construction trades and extraction workers; and operating engineer and other operator of construction equipment, for example, all pay above the county median wage and could be high-road jobs. Many of the other occupations in construction, such as construction laborers; industrial truck and tractor operators; and secretaries and administrative assistants, are paid below Imperial County's median wage and are not potential high-road jobs as we define them.

28 Our source for occupational wage estimates is IMPLAN 2022 Data for Imperial County, which are, in turn, derived from data collected by the US Bureau of Labor Statistics Occupational Employment and Wage Statistics program. Our source for occupational educational attainment data is the Education and Training module of the 2022 O*NET data produced by the North Carolina Department of Commerce for the US Department of Labor, Employment and Training Administration.

Figure 3-1. Total number of blue-collar jobs and high-wage blue-collar jobs created (directly or indirectly) or induced in Imperial County for every 100 jobs in power plant construction



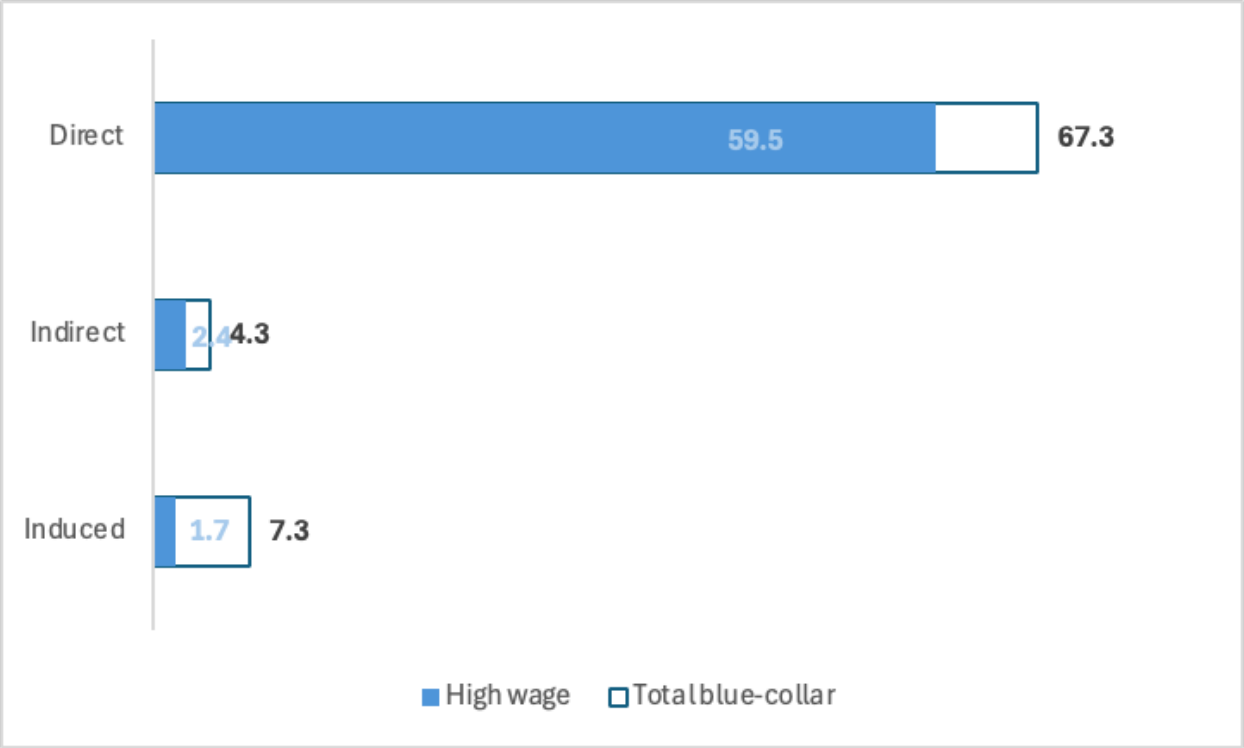
Source: Authors' computations from IMPLAN 2022 Data for Imperial County.

Figure 3-1 also shows that most of the potential high-road jobs created by investing in building a new DLE facility are the jobs directly required in construction. There are comparatively few local employment spillovers from building a geothermal power plant: For every 100 jobs in power plant construction, we estimate only 2.7 local, high-road jobs would be created indirectly in industries that *supply* that construction, and only 1.8 local, high-road jobs induced by construction employees' local spending. Most of the industries that supply construction are outside of Imperial County and most of the local economic multiplier effect of construction workers' wages would not yield high-road jobs but would instead be spent on industries that employ relatively low-wage workers, such as home health aides, fast food and counter workers, and retail salespersons. These are the low-road occupations that were already projected to grow in Imperial County.

The precise mix of construction jobs involved in building a battery manufacturing facility might be different. We approximated the mix of jobs that could be involved in building a new battery manufacturing plant by using 2022 IMPLAN Data on Imperial County occupations involved in the construction of manufacturing plants in general. This approach assumes that the mix of construction jobs required to build a battery manufacturing plant

would be the same as the mix of construction jobs required to build other kinds of manufacturing facilities. Most of the jobs in building a battery manufacturing plant would be high-wage, blue-collar jobs in such occupations as electrician; plumber, pipefitter, and steamfitter; and heating, air conditioning, and refrigeration mechanic and installer. There would be comparatively few indirect employment spillovers from building a battery manufacturing plant, whether in firms that supply the construction industry or in other consumer industries that provide goods and services to construction workers (see Figure 3-2).

Figure 3-2. Total number of blue-collar jobs and high-wage blue-collar jobs created and induced in Imperial County, for every 100 jobs in manufacturing plant construction



Source: Authors' computations from IMPLAN 2022 Data for Imperial County.

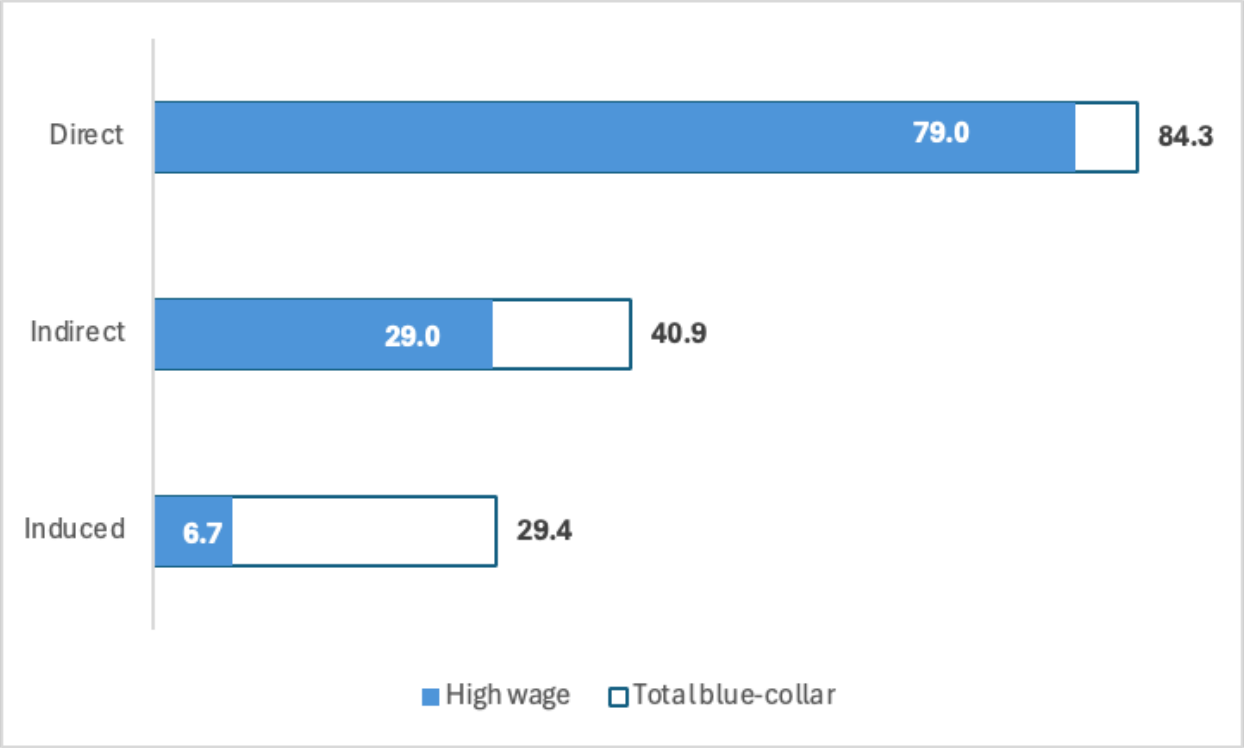
In other words, construction of facilities for the renewable energy storage and materials sector could be a source of many short term, high-road jobs in Imperial County, but there are relatively few long-term positive economic spillovers for Imperial County from this construction.

The potential high-road jobs in direct lithium extraction

The second industry that might come to Lithium Valley is lithium extraction. We have assumed for this report that we can best approximate the future mix of jobs needed to run a direct lithium extraction (DLE) plant by using data on the current mix of jobs needed to run a geothermal power plant. There are three reasons for this working assumption: (1) all the DLE facilities proposed for Imperial County are coupled with geothermal power generation; (2) interviews with key informants suggest that most of the employment in a plant will cover a similar mix of occupations; and (3) more precise assumptions about the distribution of occupations in a DLE facility are unavailable without access to proprietary information that companies have not made public. Because no company has yet operated a DLE plant on a commercial scale, it is still unknown exactly what mix of jobs would be required to keep a plant like that operating. By modeling the mix of occupations needed to run a DLE plant as if it is *identical* to the mix of jobs required to operate a geothermal power plant without DLE, our models can be expected to underestimate the number of chemical laboratory technicians and people in related occupations needed to operate a DLE plant, as well as the number of jobs in trucking required to transport lithium. But the same working assumption allows us to use existing employment data reported to the federal government by companies that already operate geothermal power plants in Imperial County to estimate both the spillover effects of adding new jobs in geothermal power generation, and the occupational mix of those jobs. We use those projections to approximate the effects of adding new jobs in DLE.

Our projections show that any DLE jobs created in Imperial County could be expected to include a high proportion of potential high-road jobs. For every 100 jobs directly created in geothermal power generation, for example, 84.3 are blue-collar jobs, and 79.0 are also high-wage jobs. Another 29.0 potential high-road jobs in Imperial County would be created indirectly in companies that supply inputs for geothermal power generation, and another 6.7 potential high-road jobs would be induced by workers' consumer spending in Imperial County (see Figure 3-3).

Figure 3-3. Total number of blue-collar jobs and high-wage blue-collar jobs created (directly and indirectly) and induced in Imperial County, for every 100 jobs in geothermal operations



Source: Authors' computations, IMPLAN 2022 Data for Imperial County.

These estimates show that most of the new jobs in the geothermal power industry–and, by extension, the DLE industry–would be high-wage, blue-collar jobs that could contribute to the development of a high-road economy in Imperial County. Almost a third of the jobs created indirectly through industry spillovers—for example, jobs for maintenance and repair workers—might also be potential high-road jobs. The jobs induced by workers' spending in the local economy might also produce a few potential high-road jobs, such as jobs for automotive service technicians and mechanics, but most of the jobs that are likely to be induced by increased consumer spending in Imperial County are not potential high-road jobs. The largest numbers of local jobs that would be created indirectly by the increased consumer spending of people employed in DLE likely would be in the fast-growing, comparatively low-paid occupations of home health and personal care aides, fast food and counter workers, retail salespersons, cashiers, stockers and order fillers, and waiters and waitresses.

The potential high-road jobs in battery manufacturing

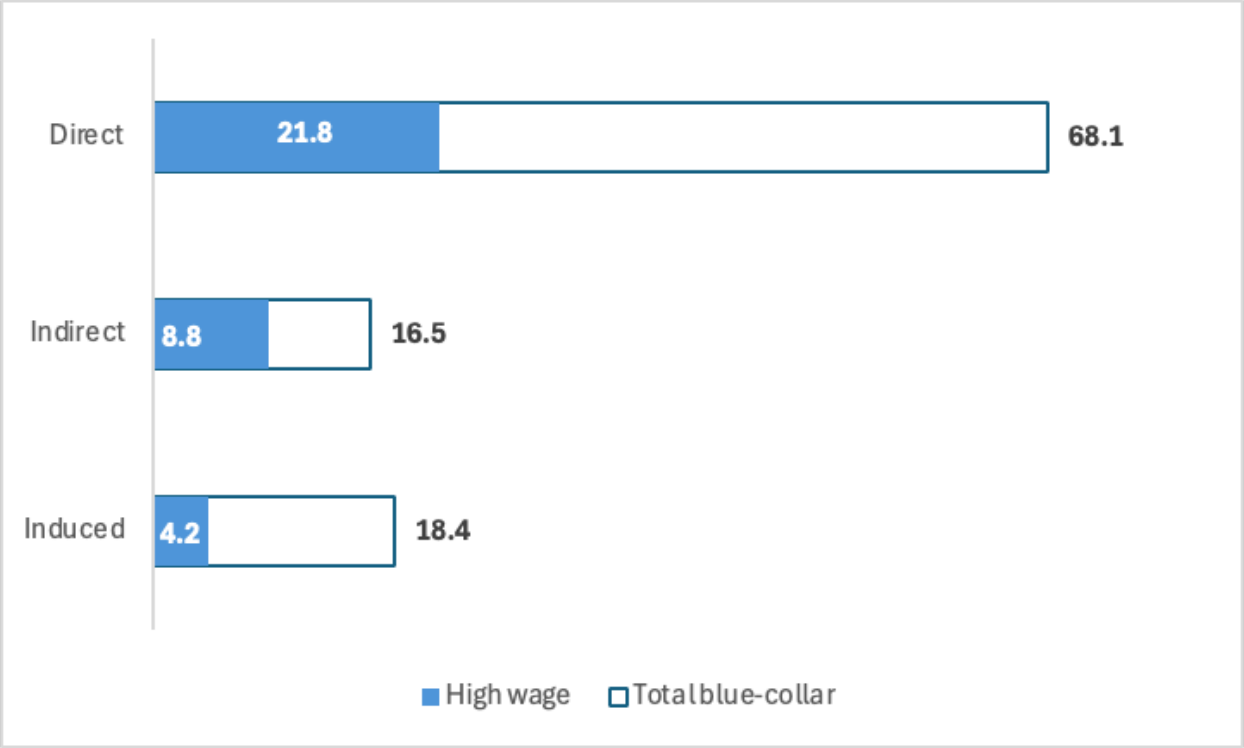
The third industry that could be part of a Lithium Valley industry cluster is lithium-ion battery manufacturing. The manufacturing of storage batteries is a well-established industry meaning that employment statistics of existing battery manufacturing firms permit reasonably accurate projections of the occupational mix in any new battery plants that might come to Imperial County. Because there is no battery manufacturing in Imperial County at the time of this writing, however, our Imperial County estimates relied on multipliers derived from the averages reported by battery manufacturers elsewhere in California. Our data on the occupational mix of directly created jobs also comes from data on existing battery manufacturers elsewhere in California. These employment data are industry averages for "storage battery manufacturing," which is a general category that includes manufacturing of all kinds of rechargeable lithium-ion batteries.

Analysts have argued that the greatest promise of employment in Lithium Valley is in battery manufacturing.[29] The reason is simple: for every person involved in extracting a kilogram of lithium from the ground, it takes many, many more people to turn that lithium into a battery. Compared to jobs in geothermal power generation, however, many jobs in battery manufacturing require education beyond a postsecondary certificate and a smaller percentage of them are high-wage, blue-collar jobs. Out of every 100 new battery manufacturing jobs created in Imperial County, we would expect 68.1 to be blue-collar jobs. We would expect only 21.8 of those blue-collar jobs to also be high-wage jobs, relative to Imperial County as a whole. Lithium is a small fraction of a lithium-ion battery, and most of the other inputs for battery manufacturing, and most of the indirectly created jobs, likely would be supplied by industries outside of Imperial County. Our model therefore projects that battery manufacturing would create relatively few indirect jobs in the local supply chain. For every 100 battery manufacturing jobs, we could expect the indirect creation of another 8.8 potential high-road jobs in Imperial County. Workers' local spending could induce another 4.2 potential high-road jobs (see Figure 3-4).

We would expect only a small share of the new jobs in battery manufacturing to be high-wage, blue-collar jobs that could contribute to high-road economic development in Imperial County. We would expect the indirect industry spillovers from companies' purchases of supplies, or from workers' spending in the local economy, to produce a few, but not many, additional high-wage, blue-collar jobs.

29 Benner, C., et al. (2024), p. 42.

Figure 3-4. Total number of blue-collar jobs and high-wage blue-collar jobs created and induced in Imperial County, for every 100 jobs in battery manufacturing operations



Source: Authors' computations from IMPLAN 2022 Data for Imperial County.

Three possible futures

Because the prospects for Lithium Valley job growth are uncertain, we consider three possible futures. The first possible future is what we will call the *construction-only* scenario. Construction jobs are the first high-road jobs to be created in Lithium Valley, and our construction-only scenario describes a near-term future in which facilities are under construction but the operating jobs in extraction and battery manufacturing have not yet come online. Construction jobs in Lithium Valley will be only temporary. Because publicly available information does not allow estimates of when the proposed facilities might be developed, how long their construction might take, or in what sequence they might be built, it is not yet possible to put together project-specific estimates to yield a total number of construction jobs that will be available in Lithium Valley as a whole in any given year. One project-specific estimate comes from CTR's projection of "up to 480 construction jobs under a comprehensive Project Labor Agreement with the Building and Construction Trades Council of California."[30] Another project-specific estimate comes from BHER's pro-

30 Controlled Thermal Resources (2021), p. 6.

jection of 504 construction jobs for a geothermal power facility.[31] We therefore consider a scenario that involves 1,000 total construction jobs at one time. We assume that the occupational distribution of these jobs is an average between the typical mix of jobs involved in power plant construction and the typical mix of jobs involved in manufacturing plant construction. The construction-only scenario answers the question: How much high-road employment could we expect from the construction of Lithium Valley in the short term?

The second possible future is the *extraction-only* scenario. The extraction-only scenario is a medium-term scenario that excludes temporary construction jobs to focus on relatively permanent employment in the operation of direct lithium extraction (DLE) facilities. It assumes that jobs will be created in DLE and that the total number of jobs will be the number that the lithium extraction companies have already announced in interviews and public documents. This scenario also assumes no addition of battery manufacturing capacity in Imperial County. The extraction-only scenario answers the question: How much potential high-road employment could we expect from Lithium Valley investment in Imperial County, if all the lithium extracted from the Imperial Valley is transported out of the county to supply electrical vehicle (EV) battery manufacturing that takes place elsewhere?

To estimate the extraction-only scenario, we rely on public estimates offered by the three lithium extraction companies. These companies have offered cautious projections of the number of permanent jobs that can be expected in the early phases of operating DLE facilities. These projections range from 27 jobs in BHER's demonstration facility to 112 jobs in CTR's Hell's Kitchen campus. In interviews and public documents, some of these companies have offered more ambitious projections for the later phases of their planned DLE operations. The largest of these is CTR's projection of 1,400 "direct CTR project jobs" at the Hell's Kitchen campus by the year 2030 in facilities that combine geothermal power generation and lithium extraction.[32] We summarize the low and high estimates that we have been able to locate for each company in Table 3-1. We rely on the high estimates to project the extraction-only scenario that we describe in this report.

31 California Alternative Energy and Advanced Transportation Financing Authority (2023), Request to Approve Project for a Sales and Use Tax Exclusion, BHE Renewables, LLC and its subsidiaries Magma Power Company, Elmore North Geothermal LLC, and Cal Energy Operating Corporation, July 18, Agenda Item 4.A.17, Resolution No. 23-SM008-01, p. 6.

32 Controlled Thermal Resources (2021), p. 6.

Table 3-1. Forecasts of new jobs in direct lithium extraction in Imperial County

Company	Low estimate[a]	High estimate[b]
Berkshire Hathaway Energy Renewables	27	400
Controlled Thermal Resources	112	1,400
EnergySource	60	80

[a] Sources include California Alternative Energy and Advanced Transportation Financing Authority, Request to Approve Project for a Sales and Use Tax Exclusion, BHE Renewables, LLC and its subsidiaries Magma Power Company, BHER Minerals, LLC, and CE Generation, LLC, June 21, 2022, Agenda Item 4.A.1, Resolution No. 22-SM020-01, p. 4; Chambers Group, SB 610 Draft Water Supply Assessment for Hell's Kitchen PowerCo 1 and LithiumCo 1 Project Prepared for Imperial County Planning and Development Services, November 2023, p. 15; and California Alternative Energy and Advanced Transportation Financing Authority, Request to Approve Project for a Sales and Use Tax Exclusion, EnergySource Minerals, LLC and its subsidiary, ESM ATLiS, LLC, December 12, 2022, Agenda Item 4.A.1, Resolution No. 22-SM016-01, p. 5.
[b] Company estimates reported in Benner, C. (2024), p. 31

Our extraction-only scenario assumes that there will be a total of 2,000 jobs in direct lithium extraction (DLE) when the industry is fully developed in Imperial County. This assumption aggregates the highest public estimate reported by each company and rounds to the nearest thousand to reflect the imprecision of those estimates. It may seem like an optimistic scenario, but compared to other projections that Lithium Valley investment could bring tens of thousands of jobs to Imperial County, the extraction-only scenario is cautious.

The third possible future is what we call the *battery supply-chain* scenario. The battery supply-chain scenario answers the question: How much potential high-road employment could we expect from Lithium Valley investment in Imperial County, once all battery manufacturing capacity that companies have proposed to develop is operating? This is a long-term scenario that assumes that all the jobs in the extraction-only scenario will be created, *and* that *some* EV battery manufacturing will also be developed in Imperial County. To project the total number of battery manufacturing jobs that could be expected in this scenario, we consulted the total capacity for battery manufacturing employment that companies have specifically projected in proposing to develop facilities in Imperial County, as reported in publicly available documents. These projections include 7,000 jobs envisioned at CTR's Hell's Kitchen campus (4,500 jobs at the site called "Battery Hub 1," and 2,500 at the site called "Battery Hub 2").[33] They also include "up to 2,500" direct jobs at the proposed StateVolt gigafactory.[34] Because CTR's projections for on-site manufacturing were

33 Controlled Thermal Resources (2021), p. 6.
34 Statevolt (2023), *Our Approach*. <https://statevolt.com/our-approach/hyperlocal-model/>

developed before Statevolt announced its own plans to develop battery manufacturing on an alternative site using lithium supplied by CTR, we assume that these projections might be counting many of the same jobs twice. For the purposes of our battery supply-chain scenario, we therefore assume that the development of Lithium Valley will directly create 7,000 jobs in the storage battery manufacturing industry. To be sure that this assumption is potentially realistic, we checked it against the ratio of *existing* jobs in raw material extraction to existing jobs in battery manufacturing in the electric vehicle supply chain in the US. Researchers have estimated that ratio as approximately 1:4, suggesting that the assumption of 7,000 battery manufacturing jobs in Imperial County could be consistent with a scenario in which there are 2,000 jobs in direct lithium extraction (DLE) and that most of the lithium extracted is processed into batteries locally.[35] The assumption of 7,000 battery manufacturing jobs in Imperial County is also consistent with what we know about proposals for manufacturing facility development in Imperial County.[36]

All three of these scenarios are models meant to answer questions of the form: *what if* a specific plan comes to pass? They are not economic forecasts of the likelihood that these scenarios *will* come to pass. They are benchmarks that we can use to compare the implications of different possible futures. For each scenario, we report the *high-road jobs potential*, which is the total number of projected new jobs in Imperial County that could meet our criteria of high-road employment.

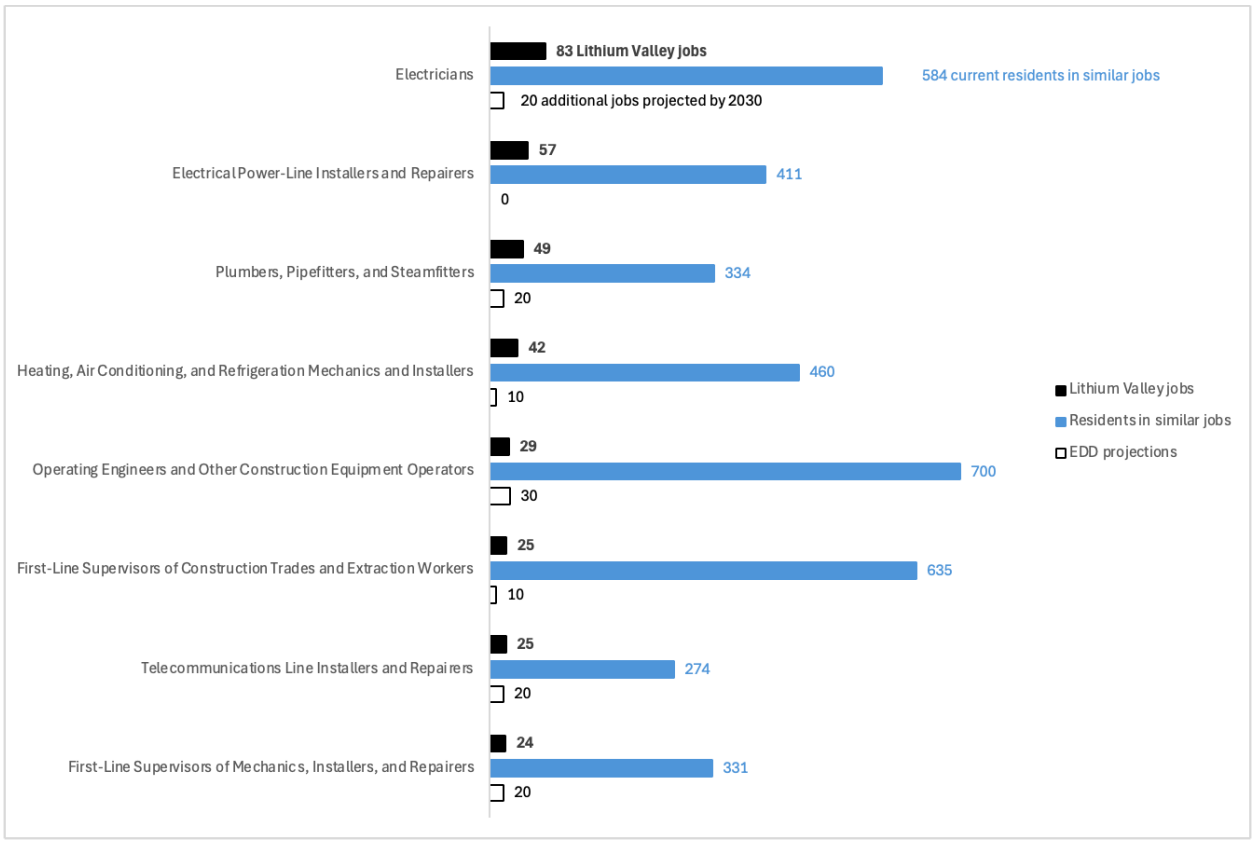
The construction-only scenario

Our *construction-only scenario* assumes 1,000 new construction jobs would be directly created to build new facilities for Lithium Valley. In this scenario, we estimate that we could expect a total of *538* directly or indirectly created high-wage, blue-collar jobs in Imperial County. Many current residents of Imperial County already work in these occupations or in other closely related occupations. Figure 3-5 lists all potential high-road occupations in which at least 20 new jobs would be created, whether directly or indirectly, in the construction scenario. For each occupation, the graph shows the estimated number of new jobs created by Lithium Valley development (in black), the estimated number of Imperial County residents who already work in that occupation or in one of the five most closely related occupations (in blue or gray), and the projected net new job growth by 2030 *without* Lithium Valley development (in white).

35 For an analysis of the jobs in the EV supply chain that shows approximately a 1:4 ratio of jobs in raw materials to jobs in "battery component, cell, and pack manufacturing," see Benner et al. (2024), p. 6.

36 Campognól, N., Pfeiffer, A. & Tryggestad, C. (2022), *Capturing the battery value-chain opportunity*, McKinsey & Co., January 7, https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/capturing-the-battery-value-chain-opportunity. Campognòl and co-authors estimate that "a new battery manufacturing plant with a total capacity of 30 to 40 gigawatt-hours (GWh) per year could directly create as many as 3,200 jobs." That describes the projected capacity of the Statevolt "gigafactory," and Rick Planning + Design. (2023), outlines land use scenarios for the Lithium Valley Specific Plan Area that could permit two or more such facilities in Imperial County.

Figure 3-5. Projected Lithium Valley jobs, projected other new job openings, and currently employed Imperial Valley residents, by occupation, construction-only scenario



Source: Authors' computations from California Employment Development Department, 2020-2030 Occupational Employment Projections, El Centro Metropolitan Statistical Area (Imperial County); IMPLAN 2022 Data for Imperial County; US Bureau of the Census 2022 5-year American Community Survey Public Use Microdata Sample; and US Department of Labor, Employment and Training Administration, National Center for O*NET Development, O*NET Related Occupations module.

The graph in Figure 3-7 illustrates that construction skills are well represented in Imperial County. All of these construction jobs are the kinds of jobs that could expect to find qualified applicants among residents of Imperial County. All of these occupations would be projected to grow even in the absence of Lithium Valley.

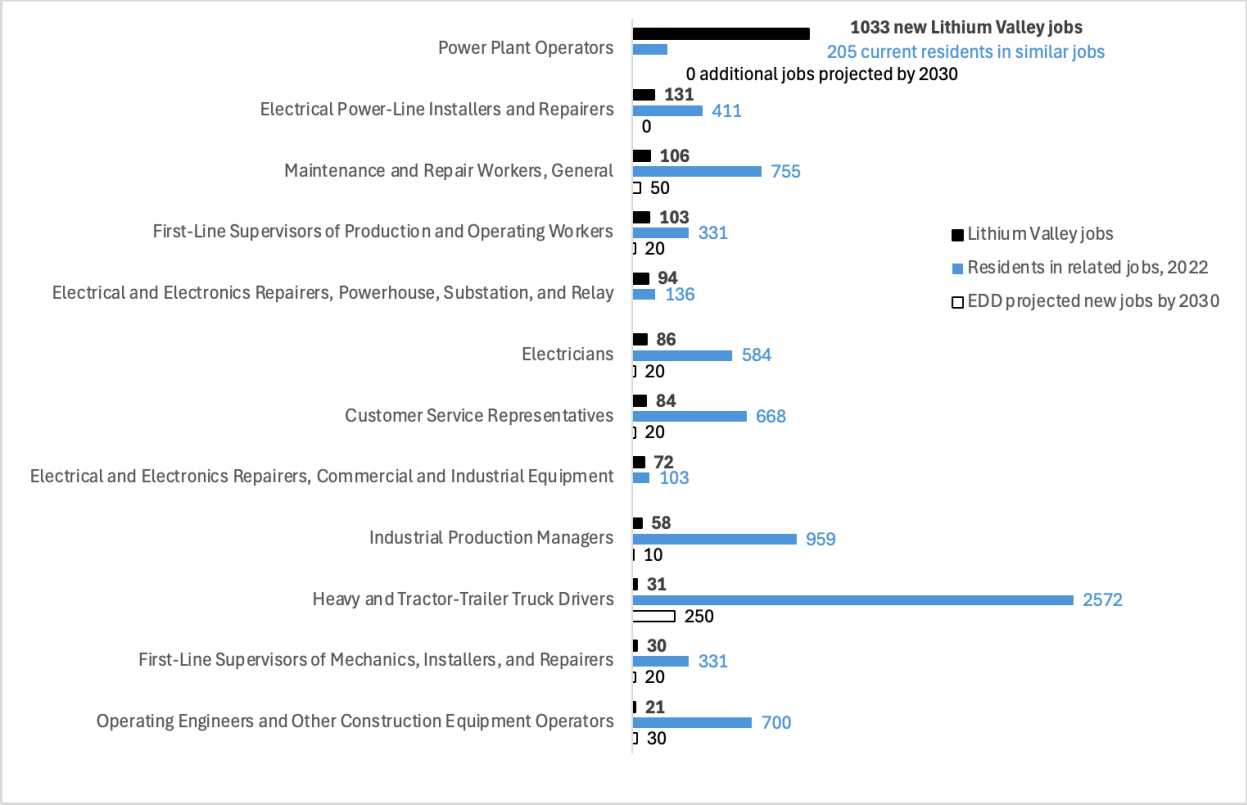
The extraction-only scenario

We estimate that the extraction-only scenario, with 2,000 new jobs directly created in DLE, could yield a total of *2,163* high-wage, blue-collar jobs in Imperial County, including jobs in DLE and jobs in industries that supply the geothermal power and DLE industries. Figure 3-6 lists every occupation that could expect at least 20 new jobs to be created in this scenario. The black bar next to each occupation represents the estimated number of jobs directly or indirectly created in that occupation in the extraction-only scenario. The blue or gray bar represents the estimated number of residents of Imperial County, aged 18 to 65, who worked in that occupation or any of the five other, most similar occupations as of 2022.[37] The white bar, which is visible for only some occupations, represents the total number of other net new job openings by 2030, according to 2020 projections by the California Employment Development Department that did not include projected Lithium Valley development. Occupations for which the white bar is visible are occupations that were already growing in Imperial County.

The graph in Figure 3-6 yields two important conclusions. First, most of these occupations have more Imperial County workers than projected new job openings. An employer who is considering whether to open a plant here might reasonably conclude that many Imperial County residents have relevant experience for these occupations.
Second, there is one occupation that has more new job openings than there are current residents working in that job or a closely related one: *power plant operator*. This occupation comprises almost half of the total high-wage, blue-collar jobs created in the extraction-only scenario. We estimate that there would be 1,033 new jobs in this occupation, compared to an estimated 205 current residents of Imperial County employed in closely related occupational categories. Because the extraction-only scenario would demand many more power plant operators than currently can be found in Imperial County, any approach to high-road workforce development in Lithium Valley should expand access to this occupation through education, training, and recruitment. (We describe the existing training landscape as it pertains to high-road employment in Lithium Valley in Chapter 4 of this report.)

37 "Most similar" occupations here are those that experts who were surveyed for the Department of Labor Employment and Training Administration's O*NET program judged to be most closely related with respect to characteristics of the work performed. For details on the measurement of "relatedness" see Dahlke, J. , Putka, D.J., & Schewach, O. (2022), *Developing related occupations for the O*NET program*, National Center for O*NET Development, <https://www.onetcenter.org/dl_files/Related_2022.pdf>

Figure 3-6. Projected Lithium Valley jobs, projected other new openings by 2030, and currently employed Imperial Valley residents, by occupation, extraction-only scenario



Source: Authors' computations from California Employment Development Department, 2020-2030 Occupational Employment Projections, El Centro Metropolitan Statistical Area (Imperial County); IMPLAN 2022 Data for Imperial County; US Bureau of the Census 2022 5-year American Community Survey Public Use Microdata Sample; and US Department of Labor, Employment and Training Administration, National Center for O*NET Development, O*NET Related Occupations module.

The battery supply-chain scenario

We estimate that the battery supply-chain scenario, in which 2,000 new jobs are directly created in direct lithium extraction (DLE) and another 7,000 jobs are directly created in storage battery manufacturing, could yield a total of *4,316* high-wage, blue-collar jobs in Imperial County, including jobs in DLE, in battery manufacturing, and jobs indirectly created in other industries that supply these industries.

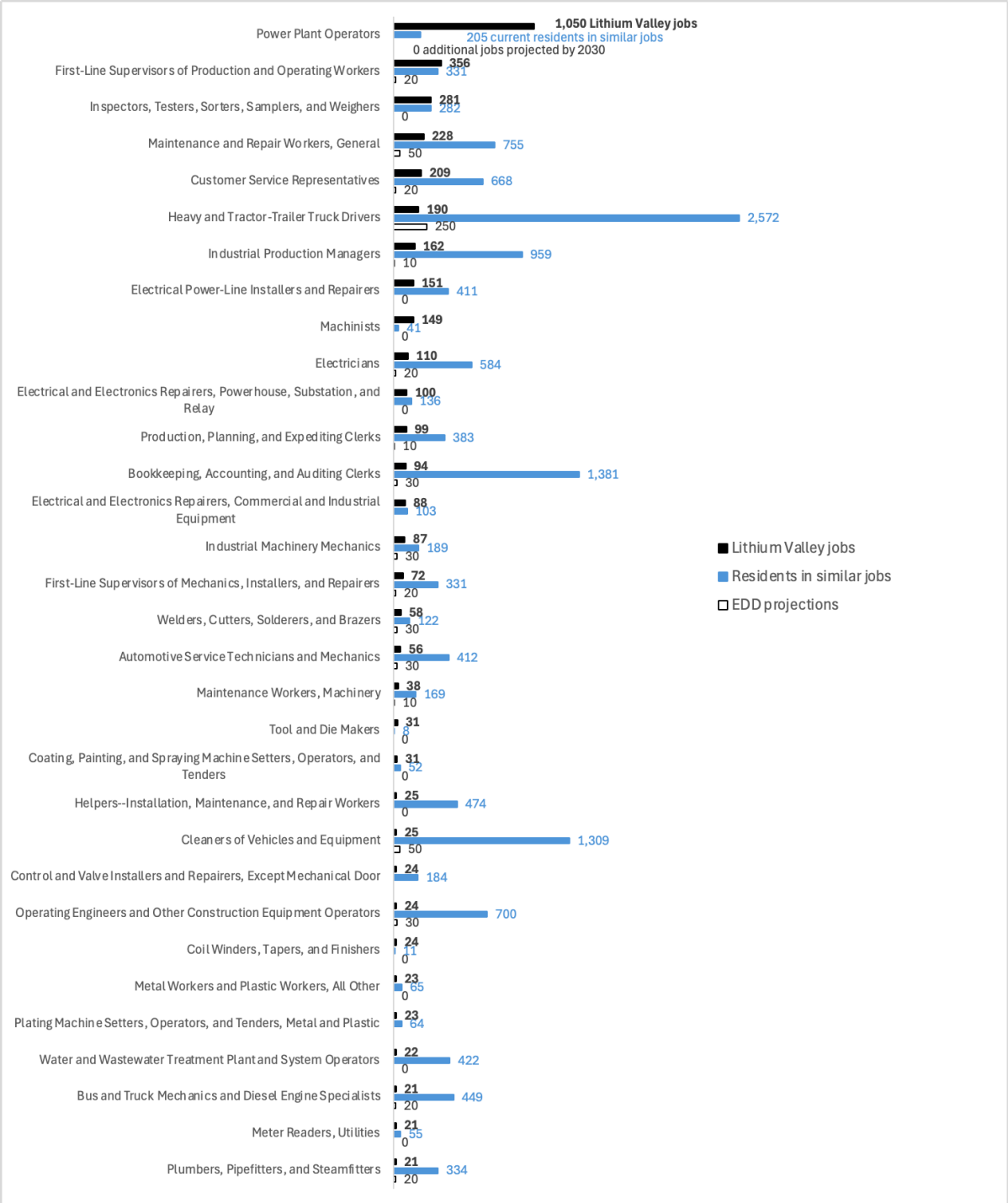
Many of the new jobs in the battery supply-chain scenario would be in occupations that are already present in Imperial County. Figure 3-7 lists every high-wage, blue-collar occupation in which at least 20 job openings would be created in the battery supply-chain scenario. For each occupation, this graph shows the estimated number of job openings directly or indirectly created in the battery supply-chain scenario (in black), the number

of Imperial County residents who currently work in that occupation or another closely related occupation (in blue or gray), and the other net new job openings projected by the Employment Development Department (in white). The graph illustrates the wide range of high-wage, blue-collar jobs that could be expected in the battery supply-chain scenario. It shows that openings in some of these occupations could come close to, or exceed, the number of County residents with relevant experience. It also shows that few of these occupations would be expected to have many new job openings in the absence of Lithium Valley development.

Although none of these high-wage, blue-collar jobs require college degrees, many of them are highly skilled and technical occupations that require both training and experience. In addition to power-plant operators, the list includes "inspectors, sorters, testers, samplers, and weighers"; heavy truck drivers; machinists; and many other occupations. If the battery supply-chain scenario is to become a reality in Lithium Valley, these are the occupations in which it will be necessary to invest in training, education, and recruitment to expand residents' access to these high-road jobs.

In contrast to the extraction-only scenario, the battery supply-chain scenario assumes that Lithium Valley has the potential to generate many more high-road jobs. The graph in Figure 3-7 implies that this scenario would also require much greater investment in training and placement services to develop the pipeline into those jobs for residents of Imperial County. We discuss the current training landscape in Chapter 4.

Figure 3-7. Projected Lithium Valley jobs, projected other new job openings, and currently employed Imperial Valley residents, by occupation, battery supply-chain scenario



Source: Authors' computations from California Employment Development Department, 2020-2030 Occupational Employment Projections, El Centro Metropolitan Statistical Area (Imperial County); IMPLAN 2022 Data for Imperial County; US Bureau of the Census 2022 5-year American Community Survey Public Use Microdata Sample; and US Department of Labor, Employment and Training Administration, National Center for O*NET Development, O*NET Related Occupations module.

Even more possible futures

This chapter has reported economic models that translate estimates of industry employment into estimates of potential high-road jobs by occupation. The three scenarios we consider here are benchmarks that allow us to consider a range of different possible outcomes. These scenarios are based on information available in the public domain. Although our models were informed by data, they rely on assumptions about *which* data are the best approximation of the future industry and occupational employment patterns we should expect in Lithium Valley. All projections involve uncertain assumptions, but our scenarios may be especially uncertain. DLE is a new and proprietary technology; Imperial County has no history of battery manufacturing; and the future plans of the companies that are investing in Lithium Valley may change as the competitive landscape changes. Therefore, these scenarios should not be read as predictions of the future. They are guideposts that may be useful for decision-makers considering alternative possible futures for Lithium Valley: *if* this scenario were to happen, *how many* potential high-road jobs, and in which occupations, could we reasonably expect?

Our first important finding is that the answers to these questions vary widely from one scenario to the next. Our second important finding is that the development of battery manufacturing in Imperial County could bring many more high-road jobs than other scenarios–and also many *different* jobs than those that residents already have. If something like the battery supply-chain scenario is to come to Imperial County, regional stakeholders may need to develop more education and training infrastructure, to provide employers with the assurance that they will be able to hire the skilled workers they need and to provide residents with pathways to potential high-road jobs.

CHAPTER 4. WORKFORCE TRAINING TO GET ON THE HIGH ROAD

A *high-road training partnership* (HRTP) brings companies, training institutions, unions, and community organizations together to ensure that community residents have a pathway into high-wage, highly skilled jobs. HRTPs are a particularly important part of California's strategy for climate transition. The State is a leader on climate policy, with ambitious plans to achieve net zero carbon emissions by 2045 through innovation in building, manufacturing, transportation, and carbon removal.[38] But the State's commitment to reducing greenhouse gas emissions is expensive. Producers in California cannot, and should not attempt to, compete by engaging in the so-called race to the bottom: lowering standards to match low-road jurisdictions where labor and environmental standards are weaker. To stay competitive in national and international markets, the state's industries must become and remain innovative. To that end, they must attract, train, and retain skilled employees, and they must innovate continually to stay at the leading edge. The State's approach must "build skills, respond to employer needs, and improve job quality, simultaneously" and continually.[39]

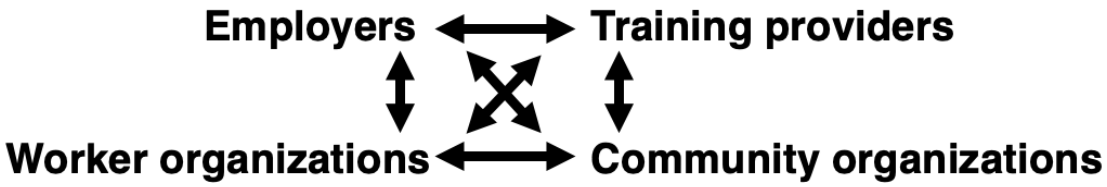
The State's HRTP strategy assumes that this approach can be most successful where workers have a voice on the job, where community organizations have a role in ensuring that jobs benefit local residents, and where people and organizations with expertise in job creation, job quality, and job training come together: "Workers, labor and other worker organizations, and employers are recognized as industry experts and work alongside community-based organizations and training institutions to provide workforce development solutions with pathways to quality jobs for all Californians, especially those from the most disadvantaged communities."[40] We represent this model of mutually reinforcing, cooperative relationships with the diagram in Figure 4-1. The arrows here represent cooperative relationships among different kinds of organizations.

38 See Newsom, G. (2022), *California releases world's first plan to achieve net zero carbon pollution*, <https://www.gov.ca.gov/2022/11/16/california-releases-worlds-first-plan-to-achieve-net-zero-carbon-pollution/>

39 Zabin, C., Auer, R., Cha, J. M., Collier, R., France, R., MacGillvary, J., Myers, H., Strecker, J., & Viscelli, S.(2020), *Putting California on the High Road: A Jobs and Climate Action Plan for 2030*, UC Berkeley Center for Labor Research & Education, < https://laborcenter.berkeley.edu/wp-content/uploads/2020/09/Putting-California-on-the-High-Road.pdf>, p. 8.

40 UCLA Labor Center (2020), *The High Road in Workforce Development*, <https://cwdb.ca.gov/wp-content/uploads/sites/43/2020/08/OneSheet_HRTP_ACCESSIBLE.pdf>.

Figure 4-1. The High Road Training Partnership model



If Lithium Valley is to provide current residents of Imperial County with high-road jobs, it will be especially important to develop *local* high-road training partnerships. As we showed in Chapter 2, most working-age residents of Imperial County will need family-supporting wages that do not require a college degree. As we showed in Chapter 3, many of the new high-road jobs that could come to Imperial County as a result of investment in Lithium Valley are in occupations that currently employ very few residents of the county. A high-road training partnership could provide community members with the training they need to fill the jobs that employers most need filled.

Any high-road training partnership in Imperial County will build on existing relationships among organizations and across sectors. This chapter offers an overview of the landscape of training institutions in the lithium-ion battery value chain in Imperial County. We limit our overview to institutions that provide training for high-wage, blue-collar jobs, defined as jobs that pay above the county's median wage and that do not require a college degree. We limit our geographic scope to training providers already located in Imperial County. Our focus is on state-recognized training programs that lead to occupation-specific credentials in occupations that are related directly to lithium extraction, lithium processing, or battery manufacturing. Our aim is to identify the current training landscape that is available to current residents and identify both opportunities for building high-road training partnerships and gaps in the current system.

We begin with registered apprenticeship programs.

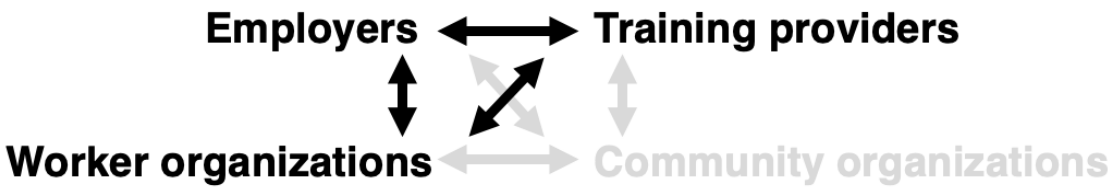
Apprenticeship programs

Registered apprenticeship programs are an important part of many HRTPs. In a registered apprenticeship program, apprentices learn skills through a mix of classroom instruction, on-the-job training, and supervised work experience. Apprentices are paid while they learn, with wages that increase as their skills improve. An apprentice who completes the required hours and passes the required examinations earns a certificate of completion from the California Division of Apprenticeship Standards (DAS) and a journey card (sometimes also referred to as a "journeyman's card"), verifying their status as a skilled tradesperson. Workers who have completed their apprenticeship may be called journeymen,

journeywomen, or journeyworkers. The number of openings for apprentices is adjusted to match available jobs for journeyworkers, so that apprentices have some assurance that there will be jobs for them at the end of their training.

Registered apprenticeship programs are rigorously evaluated by the DAS and by the US Department of Labor to ensure that they uphold industry standards. Apprentices are also represented in the management of every registered apprenticeship program in California, either through their labor unions or through nonunion worker representation on an advisory board. Apprenticeship programs may be governed by a Joint Apprenticeship Committee that includes labor and management representatives, or by a Unilateral Apprenticeship Committee of solely labor or management. Joint apprenticeship programs in the building and construction trades have a particularly strong track record of providing high-wage, blue-collar employment to Californians, and this track record was one of the inspirations for the State's high-road training partnership model. The California Workforce Development Board's 2020 report, *Putting California on the High Road: A Jobs and Climate Action Plan for 2030*, describes apprenticeship as "the gold standard in training for occupations that do not require a four-year college degree."[41]

Figure 4-2. The apprenticeship model



In the apprenticeship model depicted in Figure 4-2, worker organizations and training providers work together to ensure that apprenticeship training meets the needs of employers and workers alike. This model is common in building and construction trades and in some other occupations in which unions play an important role in the governance of apprenticeship programs. The diagram omits community-based organizations, which most typically do not have a formal role in the governance of an apprenticeship program. Some Joint Apprenticeship Committees, however, include a designated role for community-based organizations that represent the needs of area residents. That model approximates the ideal of an HRTP.[42]

41 Zabin, C. et al. (2020), p. 136.

42 See A. Gonzalez-Vasquez & M. Lopez (2021), The High Road to Economic Prosperity: An Assessment of the California Workforce Development Board's High Road Training Partnership Initiative, UCLA Labor Center, p. 31

Some of the new high-road jobs that might be created in Lithium Valley–including jobs in DLE and in battery manufacturing–are especially suitable for apprenticeships. Table 4-1 lists the potential high-road occupations in the Lithium Valley scenarios described in Chapter 3 that are also apprenticeship occupations. These are "apprenticeship occupations" because they include jobs that are reported by experts to require a postsecondary certificate and that are on the US Department of Labor list of apprenticeship occupations, meaning that every occupation on this list has been approved for an apprenticeship program somewhere in the US.[43] We limit the table to occupations that are projected to have at least 10 new jobs in at least one of the three Lithium Valley scenarios described in Chapter 3. Next to each occupation, Table 4-1 lists the net number of new jobs in that occupation that the California Employment Development Department projected over the period 2020 to 2030: this is the number of new jobs in this occupation that might be expected in Imperial County *without* the development of Lithium Valley. The last three columns list the number of openings directly or indirectly created in each occupation, by scenario, for three scenarios: the construction-only scenario, the extraction-only scenario that excludes temporary construction jobs but includes relatively permanent jobs in DLE, and the battery supply-chain scenario that excludes temporary construction jobs but includes relatively permanent jobs in *both* DLE *and* battery manufacturing.

The analysis suggests that apprenticeships could be an especially valuable avenue for high-road training in Lithium Valley. Table 4-1 lists 39 high-wage, blue-collar, apprenticeship occupations associated with Lithium Valley. Together, they include more than 75% of the potential high-road jobs projected in the construction-only scenario, in the battery supply-chain scenario, and almost 85% of the potential high-road jobs projected in the extraction-only scenario.

43 Our employment projections for the battery supply-chain scenario also included 209 job openings in one high-wage, blue-collar occupation on the approved apprenticeship occupations list that was *not* named by experts as requiring a postsecondary certificate: customer service representatives.

Table 4-1. Potential high-road apprenticeship occupations in Lithium Valley

Occupation	Without Lithium Valley	Lithium Valley scenario		
		Construc-tion only	Extraction only	Battery supply chain
Power Plant Operators	0	0	1033	1050
Inspectors, Testers, Sorters, Samplers, and Weighers	0	1	3	281
Maintenance and Repair Workers, General	50	2	106	228
Electrical Power-Line Installers and Repairers	0	57	131	151
Heavy and Tractor-Trailer Truck Drivers	250	14	31	190
Electricians	20	83	86	110
Industrial Production Managers	10	0	58	162
Machinists	N/A	0	1	149
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	N/A	4	94	100
Production, Planning, and Expediting Clerks	10	1	18	99
Bookkeeping, Accounting, and Auditing Clerks	30	6	19	94
First-Line Supervisors of Mechanics, Installers, and Repairers	20	24	30	72
Electrical and Electronics Repairers, Commercial and Industrial Equipment	N/A	1	72	88
Industrial Machinery Mechanics	30	2	17	87
Plumbers, Pipefitters, and Steamfitters	20	49	18	21
Welders, Cutters, Solderers, and Brazers	30	7	3	58
Automotive Service Technicians and Mechanics	30	3	5	56
Operating Engineers and Other Construction Equipment Operators	30	29	21	24
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	10	42	1	4
Maintenance Workers, Machinery	10	0	1	38
Telecommunications Line Installers and Repairers	20	25	2	11
Helpers--Installation, Maintenance, and Repair Workers	0	6	2	25
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	0	0	1	31
Cleaners of Vehicles and Equipment	50	1	2	25

Control and Valve Installers and Repairers, Except Mechanical Door	N/A	1	20	24
Bus and Truck Mechanics and Diesel Engine Specialists	20	2	6	21
Water and Wastewater Treatment Plant and System Operators	0	0	15	22
Dispatchers, Except Police, Fire, and Ambulance	20	3	9	18
Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	N/A	0	0	18
Mixing and Blending Machine Setters, Operators, and Tenders	N/A	0	0	18
Installation, Maintenance, and Repair Workers, All Other	0	3	3	14
First-Line Supervisors of Retail Sales Workers	140	1	3	15
Painters, Construction and Maintenance	10	14	0	1
Cement Masons and Concrete Finishers	N/A	14	0	0
Mobile Heavy Equipment Mechanics, Except Engines	20	5	2	9
Wind Turbine Service Technicians	N/A	3	9	11
Automotive Body and Related Repairers	0	1	1	12
Sheet Metal Workers	N/A	10	0	1

Sources: Authors' computations from IMPLAN 2022 Data for Imperial County and US Department of Labor (2024), Apprenticeship Occupations.

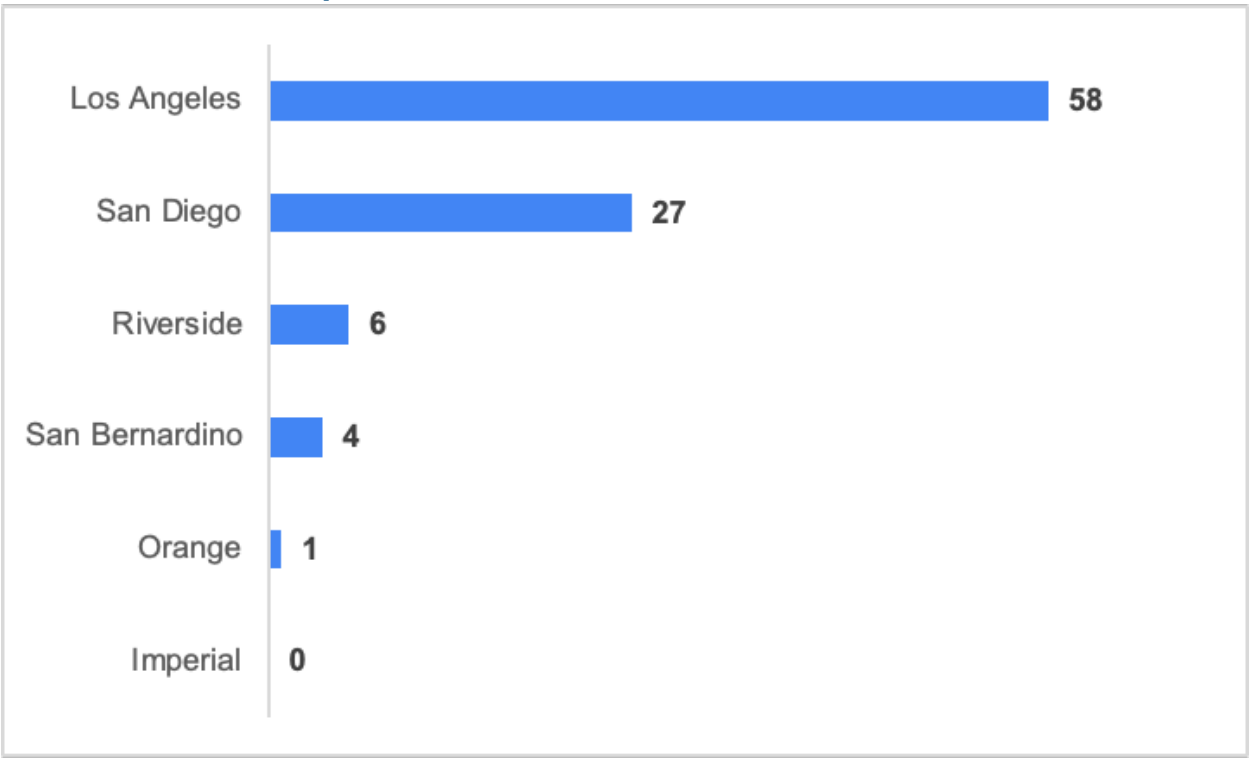
As of now, however, there are very few registered apprenticeship programs, in these or any other occupations, that are easily accessible to Imperial County residents. Among the region's building and construction trades unions, only the International Brotherhood of Electrical Workers (IBEW) Local 569 operates a training center in Imperial County. With comparatively few jobs in Imperial County for journeyworkers in skilled trades, there have been few opportunities to place workers who complete their apprenticeship training and therefore few openings for apprentices.

There are zero registered apprenticeship programs in Imperial County that are eligible for training funds from the Workforce Innovation and Opportunity Act (WIOA), the principal federal source of job training funding for adults and displaced workers. Figure 4-3 shows the number of registered apprenticeship programs in Imperial, Orange, Riverside, San Bernardino, San Diego, and Los Angeles Counties that are eligible for WIOA funds. Residents of Imperial County who want to enroll as apprentices generally must move out of the county or else spend hours commuting to far-distant apprenticeship programs.

Improved access to apprenticeships could make a big difference for Imperial County's residents. According to data published by the Division of Apprenticeship Standards, 421 Imperial County residents were registered apprentices as of June 2024 (see Figure 4-4). Most of them (93%) were men, and most of them (63%) were between the ages of 18 and 24, but in other respects they resemble a reasonably representative cross-section of the working age people of Imperial County. With respect to race and ethnicity, for example, 91% of the apprentices in Imperial County reported that they are Hispanic, 6% reported that they are White and not Hispanic, and smaller numbers indicated that they are Native American, Black, Filipino, Asian American, or Pacific Islander. With respect to family care responsibilities, approximately 30% of them reported that they have one or more dependents and approximately 46% said that they did not have dependents; the remaining 24% did not respond to this question. In short, the typical Imperial County resident in a California registered apprenticeship program is a young Hispanic man who may be looking for a family-supporting wage. That is also a good statistical description of the typical Imperial County worker.[44]

44 These demographic totals are slightly discrepant with 2024 data retrieved from the US Department of Labor Registered Apprenticeship Partners Information Database System (RAPIDS) in June 2024, which included 400 registered apprentices in Imperial County and another 45 with no county listed, but who were associated with registered apprenticeship programs of the Imperial Irrigation District. Out of this total, federal statistics show 98% were men. We report DAS data here because they provide more complete social and demographic information. A companion report to this one reports a more detailed analysis of the RAPIDS data: see I. W. Martin with Z. Cooper, A. Kvietok-Dueñas, & A. Lopez-Ricoy (2024), High Road Training for Lithium Valley: Opportunities and Challenges. UC San Diego Labor Center.

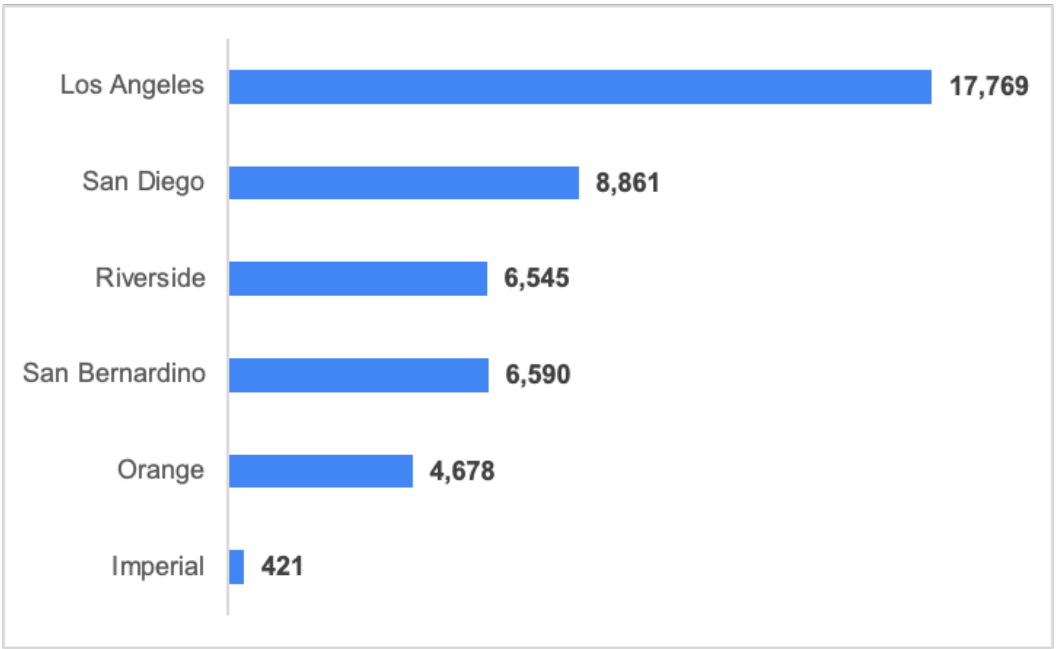
Figure 4-3. Number of registered apprenticeship programs eligible for Workforce Innovation and Opportunity Act Funds, in Imperial County and selected comparison counties, 2024



Source: Calculated from CalJOBS Eligible Training Provider List (ETPL), Registered Apprenticeships, retrieved 28 April 2024 from https://www.caljobs.ca.gov/vosnet/default.aspx

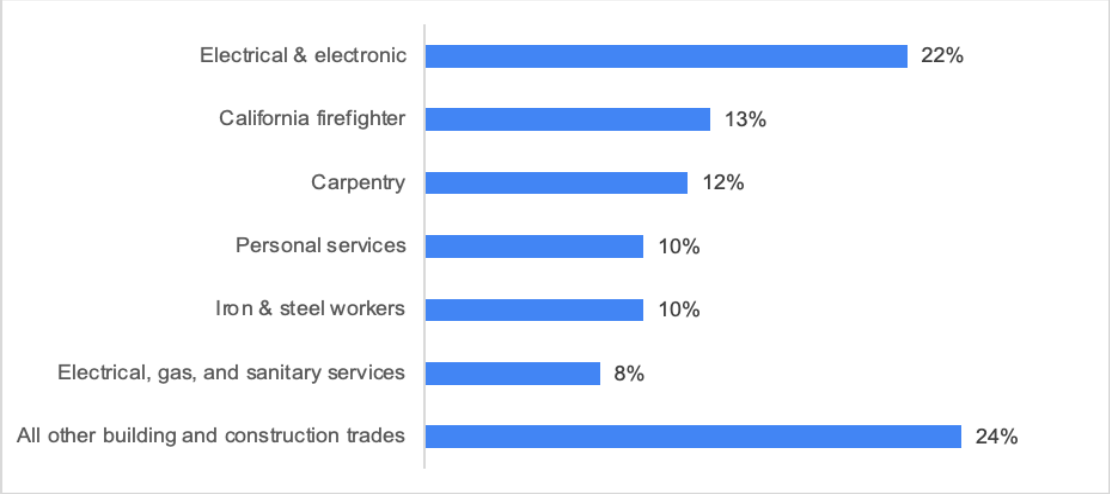
The Imperial County residents who are currently in registered apprenticeship programs are primarily in construction. They include apprentice electricians, carpenters, iron- and steelworkers, and workers in other building and construction trades. They also include a substantial share of apprentice firefighters and apprentices in personal services (see Figure 4-5).

Figure 4-4. Number of state-registered apprentices resident in Imperial County and selected comparison counties, 2024



Source: California Division of Apprenticeship Standards, Registration Dashboard, retrieved 2 June 2024

Figure 4-5. Industry of apprenticeship as percentage of all registered apprentices, Imperial County, 2024



Source: Calculated from data from the California Division of Apprenticeship Standards, Registration Dashboard, retrieved 2 June 2024

These percentages reflect the current availability of apprenticeship placements. Some of the apprenticeship programs located outside of Imperial County may have capacity to place apprentices in Imperial County for part of their training, but until the local demand

for apprentices grows, any apprentice in a skilled trade must rely on at least some placements outside of Imperial County to gain exposure to the full range of required skills and training.

Box 4-1. Apprenticeship programs in Imperial County: The International Brotherhood of Electrical Workers (IBEW)

IBEW Local 569 operates a joint apprenticeship program with the National Electrical Contractors Association, with training centers in San Diego and in the City of Imperial.

Number currently served: Approximately 15 apprentices annually at the Imperial County location.

Constraints on growth: The chief constraint is the lack of Project Labor Agreements (PLAs) that would provide jobs for skilled tradespeople on local projects. Without jobs for which to train apprentices, the IBEW apprenticeship program cannot scale up. Another challenge is that work training opportunities are limited to solar energy and battery storage projects, and do not provide enough breadth of experience for a skilled electrician. For that reason, Imperial County-based apprentices are often sent to work on jobs in San Diego to learn other aspects of the trade.

Recruitment pipeline: Recruitment is through word of mouth, job fairs, invited talks at Imperial Valley College, the Imperial Valley Regional Occupational Program, and high schools. The pre-apprenticeship program launching this fall will also form an important part of the recruitment pipeline for apprentices, although it is anticipated that those apprentices will be trained in San Diego.

Box 4-2. Apprenticeship programs in Imperial County: Imperial Irrigation District

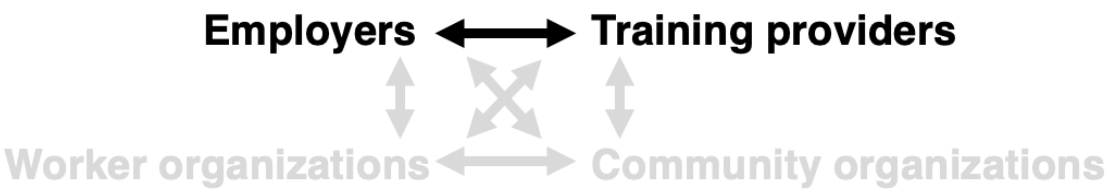
The Imperial Irrigation District (IID) has eleven apprenticeship programs, covering trades that include Control Operator, Electrician, Generation Mechanic, Hydro Operator, Instrument Technician, Meter Technician, Power Lineperson, Relays Technician, SCADA/Telecommunications Technician, Substation Electrician, and Telecommunications Technician. The IID provides on-the-job training, and the related and supplemental classroom instruction is provided by Imperial Valley College (IVC).

Number currently served: Approximately 12 apprentices annually across all programs
Recruitment pipeline: Recruitment is through an online jobs portal, career fairs, other community outreach events, and IVC.

Post-secondary certificate programs

Non-apprenticeship certificate programs could be another important component of a comprehensive HRTP. Postsecondary certificates are a common and important credential for entry into many skilled, blue-collar occupations. Although "certificate" has no standardized meaning, the standard for high-quality post-secondary certificates for blue-collar jobs in California, other than apprenticeship certificates, is set by the California Community Colleges. The Community Colleges are authorized by state law to define certificates of achievement that can be awarded to students who complete a set of courses toward career education. The contents of particular certificate programs vary from college to college, but they are all reviewed by the college curriculum committees, and they are generally crafted with input from employers and advisory bodies so they meet genuine workforce needs. As represented in the diagram in Figure 4-6, unions and other worker organizations may, or may not, be part of their advisory structures. A student may combine a certificate with the pursuit of a college degree, but many certificate programs are designed to be completed by students who are pursuing specific career goals and who are *not* working toward a degree. The number of people admitted to a certificate program may or may not be limited to the number of job opportunities in a specific occupation, but all certificate programs in the California Community Colleges are reviewed regularly to be sure that they meet a need for the labor market or for transfer to another educational program. These certificates provide a portable credential that workers can carry with them from job to job.

Figure 4-6. The certificate program model



Some of the jobs that might be created in Lithium Valley–including jobs in DLE and in battery manufacturing–are good candidates for industry certificate programs. Table 4-2 lists them. We identify an occupation as a potential candidate for a non-apprenticeship postsecondary certificate program if occupational experts surveyed by the Department of Labor Employment and Training Administration O*NET program reported that a certificate is required for one or more jobs within that occupational category and if it is *not* on the Department of Labor list of apprenticeship occupations. These all are occupations in which certificate programs provide at least some job seekers with an important advantage in at least some labor markets.

At the time of this writing, two certificate programs in Imperial County have been developed to support the Lithium Valley workforce, and a third is under development. All three are part of the Lithium Industry Force Training (LIFT) Program of Imperial Valley College. They were created with input from representatives from BHE Renewables, CTR, and EnergySource, who were members of an industry advisory board.

There may be opportunities to develop additional certificate programs as job opportunities expand in Lithium Valley. The three lithium extraction companies have expressed their intentions to recruit locally for skilled positions. Any opportunities for high-road economic development in battery manufacturing could also involve certificates in an even wider range of occupations. As the only community college in Imperial County, Imperial Valley College (IVC) is likely to remain a key partner in any such programs. The College must manage the pace of expansion carefully to ensure that students can be placed in jobs upon completion of the program. The success of the LIFT program was the result of two years of collaborative design and curriculum development prior to its launch.

Table 4-2. Potential high-road non-apprenticeship certificate occupations in Lithium Valley

Occupation	Without Lithium Valley	Lithium Valley scenario		
		Construc-tion only	Extraction only	Battery supply chain
First-Line Supervisors of Production and Operating Workers	20	1	103	356
First-Line Supervisors of Construction Trades and Extraction Workers	10	25	5	13
Meter Readers, Utilities	N/A	0	19	21
Solar Photovoltaic Installers	N/A	4	16	17
Roofers	N/A	16	0	0
Refuse and Recyclable Material Collectors	N/A	0	5	10
Coil Winders, Tapers, and Finishers	N/A	0	0	24

Sources: Authors' computations from IMPLAN 2022 Data for Imperial County; US Department of Labor (2024), Apprenticeship Occupations; and US Department of Labor, Employment and Training Administration, National Center for O*NET Development. (2022), Education, Training, and Experience module.

Box 4-3. Certificate programs in Imperial County: Plant Operator (LIFT Phase 1)

The Plant Operator Technology Certificate program was the first program to open as part of the LIFT program at Imperial Valley College (IVC). The program opened in Fall 2023 with two cohorts of 30 students, of whom 48 completed the first training course. The evening cohort included more older adults with experience in geothermal power industry, whereas the morning cohort IVC plans to reduce the program from two cohorts to one in Fall 2024, and reduce the cohort size from 30 to 24 students in order to provide enough opportunity for meaningful lab hours, internship placements, and job placements.

Number currently served: 60 students in 2023-24, of whom 40% were women; an estimated 24 students in 2024-25.

Constraints on growth: The program could grow to enroll 75 technicians per year, if there were demand for that many graduates. One particularly important constraint is the need to place students in internships. Students in the program are required to complete internships, but no DLE plants are yet operating at a commercial scale. Students, administrators, and industry advisors to the program all told us that opportunities to place interns in geothermal power plants have grown more slowly than initially projected, and plant operator positions in other facilities, such as municipal water treatment plants, have been important opportunities for students.

Box 4-4. Certificate programs in Imperial County: Chemical Technician (LIFT Phase 2)

The Chemical Technician certificate program is the second one-year certificate introduced as part of the LIFT program at Imperial Valley College. The program is scheduled to open in Fall 2024 with 25 students.

Number currently served: An estimated 25 students in 2024-25.
Constraints on growth: Construction of a new science, technology, engineering and math (STEM) building at Imperial Valley College, which may commence in 2026, should address short-term capacity issues with labs and classrooms. As with the plant operator technology certificate program, the important constraints on the chemical technician program include the need to provide students with lab opportunities, and the need to place students in internships.

Box 4-5. Certificate programs in Imperial County: Instrumentation Technician (LIFT Phase 3)

Imperial Valley College plans to enroll the students in the third LIFT certificate program, the instrumentation technician program, in Fall 2025.

Number currently served: 0
Constraints on growth: As with the other LIFT certificate programs, lab capacity and the availability of openings for job and internship placements are among the most important structural constraints on growth. The staggered timing of the LIFT certificate programs should permit the College to scale its capacity to meet labor demand; but uncertainty about the scale of future industry growth makes it difficult to predict the opportunities that will be available in 2026 or 2027.

To our knowledge, battery manufacturing companies have not yet reached out to the IVC or other local training partners to plan for training needs. Participation in developing training partnerships in the region would be an early indicator of a firm's commitment to battery manufacturing in Imperial County.

The need for training

The most important finding of this chapter is that high-road occupations in Lithium Valley will require expansion of the region's training capacity. Our projections of future employment in Lithium Valley identified only one potential high-road occupation that required neither an apprenticeship nor a postsecondary certificate: the battery supply-chain scenario would indirectly create demand for 12 postal service mail carriers.

Almost all potential high-road jobs that could be developed in Lithium Valley are also highly skilled jobs that may require a postsecondary certificate, and most of them are compatible with an apprenticeship model. In the next chapter, we turn to the challenges facing Imperial County residents seeking such training.

PART II. BARRIERS TO ACCESSING HIGH-ROAD EMPLOYMENT IN LITHIUM VALLEY

CHAPTER 5: INSUFFICIENT ACCESS TO EDUCATION AND TRAINING

The residents of Imperial County want high-road jobs, but face many barriers that stand in the way of attaining them. To identify those barriers, a team of 25 bilingual researchers from the University of California-San Diego (UCSD) Labor Center completed in-depth interviews with 214 residents in Imperial County, including 17 current students in the Imperial Valley College (IVC) Lithium Industry Training Force (LIFT) programs. By speaking directly with residents, we aimed not only to identify likely barriers to their access to high-road jobs in lithium extraction and battery manufacturing, but also to identify strategies to help overcome those barriers. The next four chapters summarize what they told us about the most important barriers they faced.

Our interviews ranged widely over topics such as residents' experiences at work, the differences between good and bad jobs, and the challenges they faced finding and keeping good jobs. Because most residents had limited understanding of the lithium-ion battery value chain, and because few jobs in lithium extraction yet exist in the County, we extrapolated from residents' *current* experiences of finding and keeping jobs in Imperial County to identify barriers that might impede their access to high-road, Lithium Valley jobs in the future. We sought the experiences of individuals currently in the workforce or seeking work, rather than soliciting the perceptions or predictions of youth, who may be the region's future workers. We aimed to reach a cross-section of working-age Imperial County residents that approximated the distribution of the county with respect to age, ethnicity, employment status, and educational attainment. We also aimed to oversample respondents from hard-to-reach populations and economically disadvantaged populations that could benefit from development of high-road jobs. (More details about our methods and sample can be found in the appendix.)

One of the most important themes to emerge from these interviews was the importance of education and training. Among the residents we interviewed, it was relatively common for those with college degrees to have jobs in education or healthcare, for instance, whereas those with less than a high-school education were more likely to be unemployed

or in farm work or other low-wage occupations. Many residents said they would like more education and training.

This chapter examines the barriers Imperial County residents currently face in accessing the education and training they need for high-road employment. In Imperial County, as in the rest of the US, higher levels of education and English proficiency provide access to better-paying jobs. Although financial barriers to education are a significant piece of the puzzle, participants also highlighted three other barriers. First, scheduling conflicts between work, carework, and training programs hinder residents' ability to further their education (and thus their future employment prospects). Second, the narrow range of course and degree options offered by local colleges, and the limited locations where courses are offered, also limit access to educational opportunities. Third, many Spanish speakers had limited access to the English language instruction they needed to qualify for job training.

Lack of access to the most valued credentials

Interview respondents perceived limited opportunities to access "good jobs" without three things: specialized training; education beyond a high school diploma; and English proficiency. The importance of education to access employment opportunities was raised by Agustín, a 37-year-old father who lived with his wife and four children. A resident of Holtville, he spoke both English and Spanish and worked as an In-Home Supportive Services (IHSS) caregiver for one senior client. Agustín said that his hours did not allow him to earn enough to cover his family's needs, but he could not take on more as his wife was disabled, making him the main caregiver for his family. When asked about the biggest challenge in getting the kind of job he wants, Agustín emphasized that he would need a certification or diploma that proved sufficient training or education. For instance, he recently applied to an accountant position but did not get the job: "I didn't get the job because I have only high school/GED and no training as an accountant. And I told them, I know how to do the work. I was an accountant for a different company. That company closed, so there was no way to verify my work experience as an accountant." Although Agustín had accumulated practical experience in other jobs, potential employers often rejected his application because of his lack of specialized education.

Augustín, like most respondents, believed that education was the key to "better jobs." That is, "people who actually went to school and got some sort of a certificate or a training certification" could get better jobs. As a result, Augustín planned to go back to school soon to become an electrocardiograph technician through an online program. After the six-week online program, he planned to pass the state exam to obtain his license and then land a higher-paying job that would allow him to hire an in-home care provider for his disabled wife and thus work more hours.

In contrast, respondents with more schooling and English proficiency had more options. For instance, Danilo, a bilingual 31-year-old single man from Calexico, had attended a high school that encouraged its students to apply to college and provided guidance about college requirements. Thanks to that high school experience, he attended UC Riverside, where he studied chemical engineering and interned at an air pollution research lab. Upon completing his degree, he returned to Calexico, where he "sat down for like six months, worked on [his] resume, applied to a bunch of jobs, and focused on finding a high paying job, especially in Imperial Valley, 'cause [he] wanted to be closer to [his] family." Eventually, Danilo landed a job at the Imperial County Air Pollution Control District, where he stayed for two years before moving on to a position working for the State of California.

The limited availability, location, and cost of courses

While respondents almost universally recognized the importance of postsecondary education, they also lamented the scarce options for postsecondary education in Imperial Valley. Imperial Valley College (IVC) and San Diego State University (SDSU) Imperial Valley were the only degree-granting postsecondary institutions in the area. Often, respondents asserted that even completing a degree at one of these institutions would not guarantee access to a well-paying job, because there were too few such jobs in the region. Several participants also noted that access to career and technical education and other job training opportunities were also limited. They told us that local colleges, institutes, and universities offered few degrees and programs, and that their courses had limited capacity and were generally only available in El Centro, Imperial, and sometimes Calexico.

Melissa, a technical education teacher in El Centro, addressed the limited courses and enrollment spots. After earning her bachelor's degree in dental hygiene from Loma Linda University, Melissa worked as a registered dental hygienist. When the principal of a high school in El Centro personally invited Melissa to teach in a career technical education pathway for health science, she made a career change. She had been working in this role for the past 16 years. When asked about her impressions of the post-secondary trajectories of her students, Melissa replied:

> I would say the majority stays, and maybe they get stuck at IVC. What I've been hearing recently is that they are not getting the classes that they need to continue to pursue transferring. 'Cause see, that's another thing, we [in Imperial Valley] don't offer a lot of post-secondary education in health careers specifically. We have nursing, we have emergency medical technician, paramedic, but we don't have dental hygiene, we don't have ultrasound technician, we don't have certified athletic trainer, we don't have physical therapy schools locally. So those students have to leave. They'll get their—maybe they'll do their prerequisites at IVC and then transfer, and then we

> lose them, of course, because they're moving to San Diego or they're moving out of state and they don't want to come back.

Although Melissa focused on the limited range of health-related degree options, other participants also brought up this issue more broadly, pointing to the lack of degree programs outside of nursing, law enforcement, and agriculture. Accounts like Melissa's underscored how the limited options could drive students away from Imperial County to pursue their educational interests, creating a brain drain.

Limited course offerings also pushed some respondents to reduce their educational aspirations and simply settle for what was available. Such was the case of Joel, who completed a four-year college degree at the San Diego State University (SDSU) campus in Imperial Valley. Joel initially wanted to get a bachelor's degree in neuroscience but was not able to do so at SDSU-Imperial Valley. He said, "There's no degrees here specifically for neuroscience. So, that was one of the things that prevented me from being able to get to that point. So, the next best thing for me was just psychology." He also underscored the lack of research opportunities available to students. Only after Joel graduated was he able to land a research internship through volunteer work.

Participants also noted that training and educational facilities in Imperial Valley were limited and concentrated mainly in El Centro, Imperial, and Calexico. The distance between interviewees' places of residence and the location of these facilities could mean the difference between participating and not, thanks to gas costs and travel time. For instance, Carolina, a 39-year-old mother and Spanish speaker, said her educational journey ended with middle school. Ever since, Carolina had worked as a farmworker. Carolina wanted to learn English and get a GED, and she enrolled in a program offered by SER-Jobs for Progress. However, budget cuts led to the closure of the program site in Brawley, where Carolina lived. When the program moved to El Centro, Carolina had to drop out. She said, "Right when you're trying your hardest, the program ends, because they didn't want to give it a grant anymore. What happens if you have the will, but they don't give you the chance, because they move the program? For us [me], this made it really difficult–to be spending money on gasoline [to get] to El Centro, where they moved it to. Because we live day by day." She wished there would be public transportation to help take people like her to classes.

In contrast, residents who lived in El Centro or Imperial found it easier to get to classes and stay in them. For instance, 40-year-old Fernanda, who lived in El Centro, transitioned from her job as a farmworker to a better-paying position as an outreach specialist at a local food bank within a few months. She believed that attending English classes at a local church and completing her GED at SER-Jobs for Progress in El Centro enabled her to make

this change. At the time of our interview, Fernanda had stopped attending English classes because they clashed with her working schedule. Although she was sad about it, she was also grateful that her current job "allowed [her] to grow little by little and had been very patient with [her] in terms of the language."

The distance to training facilities also made them impossible for some residents to reach. Jocelyn was a native Spanish speaker who had finished middle school and worked as a caregiver for the In-Home Supportive Services (IHSS) Program. When asked if she had ever received specialized training as part of her job, she replied: "There is training, yes, but it is also very far away, almost by El Centro." If she were to go, she added, she would learn "how to better assist people with Alzheimer's, dementia, how to do CPR, and how to clean houses with non-chemical products." Living in Calipatria, however, Jocelyn was unable to attend these free sessions because of the distance, scheduling conflicts with her job, and family responsibilities.

In addition to the lack of locations, educational institutions often do not offer enough classes to meet demand, leading to waitlists and preventing students from completing their educational programs. For instance, when Jocelyn looked into English classes, she learned that the class that worked for her schedule was already full. At the time of our interview, she had been attempting to take the class for two years without success.

For other residents, the cost of training or additional education was prohibitive. Several respondents mentioned tuition as a barrier. For instance, while Adriana considered going back to school, she reflected that the major issue was "The cost, I guess.... I'm about to see, maybe they have an online for the pharmacy tech, but I don't know. I know that costs too, but maybe not as expensive." For Adriana, the cost of training was an important consideration in her choice of occupation. This issue was particularly pronounced for working-class families who lacked the disposable income to invest in their education.

A broader range of affordable degree options, non-degree options, and locations, could encourage Imperial County residents to stay in Imperial Valley, pursue their educational aspirations, and improve their skills. In particular, respondents told us that more training and educational facilities are needed in center-north parts of the county, along with (or in addition to) better transportation to and from educational institutions.

Scheduling conflicts

Participants often mentioned that their work schedules and carework responsibilities conflicted with job training courses and programs. They told us that the few Saturday classes at IVC, for instance, tend to fill up right away and are more expensive than other courses, making the classes difficult to access for anyone with a job. Sometimes respondents chose to work night shifts to be able to study during the day. But such an arrangement was not possible for most. This scheduling conflict created a Catch-22: without more education people could not get better jobs, yet without better jobs (more income and flexible schedules), people could not obtain more training.

Bayron, the 43-year old construction worker introduced in chapter 2, completed middle school, worked in agriculture, and then entered construction, before he learned that he qualified for comprehensive financial assistance for technical educational programs. Although he was very interested in earning a commercial driver's license, he soon realized that to enroll in the morning courses he would have to "quit [his job] and grab a study check," which totaled only around $200 dollars a month. Because he could not afford to quit his job and continue to support his children, Bayron decided to "leave [his] studies for later." He said the experience "really tore [him] apart." In his experience, such unmet aspirations were common among farmworkers: "Sometimes when people say I'll stay for a couple of months [in the field and then quit], they stay all their lives, because it is difficult to make the change." When asked what would make educational opportunities and training programs more accessible, Bayron said he wished he could work in the mornings and pursue courses in the afternoons or evenings, so that he did not have to choose between "studying or eating."

Kayla, a 44-year-old divorced mother with three children, had a similar experience. A Seeley resident, Kayla completed a nursing assistant certificate through an Imperial Valley Regional Opportunity Program. A couple of years after graduating, she started working at the Imperial County Public Health Department, where she has now been for 23 years. Although Kayla's job matched her educational background, her income did not match her family's needs, forcing her to "really stretch [her] dollars until the end of the month." When asked if she had considered other employment opportunities, Kayla shared that she once aspired to become a nurse and even enrolled in a nursing program at IVC. Initially, she took night courses, but eventually had to take morning classes, which made it impossible for her to complete the program. Reflecting on this scheduling conflict, she stated:

> I couldn't do [day courses] because of my job, I couldn't take the time off, or I needed to become either a part-time employee or go get another job. So obviously I couldn't, you know, I was a mom with kids. So I didn't achieve my dream of being a nurse, because that flexibility wasn't there with the job, but

> I already had children, so it was real hard for me to leave it. So that was an obstacle for me.

Kayla's schedule and need to support her children made it hard for her to pursue her studies.

The stories of Bayron, Kayla, and many others underscore the need for programs with flexible course schedules, offered in the morning *as well as* in afternoons, evenings, and weekends, to accommodate people's work commitments. In addition to more flexible course schedules, Kayla's experience also reinforces the need for on-site childcare to assist working parents in balancing their roles as employees, students, and parents.

Language barriers

The challenges of educational access are much greater for monolingual Spanish speakers, who must learn English before accessing most training. Currently, English as a Second Language (ESL) classes are offered by the Imperial County Office of Education (ICOE) in Calexico, Imperial, Holtville, Calipatria, and Brawley. Distance-learning options are also available at most of these sites. IVC, too, offers ESL classes. Nevertheless, many respondents reported that they struggled with limited schedules, availability, locations, and costs of English language training.

The pivotal importance of English proficiency in education and employment opportunities was evident to interviewees, nearly 32% of whom did not speak English. Although many jobs in agriculture do not require employees to speak English, farmworkers emphasized the importance of learning English to "move up the ladder."

English proficiency was also important to finding out about and securing jobs. For instance, Celina, an unemployed 38-year-old mother, identified her lack of English proficiency as a major barrier to securing employment in any job other than farmwork. Celina hoped to find a full-time job that did not require English proficiency, such as working in school cafeterias. When asked if she had heard of any recent job openings, however, Celina said that it was hard to find information about jobs in Spanish. Similarly, Laura, a 62-year-old widow and mother of three, had worked in the fields her entire life. She said that not knowing English had been "a hindrance to moving forward," limiting her ability to find and secure better jobs. Although Laura had considered studying nursing, she could not find a nursing program taught in Spanish. She suggested that Imperial Valley institutions offer more training in Spanish to help residents improve their job skills and prospects. Likewise, Jacqueline, a 27-year-old mother of a one-year-old baby boy, initially said that her job as a DoorDash delivery driver provided the flexibility to work while also caring for her newborn. When discussing her future employment goals, however, she stressed

the need to learn English to secure a job that would meet her family's financial needs. For Jacqueline, enrolling in IVC's free English courses was a crucial step towards this goal, enabling her to "learn English and after that to get a job to be able to pay for a career that pays better."

The vital role of English proficiency in obtaining better-paying jobs was mentioned even by participants with more schooling. Born and raised in Mexicali, 43-year-old Renata completed a five-year-degree in veterinary medicine at the Autonomous University of Baja California (UABC), with a specialization in small animals, and began working for Mexico's Secretariat of Agriculture and Rural Development in 2004. Heeding her husband's long-standing wishes to relocate to the US, Renata moved to Brawley with him and their two children in 2019. While the move allowed her husband to work at an export company in Calexico, Renata had to leave her job in Mexico. She started applying for jobs in the US in 2023, after she felt her children were settled at their new school. Describing the job search process, she stated: "I have struggled a lot, as an adult, to look for a job. ... I started [applying] last year, and I tell my husband, I have never felt so much rejection in my life." Despite her education and work experience, Renata attributed her difficulties to her lack of conversational English, adding, "Maybe if I had a better command of English I could get a very good job, because I tell you, I feel that I am very qualified." At the time of the interview, Renata had started ESL classes at IVC and was looking forward to completing the program. When asked about the program itself and who was enrolled, she responded, "There are a lot of qualified people, also with a degree and everything, but we don't have English [proficiency]."

While participants emphasized the importance of English proficiency, many highlighted barriers to accessing English language courses, such as scheduling conflicts and limited enrollment spots, much like the challenges faced in pursuing postsecondary education and training opportunities. For instance, in addition to wanting to attend training workshops for her job as an IHSS caregiver, Jocelyn also discussed wanting to enroll in English courses at a nearby primary school. Both times she attempted to enroll, Jocelyn was told that she had to wait until the next session was going to be offered, as there were no more available spots. Another barrier Jocelyn highlighted was the schedule of courses. She added, "They were in the morning. That was the problem because I work in the morning." Because of conflicts between her job and the English program, Jocelyn has not been able to access opportunities to improve her English, which could increase her access to jobs.

Scheduling, availability, cost, and lack of locations were also issues for English classes. For many participants, English courses conflicted with work and caregiving commitments, leading students to drop out. For example, 32-year-old Ruth was the main caregiver for her two daughters (ages 3 and 10), as her husband worked full-time in farmwork. After moving to Imperial Valley six years ago from Mexicali, she found that her lack of English fluency was the biggest obstacle to obtaining employment. Although she enrolled in English lessons during her first year in the US, she could not complete the course sequence because her oldest daughter was diagnosed with hyperactivity and required additional care. Instead, Ruth took a part-time job as a sales representative at Levi's. Commenting on the advantages of this job, Ruth emphasized that although her job did not require English, as most of her customers spoke Spanish, her employers and co-workers provided a supportive environment for practicing English. Similarly, Dominga, a 62-year-old mother of three, recounted the financial struggles she and her husband endured as parents when they first moved from Mexicali to Imperial County. Although both were employed–her husband as a farmworker and Dominga as a preschool teacher–they could not afford to enroll in English courses. She recalled, "At that time we could not—I mean because of the expenses we had, medical bills because my son had asthma, the payments that you had to make all the time, it was very difficult, because IVC had English classes, but it was expensive." In contrast, Dani, 43, was able to take IVC's free English courses with his wife, as these were offered in the afternoon after his workday ended.

Seasonal workers, such as farmworkers, faced significant challenges with their work schedules that drastically limited their ability to attend English courses. For instance, Leticia, a 53-year-old mother of three who had worked in the agriculture sector for over 20 years and now served as a crisis hotline advocate for victims of domestic abuse and sexual violence, shared the difficulties she and her fellow day-laborers faced when trying to learn English: "For a while I started to study English, but the bad thing was that when the [picking] season started, I had to leave because those English classes are during the season. When the season ends, which is April onwards, classes have already started, I could no longer study." Leticia also expressed a desire for English courses and job training programs that accommodated seasonal workers' schedules, so that in their off time "they can use [these programs] for a better future for them." Her account underscores the need for English courses with multiple, flexible starting dates to assist seasonal workers in balancing their roles as employees and students.

Conclusion

Limited course offerings, limited enrollment, high costs, and the concentration of educational facilities in just a few locations in the southern part of Imperial County make it challenging for many residents to pursue educational and job training opportunities. The costs associated with education and training programs are prohibitive for many working-class families. Additionally, scheduling conflicts between work, caregiving responsibilities, and educational programs create a Catch-22, in which residents cannot access better jobs without more education, yet cannot pursue education without the more flexible schedules and higher incomes that come with better jobs. For Spanish speakers with limited English proficiency, these challenges are compounded by the need to learn English. Although English language courses are available, residents often face the same obstacles accessing English classes as they do with as other educational and job training programs.

The barriers to accessing education and training in Imperial County are interrelated with the difficulty of finding information about available opportunities, the challenge of finding adequate transportation, and the lack of accessible childcare and dependent care. We turn to those barriers next.

CHAPTER 6: LACK OF PUBLIC JOB INFORMATION AND CAREER SERVICES

Lack of information about available opportunities represents another major barrier that can prevent many Imperial County residents, especially Spanish speakers, from accessing high-road jobs. Public information about job opportunities, including where to search for jobs, how to advance in one's current job, or how to move into better jobs, is not widely available in the Imperial Valley. Available public sources of information tend to be unreliable. Lack of English and computer skills make it even harder for people to find information about work. Often, we were told, job placement offices act like brokers for employers rather than advocates for job-seekers, and funnel clients into low-wage jobs, regardless of their experience or education. As a result, most interviewees got job information only informally, through friends and family. Respondents repeatedly told us that that in Imperial County, finding a job "is all about who you know."

Even when respondents did not specifically name the lack of information as a barrier, their stories revealed how poor access to information undermined job mobility. For instance, many people complained about not being able to change jobs or said they felt that they had no alternatives to exploitative, underpaid, or insufficient work. While hunting for jobs, many found themselves frustrated. Sometimes, people expressed feeling disoriented when it came to finding jobs or did not know where to look for job listings. Others complained that vacancies are not widely publicized. Many described periods of unemployment as both expected and normal. When asked why they had not found a job (or the job they desired), many blamed their lack of social or family connections. Some of those who had been able to move up in their fields told us they had relied on years of informal learning on the job, rather than access to formal instruction or training.

People we interviewed knew little about lithium. Most people we spoke to had never heard of or knew very little about lithium-related development in Imperial County. Many were curious and extremely interested in job options in the sector, including technical positions as well as anything from construction to janitorial work. Most people said they would be happy to take a job in lithium extraction or processing if it was stable and well-paid. Many wanted more information about the industry and asked about the steps they should take to seek training or employment in it. They expressed the view that advocates, local governments, and lithium extraction companies should publicize opportunities for training and work more widely.

Insufficient and inaccurate job information

In interviews, many people told us that better information would help make high-road jobs more accessible in the Imperial Valley. Respondents made this point regardless of their job sector or level of education. For instance, Celina, a 38-year-old seasonal farmworker, said, "There should be more advertisements, right, where they notify where there is work, that is, more publicity about where they are hiring." Irene, a 43-year-old employee of a non-profit, added that a critical step to better work was, "Knowing where to go for job openings and stuff like that." Similarly, Agustín, the 37-year-old home care provider we met earlier, told our team, "Nothing is really publicized ... It needs to be more out there, more open." When asked what was needed to help people get better jobs in the county, Adrian, who was 22 and unemployed, replied, "I feel like a lot of people aren't sure. They aren't aware of what services are in the Valley", and Idalis, a 27-year-old McDonald's employee suggested, "Maybe posting it (job advertisements), more like letting people know, 'cause not a lot of people have social media to look for a job or everything."

However, as residents talked about their experiences with employment, those with post-secondary degrees who were looking for white collar jobs tended to offer the most detailed examples of the lack of information. For instance, these individuals spoke of searching the internet for jobs and finding very little. Meanwhile, people with less education, such as farm or construction workers, often expressed a desire to access better jobs, together with a sense of impotence, based on not having the English or other skills required to get a higher paying job. When pressed, many said they did not know how to access the kinds of training or support needed to obtain such skills.

Typically, jobs for college-educated individuals are posted online and filled following a formal hiring process. Yet, respondents with a college degree (13% of our sample) often told us that it was very difficult to search for jobs in Imperial County this way. For instance, Alondra was a 34-year-old woman who grew up in Calexico but spent some time working in the San Francisco Bay Area at a tech company. When she came back to the Imperial Valley, Alondra was shocked at how difficult it was to find a job. At the time of our interview, Alondra was still searching for work. She was having difficulty finding information about jobs on the Internet. She said, "I started my Imperial Valley search maybe two weeks ago, and I've been refreshing [my online search]. So, I do see them [job openings], but it's like, I don't know, I mean, just considering the volume. I mean, the Bay Area is huge. But there are like, what, 180,000 people living in Imperial Valley and like 20 jobs [online]." Alondra had been conducting her search mostly online, on job platforms such as Indeed or LinkedIn. Yet she found little local work on those sites. Already she was frustrated, asking, "Do I have to go in person to each establishment and ask if they have openings and stuff? Because it's not clear where I should be looking for [jobs]."

We heard several stories of people who found online job postings, but they were outdated and thus unreliable. When people did find information online, they described having to "dig it out." For example, Anabella had just finished college and moved back to the Imperial Valley to be with her family. She had been searching for a job for over five months at the time of the interview, beginning before she moved back to the Imperial Valley. She said:

> In the summer before I moved back to Calexico, I was looking for receiving homes and that kind of stuff. And it was very difficult for me to even find those online. It wasn't until, like, I did a huge dig in the job offering websites that I found the one that I'm currently hoping to get hired [by]. But I think they could do more postings, more, like be more active on LinkedIn and have more websites.

Both Alondra and Anabella had college degrees and experience using the Internet—which had helped them get jobs elsewhere—but found that the lack of jobs (and online information about jobs) made the search in Imperial County more difficult.

Lack of information also hurt people with less education: not only did they lack information about job openings but they also tended to be unaware of hiring processes or requirements for available openings or about educational and job training opportunities. Many Spanish speakers told us they had "no choice" about jobs because of their lack of English or education. As a result, many of them did not even consider trying to seek less exploitative jobs. Even though some well-paid jobs *were* available to non-English speakers (as evidenced by our interviewees), most respondents were not aware of such opportunities.

Emilia, a 49-year-old resident of Brawley, revealed how people's *assumption* that they needed English (and lack of information about where and when English was *actually* required) inhibited access to better paying jobs. Emilia had worked at Carl's Jr. for 19 years. When asked about the biggest challenge to accessing good jobs, the first thing she said was: "Normally, for a job that is better paid, one has to have education and English, above all, to have a grip on English, because I did want to enter other kinds of work, and really, no, I did not even take the time to apply or anything because I knew that I needed to know English." When the interviewer asked Emilia whether she had been rejected from a job because she did not fulfill the language requirement, she told us that at her current job, to get promoted to supervisor, she needed the language. However, she also shared that her most recent manager promoted her to team leader (13 years into the job) and offered her the supervisor position. Yet, Emilia turned it down, explaining: "I am scared because she offered me the position of supervisor up front and in back, but no, I do not feel capable

of being in front." In other words, Emilia's supervisor made it clear that English was *not* a requirement for advancement. Rather, Emilia herself operated under the mis-perception that she could not try to advance in her own job, let alone pursue another position, without English.

Similarly, Concepción, a 53-year-old woman from Calipatria, saw her lack of English as a major barrier to improving her employment. Though unemployed at the time of the interview, Concepción had worked as a janitor at a preschool for many years. She would like to have a "lighter" job, for example, "in an office, but I do not have the language." Again, when an interviewer asked whether Concepción had been rejected from a job due to language, she said no. On the contrary, she explained, "I thought that in the preschool where I was, I said to myself, maybe I am not going to be able to get in because of language, but no. In fact, it was not hard at all. They did not even ask for me to know 50% or anything. They accepted me fine." Again, despite evidence to the contrary, Concepción's lack of information about English requirements led her to *believe* she could not find better work.

Although people like Emilia and Concepción wanted to find different, "better" jobs, many assumed those "better" jobs required English skills. Often, they made this assumption despite personal experiences to the contrary, preventing them from even seeking out opportunities or information about other jobs.

Language and technology as barriers to information

Often, jobs were posted only in English and online (if publicly posted at all), making it hard for Spanish speakers and those with few technological skills to access information about openings or their requirements. Spanish speakers could not read job ads in English, either online or offline. In addition, older people and those with less education or experience with technology often found online platforms to be barriers in themselves: difficult to find and to use.

When posted only in English, job information is inaccessible to Spanish speakers. One example is Delila, a 38-year-old farmworker who was raised in Mexicali and got established in Imperial Valley as an adult. Like Anabella and Alondra, Delila complained about how hard it was to find information about jobs. Like Emilia and Concepción, she felt stuck working in the fields and did not feel capable of getting a different job. She explained that she had always worked in the fields (where work was seasonal, hard, and poorly paid) "because it is what comes the easiest to me." Likely, she perceived farmwork as "easy" because she did not know very much about what other jobs would be like. At the same time, she continued, "I do feel I need to find either a job where I earn more or one that is more stable, one that is year-long even if the income is not so high, but at least one that is

steady throughout the year." Delila added that, in her impression, "a lot of times there *are* jobs, but we don't *know* about them."

The lack of bilingual job advertisements also made it hard for Spanish speakers to understand job descriptions and requirements. As Jocelyn, a 51-year-old single mother from Mexicali, put it, "I have noticed that they have a website where they advertise jobs, but they always put them in English. I would like it if they were in Spanish to understand them, what the job is about and what the requirements are." Delila added, "I don't know, maybe I have it really stuck in my mind, that if I don't know English it is much harder to find a job." In contrast to Emilia or Concepción, however, Delila's lack of English *did* inhibit her search for work. It was hard for her to complete a job application "because they (the websites) are in English. I do not know how to move forward."

Unfamiliarity with technology also made it hard for respondents to complete online job applications. Delila's story offers a good example. Despite her lack of English, Delila did *try* to apply for a job online. Yet she felt so disoriented by the job application platform that she gave up. She said, "Online, I have applied. I have gotten to send a couple of applications, but they have never called. It has not gotten farther than that. Or sometimes I start an application, but it is random, like there is a part where I do not know what is going on, and I just leave it there. [I think], 'Ok, that's enough!' and I'm done." Delila remembered one application for a cleaning job where she found she was unable to advance to the next step of the application form, without understanding why. She added, "When I wanted to move forward to the next step, it would not let me anymore."

Similarly, Pablo, a 38-year-old construction worker, identified both language and technology as barriers to finding the job he wanted. Pablo had recently migrated to Calexico from Mexicali. Although he had 15 years of experience in the education sector in Mexico, he could only get a job in construction in the United States. Pablo felt he needed more information to get a better job, and he commented on how different the hiring processes were in the United States. He told the interviewer, "What you need is to learn to fill out applications and start using technology. People don't use much technology in Mexico, and here everything is done very much by email, by phone. Sometimes they will interview you by phone or email." Pablo suggested the city or employers set up an office that would help people with their job searches, such as by telling them, "Here, we can help you enter an English school, so you can learn English. We will teach you to fill out your background. We will teach you to write your cover letter, your resumé, and with this they guide you through the Indeed application and accessing the job bank." Pablo's suggestion reflects the unmet needs of people like him, for whom information about employment is inaccessible. It also shows that existing workforce centers that provide these services are not reaching people like him.

Unreliability and limited reach of employment centers

Although a few respondents were able to find work through employment centers such as the Imperial Valley Workforce Development Board's One-Stop Centers (which respondents called "One Stop"), CalWorks, or the Center for Employment Training (CET), the reach and ability of these employment centers to distribute accurate job information (especially about high-road jobs) was insufficient to meet the need. In addition, respondents said that centers such as these sometimes channeled them into low-road jobs or positions far from Imperial County.

We asked about work and job searches at length in our interviews, yet people rarely mentioned local employment centers. Several interviewees said there was a need for (more) such places. For example, 22-year-old Adrian was unemployed at the time of the interview and spoke at length about the difficulties of getting the kind of job he wanted. When asked what kind of services would be needed for him to make jobs more available, he replied:

> I feel like a lot of people aren't ... aware of what services are in the Valley. I see on movies and TV, like, go to this place if you want them to match you with a job or help find you a job, or help prepare you for vocational training or all these, all these different things. And I feel like those services exist here in the Valley. But like, I don't know about them and I—my friends don't talk about them. I feel like people generally don't know about them.

Only 23% of respondents we interviewed were aware of workforce centers near them, including One Stop, People Ready, CITI, SER-Jobs, or CalWorks.

When respondents did go to centers such as One Stop, they told us that these institutions did not always provide access to accurate information about existing job openings. For example, 68-year-old Vilma said that even when she knew of job openings, One Stop was not aware of them, nor able to help her apply. She explained, "Sometimes I hear that a company opened—say, a packaging company—and that they were hiring people, but I never heard (on time) ... I always go to One Stop, but they say: 'No, I think they are hiring people on their own account or posting it on the Internet.'"

Interviewees also told us that it was also rare for workforce centers to help them get stable, 40-hour employment. Rather, these centers tended to direct people to short-term jobs, ranging from fast food positions to three-month stints in the salmon industry in Alaska, where people work grueling 16-hour days inside refrigerated facilities processing fish.

In addition, some such centers discriminated by citizenship status and placed clients in inappropriate jobs for their level of training. For example, Ramona, now 27, told us that she had gone to CalWorks to look for a job and had been rejected from their training program, with the explanation that she could not participate, despite her being a lawful permanent resident, because she was not a citizen. Later, she found out she had been misinformed. After becoming a US citizen, Ramona returned to CalWorks. Even though Ramona had a college degree in international business, the organization assigned her to work at an ice cream shop. Ramona, who had come to the office for help using her degree, replied, "Sorry, but can you send me somewhere else?" Three months went by. Again, "the lady (social worker) had told me that she was going to send me to the ice cream shop for two weeks." Ramona insisted and was ultimately connected to her current job at a non-governmental organization, along with a salary she felt comfortable with, that allowed her to buy a house. But, she insisted, "If I had not said anything, I would have stayed in the ice cream shop."

We met multiple people who told us that workforce centers had sent them to seasonal jobs far from Imperial County. For example, Fernanda told us that she had heard on the radio about a seasonal job packing salmon in Alaska, facilitated by One Stop. At the time, Fernanda had recently moved to the United States from Mexicali. Four days later, she was packing salmon in Alaska. She did the same job three months per year for 13 years. She reflected, "It was not something I wanted to do all my life because the temperatures are extremely cold. And I worked sixteen hours a day, seven days a week." She would have preferred a job closer to home; the referral available to her sent her far from family, into a refrigerated facility where she worked long hours. After returning to Imperial County, Fernanda began volunteering at a food pantry where she heard about WIC and applied to work for WIC instead.

While workforce centers could be critical pathways into high-road employment, interviews reported that these centers have insufficient reach in Imperial County and sometimes have channeled participants into low-road jobs.

In sum, this lack of public information, on the Internet, in public job postings, and in workforce centers—especially for Spanish speakers—leaves residents of Imperial County reliant on family and their social networks for access to jobs and information about upcoming job training, including in the geothermal and lithium industries.

Reliance on informal channels for job information

In the absence of formal and public sources of information, almost everyone we interviewed had to rely on friends and family for information about job openings, education/training, requirements, and labor conditions. For instance, Agustín, the 37-year-old home care provider we met earlier, suggested: "Nothing is really publicized unless you hear from someone … you have to hear about jobs from someone, from other people."

Most respondents said they learned about jobs by word of mouth, rather than through other formal sources of information such as employment websites or offices. Cristina, a 59-year-old lifelong resident of the Imperial Valley who had worked multiple jobs, explained that she got most of these jobs by knowing people. For example, she learned about her first jobs through "school friends." As a young woman, Cristina worked in the fields with her mother. This is where she built her social network, meeting other teens and their mothers. She went on, "And then they told me—they would tell me about many jobs. So, then I would just go in there and then apply to where they were." This was how she got one of her longest-lasting jobs, at Circle K, where she worked for 17 years. In customer service, she said, she "talked to so many people," leading to information about still other jobs. Specifically, Cristina learned she could get paid for taking care of her parents through In Home Health Services (IHHS). She explained, "I was working in retail, and everybody vents. Everybody talked about their day, and they told me about the program. And so they … said that I should look into it, because I had my father and my mother (who needed care). So they said, 'Try.' And I'm like, 'Okay, well then I will try.' At this suggestion, Cristina researched the program and was able to get hired to care for her mother. When our team interviewed Cristina, she had done so for more than a decade.

Thiago, who worked at a geothermal plant, got the job because his best friend had worked there "for decades." Thiago acknowledged that he got this far by asking people for information. He was certain his social skills had opened job opportunities. He explained:

> A lot of people, they won't give you that knowledge unless you actually become friends with them or give them a reason to. And I have a likable personality to where they actually gave me that upper hand. [They say], "Hey, come on, come on, come over here. Let me show you this," you know, kind of attitude. That's one thing I'm grateful for because it's been able to get me where I'm at.

Thiago would not have known of the well-paying job in the geothermal plant without information from friends. He believed that his social skills also helped him work his way up the career ladder at his current place of employment. He went on, "I'm actually already

higher than what I would have got through that company. But due to my extensive talking to certain people within that program, they were like, 'We need you.'"

Indeed, most of the people we interviewed in the Plant Operator Program at Imperial Valley College (IVC) had learned about the program because they had a family member working in geothermal, they had a family member attending or working in IVC, or they were already students at IVC. For instance, Ulises, a 24-year-old lifelong resident of Brawley, had two sisters studying at IVC who informed him that the plant operator opportunity was about to become available. Because his sisters "spent a lot of time over there (at IVC)" they knew what was happening there. He explained, "So they would essentially relay the information to me here at home saying like, okay, like this is what you gotta do. You gotta apply to this. And then luckily on the website for IVC, they essentially had—they got their curriculum set, ready to go." For Ulises, starting the plant operator program was a "great life opportunity." He had been majoring in history at a liberal arts college but decided to drop out and got a job at a pet shop. Then, he heard about the IVC program.

Such stories show how, in the absence of formal channels of information about jobs, social networks become critical to people's employment and career advancement.

Public institutions as potential information hubs

Nevertheless, a few respondents found information about employment or training opportunities through public institutions such as schools or career fairs, pointing to a possible path for addressing this issue.

For instance, Rebeca found both a job and educational opportunities through her children's public school in Brawley. Rebeca had dropped out of high school when she became a mother at 18. Having children made it hard for her to attend school or pursue a career, but she was able to get a job at Subway through her sister-in-law and worked there for many years. Still, she dreamed of getting an education and a higher-paying job. Yet, the adult schools she knew of were in other cities—too far to commute with three children. Then, at the orientation for her children's school, she came upon a table advertising a local adult school. She enrolled and, when we interviewed her, she was completing her high school diploma. "I want to finish school," she said. "It is one of my priorities so I can get a better job. Continue to college to search for a better job. I really like careers in law enforcement."

Similarly, local community organizations helped others access information about both job training and awareness of their rights as workers. For example, Carolina, a 39-year-old farmworker, had moved from Mexicali to Imperial Valley when she was pregnant with

her son at age 18. The first thing she said about working in Imperial Valley was, "It is very hard because you can't find a job easily. The easiest [to find] is fieldwork, but in fieldwork there is a lot of discrimination, a lot of harassment. If you are not quick, the overseers will yell at you. I think the treatment is very bad. They won't respect your rights." After several years in farm work, Carolina wanted to learn English, get a high school degree, and "open doors." Then, at a local health fair, she learned about the SER-Jobs program. She recalled, "I was always looking for information about schools, and they would not give it to me. Until I came up with this school because there was a health fair and I remember that I got on the list and started attending."

Later, Carolina's son also introduced her to Comité Cívico del Valle, where she began attending workshops and learning about her rights as a worker. Looking back, she reflected, "There is a great lack of information in Imperial Valley. People are afraid, and apart from that there is little information. That is what happened to me, but now I can protect my rights. I can take my breaks because I know I have the right to my break, I know I have the right not to be harassed and earlier I was afraid to say something." Carolina added that if she had one suggestion it would be to spread more information on work and training opportunities, and on workers' rights. She insisted, "I would like you to–if you could write this down–to suggest that they place information over on Main [Street] for farm workers, for everyone."

Conclusion

In sum, people in the Imperial Valley do not have enough access to accurate information about jobs. People with university degrees face time-consuming processes of "digging out" information from the Internet; meanwhile, those with less education often simply assume that jobs are not widely available. Often, employers do not post jobs at all. If openings are posted online, they are typically only in English, making them difficult for many residents to find or understand.

Meanwhile, career services in Imperial County have a limited reach and can be unreliable, failing to link clients to jobs that match their qualifications. Less than a quarter of respondents knew about such services. They rely on social networks to make up for these gaps, a practice that privileges people who have better connections over those who do not.

CHAPTER 7: TRANSPORTATION AND INFRASTRUCTURE BARRIERS

Residents frequently mentioned the expense and difficulty of transportation as other barriers to accessing high road jobs. Our in-depth interviews with 214 Imperial County residents identified five transportation-related barriers for residents. First, respondents emphasized that limited bus schedules and bus routes made it hard to use public transit to get to work (or anywhere). Second, and as a result, interviewees considered having a car or employer-provided transportation as essential to getting and keeping work. Third, even people with cars struggled to afford gas, maintenance, and rideshare costs, leaving more than half of respondents (57%) without reliable transportation. Fourth, the poor quality of Imperial County's roads made driving hazardous and costly. Finally, some interviewees reported that they were afraid to drive because of negative encounters they had with law and immigration enforcement authorities, including experiences of discrimination, unlawful searches, detentions, and even deportations. These factors left most people we interviewed reluctant to travel between towns in Imperial Valley, even if doing so might help give them access to job training or other employment-related services. Transportation issues are likely to impact Imperial County residents' access to high-road employment, especially because most jobs in lithium extraction and lithium-ion battery manufacturing will be located far from the county's population centers.

Limited and unreliable public transit

For almost everyone we interviewed in Imperial County, public transit was too limited and unreliable to use on a regular basis. The transit routes serving potential Lithium Valley workplaces include Imperial Valley Transit (IVT) Route 2 (between El Centro and Niland); IVT Route 22 (between Imperial Valley College and Niland); and IVT Route 51 (between Brawley and Bombay Beach). None of these bus services are frequent or reliable enough to serve residents' needs. For example, Route 2 routes operate anywhere from every 60 minutes to only once every 3 hours. Route 22 buses are also infrequent, and operate during peak commuting hours, with a cutoff time of 5:11 pm. Route 51 buses operate only on Thursday.[45]

Nearly half of the people we interviewed (45.8%) said that they never use public transit because of the lack of consistent, well-connected inter-city bus routes, and many of them noted the significant amount of time it took to ride buses, which made it difficult to access

45 Rick Planning + Design (2023), *Land use alternatives memorandum*, October 27, pp. 118-120.

job interviews, trainings, and employment opportunities. Among them, 35-year-old Jesus shared that he grew up in a household without a car and often relied on taxis as means of transportation. When asked why his family used taxis instead of public transit, he responded: "Because there's not really public transportation routes. The routes are inefficient. They don't intersect the city as well as they should, and they don't connect. Or they do connect to other cities, but the waiting time is just absurd. It's like an hour between buses."

This situation particularly affected participants living in the northern parts of the county (Bombay Beach, Calipatria, Niland, Slab City, and Westmorland). For example, to get from her home in Niland to her part-time job at McDonald's in El Centro, Morelia, age 45, must take an Imperial Valley Transit bus from Niland to El Centro, stopping first in Calipatria, Westmorland, and Brawley, for a total of seven stops. As Morelia did not have a working car, and could not afford to fix her old one, she *had* to use public transit to get to work. The bus route, she said, took two hours each way, whereas it would take only 30 to 40 minutes by car. Emphasizing the time-consuming aspect of taking public transit, she added: "It takes forever, I hate it."

Of the 29 participants living in the northern part of the county, 19 (65.5%) said they *required* a car, because "buses don't go there." A resident of Bombay Beach, 38-year-old Karina explained that she had to take a car, because there was only one bus where she lived: "There is a bus that comes once a week, every Thursday, and picks you up at one time, and then they come hours later to drop you off. So, if you must come to town and you don't have a car, you're here pretty much all day." Instead, Karina drove to Brawley and then carpooled, with some of her colleagues, to her job as an inventory specialist in San Diego.

Limited bus schedules also affect people's ability to keep a job and their working hours. Morelia went on, "The majority of the jobs are in the evenings, and if the bus doesn't run, then you don't have a ride home. So, I've had to quit a job before because my car broke down, and I didn't have a ride to work, and I couldn't take the bus." Although Morelia's current supervisor allowed her to schedule her hours to coincide with the bus schedule, she felt people without a car were at a disadvantage when looking for jobs. She explained, "You have to let your employer know you can't work such and such hours because of the bus. And depending on if they're hiring for those hours you may or may not get the job." Similarly, Emmanuel, 26, said that he used to take public transit but "I almost did lose two jobs before for not having transportation, and mind you, the bus wouldn't go that way."

People without a car and a nearby bus stop often had to walk long distances to catch the bus, often enduring harsh weather conditions. For example, when 60-year-old Daniel

moved to Brawley from El Salvador almost thirty years ago, he did not have a car to get to his job in the fields. Instead, he had to walk for almost 30 minutes every day at dawn, braving cold temperatures, to reach the nearest bus stop. Some participants also emphasized the need for better public transportation infrastructure to protect individuals from these weather conditions. Now a car owner, 34-year-old Estefan used to frequently rely on public transportation to get around. When asked about how environmental issues affect life in Imperial County, he replied: "Heat is a big deal here. I think in Saudi Arabia, they have the bus stops with the air conditioning. That would help here a lot, because when it gets like to 120 degrees, it becomes unbearable." Similarly, Alonso said that due to the lack of bus stops, he needed transportation just to get from home to the bus, relying on his father to drive him to the bus station.

When buses *did* arrive, they were often overcrowded. Born and raised in Calexico, 21-year-old Elmer relied on the bus daily to get to work before purchasing his car. He emphasized that the buses got very crowded in Calexico, because "We have a lot of people coming in from Mexicali, so once the bus got to the donut shop, it would be like shoulder-to-shoulder sometimes, unless you got the very first bus at 6:30 in the morning. And the bus driver's job is just to pull up to the stops and see if they can fit more people in." The high demand for public transit in the border city of Calexico sometimes resulted in Elmer having to wait for another bus to arrive, making him late to work.

Safety concerns made some respondents uncomfortable waiting at bus stops. For instance, Giovani, a 35-year-old father of a blended family with eleven children, was unemployed and could not afford to fix his car after it broke down. Nevertheless, he refused to take public transit. Not only were there insufficient bus routes near his place, but he also believed "There are a lot of people out in the street using drugs. (...) you'll see people doing drugs on Main Street. Right outside. So that's why (...) I don't want my kids to be seeing stuff like that." Instead, Giovani and his children walked or carpooled, borrowing his mother's car if they needed to get somewhere urgently, like school or the doctor. Critstina, similarly, said she avoided public transit because she saw it as filled with drugs and homeless people.

As a result of barriers like these, very few residents of Imperial County use public transit to commute to work.[46] For instance, 43-year-old Adela said she had not taken public transit in more than a month and took buses only when she had extra time. Her response, although brief, highlighted the perception of public transportation as unnecessarily time-consuming. Other participants emphasized how having a car was essential to their jobs. Born and raised in Brawley, Emmanuel traveled throughout Imperial Valley "doing

46 Southern California Association of Governments (2019), *Profile of Imperial County*, p. 18. <https://scag.ca.gov/sites/main/files/file-attachments/imperialcountylp.pdf>

roofing and remodeling houses." In the past, Emmanuel said, he had lost good job opportunities at companies like Cal Energy because he did not have a car and could not find rides to the company's site outside Calipatria. He also observed that, "It's already hard to find a job. Keeping a job is where you gotta be at." If one could not make it to work on time, "they'll just replace you like that." He emphasized that since the geothermal (and soon lithium) companies are located "out in the country," they are removed from bus routes and would require a car or company transit.

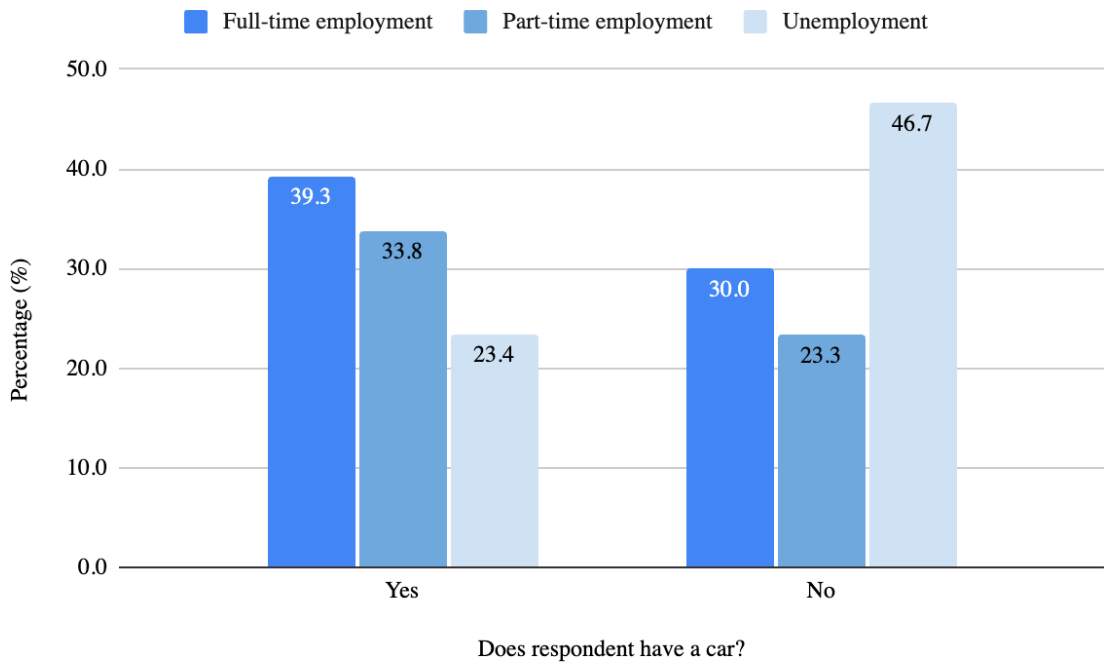
Having a car is "essential"

Although cars are essential to access jobs, large numbers of Imperial County households have no car, or share one car among multiple adults. In 2021, an Imperial County Transportation Commission report found a "relatively high incidence throughout Imperial County of households that do not have access to a vehicle or share one vehicle among the members of the household." The report also noted differences among cities; Calipatria had the highest percentage of households with no vehicle at all (12.6%) and single-vehicle households (34.2%), followed by Brawley (9.2% and 32.6%, respectively) and Calexico (10.2% and 25.1%, respectively). Such households, the report highlighted, "can be more dependent on others for transportation, including public or social service transportation providers, friends and family members, or private services like taxis."[47]

In our interviews, 17.1% of participants had no car, and lacking a car was associated with dramatically lower levels of employment. Among those we interviewed, 46.7% of people with no car were unemployed, compared to 23.4% of those with a car (see Figure 1).

47 Imperial County Transportation Commission (2021), *2021 Coordinated Public Transit – Human Services Transportation Plan*, p. 11.

Figure 7-1. Employment status by respondents' access to a car



Source: See methods appendix.

Lacking access to a car limited the types of jobs and training opportunities that residents could pursue, making it harder for them to find employment, and leading to financial stress. Antonia, a 21-year-old Brawley resident, was enrolled in the Plant Operator Program at IVC along with her sister Catalina, who drove her to and from campus. Unlike her sister, who had a car and worked as a barber, Antonia was unemployed. Her employment situation caused her significant stress. Antonia could not afford to pay her share of the rent for the apartment she shared with her sister, so she had to rely on financial assistance from their mother. Discussing how not having a car has affected her job search, she stated, "I have to find somewhere where it's close [to where I live] and I'm able to walk to. And that is very hard because where I live, there's not a lot of things that are close by. If I had a car, I think I would have had a job by now, because I would be willing to go anywhere." Although her mother and sister have offered to give her rides to job interviews in the past, their ability to do so is often dependent on their work schedules. Antonia went on, "There was one interview for Hot Topic that I wasn't able to go to, in a mall in El Centro, because my sister said that was going to be too far for me and her." Recognizing that her job prospects were confined to Brawley, she added that she was considering applying for a job at a gas station around the corner from where she lives to start earning at least some money.

Although having access to a car corresponded to higher levels of employment, having access to more than one vehicle enabled parents to manage their job, carework, and school

responsibilities. Born and raised in Calexico, 33-year-old Derek lived with his wife and two sons in El Centro. He was enrolled in the Plant Operator Program at IVC, taking courses in the morning and working at a group-home facility for adults with mental and physical disabilities in the afternoon. He described his family's daily routine:

> My wife wakes up and goes to work because she has to be there an hour earlier. I get the kids up, take them to school, and then go to IVC. The kids stay in ACES, an after-school program, and my wife picks them up after. After I get out of school, I go home, make lunch, and go to work. My wife gets out at 5pm and picks them up from the after-school program. I go to work from 2pm to 10pm.

Having two cars enabled Derek's wife to arrive at her job on time and pick up their two sons from the after-school program at the end of her workday, while Derek got their children ready for school in the morning, dropped them off, attended his courses at IVC, and worked in the afternoon.

High costs of cars and carpools

Although respondents relied on cars to access job interviews, trainings, and employment opportunities, few of them earned much more than minimum wage. Therefore, they often struggled to afford gas and car maintenance. In the absence of reliable public transit and money for car costs, many people turned to carpooling or rideshares, which themselves could be both costly and difficult to find.

Low wages and unemployment made it hard for people to afford car repairs and new vehicles, which in turn undermined their ability to look for better jobs. When asked why she was unable to buy a new car, Morelia stated, "With a minimum wage, I can only afford to buy a used car, so it always ends up breaking down eventually. Just having to travel outside of town to look for work is time-consuming, it takes mileage on your car, it takes gas money." Though it was time-consuming to take the bus to work, Morelia's financial situation made it impossible to repair her car and keep it working. Introduced earlier on, Daniel had worked as a farmworker after moving to the US. Although he initially took the bus to work, as soon as he was able to "fix his papers" he started saving up to buy a used car. He emphasized, "It was an old car, [I] did not have the money to buy a new one." Although his car helped shorten his commute time, he also emphasized how costly it was to use, given his status as a low-wage worker. He went on, "One must spend $200 a month on gasoline, I can spend only $50 a week because I'm earning very little." These vehicle-related costs strained Daniel's household budget.

Those working in low-wage jobs often struggled to afford the costs associated with having a car. Introduced earlier, Adela shared how expensive it was to use her car for work. Born and raised in Puebla, Mexico, she now lived in Brawley with two of her three children. Last year, Adela started working in a lemon field, making $15 per hour, and working only three or four days a week. After the season ended, she decided to sell her car, after she realized she was spending too much money on gas. She added, "It's either the car or paying my bills." The following season, California increased its minimum wage to $16 per hour. Adela wanted to work, but she could not, because she no longer had a car to get to the fields. Instead, she must pay a friend to take her to and from work.

People who do not own cars often carpool with co-workers. Many farmworkers we interviewed said that such carpools were costly, both for drivers and passengers. Born and raised in Mexicali, 46-year-old Lana came to the US in 2009 to work in the fields. Although she had recently moved back to Mexicali, Lana crossed the border by car three to four days a week to get to her job in a broccoli field. She shared that one of the first things the overseers (*mayordomos*) ask workers is if they have a car and if so, how many people can fit in the car. She added, "The companies practically force you to transport these people as a condition of employment." She emphasized that she does not agree with this practice, as it puts both responsibility and pressure on the driver: "I don't like it because let's say I have an accident, my car insurance is going to cover me, not the five or six passengers I have with me. Then, if one of them dies or loses a leg or an arm, they will come for me. I have no need to take them. It is the company's obligation to rent a bus and transport their people." In addition, while passengers are expected to share the cost of transportation to and from the fields, they do not always do so, leaving Lana sometimes uncompensated.

Ridesharing also imposes significant costs for workers, who rarely receive compensation from their employers for transportation. For example, 54-year-old Uriel said he traveled to Yuma, Arizona, every day to work in the fields. He explained, "I would ask for a ride. Each way to Yuma was $5 out of my wallet." He added, "The company never offered [us a ride]. That was an injustice. I had to pay to go to a job that needed me." Although Uriel now works as a handyman at an apartment complex in Brawley, he stressed that his family struggled financially while he was working in Yuma. Erica, age 55, shared a similar story. As a long-time farmworker, she spent her winters (December-February) crossing on foot from Mexicali to Calexico, at midnight, to find work in the fields. When asked if her earnings were enough to support herself and her family, she replied "Well, no. It's not, because you can only work two days a week, nothing else. And then you pay the ride, which is—sometimes they charge you as much as $10 to take you to work, because the companies don't provide trucks." Such stories point to the struggles workers face, especially when their workplaces are far from bus routes.

In contrast, employers that provide transportation alleviate the cost of travel for workers. Take 47-year-old Diego, who has been working as a project manager since 2015 at CalEnergy's geothermal plants, overseeing the disposal of hazardous waste. Residing in Calipatria with his wife, Diego traveled to and from work in the truck CalEnergy gave him when he started, paying for gas and maintenance as part of his employment contract. He explained, "[For my job], I need to be able to move around containers. I also have access to a smaller vehicle so I can move around in the plants. If I'm at one plant on one of the facilities, the furthest plant away is like five miles, so I need a vehicle if they need me for some reason." Diego emphasized that for him, travel to and from work was not a concern. Although many residents were limited in how far they could travel because of gas and maintenance, Diego could travel up to 70 miles per day without issue. Twenty-four-year-old Alonso also got transportation assistance from his employer. Although he worked for a company that remodeled houses, he had previously worked as a seasonal confined-space attendant at a geothermal plant, providing maintenance during shutdown periods. His company provided shuttle services for employees, who only had to get to Imperial to access this service. Alonso appreciated this, reflecting that with the shuttle: "It's just for sure that you're going to get there on time, everybody's in the same car, you save on gas. It's just better." The stories of Diego and Alonso showcase the positive effects of companies providing their workers with transportation, which can serve as an example when thinking about facilitating access to high-road employment in the lithium industry.

Poor infrastructure

Residents also described Imperial County's transportation infrastructure as underdeveloped. Participants emphasized the poor quality of the roads, noting excessive potholes, horrible traffic, and ineffective storm drainage. They often said that poor roads damaged their cars, leading to further costs. For example, when asked how she would like to see city funds allocated, 20-year-old Mayte responded: "Fixing the roads. There's so many roads with potholes. They're uneven, they get flooded because it rains over here, and everything gets flooded. There needs to be a new sewer system, maybe, stuff like that. Basic things to get you from point A to point B. Yes, we need better infrastructure." She added that the roads had completely destroyed the underside of her car , damage her insurance did not pay to repair. Aliya, 29, who lived in Calipatria with her partner and three kids, raised a similar issue. Aliya worked as a seasonal confined-space attendant at the geothermal plants, providing maintenance during shutdown periods. She balanced her 12-hour work schedule—from 5:30pm to 6am—with morning courses as part of the Plant Operator Program at IVC. Describing her experience driving to work, she stated: "I feel like the roads on the way to the plant are really dilapidated, full of potholes, and need to be fixed."

Participants who worked in the geothermal plants were frustrated with the bumpy, unpaved (or poorly paved) single-lane roads in northern parts of the county and emphasized the necessity of having a "good car" to work in this industry. Residing in Calipatria with his wife and three children, 34-year-old Estefan worked in a geothermal plant and attended morning courses as part of the Plant Operator Program at IVC. He described how he got to and from his place of employment, "I have my own vehicle; well, I have two vehicles, and in one I can't go because, like, the roads are really messed up. If it's raining, that car is not going to make it. If it gets too muddy, you can't make it. Certain cars out there, you won't make it." He expressed frustration with the industry: "These are billion-dollar companies, and they can't fix one road."

Poor transportation infrastructure was also an issue for respondents in other places in Imperial County. Recounting her experience driving to morning classes at IVC, Aliya commented: "My car is actually completely damaged from me driving to school every day. I got a flat tire in October from hitting a pothole so hard. The steering pin got damaged. That was a huge repair." She also discussed how the roads cannot sustain the number of people driving to and from the current geothermal plants, leading to traffic congestion. She added, "Every day, I'm trying to get to work on time, and everyone gets out at the same time, so there's a line of cars trying to leave as soon as possible, it's just chaotic, the road is not even wide enough." As growing numbers of people come to the area to work in lithium, this issue could get worse.

Most respondents did not mention bicycles as a viable commuting mode. Imperial County lacks sufficient bike lanes or infrastructure for alternative modes of commuting. In 2018, a report by the Southern California Association of Governments Regional Council highlighted Imperial County's underdeveloped active transportation infrastructure, compared to other counties. From 2012 to 2016, the length of bike lanes increased by 35.8% in Los Angeles County (by 35.8%), by 30.6% in Ventura County, and by 7.9% in Orange County, but there was no change in the total length of bike lanes in Imperial or Riverside counties. Additionally, Imperial County has only about 20% of Riverside County's total lane mileage (89 versus 421).[48] The lack of alternative infrastructure, combined with extreme summer heat, could help explain the low usage of bicycles among participants. In our interviews, only 7 out 181 people (3.9%) mentioned using their bicycles for even short distances, either by themselves or alongside other members of their households.

48 Southern California Association of Governments (2019), p. 20.

Fear of law and immigration enforcement

Finally, some participants were hesitant to drive because they feared negative encounters with law and immigration enforcement. Nearly a quarter of interviewees (23.6%) reported negative encounters with these authorities, citing experiences of discrimination, unlawful searches, detentions, or deportations. These interactions predominantly affected border-crossers and migrant farmworkers, leading to delays or complete hindrances in their mobility and discouraging them from using public transit. For instance, some border-crossers said that long interactions with border patrol agents extended the time required to cross the border for work or educational training. About half of those who had *not* had any such experience attributed their good fortune to their legal status or their "good" behavior.

Participants who self-identified as Latino or Hispanic and lived closer to the Calexico-Mexicali border sometimes reported being stopped by US immigration enforcement officials for no valid reason. Elmer, a 24-year-old Calexico resident, described several instances of bring stopped by Border Patrol. For instance, he said, "I go fishing, it's one of my hobbies, and [Border Patrol agents] are near the canal where I go fishing 'cause it follows the border. Sometimes they'll drive over and they'll just ask me like, "Oh, what are you doing? How long have you been fishing?" Like essentially just seeing if I'm legitimately there just to go fishing." While Elmer suspected he was being profiled for "looking a little Mexican or Latino," he always moved away from the area to avoid any problems.

It was also common for farmworkers (many of whom crossed the border regularly) to report negative experiences with immigration enforcement, leading to detention or deportation. For instance, Daniel, a thirty-year resident of Brawley originally from El Salvador, relied on the bus before he could afford his own car. He recalled that one day he was returning from work on a bus with other farmworkers and overseers. He described, "When we passed a checkpoint near Westmorland, immigration control (*la migra*) got on the bus, and only seven of us remained at the end, out of a full bus." He added that these searches were not isolated incidents but occurred regularly. He went on, "Most people drive [to and from the fields] for this reason." Adela recounted a similar experience with immigration enforcement when she was undocumented: "About eight years ago, picking up my check from an overseer, I was stopped by immigration. They sent me back to Mexico. And well, yes, it was very sad because I left my children [in the US]." Although she was eventually reunited with her three children, Adela emphasized that this was a traumatic experience for her and her family.

Conclusion

The transportation and infrastructure barriers outlined in this chapter *already* impact Imperial County residents' ability to work and carry out daily activities, even without considering the need to commute longer distances to lithium jobs in the area of the Salton Sea. Despite the fact that the county's buses are free, many people we spoke to rarely used public transit, because of its unreliability and lack of geographic coverage. Consequently, residents often relied on personal vehicles or employer-provided transportation, which was not always feasible due to high costs of gas, maintenance, and rideshares. Additionally, the poor condition of the county's roads made driving both hazardous and expensive. The fear of negative encounters with law and immigration enforcement authorities further deterred some individuals from driving. Transportation was such a challenge that many people we spoke to almost never traveled between cities in Imperial County. Ultimately, these issues impaired residents' ability to travel between cities within Imperial County, reducing their access to jobs, as well as to employment-related services and training programs.

These barriers are likely to affect residents' access to high-road employment, especially because most lithium extraction jobs will be located in northern parts of the county, far from bus routes and plagued by poorly maintained single-lane roads. Although residents are more than willing to work in the areas where the geothermal plants are currently located, many respondents suggested that commuting to IVC (for training) or to the lithium extraction facilities was inconvenient, financially difficult, or even impossible.

CHAPTER 8: LACK OF ACCESSIBLE CHILDCARE AND DEPENDENT CARE

The lack of accessible child and dependent care in Imperial County also threatens many residents' access to high-road employment. As we noted in Chapter 2, more than half of the county's working-age adults live with minor children and 22% live with children under age six. Childcare presented a major challenge for parents, especially mothers, hindering their ability to obtain and retain paid employment. Interviewees told us that very few jobs in the county provided on-site childcare. It was also hard for parents to find jobs with schedules that allowed them to drop off and pick up their children on time. Many parents also reported challenges accessing licensed childcare. As a result, parents often had to rely on relatives (typically older women) to care for their children, usually without pay, while they were at work. Such arrangements could be unreliable. The burden was especially difficult for single mothers.

Many respondents were also responsible for caring for elderly or disabled family members. Some had spouses, parents, or other family members who had been injured or become ill at work, especially in farmwork. Many others had elderly family members living with them. Because of their responsibilities as caregivers, family members of such individuals struggled to hold down paid employment. Instead of working outside the home, respondents with disabled family members often resorted to working for California's In-Home Support Services (IHSS) Program, which paid them wages to work as caregivers for disabled relatives. As of January 2024, there were 6,605 IHSS providers in Imperial County, or about 9% of the employed workforce (compared to 4% statewide). Average pay was $17.15 per hour. However, hours for IHSS are capped by a social worker's determination of how much care a family member needs, which average about 100 hours of services per month, or only about 60% of a full-time job.[49]

Limited public or employer-sponsored childcare

Interviewees repeatedly told us that existing childcare services were neither sufficiently accessible nor sufficiently affordable. Currently, several kinds of services are available exclusively to low-income families in Imperial County: an alternative payment program funded by the state, which funds childcare costs for families receiving other welfare ben-

49 California Department of Social Services (2024), IHSS program data, January, <https://www.cdss.ca.gov/inforesources/ihss/program-data>; California State Auditor (2021), *In-Home Supportive Services Is Not Providing Needed Services to All Californians Approved for the Program, Is Unprepared for Future Challenges, and Offers Low Pay to Caregivers*, Report 2020-109.

efits; federally-funded Head Start and Early Head Start programs; as well as programs run by United Families (a local nonprofit organization) and Volunteers of America. The alternative payment program has a waiting list and funding is allocated based on family need, as determined by income and family size. But, according to a 2021 Annual Report for the Head Start Program in Imperial County, these programs are undersubscribed, and many families exceeding the income limits of 130% of the federal poverty line are accepted into the program.

These programs may not meet the needs of the Lithium Valley workforce for several reasons. First, according to a knowledgeable staff member at the Imperial County Office of Education (ICOE), the majority of Head Start programs do not provide full-day care and many serve only preschool-age children. Second, if families earn wages above the poverty level (as intended for the HRTP program), they may not qualify for even the limited childcare provided by public programs.

Indeed, caregivers often reported having limited access to public- or employer-sponsored childcare, citing institutional criteria that set limits on the number of hours of government-sponsored daycare that parents can access. Their accounts also reveal how the lack of access to public childcare exacerbated the incompatibility between paid work and family caregiving, constraining caregivers' employment opportunities and reinforcing traditional gender roles.

Joel, a 32-year-old who lived in El Centro with his fiancée and two children (aged 10 and 3), raised this issue. Joel, who had completed a bachelor's degree in psychology at San Diego State University (SDSU), was looking for work and working occasionally as a substitute teacher when his first son was born. He recalled:

> I was lost in the whole childcare scenario when I was first going into the workforce, because I didn't qualify for certain ones. And I had to pay out of pocket for him to be at childcare before he was in school, and that was making a big dent in the money I was getting. When I started, it was getting into subbing and having to think of rent and, on top of that, like a monthly $300 or $400 that I would spend on childcare was a lot for me ... For some of them [programs], I remember being on a waitlist and not being able to get the childcare that I needed and struggling a lot to find programs that would cover my specific case. Because in order to get help from them, I think I needed to be a full-time worker, and I wasn't at the time. So it was hard for me to get him in certain places ... I had to be full-time, and I couldn't be taking him. So it would just backfire ... It just makes it hard for people to go out there and get a job because, like, they don't have anywhere to take their children to play, to be taken care of.

Ironically, Joel emphasized, he needed childcare to go out and get a full-time job, but the childcare required he already have a full-time job for his son to be admitted.

At the time of our interview, Joel had given up teaching and worked as a muralist at the border instead. Ironically, because he now made less money, his second child had been accepted into a free Head Start Program run by the Office of Education and his eldest into a public after-school program. He had fought hard to get these spots, which he described as highly coveted.

Aracely, a 34-year-old stay-at-home mom, said that it was not possible for her to work because public childcare was available for only four hours per day. Born and raised in Westmorland, Aracely lived in Calipatria with her husband and four children, all under age 18. Aracely's youngest was four years old and her husband worked full-time. Instead of working herself, Aracely stayed home to provide care. She explained, "If I was to get childcare for my youngest daughter from the government, she could only go for four hours a day, and the extra hours would have to be paid out of pocket from us. That's something we can't do right now. And that's what's kind of a little frustrating with childcare. Yeah, because they do have childcare there in Calipat[ria] they do okay. But I just, I don't have anybody else that I can trust to watch my kid." She added that when the "hours are up," she and her husband had to "make sacrifices" about who goes to work and who stays at home. She added that—as the woman—she was "used to" being at home, while her husband was "used to" working a lot—reinforcing their traditional gender roles. Again, Aracely was caught in the Catch-22 of needing money to fund extra childcare, being unable to find a job due to the lack of full-time childcare, and thus remaining at home as an unpaid female caregiver.

Similarly, Alison, a 37-year-old born in Mexicali, has struggled to cover childcare since she moved to the US with her three children. Alison worked packaging grapes, alongside her brother and eldest son. She explained that to do this job, she had to wake up at 3:00 am and leave her children by themselves. She added, "I don't want to leave them, but I don't have anyone to take care of them. That's the only thing that is missing, is for employers to help you take care of your children." Being a single mother, Alison cannot afford to forgo work. At the same time, she added, she has not "worked as much because of the kids." When Alison does work, she relies on her middle child to care for the youngest. Every time she leaves, she worries about their well-being.

On-site childcare makes it easier for caregivers to get education and sustain jobs. For example, Estela, a 30-year-old mother with a three-year-old son, was enrolled in morning classes at the Plant Operator Program at Imperial Valley College (IVC). Nights, Estela worked 12-hour shifts (6 am to 6 pm) at a geothermal plant in Calipatria. After her shift,

she would drive to Imperial to pick up her son from her mother's house. While Estela attended courses at IVC, the school provided daycare for her son. She explained, "When I go to class, he goes depending on my class schedule. They really work with us and it's very convenient ... I know he'll be in good hands ... he's been to a couple of other daycares as well, but the most improvement that he showed is here." Though Estela *also* relied on a female relative—her mother—to provide overnight childcare while she worked and while she slept in the afternoon, the on-site childcare at IVC reduced her burden a bit.

Inflexible working hours

Respondents with caregiving responsibilities told us that it was critical to find jobs with flexible hours so that they could pick up their children or attend to special instructions or administer time-specific medications to disabled dependents.

The impact of inflexible work schedules on caregivers' ability to work was illustrated by 31-year-old Marcela. Born and raised in Brawley, she relocated to San Diego to pursue her bachelor's degree in psychology at San Diego State University (SDSU), followed by an online master's degree in social work from the University of Southern California. Upon completing her studies, Marcela returned to Imperial Valley with her husband and purchased a home in Calipatria. Soon after the move, Marcela began a full-time job working for Imperial County, and her husband began working at a prison full-time. Although Marcela took a temporary break from work during her first pregnancy, she resumed work shortly after giving birth. When asked about her experience going back to work after having her first child, Marcela responded, "It was hard because, like I said, it's very demanding. We don't often get a chance to get off at 5pm because of how much work we have. [...] I was breastfeeding at the time, I had to go pump during my lunch break and I had to make sure I had my two 15-minute breaks, but when you have so much work, you're responsible to make sure those reports are done on time."

While Marcela appreciated her overall salary, she also underscored the demanding nature of her job, which often required her to work extended hours without adequate breaks to complete all of her caregiving tasks. This heavy workload compromised Marcela's ability to spend time with her newborn. When Marcela became pregnant with her second child, she decided to quit her job. Luckily, she was able to rely on her husband's salary while she stayed home with her children. Although Marcela wants to resume working as a social worker this year, she also feels hesitant. She added, "I know that as soon as I start working, I'm never going to be seeing my kids, you know?"

Other parents struggled to make it from their own jobs to pick up their children from school or childcare. For instance, Amanda worked at a family daycare, while also trying to

finish her GED and take classes in child development. Amanda and her husband did not qualify for free childcare or for school transportation. At the same time, they could barely afford to pay out-of-pocket. Amanda explained that to keep her job, she had to pay someone to pick up and drop off her children. Sierra, a farmworker, added that when she did not have a car she had to get up at 4:00 in the morning to take her children on the bus to daycare and that she would not be back to pick them up until 8:00 in the evening, a "late pick-up" for which she was charged additional fees. Marina, likewise, added that she could not work because "There are not a lot of places where they [the employer] will take care of your kids and all that—and that's why I'm not working right now, because my kids go to school, and sometimes there is no one to pick them up."

Likewise, Brianna, a 58-year-old mother of three children, including one with a disability, and a mother with Alzheimer's, had to resign from her job at a bank because of scheduling conflicts. She explained:

> I am speaking for myself as a mom, because I can't go out to work. You understand? I am grateful that I'm in this program [In-Home Supportive Services], because when I went out to work for a while, I had a lot of problems. They wouldn't let me leave on time to pick up my daughter, and since she is in a wheelchair and you had to push, sometimes she got left alone. So I couldn't put my daughter at risk like that. And I lasted for like six months in one [job]. At an ATM. ... I was supposed to get out at 2:00 and they wouldn't let me leave until 4:00. And so I would leave my daughter alone for an hour. And the other kids would walk home alone. So it really doesn't work for me to be working and ignore my kids like that.

Instead, Brianna applied to work for IHSS as a caregiver for her disabled daughter and mother.

In contrast, flexible work schedules made it easier for caregivers to keep full-time jobs. Jocelyn, a 51-year-old single mother of three, chose to take a job working for IHSS. She moved from Imperial to Calipatria to begin taking care of two senior residents, one of whom has since passed away. She explained, "I really like this job because I have an eight-year-old boy and it helps me a lot that if he's sick, I can tell the ladies, today I will only be able to work two, three hours, and the next day I will work the other hours that I need to complete." Being able to adjust her hours allows Jocelyn to keep her job while also caring for her children and being a "good mother." Her employer is also empathetic with the fact that she has a child and does not penalize her for arriving late in the morning: "I clock in at 8:00 am, and I drop my child off at school first, and then I go to work. If I'm five minutes late, that's fine, I leave five minutes later. That's the advantage of the job." In her interview,

Jocelyn underscored that other jobs, particularly in the fast-food and retail industry, would not give her that same flexibility, which as a single mother she considered indispensable. Brianna, who also worked for IHSS, emphasized that the best part of her job was the flexibility.

Often, respondents caring for disabled relatives decided it was easier to apply for IHSS and become their relative's official caregiver than to hold an outside job. For instance, 44-year-old Lineth worked as an IHSS caregiver for her disabled mother, who had diabetes and heart problems. After hearing about IHSS from a friend, Lineth applied and was called in for an evaluation interview with medical professionals. She also had to bring her mother so that they could determine if she needed in-home supportive services (such as someone to accompany her to medical appointments, personal care services, assistance with drug administration, meal preparation, and grocery shopping, among other "activities of daily living" (ADLs). Lineth felt that working for IHSS enabled her to be a "good daughter" while also being paid. The job also eased Lineth's childcare responsibilities, as it did not require her to be away from or secure daycare for her two children. Similarly, 37-year-old Agustín, who we met earlier, emphasized how his part-time job as an IHSS caregiver for a friend gave him the flexibility to be a "good parent" and care for his five children (all under 18) and disabled wife.

However, respondents who took care of disabled dependents also felt tired and spread too thin. For example, 31-year-old Armando described the time-intensive nature of caring for his invalid mother: "It takes up a good 19 hours, a day, because I live with my mom and I take care of her. She's had a stroke, so she can't move or talk. So, I do everything for her." His mother benefitted from in-home supportive services in the morning, yet these did not cover the full extent of her care, leaving Armando to fill in for the rest of the day. Although committed to being a "good son," Armando said his caregiving responsibilities made him pause his pursuit of a degree in psychology. Likewise, Lineth emphasized how the 24/7 nature of her work as a caregiver made it hard to balance her responsibilities as a mother. Because of her husband's long work hours in construction, Lineth was also in charge of her children's school drop offs and pick-ups. She added, "I have to know how to balance and juggle everything. I'm always pressed on time. I'm always on the run and I'm always on the go. It can be overwhelming."

In addition to being overworked, IHSS caregivers also felt underpaid. For instance, Agustin was authorized to work only a certain number of hours per day, which he felt was not enough to provide comprehensive care for his client *or* to support his family. Normalizing this chronic underpayment, Agustin said, "It's not enough for what I need, but at least it's not zero, at least it's not no income, at least it's something that comes in. So, I'm pretty good at spreading, managing money for a family of five kids." In short, although IHSS gave

people a chance to attend to caregiving responsibilities with more flexibility, it was not sufficient to fully cover their needs.

Reliance on unpaid female relatives

To be able to work, caregivers often relied on relatives or friends (usually older women) to provide unpaid care for their dependents. This form of assistance was often unreliable, temporary, burdensome, and risky. The challenge of relying on unpaid relatives was especially difficult for single mothers, who represent a large percentage of parents in Imperial.

Estela, the 30-year-old single mother with a three-year-old son who worked at the geothermal plant and is training to be a lithium plant operator, emphasized that she could not work and attend school without childcare help from her mother. Her mom, she said, was her "biggest support system, because when I go to work, she's the one that watches him for me … I go to class, and I don't see him afterwards because I go home, get some rest, and then my mom will be the one to pick him up after school." Estela sees her son for only a few hours in the morning when she drives him to childcare. She repeatedly mentioned that she would not be able to work or get training for the lithium industry without her mother's help.

Yet, caregivers also shared that family support can be temporary, limiting their job opportunities once again when they stop receiving this type of support. Lesly, a 28-year-old mother, lived on the outskirts of Brawley with her husband, young son, and parents-in-law. Although she was then a stay-at-home mother, Lesly formerly worked cleaning houses, a job she got through a relative. Describing her job schedule, she emphasized that it was "very flexible, because you choose how many houses you want and how many hours it'll take you to clean them." Lesly could plan her work around her son's school schedule. When the two overlapped, Lesly relied on her mother-in-law and sister to take care of her son. This assistance ended when her mother-in-law had hip surgery and ended up on disability and her sister's university schedule got busier. Without the help of family members, Lesly decided to stop working altogether to focus on her son, who had recently been diagnosed with attention-deficit hyperactivity disorder (ADHD). When asked if she had been applying to jobs, she responded, "More or less. I haven't put in a lot of applications yet. Since my husband has a job here, I haven't really dedicated myself to looking for work."

Families separated from extended relatives due to migration must manage caregiving responsibilities on their own, often alongside their work commitments. For instance, Bayron and his wife were the primary caregivers for their children and his diabetic mother-in-law, as his extended family resides in Guadalajara, Mexico and her extended family lives in Ontario, California. When asked how they managed their roles as employees and caregivers,

he emphasized that the latter often took precedence over work when it came to health concerns: "When my son got sick, my wife had to take him to San Diego for four days. So, I missed work to take care of my mother in-law." Describing the 24/7 type of assistance she needed, Bayron stated: "We cannot go on a trip because she will die." The time they took off was unpaid, leading to financial struggles that month.

Family support can also incur a cost. For instance, Zoe, the primary caregiver for her three daughters, was applying to part-time jobs while she finished her associate's degree at IVC. When asked if she had family members who could help her take care of her children if she got a job, Zoe replied, "My sister helps me, but I still have to pay for a service." Clarifying what she meant by "service," Zoe mentioned that her sister worked at IV Respite providing in-home support to families of the intellectually and developmentally disabled. Although Zoe's insurance covered some hours from that program for her autistic daughter, she still had to pay her sister to take care of her other two daughters. To be more sustainable, Zoe hoped to get a job in the mornings to better coincide with her daughters' school schedules.

Most respondents who discussed family support emphasized the importance of finding trustworthy caregivers and the fear of leaving one's children with anyone outside the family. Adela, a farmworker, had two teenage daughters. As a young child, Adela's youngest daughter had been abused in a daycare center by a man who Adela thought of as family. In addition to this breach of trust and act of sexual violence, Adela did not receive any type of support from her daughter's school or the police and felt ignored. She could not bring herself to file a complaint, even after the hospital helped her contact the police, given her undocumented status at the time. Today, instead of relying on a caregiver, Adela leaves her daughters alone while she works. Though she has asked her children to always inform her of their whereabouts, she worries constantly and relies on her faith in God to keep them safe.

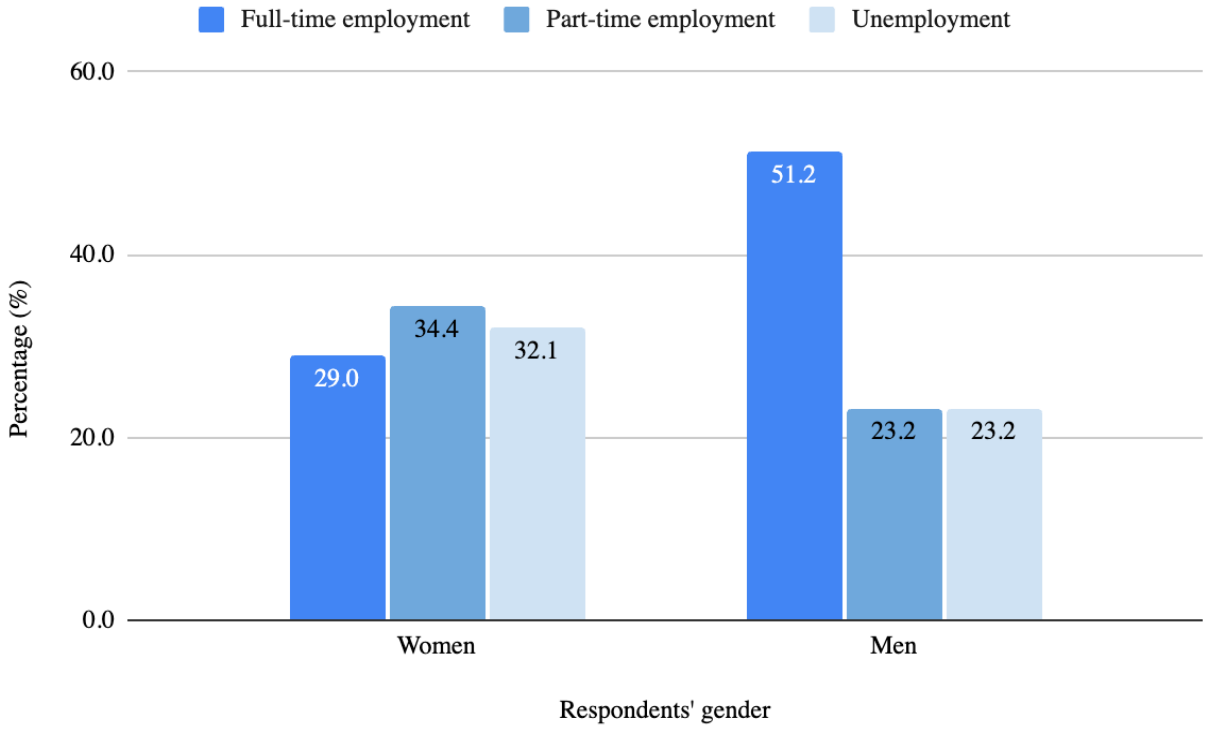
Women caregivers dropping out of the workforce

Carework responsibilities fall disproportionately on women, affecting their ability to access and maintain employment. The pattern is evident in several of the interviews described earlier, in which women described having to leave their jobs due to lack of childcare or because of scheduling conflicts.

Interviewees displayed patterns of labor force attachment that varied by gender and care responsibilities. Among respondents who held full-time employment, 51.2% were men and 29.0% were women. In contrast, 32.1% of unemployed respondents were women and 23.2% were men. Figure 8-1 shows respondents' employment status by gender,

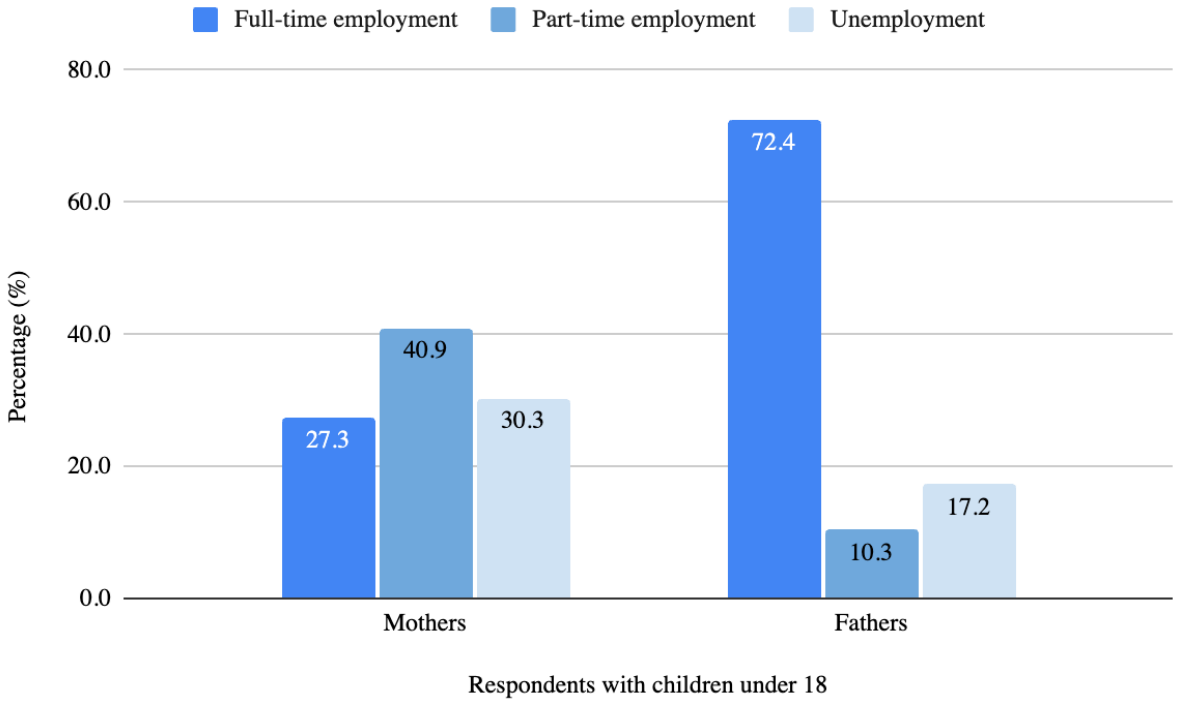
and Figure 8-2 shows data on the employment status of parents with children under 18 by gender, among our 214 respondents. Among these interviewees, mothers were less likely than fathers to be employed full-time (27.3% versus 72.4%). Mothers were also more likely than fathers to be non-employed (meaning either unemployed or out of the labor force altogether) (30.3% versus 17.2%). The gender gap for both full-time employment and non-employment is greater for parents. It is important to note that, while most participants spoke about carework responsibilities in relation to children, several participants also had to care for disabled and older family members.

Figure 8-1: Respondents' employment status disaggregated by gender



Source: See methods appendix

Figure 8-2: Employment status of respondents with children under 18, disaggregated by gender



Source: See methods appendix

Forty-year-old Zoe brought up the hardship of finding employment as a mother. Born and raised in Mexicali, she now lived in El Centro with her husband and three daughters, one of whom is on the autism spectrum. In addition to working towards her bachelor's degree at IVC, she had been working for a non-profit organization as a student services coordinator. However, Zoe had to leave her job about a month ago, because it was too overwhelming to try to balance both work and school with her responsibilities as a mom. She explained,

> Every day I get up between 6:00-6:30 in the morning, because at the end of the day I'm a mom. Getting myself ready, getting the girls up, getting them ready, breakfast, taking them to school, dropping two off at school and dropping the other one off at preschool, getting back to my house, clean up. By 12:30 pm at the latest, I already have to be at school because my classes on Mondays and Tuesdays are from 12:55 to 3:30 in the afternoon. Then I [leave IVC], go to school to pick up the girls, and I'm with them until 11:00 at night when I finally have peace at home.

In Zoe's account, motherhood took precedence over both work and school. Her carework responsibilities were time-intensive, as her 8-year autistic daughter had regular medical appointments. In contrast, when asked about her schoolwork, Zoe said it happens "when-

ever I have some free time." Although Zoe had applied for several part-time jobs, she had not been able to find a job that allowed her to parent as well. It was difficult, she said, to find an "empathetic" employer who was willing to both limit her hours and offer flexibility of scheduling. When asked what her ideal job schedule would look like, she said that it would need to be in the mornings to coincide with her daughters' school schedules.

While the lack of flexible working hours limits job opportunities for mothers, so do gendered household roles, which position women as the primary care providers. For instance, Zoe's husband worked more-than-full-time (more than 48 hours per week) as store manager in Calexico. He was out of the house for most of the day, leaving Zoe to take care of the house and their daughters. She added that on Sundays, her husband's only day off, "he is at home, but all he wants to do is rest and be calm." Similarly, Renata, a monolingual Spanish speaker who had been educated as a veterinarian in Mexico, shared that her responsibilities as a mother of two had limited her availability to work. Last year, she had been invited to interview for an assistant position at a veterinary clinic in Coachella for which she did not need English. But she was offered only a night shift, which would have required her to work 12-hour shifts and be away from her children, ages 8 and 10, overnight. Renata turned down the job because she hesitated to be away from her children for an extended period of time, and because her husband was unable, or unwilling, to provide childcare in her absence.

All the barriers described in this chapter could be especially acute for single mothers. Sierra, for instance, age 35, left an abusive family situation in San Diego and relocated to Imperial Valley with her two sons, aged 13 and 10. She worked in agriculture for four years when she first arrived, and was currently searching for a better job. To make some money, she cleaned houses here and there, and made tortillas to sell to neighbors and friends. When asked about how carework affected her ability to get a job, Sierra said that she struggled, especially when her children got sick and could not go to school. At the time of the interview, her youngest son had bronchitis and had missed school for a week, leaving Sierra unable to work. As a single mother, Sierra had no one to help with carework duties.

Conclusion

The lack of accessible and affordable childcare and dependent care in Imperial County poses a significant barrier to high-road employment, particularly for women and single mothers. Although Imperial County has 263 licensed home childcare providers and 60 licensed centers, more than the statewide average, these providers have capacity to care for only 35% of the county's children whose parents are in the workforce.[50]

Many residents struggle to balance work commitments with time-intensive caregiving responsibilities, often leading to reduced work hours, job losses, or complete withdrawal from the workforce. This issue is exacerbated by inflexible work schedules, limited public or employer-sponsored childcare options, and the high costs and risks of childcare facilities.

50 California Child Care Resource and Referral Network (2023), 2021 *California Child Care Portfolio: Imperial County Family and Child Data*, <https://rrnetwork.org/assets/general-files/Imperial_2023-01-25-040148_hdmb.pdf>

CHAPTER 9: SKEPTICISM OF EMPLOYMENT PROMISES

The final major barrier we encountered to high-road employment was cynicism and mistrust. Many respondents expressed skepticism about whether the lithium industry would really benefit Imperial County or its residents. Often, people felt they would be unlikely to obtain a job in this industry, for the reasons outlined in previous chapters. In addition, they described significant mistrust of new industries, based on past experiences with companies that they said exploited local resources and residents, while bringing in outsiders to work in the better-paying jobs, rather than hiring local residents.

Many interviewees felt excluded from *any* job opportunities by unwritten employment practices including intentional underemployment, nepotism and closed hiring, preferential hiring of non-residents, and exploitative labor practices. They also expressed concern that state and federal economic development subsidies for Imperial County were mainly captured by elites, in both business and government. This mistrust and cynicism were visible even when participants had accurate information about educational and employment opportunities. In fact, some respondents were well-informed about job-related services, but still felt skeptical about the prospects for high-road development in renewable energy. If the high-road vision of Lithium Valley is to succeed, stakeholders must find a way to overcome residents' deep-seated mistrust of and cynicism about development efforts.

Underemployment

Residents widely agreed that it was hard to find *any* job in Imperial Valley, let alone a good job. More than 25% of the people we interviewed were unemployed, and many more were underemployed. Though all were of working age and almost all *wanted* stable, full-time employment, only 24.6% actually worked in a single, full-time job. Instead, because of the lack of job opportunities, most participants worked in unstable jobs: part time, seasonally, as day laborers, or in multiple part-time positions. As Belén, a 43-year-old mother and administrative assistant to a farm overseer, put it, "Here in Imperial Valley we don't have employment all year … there are no stable jobs. They are temporary jobs."

For instance, Carlota, a 37-year-old single mother from Brawley, struggled to find a job to support her family. She had worked as a farmworker for many years and tried, unsuccessfully, to transition into something else. She said:

> It was hard when I wanted to apply [to jobs other than farmwork]. I thought, "Well, I'll apply in Target, maybe in Walmart." But all those things in the valley are really hard to get and not just because of language—language is one of the factors that makes it hard, but really there are other things—if they hire you even though you don't know English, 20 hours of work, you can't take two jobs. Because, for example, I tried to get a job at a McDonalds and at a Carl's, Jr. and then if I went with my schedule in Carl's Jr., even if you *can* take on two jobs, which is tough, but when one has the need you do it, no problem, but the jobs will not allow this.

Carlota added, "Being a single mother, with two small children, with [just] 20 or 25 hours you can't live." Carlota needed full-time work to support her family. She was unable to put together full-time work with two part-time schedules because neither allowed the flexibility to accommodate the schedule at the other. Carlota had attended training to help people transition away from farm work, learning sales and businesses. The training promised to connect her to open jobs. But so far, it had not panned out.

Many interviewees expressed being frustrated with irregular, part-time employment. Antonia, for instance, a 21-year-old Brawley resident, explained how some low-wage retail employers toyed with employees' schedules, giving them few hours per week but then calling them in at a moment's notice or threatening to fire them if they declined to work. She said of her retail employer:

> [I]t's just part time. And, you only get paid, I think, about like $15 or $16 per hour. And if you want to move up, you have to move up to assistant manager. And you can't move up, you can't even do full-time ... And on your days off, let's say on part time, you'll only be working maybe three times out of that week. But on your days off, they will call you a lot to come in, which kind of sucks, because if, like, you're doing something, or if you're somewhere and they call you, you have to, like, sometimes you have to just go all the way back and I guess just go to work.

In other words, Antonia had to keep her entire schedule open just to be paid for a few shifts per week. Similarly, 31-year-old Isaac told an interviewer, "I have not heard of any places that do full time that isn't like a big corporation. If anything, local, nine times out of ten, they're always gonna be part-time. The only people that are full-time are the managers and supervisors. Everyone else underneath, that's all part time."

Nepotism and closed hiring

Many respondents also denounced nepotism and closed hiring practices. Over and over, interviewees told us that employers did not engage in transparent or systematic evaluation of candidates based on their qualifications. Instead, they said that to get a job in Imperial Valley, you had to "know someone." That is, employers would seek out family or friends of existing employees and would not post jobs publicly, privileging social connections over experience and education. When we asked participants which jobs in the region were "good," many mentioned law enforcement (including border patrol), the Imperial Irrigation District, education, and healthcare. At the same time, they also spoke to the difficulty of getting such jobs, which required not only fluent English and a high school diploma but often personal contacts to help someone "get in." Rarely, people found jobs through online platforms such as Indeed or LinkedIn.

One example is Alex, a 32-year-old man who was unemployed at the time of the interview. Alex had worked as a barber for 17 years and a bartender for 12. When asked what was necessary to get a job, he replied "having someone kind of be on it with you to try to make it happen." He went on to explain:

> People say out here: it's not what you know, it's *who* you know. And it tends to be the case a lot out here. So like it's like, you can have someone that doesn't know jack about a job, and they get that job just because it's someone who they know, versus someone that's more qualified for that job or have been trying to apply. And it's like, they'll take the person that they know more than the person that's kind of more qualified.

Despite Alex's extensive experience, he repeatedly observed less-experienced people get a job he was interested in, because they knew the employer. In fact, Alex himself got access to his most recent job at a meat packing plant through a friend. He explained, "I didn't know s**t about that job, and I got that job because one of my friends had worked there, but just cause he told the guy, like, I'd be a good worker, hard worker, and like, fast, and they really needed somebody, so they took a chance, and they got me." However, Alex could not keep the job after he got into a fight with someone who had been working at the plant for more than eight years and was well connected to their superiors. For Alex, this experience reinforced the idea that networks were everything when it came to jobs. He argued that he got laid off, instead of his colleague, because the colleague had "connections."

Apart from Alex, 32 other people repeated the phrase "it's who you know" in the context of employment opportunities. Other ways of talking about this issue included labeling it

as nepotism (15 respondents), *compadrismo* (patronage/backscratching), *compa* (buddy) system or *palancas* (levers). Giovani, a 35 year-old man who had lived in Imperial Valley his whole life, put it this way: "If you ain't family, you ain't hired."

Respondents emphasized that the better-paying the job, the more connections one needed. They especially mentioned education, county administration, and law enforcement as industries that required connections. For example, Kyra, a 24-year-old preschool teacher, said she had experienced both sides of this issue: she got her previous job at the Office of Education through a personal recommendation. She said:

> I have a cousin who works there [the Office of Education], and I have a teacher who used to be my teacher before, and she works there. And I really wanted to go in there 'cause it was really well paid and stuff. And I was like, "Should I call them?." And I called them, and they were like, "Okay, well." Me and my cousin have the same last name. She was like, "I can't ask them 'cause they're gonna know we have the same last name and stuff." And I was like, "Oh yeah." So she was like, "But I'll tell a friend to refer them without me referring you." And then I called the teacher who used to be my teacher, and I told her, and she referred me. And she was the one that got me into an interview. So, yeah, using social connections helps a lot.

On the other hand, Kyra said, her friend's mother was able to get both of them an interview to work in a school. During the interview, Kyra had the impression that she did better in the interview than her friend did. Yet, only her friend was hired. Kyra went on:

> She [my friend] was more shy, and I'm really more talkative. I'm always really open and talkative. And I was like, "I nailed that interview." And she was like, "I don't think I did." She even told me she didn't do very well on it. And I was like, "Don't worry, both of us will get it." And later they sent me an email that I didn't get it. And she was like, "Well I don't know why, but I did." And I was like, "What?" And later, everybody was telling me that she got it 'cause her mom was talking to the directors from here to help her get the job.

Kyra added that she believed one really needed personal help to get a good job, "For the teaching, the district jobs, and the county jobs, it's very strong connections. Sometimes you kinda have to build a relationship around the people here to get that little push."

While Kyra and Alex were advantaged by their social connections, other people who were not as well connected, often those who had recently migrated to Imperial County, felt systematically excluded from good jobs. One example was Alba, a 23-year-old college stu-

dent who spent her early childhood in Mexicali but moved to Calexico at age five. When asked who gets the better jobs in Imperial county, she answered:

> It's usually people who have been here (for) more generations. Like, for example, my family, we just came, we don't really have, like, that history of being in Calexico. But I have friends, ... I know of my mom's coworkers that have been here since like, their grandparents' grandparents, you know? And so they have kind of those bonds and connections, and I don't know. They're kind of networked better just because of how long they've been here. So they have access to, like, the secrets or whatever. So they'll either get, like, advice or stuff and so they end up being in those administration jobs.

Alba's story shows how hiring through social connections makes less-connected people feel excluded. Alba felt cast out from these exclusive opportunities, despite her efforts at furthering her education. She also shared the impression that higher paying positions usually went to "non-Hispanic people or non-Mexican people." On the contrary, the "back-breaking" jobs in agriculture or fast food were more commonly taken by people from Mexicali. Generally, Alba felt pessimistic about her job prospects in Imperial Valley. She expressed skepticism at the possibility of benefitting from the growth of the lithium industry in the region as well, adding, "Hopefully it's not something like that, where it does raise the cost of living without actually helping the residents."

Hiring outsiders

It was also common for respondents to complain that new companies hired workers from outside Imperial County. Many described a pattern in which corporations brought in higher-paid and unionized employees from other parts of the US (such as Phoenix, Riverside, San Diego, etc.), while drawing the lowest paid employees from Mexicali. A few respondents worked in hiring themselves, and they attested to following such patterns in their hiring. They argued that the few jobs that went to locals tended to have harsh working conditions and lack job security. (Even some respondents who had coveted and comparatively well-paid jobs in geothermal plants complained of having to work 12-hour days plus a two-hour round-trip commute, seven days a week.)

For instance, Alba added that employment opportunities were often given to outsiders. She said, "They [employers] bring a lot of people from outside of the Valley. So either like superintendent jobs or like, just those top three, four jobs that are super important, super high paying, like, $200,000 a year or whatever. They're usually not people from here, and they'll bring someone in from, like, LA or San Diego, even, like random, like Apple Valley. But, yeah, they're not from here." Gary, a 31-year-old school technician, added that while

you needed to know someone to get any good job in the Valley, for the highest paying jobs, they hired outsiders. He observed that "The really good paying jobs, like superintendent and maybe city manager and stuff like that" often went to outsiders.

Residents also argued that companies often lack commitment to hiring locals. Eva, a 48-year-old nurse's assistant, argued that geothermal companies "promised all these things and it didn't get done." In her view, these companies were not hiring locals. She explained, "There were hardly any Imperial Valley people involved in the geothermal (plants). There are Imperial Valley workers *now* because a lot of these [outside] people didn't want to stay because of the way the heat is, you know? So, there are a lot more, you know, people from Mexicali, Imperial Valley. But it took some time for them to kind of leave." Eva added that renewable energy companies began to invest in the local population only once their outside hires got fed up with Imperial County and left. She remained skeptical of new industries like lithium, and anticipated more broken promises. She grimly predicted, "It's gonna be the same thing."

The skepticism that respondents expressed towards the prospects of lithium-related development are closely tied to their perception that outside employers tend to exclude residents of Imperial Valley from employment in new industries, particularly in the top-tier jobs.

Labor abuse and exploitation

On the premise that they did not have a choice among jobs, many respondents also tolerated exploitative conditions, including labor law violations, such as a lack of access to bathrooms or rest breaks and exposure to bleach, pesticides, and other toxic chemicals. Even in white-collar jobs, interviewees often mentioned mistreatment and described enduring conditions that may violate labor and employment laws. Such experiences left many respondents doubting that *any* employment in Imperial Valley could be good.

For instance, Lliana, a 26-year-old unemployed woman, had worked more than five jobs, most of them, in her account, abusive. First, she worked for a medical billing company. She was treated as an outsider because she was not from Brawley. Her supervisor "yelled all the time," implying that Lliana was too stupid to understand the work, and then summarily fired her. Other jobs, also entry level, were also demanding and high-pressure. She added, "You're doing the absolute best you can but they're like, 'More.'" In at least two positions, Lliana worked for a white business owner which, she added, came "with its own sets of challenges." Often, white owners acted like they were doing Lliana a favor by employing her. Eventually, Lliana started feeling despair. She went on:

> I'm kind of tired of working for people down here in the valley … After working so many jobs here in the valley, I guess, it's just kind of everyone puts the pressure … They're putting pressure to the point where it's stressing you out, and the stress is killing you, and you can't even go to the doctor to deal with the stress. So, it just feels like a deadly cycle.

After this experience, Lliana was uncertain she could find *any* good job in Imperial County. Several such individuals mentioned that they'd consider moving somewhere else to find more decent work.

Bayron's story also illustrates the poor conditions of low-road employment. Bayron, the 43-year-old construction worker who had given up a job in San Diego to help provide care cor his son and mother-in-law in Imperial County, described the contrast in labor conditions. Throughout the interview, he emphasized the low wages, instability of employment, and mistreatment he said was characteristic of work in Imperial County. He described work in Imperial County as "exploitation, because they want you to do a lot, they want you to work like a professional, and they pay you like a novice." Although Bayron had gained carpentry experience in San Diego and reached level five on the salary scale in his work, he was re-hired in Imperial County as a novice (with corresponding low wages). He believed that local employers took advantage of the high unemployment rate in Imperial County to pay low salaries and dictate unfair terms of employment.

People like Bayron and Lliana were suspicious of any employer, including new employers promising high-road opportunities in Lithium Valley. They argued that the pervasive unemployment in Imperial County enabled all employers to be abusive, exploitative, and unfair to workers.

Skepticism of development promises

Many residents also told us that even if lithium development brought resources to Imperial County, those resources were unlikely to benefit most residents. For instance, Gary asserted that outside political and corporate "leaders" extracted resources from the county. As he put it, "They come in, they squeeze it, and they leave." A few people, he said, had recently received top jobs in the county, "got millions" and left. He went on:

> They [the county government] get grants all the time, you know, like money and stuff like that. And it's like, dude, like what happened to the money? The city residents that are here, they're paying taxes, and their city taxes: Calexico has the highest taxes and highest fees for opening up businesses and for city permits and anything that has to do with, actually, growth. So, basically,

> we have resources, and they keep charging us different things, but then, somehow, the money is never enough.

Gary was skeptical about any public subsidy for economic development, viewing subsidies for Lithium Valley as yet another way to exploit the county's resources without benefitting its residents.

Our conversation with Melissa is another good representation of residents' skepticism about Lithium Valley. Melissa was a 47-year-old dental hygienist born and raised in Brawley. She worked as a teacher in a technical education pathway for health science and her husband worked in Cal Energy's geothermal plant. Her husband's job had exposed her to plenty of information about the lithium development plans. She told the interviewer that she had attended conferences on workforce development focusing on lithium. However, this information did not make her more hopeful about lithium-related employment in the valley. Melissa said she was "trying to figure out the truth" about how many jobs were really going to be available and expressed concerns about the environmental impacts of the industry:

> I'm jaded. And I get a little bitter when people say "Lithium Valley", because we're not Lithium Valley. We are *Imperial* Valley. We're Imperial County. And there's so many other things than just lithium. Lithium could be a vehicle for change for our community. But if it's not done right, then it's not going to give us these jobs or this infrastructure that maybe some of our elected officials are promising. Because they're living on political dreams instead of the reality.

Melissa was skeptical about lithium extraction as an avenue for economic development in the region. She was uncertain about what to believe and how much the promise of high-road economic development represented mere "political dreams." She was particularly critical of how the attention paid to Lithium Valley was diverting attention away from other vital services that residents needed: "We don't know if that lithium is going to bring all of those promised jobs and all of that money into the valley. Yet, some of our residents can't even get access to quality healthcare." Melissa felt that betting on the lithium industry was a gamble with hidden costs for residents that few were aware of, much less concerned about.

Other residents were especially skeptical of local government. For example, although Diego seemed very informed about local politics and employment services in Imperial Valley, he suggested that such information was *deliberately* hidden. For instance, he said, Calipatria City Hall was offering to help people with their passports but failed to promote

the opportunity, "because that stuff is expensive. So, you know, if everybody goes out and takes advantage of it, (do) you know how much money that's going to cost the state?" He also expressed skepticism about local politicians' willingness to serve their residents. As he put it, "The politics here–and I think anywhere–are very high school. Everybody wants to be the prom king, prom queen, and I was never a prom king. I think there's very few people, I guess I should say, that are in politics to hurt the community. I just think they take more before they give." When we asked Diego how he felt about the lithium industry, he said, "Hopefully it brings some money to Imperial." He said he had heard from his cousins, who were in politics, that "there were $18 million dollars [for lithium development] and when they finally went to ask for money for the Imperial Valley, there was only like $18,000 left. It's like something ridiculous. Like, there were millions."

Diego's distrust was typical of many of interviewees. Repeatedly, residents of Imperial County told us that outside employers exploited local resources without benefiting residents and mistreated employees. They were also deeply cynical about local government.

Conclusion

Mistrust and cynicism toward employers can be a barrier to new industries seeking to offer high-road employment to local workers. These sentiments are reactions to a county-wide labor system in which, amid high unemployment, residents perceive companies to mistreat workers, hire using closed or nepotistic practices, or force workers into part-time schemes requiring full-time availability. Residents of Imperial Valley told us they have watched top jobs go to outsiders and seen industry and political elites coopt the benefits of new industries for themselves, leaving everyday residents to bear the costs. They told us they feel cautious, unsure, and even "jaded" when new development opportunities arise.

Overcoming such mistrust and cynicism will require a commitment to both high-road employment practices and transparency in government. It will also require honest relationship-building. An example appeared in our interview with Abner, a 33-year-old educator. Abner grew up in Calexico but worked for almost a decade in San Diego. When the Covid-19 pandemic began, Abner returned to Imperial Valley. He had recently been hired to oversee an afterschool program for students in nine school districts. Although Abner was from Calexico, he said, "One of our biggest hurdles was convincing people that we [the program] are here for the community, because there was a lot of rumors." He explained that he overcame mistrust by following through on his promises. "If you're going to say you're going to do something, just don't say it. Do it. And now that they've noticed that we do things, there's been more trust as well. But there has to be patience on both sides because then, also, we can't expect them to accept us just like that."

CHAPTER 10. CONCLUSIONS AND RECOMMENDATIONS

> "I get a little bitter when people say 'Lithium Valley,' because we're not Lithium Valley. We are *Imperial* Valley. We're Imperial County. And there's so many other things than just lithium. Lithium could be a vehicle for change for our community. But if it's not done right, then it's not going to give us these jobs or this infrastructure that maybe some of our elected officials are promising."
>
> – Melissa, 47, resident of Brawley

Lithium Valley is not a place: it is a name for a vision of future industrial development in renewable energy that could transform Imperial County. The Imperial Valley is rich in lithium and in geothermal energy. The opportunity is there to extract lithium and transform it into batteries to power the renewable energy transition, and to do so in a way that moves our energy system closer to the goals of justice and sustainability. The promise of Lithium Valley is a future of high-road development that could bring jobs and income to the region that has the highest rates of poverty and unemployment in California.

To realize this future, investment in Lithium Valley must do more than bring just "jobs." It must bring *high-road employment*, with opportunities for local residents to work in jobs that pay family-supporting wages and benefits, promise long-term careers, offer strong protections for health and safety, and allow opportunities for workers to have a voice on the job. If the development of Lithium Valley occurs without a commitment to high-road employment, then it could reinforce the cynical views of residents who told us stories of how the Imperial Valley has been burned in the past by false promises. Residents told us that companies have brought jobs to Imperial County before, only to fill those jobs with workers from outside of the region. Some residents told us they did not expect promised jobs to materialize, but that, instead, lithium companies might simply extract resources to be shipped away for processing, leaving residents with all of the environmental impacts and few of the economic benefits from lithium extraction. This view will not be easy to dismiss, because that is what lithium extraction looks like in most places where the industry exists. The low-road Lithium Valley future is possible, too.

There are several important steps that state and local policymakers and regional stakeholders can take to steer away from the low road and move Lithium Valley development forward along the high road. We offer here some concluding recommendations for devel-

opment in renewable energy in Imperial County that can provide effective opportunities for local residents and expand the pathway into high-road employment for historically excluded groups in Imperial County. Our recommendations are for state policymakers and stakeholders engaged in planning for workforce development in California in general, and for the Southern Border Region and Imperial County in particular.

Our first recommendations concern planning for the future of imperial County.

Plan collaboratively for a high road in the Southern Border region. The State of California has established ambitious goals for the renewable energy transition. Many statewide planning processes are focused on industrial policy, workforce development policy, and land use planning, all to support a just energy transition. The future development of Imperial County is critical to many different state goals, because of the region's incredible renewable energy potential, its acute need for more economic opportunity, and the state's need for workers to support the statewide economy. Planners and policymakers should work closely with community and labor partners in Imperial County to address the challenges and barriers described in this report. Many of these barriers are not specific to employment in geothermal energy, DLE, or battery manufacturing; they are barriers that stand in the way of residents who seek employment and training opportunities in *any* high-wage, high-skill career. Overcoming them, however, will be essential to the State's ability to meet its policy goals.

Industrial policy should include the renewable energy storage and materials sector. "Renewable energy" is often used as a shorthand label for wind, solar, hydro-, and geothermal power–that is, as a name for renewable energy *generation*. These technologies are viable only with the development of storage batteries, and the renewable energy sector in California should be construed broadly to include power distribution, storage, the manufacturing of batteries, and the extraction of minerals used in their manufacture. Any statewide economic planning or industrial policy that aims to foster development of renewable energy should also consider renewable energy storage, especially lithium-ion battery manufacturing, and materials, including the extraction and refinement of critical minerals such as lithium that are essential to battery storage technology. Bringing lithium extraction and battery manufacturing to California, where labor and environmental protections are comparatively strong, is a promising way to move the entire renewable energy sector in the direction of greater sustainability across the whole supply chain—but only provided that California maintains its focus on high-road production.

Make employment projections transparent. Many of our interviewees expressed doubt about promises or projections of future employment in direct lithium extraction (DLE), because the only projections currently available to the public are from the public statements

of companies seeking permits, subsidies, or public support to develop in Imperial County. It is difficult to substantiate any projections of the employment impacts of DLE, both because the technology is so new and because it so little resembles other forms of lithium mining. To address the skepticism of local residents, and to inform planning that can support the development of this industry, lithium extraction companies and other stakeholders should agree to develop and share employment projections that are as specific as practicable.

Ensure the industry is statistically visible. Industry stakeholders should also plan to work with federal agencies to ensure that commercial-scale DLE is classified appropriately in federal statistics. The federal government will solicit proposals for the 2027 revision of the North American Industry Classification System (NAICS) in December 2024, and it could be important to the future of planning in the Southern Border region to be sure that this new industry is classified appropriately, so that its unique employment and wage profile is correctly reflected in statewide and national statistics.

Our next recommendations address the specific barriers that residents described in gaining access to potential high-road employment.

Commit to local hiring. Employers should make specific commitments to hiring and training of Imperial County residents for jobs in Lithium Valley. Such commitments are best formalized in a Community Benefits Agreement (CBA), an agreement among employers, unions, and community organizations that may include commitments related to local hiring, environmental protection, shared decision-making, and other community concerns. The Department of Energy has encouraged the use of CBAs in the renewable energy industry. State and local policymakers should consider the signing of a CBA providing for local access to high-road jobs as a criterion for public subsidies for any Lithium Valley development.[51]

51 See C. Benner et al. (2023), p. 85.

Box 10-1. Community benefits agreements

A Community Benefits Agreement (CBA) is a legally binding agreement among private companies, labor organizations, and one or more community organizations. A CBA establishes a framework for cooperation with the shared goal of providing local community members access to, and training they need to succeed in, high-road jobs. It is not a collective bargaining agreement, but is a community-focused agreement that aims to support the success of high-road companies that hire locally and provide high-road jobs. Jobs to Move America (JMA), a leading organization providing advice and support for partners who are negotiating CBAs, describes a CBA as a way to "help manufacturers develop and train a skilled workforce while creating good jos with benefits for working families."[52]

The details of the agreement differ from one CBA to the next, depending on the needs of the employers, workers, and communities. Employers typically commit to track and disclose progress toward local recruitment and access goals. These may include goals for local hiring, and goals for hiring job candidates from priority populations, such as people traditionally underrepresented in the industry. Community and labor partners may commit to help meet those goals, through such means as the following:

- Conducting outreach to workers not traditionally employed in the industry, such as women, veterans, or people of color;
- Conducting outreach to, and assisting with worker referrals from, local public agencies;
- Identifying English as a Second Language (ESL) resources for workers;
- Working with employers and training providers to help assess needs for additional training;
- Providing training, such as financial literacy, ESL, or pre-apprenticeship skills; or
- Assisting employers with identifying barriers to site access, and identifying resources to help overcome those barriers.

Many CBAs also provide for establishment of a shared governance structure with representatives from business, labor, and community organizations that are parties to the agreement. The purpose of such a structure is to help all of the partners share information and coordinate their activity in pursuit of their shared goals.

52 Jobs to Move America (2024), *Community Benefits Agreements*. <https://jobstomoveamerica.org/resource/community-benefits-agreements/>

Improve the infrastructure for transportation to work. The development of DLE and battery manufacturing will require substantial improvements in the transportation infrastructure in Imperial County. Narrow and poorly-maintained roads in the geothermal resource area will make it challenging to truck lithium or batteries in the quantities that some projections have proposed, and *especially* challenging to do so while also increasing Lithium Valley employment on the scale contemplated in our benchmark high-road scenarios. Most residents we interviewed struggled with the costs of car maintenance and gas. Residents emphasized the need for improved bus schedules and routes, a car, or company transit to reach these workplaces. Other residents described positive experiences with employer-provided shuttles to work, and this solution, which is already used by some geothermal companies, might be an appropriate and cost-effective way to allow many more Imperial County residents to work in Lithium Valley jobs as the industry scales up. More generally, improving the frequency and reliability of bus services and facilitating employer-provided transportation—such as shuttle services, company vehicles, and gas reimbursements—will significantly enhance access to high-road employment in Lithium Valley.

Provide childcare and dependent care for workers in Lithium Valley. Many residents of Imperial County are out of the workforce because they are caring for children or other dependents, and some low-income residents told us that existing childcare centers either are too expensive, or that their limited schedules conflicted with work or adult education. State and local policymakers should plan to expand childcare as an important part of planning for Lithium Valley. Companies that are planning to scale up lithium extraction or battery manufacturing plants in Imperial County should look for opportunities to provide subsidized childcare, in order to recruit and retain skilled workers who are also parents and caregivers. They should also consider work scheduling practices that accommodate the limited availability of evening and weekend childcare and dependent care in the County. Such practices could include offering more flexible work schedules to help workers balance their responsibilities as caregivers; increasing access to on-site and public daycare programs that accommodate full-time schedules; and providing dependent care options at non-traditional hours (such as overnight) to accommodate workers who must work those shifts. These strategies could help create increase opportunities for residents, particularly women and caregivers, to participate fully in the workforce. They will thereby increase the size of the workforce in Imperial County, and allow employers access to a larger pool of talent without the need to recruit workers from farther away.

Expand local training capacity. High-road employment is highly skilled employment, and almost all potential high-road jobs in Lithium Valley would require some additional post-secondary training, whether in the form of a registered apprenticeship such as the IBEW's apprenticeship program, or a postsecondary certificate such as the plant operator certifi-

cate provided by Imperial Valley College. Training opportunities in Imperial County are limited. Residents we interviewed described a lack of local training sites, especially outside Imperial and El Centro, a lack of space in classes, and schedules that conflict with work and childcare hours. There are very few training opportunities in Spanish. State and local policymakers, employers, unions, and other stakeholders should look for opportunities to expand programs, including apprenticeship programs, to train local residents for Lithium Valley high-road occupations.

Consider expanding language access for Spanish speakers. For many high-road occupations, English proficiency is an important occupational qualification. For others, it may not be critical. Training providers should work with employers to identify high-road occupational pathways that can be open to workers with range of different levels of English proficiency, and they should look for opportunities to provide training in Spanish, where it is appropriate and feasible. They should also expand access to English as a Second Language (ESL) classes. Imperial Valley College's new Vocational ESL program, supported by a grant from the Department of Energy, could be a promising model to expand opportunities for high-road employment in Imperial County.

Subsidize transportation and childcare for Imperial County residents who pursue training that requires travel. Because many occupations in DLE and battery manufacturing might not have enough local job openings in the near term to sustain the development of a local apprenticeship program or occupational certificate program, some Imperial County residents may need to travel in order to get the training they need so that they can get a high-road job close to home. High-road training for Imperial County residents may include a long commute to training programs in San Diego, or a temporary apprenticeship placement even farther away. Stakeholders should work with state and local governments to subsidize travel and childcare for residents who have the opportunity for apprenticeships in high-road employment.

Work with community partners to expand outreach. Even those residents who have heard about Lithium Valley do not generally know much about the opportunities it might hold for them. Existing pathways into potential high-road jobs in Lithium Valley–including the IBEW apprenticeship center in Imperial, and the LIFT program at Imperial Valley College–are not widely known. Many residents are frustrated with the difficulty of accessing information about both job and training opportunities. Employers and training providers should work with community organizations to expand their outreach to hard-to-reach and priority populations. Bilingual job postings in Spanish and English, specifying what level of English proficiency is required, would help many residents navigate the labor market.

To effectively spread the word about training and job opportunities in geothermal power

generation, lithium extraction, and battery manufacturing, employers and training providers should consider targeting community institutions such as schools, health centers, or churches. By making information available as part of residents' regular routines—such as attending a school orientation—and posting the information in print, they can reach qualified applicants who otherwise would not hear of opportunities.

By taking steps like these, stakeholders in the vision that is Lithium Valley could address many of the concerns we heard from local residents and help to overcome the barriers to high-road employment in Lithium Valley.

The Lithium Valley High Road Training Partnership

Our final recommendations address the importance of long-term partnership in support of high-road training for Lithium Valley. High-road employment is highly skilled employment and the only way to ensure that community members have access to high-road jobs is to provide them with access to the right training. The High Road Training Partnership (HRTP) is a model of workforce development in which employers, unions, training providers, and community organizations collaborate to ensure that employers can recruit and retain community residents who are trained with the skills that industry needs to compete.

Formalize a long-term high-road training partnership (HRTP). A successful HRTP requires stakeholders with different interests to share information and commit resources to a common project of high-road development. The trust necessary to make that kind of partnership successful takes time to develop. Some of the most successful HRTPs have built on the foundation established by previous organizational relationships, including joint apprenticeship programs and labor-management partnerships formed between unions and employers with a history of working and negotiating together. Because Lithium Valley is an emerging industry cluster, these historical foundations do not yet exist, and the stakeholders do not yet all have a long history of successful negotiation with one another to solve common problems. We recommend that stakeholders come together and negotiate a formal agreement to continue the joint development of high-road training in Lithium Valley. Such an agreement could serve as a public-facing commitment that reassures all stakeholders that the others will also come to the table in good faith and the discussions they enable can be broadened to include "equity, job quality, and maintaining industry standards in the long term."[53]

53 A. Gonzalez-Vasquez & M. Lopez (2021), The High Road to Economic Prosperity: An Assessment of the California Workforce Development Board's High Road Training Partnership Initiative, UCLA Labor Center, p. 27.

Establish a trusted intermediary. Long-term, high-road training partnerships work best when a formal agreement is coupled with support for an intermediary organization, which has a governing or advisory role for representatives from all of the parties to the agreement. In A regional or sectoral intermediary can provide multi-employer training that meets the needs of workers, employers, and community members. Intermediaries can also play an important role in convening the stakeholders to an HRTP and in securing commitments—and action—from all members in the partnership. The intermediary should be able to mediate among labor, employers, and community organizations, building each party's trust in the process.[54]

54 Ibid., pg. 17.

METHODS APPENDIX: RESEARCH PROCESS AND RESPONDENT DEMOGRAPHICS

Part I of this report, comprising chapters 2 through 4, draws on statistical and computational analysis of the following data sources:

The data sources for the statistical and numerical analyses reported here include all of the following.

- California Department of Social Services. (2022). Community Care Licensing -
- IMPLAN ® model (2022), 2022 Data, using inputs provided by the user and by IMPLAN Group LLC. <www.implan.com>.
- US Bureau of the Census. (2022). 2018-2022 5-year American Community Survey Public Use Microdata Sample.
- US Department of Labor. (2024). Apprenticeship Occupations. <https://www.apprenticeship.gov/sites/default/files/wps/apprenticeship-occupations.xlsx>
- US Department of Labor, Employment and Training Administration, National Center for O*NET Development. (2022). Education, Training, and Experience module.
- US Department of Labor. (2024). Registered Apprenticeship Partners Information Database System (RAPIDS), as of June 2024. Data on selected characteristics of apprentices and apprenticeship programs. The database lists 400 registered apprentices in Imperial County, and another 45 whose apprenticeship programs were registered in Imperial County, and who were listed with program numbers associated with the Imperial Irrigation District. The occupation codes of these 45 apprentices were determined by cross referencing the registered program name, the description of the apprenticeship programs on the Imperial Irrigation District website, and the Department of Labor list of apprenticeship occupations.

The scenario projections of potential high-road jobs in Chapters 3 and 4 use IMPLAN ® software for input-output analysis to estimate indirectly created and induced jobs for every additional job in a specific industry. This method takes existing data on transactions among industries, represented as a matrix of inputs and outputs, and uses them to compute the predicted effects of a change in the input or output of one industry on the others. The use of input-output analysis for conditional predictions relies on several simplifying assumptions about the production process, including constant returns to scale and a fixed structure of inputs for every industry. It further assumes that "an industry will always produce the same mix of commodities regardless of the level of production" and that its "production function is a weighted average of the inputs required for the production of

the primary product and each of the by-products, weighted by the output of each of the products."

In addition to these assumptions about the production process, our analysis relied on substantive assumptions about the specific industries that are likely to come to Lithium Valley. We assumed that employment patterns in DLE are best represented by employment patterns in the geothermal electric power generation industry; and that appropriate economic multipliers for battery manufacturing in Imperial County, including battery cell and battery pack manufacturing, are best represented by the California average for the battery manufacturing industry as a whole. We considered an alternative modeling strategy that would include separate multipliers for lithium mining, geothermal power generation, lithium processing, and battery manufacturing, but rejected them in favor of a simplified two-industry model of Lithium Valley that included industry employment patterns and multipliers for geothermal power generation and battery manufacturing. The reasons for this decision were that (1) according to industry sources, the production process in DLE is likely to be more similar to geothermal power generation than to the production process in lithium quarrying or open-pool evaporation mining, and employment patterns and economic multipliers applicable to the latter would not apply to the former; and (2) the processing of lithium into cathode active materials is unlikely to be accurately represented by 2022 IMPLAN data on the inorganic chemical manufacturing industry, because little or no processing of lithium into cathode active materials took place in the United States in 2022. Our models of the local battery supply chain therefore include and exclude the following industries respectively, by North American Industry Classification System code:

Table A-1. Selected industries included in and omitted from direct employment impacts of Lithium Valley

NAICS Code	Industry
	Included
221116	Geothermal electric power generation
335910	Battery manufacturing, including: lithium batteries manufacturing
	Omitted
212390	Other nonmetallic mineral mining and quarrying, including: lithium mining and/or beneficiating
325180	Other basic inorganic chemical manufacturing, including: lithium compounds, not specified elsewhere by process, manufacturing

Part II of this report, comprising Chapters 5 through 9, draws on 214 in-depth interviews and brief surveys with working-aged residents of Imperial County to evaluate barriers to

accessing high-road jobs in the lithium industry. In January-February 2024, a team of 25 bilingual researchers from the University of California-San Diego (UCSD) Labor Center completed in-depth interviews with 214 residents in Imperial County, including 17 current students in the Imperial Valley College lithium pipeline programs. By speaking directly with residents, we aimed to identify likely barriers to high-road (and other) jobs in the lithium industry. Because most residents had limited understanding of the lithium industry, we extrapolated from residents' *current* experiences of finding and keeping jobs in Imperial County to identify barriers that might impede their access to high-road, Lithium Valley jobs in the future. We sought the experiences of individuals currently in the workforce or seeking work, rather than soliciting the perceptions or predictions of youth, who may be the region's future workers.

We aimed to reach a cross-section of working-age Imperial County residents that approximated the distribution of the county with respect to age, ethnicity, employment status, and educational attainment. We also aimed to recruit an over-sample of respondents from hard-to-reach populations and economically disadvantaged populations that could benefit from development of high-road jobs. To achieve these goals, we reached out to people in the region through as many points of contact as possible: staff at Comité Civico del Valle and Imperial Valley Equity and Justice Coalition called their contacts, posted on social media, and posted flyers around the county. Most importantly, we encouraged early interviewees to spread the word to their contacts. Ultimately, we recruited 49% of participants via word of mouth, 19% via calls from Comité Cívico del Valle, 9% via social media, 4% via public flyers, and 16% by other means. We also recruited 15 students directly through the Imperial Valley College (IVC) Plant Operator Program to understand what enabled these individuals to seek out and begin training to work in lithium. Interviews lasted an hour on average and were conducted on site in Calexico, Brawley, and Calipatria, as well as over Zoom with 15 of the 17 IVC students. Each participant was compensated $50 in cash, under UCSD IRB #809338. To identify common themes in the interview data, we used Atlas.ti software. At the analysis stage, we removed 33 interviewees (5 were not recorded, 4 of the individuals turned out to be retired, and 24 had either never worked, gave low-quality responses, or had multiple close family members in the study).

Roughly reflecting the county population, interviewees ranged in age from 18-68, with an average age of 37. Just over a third (38.5%) were male and 61% female. Most (94.4%) were Latino or Hispanic, with 5.6% white, 1.4% Black and 2.3% other. Nearly half were immigrants, with 56% born in the US, 43% born in Mexico, and 1.5% born elsewhere. Among immigrants, 42.6% were naturalized US citizens, 53.5% were Lawful Permanent Residents, and 6.5% were undocumented. Nearly 90% of participants spoke Spanish, with 31.5% speaking only Spanish, and 58.5% being bilingual to some degree. During interviews, 46.3% chose to speak Spanish.

Most participants had families: 48.4% were married or cohabiting, 63.5% had children, and 44.4% had children under 18. Those with minor children had an average of 2.0 children. Meanwhile, 40.8% were single. Most people rented homes (59.2%), while 33.8% owned their home, and a few were un-housed. The average household was 3.7 people, and 54.5% reported receiving some form of government assistance. They lived all over Imperial County, including 29.4% in Brawley; 26.6% in Calexico; 15.9% in Calipatria, Bombay Beach, Slab City or Westmorland; 21% in El Centro or Imperial; 2.8% in Heber, Holtville or Seelye, and 5.5% living in Mexicali part- or full-time.

Respondents' levels of education paralleled those in the county: 19.7% had completed middle school or less, 46.9% had a GED or high school diploma, 16% had a two-year college degree, and 13.1% had a BA, BS or more.

Reflecting the precarity of employment in Imperial Valley, only 37.1% had full time jobs. Another 28.2% worked part time, and 25.8% were unemployed. The most well-represented sectors included: education/health/social services (23.8% of respondents), agriculture or mining (22.9%), food services/lodging/entertainment (9.8%), retail (9.3%), services except public administration (7%), construction (5.1%), and public administration (5.1%). Interviewees included many farmworkers, as well as teachers, nurses, numerous individuals who worked for In-Home Support Services (IHSS), employees of restaurants or fast-food chains, accountants, transportation workers, border/prison/detention guards or janitors, among others. While reported incomes are estimates at best, since many people worked as day laborers, temporary workers, seasonal workers, or in other kinds of non-salaried positions, participants reported a mean of $22,000 per year individual income and $44,765 per year household income.

Although this was not a probability sample, the social and demographic characteristics of respondents were similar to those of county residents of working age, with the notable exceptions that women were overrepresented and undocumented individuals were underrepresented in our interview sample.