

North San Joaquin Valley

STRATEGIC PLAN

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North San Joaquin Valley Strategic Plan

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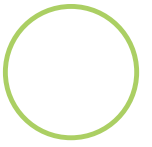
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This Strategic Plan marks a **turning point for the North San Joaquin Valley.**

This North Valley THRIVE Strategic Plan charts our roadmap to a sustainable and inclusive future, where the people of San Joaquin, Stanislaus, and Merced Counties together realize our region's full potential. We envision a future where we're known for what we create and how we innovate as well as for how we care for each other and the land in and around our communities. We will continue to be a key part of the dynamic Northern California megaregion, with growing links to the Bay Area and Sacramento region. But we are also realizing our own identity as a thriving, self-sustaining hub of opportunity and economic vitality, where our ability to live up to our full potential lifts neighboring regions and beyond.

What you're reading is more than a roadmap for the journey ahead. This strategic plan also celebrates our tri-county region's unprecedented collaborative spirit and untapped potential. Together, we are poised to foster the growth of emerging industries while preserving the core values that have always made our communities strong. This plan was crafted through collective effort, and it is through that same unity that we will achieve our shared vision.



Who We Are (Chapter One)

The NSJV's identity is deeply intertwined with its historical and cultural roots. From its early days as a bustling agricultural and industrial hub, to its present-day challenges and opportunities, the region has been shaped by waves of migration, industrial growth, and environmental changes. The region's economy, traditionally reliant on agriculture and manufacturing, is now in the midst of a transition to a carbon neutral economy, driven by opportunities in more climate friendly industries and a need for more sustainable practices.

Vision for the Future (Chapter Two)

Guided by the North Valley THRIVE initiative, the NSJV is committed to fostering a high-road economy that prioritizes equity, environmental stewardship, and sustainable growth. The region's vision centers on creating equitable access to quality jobs, protecting natural resources, and ensuring that economic growth benefits all communities, particularly those that have been historically disinvested.

Challenges and Opportunities (Chapter Three)

The NSJV faces several challenges, including high unemployment, low educational attainment, and significant environmental vulnerabilities. However, the region also has unique opportunities, such as its strategic location within the Northern California Megaregion, a strong agricultural base, and a growing university ecosystem that can drive innovation and economic diversification.

The NSJV's future depends on its ability to come together as a cohesive region, leveraging its strengths and addressing its challenges through collaborative, equitable, and sustainable strategies. The North Valley THRIVE initiative serves as a blueprint for this transformation, laying the groundwork for an inclusive and resilient regional economy that can compete on a global scale while ensuring prosperity for all its residents.

Priority Sectors (Chapter Four)

The NSJV Strategic Plan outlines a transformative vision for the region's economic future by focusing on first deploying new technologies within the region, then on translating and manufacturing of advanced products and technologies within the region, and simultaneously on nurturing home grown start-ups that take root within the region and help form distinct industry. The strategies described below focus on four priority sectors: Advanced Manufacturing, Clean Energy, Carbon Management, and the Circular Bioeconomy. These sectors are identified as pivotal in transitioning the NSJV toward a more sustainable, equitable, and high-value economy that can meet the challenges of the 21st century, such as climate change, relocation of supply chains, and increasing economic resilience in the face of technological disruption.



Advanced Manufacturing is positioned as a cornerstone of the region's economic evolution. Historically rooted in food processing and logistics, the NSJV's current manufacturing sector is expanding into higher-value activities. The plan identifies key areas such as building materials, mobility technologies, and measurement and testing products as critical subsectors. These industries not only offer higher wages and more resilient career pathways but also align with the broader goal of reducing the region's environmental footprint. The strategic plan emphasizes the importance of creating a cluster of advanced manufacturing industries that can benefit from shared talent pools, localized supply chains, and knowledge spillovers, driving innovation and competitiveness in the global market.

Clean Energy is the broad portion of the energy sector that does not use fossil fuels. The NSJV is uniquely positioned to become a hub for clean energy innovation, particularly in solar energy, green hydrogen, and biofuels. The region's abundant sunlight, available land, and existing infrastructure make it an ideal location for large-scale renewable energy projects. The plan highlights the potential for the NSJV to lead in prototyping and scaling new clean energy technologies, which will not only contribute to the state's decarbonization goals but also create significant job opportunities in energy efficiency, renewable energy generation, and the manufacturing of energy-efficient products. By strategically developing this sector, the NSJV can improve local air quality, reduce greenhouse gas emissions, and ensure that the benefits of clean energy development are equitably distributed among its residents.

Carbon Management is an emerging sector with enormous growth potential, driven by the increasing demand for carbon capture and sequestration technologies. The NSJV's geological features, particularly the Sacramento-San Joaquin Delta, offer substantial capacity for underground carbon storage, making the region a prime candidate for carbon management projects. The plan recognizes the need for a community-driven approach to Carbon Management in a way that shapes projects and investments and results in local and regional benefits. The region already has industry leading local companies and has an opportunity foster new startups that can lead in the development of carbon capture, utilization, and storage (CCUS) technologies. This sector is expected to create high-quality jobs, many of which can leverage the existing skills of the region's workforce, particularly those transitioning from the fossil fuel industry. The strategic development of carbon management infrastructure will not only contribute to global climate goals but also position the NSJV as a leader in this emerging field.

The Circular Bioeconomy strategy seeks to position the region as one of the nation's leading locations for bioindustrial manufacturing and the broader circular bioeconomy, a forward-looking sector that is transforming waste streams from biomass (such as agricultural and forestry residues, municipal solid waste, and food processing byproducts) into valuable bioproducts such as fuels, plastics, chemicals, solvents, fabrics, polymers, food additives, alternative proteins. By supporting the growth of this sector, the region can reduce waste, lower greenhouse gas emissions, and create new economic opportunities. The strategic plan outlines the importance of nurturing innovation in this sector, developing a robust talent pipeline, and ensuring that the growth of the bioeconomy is inclusive and benefits local communities. The plan also emphasizes the alignment of the circular bioeconomy with broader state and national strategies for sustainable development, positioning the NSJV as a leader in bioindustrial manufacturing.

Priority Sector Investment Strategies (Chapter Five)

To support development of the Priority sectors, the NSJV Strategic Plan proposes a series of investment strategies. These consist of three region-wide investment strategies, as well as specific strategies for each of the priority sectors.

Regionwide Sector Strategy 1: Technology Deployment

This strategy seeks to position the region as a leading hub for deploying key technologies, with a focus on clean technology to support major manufacturers and large power consumers. It aims to boost the adoption of existing clean technologies, particularly in solar, biofuels, and advanced manufacturing, among local companies. By doing so, the strategy will not only promote clean energy use but also create local construction jobs as part of these projects.

Regionwide Sector Strategy 2: Translation and Production

This strategy supports the NSJV's efforts to become a "Translation Destination" by expanding testing facilities and infrastructure to accommodate the development, testing, and prototyping of new technologies. It seeks to establish the region as a hub for innovation, where projects like carbon capture facilities and electric vehicle (EV) manufacturing can be developed and refined. By positioning the NSJV as a center for testing and scaling up innovations, the region can leverage its proximity to cutting-edge knowledge generated in other regions like the Bay Area and foster local economic growth.

Regionwide Sector Strategy 3: Cluster Formation

This strategy aims to develop competitive industry clusters in the region's priority sectors by promoting the growth of local startups. It focuses on enhancing regional competitiveness by leveraging the resources of local universities and research institutions, while also attracting larger firms to build a strong and interconnected supply chain. Through this the region can foster innovation and create a thriving ecosystem for emerging industries.

Clean Energy Strategy 1: Net Zero Facilities

Ensure that all major energy facilities in the region achieve net zero emissions by optimizing energy efficiency, increasing the use of renewable energy, and implementing carbon capture solutions. This strategy aims to make every major facility in the region carbon neutral.

Clean Energy Strategy 2: Zero-Emission Vehicles

Promote the rapid adoption of zero-emission vehicles, particularly hydrogen and biofuel commercial fleets, to boost local demand and reduce emissions.

Clean Energy Strategy 3: Green Hydrogen Infrastructure

Identify strategic locations for green hydrogen refueling stations and ensure the region's readiness for infrastructure supporting this emerging technology.

Clean Energy Strategy 4: Solar and Land Availability

Market and leverage the region's solar potential and available land, while ensuring community benefits from clean energy investments.

Advanced Manufacturing Strategy 1: Translation Destination

Promote the NSJV as an advanced manufacturing hub for companies and research centers seeking to test, expand, or scale their production, with a focus on leveraging the NSJV's existing manufacturing strengths toward energy-efficient building materials and decarbonization technologies.

Advanced Manufacturing Strategy 2: Expand Markets

Help local manufacturers find new markets, particularly for energy-efficient products.

Advanced Manufacturing Strategy 3: Talent Development

Create a manufacturing talent development center to train workers in modern manufacturing technologies, supporting local workforce needs.

Carbon Management Strategy: Feedstock Marketplace

Support biofuel and carbon management by clarifying regulations around organic waste feedstocks and establishing a local feedstock marketplace to ease transaction processes for both sellers and buyers.

Bioeconomy Strategy 1: Nurture Innovation

Establish the NSJV as a leading region for circular bioeconomy R&D, strengthening regional innovation capacity while unlocking technologies and models that support the sustainable use of local resources.

Bioeconomy Strategy 2: Translate Innovation into Industry

Create an enabling environment for attracting, commercializing, and scaling sustainable bioindustrial manufacturing activities, including through supportive infrastructure, supply chain advancement, and resources that support local businesses by improving access to capital and innovation.

Bioeconomy Strategy 3: Build an Inclusive Bioeconomy Talent Pipeline

Develop an inclusive bioeconomy workforce ecosystem that raises awareness of high-quality jobs, inspires diverse STEM leaders, and creates equitable pathways to career opportunities, while empowering local talent and adapting to industry needs.

Bioeconomy Strategy 4: Grow a Community-Centered Sector Intermediary

Establish a sector-building intermediary that will serve as a "center of gravity" for regional bioeconomy activities to coordinate strategy delivery; facilitate collaboration across multiple sectors and regional institutions; inform public policy decisions; integrate local communities into bioeconomy sector development activities, policies, and decisions; and ensure that activities deliver direct economic and environmental benefits to local communities and advance community prosperity.



Cross-cutting Enabling Strategies (Chapter Six)

The competitiveness of the region's priority sectors – and the ultimate realization of a broadly-shared inclusive and sustainable economy – is shaped by cross-cutting enablers – such as innovation, talent, infrastructure, and governance. Chapter 6 includes specific strategies and actions seven cross-cutting topics identified during this THRIVE strategic planning process. Together, these seven issue areas will help North Valley THRIVE advance the region's socio-economic development:

Strategy Area 1: Regional Innovation Ecosystem

The NSJV aims to establish a robust regional innovation ecosystem that accelerates the translation of research into economic opportunities. This includes creating a Regional Research Consortium to serve as a hub for collaboration, exploring opportunities to build a Regional Innovation System Alliance, and developing a plan to enhance the regional technology translation ecosystem.

Strategy Area 2: Small Business/Entrepreneurship

This strategy focuses on strengthening the entrepreneurial ecosystem in the NSJV by leveraging anchor institutions for procurement, supporting entrepreneurs at every stage, and removing barriers to business growth. The goal is to make it easier for small businesses to form, expand, and thrive in the region, with a particular emphasis on disinvested communities and underrepresented populations.

Strategy Area 3: Catalytic Skills/Talent Development

To foster an inclusive and equitable workforce, this strategy aligns regional training and skills development with industry needs, particularly in disinvested communities. It emphasizes the creation of an inclusive skills pipeline for high-quality jobs, the development of key skills for priority sectors such as advanced manufacturing and clean energy, and the removal of barriers to career pathways. Sustainable earn-and-learn models, such as apprenticeships, are also prioritized to equip individuals with practical skills for high-demand jobs.

Strategy Area 4: Climate-Smart Infrastructure

Investments in climate-smart infrastructure are essential to strengthen the NSJV's resilience. This includes expanding nature-based solutions to prepare for climate impacts, promoting sustainable land practices, advancing innovation in water management, and increasing accessible parks and outdoor spaces. These initiatives aim to address climate risks, support sustainable environmental management, and create jobs.

Strategy Area 5: Placemaking and Amenities

Enhancing the region's quality of life through the development of culturally relevant amenities, events, and programs is a key focus. This strategy includes developing an Arts, Culture, and Creative Economy Plan, and a Regional Node/Corridor Plan to promote sustainable growth, connectivity, and economic vitality while enhancing the experience economy across the region.

Strategy Area 6: Generational Well-being

Providing care and support services across all ages, with a focus on health, behavioral health, and childcare/eldercare, is critical for the region's well-being. This strategy seeks to expand accessible childcare services, investigate eldercare needs, and facilitate culturally and linguistically appropriate healthcare in disinvested communities.

Strategy Area 7: Regional Coordination and Alignment

Improving the coordination and alignment of regional systems is essential for building the NSJV's inter-regional identity and leveraging its role as a gateway to diverse activities across Northern California. This strategy promotes better coordination in economic innovation, workforce development, and infrastructure, and seeks to strengthen ties with other regions within the Northern California Megaregion and beyond.

What Happens Next (Chapter Seven)

This plan has been the first stage of this journey. As we transition from planning to implementation, our progress and ability to get to work in the community quickly means every dollar will benefit the region, our neighbors, and the State faster and more efficiently. We hope you'll join the residents, businesses, and community organizations invested in this work as we shape the future of the region. Together, we will transform challenges into opportunities and emerge as a leader in economic resilience.



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Chapter 1:

Who We Are - Embracing Our Roots, Shaping Our Future

What makes a region a region?

Regions are formed around shared attributes or histories, and both reflect our experience and shape our identities. Regions can be defined by natural features (e.g. counties that touch the San Francisco Bay or include the Sierra Nevada mountains), political centers (e.g. the State Capitol), or economic profiles (e.g. agriculture the San Joaquin Valley or Inland Empire). Regions can be narrower to encompass a commute shed and shared housing market (e.g. San Diego) or to reflect a larger shared bioregion that includes many commute sheds (e.g. Redwood Coast or North State).

In launching CA Jobs First, the state boldly organized the world's fifth-largest economy into thirteen distinct regions, each working toward the north stars of job quality, climate, and equity.¹ The program and its implementation comes from a recognition that California's economic, cultural, and natural diversity suggests that the state will be better planned and organized at a regional scale, which is closer to people's lived reality.

Yet while all of California falls into one or more regions, not all regions are in the same place. For some regions, the CA Jobs First initiative has helped strengthen existing efforts and regional identities. Some of these regions have existed for generations around obvious urban-rural boundaries or were drawn along the lines of California's beautiful topography. For some those regions, a host of institutions already exist – from multi-county Metropolitan Planning Organizations to longstanding economic development organizations to community college districts to joint-power authorities – to activate the opportunities that come with being a region.

The North San Joaquin Valley is in a very different moment.

The North San Joaquin Valley -- though an old region -- is earlier in its journey towards forging both a distinct three county regional identity and in forming institutions to shape and guide the region's future direction.

The roots of North San Joaquin Valley reach back to the State's earliest days. San Joaquin County was founded in 1850 (one year after statehood), and Stanislaus and Merced Counties were founded in 1854 and 1855 respectively. Since their beginning, these counties have been oriented toward both shared and distinctly different economic centers of gravity. Originally, focused on the Gold Rush and subsequent economic boom along the State's rivers and in the city of San Francisco. This period saw a bustling downtown Stockton and new towns birthed along the Merced, Stanislaus, Tuolumne Rivers, and along the railroads that began to lay across the longitude of the state. As the Sacramento valley area developed, as the Bay Area's urban expanse flowed eastward and to the south, and as the town of Fresno grew as an agricultural hub, Merced, Stanislaus and San Joaquin counties fixed their sightline west, north, and south: outward. In many ways, the NSJV was a place locked in relationships to other places. In fact, the unspoken motto "two hours from everywhere" continues to reverberate.

Certainly, the ties that bind the three counties have aimed at 'regional-ness' before. Other economic initiatives, various collaborations among councils of governments, and a multitude of cross-county partnerships have all visited the idea of a coordinated North San Joaquin Valley. However, not until California Jobs First, with its Planning Phase funds and process and promise of stackable future investment, has the region been afforded the opportunity to look inward and plot out a plan for true regional economic identity. More important has been California Job First's irrevocable commitment to equity that not just engaged but centered communities that have too often been marginalized in such economic envisioning.

What might Snelling have in common with Stockton? What opportunity do the residents of Gustine and Greyson share? And how is the experience of an entrepreneur in Lodi similar to that of a small business owner in Los Banos?

The quantitative data, aggregated from countless sources, considered by dozens of experts and shared through a variety of community-facing events, told the story of our 21,750 businesses and 1.6M residents. It identified shared pain-points and economic through-lines and continues to do so. The qualitative data, sourced through more than 30 community co-hosted sessions, dozens of interviews, and door-to-door surveys capturing the thoughts of more than 800 individuals from Merced to Stockton and beyond, painted a picture of a string of communities tied to one another. A sense of our region began to take shape, and the connective tissue born from consistent engagement hardened.

From this new sense of place, the team revisited the external relationship that has so long defined its economy. The conversation moved from 'how are we a region?' to 'what does it mean to be part of this *mega*-region?' The orientation was a move away from an economic relationship in which the NSJV was dependent on and reactive to the Bay Area, but to one that recognized the NSJV's own center of gravity, one where the NSJV is an important economic partner to the world's premier innovation and technology hub. From simply a commuting partner to a dynamically catalytic one. This orientation places megaregional opportunities and challenges in clear view, identifies new partners and suggests new collaborations to solve shared problems. Housing capacity, the manufacturing of innovations, transit, clean energy development, and more.

California Jobs First has provided an opportunity to understand who the North San Joaquin Valley is as a region unto itself and where that region will go. It has supported a process that examines a framework for equitable transition – one that considers its economic history and new prosperity, its natural resources and climate future.

Retracing a history

Early on, the NSJV understood the need to reconcile the region's economic history in order to chart its economic future. A collaborative of three county-specific historical organizations, independent researchers and a community liaison has worked to unspool the complicated history of our region's industrial growth with a specific lens on the contributions made by successive generations of migrants and immigrants in the North San Joaquin Valley.

For thousands of years before the arrival of the Spanish, the region was the home to several tribes of Yokut and Miwok peoples, each with its own territory, language and name. These tribes lived harmoniously as hunter-gatherer peoples, expert in deer hunting, basket making, and acorn preparation. This population was decimated first by the arrival of the Spanish and then by waves of white, western settlers in the dawn of the Gold Rush. It was this cataclysmic event that launched the region's industry, along the delta and rivers that supported mining in the Sierras. Chinese immigrants supplied the labor for this economic boom, in mining operations and logistics and soon after the development of the railroad system. Subsequent waves of immigrants made the North Valley home – Japanese, Filipino, Turkish, Dutch, Portuguese and many, many others – settling in communities stretching from a bustling Stockton to farmland along the Merced River and specializing in different aspects of a dynamic regional economy.

The region was also a place of refuge for Black Americans in the aftermath of the Civil War and Jim Crow, the site of small 'utopias' where ex-slaves and their descendants established agricultural communities,

such as Cookseyville and Dos Palos in Merced County. And hundreds of thousands of Mexican immigrants before, through and after the Bracero program, have worked the fields and orchards that make up the region's economy and, across generations, have helped shape the identity of every town from Le Grand to Lodi. This tapestry of cultures was so rich, and the contributions of its people so successful, that the region was identified as a prime resettlement area for refugees, and in the last several decades has been the site of rich Hmong, Cambodian and Laotian neighborhoods. More recently, Afghan refugee communities have risen across the region. Other ethnic groups, from Punjabi to Assyrian, have also settled in the North Valley, advancing businesses and industries.

These communities' collective drive – to build on the promise of opportunity – has stood up the regional economy and seeded a cultural diversity unmatched anywhere in the world. This trajectory, however, is not free from the structural racism that has traced the economic development of the State and nation as a whole. Labor exploitation, environmental inequities, neighborhood segregation and other injustices have been a part of the economic story, and the North San Joaquin Valley is committed to a future that sees prosperity shared by all.

Land and Water

The NSJV, perhaps more than any other region in the State, is defined by its access to land and water. It is the union of these two that transformed arid grassland into one of the world's greatest agricultural hubs.

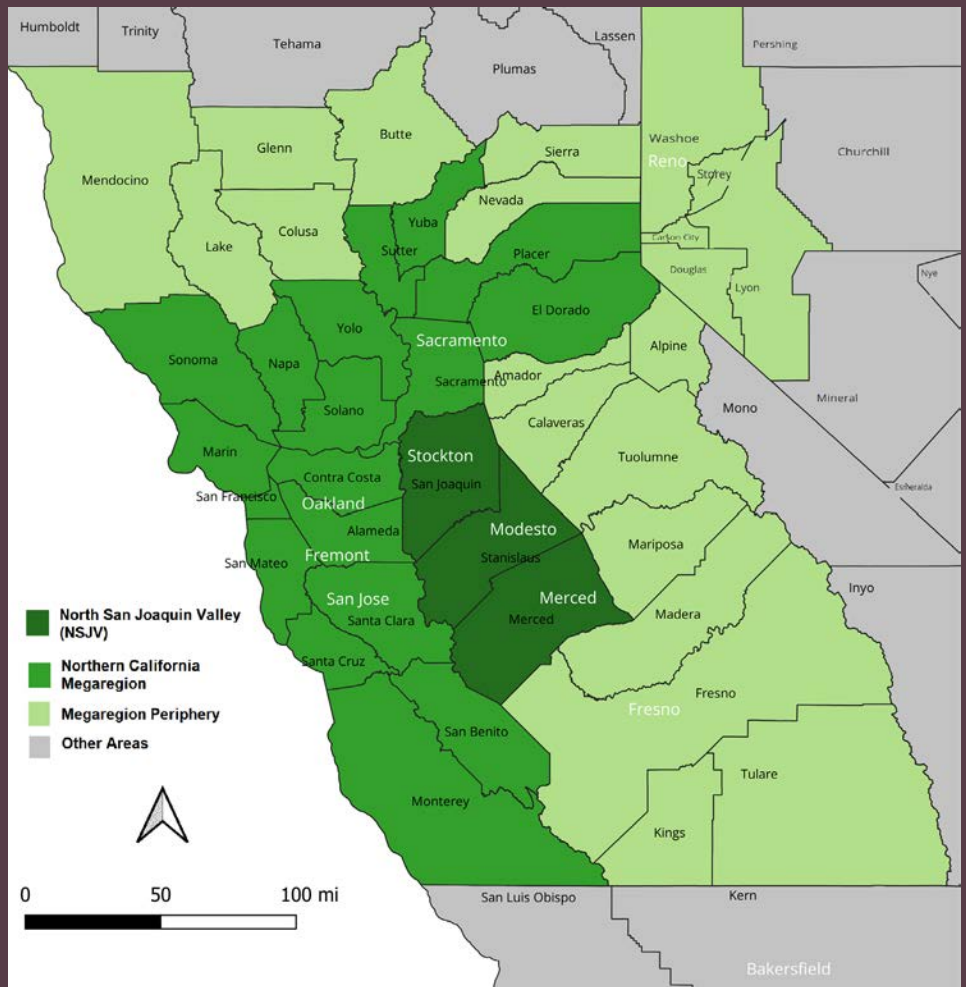
The development of intricate canal systems and reservoirs in the region, moving millions of gallons of water daily, has made California's economic growth possible. The NSJV is home to the Sacramento-San Joaquin Delta, a world-renowned ecosystem with vast climate benefits. It is the place of major rivers, and the cities that find themselves along these waterways are considering them anew. In fact, the place where two rivers meet – Dos Rios – is the State's newest State Park, and across the region, national and State wetland areas give life to millions of migrating birds – California's avian Serengeti. Water – once seemingly abundant and now under incredible pressure – continues to shape the future of the NSJV.

Increasingly, the NSJV's land is facing considerable transformation. Water policy and other factors are suggesting changing land uses and needs. Suburban growth continues to claim more open space, and emergent industry uses, from advanced manufacturing to clean energy, are placing new demands. The broad, open spaces that have attracted families from the Bay Area and beyond are now more vulnerable to development, and policy makers are confronted with a new set of considerations.

Much like the reconciliation of its economic history, use of land and water, innovations around each and their relationship to equitable economic growth, is another theme the NSJV has continued to explore in its Planning Phase. The NSJV's economy, historically shaped by globalization and shifting commodity prices, is undergoing significant transitions driven by automation, water scarcity, climate change, clean energy, and relocalization, all of which are reshaping traditional industries and creating new.

What is the North San Joaquin Valley?

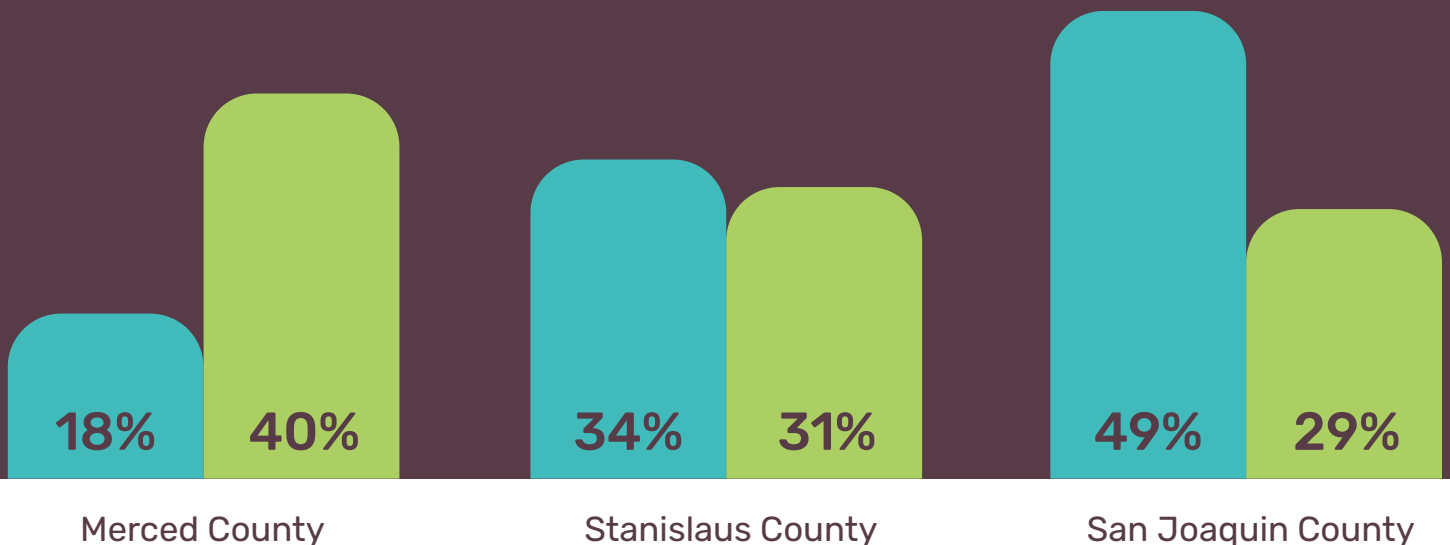
The North San Joaquin Valley (NSJV) region, encompassing San Joaquin, Stanislaus, and Merced counties, is a key part of California's heartland. Economically and geographically linked to the Northern California Megaregion, this diverse area of 4,919 square miles includes urban centers, farmland, vineyards, the Sacramento-San Joaquin Delta, and growing suburbs. It is home to a culturally rich population of over 1.6 million people, three major universities, and leading logistics and manufacturing companies.



NSJV Population & Area %

Resident Population = 1,644,315

Area = 4,919 sq. miles



Building a Regional Voice

The opportunity presented by California Jobs First has been an awesome one, in scope and in depth. It has, in many ways, been eighteen months of long-overdue conversations with residents and researchers and every stakeholder in between. These discussions have occurred in every imaginable format: in community centers; in downtown co-working spaces; in county fairgrounds; in employers' conference rooms; in the office of County CEOs; and in countless virtual meetings that often included more than 150 participants. What has emerged from this experience, slowly and steadily, is a true regional voice.

North Valley THRIVE (The High-Road for an Inclusive Vibrant Economy) is the name given to that voice, the local structure that drives the NSJV's California Jobs First initiative. North Valley THRIVE's architecture is no accident. Its three-person leadership team is comprised of a workforce board director as convener, a community leader as administrative and engagement lead, and the region's foremost economic researcher as head of the newly formed regional research collaborative. Its Steering Committee is a careful assembly of 28 community, industry, workforce, labor and innovation leaders. Its coalition is as broad as the valley floor, rich in language, age, and vantage point. An organization where none existed, it has managed to deftly thread together a multitude of perspectives on deeply complex issues and opportunities. The following Strategic Plan describes this process which has included community, labor, and industry liaisons, leadership circles of government, institutional research, and philanthropy. As much as this Strategic Plan is tactical roadmap for inclusive economic development in one of the state's most pivotal regions, it is a testament to regional confluence – of making one river of progress from a myriad of tributaries.





Chapter 2:

Where We are Going

The North San Joaquin Valley is in the middle of a shift towards a new regional economy. Through this effort we are developing the skills and institutions that will enable the region to proactively shape our future in a way that is aligned with our unique goals and values. We know we must shift from extractive to regenerative practices, from speculative to collective approaches, and from the low road to the high road.

The vision and objectives outlined below, developed by the North Valley THRIVE Steering Committee, define our strategy for shaping the future of the region.



Our Vision

The North San Joaquin Valley is a region with equitable access to high-quality jobs, where natural resources are protected and negative environmental impact is addressed, where local industries actively compete in the global economy and sustain high-road jobs, and where the quality of life is centered on the prosperity of vulnerable and historically disinvested communities.



Theory of Change

Sectors & Strategies

- Carbon Management
- Clean Energy
- Advanced Manufacturing
- BioEconomy
- Regional Innovation Ecosystem
- Small Business/Entrepreneurship
- Catalytic Skills/Talent Development
- Climate-Smart Infrastructure
- Placemaking/Amenities
- Generational Well-Being
- Regional Coordination and Alignment

Outcomes

Regional Collaboration:

The North San Joaquin Valley region works together.

Job Quality:

The region prioritizes and incentivizes investments in projects that promote the creation of quality jobs in the region that pay a living wage, provide opportunities for promotion, guarantee safe working conditions, and offer other benefits.

Climate:

The region gives special focus to the preservation, restoration and enhancement of its environmental assets while actively prioritizing the development of innovative solutions that create a healthier environment for all.

Equity

Economic development projects in the region create an environment where all individuals, regardless of their socio-economic background, race, gender, or other characteristics, can participate fully in and benefit from economic growth.

Vision

The North San Joaquin Valley is a region with equitable access to high-quality jobs, where natural resources are protected and negative environmental impact is addressed, where local industries actively compete in the global economy and sustain high-road jobs, and where the quality of life is centered on the prosperity of vulnerable and historically disinvested communities.

Values and Guiding Principles

Community and People Centered | Transparency & Accountability | Feasibility
Environmental Sustainability & Stewardship | Impact | Systemic Change | Equity

Core Values

To ensure there is congruence between the NSJV residents' aspirations and the economic development plays presented in this plan, a group of over 60 organizations representing diverse constituencies crafted the following guiding principles. This set of values guides the work of North Valley THRIVE and affirms the expectation of how our region will care for the environment, measure success, and treat its residents. These values are also integrated into the framework our region will use to make funding decisions:

Community and People Centered

Prioritize understanding the community's needs, histories, and strengths to create meaningful, culturally relevant solutions.

Transparency & Accountability

To foster accountability and trust, decisions and processes are open and accessible to the community.

Feasibility

Considers available resources, energy, and partners to make things happen in a timely manner.

Environmental Sustainability & Stewardship

Focuses on the preservation, restoration and enhancement of our environmental assets while actively prioritizing the development of innovative solutions that create a healthier environment for all.

Impact

Considers the balance of social, economic, and environmental benefits to ensure solutions create long-lasting positive impacts.

Systemic Change

Transforms underlying social and economic systems to address root causes of inequities to create long term benefits and promote generational wellbeing.

Equity

Creating solutions that break down barriers to access and opportunity for the most marginalized and disinvested communities.

The Process

To meet the opportunity of California Jobs First, the North San Joaquin Valley region quickly stood up a coalition of more than 200 partner organizations and more than 600 unique contacts – and growing. This new coalition of grassroots, government, workforce, philanthropy, labor, business, and educational organizations has formed as “North Valley THRIVE” (The High Road for an Inclusive, Vibrant Economy).

Before California Jobs First, the NSJV region didn’t have a regional identity and most organizations who are part of this growing coalition hadn’t had many opportunities to work together. The North Valley THRIVE leadership has strived to create transparency and ensure coalition members have ample opportunities to participate in any decisions made, and to create and solidify trusting relationships among its coalition members.

Engagement

North Valley THRIVE has been very intentional about establishing relationships with diverse stakeholder groups and leaders including government entities, economic developers, non-profit leaders, resident groups, coalitions and consortia, environmental justice advocates, workforce boards, labor representatives and others. This work was completed in person and virtually to ensure the needs of all parties are met and that community is being built through connections.

The democratically elected County Coordinators worked within their respective communities to connect with neighborhoods and populations that have traditionally faced disinvestment, marginalization, and negative economic outcomes. Through an RFQ process the coordinators identified partner organizations with a background in racial equity and knowledge of the unique challenges that face communities. The coordinators worked with community and faith-based organizations, schools, neighborhood groups, coalitions, youth programs, system involved, minority entrepreneurs, and more to help inform residents about California Jobs First and invite them to participate by sharing their priorities, barriers faced, life experiences, and values in Community Conversation meetings. To eliminate barriers to participation, these Community Conversations were conducted at different times of the day that were convenient to participants. Food, childcare, and participation stipends of \$50 were provided. Facilitation and outreach materials were provided in a culturally relevant manner which included the following languages: English, Spanish, Persian, Vietnamese, Hmong, and Punjabi.

Through this process North Valley THRIVE hosted 38 community conversations and received input from over 760 participants. Targeted populations included: AAPI Community, Artists/Culture Bearers, BIPOC Youth, Black/African American Community, Boomerang Young People, Caregivers, Commuters, Environmental Justice Orgs, Families with Young Children, Foster Youth, Individuals with Disabilities, Latinx Community, Labor/Union/Service Workers, Minority Entrepreneurs, Rural Communities, Seniors/Elders, Sikh Community, Systems Involved Residents, Undocumented/Immigrants/Farmworkers, LGBTQ+, as well as residents of high poverty neighborhoods.

The qualitative information gathered during these Community Conversations was embedded into the project development and prioritization process of this initiative.

In addition to NVT community engagement, the regional convener – North Valley THRIVE also leads the following advisory groups:

- **Government:** There were different government working groups including: County CEOs, Workforce Boards, and Council of Governments. The NSJV regional convener has also engaged with State and Federal government entities.
- **Philanthropy:** Composed by the San Joaquin Community Foundation, Stanislaus Community Foundation, and Central Valley Community Foundation.
- **Talent Development:** In addition to having our region's research team formed by University of the Pacific, Stanislaus State University, and UC Merced, NVT is coordinating with parallel efforts such as the K-16 Collaborative.

Types of Engagement

North Valley THRIVE consistently conducts in-person meetings with community groups, large coalition meetings, data walks and webinars, as well as online coalition meetings.

Transparent and accessible decision-making processes

North Valley THRIVE maintains nearly 700 contacts, with around 115 members actively participating in meetings and events. To select its Steering Committee, a 43-member Governance Committee, representing community organizations, county entities, and small businesses from all three regions, was formed to design the 29-seat Steering Committee. After six weeks of sessions and voting, the committee finalized the seats, opened the floor for public comment, and assembled a selection team. This team, comprising representatives from each county, developed interview questions, grading criteria, and a timeline, eventually receiving 90 applications for the available seats. Representation in the Steering Committee consists of 41% Residents and Community Organizations, 10% Climate Organizations, 3% California Native Tribe, 10% Education, 10% Business and Industry, 3% Philanthropy, and 3% Economic Development. To ensure accessibility and transparency, agendas are posted in advance on the North Valley THRIVE website and Steering Committee meetings are open to the public.

Learning Together: THRIVE School

Recognizing a historical opportunity for our region to learn from one another, the North Valley THRIVE team contracted with Groundworks Consulting to codesign THRIVE School an eight-session course aiming to better equip the Steering Committee to vote on the selection of the projects our region will uplift on its California Jobs First proposal. THRIVE School participants understood the impact of history of race, class, and gender within the context of economic development in the North San Joaquin Valley. They learned concepts and tools of traditional and inclusive models of economic development and developed shared vocabulary around good governance and inclusive decision-making.

Work Groups

To ensure that our community's priorities are front and center in our region's strategic plan 65, local organizations from across the area selected via an RFP process stepped up to help North Valley THRIVE refine its strategies. These work groups developed a deep understanding of our data and community sentiments and examined different areas of our economy through the lens of climate, job quality, land use, and equity in a way that produced a shared value set. This value set of guiding principles will help the Steering Committee develop criteria for the selection of future investments.

Information Loops

In addition to the coalition meetings, newsletters, and social media. North Valley THRIVE hosted a series Open Houses at community-based organizations across the tri-county region to report back to communities how their input is reflected on the region's strategic plan, learn how North Valley THRIVE partners expand equity and access, connect with other leaders and community members, and provide additional opportunities to envision ideas that shape the future of our region.

Data and Research

From the outset, North Valley THRIVE prioritized taking control of the NSJV narrative and empowering the region to define its direction. This goal was clearly reflected in the region's early efforts in data collection and analysis. These efforts were formalized through the establishment of a Regional Research Collaborative, made up of the three largest universities in the NSJV. This collaborative led the data and analysis efforts for the Baseline Regional Assessment, following a process that was both regionally based and community informed.

The in-depth research that informs this Strategic Plan builds on the foundations established during the Baseline Regional Assessment. In developing the plan, North Valley THRIVE continued to collaborate with regional and Megaregional partners while also incorporating insights from additional regional, state, and national experts. This approach ensures that the analyses and recommendations are of the highest quality and tailored to the region's specific needs. Beyond the work conducted by the Research Collaborative, North Valley THRIVE consulted with subject matter experts, economic development professionals, and government officials to validate and confirm the business and community-driven strategy selection process.

Selecting Priority Sectors and Cross-cutting Strategies

To build an equitable, resilient, and sustainable regional economy in the North San Joaquin Valley, it is essential to focus on the development of strong and growing industry sectors and cross cutting strategies that strengthen core parts of the enabling infrastructure for the region.

The approach taken is an attempt to realize the vision for an economy that cares for our land, cares for our people, and leverages our strengths as a place to make and ship products.

Caring for the Land: We want to care for our land in a regenerative way that respects the value of our agricultural products while ensuring healthy soils and using environmentally sustainable solutions to protect ecosystems and communities. This means we will strive towards a high degree of environmental stewardship and sustainability and pursue industry opportunities in climate friendly industries while promoting investment in projects that use nature-based solutions. Key strategy areas that elevate this goal:

- **Priority Sectors:** Carbon Management, Clean Energy, and the Circular Bioeconomy align with global trends towards sustainability and carbon neutrality, enabling the region to contribute to and benefit from the transition to a greener economy.
- **Crosscutting:** Nature Based Solutions, and Placemaking / Amenities focus on strategic investments to enhance the region's climate resilience, address longstanding challenges, and ensure inclusive access for all residents and visitors.

Caring for People: We will strive to prioritize and expand care and support services across all age groups, with a strong focus on health, behavioral health, and child/elder care, to enhance the physical and emotional well-being of NSJV residents while creating equitable career pathways in these vital sectors.

- Priority Sectors: Selection of these sectors has been focused on growing opportunity employment to enable households to be self-sufficient and prosper.
- Crosscutting: Generational Wellbeing, Small Business/Entrepreneurship, and Placemaking/Amenities all play crucial roles in empowering the region to care for its residents and ensuring they have access to care and social enrichment opportunities.

Making and Shipping: Leverage the region's historic strengths in manufacturing and shipping to create high-road economic opportunities by developing sustainable, advanced manufacturing that integrates modern technology with traditional processes. Focus on producing higher-value products by enhancing design, productivity, and reducing environmental impacts, while ensuring equitable skill-building opportunities for residents during this transition.

- Priority Sectors: Advanced Manufacturing, Clean Energy, and Circular Bioeconomy build on the region's established competitive advantages while leveraging quality growth opportunities.
- Crosscutting: Catalytic Skills/Talent, Regional Innovation System, and Small Business/Entrepreneurship aim to support and develop high-road economic opportunities in the region while leveraging its strategic location to benefit residents and others across the Megaregion and beyond.

By investing in these areas, the NSJV can create high-quality jobs, attract new businesses, and ensure that the region remains competitive in a rapidly changing economic landscape.

Our call to action

Looking ahead, unless we come together to achieve this climate-focused, inclusive vision, we risk having our future dictated by the needs of adjacent regions. The strategies identified in this plan are meant to be a starting point on a path forward for an emerging economic powerhouse in the center of California. We strive to be a region that cares for our land in a regenerative way, inclusively cares for our people, and produces climate-friendly products that are shipped globally.



Chapter 3:

Where We Are Today



Balancing Acts: Navigating Socio-Economic Opportunities Amidst Regional Challenges

Throughout development of the Baseline Regional Assessment and the Regional Plan, a series of interrelated opportunities and challenges have been seen to shape the growth dynamics of the North San Joaquin Valley (NSJV). These issues, characterized by their ‘duality,’ play a central role in guiding the strategies that aim to achieve the Plan’s vision for the region’s future. Although these dynamics are complex and continually evolving, key elements of our current understanding of them are summarized below to provide a regional overview. Recognizing that effective regional strategies must both seize opportunities and address associated challenges, this discussion of the region’s strengths, weaknesses, opportunities and threats (SWOT) sets the stage for the strategies outlined in the Priority Sectors (Chapter Four) and Cross-cutting Enabling Strategies (Chapter Five). By taking a balanced approach, we aspire to foster more sustainable and equitable development, ensuring that the benefits of growth are broadly shared across the region.

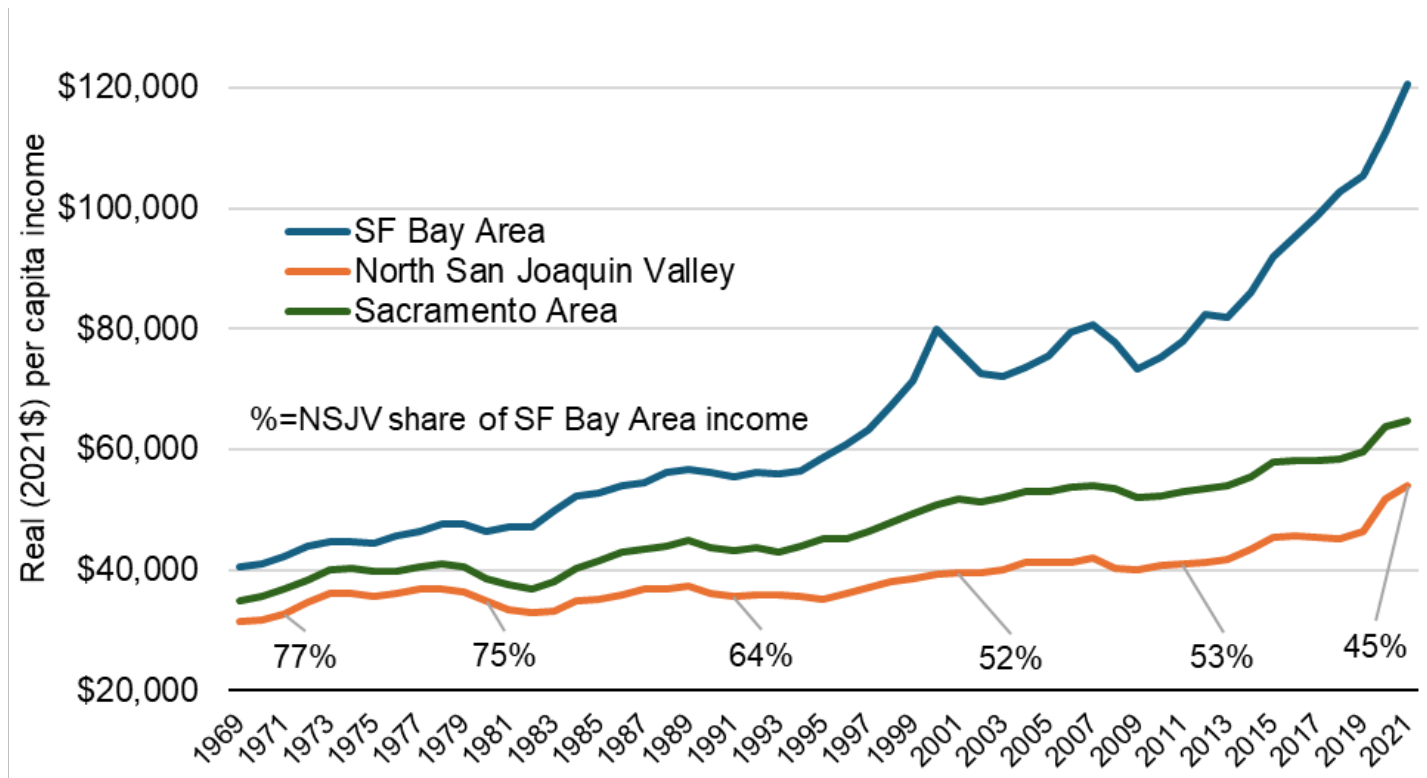
The NSJV’s geographical proximity to the Bay Area and the Sacramento region places it strategically at the center of the Northern California Megaregion, offering significant opportunities for economic growth through its transportation and logistics advantages:

- The region is connected to adjacent regions by major highways and railroads, including Interstate 580 into the San Francisco Bay Area as well as Interstate 5 and State Route 99, which link the region to Sacramento, the rest of the Central Valley, and Southern California.
- These transportation assets ensure smooth movement of goods across the state and beyond, making the region an attractive location for companies in manufacturing and logistics, where reliability and speed to market is critical.
- The locational advantages of the region present a key opportunity to drive investment, job creation, and overall economic growth by leveraging the region’s strengths in transportation, logistics, and advanced manufacturing.

However, while the region is increasingly integrated with other parts of the Megaregion, its benefits from these connections are tempered:

- While connections grow, the NSJV is falling behind the more successful parts of the Megaregion. In 1971, residents in the NSJV made 77% of the Bay Area’s per capita income. In 2021, that number had fallen to 45%.
- NSJV has not received investment in high quality jobs and industries and instead has received impacts from the Bay Area’s housing crisis and need for warehouses to support explosion of online shopping.

Figure 1 Real (2021\$) Per Capita Personal Income in the Northern California Megaregion



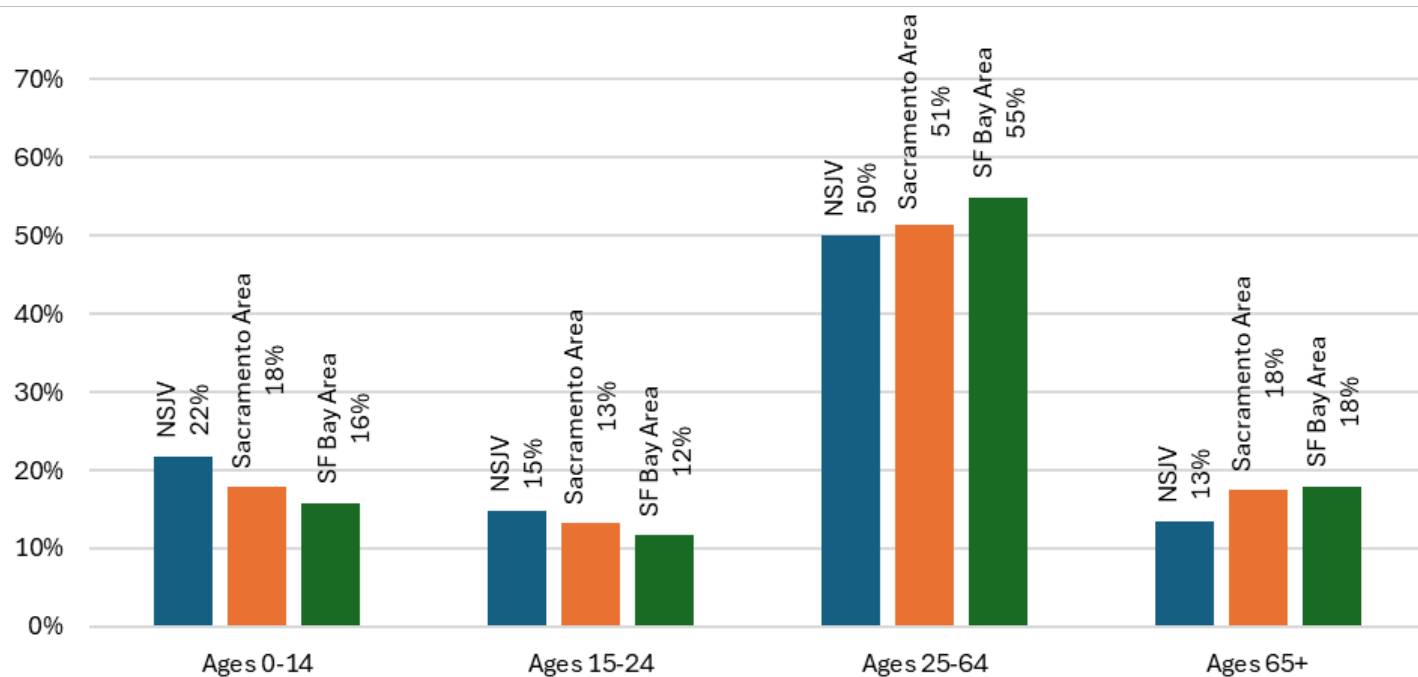
While the region is coming together with an emerging regional identity and collaboration across a growing set of portfolios, there are still many gaps in regional institutions and systems for a region of this size:

- There are county-level economic development groups, some of whom have led economic development initiatives. But currently there is no a regional economic development body or planning entity (other than North Valley THRIVE) working exclusively at the three-county level.
- There are county-level workforce development boards. And while all three WIB directors coordinate with each other, there is no single regional workforce coordinating entity.
- The region's Councils of Government and counties regularly meet and coordinate, but there is no regional planning unit working at the three-county scale.
- Data collaboration across the region has begun. But there are still many gaps in regional data which limits analyses and the realization of larger-scale efficiencies. There is also no ongoing process or organization funded to track the region's social and economic performance at the scale of the three-county region.

The NSJV is a young region, but our population growth is slowing down:

- The median age of the NSJV is 33 years, compared with 37 years for the state and 40 years for the adjacent San Francisco Bay Area.

Figure 2 Population Shares by Age Cohort in the Northern California Megaregion



- In the next decade and beyond, population growth is expected to slow due to declines in both fertility rates across all age categories in the NSJV as well as reduced international migration.

Table 1 NSJV 10-year Population Growth Rates

Decade	Population Growth Rate
1970s	24%
1980s	33%
1990s	15%
2000s	16%
2010s	9%

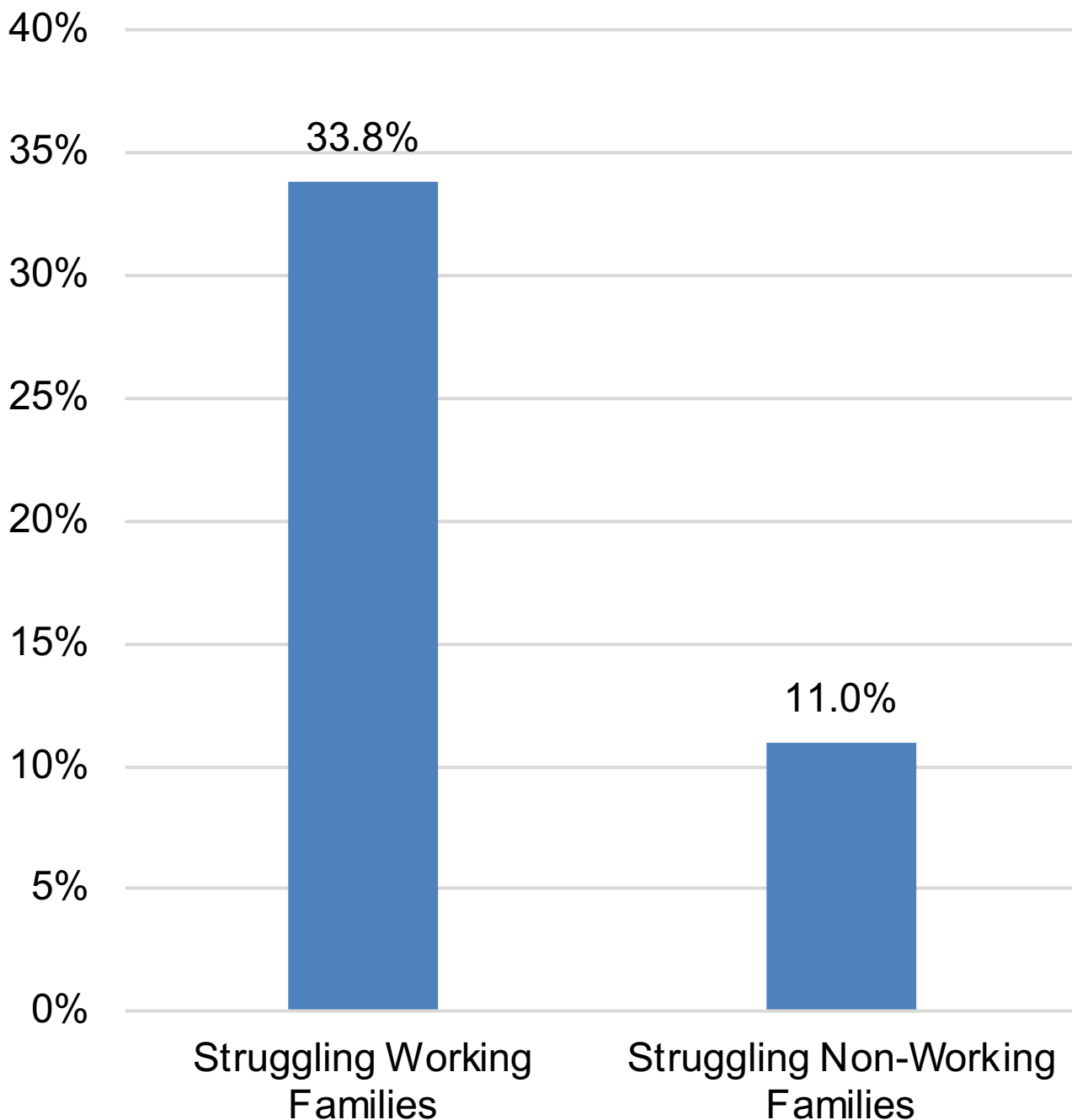
- Fertility rates for Hispanic or Latino women have decreased more sharply (-27.3%) compared to White non-Hispanic women (-3.5%), closing the gap between the two groups.
- Fertility rates are declining more rapidly among women below the poverty line and those receiving public assistance yet remain relatively high in comparison to the overall fertility rate.²
- A significant proportion of children in the NSJV are born into poverty, which could exacerbate child poverty if not addressed.
- Addressing disparities and supporting families, particularly BIPOC single mothers and children, is critical to breaking the cycle of poverty and promoting a more equitable, resilient, and sustainable future for the region.
- Looking ahead, declining fertility and immigration, high childhood poverty, and longer life

expectancy may lead to future resource challenges for local governments due to a smaller workforce that produces lower tax revenues yet with increasing demands due to an aging society.³

While we've added jobs faster than any region in the state, many of these jobs are low wage:

- Since 2019 the region has added 31,500 jobs, resulting in a 2019-2023 growth rate of 5.9%.
- However, of the 2023 jobs, 72% pay less than \$32.80, which is below the wage standard for a high-quality job that supports a family.
- As a result, at least 44% of North San Joaquin Valley (NSJV) residents live in families whose incomes do not cover basic living expenses.

Figure 3 Percentage of NSJV Population in Families that Struggle to Make Ends Meet



- Among these, 33% of residents are in families with at least one working adult, struggling to make ends meet despite being employed.
- More than half of the region's children (over 51%) live in working families that cannot afford basic needs.
- An additional 9% of children live in families without a working adult, resulting in 60% of NSJV children growing up in families with insufficient incomes.⁴
- Low-wage jobs pose a significant threat to the long-term well-being of workers and families in the region.

Despite recent growth, workers and employers face several significant structural vulnerabilities:

- Employers in the region tend to have a relatively low-skilled workforce. The NSJV has the lowest proportion of jobs requiring a bachelor's degree for an entry level position out of the 13 California Jobs First Regions across the State.
- Residents in the NSJV have some of the lowest levels of educational attainment, with less than 1 in 5 residents (18.5%) having obtained a bachelor's degree or higher qualification, compared to nearly 2 in 5 (37%) across the rest of the state.⁵
- While the region has seen employment growth of 7% between 2018 and 2023 with some 39,260 additional jobs. Most of this growth, 54%, has occurred in a single industry – transportation and warehousing – exposing the region to potential economic risks to the extent that there are major shifts in the industry (i.e. automation which eliminates jobs or shifts in locational advantages which shifts jobs). The high concentration and overreliance on single industries for job growth can result in instability and can lead to broader socioeconomic disparities.

While the NSJV benefits from a strong agricultural sector and growing manufacturing, transportation, and warehousing industries that provide numerous jobs, these sectors also pose risks of increased pollution and negative health outcomes:

- The region's strong agricultural, manufacturing, and transportation sectors may contribute to worsening air, land, and water pollution.
 - For example, of criteria pollutants (particulate matter, ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide and lead) its estimated that agriculture contributes 32%, transportation and warehousing 31%, and manufacturing 6%.⁶
- These economic trends are likely linked to many of the region's negative health outcomes.

While net migration into the region from other parts of California offsets outflows to other states, recent trends show this balance is slowing down.

- More people are moving to the NSJV from other parts of California than leaving for other states.
- The lower cost of living compared to the Bay Area attracts people from within California.
- However, the higher cost of living in the NSJV compared to other states is causing some people to move out of California.

- For most of the 2010s, more people moved into the NSJV than left, but recently, fewer people are moving in, and more are moving out.

Migration has long shaped the region.

- The NSJV has long been a region whose identity and growth have been shaped by the diversity of its residents, most of whom came from other regions (both within California and internationally)
- While current migrants from higher-cost areas in California bring resources and higher levels of education, they also contribute to rising housing costs.⁶

Commuting patterns indicate regional benefits but may present costs & risks to region too.

- The number of inter-regional commuters with the San Francisco Bay Area was estimated to be nearly 100,000 in 2019 before the COVID-19 pandemic. However, since the pandemic remote- and hybrid-work appears to have slowed tempered the number of these commuters.⁷
- This is reflected by an increase in outflows of earnings from within the NSJV region, highlighting the economic interdependence between these counties as workers move across county lines for employment.
- The overall growth in inflows, however, offsets the outflow increases, showing that the NSJV counties are still benefiting from more earnings coming in than going out.
- The rise of remote and hybrid work options may also increase the attractiveness of the NSJV to residents from more expensive surrounding communities like the Bay Area.
- However, these commuting patterns may present challenges to the NSJV region as well including higher housing costs and pressure for additional transportation infrastructure.

The North San Joaquin Valley (NSJV) faces a critical need for housing infrastructure due to high demand.

- A portion of the housing demand in the region is from workers in the Bay Area who drive east for more affordable homes. This not only leads to higher housing costs in the NSJV (driven up by limited housing supply and the ability to pay more due to higher wages from Bay Area workers). This then has a ripple impact on the NSJV as people move further from employment.
- The net result is an increase in both housing and transportation costs (referred to as H+T).
- While housing challenges are widespread across California and the United States, they are particularly severe in the NSJV and only intensified by proximity to wealthier areas like the San Francisco Bay Area.
- While housing costs and prices in the NSJV are significantly less than in wealthier nearby regions then the San Francisco Bay Area, they are also less affordable for NSJV residents because the wages in the NSJV region are lower.

As transportation costs take up a large share of household budgets, they have significant implications for the affordability of other essentials like housing, food, and healthcare.

- This financial strain can make it difficult for families to maintain a reasonable standard of living, particularly in areas where housing costs are already high.
- The need for affordable and reliable transportation directly impacts residents' ability to access job

opportunities and essential services.

Addressing housing and transportation affordability have critical implications on the overall economic stability of the region.

The majority of the NSJV's population experience compound vulnerability due to low income, disinvestment, and environmental vulnerabilities,

- Decades of disinvestment have left many NSJV residents with fewer and more limited resources to adapt to climate change.
- Disinvested communities are more likely to experience both job losses and economic hardship.

Regional climate and environmental vulnerabilities threaten the existing infrastructure, significant portions of which are old and outdated.

Infrastructure vulnerabilities include:

- outdated and vulnerable levee systems,
- degraded floodplains and riverways in need of restoration,
- roads, rails and regional infrastructure highly vulnerable to damage from extreme heat and land subsidence, and
- regional energy grids, power infrastructure, and water systems.

However, the NSJV region possesses key opportunities and resources that can be leveraged for investment and environmental hazard mitigation. Such unique regional resources include:

- The region's natural floodplains present a strategic opportunity to implement nature-based solutions that protect communities and infrastructure from flooding.
- The vast agricultural landscape offers a unique opportunity to pursue land repurposing, enabling the transition of fallowed or retired agricultural land into alternative and economically viable uses.
- The region's agricultural heritage provides an opportunity to invest in regenerative agriculture, agroecology, and less water intensive crops to sustain to the agricultural economy
- The region's unique water systems provide opportunities for innovation in water management, including the development of managed aquifer recharge, wetland restoration and forecast-informed reservoir operations, which can enhance water reliability for both agriculture and communities, increasing overall water security.
- The region's vast natural and urban landscapes offer opportunities to expand and enhance parks and open space.

Despite several promising initiatives aimed at addressing health disparities in the NSJV, the region continues to face some of the highest levels of health inequities in the state:

- High levels of air and water pollution, combined with socioeconomic challenges like poverty, housing cost burdens, and violent crime, contribute to lower life expectancy.
- Additional factors such as low park access, educational attainment, income, employment, home ownership, and school funding further worsen health outcomes.
- As a result, residents experience disproportionately high rates of conditions such as asthma, diabetes, and Valley fever.

While the NSJV has a relatively young population, it also has a growing elderly population, similar to trends across California and the United States:

- The NSJV's population 65 and over is projected to increase 48% by 2040, which is similar to the 47% increase expected across the rest of California. This will increase the region's population 65 and over by 105,000 or 18% of the total population.
- The aging population in the NSJV requires access to quality care to improve their quality of life and support those caring for them.
- Approximately 50 census tracts across all three counties, particularly in large rural areas, lack eldercare facilities.

While the NSJV benefits from one of the most diverse populations in the United States, it faces challenges in providing culturally and linguistically accessible resources to improve health outcomes:

- The region lacks culturally and linguistically proximate access to health resources, despite its diverse population.
- Communication inequalities due to language diversity and limited English proficiency contribute to disparities in information access and utilization.
- These disparities negatively impact health and wellbeing among social groups in the NSJV.

Despite the challenges, the NSJV has many key strengths and assets to build upon.

The growing university ecosystem in the NSJV will play a crucial role in translating knowledge into local opportunities, fostering long-term growth, and enhancing regional resilience:

- Leveraging the strengths of the region's higher education institutions presents a key opportunity.
- Fostering collaboration among universities and knowledge centers can create a synergistic effect, driving the development of the regional innovation ecosystem.
- Collaborating with leading technology companies, startups, and research institutions across the Northern California Megaregion and beyond will further enhance access to resources and industry-relevant skills.

Rail investments, both freight and passenger, offer significant opportunities to connect the NSJV with other regions and reduce travel time.

- Investments in the Stockton Diamond Grade Separation Project will strengthen the region's freight railroad and increase reliability for passenger rail.⁸
- Downtown Merced is the northern Terminus of Phase I of the State's High Speed Rail System. Related investments to increase rail service through ACE and the Amtrak San Joaquins will further strengthen opportunities for rail travel within and beyond the region.

Investing in climate-smart infrastructure can build resilience, improve public health and wellbeing, create high quality jobs, and reduce long-term costs.

Developing the region's circular bioeconomy holds significant potential for creating new jobs and promoting regional sustainability:

- The NSJV's fertile land and agricultural productivity make it ideal for developing a circular bioeconomy focused on producing renewable biological resources.
- New industries and job opportunities could emerge, particularly in biotechnology and sustainable manufacturing.
- Encouraging partnerships between academic institutions, private companies, and government agencies would drive innovation in sustainable practices.
- The region could position itself as a leader in green industry and sustainable agriculture.
- Through prioritization of efforts that ensure that the local skill system empowers residents to engage in these jobs, the circular bioeconomy could provide significant quality job opportunities while also preventing local displacement.

Advanced Manufacturing, Clean Energy, and Carbon Management offer unique opportunities for the region:

- The NSJV's strong manufacturing base, particularly in building materials, electronic components, and agricultural machinery, presents an opportunity to develop a robust advanced manufacturing cluster. By focusing on high-value-added products and leveraging the region's proximity to the Bay Area, the NSJV can attract new industries, create high-paying jobs, and drive economic growth.
- The region's potential to become a hub for clean energy technologies, such as green hydrogen and biofuels, offers a substantial opportunity for job creation and environmental sustainability. By expanding clean energy infrastructure and production capabilities, the NSJV can meet growing demand for renewable energy, support the state's decarbonization goals, and reduce local pollution.
- The NSJV's unique geological conditions make it an ideal location for carbon capture and storage projects. This sector provides an opportunity to establish the region as a leader in carbon management, creating quality jobs and attracting investment. The development of carbon management infrastructure can position the NSJV at the forefront of this emerging industry, contributing to both economic and environmental resilience.
- Designed in alignment with NV THRIVE's guiding principles and in partnership with community, the development of these industries can position the NSJV at the forefront of this emerging opportunities, contributing to both economic and environmental resilience.



Chapter 4:

How We Will Get There: Priority Sectors

Framing the Priority Sectors

How economies work

What are local versus traded sectors

All economies are made up of a mix of local or population-serving sectors and traded sectors.

Local, or population serving sectors, are those where the primary customers or sources of income are local. This includes major areas like health, education, retail, and local government. In general, these sectors grow as the overall economy grows.

When considering how and where to bring in net new wealth or income into a community, it is generally considered important to grow what are referred to as traded sectors. These are sectors where the customers of the goods and services are beyond the region.

How economies work and the role of local inputs – referred to here as “cross cutting enablers”

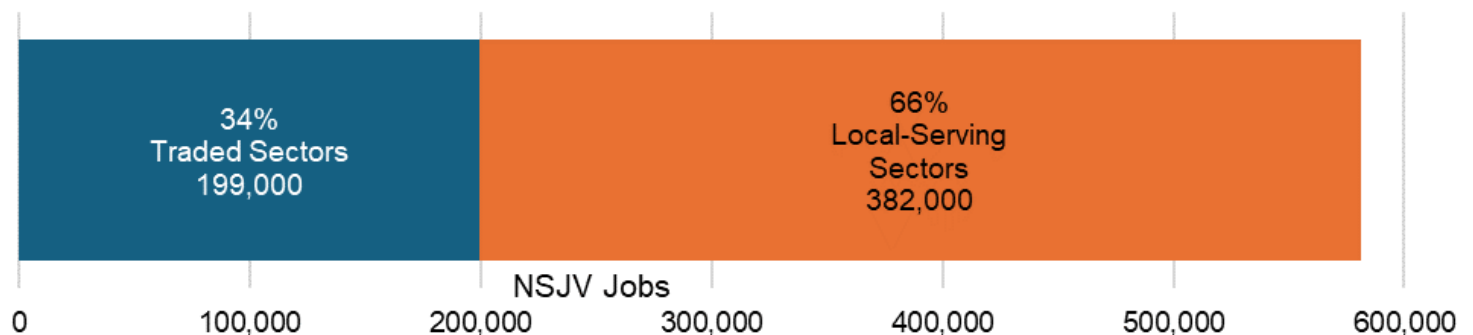
The strength of the sectors in an economy in turn are supported by the strength of the inputs that are derived locally and regionally, what we refer to as “cross cutting enablers.” These include workforce and skills, generational care infrastructure, the physical and climate infrastructure, the innovation ecosystem, the quality of place, and the systems of coordination. Those enablers and the strategies to strengthen them are described in a subsequent chapter.

What does the North San Joaquin Valley do for a living?

When analyzing the region’s economy as a whole, we grouped the region into three main sources of employment: existing local serving sectors, historic traded sectors, and emerging and high priority traded sectors.

On the locally serving side, the region’s 382,000 jobs make up nearly two-thirds of all employment, with most of these jobs concentrated in local government and public services, healthcare services, and retail.

Figure 4 Existing NSJV Job Structure



On the existing traded sector side, the region’s economy revolves around three main sectors: agriculture, food processing, and warehousing and logistics. Together, these three sectors alone account for about 1 in 4 jobs regionwide (or over 136,000 total jobs out of 581,000 total jobs, which does not include self-employed).

The region is a national center for agriculture production, and in 2022 grossed nearly \$11.5 billion in value from agricultural goods. These agricultural products go on to feed millions of Americans, though NSJV farm workers rarely reap any significant economic return for their foundational role in feeding the broader state and nation.

The region also serves as a logistics hub for the Northern California megaregion as it sits at the confluence of major interstate highways and rail lines with tens of millions of square feet of warehouses on industrial land just east of the San Francisco Bay Area. This logistics activity often provides lower-paying jobs, and heavy trucks generate air pollution that stays in the region longer due to its unique geography.

Table 2 Key Traded Sectors in the NSJV

NAICS	Description	2023 Jobs	2023 Location Quotient	Avg Earnings per Job
Agriculture				
115	Support Activities for Agriculture	20,409	10.6	\$55,303
111	Crop Production	13,787	6.5	\$64,465
112	Animal Production and Aquaculture	6,794	6.1	\$72,010
		40,990		
Food Processing				
312	Beverage Manufacturing	6,939	5.7	\$106,470
311	Food Manufacturing	24,206	3.9	\$78,484
		31,145		
Warehousing and Logistics				
493	Warehousing and Storage	34,550	5.1	\$72,892
484	Truck Transportation	13,107	2.3	\$83,788
492	Couriers and Messengers	6,002	1.5	\$50,922
424	Wholesalers, Nondurable Goods	10,278	1.3	\$84,782
		63,936		

While these three sectors are important drivers and the NSJV plays an integral role in supporting the dynamic economies of the Northern California megaregion as well as the rest of the state and country—its reward for playing this foundational role is often low road jobs, a degraded natural environment, and negatively impacted communities.

Further, these industries – like the entire economy – are also in transition.

Economies and industry sectors are always in transition.

For decades, regions like the North San Joaquin Valley were shaped and influenced by factors such as globalization where many US manufacturing companies pursued lower wage manufacturing opportunities overseas which resulted in a hollowing out of previous centers of production. Looking ahead, the region's economy will continue to face major changes from various transitions – from climate risks to the impacts of automation and AI and to the potential for onshoring of production. The following are some of the specific transitions that are having a direct impact on the region's economy:

- *Automation:* The continued growth of various forms of automation threatens not only labor-intensive industries like warehousing but also knowledge intensive industries as a result of the rise of AI.
- *Water:* The decline of available water due to changes in access to groundwater. This will reshape the historic role of agriculture.
- *Climate:* The rise in climate risks and the shifts in climate policy will reshape how and what the region grows, how and what the region builds, and how and what the region uses to get around.
- *Energy:* The shift in an energy economy powered by fossil fuels to one powered by clean energy. This will create new opportunities in clean energy.
- *Biomass:* The shift in an industrial economy where the inputs were largely generated by fossil fuels to one where the feed stocks are natural or from biomass. This will create new opportunities in the emerging bioeconomy.
- *Relocalization:* The shift from an economy that historically prioritized shifting production overseas away from the sources of innovation to one which values the co-location of innovation and production. This will create new opportunities in advanced manufacturing with the onshoring of production.

Given these transitions and the forces driving them, it's essential for local communities and urban areas to collaborate regionally and coordinate with other regions. Regions that effectively understand these changes and leverage their existing assets will be better positioned to shape a higher-wage economic future.

The NSJV Economy of the Future

New technologies, evolving opportunities, and the NSJV's unique assets mean that the region is poised to change this paradigm. Industries such as Advanced Manufacturing, Clean Energy, and Carbon Management, and the Circular Bioeconomy all present the opportunity to bring higher value-added activity to the area and subsequently deliver high road jobs, increase accessibility to these quality jobs, and improve the health of the community and natural environment. These changes to how things are done in NSJV hold enormous opportunities beyond high road employment; cleaner air, more abundant emission-free energy, and more extensive technological prowess have all sorts of knock-on effects ranging from attracting and unlocking additional industries to decreasing the costs and use of healthcare

for residents.

How did we identify these sectors?

This strategic plan is focused on the future direction of the regional economy. The process to identify industry opportunities emphasized emerging opportunities in climate, equity, and high-quality employment.

This process applied a lens to the economy that looked at emerging sectors that could become the basis for a new high road economy.

The process used was not focused on the places with the biggest sources of employment today.

For the NSJV economy, major areas of opportunity are found in the following four transitional sectors:

- Advanced manufacturing (Building Materials Manufacturing; Measurement, Testing, and Electronic Products and Component Parts; Mobility and Agricultural Machinery and Components)
- Clean Energy
- Carbon Management
- Circular Bioeconomy

These four sectors are currently a relatively small portion of the regional economy today. But they represent an opportunity to reshape the regional economy towards becoming high road, climate friendly, and equitable. This approach is not only in line with the principles and priorities of the participants in the North Valley Thrive process but are also in alignment with the policy goals of California Jobs First.

Orientation for the review of the priority sectors

The following sections share a consistent structure. Each begins with a sector definition and profile, including an overview of the sector's market outlook. Next, opportunities for sector growth are explored, along with the challenges the NVT region must address to support that growth. Building on this context, Chapter Five shifts the focus to investment strategies aimed at fostering the development of these priority sectors in the NSJV.



Advanced Manufacturing in the North San Joaquin Valley

The NSJV region is a longstanding leader in food manufacturing center with high degree of specialization on agricultural inputs as well as warehousing and logistics. Its location at the center of California and immediately adjacent to the Bay Area (the nation's center for innovation, high technology, venture capital, and emerging industries). As domestic manufacturing regains its footing in the US, many of these innovative firms will need to site locations for production in the coming years. The natural advantages of the NSJV region present a significant opportunity to support the final steps to develop an advanced manufacturing industry cluster that interacts and cooperates to share talent and infrastructure and produce cutting edge manufactured products in three key subsectors:

- Building Materials Manufacturing
- Measurement, Testing, and Electronic Products and Component Parts
- Mobility and Agricultural Machinery and Components

Sector Definition and Profile

Advanced manufacturing is a subset of the broader manufacturing sector. The manufacturing sector writ large includes a wide range of industries and technologies that produce some type of goods, from processed food products to semiconductors and everything in between. While there is no standard or universal definition of advanced manufacturing, the NSJV CA Jobs First initiative examined the entire manufacturing sector and identified those industries with the most promise in the region. The manufacturing industries in NSJV that offer a combination of stronger growth opportunities, higher wages, and more resilient career pathways were identified and defined as the region's Advanced Manufacturing sector. The definition of advanced manufacturing, for this initiative, was customized to the NSJV region and its unique strengths and opportunities for the future. In this particular sector strategy, "advanced manufacturing" in the NSJV is defined as the portion of manufacturing industries that:

- Manufacture **high value-added products**, that typically bring more revenue back into the region.
- Generally offer **higher wages** and strong career pathways for residents who work in these industries.
- Provide strong **growth potential** in resilient industries and technologies that are expected to thrive in the region in the future.

The definition of advanced manufacturing used here also has the added bonus of often being oriented towards products and solutions that proactively improve the climate. This presents a contrast to other advanced manufacturing industries, such as defense or aerospace.

This section begins by providing an overview of what the broader manufacturing sector looks like in the NSJV. Then, it applies the criteria to identify 'advanced manufacturing' industries in the NSJV region. While there are nearly 58,000 manufacturing workers throughout the region (about 10 percent of all employment), only 10,300 of these jobs fall under our 'advanced manufacturing' definition. The section then discusses each of the primary subsectors within advanced manufacturing before finally covering the outlook for advanced manufacturing in the region and opportunities that can bring additional sustained growth within the sector to the NSJV region.

Overall Manufacturing in the NSJV

Manufacturing is a substantial driver of the NSJV economy and is concentrated in the region.

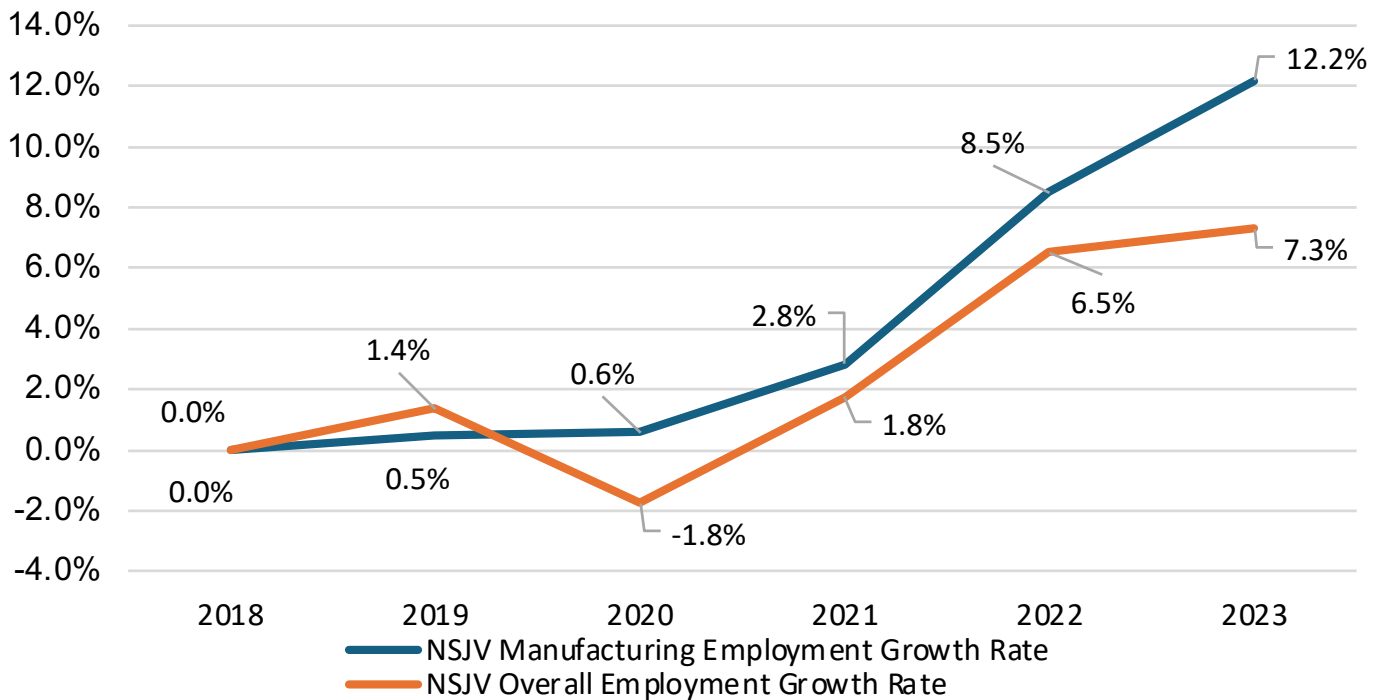
Manufacturing within the NSJV region accounts for nearly 58,000 workers, accounting for approximately 10 percent of the regional workforce. The region's overall manufacturing employment is more concentrated in NSJV than the national (20 percent more concentrated) or state (36 percent more concentrated) employment averages. Manufacturing accounts for roughly 1 in 10 jobs in Merced and Stanislaus County and 1 in 12 jobs in San Joaquin County. Manufacturing also brings in an estimated \$7.7 billion in revenue from outside of the region, which represents about 50% of the region's revenues from exported goods and services.⁹ Furthermore, an additional \$4.2 billion of manufactured goods and services are purchased within the region, meaning that the industry supports both global and local markets alike.

The manufacturing sector in NSJV is demonstrating strong growth. Between 2018 and 2023, employment rose by 12.2 percent, representing an increase of nearly 6,300 people employed. This means that the region's manufacturing employment has grown at a much faster rate than the region's overall economy (7.3 percent) and faster than manufacturing employment in the state overall (0.8 percent increase).

Manufacturing employment in the region has been relatively resilient through the pandemic.

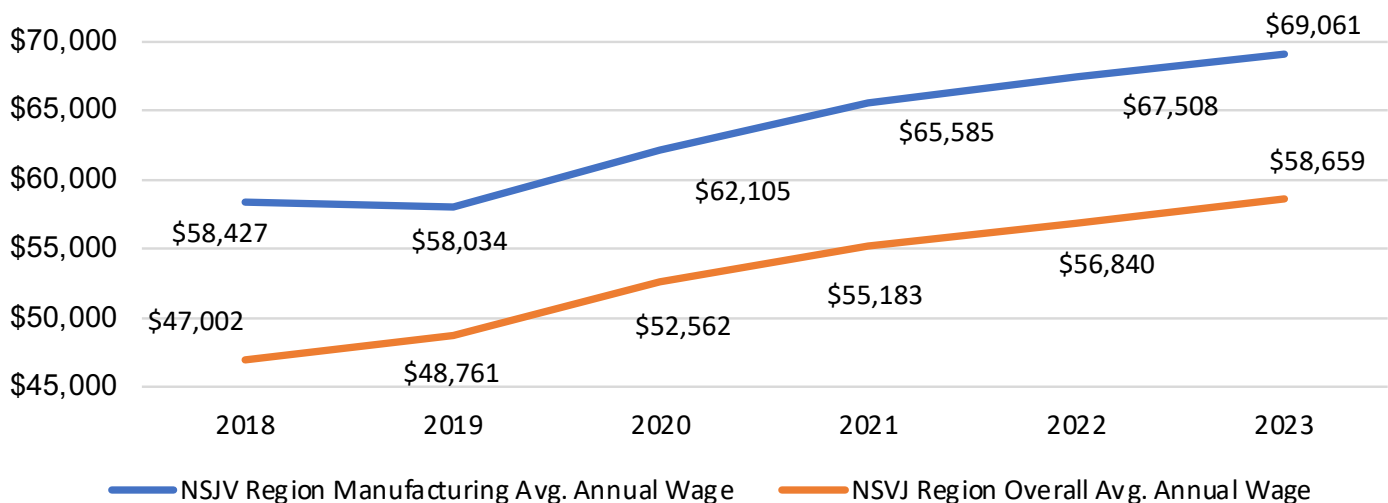
During the pandemic, employment in manufacturing was relatively unchanged compared to the broader regional economy, which saw overall employment decline by 3.1 percent between 2019 and 2020, representing a loss of roughly 17,500 jobs (Figure 4.2). This signals that the broader manufacturing sector has at demonstrated some resilience to recent macroeconomic shocks.

Figure 5 NSJV Regional Manufacturing Compared to Overall Employment



Not only does manufacturing power a sizable portion of the NSJV economy, but most of the jobs in the industry pay wages that exceed the median wages for the region overall. Manufacturing wages for the NSJV region have been consistently higher (by about \$10,000 per year) than the overall average annual wage between 2018 and 2023. Wages for the manufacturing sector in the NSJV region have also increased since 2018 by 18.2 percent. The average annual wage trend for northern San Joaquin Valley's manufacturing sector can be seen in Figure 3.

Figure 6 NSJV Manufacturing Average Wage Compared to Overall Average Wage



Identifying Advanced Manufacturing Industries in the NSJV Region

Manufacturing processes and the quality of jobs vary greatly across the manufacturing sector and its industries. For example, food and beverage manufacturing comprises a sizable portion of the region's manufacturing economy (42 percent of manufacturing employment)—but generally provide lower paying jobs (median wages are \$58,800) than other types of manufacturing in the region.

There is also “advanced manufacturing” taking place within the NSJV region that is producing higher value-added products that include advanced technological goods, large machinery, and other durable goods. The manufacturing of these types of goods often requires greater levels of design and engineering alongside more sophisticated use of tools and manufacturing methods than the typical factory floor assembly and production activities. These more advanced manufacturing requirements often command higher wages and specialization of workers. For example, using our definition of advanced manufacturing industries at the 6-digit NAICS level:

- *The average wage among the 15 most common occupations is \$73,400 within ‘advanced manufacturing’ while the average wage of the 15 most common occupations in other manufacturing in the region was only \$56,200.*

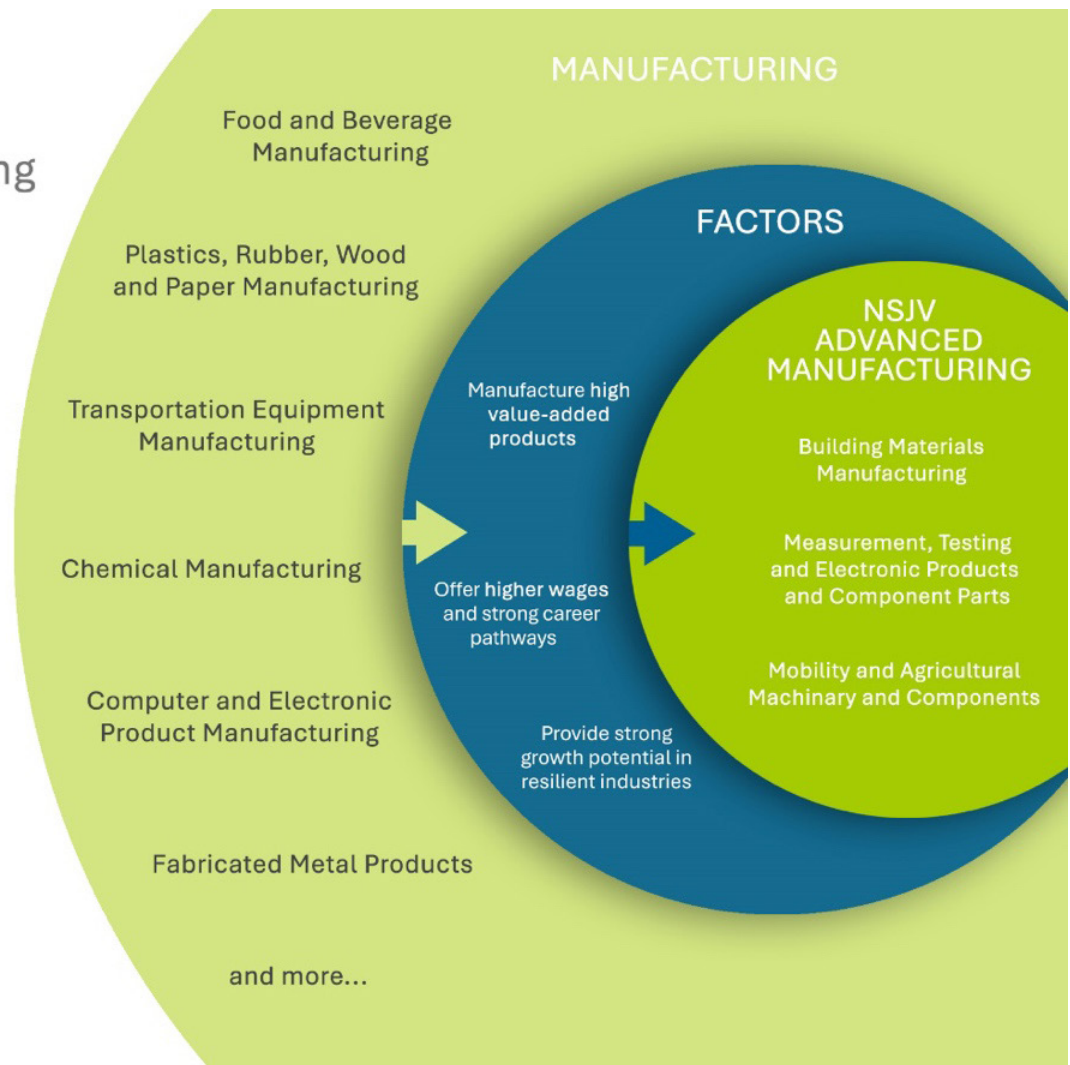
This type of manufacturing is what we refer to as NSJV's ‘advanced manufacturing’ for the remainder of this report. To arrive at the regional definition of advanced manufacturing we examined the entire manufacturing sector within the region and selected those industries that:

1. Manufacture **high value-added products**, that typically bring more revenue back into the region.
2. Generally, offer **higher wages** and strong career pathways for residents who work in these industries.
3. Provide strong **growth potential** in resilient industries and technologies that are expected to thrive in the region in the future.

Figure 7 NSJV's Advanced Manufacturing Definition

NSJV

All Manufacturing
to Advanced
Manufacturing



The figure above demonstrates the process to determine the core segments of the region's manufacturing sector that are considered "Advanced Manufacturing". The team used three key criteria to analyze the segments of the region's broader manufacturing sector to identify three key segments.

Sector Definition

Advanced Manufacturing in the North San Joaquin Valley region is a sub-sector within manufacturing that has the capacity to stimulate economic growth, create quality jobs, and export opportunities for the NSJV region. Since Advanced Manufacturing can have a wide range of meanings, the research team used a strategic approach, outlined above, to identify which industries in the region ought to be included.

We first identified and then classified six-digit industries into three categories that comprise Advanced Manufacturing in the NSJV region. These categories were developed through natural clustering of the largest six-digit industry codes and their shared product lines and manufacturing processes that produce durable and finished products and componentry. The following three components of Advanced Manufacturing are those that already have some notable strengths in the NSJV region and that the region should focus on to drive higher value-added and higher wage manufacturing in the region:

- **Building Materials Manufacturing:** Building materials manufacturing includes the manufacturing of non-basic products and materials largely used in construction. Capital Door & Window, with a location in Stanislaus County, is an example of a building materials manufacturer in the region that manufactures energy efficient windows and other building products.¹⁰
- **Measurement, Testing, and Electronic Products and Component Parts Manufacturing:** Electronic and component parts manufacturing includes the manufacturing of electronic component parts and technology that is used in a variety of industries. Opcondys, located in San Joaquin County, is an example of an electronic and component parts manufacturing that specializes in power switching devices used in a wide variety of larger high value-added products.
- **Mobility and Agricultural Machinery and Components:** Mobility and agriculture technology products and components includes the manufacturing of vehicle components and agriculture products. Laird Manufacturing, located in Merced County, is an industrial products manufacturer specializing in industrial farm equipment.

Advanced Manufacturing in the NSJV is largely a traded sector with manufactured products and components being sold outside the NSJV region.¹¹

Regional Sector Profile

Within the NSJV region, there are roughly 10,300 people employed in the North San Joaquin Valley Advanced Manufacturing sub-sector.¹² Employment has grown 14 percent since 2018¹³ and is projected to grow in the Modesto MSA (Stanislaus County) and Stockton-Lodi MSA (San Joaquin County) at 8.5 and 6.9 percent, respectively.¹⁴

In 2023, manufacturing increased by 1 percent in California, and, according to the state's Department of Transportation "Durable manufacturing is responsible for all of the growth in 2023, especially advanced manufacturing products such as computer and electronic devices, medical devices, and aerospace products." ¹⁵

The occupations in Table 4.2 are the most common within Advanced Manufacturing in the region. Many of these occupations provide average annual wages at or above the region's average of \$58,700 and all meet or surpass the living wage for a single adult in the region.¹⁶ Jobs within our Advanced Manufacturing definition are also considerably higher paying than the most common occupations in manufacturing outside of our Advanced Manufacturing definition, which average about \$56,200 per year and are largely concentrated in industries such as food manufacturing. This is considerably lower than the average wage across the top Advanced Manufacturing occupations, which is \$73,900.

Table 3 The 15 Most Common Occupations in NSJV for Advanced Manufacturing¹⁷

SOC	Occupation	Average Annual Wage
51-1010	First-Line Supervisors of Production and Operating Workers	\$78,100
51-4030	Machine Tool Cutting Setters, Operators, and Tenders, Metal & Plastic	\$49,300

51-4040	Machinists	\$55,100
53-3030	Driver/Sales Workers and Truck Drivers	\$57,900
51-9060	Inspectors, Testers, Sorters, Samplers, and Weighers	\$53,200
41-4010	Sales Representatives, Wholesale and Manufacturing	\$90,900
51-7040	Woodworking Machine Setters, Operators, and Tenders	\$43,700
51-9160	Computer Numerically Controlled Tool Operators and Programmers	\$59,100
51-9120	Painting Workers	\$51,200
53-7050	Industrial Truck and Tractor Operators	\$49,500
43-5070	Shipping, Receiving, and Inventory Clerks	\$48,700
11-1020	General and Operations Managers	\$146,000
51-2020	Electrical, Electronics, and Electromechanical Assemblers	\$55,400
15-1250	Software and Web Developers, Programmers, and Testers	\$142,100
11-3050	Industrial Production Managers	\$128,600

These jobs are also largely held by people with less than a four-year degree. One biomedical device manufacturer noted that—even with the advanced nature of their product—less than a third of their workforce had a four-year degree or more, underscoring the fact that within advanced manufacturing there is a range of opportunities for workers of all backgrounds and interests.

Regional Sector Analysis & Outlook

There is growing demand for advanced manufacturing products backed by increasing policy and financial support from the state and federal governments.

The increasing global demand for high-tech products and components is driving current and projected growth of domestic advanced manufacturing. Policies such as the Bipartisan Infrastructure Act and Inflation Reduction Act have also increased demand for the sub-sectors' products while promoting additional funding for the research and development of advanced manufacturing processes and workforce. Most recently, the federal government kicked off the Advanced Manufacturing Sprint that invested \$50 million into building a diverse and skilled workforce through workforce training and development. This initiative brought together employers, education and training providers, state and local governments, and community-based groups to construct training pipelines for students and workers to succeed in advanced manufacturing jobs. ¹⁸

There is also a statewide push to advance manufacturing talent through the Advanced Manufacturing Workforce Development Council created by the California Workforce Development Board which is bringing together different entities to promote advanced technology adoption and workforce development in California's advanced manufacturing sector.¹⁹ California also offers manufacturers a range of tax credits and savings on capital expenditures, including the California Competes Tax Credit and the Research and Development Tax Credit.²⁰

Possible risks to the growth of advanced manufacturing include changes to the political environment that alter the incentives for procurement of domestically manufactured goods. Additionally, manufacturing in California is always subject to higher local costs and global trade pressures. Generally, it is cheaper to manufacture products overseas rather than domestically which has led to current policy incentives for "reshoring" manufacturing. These incentives help to stimulate demand for and the appeal of domestic manufacturing. But the future of certain incentives could be in jeopardy depending on political outcomes.

Opportunity Statement

1. Strong Regional Manufacturing Footprint

The significant presence of manufacturing in the NSJV region highlights local skills and specialized infrastructure relevant to manufacturing. The region's nearly 58,000 manufacturing workers means that employers are constantly seeking new talent that can work on assembly lines, monitor and repair machinery, conduct quality control and assurance activities, and conduct machining and fabrication. These activities are necessary across almost all types of manufacturing, meaning that training programs and infrastructure oriented towards manufacturing broadly would benefit a wide range of employers, including some workers that could transition into roles within the advanced manufacturing sector through upskilling and additional education.

This fulfills one of the three components of agglomeration economies; the presence of dense labor market and skills matching can help employers in the region more easily find talent and can help attract additional employers from outside of the region. The other two components—knowledge spillovers and shared inputs and suppliers—may also be present at lower levels but could be facilitated to support the region's strength as a manufacturer.

2. Proximity to Larger Markets, Space, and Infrastructure

The NSJV's proximity to the Bay Area, the Sacramento region, and linkages throughout the fast-growing San Joaquin Valley and beyond means that manufactured products often do not have to travel far to reach markets. This also means that innovation and design that occurs within the Bay Area can easily be utilized by manufacturers within the NSJV region. Finally, the Port of Stockton, Burlington Northern Santa Fe and Union Pacific Railroads, and the network of highways, including I-5 and California State Route 99, mean that goods can cheaply and easily be moved throughout and out of the state.

3. Manufacturing and the Manufacturing of Building Materials

Increasing housing production in California is a critical state and regional policy goal, which could result in an more housing over both the near and long term. Over the next eight years that state hopes

to encourage the construction of more than 2.5 million new homes, which is twice the current rate of construction.²¹ Furthermore, the state's nearly \$600 million Equitable Building Decarbonization program will require an immense amount of materials to support energy efficiency, ranging from insulation to more efficient windows, doors, and other materials.

Nearly 5,100 people in the NSJV region are currently employed in industries related to building materials manufacturing, and more than 400 of these jobs were created within the past five years. The three largest Building Materials industries²² in the NSJV region are Fabricated Structural Metal Manufacturing, Prefabricated Metal Building and Component Manufacturing, and Engineered Wood Member Manufacturing. Businesses that produce more energy efficient and environmentally friendly products are likely to experience additional demand, simultaneously supporting quality jobs and reducing the region's climate impact.

4. Centers for Development, Prototyping, and Testing

The NSJV region's proximity to the Bay Area means that tech companies that are innovating in a wide range of technology sectors are only a few hours away. While the Bay Area is a hub of innovation, it lacks the necessary amount of physical space that is needed to safely and securely translate fledgling ideas into workable prototypes that are ready to be tested and iterated upon. This creates a unique position for the NSJV to become the destination for these "translation activities"; businesses want locations to be close and accessible to their original places of design so that necessary engineers and decision-makers can see the physical prototypes themselves, but the Bay Area is spatially constrained, making the NSJV an ideal location close by. These types of translation activities, that help transform ideas on paper or in computer programs into physical products that can be tested and refitted in the field can bring a lot of economic activity to the NSJV, along with quality jobs that support the engineering, design, prototyping, and machining necessary for this rapid iteration design and testing.

One potential area of technological innovation is in transportation technologies where many emerging companies are producing new vehicles and products in electric vehicles, autonomous vehicles, personal aircraft, and other forms of transportation. As these emerging companies look to cite manufacturing, the NSJV should be positioning itself as a leading location for translation from idea to product.

The region has several existing sites and mobility ports that facilitate activity within the region while also making the region more accessible and attractive to the world outside the region. The Port and Airport of Stockton ensure that the region is accessible to commercial activities by both sea and air, while the myriad rail and highway systems ensure access by land. There are also several decommissioned military installations within the area that hold potential for redevelopment and reuse. They include Sharpe Army Depot in San Joaquin County a site undergoing remediation efforts. While this site is not permitted by the EPA to have residential development, there are many other potential uses for this land. In addition, Crows Landing is a former Navy air station in Stanislaus County that is currently being envisioned as an industrial park and has received more than \$30 million in investment to date.

One of the decommissioned military installations with significant active uses is the Castle Commerce Center, a 1,912-acre multi-modal freight transportation hub with nearby access to seaports, airports, highways, and rail systems. Castle was where Waymo tested and perfected their autonomous vehicles, which now have driven more than any other autonomous car system.

In addition to serving as a transportation hub, the Castle Commerce Center is home to an FAA-approved airplane pilot training center and an automotive research test facility for many leading electric and autonomous vehicle firms to test their hardware and software in the real world. Byron Airport just north of the NSJV region offers an example of how existing infrastructure can be leveraged. Byron airport is an FAA “reliever” airport, which means that it can be utilized during periods of intense commercial traffic. This status also helps the airport maintain its facilities, which are also used for pilot training and for recreational skydiving.

In fact, demand is already outstripping existing resources at the Transportation Research Center (TRC), the non-profit testing center at the Castle Commerce Center. It should be noted that these facilities are not just where innovative companies come to test their equipment and then leave the region; these employers are increasingly setting up small test shops in the area surrounding, and TRC plans to offer workshops cited within TRC.

This growing network of nearby workshops and machine shops has a substantial opportunity to bring more high-quality jobs that are oriented towards designing and engineering advanced technology products. The relatively low location quotients of Engineers and Computers Occupations signal that further development of education programs and training pipelines for students and workers may be worth undertaking, as these higher paying occupations are underrepresented in the region. Supporting the design elements within new and existing manufacturing can help increase demand for Engineers and Computers Occupations in the region, which could be met by local supply of workers through UC Merced, University of the Pacific, or CSU Stanislaus.

In addition to the growing testing and iterative design workforce, the region’s manufacturers of mobility machinery and input components is growing. About 4,300 jobs in the region are involved in the manufacture of farm machinery, construction machinery, boats, aircraft parts, and measurement and control devices, and 1,000 of these jobs were added within the past five years. This represents the further development of a cluster that is oriented towards the manufacture of advanced technology components and products that are at the cutting edge of mobility technology. In addition to being complimentary to the testing and iterative prototyping sector outlined above, these manufacturers directly produce high value-added products that are sold outside the region.

Problem Statement

- 1. Although there are several strong industries within Advanced Manufacturing, none of these industries have yet reached status as a ‘cluster’.** Developing a manufacturing cluster requires the accumulation of adjacent suppliers and buyers who benefit from close geography, shared talent pools, closely integrated supply chains, and knowledge spillovers where workers across companies learn best practices from each other. Formation of a cluster is not an easy feat, and often requires some element that serves as a ‘magnet’ or ‘anchor’ that draws in suppliers, buyers, and even competitors.
- 2. An Unequally Educated Workforce.** As manufacturing becomes increasingly more complex in the need to interact with and repair machinery and robotics, those working on the production line will require greater levels of technical training and education. Educational attainment in the region varies greatly along racial and ethnic lines, so additional high-quality jobs that require more education or training may only reinforce inequalities if no additional efforts to address these educational inequalities are made.

- 3. Becoming a “Translation Destination” requires a lot of infrastructure and invested stakeholders.** While the NSJV has some geographic advantages in developing into a full-fledged Translation Destination, there are several factors that can accelerate this status or hinder or halt it altogether. For example, if the region does not invest in this vision and make it easier for the companies that are seeking out these types of services, then the region’s foothold in the translation space is unlikely to grow. Investment in this vision could come in the form of a regional research and innovation agency that has robust political support and is led and staffed socially aware technology-savvy bureaucrats with the purpose of attracting and retaining research, development, and design firms, anticipating opportunities and challenges to innovation system actors, and supporting the capture of these opportunities or mitigation of challenges.
- 4. Global and Domestic Competition:** Approximately 1/3 of all manufacturing jobs in the United States in 2000 had disappeared by 2010,²³ largely due to global trade pressures, cheaper offshore production, and the Great Recession. While the fourteen years between 2010 and 2024 saw a resurgence of about a million and a half manufacturing jobs, today’s 13 million manufacturing jobs are a far cry from the more than 17 million that worked in the industry in 2000. While the types of manufacturing that remain today within the US are often industries in which domestic production is advantageous—either due to proximity, advanced componentry, or security of proprietary technology—lower input costs and interest in strengthening trade alliances still exist. The current strength of the dollar also makes international exports less attractive. These macroeconomic factors are hard to predict and even harder to mitigate, so focusing on sub-industries within manufacturing that are less exposed to fluctuations from these elements is important.
- 5. Uncertain Future of Policies:** The trade policies put in place over the past two presidential terms have increasingly made US manufactured goods more attractive. The Trump administration imposed several tariffs, primarily on goods from China, ranging from steel to solar panels and washing machines. The Biden administration has also sought to make domestically produced goods more competitive through the Inflation Reduction Act’s additional tax credit provision by meeting local content requirements. While these policies have supported demand for domestic goods, there is no guarantee that these policies are here to stay, particularly with the 2024 Presidential and congressional elections. Supporting industries and projects that are profitable before these tariffs and tax credits can help decrease the local economies risk or reliance upon the permanence of these policies.



Clean Energy

Clean energy jobs are growing in the NSJV (North San Joaquin Valley) labor market and currently account for an estimated two percent of jobs in the region. There are several opportunities to continue to further grow the sector in the immediate future as national and statewide climate goals require new clean technologies and more clean electricity. The NSJV region is well-equipped to both become a hub for several nascent clean energy technologies such as green hydrogen and biofuels and reinforce its already large workforce making buildings more energy efficient and installing and maintaining solar. Because the region holds many advantages for the development of clean energy technologies, this transformation is likely to happen with or without intentional planning and coordination by local government and the community. However, an unguided transformation may yield the same inequitable status quo that has historically not prioritized the needs of community residents. Through proactive planning and community engagement, the region can become a clean energy powerhouse in a way that benefits those who currently live in the NSJV region. If an appropriate strategy is developed and implemented, the opportunities through clean energy meet all three of California Jobs First's priorities and can make the region healthier, more resilient, and better off economically while also propelling the state and new clean technologies forward.

Sector Definition and Profile

Sector Definition

Clean energy is the part of the energy sector that does not include the use of fossil fuels. For this analysis we used the Department of Energy definition of the Energy Sector which is anything "directly involved with researching, developing, producing, manufacturing, distributing, selling, implementing, installing, or repairing components, goods or services related to Electric Power Generation; Electric Power Transmission, Distribution, and Storage; Energy Efficiency, including Heating, Cooling and Building Envelope; Fuels, including Extraction, Processing, Production, and Distribution; and Transportation, including Motor Vehicles. This also includes supporting services such as consulting, finance, tax, and legal services related to energy." ²⁴

Clean energy encompasses 144 different NAICS codes within its definition. There are roughly another dozen NAICS codes which are primarily "fossil fuel" NAICS codes that contain some clean energy employment, such as Fuel Distributors. For more information on the NAICS codes used in these definitions, please see Appendix 4A.

The clean energy sector is one that is both traded and local serving. Local generation and use of clean electricity and fuels means lower local emissions and pollution and better air quality. But the traded portion of clean energy represents a notable opportunity for the region too if the region can plan and act strategically to support key areas of the clean energy economy. Becoming a hub for prototyping and manufacturing high value-added clean energy products—ranging from energy efficient building products to electric vehicles to low-carbon 'Green' Hydrogen and biofuels—will bring high quality manufacturing jobs to the region while also bringing in revenues from outside of the region. This opportunity represents a shift in how much of the NSJV economy has operated to date, as targeted higher value-added products with higher margins can garner high road jobs and revenues for the region.

Regional Sector Profile/Analysis & Outlook

Clean energy accounts for a notable part of the NSJV economy measured by total number of jobs (12,346), share of employment in the region (2%), and the nearly 1,100 GWh of solar energy produced in the region²⁵ that is enough to power approximately 101,900 households.²⁶ The demand for clean energy and climate-oriented products is increasing globally and expected to continue growing. As the federal government increases domestic content requirements and procurement policy, like the Inflation Reduction Act—which offers additional tax credits for using American-made materials in construction, including special provisions for qualifying energy projects--the demand for domestically produced goods is expected to rise even higher. At a state level, “The 100 Percent Clean Energy Act of 2018” (SB 100) in California requires all retail electricity to be from renewable energy and zero-carbon resources by 2045.

The employment gains made within the NSJV are heavily driven by the Energy Efficiency subsector, including activities like building decarbonization and weatherization practices. Almost half of the clean energy jobs in the region are in the Energy Efficiency sector. Transmission, Distribution and Storage (TDS) is the next-largest sector followed by Electric Power Generation (Figure 5).

Figure 8 Clean Energy Employment by Sector

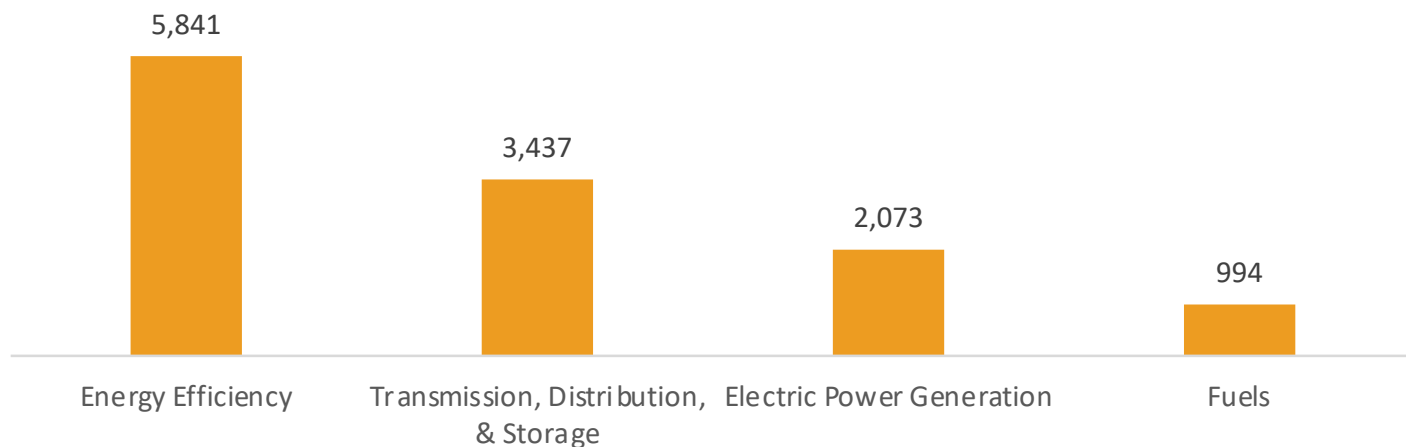
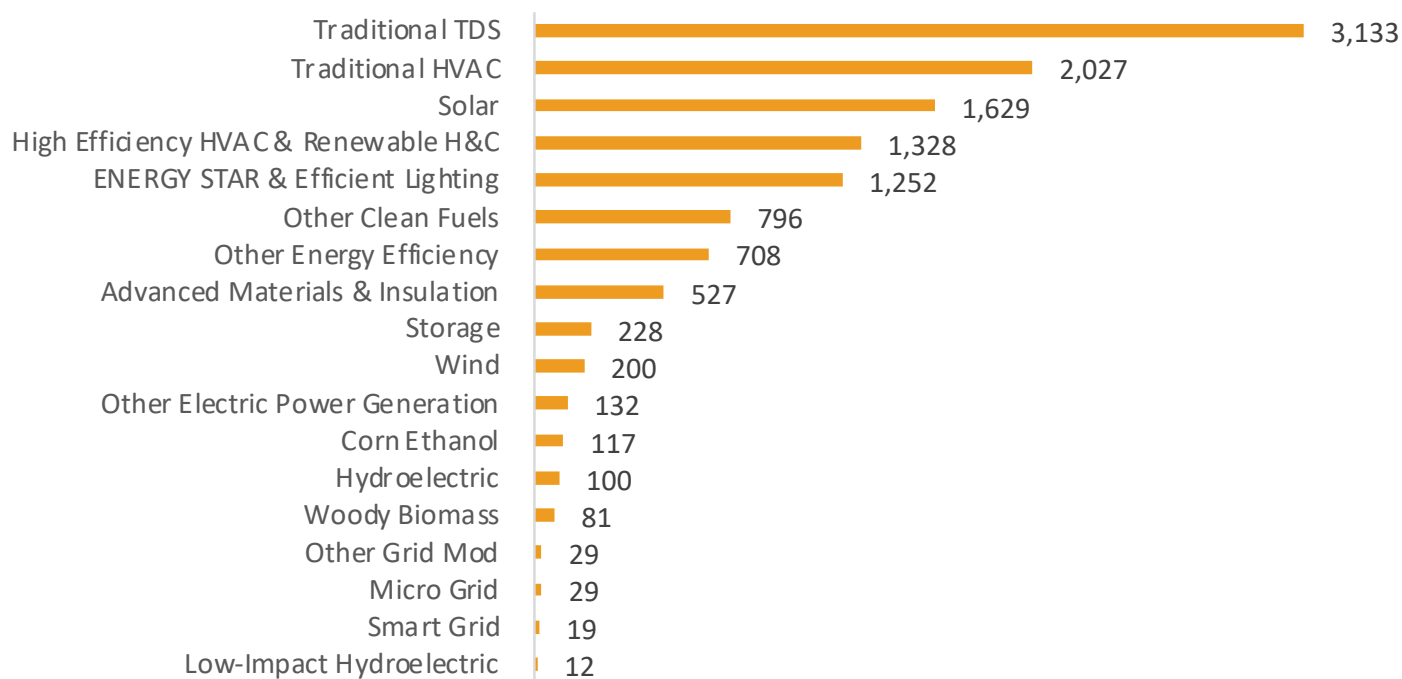


Figure 9 Employment by Clean Energy Technology



But the economic opportunity for clean energy in NSJV does not lie solely within solar. The state’s building decarbonization goals, demand for clean fuels, and an overall increase for clean power to power carbon capture and green hydrogen also encompass significant economic opportunity. The Hydrogen ARCHES program alone will direct \$1.2 billion in federal funding, an amount matched by the state, to 39 different hydrogen projects throughout the state, creating an estimated 200,000 jobs or more.²⁷ Additionally, the state’s \$639 million Equitable Building Decarbonization Program incentivizes energy efficiency retrofits and low carbon technologies within homes and buildings to reduce greenhouse gas emissions.²⁸

Access to inexpensive, reliable, clean energy can unlock other opportunities for the region.

Clean energy is the underpinning resource that all other key industries from the region—ranging from agriculture to advanced manufacturing—need in order to continue to provide goods and services, while not worsening the air quality in a region that suffers from chronically poor air quality. This new paradigm also offers the opportunity for the NSJV community to build a future that is based on innovation and export of goods and services, while avoiding worsening air quality or intensive use of local resources. While clean energy cannot solve the full range of challenges for the NSJV region, it is a critical component to addressing many of these obstacles.

Employment and Outlook

Clean energy employment growth in the Northern San Joaquin Valley (NSJV) region has outpaced that of the total employment growth in the region, state, and country, along with the overall energy employment rate in the region which includes non-renewables, such as gas and coal. As of 2022, the Northern San Joaquin Valley Region has 12,346 jobs in the Clean Energy industry, a 7.1 percent, increase from 2021.

Table 4 Common Clean Energy Occupations^{29 30}

Clean Energy Occupations	Economywide Employment in NSJV	Annual Mean Wage		Less than 4-Year Degree
Electrical Engineers	374	\$127,200	0.52	19%
Construction Laborers	4,364	\$55,500	0.82	94%
Electricians	2,361	\$75,900	0.82	93%
Plumbers, Pipefitters, and Steamfitters	1,431	\$74,000	0.79	94%
Sheet Metal Workers	425	\$76,400	0.90	94%
Solar Photovoltaic Installers ³¹	206	\$51,600	1.61	84%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,266	\$66,900	0.82	95%
Electrical Power-Line Installers and Repairers	305	\$119,100	0.65	92%
Welders, Cutters, Solderers, and Brazers	1,378	\$54,500	0.85	97%
Power Plant Operators	61	\$109,500	0.50	80%

Clean energy employment in the region currently offers a range of quality employment opportunities. Table 3 showcases common occupations in the Clean Energy industry in NSJV. Seven of these ten occupations have an annual mean wage above the region's overall average (\$58,700). Aside from Electrical Engineers, a majority of workers in all of these occupations have less than a four-year degree, meaning these jobs are not only high quality but also accessible for job seekers with an array

of backgrounds and interests. While these jobs are not the exact same profiles of the existing fossil fuel workforce, they can still offer employment opportunities with wages above the regional average. Strategic planning and engagement are also crucial within this industry to ensure that the jobs created from the opportunity within the region are accessible to talent already living in the region.

Opportunity Statement

1. A Robust Clean Energy Workforce Already in the Region

In 2022, 2.1 percent of the region's total workforce were clean energy workers, a rate similar to the national rate of 2.6 percent. This employment includes the Tesla Megafactory that produces utility-scale battery storage in Lathrop, which employed approximately 3,600 workers at its peak. Given the over seven percent increase of clean energy workers from 2021 to 2022, the region is likely to continue growing, particularly as the state's decarbonization goals and initiatives continue to accelerate.

2. Prototyping and Scaling Green Hydrogen in Region

The California Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) is the state's application to the Department of Energy's hydrogen. Up to \$1.2 billion in federal funds, complimented by a state match, will support 39 different hydrogen infrastructure projects around the state. A map of proposed production and offtake sites shows that the NSJV is a likely candidate for at least one production site and several offtake sites. Within the NSJV region under ARCHES, there is a plan for:³²

- Electricity generation using a combination of natural gas and green hydrogen to power a combined cycle power plant in Lodi.
- Green hydrogen-powered public transit vehicles and systems for the San Joaquin Regional Transit District
- Numerous potential green hydrogen fueling stations throughout the NSJV region.

ARCHES projects are estimated to create 200,000 new jobs throughout the state and will save an estimated \$3 billion annually in healthcare and related costs as fossil fuel use is substituted with hydrogen. The concentration of planned projects in the NSJV region means that the region is already poised to capture a greater proportion of these jobs and healthcare cost reductions. Additional efforts to bolster green hydrogen production and deployment infrastructure can increase the amount of opportunity that the region is able to capture.

Alongside efforts that ensure these projects can be developed in a safe but timely manner, ARCHES projects present a substantial opportunity for the region's high traffic logistics centers, which may be able to substitute for a fuel with far lower levels of pollutants. Interstate 5 (I5) is among the busiest highways in the state and connects NSJV to other parts of the state, Oregon, and Washington. The average daily traffic (AADT) in 2022 for trucking across various locations within the NSJV parts of I-5 of 81,741 trucks per day. Interstates 205 and 580 in San Joaquin County offers easy connectivity to Silicon Valley and San Francisco Bay Area, with an average AADT of 72,000 trucks per day, and California State Route 99, which runs along the three-county region and connects the entire state from north to south, averages 100,894 trucks per day.³³

There is also an opportunity to leverage and eventually transition the region's existing fossil fuel workforce. Many of the workers supporting green hydrogen production and transportation efforts are likely to come from the fossil fuel industry as they have many of the necessary skills and experience with

chemical industrial production processes and the storage and transportation of volatile liquids. There are currently more than 2,600 fossil fuel-related workers in the region, with a majority of workers falling within four industries:

- Natural Gas Distribution (1,750 workers)
- Petroleum and Petroleum Products Merchant Wholesalers (350 workers)
- Petroleum Bulk Stations and Terminals (270 workers)
- Fossil Fuel Electric Power Generation (200 workers)

Workers in these industries likely have much of the knowledge, skills, and abilities required to develop and operate hydrogen technologies, and existing fossil fuel assets and infrastructure may be leveraged for green hydrogen production, transportation, and storage. Green hydrogen jobs are also likely to be similar to fossil fuel employment in the region, which are also generally high-quality jobs and offer average annual wages of roughly \$126,400.

3. Biofuels Prototyping and Scaling

There are several conditions that make the NSJV an ideal location for biofuels production and use. First, the San Joaquin Valley is an agricultural powerhouse in California, with the industry making up 14 percent of the regions GDP, 17 percent of their employment, and 19 percent of their revenues.³⁴ This tremendous amount of land and organic material generate a significant amount of organic waste. *(Note: Biofuels is a cross-cutting sector that is also affiliated with bioindustrial manufacturing. See Circular Bioeconomy sector strategy for more information on the biomass feedstocks in the region and other related assets.)* San Joaquin County is already the fourth-largest biomass electricity producer in the state.³⁵ There are a range of technologies, including Bioenergy with Carbon Capture and Storage (BECCS), as well as Biomass Carbon Removal and Storage (BiCRS), which is a technology that uses organic waste to generate energy and captures the carbon emitted from the combustion process and gasification which generates a combustible fuel and biochar.

The second factor is that there are already several current and proposed biofuels pilot production sites within the NSJV region, including San Joaquin Renewables. A third factor is the recent National Science Foundation proposal for a “Central Valley Circular Bioeconomy Innovation Engine: Advancing Feedstock Diversification and Scale-up for Bioindustrial Manufacturing” that was submitted as a Regional Innovation Engines program from the Circular Bioeconomy Innovation Collaborative (and described further in the Circular Bioeconomy sector strategy). The proposal will help support the development an ecosystem that focuses on the production of bioproducts. As Deepti Tanjore, director of the Advanced Biofuels and Bioproducts Process Development Unit (ABPDU) at Berkeley Lab (and one of the CBIO partners) noted “[the Northern San Joaquin Valley]’s renewable agricultural residues can serve as feedstocks for biomanufacturing technologies, and its complementary manufacturing capabilities can enable commercial-scale production.”³⁶

However, it is vital to consider the development of these technologies with a focus on ensuring environmental integrity and social equity as aligned with the principals and values of North Valley THRIVE. For example, this includes working to manage the creation and use of organic waste to prevent negative impacts on regional biodiversity or community well-being.

Aligning regional biofuels production with North Valley THRIVE goals will ensure that the region can consider biofuel prototyping and scaling in way that both consider and minimize potential negative impacts while maximizing the benefits for both the economy and the environment.

4. Energy Efficiency Installation and Manufactured Products

Energy efficiency is the largest sector of the clean energy economy, employing more than 5,800 people in the NSJV region. These occupations often pay above the median wage for the region and typically require less than a four-year degree (Table 4.3). The state's Equitable Building Decarbonization program, which offers nearly \$640 million in state funds to support building decarbonization, presents a significant opportunity to increase the number of these workers. This will also spur a greater number of entrepreneurs and independent contractors who can conduct these home retrofits. It is also notable that occupations necessary for building decarbonization—such as Electricians and HVAC/R Installers and Repairers—are likely to continue to see high demand in other sectors as there's heightened demand for electrical services and building construction.

The NSJV region is also a manufacturing powerhouse for building materials, with at least 5,100 workers in the region employed within building materials manufacturing. As consumers demand more energy efficient products due to both cost effectiveness and policy incentives and mandates, manufacturers in this region are set to benefit. Ensuring that the products produced are compliant with any state policies or regulations for home retrofit programs is one way to support this sector, while increasing marketing and awareness of regional manufacturers could also help drive demand for locally produced building materials products.

5. Proximity to the Bay Area and Connections to Other Large Markets

Being close to the Bay Area allows people and goods to easily flow from one region to another. This means that the NSJV region has the benefit of being able to access the ideas, opportunities, and companies that are located within the Bay, but without having the same challenges with land availability and land price.

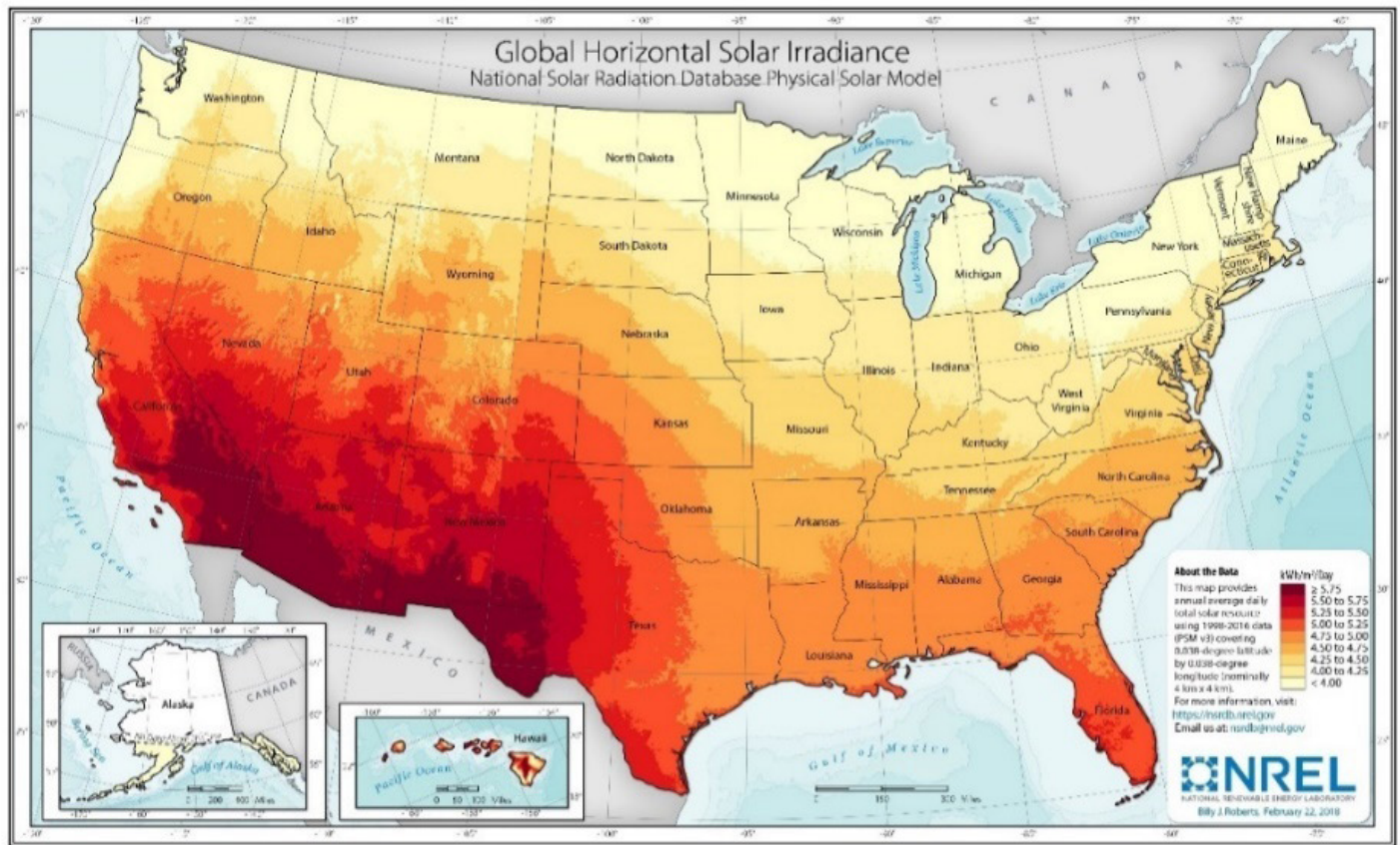
6. California is Invested in Clean Energy Deployment

The state has committed to reaching zero-carbon electricity by 2045 and continues to commit substantial resources and assistance to meet this objective.

7. Availability of Land and Solar Irradiance

Land in the NSJV is relatively less expensive and more available than in many other parts of the state. The NSJV region also has significant potential for solar development due to its sunny climate, as shown in FIGURE 10. In addition, land is relatively abundant compared to many other parts of California. This makes additional renewable electric energy generation more feasible and attractive for project owners.

Figure 10 Average Daily Total Solar Resource ³⁷



Problem Statement

- 1. History of resource intensity creates concerns that clean energy development will be similarly intensive.** The NSJV region has a history of its resources being intensively utilized for the benefit of those who live outside of the region. There is a deep desire within the community—and among decisionmakers—to break this cycle. It is therefore important to consider the end use of clean energy products manufactured or sited within the region.
- 2. New technologies present novel and unknown risks.** There are still concerns within the community about the safety of new technologies, particularly the production, transportation, and use of hydrogen and biofuels. Additional research—and accessible and transparent sharing of the findings—are needed to highlight the potential risks and the mitigation and management strategies to protect residents and the environment.

- 3. Uncertainty in Political and Policy Outcomes:** State and federal policies have increasingly incentivized the development and deployment of clean energy technologies. If these policies or the funding put in place is diminished, then some sectors may see lower demand as projects are no longer profitable. Fortunately, there is likely to be at least some continuity in existing policy at the state and federal levels. Furthermore, many clean energy technologies are now financially preferable to alternatives; solar and storage is often cheaper than fossil fuel alternatives, and energy efficiency can save homeowners substantial money in the long run. Strategically planning a diverse range of initiatives to prevent sudden gaps in policy support can help mitigate much of this risk.
- 4. Benefits from Operational Renewable Energy Facilities:** One concern surrounding clean energy—particularly among communities with a legacy of well-paying fossil fuel jobs—is that once operational, many facilities (i.e. solar and wind) do not require the same number of jobs, nor offer the same compensation. Green hydrogen and biofuels present opportunities to support infrastructure and occupations more similar to fossil fuels.



Carbon Management

The demand for carbon management services is set to grow significantly, aided by California's goals for carbon emissions reductions and corporate America's increasing interest in meeting carbon neutrality and Environmental, Social Governance (ESG) goals. The NJSV region is uniquely positioned to capture a significant portion of the carbon management sector as an early adopter and a beneficiary of geology that is amenable to carbon sequestration. It is important for the region to work strategically to support existing companies and their technologies as they develop within the region, while also leveraging public policy and community engagement to ensure that communities benefit greatly from carbon management rather than merely as a location for sequestering of the world's carbon pollution.

Sector Definition and Profile

Sector Definition

Carbon Management is a sector full of developing technologies with strong economic and quality job creation potential. This sector is defined to include any technologies or activities that capture carbon and sequester it for a substantial amount of time. This definition encompasses four main technological pillars within the North San Joaquin Valley (NSJV) region. These pillars are:

- 1) carbon-oriented land management and nature-based practices;
- 2) carbon capture, transportation, and storage;
- 3) waste management practices to minimize greenhouse gas emissions; and
- 4) experimental sciences in carbon sequestration.

The carbon management sector is primarily a traded sector. Firms and even states seeking to meet their decarbonization goals will pay companies within the sector for "carbon offset credits," which serve as proof that carbon has been sequestered. California carbon allowance prices under California Air Resources Board's Cap and Trade program hovered between \$35 and \$45 per ton of emissions over the past year, though these prices have increased in recent years.³⁸ There is a local services component, however, as some sequestration processes (BECCs: Bioenergy with Carbon Capture and Storage; and BiCRS: Biomass with Carbon Removal and Storage) will remove organic waste from farms, forests, and restaurants.

There are state and federal policies that support carbon management activities and facilitate experimentation and technology development. This includes the federal 45Q tax credit for carbon sequestration and the qualifying advanced energy project credit, alongside millions of dollars in federal grants and prizes focused on carbon management. The state of California has also been leading in the field of carbon management policy. SB905 establishes a Carbon Capture, Removal, Utilization, and Storage program for permitting, monitoring, and supporting these technologies and SB038 which—if passed—would create a statewide regulated market for carbon by 2027.

Regional Sector Profile/Analysis & Outlook

It is not clear at this point how many workers are involved in carbon management throughout the NSJV region, as there are no clear industry codes linked to these very nascent industries, and there are no comprehensive studies on the topic for the region, nor for the state. The research team examined existing companies in the region to develop an estimated incidence rate among the industries included in the

Carbon Management definition.³⁹ This exercise suggests that as many as 400 workers throughout the NSJV region could currently be involved in Carbon Management. What is certain is that there will be high demand for these products and services going forward and there are six different planned or active carbon capture and storage projects within the region, ranging from Direct Air Capture (DAC) to Bioenergy with Carbon Capture and Storage (BECCS),⁴⁰ and that these projects could bring a significant number of quality jobs to the region.

A study by the Rhodium Group⁴¹ suggests that the development of a single 500-kiloton direct air capture facility would create more than 1,500 jobs, about 78% of these jobs are projected to be 'plant investment jobs' which entail supply chain jobs and the construction of the plant. These construction jobs are also often high-quality union jobs; the DAC pilot project developed in San Joaquin County by Heirloom utilized construction laborers from State Building Trade Union, UA Plumbers & Pipefitters, and the International Brotherhood of Electrical Workers.⁴² Once operational, 65% of the jobs would be within operations and maintenance, and 35% within the supply chain.

The potential for significant, lasting job creation through carbon management is enormous as the demand for DAC alone is projected to grow exponentially. By 2050, the Rhodium group estimates that under a 2050 decarbonization scenario, the United States will require between 690 and 2,260 million metric tons of Direct Air Capture (DAC) installed capacity by 2050, compared to the one to eight million metric tons of DAC capacity projected to be installed by 2030. This could mean that as many as 6.8 million workers are involved in DAC alone by 2050.⁴³ If the NSJV region captures the same proportion of these jobs as existing employment relative to the country, this represents nearly 24,800 jobs, and given the unique advantages of the region, this proportion is almost certainly an under-estimate of the proportion of carbon management activity that can be captured by the region. If the NSJV region can capture a disproportionate share of these jobs, then this could be a significant job creator for the region.

Table 5 Top Occupations Involved in Carbon Management Activities⁴⁴

	Employment in NSJV	Annual Average Wage	LQs	Less than 4-Year Degree
Industrial Machinery Installation, Repair, and Maintenance Workers	1,819	\$69,800	0.96	0.93
Business and Financial Operations Occupations	24,210	\$85,400	0.63	0.35
Metal Workers and Plastic Workers	3,930	\$51,400	0.63	0.96
Production Occupations	36,176	\$49,100	1.08	0.92
Laborers and Freight, Stock, and Material Movers, Hand	19,473	\$45,100	1.82	0.92
Construction Trades Workers	19,830	\$65,900	0.95	0.95
Engineers	3,120	\$117,100	0.48	0.20
Top Executives	8,647	\$143,400	0.62	0.55

Not only is the number of potential jobs substantial, but the types of jobs tend to be higher quality. Most of the occupations identified in the Rhodium Group report for both the construction and operations phases offer annual average wages that are higher than the regional average (\$58,700), and most have a majority of workers with less than a four-year degree (Table 4.4).

Opportunity Statement

1. The Region has Significant Sub-Surface Storage Capacity

The Sacramento-San Joaquin River Delta provides a tremendous competitive advantage to the region in attracting carbon management companies. One study by the Lawrence Livermore National Laboratory found that the Central Valley can likely store a minimum of 17 billion tons of carbon, or about 100 years of sequestration at the projected rate. The same research suggests that the storage potential may be as high as 200 billion tons, or nearly 1,200 years of active sequestration.⁴⁵ Importantly, this storage capacity can be found throughout the Central Valley, including the NSJV region.⁴⁶ This storage potential, combined with favorable geological conditions and local fossil fuel expertise, means that the NSJV has a significant competitive advantage for carbon management.

This advantage is already materializing as an array of carbon capture and sequestration projects take hold in the region. The research team identified six different companies⁴⁷ focused on carbon capture and sequestration or carbon removal, though there are likely more projects in the planning stage. There are also several more facilities in the southern part of the valley, which means that broader regional infrastructure and resources could be explored.

2. A Prepared Workforce for a Novel Industry

New industries often face workforce challenges as they try to scale. Fortunately, much of the knowledge and skillsets that are abundant in the NSJV through the fossil fuel industry are directly transferrable to the carbon management industry. As one industry professional stated “90% of our workers are repurposed from the Oil and Gas industry.” The benefits of this existing workforce are twofold; first, the learning curve for the workforce will be much shorter than most other new technologies. Second, this presents a substantial opportunity to support a just transition for fossil fuel workers as new opportunities in carbon management arise and require little reskilling for existing workers. While the technologies and mechanisms of these jobs may be slightly different, many of the knowledge and skills are transferable, and the wages and quality of these jobs are likely to be similar as well.

3. Network Effects as a Clean Energy ‘Hubs’

The NSJV region is set to become a clean energy ‘Hub.’ There are significant benefits to developing clean energy ‘hubs’ that include a group of actors that both produce and offtake clean energy products instead of some models that focus on interaction between a single producer and a single buyer. The US Department of Energy has intentionally funded programs that utilize this ‘hub’ model, and it is particularly useful in the case of carbon management. Deploying a range of carbon capture technologies ensures that the region is well-equipped to manage and reduce carbon emissions, which in turn supports the development and scaling of sequestration infrastructure. Similarly, in the case of BECCs and BiCRS, having a steady stream of inputs (agricultural or forestry waste), can help carbon negative biofuels producers plan and operate, now having a steady stream of inputs. The network effects of multiple providers of inputs and buyers of outputs helps develop a robust economy locally.

While a strong network of input providers and output buyers can help smooth supply and demand fluctuations of any one actor, this must be done in a way that prioritizes environmental integrity and economic equity for all stakeholders involved.

It remains critical that the development of carbon management strategies under this hub model remain aligned with NV THRIVE’s goals around equity, sustainability, and community impact. For example, this includes carefully considering the sources of potential inputs, such as agricultural or forestry waste, to ensuring that these sources do not exacerbate existing disparities or negatively impact surrounding ecosystems.

4. Prevalence of Feedstocks

The San Joaquin Valley is an agricultural powerhouse for both the state and the nation, though these agricultural processes result in a lot of agricultural byproducts that are often expensive or challenging to dispose of. State Bill 1383 prevents organic waste from entering landfills, so the two remaining disposal methods are composting and plowing the waste directly into fields. The former solution often generates greenhouse gas emissions during the decomposition process and the latter solution is resisted by farmers because it can propagate disease among crops. A third solution is the development of biofuels using certain processes which also capture and sequester carbon while generating fuel. This means that the abundance of feedstocks in the region offer significant opportunity for growth in both carbon

management and clean energy by enabling the production of biofuels and supporting the growth of the bioeconomy, which includes the creation of bio-based products.

5. Local and Regional Education and Research Centers

There are also a range of existing and nearby academic opportunities that will simultaneously provide the next generation of talent necessary for these new technologies while also developing the next generation of technologies themselves. UC Merced has a range of environmental-oriented research institutions, including the Environmental Analytical Laboratory, Natural Reserve System,⁴⁸ and Sierra Nevada Research Institute.⁴⁹ Kern County's Better Bakersfield and Boundless Kern (B3K Prosperity), California Renewable Energy Laboratory at Kern Community College District,⁵⁰ and California Energy Research Center (CERC) and CSU Bakersfield Energy Innovation Building⁵¹ also all have programs directly aimed at carbon management technology and talent development. These greater regional resources can support the activities within the NSJV, resulting in faster economies of scale and technological advancement. It will be incumbent on CA Jobs First to help support the coordination across various regional strategies with related industries, including carbon management.

6. Co-location of Renewable Electricity Generation Sites

Many carbon management activities, such as DAC and BECCS, require a substantial amount of electricity, and for projects to remain carbon negative, this electricity must come from clean sources. This means that having additional clean energy capacity available—either through assets that are in-front of or behind the electric meter (co-located generation)—is paramount to the success of these technologies. While this in itself is yet another criteria for these technologies, it is also a significant economic opportunity to generate more electricity locally with no pollutants emitted to local communities and to reap the benefits of that power (high-demand exportable goods, local jobs in construction and O&M, and decreased carbon emissions).

7. Natural Carbon Sequestration

The region's substantial amount of fertile agricultural land makes the region an ideal candidate to support natural carbon sequestration. This can be achieved through growing carbon-fixing crops and then either naturally decomposing the waste in a way that sequesters the carbon back into the soil or by using the waste as a feedstock into a BECCs or BiCRS system that creates energy and captures carbon. This provides a viable pathway for farmers and farm workers to join regional efforts to find climate solutions, and potentially receive additional income streams for what is otherwise often seen as "waste" products. The unique geology of Sacramento-San Joaquin Delta also provides the opportunity for significant space for carbon storage and sequestration, trapping carbon under thick sedimentary layers and deposits. Ongoing work in the Delta include efforts to utilize rice cultivation and re-wetting of deeply subsided peat soils to address subsidence and promote carbon mitigation through the reduction of CO2 emissions.

Problem Statement

1. Local Interests, Regulation, and Permitting

The Sacramento-San Joaquin Delta offers a substantial competitive edge for attracting carbon management companies. In fact, many of these companies are already setting up roots in the region. However, this early rush of activity has spurred the concerns of some residents, as the effects of various carbon mitigation strategies—particularly the effects on sensitive wetlands already imperiled by other factors—are somewhat unknown. This uncertainty—paired with the historical legacy of exploitive companies rushing into the region and depleting resources and wealth but leaving little benefit behind for

the community—has left some community members concerned and often skeptical of the environmental and worker impacts of new technologies. Ninety-one percent of surveyed residents in South Stockton stated that it was at least ‘important’ that the “government protects the environment and workers when it comes to industries related to climate change.”⁵² Addressing these concerns is paramount to ensuring that the opportunity of carbon management activities is not overshadowing the needs of the residents and their community.

Scientific studies—many of which are already underway—are attempting to mitigate the uncertainty around ecological impacts. In the case of carbon management, the new technologies often lack robust regulation. This lack of regulation is not always good news for companies, which may struggle under uncertainty to move forward with a project or a site, should it run afoul of future regulation. Therefore, it is in the interest of the region to proactively work on the development of regulations around these novel technologies in a way that avoids harm and mitigates risks, and supports the development of these technologies, rather than the hinderance.

Another important factor is permitting such as NEPA, CEQA, and local zoning ordinances. While significant for protecting the environment and encouraging responsible industrial development, these regulations often seriously delay or threaten project timelines and thereby can impact project finance and project feasibility. Several interviewees of target sector companies identified the support of the local government as one of the leading contributors for why their organization chose to locate within the NSJV. To continue to attract more target sector companies, local governments in partnership with regional entities such as North Valley THRIVE should continue to engage with communities to generate consensus around economic opportunities and connect with relevant employers, while streamlining and finalizing of permitting can help give companies concrete targets to meet and assurances that those targets will not change at a later date. This type of “de-risking” of investment projects is critical to not only bring investment to places that need it but also to bring the investment in a way that meets the needs of the community, build enduring support, and shape inclusive outcomes.

2. New and Relatively Unproven Technologies

New technologies inherently are higher risk strategies for economic development, but they can also reap substantial rewards, particularly if a region is able to be a “first mover” and get an early edge in attracting several related companies. While carbon sequestration activities are broadly just coming into their own as an industry and as a technology, the future demand for these products and services is ironclad. One of the ways to mitigate the risk of technological development, while also supporting meeting the future demand is to devise a strategy that supports numerous types of technologies, so that if one technology or method fails to take hold in the market, there are other offsetting successes.

The NSJV region is well-positioned to implement this strategy, by including DAC, BECCS, nature-based sequestration, and other technologies within its carbon management industry strategy. However, because carbon management strategies like DAC, BECCs and BiCRS are being explored for the NSJV external from the sectors prioritized by North Valley THRIVE, it is essential to consider the specific risks and challenges associated with their development in this region and how THRIVE can play a role in mitigating them. The state’s priorities for decarbonization and clean energy, combined with the availability of land and a robust agricultural sector, make the NSJV an attractive area for these technologies. However, development of these strategies within the NSJV region should be approached with caution.

The challenges posed by these carbon management technologies in the NSJV include concerns around scalability, potential impacts on local biodiversity, and the need for careful site selection to avoid negative

effects on surrounding communities. Any implementation of BECCs or BiCRS should prioritize the use of existing agricultural residues or byproducts and low-carbon energy crops, rather than promoting the cultivation of new crops solely for bioenergy.

Moreover, these technologies must be aligned with NV THRIVE's guiding principles, which emphasize equity, job quality, and sustainability in climate and environmental efforts. In doing so, North Valley THRIVE can play a key role in ensuring that these projects do not exacerbate existing disparities or harm vulnerable populations and can work to consultatively define what community and other stakeholders expect and want from the technology.



Circular Bioeconomy

The goal of this sector strategy is to establish the North San Joaquin Valley as a world leader in circular bioeconomy innovation, developing a cluster of bioindustrial manufacturing industry activities that create quality jobs and make sustainable use of local resources and diverse waste-streams. Bioindustrial manufacturing uses biotechnology and bioengineering to produce non-medical bio-based products, including chemicals, materials, energy, food, and other goods. This strategy will not only jump-start a high wage sector in the North San Joaquin Valley but will also help accelerate environmental solutions such as reducing greenhouse gas emissions, improving soil health, and supporting local water and air quality.

Sector Definition and Profile

Sector Definition

The Bioeconomy represents the segment of the economy based on products, services, and processes that come from biological resources (e.g., plants and microorganisms). This broad sector spans many industries and product categories that use biology and biotechnology to create valuable products from renewable organic materials (biomass).

Table 6 Summary of how bioeconomy has been defined by several institutions

Organization & Year	Definition
2018 – European Commission, Updated Bioeconomy Strategy	“The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions, and principles.”
BioPreferred-Daystar Analysis, 2018 updated in 2023	“The seven major sectors covered that represent the U.S. biobased products industry’s contribution to the U.S. economy are: agriculture and forestry, biobased chemicals, biobased plastic bottles and packaging, biorefining, enzymes, forest products, and textiles. The report specifically excludes the energy, livestock, food, feed, and pharmaceuticals sectors.”
National Academies report, Safeguarding the Bioeconomy , 2020	“Economic activity that is driven by research and innovation in the life sciences and biotechnology and biomanufacturing, including industries, products, services, and the workforce.”
White House Executive Order , 2022	“Economic activity derived from biotechnology and biomanufacturing.”
Congressional Research Service, Follow-up Brief to the Executive Order, 2022	“The portion of the economy based on products, services, and processes derived from biological resources (e.g., plants and microorganisms).”
Schmidt Futures , 2022	“An economy that forgoes the traditional linear economic model of “take-make-consume-throw away” for one that uses the power of biotechnology, design for bioproduction, and machine learning/artificial intelligence to create and economic system in which waste products serve as inputs to create highly valued products and materials that are used as long as possible, and reused without drawing down limited resources or generating waste that are disposed into the atmosphere, landfills, or rivers, lakes, and oceans.”

The term “circular” emphasizes sustainable manufacturing practices and solutions that limit waste and strengthen environmental sustainability by repurposing biomass residues that come from existing activities, such as agricultural production, food processing, and municipal waste processing.

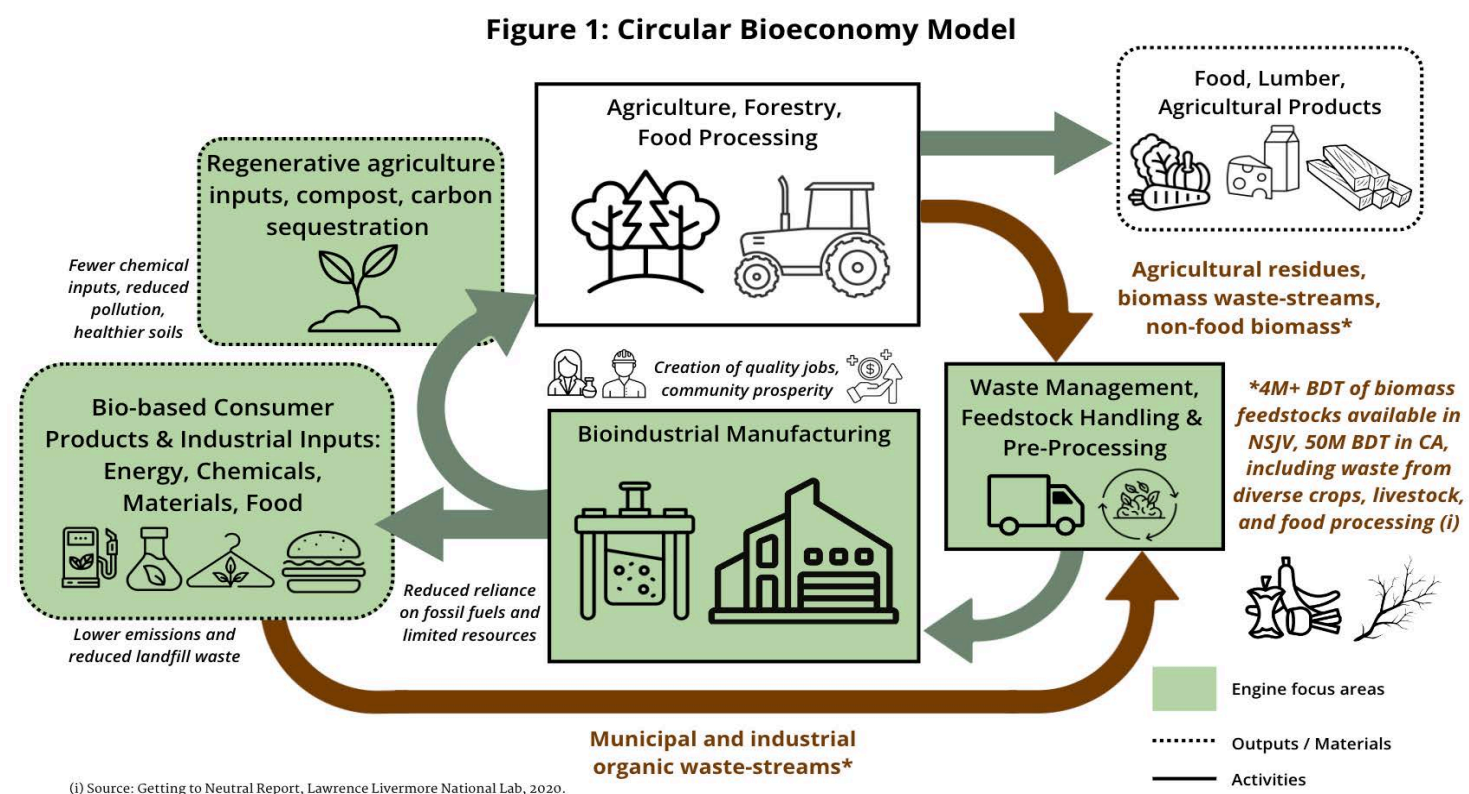
In the circular bioeconomy, materials that would otherwise be wasted serve as inputs to create products and materials that are used and reused as long as possible, without drawing down limited resources or generating wastes that are disposed into the atmosphere, landfills, or rivers, lakes, and oceans.

Bioindustrial manufacturing refers to manufacturing that uses biology to produce non-medical or non-pharmaceutical bio-based products including bio-based energy, chemicals, materials, food, agricultural products, and other goods. Therefore, the Circular Bioeconomy represents many types of activities, innovations, and technologies that use the power of biology to create useful products and reduce waste.

Bioeconomy definitions are broad, overlapping, and inconsistent. Very few definitions lend themselves to precise employment measurement. European definitions encompass sustainability. US-based definitions tend to focus on the innovative manufacturing aspects of the bioeconomy. The industry would greatly benefit from a set of standards and measurable definitions. However, this can only be fully achieved at the national level.

The following is a visualization of the Circular Bioeconomy and the proposed strategic approach of the NSJV circular bioeconomy strategy. As is evident in the below diagram, the goal is to connect lab-scale R&D to the region’s diverse feedstocks and also increase the technology readiness level of projects that use these diverse biomass feedstocks and biomanufacturing operations in order to reach commercial scale production. This will enable both an integrated innovation pipeline and the demonstration of a circular bioeconomy model.

Figure 11 Circular Bioeconomy Model



Regional Sector Profile/Analysis & Outlook

Measuring total employment in the bioeconomy

Defining overall employment in the bioeconomy is challenging in part because the bioeconomy is defined more by the inputs it uses (i.e. bio-based instead of fossil-fuel based) than by traditional industry classifications which focus on a process (i.e. manufacturing) or a function (i.e. energy). Traditional industrial classifications currently do not distinguish between manufacturers who use biomass or bio-based inputs versus those who use fossil fuels. As a result, to create a picture of the bioeconomy it is necessary to make job estimates based on the potential for companies and industry groups of industries to use or shift to bio-based inputs and outputs.

To analyze industrial employment, analysts use NAICS codes (the taxonomy for the North American Industry Classification System). These are imperfect tools. But they are necessary for tracking measures like employment, gross regional product, and wages on a consistent and comparative basis.

As noted above, defining the employment and industry segments in the bioeconomy in the North San Joaquin Valley is difficult as there is no defined NAICS code for bioproduction or biomanufacturing. Some segments are exclusively bioindustrial (such as biodiesel) while other segments of the bioeconomy (such as food, beverages, leather, and textile manufacturing) include companies who do bioproduction as well as companies whose waste streams are inputs to the bioeconomy. In addition, bioindustrial manufacturing is a collection of industries that either are or have the *potential* to do bioproduction if they switch their feedstock to biomass (such as chemicals and plastic). There are also important suppliers and specialized inputs to bioproduction such as machinery manufacturing (which includes the manufacturing of specialized fermentation tanks) and specialized logistics (which includes specialized trucking, waste collection, and refrigerated storage).

Overall, for the purposes of analyzing and understanding the structure and size of the bioeconomy in the North San Joaquin Valley, the following are the four areas to analyze and measure:

- **Foundational activities** – This includes agricultural activities as well as wood and paper manufacturing. The waste products from these industries can become inputs to the bioeconomy.
- **Food Manufacturing** – This includes the large sub-category of manufacturing that encompasses food, beverage, textile, and leather manufacturing. These are defined separately to acknowledge that while waste from these industries can be a bioeconomy input, these industries also do bioproduction (which is distinct from wood and paper manufacturing).
- **R&D & Technical Services** – This includes private research and environmental consulting services.
- **Bioindustrial Manufacturing** – This includes the collection of industries that either are *currently* doing bioproduction or have the *potential* to do bioproduction.

In addition, there are other segments of the economy that are worth tracking at the employment level as they provide specialize inputs to the emergence of a bioeconomy cluster:

- **Specialized Logistics** – This includes a collection of industries such as specialized trucking, waste collection, and refrigerated storage.
- **Pharmaceutical Manufacturing** – This involves the manufacturing of medicines. This is a widely noted sub-category of the bioeconomy.
- **Machinery Manufacturing** – This is an important input to bioproduction (ex: the manufacturing of specialized fermentation tanks).

For further examination of the methodology and approach for the measurement of the bioeconomy and the various approaches, see Appendix 4B.

Given the above, the current overall employment in the NSJV's bioeconomy is primarily concentrated in the foundational agriculture and food and textile manufacturing segments. Together, these two segments account for 13% of *all* employment in the region, roughly 80,400 jobs. In Merced County alone, these two segments account for 25 percent of all jobs in the county.

Based on an initial estimate, the bioindustrial manufacturing segment of the local bioeconomy alone represents about 1% of all NSJV employment, just 8,200 jobs.⁵³ This is a count of jobs located at bioindustrial companies in the region that *could be or have the potential to be* performing bioindustrial manufacturing. It is not a reflection of the entire bioeconomy as that also includes major inputs (from agriculture, food manufacturing and other sources). As explained further in Appendix 4B, there is no current source or census that provides a complete list of all the manufacturers in the region (or country) doing confirmed bioindustrial manufacturing.

The 8,200 jobs also include some jobs that are included in the other three priority sectors of the North Valley THRIVE strategy (See Table 4.6).

Table 7 NSJV Bioindustrial Manufacturing Employment

Total NSJV employment in bioindustrial manufacturing:	8,198
Job totals also included in Advanced Manufacturing:	2,669
Job totals also included in Clean Energy:	693
Job totals also included in Carbon Management:	1
Remaining jobs that are exclusively Bioindustrial:	4,835

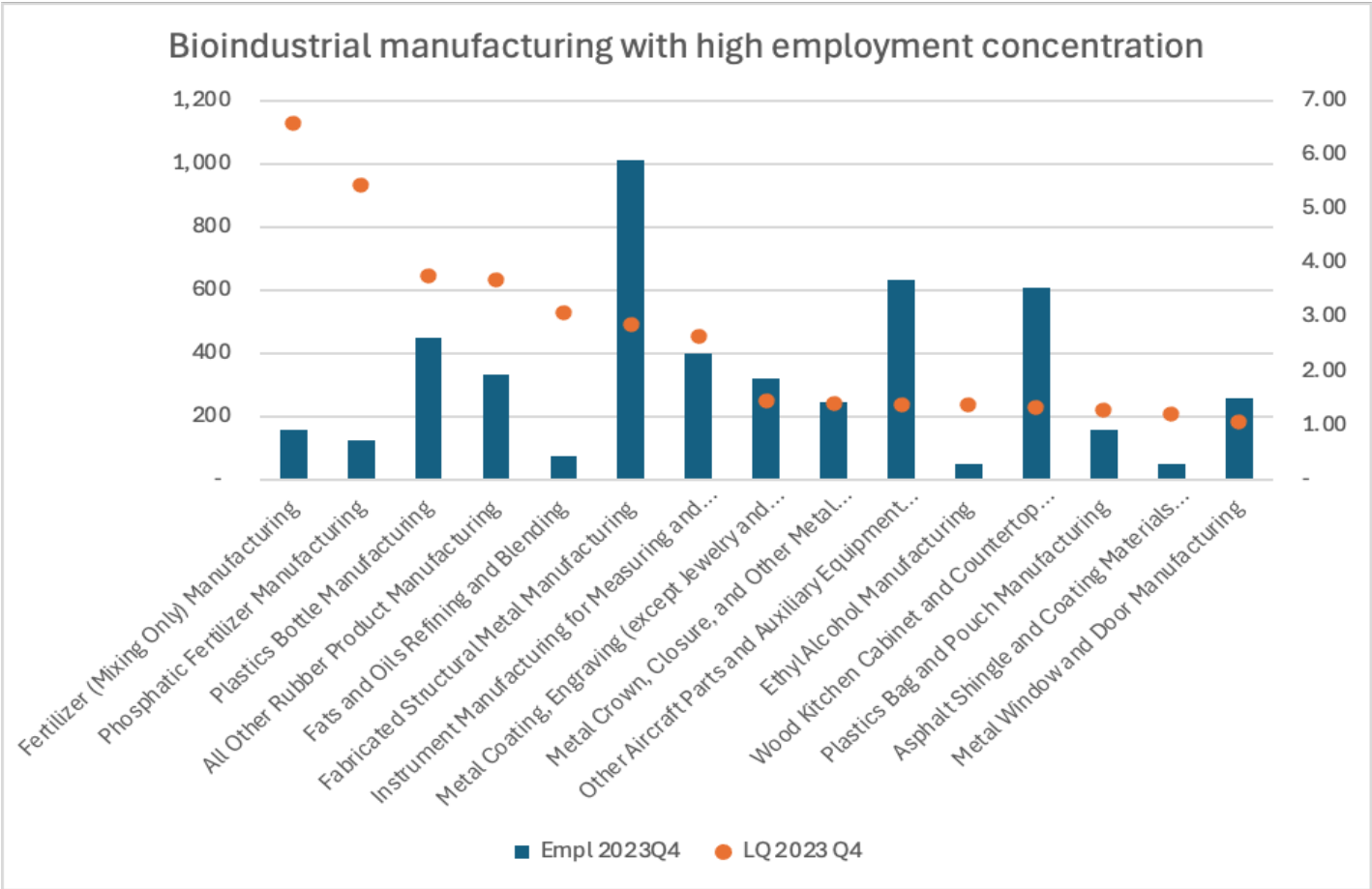
This overlap is natural as bioindustrial manufacturing includes some notable industry sectors that are included in both Advanced Manufacturing and Clean Energy (such as Fabricated Structural Metal Manufacturing which has over 1,000 jobs in the region). In this segment, 64% of jobs are allocated to Advanced Manufacturing and the remaining 36% are allocated to Clean Energy.

Table 8 NSJV Fabricated Metal Manufacturing Employment

Fabricated Structural Metal Manufacturing (NAICS 332312)	Total jobs 1,015	Location Quotient 2.88	Avg Annual Wages per Worker \$80,307
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Within the complete definition of bioindustrial manufacturing, there are some segments with current high employment concentration. Figure 4.9 shows the current employment for industries at the 6-digit NAICS that have a location quotient greater than 1.0.

Figure 12 Bioindustrial Manufacturing with High Employment Concentration



Wage levels in the bioeconomy vary by subsegment with the highest wages in bioindustrial manufacturing.

Currently, the food and textile manufacturing industries have among the lowest median wages and offer a relatively small percentage of quality and promising jobs. Only 9% of jobs in local agriculture production and 21% of jobs in local food and textile manufacturing meet the region’s “good job” wage standard of about \$66,900 annually. The median wage of occupations typically found in food and textile manufacturing is \$48,000 (on par with the region’s median wage). This is nearly 40 percent below the quality job wage threshold in the NSJV.

Median wages in the region for current activities in the bioindustrial manufacturing segment are currently \$69,974, which is over 43 percent higher than the region’s median wage of \$48,200. It is also above the region’s quality job threshold of \$66,900. It is also comparable to the wages for R&D services (\$68,700).

Overall, in all cases, median wages by industry in the North San Joaquin Valley lag median wages across California for the same industries. In California, the median wage is \$76,700 and the average wage for R&D services is \$86,600 statewide. Additionally, the share of jobs by industry that are defined as quality or promising varies, with R&D services having the highest share of quality jobs.

These dynamics suggest that growing the bioindustrial manufacturing industry offers opportunities to not only increase wages above the region’s current median, but also to meet the region’s quality job threshold. In particular, the region should especially target higher-value segments of bioindustrial

manufacturing, including growth of innovation and R&D activities as well as segments of bioindustrial manufacturing that are higher up the value chain, in order to target wages above the region's quality job threshold.

Market outlook

Nationally and globally, the bioeconomy has potential for major growth.

This growing bioeconomy plays an increasingly critical role in our environmental future, national security, and global economy. Bioindustrial manufacturing has a forecasted economic impact of \$4 trillion over the next 20 years.⁵⁴

The Federal government has taken proactive steps to support the growth of the bioeconomy sector in order to meet important national security, climate, and economic innovation goals.

Currently, the U.S. lags competitor nations in bioindustrial capabilities. As a result, the Federal government has taken an increasing interest in standing up the industry and rapidly building out the domestic capacity in this sector. Key actions include the Biden Administration's 2002 Executive Order 14081 on Advancing Biotechnology and Biomanufacturing Innovation, the Sustainable Aviation Fuel Grand Challenge, the release of the USDA's plan to build a Resilient Biomass Supply chain, and the DoD's announcement of over \$1.2 billion of investments into domestic biomanufacturing.⁵⁵ Together these reflect growing recognition of the national importance of accelerating biomanufacturing capacity and capabilities. Overall, the growth of this industry supports key national goals, including supply chain resilience, climate change solutions, food and agriculture innovation, and furthering human health.

There is increasing private sector investment in biomanufacturing.

Since 2020, private companies have announced over \$20 billion in biomanufacturing investments across the US.^[4] Nationally, industrial bioeconomy outpaces both solar photovoltaic and wind turbine production in the number of total jobs nationally as well as contribution to US GDP.

Policy and market forces are driving demand for alternatives to petroleum-based products.⁵⁶ Biobased products contributed \$489 billion to the U.S. economy in 2021, an increase of over 5% from \$464 billion in 2020.⁵⁷

The industry's growth is not limited by global supply chains as feedstocks and inputs are localized (and significant available biomass is currently unused).

The growth of the bioeconomy relies on local suppliers (biomass feedstocks and commodity inputs), which are generally near manufacturing. Feedstocks come from both major population areas as well as natural and working lands (e.g. agriculture, forests).

To meet the demand for bioproducts and establish a bioeconomy that is competitive, sustainable, and resilient, the U.S. must invest in regional solutions and circular bioeconomy models that make use of diverse biomass feedstocks, reduce waste, and enable biomanufacturing at scale.

The DoE estimates that available but unused biomass resources could provide an extra 350 million tons of biomass annually, potentially doubling the size of the U.S. bioeconomy.⁵⁸

Problem Statements

Regional feedstocks need to be better studied and made more easily accessible.

The biomass inputs to bioindustrial manufacturing, or “feedstocks,” are key enablers of industry growth. The NSJV has natural competitive advantages in the attraction and development of bioindustrial manufacturing due to the variety and abundance of biomass residues that come out of existing agricultural and food processing activities in the region. It is economically advantageous to base biomanufacturing activities that rely on large volumes of biomass within 50–75 miles of the feedstock source, creating natural clustering opportunities for manufacturing activities within the NSJV. However, innovation is necessary to ensure that bioindustrial manufacturing activities can take advantage of more diverse feedstocks than the historic reliance on only a few types of sugar sources (e.g., corn). Biomanufacturing processes in the U.S., thus far, use only a select few feedstocks, predominantly corn.⁵⁹

In addition, coordination and solutions are required to ensure that local feedstocks are readily accessible to potential users. Currently there is limited understanding in the market of the volume and potential uses of the region’s feedstocks, and potential suppliers and customers are not well connected.

Bio based products are not yet cost competitive with traditional fossil fuel-based products.

Like all emerging sectors, bio-based products remain higher cost than other products produced by traditional fossil fuel methods, which are matured technologies. The production processes for many bio-based products are novel, often more complex and less efficient than those for fossil fuel-based products. Bio-based materials typically require more processing steps, specialized equipment, and additional treatments to meet performance standards. Therefore, the overall production costs for now are higher. Ongoing investment in research and development is required to improve the efficiency and cost-effectiveness of bio-based products.

The bio-based product industry is still relatively young compared to the fossil fuel industry. Fossil fuel-based products benefit from large-scale production and established supply chains, infrastructure, and subsidies, which reduce costs. Consumer and industrial acceptance of bio-based products is also still growing. Limited demand can result in higher costs due to lower production volumes. As bioindustrial manufacturing technologies scale up and market demand grows, production will reach economies of scale that will make bioproducts more cost competitive.

Despite these challenges, continued advancements in technology, increasing environmental awareness, and supportive policies are rapidly improving the competitiveness of bio-based products; BCG analysis suggests that biological technologies and processes will be used extensively in the manufacturing industries that make up two thirds of all global economic outputs by the end of this decade.⁶⁰

The region has a low level of employment in R&D services that are necessary to grow the sector.

With less than 1,300 total jobs, the region underperforms in R&D services. The North San Joaquin Valley has half the level of jobs in R&D (LQ of 0.81) compared with California overall (1.61 LQ). California overall is highly specialized in R&D and technical services with a LQ score of 1.61 means that if the region matched CA’s specialization in research and development, they would need an additional 2,134 jobs in this industry. This is more than double current levels.

Wages in the region’s bioeconomy lag the wages for California.

There are large gaps between NSJV median wages and CA median wages. This is due both to different

costs of living as well as to varying occupational distributions within the groups. There is a gap in scale-up infrastructure in California and the United States, in comparison to other countries.

Currently, the United States has a shortage of pilot- and demonstration-scale biomanufacturing facilities that enable companies to validate their technologies beyond the lab scale, a key step in the path to commercialization. If companies that the NSJV hopes to nurture and attract in bioindustrial manufacturing do not have access to scale-up facilities and related resources to support their path to commercial-scale manufacturing, they are likely to fail on their path to scale and/or leave the country to access this capacity overseas, where it currently is more available than in the US.

Opportunity Statements

Growing the bioeconomy requires tailored solutions at the regional scale.

The growth and progress of the bioeconomy sector is slowed by gaps in numerous areas: biomass conversion technologies, biomanufacturing scale-up capacity, biomass supply chain readiness, and workforce capacity. However, each of these gaps each require regional approaches and solutions. The opportunity to tackle these precise barriers are also aligned with the needs and capabilities of agricultural communities and manufacturing industries.

Bioindustrial manufacturing is best located near the sources of biomass feedstocks that will be used in production.

The communities that support natural and working lands, often rural and disinvested communities are best positioned to both lead and benefit from manufacturing in this growing sector, which will generate high quality jobs and return new value to existing industries. Siting bioindustrial manufacturing near biomass feedstock sources is a strategic decision that enhances economic, environmental, and logistical efficiency, contributing to the viability and sustainability of bio-based industries.

Transporting biomass feedstocks over long distances can be expensive due to their bulkiness and relatively low energy density. Locating manufacturing facilities close to the biomass sources minimizes transportation costs and logistical challenges. Further, transporting biomass over long distances not only incurs financial costs but also results in additional greenhouse gas emissions from the transportation process. By situating manufacturing near biomass sources, the environmental footprint associated with transportation can be significantly reduced.

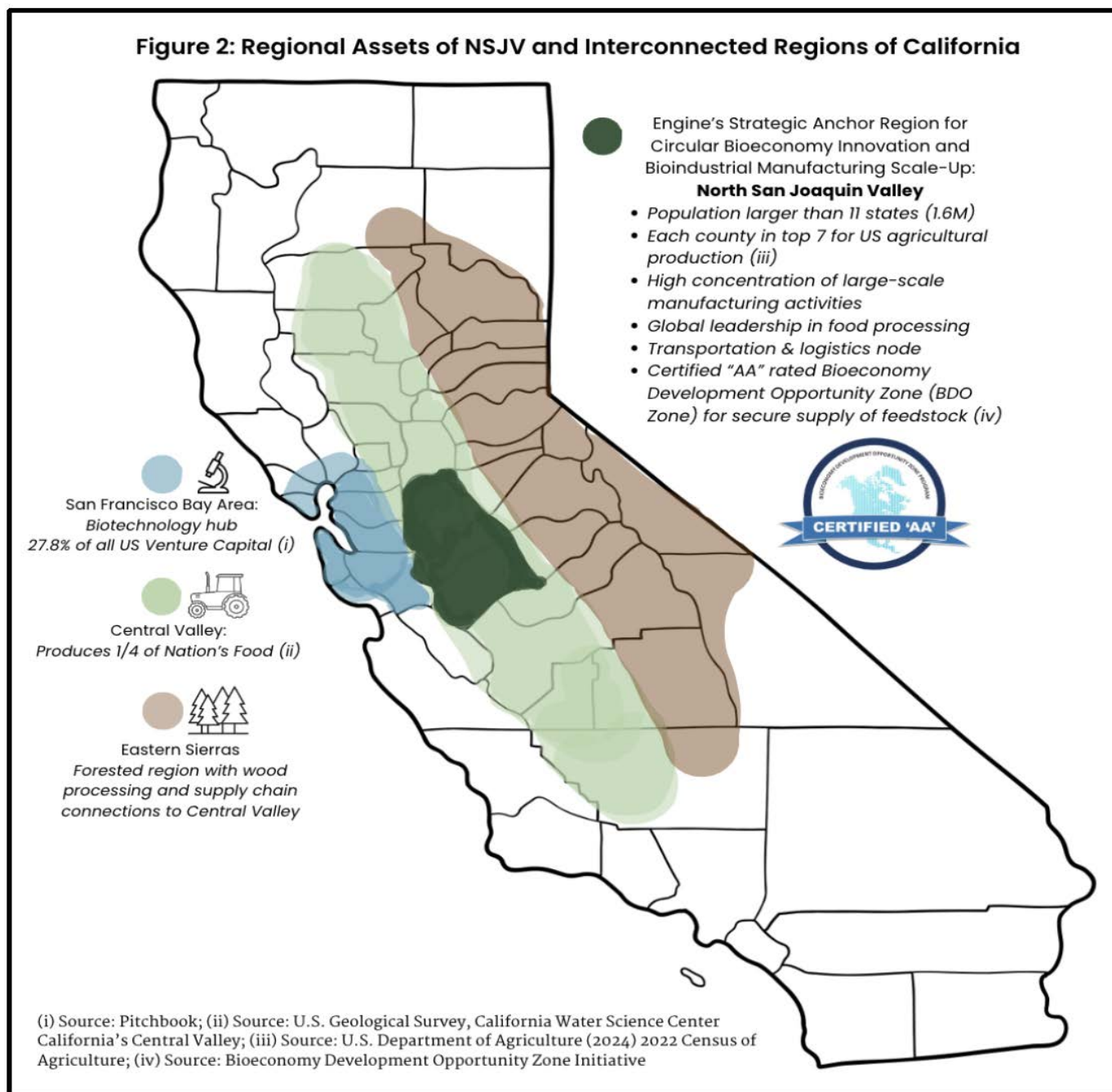
Biomass feedstocks, especially those derived from agricultural, food and forestry residues, can degrade over time. Proximity to the source ensures that the feedstocks are processed while they are still fresh, maintaining their quality and maximizing the efficiency of the manufacturing process.

Being close to biomass sources reduces the risk of supply chain disruptions. Factors such as weather, transportation infrastructure issues, and geopolitical events can impact the delivery of feedstocks if they need to be transported over long distances. Local sourcing enhances reliability and consistency.

Establishing bioindustrial facilities near biomass sources can stimulate local economies by creating jobs and supporting local businesses. This can lead to economic development in rural and agricultural regions, providing additional incentives for local communities to support bioindustrial projects.

Proximity to biomass sources often means proximity to existing agricultural, food and forestry industries enabling the sharing of infrastructure and logistics networks.

Figure 13 Regional Assets of the NSJV and Interconnected Regions of California



California has the opportunity to be a national and global leader in the circular bioeconomy.

The Circular Bioeconomy sits at the intersections of biotechnology, manufacturing, and agriculture. California leads the nation in all three, as the most agriculturally productive state, with the largest share of manufacturing activity, and boasting the United States' largest concentration of biotechnology firms and workforce.

Within California, the North San Joaquin Valley has the greatest concentration of assets for bioeconomy startups.

The combination of three factors: agriculture, manufacturing, and adjacent biotechnology expertise makes the NSJV a preferred potential home for bioproduct start-ups (possibly nurtured in the Bay Area) who wish to scale production beyond a lab setting and take advantage of some combination of abundant feedstock, manufacturing talent, or a large grower/food processor customer base.

The North San Joaquin Valley is the nation's best-positioned region for the bioeconomy due to abundant feedstock, infrastructure, proximity to markets, and access to capital and talent.

The NSJV the only region in the nation with a combination of large-scale agricultural production, a top-tier concentration of manufacturing activity, and driving-distance proximity to a leading hub of biotech innovation.

These assets give the NSJV unparalleled access to relevant feedstocks, manufacturing infrastructure, workforce capabilities, and world-class innovation.

The region has abundant feedstocks to support the growth of the bioeconomy.

The NSJV is one of the most productive agricultural regions in the world. The region has high-volume specialty crop production, dairy farming, and food processing, with several of the largest food manufacturing facilities in the world – including for wine, dairy, fruit, nut, and vegetable processing. The NSJV produces 30% of the almonds, 41% of the corn, 71% of the chicken eggs, and 20% of the dairy products produced in California.⁶¹ Additionally, each of the NSJV's counties is in the top seven agricultural producers in the U.S.⁶²

As a result, the NSJV region offers some of the highest diversity and abundance of biomass – an estimated 4 million BDT (“bone dry tons”) per year of total waste biomass in 2045. Combined, the NSJV offers diverse agricultural byproducts as well as factory food waste and organics from municipal solid waste. These abundant and diverse residues that can be used as inputs (feedstocks) for bioproducts.

The region has an existing manufacturing base to leverage.

The region has a high concentration of manufacturing activities with over 58,000 total jobs in manufacturing (reflecting 10 percent of employment). The NSJV also leads the state and nation in food manufacturing in particular, an industry that closely relates to and intersects with bioindustrial manufacturing.

The region also has high employment concentration in two of the key inputs to the bioeconomy in the region. Specialized logistics and machinery manufacturing have regional location quotients of 2.36 and 1.28 respectively. This represents that the NSJV appears to have a competitive advantage that could contribute to the building of a local bioindustrial manufacturing cluster. In addition, North Valley Thrive has further identified machinery manufacturing as a core part of the Advanced Manufacturing priority sector.

The region is proximate to the biotech and life sciences cluster of the Bay Area, which provide skills and expertise which can be leveraged for the growth of the bioeconomy.

The region is located next door to the San Francisco Bay Area, a global leader in biotechnology innovation and resources. This North Valley Thrive strategy seeks to further leverage the benefits of adjacency of the North San Joaquin Valley and Bay Area as part of a more unified Northern California megaregion. There are growing connections between economic development organizations and entities within both regions.

The region's workforce is poised to capture the opportunity of the bioeconomy.

The workforce in the NSJV have expertise in managing and processing these materials. This local knowledge and experience can be beneficial for the efficient operation of bioindustrial manufacturing facilities.

Supporting the circular bioeconomy advances key state goals in climate (GHG reduction), equity (quality jobs in disinvested communities), and economy (economic diversification).

Approximately 24% of all greenhouse gas (GHG) emissions are attributed to food, agriculture, and land use, driven largely by waste across the food supply chain.⁶³ Additionally, 58% of the methane emissions from U.S. landfills is caused by food waste, contributing greenhouse gas emissions equivalent to over 50 million gas-powered passenger vehicles every year.⁶⁴ The transition to a circular economy and reduction in waste across food and agriculture systems provides a significant opportunity to reduce GHG emissions, accelerate the transition to a carbon neutral economy, support regenerative agricultural practices, and reduce dependence on fossil fuels.

Food and organic waste that ends up in landfills is a significant source of methane emissions, a powerful greenhouse gas. Methane also comes from dairies. Other activities related to agriculture such as trucking and agricultural burning also add to pollution and contribute to poor air quality in local communities. Clean energy solutions like wind and solar energy and transitioning to electric vehicles are critical for reducing many sources of greenhouse gas emissions. Bio-based solutions add to these important tools by preventing and reducing methane emissions, keeping waste out of landfills, providing low-emission biofuels for sectors that will take time to electrify (like long-range trucking and aviation), and providing clean alternatives to burning agricultural waste.

Bio-based chemicals and materials also reduce emissions by offering more sustainable alternatives to petrochemicals across a wide range of industries. The petrochemical industry is responsible for approximately 10% of the global energy-related greenhouse gas emissions. Petrochemicals are used in a wide range of products beyond fuels including plastics, fertilizers, solvents, packaging, clothing, digital devices, medical equipment, detergents, cosmetics, tires, and many other everyday items. By replacing petrochemicals with bio-based alternatives we can reduce emissions and the use of toxic chemicals that affect our water, air, and health.

Bio-based alternatives also support regenerative farm practices and healthy soils, for example using organic fertilizers, compost, sustainable pest management options, and soil amendments that support soil health, biodiversity, and water retention.

Incorporating circular bioeconomy principles into biomanufacturing avoids greenwashing and leverages California's true climate and environmental leadership.

Not all forms of biomass management and biomanufacturing have a positive environmental impact. Some involve intensive water or energy use and may add to local pollution. It is important for our region to invest intentionally in the technologies and projects that reduce emissions, prevent burning, and have a net positive impact on local environmental conditions rather than creating harm. To do this, the sector must take care to avoid "greenwashing" (or making false claims of sustainability), and work to carefully assess and monitor the impact of new projects. By being intentional, using a community-centered approach, and grounding our work in scientific expertise, the region has the power to accelerate some of the world's most exciting climate solutions while ensuring that vulnerable local communities benefit both economically and environmentally.

Key existing assets to leverage:

The region has key employers in food and beverage manufacturing, especially those that leverage fermentation technologies.

These global leaders include Gallo, the world's largest winery and Hillmar Cheese, one of the largest dairy processing facilities in the world. The size and scale of these companies allows them to be leaders not only in fermentation research but also feedstock aggregation. The larger beverage manufacturing industry also has existing infrastructure (e.g. fermentation tanks, preprocessing and downstream processing equipment) which could be assets for bio-based manufacturing companies. There are also intersecting occupations across these industries and firms.

The region received the first Bioeconomy Development Zone in California.

The Bioeconomy Development Opportunity Zone (BDO Zone) Initiative recently certified NSJV as a rare "AA-rated" BDO Zone [36], signifying a technical, standards-based assessment of regional manufacturing readiness and potential for biofuel, renewable chemical, biogas or bio-product plants. This is the first certified BDO Zone in California, and the first in North America certified for its secure supply of tree nut crop residues as feedstocks.

The region has an existing and growing cluster intermediary organization - BEAM Circular - whose stated mission is to advance the bio-circular economy in rural agricultural regions.

BEAM Circular is the hub organization for the BEAM Initiative (BEAM stands for "BioEconomy, Agriculture, and Manufacturing"). BEAM is hub for the circular bioeconomy in California's agricultural heartland and manages a portfolio of public and private projects designed to scale the most promising innovations in bioindustrial manufacturing and to advance solutions that support economic and environmental outcomes for local communities. BEAM facilitates strategic planning, program delivery, and community engagement to ensure inclusive and sustainable outcomes, while also providing support to organizations, businesses, and government agencies involved in the circular bioeconomy. Through direct community engagement and collaborative governance, BEAM Circular works to center local communities and partner with a diverse range of stakeholders to oversee and implement regional bioeconomy development efforts.

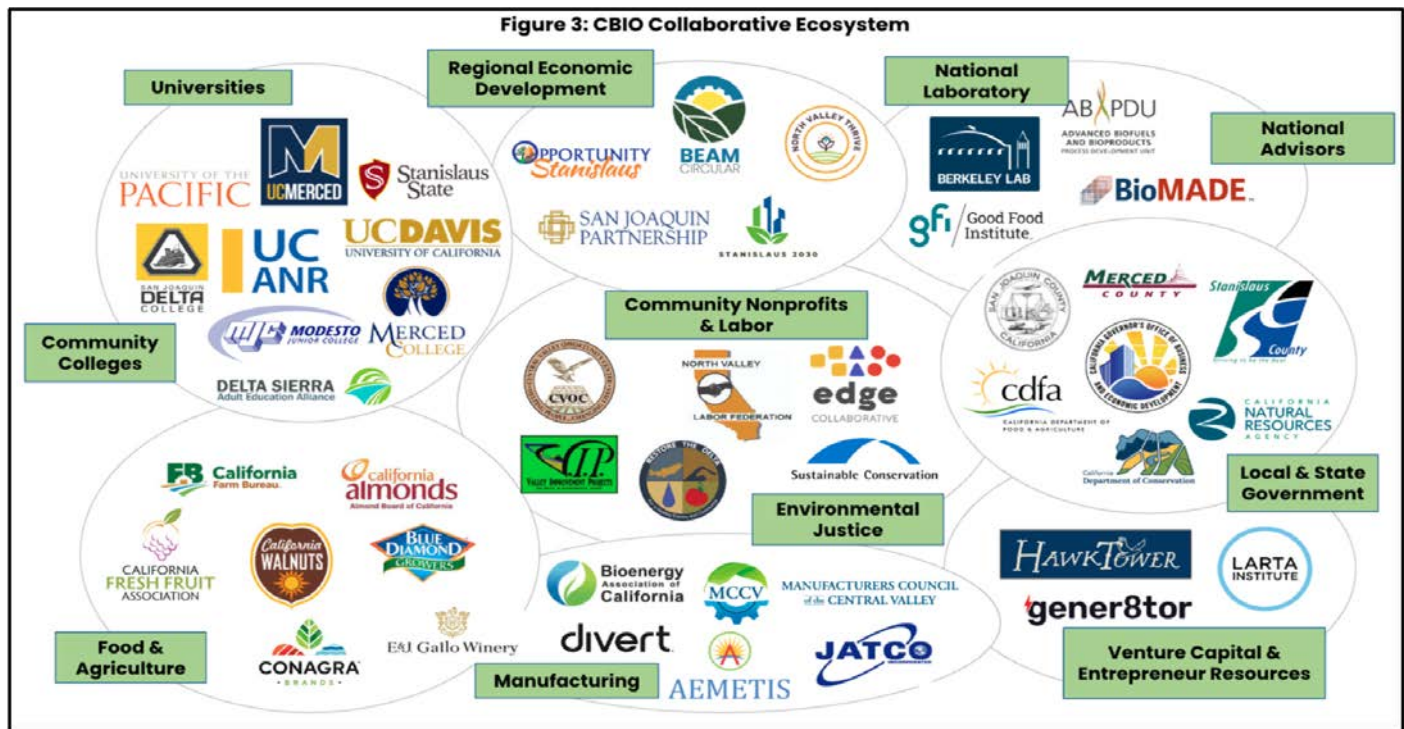
The BEAM Initiative is prepared to support this industry's takeoff in the NSJV and statewide, and has secured \$55+ million from private, federal, state, and local sources over its first 18 months. This includes \$10 million from Stanislaus County funding through ARPA, \$15 million in other state and federal public and philanthropic grant funding, and a \$30 million venture capital commitment to support biocircular startups in the NSJV over the coming decade.

Grant funds include a \$1M National Science Foundation Regional Innovation Engine Development Award to support development of a \$160 million NSF grant proposal. BEAM Circular with co-leadership from Lawrence Berkeley National Laboratory and UC Merced have formed a coalition of partners called CBIO Collaborative that includes over 60 regional institutions, and which engaged hundreds of collaborators and community members in development of a strategic vision for a Regional Innovation Engine that will advance the region's leadership in circular bioeconomy innovation and bioindustrial manufacturing industry development. University of California, Merced is a Minority-Serving Institution with research, education, and practice strengths in business ecosystems, bio-based products, regenerative agriculture, and other areas of multidisciplinary research and development. Lawrence Berkeley National Laboratory (LBNL) is a national leader supporting the science and scale-up of bio-based fuels, chemicals, and materials and houses the Advanced Biofuels and Bioproducts Process Development Unit (ABPDU).

The BEAM Initiative is led by a diverse, cross-sector coalition of partners including:

- Industry leaders from food, agriculture, and biomanufacturing
- Local, regional, and state governments partners
- Education and workforce development institutions, including all six of the community colleges and four-year universities in the NSJV region
- Labor, environmental justice, economic dev., and community-based organizations
- Regional and national bioeconomy innovation institutions; national laboratories

Figure 14 CBIO Collaborative Ecosystem



BEAM was one of the recipients of the first 10 pilot projects under CA Jobs First.

Through this \$3.6 million investment, BEAM Circular is launching a wide variety of pilot projects across its portfolio, including workforce development programs; innovation vouchers and other assistance programs for local businesses that enable access to capital and innovation resources; a startup accelerator program; community engagement activities; and research on local community impact of the bioindustrial supply chain.

Lawrence Berkeley National Laboratory is increasingly working on bioeconomy solutions with the North San Joaquin Valley.

LBL is co-leading CBIO Collaborative with BEAM Circular and UC Merced, and also serves as lead – alongside co-leads BEAM Circular and UC Berkeley, and in partnership with UC Merced, UCANR, and USDA – of a new joint project called BioCircular Valley that has received a \$9.7 million award from Schmidt Sciences and Foundation for Food and Agricultural Research (FFAR). The project will study and develop a public portal for improving sustainable use of feedstocks from the NSJV. The project is an example of the NSJV's growing engagement with LBNL and other leading innovation institutions from the broader Bay Area and Northern California megaregion to advance innovation that results in increased opportunities for bioeconomy development in the NSJV that returns value to local communities.



Chapter 5:

How We Will Get There: Priority Sectors Investment Strategies



The Strategic Opportunity for the Region is Rooted in Capturing a High Road Economic Transition

The growth of the region's four emerging priority sectors will not occur without intervention. It requires continued proactive planning and implementation that the region is currently undertaking. This work is being led by North Valley THRIVE and its many partners. The goal is to change the region's economic model from a status quo where many jobs pay low wages and the region's traded sectors are in lower value-added activities. While traded sectors like agriculture, food processing, and warehousing/logistics will continue to be important drivers of the region's economy and a significant source of employment, the region also has new employment opportunities in the emerging priority sectors described in Chapter Four. These emerging industries can lay the groundwork for a different future regional economy. This new direction for the region will result in higher wage employment and economic activities moving up the value chain. It will capture the state and federal investment into climate friendly and sustainable industries while prioritizing inclusion.

Achieving this different economic future requires both proactive planning and extensive community engagement and consultation. This means that residents, businesses, local government, and other stakeholders and decision makers must continue to convene to develop a common vision for what the region can look like and how to get to that point.

In addition, it requires implementation of a new economic framework for the region. This framework identifies first the importance of deploying locally new technologies (such as clean energy) which are developed elsewhere. Second the framework recognizes the need to then produce and manufacture these new products and technologies locally. Below this is referred to as "translation." (This is related to a concept in international economics called "import substitution"). And third, the framework focuses on turning locally generated innovation into new start-ups as part of emerging specialization and competitiveness of the region's priority sectors. This emergence of distinct specialization (which some refer to as the growth of an industry "cluster") would imply the region has a range of firms across the value chain and a healthy mix of start-ups and existing firms looking to expand through sales of goods and services beyond the region (i.e. as part of a traded or export sector).

What follows is a high-level explanation of this approach which is designed to foster a stronger and more resilient NSJV regional economy that produces more high-quality jobs, increases accessibility to opportunity, improves the local environment, reduces pollution, and captures market shift towards climate-friendly industries.

The overall approach of the investment strategies requires these three investment ideas:

- 1. Technology Deployment: Increase deployment of existing technologies across local companies already in the NSJV region.** This includes investments that spur existing companies in the region to expand their offerings or bolster their workforce within existing technologies, such as solar, advanced manufacturing, and biofuels. These strategies tend to be oriented towards short-term development. For example, Wright Solar Park in Merced County, a ground-mounted solar project which is spread over an area of 1,392 acres. These projects tend to generate local construction jobs.
- 2. Translation and production: Translate ideas from elsewhere regionally as demonstration projects and position the region as a place for testing ideas.** This type of investment is what builds towards establishing the NSJV region as a "Translation Destination," which is a location where cutting-edge researchers, developers, and designers can materialize their visionary

products and test and iterate upon them. These strategies are likely to be executed and actualized in the medium term. For example, Heirloom's direct air capture facility in Tracy is an example of such a demonstration project with the potential for growth of an emerging industry – Carbon Management. The firm is headquartered in San Francisco, but their start-up production facility is in the North San Joaquin Valley. Tesla's manufacturing facility in Lathrop, which primarily produces parts and components for its electric vehicles, is an example of a regional production facility that reflects the NSJV's positioning itself as a site for advanced manufacturing.

3. Cluster formation: Support startups and clusters of industries and economic activities.

These investments are focused on longer-term development opportunities for the region. This includes activities that will foster start-ups and innovation within the NSJV region and attract larger scale manufacturers to bring their full suite of operations into the NSJV region. For example, Datapath is a startup from Modesto providing information technology and networking solutions. Additionally, all major firms locally once began as a start-up, including firms such as E. & J. Gallo Winery (beverage manufacturing), Laird (farm equipment, within Advanced Manufacturing).

This approach and the associated investment strategies adhere to North Valley THRIVE's guiding principles. These principles aim to align community aspirations with economic development efforts while guiding decision-making and funding strategies. Transparency and accountability are key, with decisions and processes remaining open and accessible to foster trust within the community. There is also an emphasis on feasibility, carefully considering available resources and partnerships to ensure timely execution of projects. Environmental sustainability and stewardship are also central, with a focus on protecting and enhancing the region's environmental assets through innovative solutions that promote a healthier environment for all. Equity is also a core principle, driving efforts to break down barriers and provide opportunities for disinvested communities. These and the other values detailed in Chapter Two collectively define how the region measures success and its support of these investment strategies.

Proposed Investments: Regionwide sector strategies

Within the above framework three regionwide investment strategies have been identified that apply across all four of the NSJV's priority sectors: advanced manufacturing, clean energy, carbon management, and the bioeconomy.

Regionwide Sector Strategy 1: Technology Deployment

Establish the region as a leading center for the deployment of key technologies, especially in clean technology to support major manufacturers and other major power users.

Timeframe: Short-term, Medium-term

Key Partners: Industry and other power consumers, local government, utilities and irrigation districts.

Investment Description:

This strategy is focused on investments and actions to spur existing companies in the region to become early adopters of new technologies and inputs. This will not only improve their environmental footprint (e.g. in switching from fossil fuel energy to clean energy or fossil fuel feedstocks to biobased feedstocks) but also help them expand their offerings (e.g. shifting from traditional manufacturing to advanced manufacturing). It will also bolster the region's skills in the application of these new technologies, especially clean energy, advanced manufacturing, and bioeconomy.

This deployment strategy tends to be oriented towards short-term development and will result in significant construction employment. The expansion of clean energy offers one clear example of the application of the “Deployment” strategy idea.

All four priority sectors in the region – and many existing sectors – require substantial amounts of power. Capturing more clean energy, especially solar energy paired with energy storage, could directly power local manufacturing and other activities without polluting the community. The region is well equipped to continue to install large amounts of solar capacity. Employment in the solar industry is the largest of the Electric Power Generation in the NSJV region. Solar Photovoltaic Installers have a relatively high location quotient in NSJV at 1.61, as well as a predicted growth rate three and a half times greater than any other clean energy occupation listed in TABLE 2 in Chapter Four.

The co-location of solar and storage for cheap, pollution-free electricity can help boost local companies as they seek to decarbonize and meet emissions standards. Additional onsite electricity generation may help manufacturers in the region. As one of the largest users of electricity in the region, manufacturers having access to cheap, clean electricity could serve as a significant attractant and retention tool to manufacturers in the area. The US Department of Energy’s Onsite Energy Program offers a range of resources designed to help prospective energy generators navigate considerations and potential pitfalls,⁶⁵ and these resources could be utilized and adapted to the regional needs of the NSJV region. The direct application of this energy may also make these types of projects more palatable to residents who may resist other projects that power the broader grid.

Further, investment in clean energy paired with utility-scale batteries reinforces existing regional assets as utility-scale batteries are already manufactured in Lathrop. Therefore, deploying more clean energy and other technology will also stimulate demand for existing local products.

The following are several actions associated with this strategy:

- *Create a streamlined permitting and zoning process for NSJV companies* that are looking to generate and store energy on-site and provide information to companies on how these projects can attain maximum tax credits from state and federal legislation.
- *Invest in community engagement activities that increase residential knowledge of new technologies and the opportunities associated with their development.* The array of new technologies and additional development within communities requires additional engagement and convening of residents. These public meetings and convenings could be used as an opportunity to provide information about new technologies, gather input and feedback about proposed projects, and identify potential barriers to development early in project planning. A survey of residents showed that roughly half of residents were familiar with hydrogen and biofuels as means of energy, and just more than one-in-five reported they were familiar with carbon capture and sequestration. Community engagement is difficult, and developers rarely have the communities trust at the beginning of the relationship. Local government can serve as a convener and a trust facilitator by bringing both parties to the table and facilitating conversations and information sharing.

Alignment with Guiding Principles:

- *Job Quality & Access:* Community engagement requires the participation and facilitation of those most deeply involved in the community, and it is important that these engagement and facilitation

exercises are compensated. While this investment may not represent many or any full-time employment opportunities, it does facilitate an improvement in local well-being.

- *Equity:* Meaningful and thoughtful engagement is a crucial component of equity in any initiative. Increasing engagement, outreach, and communication can ensure that community members are informed and genuinely involved in and supportive of the initiatives underway in the region.
- *Climate:* Community engagement can help projects move along faster and avoid litigation or opposition, thereby ensuring that carbon abating projects are more likely to occur within the region.

Regionwide Sector Strategy 2: Translation and Production

Support the NSJV Region's Efforts to become a Translation Destination—Where Testing, Development, and Prototyping Occurs—Through Additional Testing Space and Infrastructure.

Timeframe: Short-term, Medium-term

Key Partners: Local government, manufacturers

Investment Description:

The focus of this strategy is to establish the region as a "Translation Destination," which is a location where cutting-edge researchers, developers, and designers can materialize their visionary products and test and iterate upon them. These strategies are likely to be executed and actualized in the medium term.

Achieving this vision will require specialized infrastructure and investment, such as through preparing existing opportunity sites for investment as well as leveraging the region's existing foreign trade zones (FTZ's). It will also require ensuring sufficient space to carry out the translation and/or testing.

For example, there are numerous sites regionally where additional infrastructure could support the attraction of major production facilities. For example, there is an existing testing facility in Castle Commerce Center. The testing center has also recently installed several EV-charging stations on-site. The recent uptick in EV-testing means that more on-site charging stations are already needed. These infrastructure upgrades could also be adjacent or complementary to the ARCHES hydrogen refueling stations to allow for green hydrogen vehicle testing. The need for additional power also lends itself to an opportunity to generate cleaner electricity in the region either through on-site panels or larger off-site facilities connected to the grid. Offering additional resources in terms of infrastructure, housing, and quality of life for these engineers and product testers can help attract and retain even more workers focused on the next generation of transportation. Additionally, there is a need for additional space for safely and securely testing more vehicles. In addition to Castle, which already houses an automotive and flight training center, other potential sites and resources regionally include Crows Landing, Sharpe Army Depot, the Stockton Airport, and the Port of Stockton. More space—and proper airspace approvals—could also make the area a potential site for aviation flight testing for companies, such as Joby, or upcoming aviation start-ups focused on alternative fuels.

A few of the key steps for this strategy include:

- Create and establish a regional "Translation Destination" brand identity focused on capturing innovative companies looking to cite production facilities near their global headquarters. Develop targeted marketing campaigns to tell the North San Joaquin Valley story and value proposition to adjacent regions and attract new businesses, talent, and investment into the region. Leverage the region's locational advantages (proximity to the Bay Area, access to rail/highways, water/power

availability, access to land suitable for development, growing workforce with strong manufacturing skillsets).

- Monitor the region's industrially zoned land supply and demand and ensure availability of key sites for major expansion. This effort should build on the analysis conducted during the planning phase for North Valley Thrive and monitor sites of varying sizes and scales (10 to 20 acres, 50 or more acres, etc.)
- Ensure that the NSJV region's key development opportunity sites are listed in Bay Area directories for firms looking to expand.
- Target infrastructure investment towards high priority sites and districts that could best support new clean production facilities. These locations should be vetted to ensure not only proximity to an existing workforce and infrastructure (i.e. access to rail) but also to maximize community benefits.
- Leverage and market the region's current foreign trade zones (FTZ's) as potential hubs for value added manufacturing work while capturing the tax and benefits such as duty exemption on re-exports, relief from inverted tariffs, quota avoidance, and waived customs duties on zone-to-zone transfers.⁶⁶
- Establish and grow an effective and savvy regional research and innovation agency (or economic development corporation) that maintains megaregional connections and local political support. Such an entity would need to be led and staffed by a socially aware technology-savvy team focused on attracting and retaining research, development, and design firms, anticipating opportunities and challenges to innovation system actors, and supporting the capture of these opportunities or mitigation of challenges. See Strategy 3 below for additional information on this action.

Alignment with Guiding Principles:

- *Job Quality & Access:* An expanded test facility would help bring more vehicle manufacturers into the region, which can present more direct employment opportunities, which are often higher paying engineer or technician roles. Additional workers and activity in the region will also bring induced effects, supporting existing local services businesses such as lawyers, restaurants, and hospitals.
- *Climate:* Testing more EVs and other alternative fuel vehicles in the region—and having the infrastructure to support that additional testing—helps drive the deployment of these technologies, while also not generating additional greenhouse gas emissions locally.

Regionwide Sector Strategy 3: Cluster Formation

Support the growth of regionally competitive industry clusters in priority sectors including the growth of local startups.

Timeframe: Short-term, Medium-term, Long-term

Key Partners: local government, local businesses, residents, economic development institutions

Investment Description:

This strategy is focused on longer-term development of jobs and firms that draw from the region's competitive advantages to conduct the full suite of activities from research and development to commercialization, including testing, production, design, and marketing. The goal is to seed the formation of new industry clusters across the region's priority sectors (or other emerging ones).

This includes leveraging the region's universities and research institutes to support additional R&D as well

as potential spinoffs and new company formation. It includes providing greater access to risk capital for emerging firms and developing specialized infrastructure to support smaller firms. It includes the creation of new enduring institutions whose job it will be to manage the region's portfolio of clusters and work and operate with a mindset of "Think Regionally; Act Megaregionally." In other words, the mindset must be region first and promote opportunities across the three-county region. But the action must look to the larger megaregion – from the Bay area to Sacramento to the Central and Southern San Joaquin Valley – for potential partnerships and economic linkages.

The following are some of the specific actions and tactics of this strategy:

- Establish a three-county regional economic development corporation to guide regional economic development as well as sector investment and growth strategies. This includes creating and funding a team within the region that is tasked with strategic economic development planning and execution. The investments highlighted throughout the remainder of this section all require extensive coordination, staffing, and expertise. Having a single organization that is solely accountable for devising and delivering on these plans is important to ensuring their implementation. This organization would be made up of economic development experts who are also knowledgeable of the technology and policy landscape for the region.
- Attract a larger scale advanced manufacturing company to bring their full suite of operations into the NSJV region and leverage their purchasing to build out a regional supply chain.
- Strengthen the collaboration across the region's research Universities by forming a research consortium.
- Establish a region wide venture fund to support investment and capital into startups.
- Invite Bay Area investors to the region to tour startups and innovation at the region's universities. Note that Bay Area venture investors took a similar tour to the Fresno region annually for several years to tour startups and support entrepreneurs.
- Establish high school focused on entrepreneurship. Look to the experience of the Patino School of Entrepreneurship at the Fresno Unified School District.⁶⁷
- Leverage available land adjacent to UC Merced to establish a technology park and support spinoffs from the University. This is akin to the success of the Stanford Research Park adjacent to Stanford University.
- Invest in the creation of a business incubator on or adjacent to a university. Learn from and tour successful examples such as the adaptive reuse project of the Bakar BioEngenuity Hub across the street from UC Berkeley.⁶⁸
- Fill gaps in the regional supply chain and recruit companies to fill these gaps or encourage existing businesses to expand and supply these needs.
- Monitor the region's cluster growth and development and adapt over time. This includes establishing key performance indicators (KPIs) to track the growth and impact of these priority sectors. These indicators will also enable the region's economic development institutions to assess progress and prepare to adjust the strategies as needed to continue working towards meeting the performance indicators.

Alignment with Guiding Principles:

- Devising and implementing economic development strategies that are intentionally centered around Job Quality & Access, Equity, and Climate can, and should be, be a leading mandate of NV THRIVE.

Additional Regionwide Strategies

In addition to the three regionwide strategy ideas described above, there are numerous related strategies described in the cross-cutting section of this report. These are all important and necessary to support the growth of priority sectors. These strategies include the following:

- CCES 1: Build out a regional innovation ecosystem
- CCES 2: Foster small business entrepreneurship
- CCES 3: Catalytic skills and talent development
- CCES 7: Enhance regional coordination and alignment

To read those in more detail, see Chapter Six.

Proposed Investments: Sector Specific Strategies

The following section identifies the sector specific actions for the four priority sectors: Advanced Manufacturing, Clean Energy, Carbon Management, and the Circular Bioeconomy.

Priority Sector: Clean Energy

Clean Energy Strategy 1: Make all major facilities in the region net zero

Ensure all major energy facilities achieve net zero emissions by maximizing energy efficiency, expanding renewable energy generation, and implementing cutting-edge carbon capture solutions. By integrating smart grid technologies, advanced energy storage, and energy management systems operational efficiency will be enhanced, and overall consumption reduced. Electrifying infrastructure and exploring green hydrogen for challenging sectors may also be pursued to accelerate decarbonization efforts.

Alignment with Guiding Principles:

- *Job Quality & Access:* Clean energy occupations—including both the construction as well as the operation of facilities—generate many high-quality jobs that pay higher than the regional median wage.
- *Equity:* Onsite location of renewables means that the energy generated in the NJSV region is used in that region. This means lower demand for electricity that may come from more polluting sources, and disadvantaged communities are disproportionately located close to these polluting power generating facilities.
- *Climate:* Creating more products that generate greater energy savings means that less energy will be expended throughout the region, state, and any export regions. Less energy means lower emissions and lower demand for power.

Clean Energy Strategy 2: Accelerate the purchase and adoption of zero emissions vehicles (especially hydrogen and/or biofuel commercial vehicle fleets)

Timeframe: Medium-term

Key Partners: green hydrogen and biofuels producers, logistics and shipping hubs

Investment Description:

Support transportation and logistics centers to onboard green hydrogen and biofuel vehicles. This effort

would have the dual benefit of reducing the emissions impact of transportation and logistics fleets within the region, while also driving demand for the very products that the region aims to produce. Driving demand for early green hydrogen developers is crucial to project viability and the progression of the industry; an estimated 77% of green hydrogen projects in the US do not have formal offtake agreements⁶⁹ for the hydrogen they produce, which will likely stall any chance of securing project financing. A devoted local market can help facilitate project viability and attract more green hydrogen producers.

Finally, having a regional economy increasingly fueled by alternative fuels will serve as a profound 'proof of concept' that signals to other regions they could follow a similar path, thereby increasing demand for alternative fuel products developed within the region. The growing electrification of school buses around the country offers one example of how local governments can facilitate a transition to alternative vehicles.⁷⁰

Note: This strategy is also applicable to advanced manufacturing and carbon management.

Alignment with Guiding Principles:

- *Job Quality & Access:* The production and use of biofuels creates a number of high-quality jobs around the research and development, refining, and distribution of biofuels.
- *Equity:* A greater use of biofuels and green hydrogen among commercial vehicles in the region can lead to greater air quality, particularly near disinvested communities, which tend to be in the closest proximity to pollution-dense transportation networks.
- *Climate:* Fuel switching from fossil fuel combustion to biofuels or green hydrogen can drastically reduce the amount of carbon dioxide emitted into the atmosphere from vehicles.

Clean Energy Strategy 3: Identify strategic locations for green hydrogen refueling stations.

Timeframe: Medium-term, Long-term

Key Partners: regional governments, green hydrogen industry

Investment Description:

The ARCHES project has planned green hydrogen projects throughout the region. Identifying the strategic locations for these facilities is critical to both ensure the success of the investments as well as to maintain (or establish) community support.

Identifying key sites to produce green hydrogen is a necessary step for the growth of this emerging subsector.

This approach will create opportunities that incentivize regional collaboration in green hydrogen development and deployment.

A few key actions for this strategy include:

- Conduct an analysis of the specific infrastructure and site characteristics of green hydrogen production sites.
- Evaluate the region's availability and land (leveraging the region's current analysis of industrial lands).
- Convene and leverage the region's markets for green hydrogen. This includes the region's trucking sector as well as its extensive rail system and infrastructure. Major sites for rail and/or trucking and warehousing are all potential market sources for green hydrogen.

- Establish a process for the continual sharing of best practices and learning from other regions. For example, leverage examples from other regions to identify ways to locate green where the logistics and shipping industry most need them and are within driving range of one another to create a full network for transportation systems. For example, Michigan's Automotive Industry Association, MichAuto, provides an example of how an industry association can work closely with local governments, chambers of commerce, and other stakeholders to support an industry undergoing transformation.⁷¹
- Visit with and partner with adjacent regions to leverage that knowledge for the region.

Alignment with Guiding Principles:

- *Job Quality & Access:* The Hydrogen industry is likely to mirror the fossil fuel industry, which offers average wages that are nearly double that of the broader economy.
- *Equity:* Accelerating the development and deployment of green hydrogen in the NSJV can decrease local pollutants. Furthermore, supporting local institutions' expertise in hydrogen can ensure that local job seekers of all backgrounds can gain relevant education and expertise locally and at relatively lower cost through the accessibility of the UC and CSU systems.
- *Climate:* Faster development and deployment of green hydrogen means greater displacement of fossil fuels in the region, which will decrease greenhouse gas emissions and improve air quality.

Clean Energy Strategy 4: Market the region's availability of land and solar irradiance

Timeframe: Short-term, Medium-term

Key Partners: local governments, economic development organizations, clean energy firms

Investment Description:

Land in the NSJV is relatively less expensive and more available than in many other parts of the state. The NSJV region also has significant potential for solar development due to its sunny climate, as shown in FIGURE 7 in Chapter Four. In addition, land is relatively abundant compared to many other parts of California.

At the same time, this land availability will increase investor interest in the region. This will require the North San Joaquin Valley to develop a clear set of requirements and expectations to ensure that clean energy investments result in appropriate community benefits.

A few key actions include:

- Prepare an analysis of potential sites for clean energy production regionally.
- Test out and explore the opportunities to co-locate clean energy production (e.g. solar) with agriculture (e.g. crops that can be adjacent to panels). Additionally, identify adjacencies to major energy users to locate clean energy production and on-site battery storage.
- Prepare sample community benefits agreements (CBAs) and community expectations for investors of clean energy products. Many investors will require a community benefits agreement to the extent they are using funding from the Federal Department of Energy. Nonetheless, having clear local expectations is critical to not only achieve better community outcomes but also to derisk the projects as they come forward.

Alignment with Guiding Principles:

- *Job Quality & Access:* Marketing the region's land and solar potential could stimulate significant

clean energy investments, leading to the creation of construction, operations, and maintenance jobs. This can open new career pathways, enhancing job quality. If CBAs include local hiring requirements, the strategy could also improve job access for residents.

- **Equity:** CBAs can promote equitable job access, affordable energy options, and infrastructure improvements. Co-locating energy production with major energy users, such as agriculture, could also lead to lower energy costs for residents and businesses, reducing the economic burden in lower-income communities. In addition, ensuring that clean energy projects adhere to community-driven priorities should help mitigate environmental inequities.
- **Climate:** Reduces the region's reliance on fossil fuels and lowers greenhouse gas emissions. Co-locating solar with agricultural production (agrivoltaics) offers an innovative way to use land more efficiently while supporting both energy generation and agricultural productivity. This could enhance the region's climate resilience by diversifying land use and optimizing water and energy resources. In addition, by integrating energy storage solutions, the NSJV's energy resilience could be enhanced, ensuring reliable access to power during peak demand or extreme weather events. This also aligns with California's broader goals for renewable energy and sustainable growth.

Priority Sector: Advanced Manufacturing

Advanced Manufacturing Strategy 1: Market the region as a Translation Destination focused on companies looking to test, expand, and/or scale their production.

Timeframe: Short-term, Long-term

Key Partners: Landowners, local manufacturers, local governments

Investment Description:

The goal of this strategy is to connect with investors or companies looking to relocate and/or expand their existing facilities in the hopes of attracting additional design and manufacturing into the NSJV region. For example, the scale of new construction and decarbonization retrofits set to occur across California in the coming decades resembles a significant opportunity for building materials manufacturers in the NSJV region. The region could become a major site for testing and/or translation of new products. The notion of a Translation Destination is also described as a regionwide strategy as it could also apply to Clean Energy and the Circular Bioeconomy. It is especially key in Advanced Manufacturing as a core advantage is in siting production in the region.

This strategy includes some key steps:

- Develop marketing strategies and campaigns to support an increase in advanced manufacturing activity within the NSJV region.
- Establish an office located within the Bay Area with the purpose of visiting companies with custom manufacturing needs. This type of outreach can help connect Bay Area innovators and designers with manufacturers in the NSJV region who can help them prototype and test their products outside of the Bay but within proximity to facilitate rapid ideation and prototyping.

Alignment with Guiding Principles:

- **Job Quality & Access:** Manufacturing offers higher wages than what can be found in the overall economy, so bolstering manufacturing can bring more high-quality jobs into the region.
- **Equity:** Small, minority, or disadvantaged businesses could receive additional or elevated support.
- **Climate:** Creating more products that generate greater energy savings means that less energy

will be expended throughout the region, state, and any export regions. Less energy means lower emissions and lower demand for power.

Advanced Manufacturing Strategy 2: Find new markets for existing manufacturers.

Timeframe: Short-term, Long-term

Key Partners: Local manufacturers, economic development organizations

Investment Description:

The goal of this strategy is to increase the sales of products by existing NSJV manufacturers.

A key action for this strategy is:

- Establish a marketing campaign for manufacturers of energy efficiency products within the region. This may help manufacturers reach larger markets that may be unaware that these products are manufactured locally and meet efficiency standards. This investment opportunity aligns directly with manufacturers of energy efficiency building materials and products.

Note: This strategy applies to both advanced manufacturing and clean energy.

Alignment with Guiding Principles:

- *Job Quality & Access:* Expanding markets can enable existing manufacturers to become more profitable and – if coupled with labor support – achieve higher wages for workers.
- *Equity:* Small businesses could benefit as they sell goods and services to the expanding set of local manufacturers.
- *Climate:* Expanding access to energy efficiency products can help achieve climate outcomes as energy efficiency and other demand reduction is generally the first critical step.

Advanced Manufacturing Strategy 3: Create a manufacturing talent development center.

Timeframe: Short-term, Long-term

Key Partners: Local government, residents, current and prospective firms

Investment Description:

The common set of manufacturing knowledge and skills necessary across a range of manufacturing activities means that there is a great opportunity for investment in shared workforce training space. This shared training space could have a range of training equipment including offline production lines, CNC machines and control systems, automated controls systems for diagnostics and troubleshooting, and more. This facility could be used by manufacturers throughout the region.

The Marshall Advanced Manufacturing Center—formerly known as the Robert C. Byrd Institute—at Marshall University has provided manufacturing training for more than 26,000 workers since its founding in 1990. The center trains workers for approximately 300 different companies every year in skills ranging from computer-controlled machining and welding technology to quality implementation and 3D printing.⁷²

Alignment with Guiding Principles:

- *Job Quality & Access:* Manufacturing is a prime opportunity for job seekers in the region, often having lower education barriers while offering relatively higher wages. Furthermore, the establishment of a facility that helps develop talent will increase accessibility to manufacturing roles via hands-on education and training in the technologies that are needed for this industry.
- *Equity:* The shared training center could offer reduced or no-cost admission for income-constrained or disadvantaged job seekers. Revenues for the facility could be generated through a combination of grants and cost-sharing by manufacturers in the region.

Priority Sector: Carbon Management

Carbon Management Strategy: Support feedstock collection and offtake by clarifying regulations and supporting a local feedstock marketplace.

Timeframe: Short-term, Medium-term, Long-term

Key Partners: agriculture producers, local government, biofuels and carbon management firms

Investment Description:

Regulation remains a considerable potential hurdle for those who have organic feedstock material they want to get rid of and for those who want to make use of those feedstocks. Ambiguity around regulation of the disposal of organic feedstocks can make it hard for feedstock buyers and sellers to transact. The first step to addressing this uncertainty would be to pass a local ordinance that deems any organic feedstock eligible for biofuel or carbon sequestration activities to be a “useful” material that is not waste. This clarification would give feedstock buyers and sellers more certainty that they are not running afoul of local waste disposal laws. Having such clarity in laws could also help differentiate the NSJV region from other prospective locations looking to similarly build out their biofuels and carbon management sectors. Supporting a similar legal clarification at the state level would also be useful for supporting the local feedstock market.

A second useful effort would be to develop or facilitate a feedstock market to make it easier for smaller buyers and sellers to find one another. Feedstock material is a problem for farmers, and they may not always feel that contacting a biofuel manufacturer is their best or easiest option. As one Agriculture industry interviewee said “[the biofuels industry] will take anything off our hands that we’ll give them” but biofuels usually only receive the waste products that no other industries will take on. Working with farmers to routinely collect waste is another opportunity. A central market for feedstock products may make both the collection and purchase of these products easier for all parties involved.

This strategy is crucial to the region as it has the potential to facilitate the expansion and unlocking of three of the target sectors: clean energy, carbon management, bioeconomy.

Note: This strategy also applies to clean energy and the bioeconomy.

Alignment with Guiding Principles:

- *Job Quality & Access:* Jobs in biofuels production and within carbon management are likely to require many of the same types of engineers and technicians currently employed by the fossil fuel

industry in the region.

- *Equity:* A clearinghouse for waste bioproducts can help farmers and other generators of biowaste dispense—and get compensated for—their waste. Facilitating greater adoption of biofuels and carbon management efforts can also indirectly support lower air pollution within the NSJV.
- *Climate:* Increasing the accessibility of feedstocks can help accelerate production of low- or no-carbon fuels and decrease waste-related emissions.

Priority Sector: Circular Bioeconomy

The overall goal of these investment strategies is to support the scale-up of bioindustrial manufacturing innovations that:

- repurpose biomass waste, especially underutilized residues and by-products from agriculture and food processing;
- support the transition to a more sustainable and circular bioeconomy through development of renewable inputs to the national supply chain, including bio-based chemicals, materials, agricultural inputs, and energy; and
- use bioproducts to improve agricultural productivity, climate resilience, and sustainability.

The four investment strategies detailed below are:

- Nurture Innovation
- Translate Innovation into Industry
- Build an Inclusive Bioeconomy Talent Pipeline
- Grow a Community-Centered Sector Intermediary

Bioeconomy Strategy 1: Nurture Innovation

The goal of this strategy is to establish the NSJV as a leading region for circular bioeconomy R&D, strengthening regional innovation capacity while unlocking technologies and models that support the sustainable use of local resources. Through coordinated multi-sector collaboration, the NSJV will create a regional innovation ecosystem that:

- advances high impact innovation to enable the circular bioeconomy.
- facilitates scale-up and translation of innovations to industrial scales.
- is inclusive, connected, and collaborative.
- grounds research in regional industry and community values, concerns, and needs; and
- promotes sustainability, human and environmental health, and economic and social benefits.

Tactics and example initiatives:

- Generate technologies and research that advance the circular bioeconomy in the NSJV and beyond. Example initiatives include development of new platform technologies that enable use of more diverse and regionally available waste-streams as feedstocks for bioproducts; development of new processes that enable biomanufacturing at scale.
- Connect R&D to community values, and industry and market needs through continued feedback on projects. Example activities include coordination of focus groups and review panels for innovators to test ideas with farmers, food producers, customers, and local communities.
- Establish a resource and data hub to support R&D activities. Example activities include support for

grant writing, accessing funding, feedstock database, feedstock repository of physical samples, access to test farms, etc.

- Provide strategic guidance for circular bioeconomy R&D that embodies the shared mission and vision of local collaborators. Example activities include R&D Prioritization Matrix available for use by all collaborators that includes considerations of technical feasibility, DEIA, community benefits, environmental impact, circularity, and a regional strategic R&D plan.
- Provide access to R&D opportunities to students and trainees in the region. Example activities include opportunities to help collect data on existing projects; matching opportunities to paid internships (through Workforce Development); non-traditional research opportunities.
- Implement research incentives to drive innovations that address shared problems, opportunities, and gaps in the industry and community. Example activities include seed grants, access to feedstock samples and farmer/grower/waste originator expertise, access to pilot and scale-up resources and facilities, access to regional community and the CBIO network.

Table 9 Bioeconomy Strategy One Funding (Approximate 3-Year Targets)

Bioeconomy Strategy 1	High-End Estimate	Secured	Gap remaining
Innovation Engine/CBIO Collaborative	\$16,000,000	\$1,476,163	\$14,523,837

Bioeconomy Strategy 2: Translate Innovation into Industry

The goal of this strategy is to create an enabling environment for attracting, commercializing, and scaling sustainable bioindustrial manufacturing activities, including through supportive infrastructure, supply chain advancement, and resources that support local businesses by improving access to capital and innovation. This strategy focuses on investments that:

- Provide support and resources (e.g., infrastructure, services, accelerator programs, funding, knowledge) to mature circular bioeconomy technologies and support the scale-up of biomanufacturing activities in the NSJV.
- Support reliable and efficient access to diverse feedstocks (specifically residues, co- and by-products, and wastes) from the region for use in commercial biomanufacturing processes.
- Attract, grow, and sustain circular bioeconomy development firms and talent.

Note: This strategy is an application of the “Translation Destination” strategy (described above) but focused on the Circular Bioeconomy.

Tactics and example initiatives:

- *Establish and Build Shared Spaces & Facilities:* Build an Innovation Campus with a world-class testbed biomanufacturing facility to help technologies move from the lab to commercial production. Build Incubator & Maker Spaces to nurture entrepreneurship.
- *Create Specific Programs, Services, & Capital for local firms to support commercialization and growth.* This includes innovation subsidies, matching grants for public commercialization funds, technical assistance resources, and investor exposure to support access to public and private capital as well as establishing targeted accelerator program(s) that attract and grow local startups with specialized support programming and resources.

- *Build Shared Infrastructure to Improve Access to Biomass Feedstock.* This includes managing shared data on regionally available feedstocks and building a marketplace portal to connect suppliers with users for R&D and commercial use. It could also include investment in infrastructure for transporting, storing, and processing feedstocks, especially through models that support local entrepreneurship and community wealth-building.
- *Support the Bioeconomy Ecosystem Development.* This includes facilitating collaboration, deal flow, and connectivity across the region. It also includes coordination of public/pooled investments for shared infrastructure and projects as well as capacity-building and knowledge sharing of technologies, project development resources, market opportunities, and best practices.

Table 10 Bioeconomy Strategy Two Funding (Approximate 3-Year Targets)⁷³

Bioeconomy Strategy 2	High-End Estimate	Secured	Gap remaining
Circular Bioeconomy In- novation Campus	\$350,000,000	\$1,232,980	\$348,767,020
Accelerator program	\$15,000,000	\$1,200,000	\$13,800,000
Bioproducts Value Chain Technical Assistance Vouchers	\$ 1,500,000	\$400,000	\$1,100,000
Knowledge Transfer Programs & Innovation Vouchers	\$3,000,000	\$600,000	\$2,400,000
Investor Network	\$600,000	\$ -	\$600,000
Matching Grants and Application Assistance for Commercialization Funds	\$3,000,000	\$900,000	\$2,100,000
Anchor Firms Develop- ment Fund - Targeted Incentives for Large Em- ployers	\$15,000,000	\$2,000,000	\$13,000,000
Feedstock access devel- opment	\$10,000,000	\$ 9,700,000	\$300,000

Wet labs and facilities fund	\$5,000,000	\$1,500,000	\$3,500,000
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Bioeconomy Strategy 3: Build an Inclusive Bioeconomy Talent Pipeline

The goal of this strategy is to catalyze a leading bioeconomy workforce development ecosystem that:

- Creates awareness of high-quality jobs in the bioeconomy.
- Inspires future generations of diverse STEM and innovation leaders.
- Builds inclusive, equitable, and accessible pathways to high quality jobs.
- Empowers diverse local talent with skills to thrive in the bioeconomy; and
- Evolves capabilities with emerging industry needs.

Note: This specific bioeconomy workforce development strategy is consistent with the existing crosscutting enabling strategy focused on skills and talent development.

Tactics and example initiatives:

- Build upon pathways to related good jobs in the NSJV's existing agriculture and manufacturing industries. This could include collaborating with regional initiatives and organizations that strengthen the talent pipeline for critical roles in manufacturing and agriculture industries that intersect with required capabilities in the growing bioeconomy. It could also include building a short-term "Bridge to Bioeconomy" training programs for upskilling and reskilling incumbent workers to create access from adjacent Agriculture and Manufacturing roles to bioeconomy jobs as these opportunities grow in the region, especially as jobs become automated in the region's legacy industries.
- Launch inclusive and equitable early career exposure programs in STEM and the bioeconomy. This includes launching BioTechBuilder (and similar) programming in K-12 and community colleges to support STEM education and engagement.⁷⁴ It also includes supporting STEM- and bioeconomy-related professional development for K-12 educators and creating access to industry mentorships and internships in the bioeconomy, with a particular focus on traditionally disinvested communities and underrepresented populations in STEM fields.
- Create equitable access to education and training pathways into the bioeconomy mapped to new federal standards. This includes partnering with educational institutions to launch and evolve industry-aligned coursework and developing stackable certificates that provide accessible pathways into high quality jobs and new degree programs for the bioeconomy. It includes subsidized programs, training stipends, and other financial support to remove financial barriers to education and training. It also includes building talent-to-industry internship and apprenticeship programs mapped to new and emerging U.S. Dept. of Labor-defined roles in bioeconomy, building workforce returnship programs for diverse residents who have adjacent skills from previous work experiences and/or training. Finally, success requires a robust regional equity data dashboard to

track supply and demand. This data-driven approach allows workforce and education providers across the region to adapt as industry needs and pathways evolve.

Table 11 Bioeconomy Strategy Three Funding (Approximate 3-Year Targets)

Bioeconomy Strategy 3	High-End Estimate	Secured	Gap remaining
Bioeconomy Workforce Development Fund	\$4,000,000	\$1,255,000	\$2,745,000

Bioeconomy Strategy 4: Grow a Community-Centered Sector Intermediary

The goals of this strategy are to establish a sector-building intermediary that will serve as a “center of gravity” for regional bioeconomy activities to coordinate strategy delivery; facilitate collaboration across multiple sectors and regional institutions; inform public policy decisions; integrate local communities into bioeconomy sector development activities, policies, and decisions; and ensure that activities deliver direct economic and environmental benefits to local communities and advance community prosperity.

Tactics and example initiatives:

- Grow the region’s circular bioeconomy cluster intermediary organization. This entity will both support the development of a world-class ecosystem for the circular bioeconomy in the North San Joaquin Valley. This role is currently being led by BEAM Circular (see opportunities). Some activities of the cluster intermediary entity involve attracting bioindustrial manufacturing firms and fostering cross-sector collaboration for economic prosperity and environmental solutions. It will also include management of various community engagement processes (described below). It could also include establishing an organized space for industry discussion and feedback on policy topics, and for policymakers to learn about ways to support the circular bioeconomy.
- Track and support regional alignment with emerging federal bioeconomy definitions and standards: Enable ongoing refinement of regional metrics and industry development standards through participation in national bioeconomy industry networks and policy conversations; build local awareness of and capacity to align with evolving industry standards.
- Advocate to the State of California for an ongoing tracking and monitoring of the bioeconomy statewide and regionally. Given the importance of the sector for the state’s climate goals and economic development potential across rural and metropolitan regions, the State of California should undertake an ongoing monitoring and studying of the bioeconomy to track employment. This may be comparable to how the Federal DOE conducts a clean energy jobs analysis annually.⁷⁵
- Create a BEAM Fellows Pilot Program. This program provides funding, training, and professional development for a cohort of BEAM Fellows to be embedded across institutions in the region, increasing regional capacity to support circular bioeconomy-aligned workforce and economic development activities.
- Develop and implement specific Public Policies to enable the expansion of the sector. This could involve research on local and regional government policies, infrastructure planning, regulatory considerations, incentives criteria, and best practices (e.g. local zoning/permitting options) that affect the circular bioeconomy.
- Implement inclusive community engagement activities that involve local communities in

oversight and decision making. This includes engaging community-based organizations in formal partnerships and convening stakeholder and community focus groups to provide feedback on and advise ongoing activities in the bioeconomy strategy to ensure they meet community needs. Inclusive engagement activities will follow best practices for ensuring access, such as holding events with options in multiple languages, participant compensation, childcare support, and other interventions to ensure events are inclusive.

- Ensure consistent information sharing and transparency. This could include providing consistent information and support to community members about the bioeconomy strategy, industry science, and local impacts, as well as maintaining a broad range of information channels including information sessions, workshops, and online educational materials in multiple languages.
- Increase Local Circular Bioeconomy Knowledge and Capacity-Building. This could include organizing programming and communications that enable local community members to understand the circular bioeconomy and see themselves as active participants and beneficiaries in this growing sector. It could also include investing in local community projects that demonstrate the potential of the bioeconomy, build capacity, and align with local priorities.
- Develop innovation in Community Benefits models. This could include researching, developing, and launching innovative community benefit models and funding mechanisms based on best practices that deliver community wealth-building and investment opportunities to local neighborhoods as industry grows (e.g., community-owned assets such as a Community Benefits Fund that can be used for community-directed projects).

Table 12 Bioeconomy Strategy Four Funding (Approximate 3-Year Targets)

Bioeconomy Strategy 4	High-End Estimate	Secured	Gap remaining
BEAM Fellows	\$1,000,000	\$250,000	\$750,000
BEAM Circular (Sector Intermediary)	\$12,000,000	\$4,763,643	\$7,236,357

Alignment with Guiding Principles

Job Quality

- The bioindustrial manufacturing industry will generate quality jobs in the North San Joaquin Valley as the sector has a high proportion of quality jobs across all skill levels, important in a region where currently only one-third of jobs provide pathways to prosperity.
- Current regional sector development efforts organized through BEAM Circular prioritize generating jobs that meet the following labor standards, 1.) Pay family-sustaining wages with enough income to “make ends meet” based on a localized set of basic living expenses and savings, and to be ineligible for public “safety net” benefits in California 2.) Provide stable employer-sponsored health insurance, retirement benefits, and worker advancement opportunities 3.) Afford durability in retaining or leading to jobs with family-sustaining wages by offering access to quality education, training, and support services. 4.) Offer stable and predictable schedules. 5.) Value and respect worker knowledge and expertise, ensuring the right to organize and join unions 6.) Ensure the work environment is safe and healthy by offering protections to reduce the risk of on-the-job injuries

Climate

- Accelerate the transition to a net-zero carbon economy through advancement of bio-enabled climate solutions.
- Reduces GHG emissions by reducing direct emissions from organic waste into products and by diverting use of fossil fuels through production of renewable energy and materials.
- Enables regenerative agriculture practices, for example through reduced reliance on chemical fertilizers that are a major source of local pollution and global GHG emissions.

Equity

- Creates high road employment opportunities, including bioindustrial manufacturing jobs in disinvested communities, with community wealth-building opportunities and environmental justice benefits across the value chain.
- Enables a more resilient and sustainable food and agriculture system by reducing waste, enabling regenerative practices, and creating new value opportunities for local farmers and food producers.
- Improves environmental and public health outcomes among vulnerable local communities by advancing solutions that improve air and water quality.
- Advances equity and builds community prosperity through entrepreneurship and workforce development strategies that center diversity, inclusion, and access.

Economic Diversification

- Supports regional and state economic vitality and resilience by leveraging global competitiveness in food, agriculture, and biotechnology, benefitting existing local industries while diversifying with the growth of a new industry concentration.

Realization and Implementation

The sector profiles (Chapter Four) and these associated recommendations are important for informing and guiding conversations. However, realization of the opportunities identified in this analysis will require further information, consultation with additional stakeholders and community members, and firming up investment strategies.

Among the next steps in implementation to consider are some of the following:

- 1. Share preliminary investment strategies and collect feedback.** While many of the investment strategies are informed directly through conversations with stakeholders, it will be important to test these ideas with broader stakeholder groups that may have different ideas about the challenges these sectors face or the best ways to implementation solutions.
- 2. Continue to put impacts on equity and job quality at the forefront.** While many of the recommended strategies directly or indirectly improve equity and job quality, specific instructions about implementation strategies can significantly impact the equity and job quality outcomes of many of these efforts.
- 3. Consider the legal and logistical barriers to proposed investments.** Ensuring that the region has the legal authority to implement these ideas and the capacity to carry out the implementation is crucial.
- 4. Work with megaregional partners.** The NSJV is not alone in hoping to advance equity and accessibility to high quality jobs through these emerging and high value-added sectors. Surrounding regions offer different strengths and assets that can support or accelerate the efforts



Chapter 6:

How We Will Get There: Cross-cutting Enabling Strategies

of the NSJV region, and vice versa. Working with these regions to maximize the effectiveness of shared assets, sharing best practices, and leveraging each region's competitive advantages can simultaneously benefit the NSJV region and surrounding areas.

What are cross-cutting enabling strategies?

In navigating the evolving transitions facing the North San Joaquin Valley (NSJV), a range of facilities, services, and systems are needed if the envisioned changes to the region's resilience and opportunities are to be realized. In a broad sense these facilities, services, and systems form the region's underlying infrastructure. These strategies are "cross-cutting" because they influence all sectors where investments are prioritized, providing for critical infrastructure to advance equity and promote sustainability while growing the economy. Further, these strategies are "enabling" as they guide the shift towards higher value-added activities and shape the nature of these activities. Finally, these strategies are inherently regional, focusing on actions and areas where regional policies and strategies are likely to have the most significant impact on the infrastructure.

How did we identify these cross-cutting enabling strategies

In selecting the cross-cutting enabling strategies, actions and initiatives were first identified during the Baseline Regional Assessment, which involved consultative data and analysis developed in collaboration with the community, local government, and businesses. The themes, focus areas, and issues identified in that process were then further examined by the Work Groups to pinpoint specific cross-cutting strategy areas that could create enabling environments for the NSJV's priority sectors and address critical needs. In parallel, County Coordinators, Labor, and Industry Liaisons conducted asset mapping activities to identify regional initiatives, organizations, and resources that could support the implementation of those strategy areas. To further refine these strategies, input was also sought from regional, megaregional, state, and national experts. In addition, potential enabling strategies were filtered to avoid duplication and leverage complementarities with other regional programs and initiatives, such as the 'We Will!' K-16 initiative aimed at building skills in the education and health care industries.

Through that process seven strategy areas were identified:

1. Regional Innovation Ecosystem
2. Small Business and Entrepreneurship
3. Catalytic Skills and Talent Development
4. Climate Smart Infrastructure
5. Placemaking, and Amenities
6. Generational Well-Being
7. Regional Coordination and Alignment

These strategy areas and their components are highly interconnected, while the overarching framework for each is regional (and inter-regional) coordination and alignment, there are distinct areas of activity around innovation, entrepreneurship, talent, and the creative economy on the one hand and an emphasis on the importance and interrelationship of caring for our residents and the environment.

Orientation for the following Strategy Areas and Component Strategies

Each of the seven cross-cutting enabling strategies described in the remainder of this chapter follows a consistent structure. Each section begins with an executive summary that outlines the core issues, such as talent development, and identifies the primary problem along with proposed strategies. Each strategy

section then provides further details of the cross-cutting issue and core problem that the strategy area addresses. This is followed by a discussion of regional opportunities and assets related to the strategy area.

Detailed investment strategies then follow. Each strategy includes an action plan with implementation steps and tasks as well as a discussion of necessary partnerships. Each strategy area concludes with an analysis of how the outlined cross cutting strategies align with state policy and strategies as well as California's "Jobs First" priorities, ensuring the strategies promote job quality, equity, and climate resilience. This structured approach ensures that the strategies are comprehensive, actionable, and aligned with broader regional and state goals.

Strategy Area One: Regional Innovation Ecosystem

The North San Joaquin Valley (NSJV) currently faces challenges in building a sustainable and equitable economy and creating quality jobs due to its underdeveloped regional innovation ecosystem, especially when compared to neighboring areas. However, key institutions in the region are dedicated to collaboration and shared progress, emphasizing both the need and opportunity to strengthen the innovation ecosystem. This strategy aims to address these challenges by leveraging the region's key knowledge-creating assets—its higher education institutions and its proximity to global centers of knowledge and startup creation—within a coherent framework that will guide future development and foster a more robust innovation ecosystem.

Cross Cutting Issue Definition and Profile

Regional innovation ecosystems consist of networks of interconnected organizations, institutions, and individuals working together to drive innovation, economic growth, and development. These ecosystems are vital in shaping a region's development trajectory and adapting to economic and technological changes. A strong regional innovation system fosters the creation of quality jobs, which are essential for resilient economic growth and the expansion of regional assets and public funds. Therefore, enhancing the NSJV's innovation capabilities is crucial for building opportunities, resilience, and adaptability.

Like other regions, as the NSJV transitions to sustainable technologies there is a complex multi-dimensional cluster of practices associated with these technologies that must be navigated. This is a "wicked problem" characterized by incomplete, changing and often contradictory requirements that are often difficult to recognize as they affect change at a domain level with the constellation of these technologies creating and reframing wealth and power structures. Hence, while not sufficient in themselves, innovation capabilities are also necessary to evaluate and direct technology and economic growth dynamics through transitions.

In addition, as technologic interdependencies grow in scope and scale innovation is increasingly a necessity to access high-value production opportunities and to address social challenges. Importantly, this does not necessarily require a move to the newest or most complex technology. Rather, an effective innovation system at a regional level can leverage opportunities for existing businesses and attract new enterprises that improve regional opportunities for existing residents as well as making the region more attractive to more skilled migrants.

Given the importance of the NSJV's proximity to the world class technology cluster in the San Francisco Bay area, framing the region's innovation system at a megaregional level is necessary. This relationship also framed the selection of the priority sectors in Chapter Four, but at its essence it recognizes that

there is an opportunity for the NSJV to complement the exploratory capabilities of other parts of the Northern California Megaregion by targeting opportunities to build the NSJV's capabilities in technology translation.

Problem Statement

The Baseline Regional Assessment identifies several significant challenges in the NSJV's innovation ecosystem. Among these are:

- The region's private sector research and development (R&D) spending is less than one percent of gross regional product, placing the NSJV among the least R&D intensive metropolitan areas in California.
- Limited business starts, with the region creating new businesses at about half the statewide rate.
- Small totals and relatively static generation of new knowledge with annual utility patents registered in the region numbering between 140 and 160 annually during the 2010s.
- Overall employment knowledge intensity, measured by the percentage of jobs with a bachelor's degree or higher required for entry level positions, is the lowest (21.1%) of the 13 California Jobs First regions.
- Comparatively underdeveloped venture capital with the value of the NSJV's risk capital investments (\$228.4m) over the past decade about 26% that of the Central San Joaquin Valley and about 2% that of the Sacramento region.
- Relatively low levels of formal education with the third lowest attainment level of the 13 California Jobs First regions.

Fostering a more robust regional innovation ecosystem is crucial for the NSJV to effectively leverage its distinct economic structures, cultural contexts, and resources in defining its development pathways. Enhanced capabilities within its innovation ecosystem will facilitate localized knowledge creation and diffusion, thereby fostering innovations directly relevant to regional industries and communities while translating knowledge into local opportunities. This localization not only enhances competitiveness by developing niche markets and specialized industries but also empowers local non-profits and community organizations. By better articulating their needs and their relationships to other regions and issues, these organizations can more effectively advocate for their stakeholders.

Further, the region's lack of ability to develop new technologies leads to adoption of systems – such as robotics or additive manufacturing – without direction from the unique and specific challenges faced by the region's companies. While many companies in the region who introduce systems innovate to make the technologies work within the regional constraints and endowments this is a reactive rather than proactive process. This means the region is a user of innovation but not a developer of innovation.

The underdevelopment of the regional innovation ecosystem also reduces the diffusion and connectivity of innovation regionally. While some organizations view their technology as internal property, much of the dynamism that characterizes California's innovation system results from knowledge spillovers that results from the circulation of talent, networks, and knowledge circulation. Hence, while innovative companies and universities in the NSJV may be engaged in the diffusion of knowledge and technologies, the underdevelopment of the regional innovation system results in them operating as enclaves with little or no connection to the regional economy.

Opportunity Statement and Regional Assets

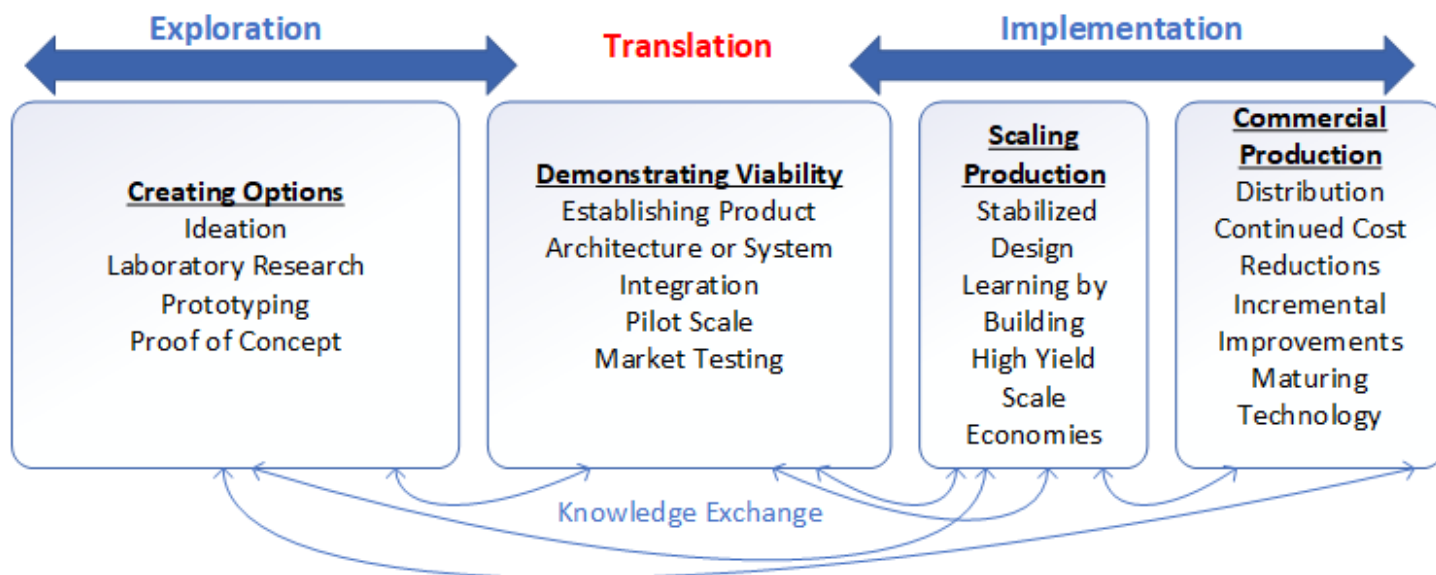
Given these challenges, strengthening the NSJV's innovation ecosystem is crucial for developing

its businesses competitiveness. By promoting synergies between businesses, universities, research institutions, and government entities, a more robust innovation ecosystem could be developed that drives continuous improvement and adaptation. This would also support and leverage investments in the Priority Sectors, as well as attract investment and talent, further enhancing the region's economic vitality and broader competitiveness.

Enhancing the NSJV's innovation ecosystem will bolster the agility, resilience, and long-term growth capabilities of its businesses. Leveraging the complementarities among the region's higher education institutions presents a significant opportunity to drive the growth and development of the regional innovation ecosystem. By fostering collaboration among universities and other knowledge centers within the NSJV, the region can harness diverse expertise and resources, creating a synergistic effect greater than the sum of individual efforts. Notably, the region has already established a foundation for regional and inter-regional collaboration in its development of the Baseline Regional Assessment and this Strategic Plan.

The creation of the Baseline Regional Assessment is already yielding benefits to the region as its analyses and data have supported collaborative planning and investment such as aligning development of the region's Comprehensive Economic Development Strategies (CEDS), supporting regional coordination of funding applications, and the mutual application for several of its higher education institutions to the National Science Foundation's Enabling Partnerships to Increase Innovation Capacity (EPIIC) program.

Figure 15 Multiple Stages and Directions of Innovation



While generating new knowledge is a key aspect of innovation, it is equally important to ensure that the system can effectively translate this diverse knowledge into local opportunities. In the NSJV's innovation system, translation represents a significant area of opportunity. Innovation is not a simple, linear progression from the discovery of new knowledge into a product or service and then to market implementation. Recognizing this, Figure 5.12 identifies three distinct but iterative stages in the innovation process: exploration, translation, and exploitation. Within this framework, translation locations have been identified as a critical need in the Megaregion. The NSJV's proximity to the Bay Area's world-class exploration activities and venture capital markets, along with its relatively lower-cost industrial infrastructure, positions it well to capitalize on this opportunity. However, to successfully develop its translation system capabilities, the NSJV must ensure it is leveraging existing exploitation capabilities.

By adopting this approach, the NSJV can position itself as a key player within California's broader innovation ecosystem, attracting and retaining firms, entrepreneurs, and research investments that drive economic growth and innovation in the region.

Investment strategies

Strategy 1.1 Establish a Regional Research Consortium

Establish a regional research and policy consortium to serve as a central hub for sharing research, data, and resources, and for collaborating on grants, policy development, and community engagement. This consortium would aim to enhance knowledge about the region and make it accessible to a broad and inclusive range of stakeholders. By providing consistent data and narratives, the consortium would help grant applicants strengthen their proposals and improve their competitiveness for federal, state, and philanthropic funding. Additionally, the consortium would support policy and strategy development by offering reliable information and fostering awareness of related regional efforts. Beyond reducing costs and barriers to accessing regional information, the consortium could also raise awareness of emerging and relevant analyses from other regions that could impact the NSJV.

Action Plan:

- Convene potential partners to establish a *Regional Research Consortium* (Consortium) consisting of a leadership team with representatives from the NSJV's principal higher education institutions as well as local business, government, and other organizations engaged in regional research or policy analysis.
- Use the Consortium to review and rank pilot funding requests from a host of investments to further invest in the development of regional research and policy capabilities developed in support of the Baseline Regional Assessment and Strategic Plan. These include, but are not necessarily limited to:
 - Further developing the NVT Geospatial Portal to identify what form, goals and objectives a regional geographic information system in the NSJV may entail.
 - Building on the NVT Baseline Assessment and Strategy, to create a central hub for accessing regional data, research and policy analyses. This could be modeled on other region's data profiles like the Bay Area Equity Atlas.
 - Expanding the regional climate and job survey and/or the community health disparities survey.
 - Developing the NSJV Opportunity Jobs Analysis to monitor and evaluate household self-sufficiency in the region.
 - Building on the Industrial Lands analysis and investigate the spatial distribution of jobs and workers in the region including differentiating between locally serving and traded sector clusters.
- Use the Consortium to review and recommend further mandate(s) and functions. These include, but are not limited to:
 - Inter-institutional collaboration on business and economic analyses for local governments, economic development councils, chambers of commerce, non-profit organizations, the private sector, and the community in general.
 - Collaborative research studies on various topics such as demographics, income distribution, labor market analysis, environmental sciences, and health economics.
 - Convening a forum or conference for the investigation, discussion, and dissemination of information about the NSJV region.
 - Supporting research and policy analyses on priority sectors and cross-sectoral initiatives

by regional coalitions of academic institutions, community organizations, service providers, government agencies, and other stakeholders.

Partnerships:

- Collaboration and representation across the region's principal institutions of higher education (such as the University of the Pacific, California State University Stanislaus, UC Merced, and community colleges).
- Collaboration and participation with local government agencies, regional planning agencies, economic development agencies.
- Non-profit and community organizations such as community development organizations, health and social service providers, and environmental and social justice organizations.
- Regional research institutions and sector specific research entities (such as BEAM/CBIO).

Strategy 1.2 Explore Opportunity to Build a Regional Innovation System Alliance

To further expand access to resources and enhance the regional innovation ecosystem, explore opportunities to leverage complementarities among the NSJV's higher education institutions and other research agents to enhance regional capacity for transforming ideas into economic impact. Additionally, explore opportunities for the region to collectively engage with leading technology companies, startups, and research institutions across the Northern California Megaregion and beyond.

Action Plan:

- Create a strategic alignment framework that defines common goals and mutual benefits to sustain the Regional Innovation System Alliance. The purpose of this framework would be to ensure long-term commitment from higher education institutions and external partners, thereby protecting the alliance from changes in priorities, leadership, or market conditions.
- Build on the initial work of the Research Collaborative and emerging recommendations of the Research Consortium to propose a priority list of collaborative initiatives for the leaders of NSJV's higher education institutions and regional research partners. These may include establishing incubators and accelerators, entrepreneurship training and mentorship programs, and applying for collaborative funding opportunities. The goal is to support innovation and entrepreneurship across the region.
- Initiate a strategy that leverages the Regional Innovation System Alliance to collaborate with leading research centers and institutions of higher education in other regions. This strategy would consider how to establish partnerships for joint research projects, create exchange programs for faculty and students, and source funding for collaborative initiatives. The goal is to enhance the research capabilities of the alliance, attract talent, and drive innovation by tapping into the expertise and resources of leading research institutions. This approach will help bridge the gap between the less knowledge-intensive NSJV region and advanced research centers and innovation ecosystems in neighboring regions, like the San Francisco Bay Area, to foster economic and technological growth.

Partnerships:

- Collaboration and representation across the region's principal institutions of higher education (e.g., University of the Pacific, California State University Stanislaus, UC Merced, and community

colleges).

- Leading research and higher education institutions across the Northern California Megaregion (e.g. Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, U.C. Berkeley, Stanford University).
- Leading high-road employers in the region as well as associated industry associations, labor unions, workforce development boards, and private companies and organizations specializing in skill-specific training and professional development courses.

Strategy 1.3 Develop a Translation Innovation Ecosystem Enhancement Plan

Conduct an assessment and develop a plan for fostering the region's translation innovation ecosystem. Developing a region's translation innovation ecosystem involves a complex and multi-dimensional set of policies and investments. Therefore, interventions must be based on a comprehensive and systematic assessment of the translation innovation ecosystem and its relationships to exploration and exploration components. This approach ensures that interventions are targeted and impactful, avoiding broad and unstructured efforts that could have detrimental effects or be ineffective.

Action Plan:

- Build on and align with translation opportunities identified in the Priority Sectors such the 'Translation Destination' concept.
- Leverage all existing material from the Baseline Regional Assessment and other sources to identify gaps in the current analysis of the region's translation innovation ecosystem.
- Conduct a comprehensive assessment of the region's translation innovation ecosystem by mapping stakeholders, collecting and analyzing data, benchmarking against other regions across the Megaregion and performing a SWOT analysis to understand current activities, capabilities, and opportunities.
- Identify and foster additional collaboration among stakeholders across the Megaregion's translation innovation ecosystem through network analysis, workshops, and matchmaking initiatives.
- Develop targeted policies and strategic investments based on assessment findings. These should consider identified needs in building local translation capabilities, strengthening entrepreneurship, and developing workforce skills. Ideally, the plan will also guide implementation of incentive programs and allocate resources to the NSJV's priority sectors and other initiatives that show significant promise in building the region's high-road economy.

Partnerships:

- Private sector companies and local organizations, such as BEAM, currently investing in translation capabilities as well as possessing the capacity to collaborate on innovation projects.
- Industry associations identifying policies and opportunities to support regional development of the translation innovation ecosystem in support of opportunities across the Megaregion.
- Investment community, including regional and inter-regional investors and financial institutions that can provide services to support translation investments in the region.
- Local government and economic development agencies to provide funding, infrastructure, and facilitate business development and promotion of the region's translation innovation ecosystem.
- Higher education institutions for knowledge transfer and collaboration with industry by building on the Research Consortium and Higher Education Regional Synergy Alliance. Also, ensure vocational

and technical school engagement to build a skilled workforce in the NSJV aligned with the region's innovation ecosystem needs and capabilities.

Alignment with Guiding Principles

- **Quality Jobs:** These strategies to strengthen and develop the Regional Innovation Ecosystem facilitate collaboration among higher education institutions, businesses, community organizations, and government, leading to increased research and innovation-related job opportunities. These regional strategies are aligned with several state strategies, including the Accelerate California Inclusive Hubs program administered by the California Office of the Small Business Advocate (CalOSBA), which similarly aims to stimulate socio-economic development and high-road, quality job creation through regional innovation. The regional strategies create an understanding of quality job pathways and methods to enhance their development within the region. Additionally, they support the establishment of seamless learning pathways and training programs aligned with industry needs, further enhancing job readiness and access to quality employment. These strategies also encourage the development of incubators and accelerators, fostering entrepreneurship and job creation. By identifying and supporting the development of high-potential sectors, they contribute to high-road job creation efforts. Finally, by implementing policies and investments that strengthen local research and development as well as entrepreneurship, these strategies further support the creation of quality jobs.
- **Equity:** The Regional Innovation Ecosystem strategies promote equity by equipping local organizations with information and data to advocate for their stakeholders. These strategies enhance access to educational resources and opportunities across the region, particularly benefiting disinvested communities. By advancing coordinated training programs, they support initiatives for equitable skill development and professional growth. Additionally, these strategies involve a broad range of stakeholders in the innovation ecosystem, ensuring diverse perspectives and inclusive growth. They focus on developing workforce skills, which, given the prevalence of disinvested communities across the region, will promote equitable access to innovation-driven opportunities.
- **Climate and resilience:** The Regional Innovation Ecosystem strategies also endeavor to promote sustainability by facilitating access to essential data to inform sustainable development policies as well as supporting climate resilience efforts. Sustainability and climate resilience are also fostered by leveraging partnerships with research institutions to drive innovation in sustainable technologies. Additionally, these strategies develop strategic investments in sustainable industries and technologies, further driving regional climate resilience. They establish a governance structure that can be leveraged to oversee sustainable practices, ensuring long-term environmental resilience. Thus, these regional strategies also align with the California Workforce Development Board's initiatives, particularly those utilizing the High Road Training Partnership (H RTP) model, which emphasizes job quality, equity, and environmental sustainability.

Strategy Area Two: Small Business and Entrepreneurship

The North San Joaquin Valley (NSJV) is home to a diverse array of locally owned businesses, micro-enterprises, street vendors and growing companies that embody the community's rich cultural diversity.

Many of these businesses are owned by immigrant families who often face challenges in navigating city processes and accessing the capital necessary for sustainable growth. A robust and diverse small business sector is a crucial economic driver for neighborhoods, fostering a thriving local economy that benefits all residents.

Although there is a variety of organizations providing services to small business in the region, often there is not enough awareness of each other's programs and activities which prevents efficient coordination to have more efficient referral systems. To truly foster entrepreneurship, it is essential to develop a robust ecosystem that supports businesses in the full spectrum of their journey, from the ideation stage to their launching, expansion, and integration into broader procurement practices, and value chains. By increasing the capacity of the region's small business service providers such as the SBDCs, Chambers of Commerce, CDCs and CDFIs so that they can expand resources, training, and access to capital, the North San Joaquin Valley businesses can scale and become competitive players in larger markets. This not only strengthens individual businesses but also enhances the overall economic fabric of the community, creating more opportunities and fostering inclusive growth.

Vision

Every individual who aspires to start, or expand a business has access to the technical assistance, capital, networks, and support they need to achieve success.

Cross Cutting Issue Definition and Profile

Small businesses are a critical lever for economic opportunity in the North San Joaquin Valley. Using the Federal Small Business Administration (SBA) definition of less than 500 employees, there are over 20,121 small businesses, representing 93% of all enterprises in the region. Among these, microbusinesses with fewer than nine employees make up nearly 70% of all small employer firms. Small businesses are a well-known, critical lever to creating pathways for economic mobility. In the North San Joaquin Valley, they represent a large percentage of the region's employers and workforce with 186,726 employees.

Problem Statement

Complexity of Business Launch Processes: Aspiring business owners face significant challenges in navigating the myriads of regulatory compliance requirements, including obtaining necessary licenses and permits. The absence of comprehensive support and resources to assist in this process leads to delays, increased costs, and potential legal issues. Incubator spaces as well as navigation services and streamline permitting processes can foster the establishment of new businesses.

Limited Access to Funding Options: The scarcity of start-up funding options presents a critical hurdle for new businesses. Without adequate financial support, many entrepreneurs struggle to cover initial costs, invest in necessary infrastructure, and sustain operations during the crucial early stages of their business journey. This lack of funding stifles innovation and economic growth. Many small businesses are not able to scale due to the limited ability to access available sources of capital. This financial barrier hampers their ability to invest in new equipment, hire additional staff, or enter new markets.

Supplier readiness: Despite a growing pipeline of diverse suppliers and anchor institutions in the region, there is a gap for industry-specific supplier support and assistance. Securing government contracts and fulfilling their contractual obligations presents additional hurdles, as businesses must comply with stringent eligibility criteria, competitive bidding processes, and detailed documentation requirements.

Limited access to technical assistance and advanced business support services, and accelerators, complicates efforts to scale operations.

Ecosystem gaps: Although the region has valuable small business service providers, such as the SBDCs, and other nonprofits, there is a shortage of incubators, accelerators, and cooperative business models as well as comprehensive networking opportunities that could facilitate shared growth and market integration. Local governments do not seem to have a particular focus on technical assistance and where there is specialized staff, there seems to be high rotation. In some instances, ethnic chambers have played an important role of connecting and coordinating service providers, but there are no permanent formal coordinating efforts at the regional level. These challenges underscore the need for a more robust support ecosystem to help businesses overcome these hurdles and achieve sustainable growth. Additionally, despite the presence of SBDCs, their geographic coverage does not match the region's boundaries. The San Joaquin County SBDC is part of a separate region than the Stanislaus and Merced Counties regions. While all regional SBDCs collaborate, sharing geographical boundaries would allow them to develop more efficient regional frameworks.

Opportunity Statement and Regional Assets

There is a growing movement in Stanislaus County through an effort led by Stanislaus 2030 to bring together small business support organizations to coordinate efforts and better serve local businesses. This model of collaboration can be replicated at the regional level to strengthen the capacity of current service providers to give entrepreneurs better access to technical assistance, capital, and supplier opportunities. This will help businesses in the region flourish.

Key institutions delivering services in the region:

- Small Business Development Centers: Valley Sierra SBDC and San Joaquin SBDC.
- Institutions of Higher Education: UC Merced, Stanislaus State University, University of the Pacific, which are both anchor institutions and sources of small business and entrepreneurship education.
- Anchor companies purchasing and resourcing small businesses such as Kaiser Permanente and Gallo Winery.
- Government: Workforce Development Boards and City and County Economic Development.
- Non-Profit Support: Community Development Corporation, Business Incubators.
- SCORE and Local Chambers of Commerce.
- Community Development Financial Institutions.

Investment strategies

Strategy 2.1 Anchor Collaboration and Supplier Readiness

Leverage the region's anchor institutions and employers as potential to promote small business procurement practices and commitments. Provide supplier technical assistance and financing via programs and partnerships to expand local business capacity to secure and fulfill government contracts and to sell their goods and services to anchor employers.

Action Plan/Suggested Strategies:

- Further leverage purchasing of the region's government and anchor institutions by preparing local small businesses to sell to the universities, hospitals, government agencies, and other anchor

institutions.

- Develop capabilities and opportunities for supplier businesses to scale.
- Conduct detailed analysis of market and supply chain needs in the NSJV region to identify key industries, major players, and supply chain gaps.
- Engage with local businesses, large corporations, and government entities to understand their supplier requirements and procurement practices.
- Assist small businesses in obtaining necessary certifications to meet government contracts requirements and large companies' standards. Provide resources to ensure small businesses comply with industry regulations.
- Develop programs encouraging collaboration between small businesses and larger corporations, including joint ventures and subcontracting opportunities.
- Develop training programs on supply chain management, quality control, compliance, and financial management.
- Establish a network of mentors and advisors from successful businesses and industry experts.

Strategy 2.2 Develop a More Robust Entrepreneurial Ecosystem

Support entrepreneurs at every stage of their journey increasing the capacity of existing local technical assistance providers, supporting the creation of new entities such as business incubators, accelerators, co-op and models, as well as expanding access to capital.

Action Plan/Suggested Strategies:

- Enhance the ability of local technical assistance providers to support small businesses effectively by investing in their capacity.
- Establish and expand revolving loan funds: collaborate with Community Development Financial Institutions and Banks to create flexible loan products to provide small businesses with the financial resources they need.
- Facilitate access to grants, loans, and investment opportunities, partnering with local banks and financial institutions.
- Support the establishment of business supporting organizations such as business incubators, and accelerators. Establish centers offering access to shared facilities, equipment, and technology.
- Example project: Fund the creation of a business accelerator that helps existing companies expand.
 - Example project: Fund the creating of a business incubator to help startup companies and individual entrepreneurs to develop their businesses by providing a full-scale range of services, starting with management training and coworking space, and ending with venture capital financing.
- Networking and Partnership Development: Support capacity of business services providers to organize events, trade shows, and business expos to connect small businesses with potential clients and partners.

Strategy 2.3 Foster an Enabling Environment for Business Growth and Entrepreneurial Support

Work with jurisdictions and advocate for the removal of barriers to entrepreneurship such as complicated permitting processes with a special emphasis on supporting marginalized populations such as female

entrepreneurs and undocumented residents.

Action Plan/Suggested Strategies:

- Work with local jurisdictions to streamline permit and licensing processes.
- Develop a one-stop-shop models at the county levels to act as centralized resources for small businesses to access support and financing.

Alignment with Guiding Principles

- **Job Creation:** Entrepreneurial businesses create jobs, not just for the founder but for employees as well. This job creation can have a ripple effect, boosting the local economy and offering opportunities for others to climb the economic ladder.
- **Innovation and Opportunity:** Entrepreneurs are often at the forefront of innovation, developing new products and services that can disrupt established industries. This creates new markets and opportunities, potentially leading to wealth creation for those involved.
- **Focuses on Equity and Inclusion:** Entrepreneurship can be a path to success for those who face limitations in the traditional job market. Individuals with limited education or unconventional backgrounds may find it easier to break into the market with their own ventures. This strategy aims to bridge the gap for marginalized populations by providing them with the resources they need to navigate the business landscape and succeed. This aligns with California Jobs First focus on inclusive growth.
- **Increases Access to Capital:** The strategy highlights the need to increase access to funding options for aspiring entrepreneurs. This directly addresses a hurdle identified by California Jobs First as critical to economic development.
- **Strengthens the Local Economy:** The strategy acknowledges that a robust small business sector is essential for a thriving local economy. This aligns with California Jobs First' focus on economic development throughout the state.
- By supporting small businesses, providing access to capital, and fostering an inclusive environment for entrepreneurs, the strategy in the image directly contributes to the goals of the California Jobs First Initiative.

Strategy Area Three: Catalytic Skills and Talent Development

The North San Joaquin Valley (NSJV) region faces a significant challenge in its insufficient skills and talent pipeline to meet current and future job opportunities. The core problem lies in the limited access to training and career pathways that would enable individuals to secure high-quality jobs in key industries. To address these challenges, this strategy proposes the development of an inclusive skills and talent pipeline, incorporating sustainable earn-and-learn models and advanced manufacturing workforce development. Additionally, efforts should focus on removing inequitable barriers in career pathways and aligning regional training programs with the needs of the community, environment, industry, and labor.

Cross Cutting Issue Definition and Profile

Skills and talent development encompasses the creation of an inclusive and equitable workforce by bridging gaps for disinvested communities and promoting high-road, quality jobs that catalyze socio-economic development and environmental sustainability for the region. This includes developing a skills and talent pipeline, enhancing training programs, removing barriers, and aligning with industry

opportunities. Key institutions involved are educational providers, workforce development boards, employers, and community, environmental, and labor organizations.

Problem Statement

The NSJV region faces challenges in providing equitable access to skills development and jobs, including high-road, quality jobs in demand by opportunity industries that present the potential for advancing equitable socio-economic development and greater environmental sustainability. Compounding these challenges is a lack of regional coordination between education providers and additional stakeholders (e.g., community, labor, industry, employers, workforce groups), which affects the region's ability to meet current job demands and future growth opportunities, particularly in prioritized occupations such as electricians, machine mechanics, and healthcare workers.

The baseline assessment found that the NSJV ranks lowest among California regions in terms of the percentage of jobs requiring a bachelor's degree or higher for entry-level positions, and less than a quarter of jobs in the region meet the definition of high-road, quality jobs with benefits and a wage (\$32.80/hour) sufficient to reduce the NSJV's struggling children by half and provide pathways to another quality job. As a result, many people commute 3 hours or more in and out of the NSJV daily, and nearly half of families in the NSJV struggle to meet basic needs, especially single-mother households.

Due to the significant gaps in skills and talent development, the NSJV region struggles to provide a representative workforce and to attract, enhance, and support opportunity industries and enabling occupations in demand in the region. According to the baseline assessment, the region experiences income inequality and disparities in many areas, including the following:

unemployment, educational attainment, intra- and inter-generational social mobility, services in languages other than English (e.g., Spanish), business ownership, regional innovations and entrepreneurship, childcare and eldercare access, digital and financial literacy, environmental and public health, commute times, college preparation, school funding workforce capacity in key opportunity industries, including those utilizing electricians and machine mechanics, advanced manufacturing, carbon sequestration and clean energy, education (e.g., teachers), and healthcare (e.g., nurses, primary care physicians, other primary care providers, specialists mental health providers, dentists, community health workers).

These disparities harm socio-economic development and affect workforce development throughout the region, particularly among disinvested communities, single mothers (about a third of children are in single-parent households), people with limited English proficiency, justice-involved households, unhoused and housing insecure people, people with disabilities, youth, and immigrants, including not-yet-documented residents.

Opportunity Statement and Regional Assets

The baseline assessment suggests the importance of simultaneously enhancing equitable education and training opportunities for the region's population, particularly disinvested communities experiencing disparities, while supporting employers and industries that foster equitable socio-economic development and environmental sustainability.

Indeed, developing and enhancing a robust, inclusive regional skills and talent pipeline can enhance equitable workforce participation, create high-road job opportunities, support socio-economic development, and foster greater environmental sustainability for the region. The NSJV's diverse population, as well as existing education providers, workforce development boards, community/

labor/industry organizations, cultural and environmental groups, and employers provide a strong foundation of regional assets for developing and enhancing inclusive training programs for high-road job opportunities that can grow and diversify over time to continuously improve regional resilience, equity, and sustainability.

Investment strategies

Strategy 3.1 Align Priority Sector Needs with Regional Training and Skills Development

Align industry needs with regional training that prioritizes disinvested communities and promotes collaboration among educational institutions, workforce boards, labor organizations, and employers.

Action Plan:

- Foster collaboration between stakeholders, such as by creating partnerships between educational institutions, training providers, workforce development boards, community and labor organizations, cultural and environmental groups, industry associations, and employers to align models with community and industry needs and opportunities.
- Promote regional consortia of community colleges and workforce development boards to coordinate training efforts.
- Conduct regular regional industry assessments to identify current and future regional job opportunities.
- Develop and update training programs to match opportunity industry requirements to provide for enabling occupations.
- Orient training models to respond to community needs, such as modality, schedule, language, location, transportation and childcare access, and mini-credentialing programs to provide quick, relevant skills training that is culturally responsive and accessible to residents throughout the region.

Partnerships:

Collaborate with stakeholders, including adult education consumers and providers (e.g., Delta Sierra Adult Education Alliance, Gateway Adult Education Network, Yosemite (Stanislaus Motherlode) Consortium), other educational institutions (e.g., community colleges, CSU Stanislaus, UC Merced, private colleges/universities and training providers), support services and community organizations (e.g., California Partnership for the San Joaquin Valley, DRAIL, Friends on the Outside, iHub San Joaquin, Ready to Work, Time Done), labor organizations (e.g., unions), employers, business and industry associations (e.g., chambers of commerce, San Joaquin Partnership), cultural and environmental groups, and workforce development organizations (e.g., county workforce development agencies, Bay Valley Tech, Central Valley Opportunity Center, Digital Nest, GRID Alternatives, Rising Sun Center for Opportunity, VOLT Institute).

Strategy 3.2 Target Enabling Occupations and Related Skills for Investment and Development

Create an inclusive skills pipeline to meet regional demand for high-quality high-road jobs in the region, for example, electricians, machine mechanics, and registered nurses. This includes multilingual education and workforce programming with a focus on disinvested communities, as well as cross-training in digital

and financial literacy.

Action Plan:

- Enhance partnerships between educational institutions, training providers, workforce development boards, community/labor/industry organizations, cultural and environmental groups, and employers to align training programs with community and industry needs.
- Collaboratively conduct a regional needs assessment to identify barriers and gaps in skills and training programs for opportunity industries and enabling occupations.
- Develop and enhance training programs for high-demand occupations, such as electricians, machine mechanics, and healthcare workers.
- Provide support services, such as career counseling and job placement assistance, to engage the workforce, particularly in disinvested communities, to inclusively access and equitably succeed in training programs.

Partnerships:

See some examples in 3.1 Partnerships above. Collaborate with stakeholders, including educational institutions, training providers, workforce development organizations, cultural and environmental groups, employers, and community, labor, and industry organizations. Engage trusted community organizations to promote the programs and support the participation of disinvested communities

Strategy 3.3 Develop the Skills Needed to Grow Priority Sectors

Expand workforce programs with a focus in key skills, such as STEAM, digital literacy, additive manufacturing, and construction trades, to ensure access to High-Road jobs in the Advanced Manufacturing, Clean Energy, and Bio-Industrial sectors.

Action Plan:

- Scale up and enhance existing initiatives that have identified local manufacturing skills needs to develop a regional understanding of what skills are most in demand and by what industries, as well as what transferable skills best equip workers and students for the evolving manufacturing environment.
- Expand STEAM-based training and education and skills development in high-school, college, and worker pathways to prepare the workforce to meet the needs of future job opportunities and technological innovations.
- Deepen student and jobseeker exposure to quality jobs and industry leaders in the manufacturing space, including traditional operations as well as those in circular manufacturing processes, the manufacturing of climate innovations, and other emergent opportunities.
- Develop and implement training programs focused on carbon sequestration and clean energy technologies and practices, such as solar panel installation, wind turbine maintenance, and energy-efficient manufacturing processes.
- Establish courses in Spanish and VESL programs to support non-native English speakers in gaining the technical skills and language skills for success in advanced manufacturing roles.
- Offer courses on smart controls and automation technologies, which are critical components of modern manufacturing. Courses should include practical, hands-on training to ensure participants can apply their knowledge in real-world settings.

- Establish courses in Spanish and VESL programs to support non-native English speakers in gaining the technical and language skills for success.

Partnerships:

See some examples in 3.1 Partnerships above. Collaborate with stakeholders, including educational institutions, training providers, workforce development organizations, cultural and environmental groups, employers, and community, labor, and industry organizations. Engage trusted community organizations to promote the programs and support the participation of disinvested communities.

Strategy 3.4 Remove Inequitable Friction in Career Pathways

Align services to ensure that job seekers, particularly those from disinvested communities, can easily access training, career navigation, employment and continued skills development, utilizing collaborative models that integrate community support, labor, workforce intermediaries, and employers to create a seamless experience.

Action Plan:

- Create partnerships between America's Job Center of California (AJCC), educational institutions, training providers, workforce development boards, cultural and environmental groups, employers, and community, labor, and industry organizations to align models with community and industry needs and opportunities.
- Better understand how different jobseekers are faring in the workforce development system to uncover inequities in various domains, such as service wait times, career choice, training access, and, ultimately, earnings and job quality.
- Orient training models to meet the needs of parents, immigrants, and unhoused individuals, such as regarding modality, schedule, language, location, and transportation and childcare access, to provide quick, accessible, and relevant skills training.
- Work with employers to develop felony-friendly hiring practices and provide incentives for hiring justice-involved individuals.
- Work with employers to streamline the hiring and accommodations processes for people with disabilities.

Partnerships:

See some examples in 3.1 Partnerships above. Collaborate with stakeholders, including educational institutions, training providers, workforce development organizations, cultural and environmental groups, employers, and community, labor, and industry organizations. Engage trusted community organizations to promote the programs and support the participation of disinvested communities

Strategy 3.5 Develop Sustainable Earn-and-Learn Models

Develop and invest in sustainable work-based learning models such as registered apprenticeships, partnering with employers, labor, and community organizations to equip individuals, especially from disinvested communities, with practical skills for high-demand high-road jobs.

Action Plan:

- Catalogue and assess the availability of work-based learning and earn-and-learn models that currently exist in the region to better understand their aims, eligibility requirements, and funding

models.

- Explore innovative practices, including new models of apprenticeships, Registered Apprenticeship Programs (RAPs) in industries where they do not currently exist, wage-replacement scholarships, and other ways of supporting workers as they gain skills and credentials or advance along a promotional pathway.
- Expand and leverage youth-focused Work Experience Programs (WEX) as an important tool in career exploration, job readiness, and youth development.
- Broaden the partnership structure supporting Earn-and-Learn models to include community-based-organizations who are uniquely equipped to provide important scaffolding to ensure students and workers gain skills and maintain financial security.

Partnerships:

See some examples in 3.1 Partnerships above. Collaborate with stakeholders, including educational institutions, training providers, workforce development organizations, cultural and environmental groups, employers, and community, labor, and industry organizations. Engage trusted community organizations to promote the programs and support the participation of disinvested communities

Alignment with Guiding Principles

The vision for enhancing skills/talent development aligns with state goals for workforce development with attention to the three principles of high-road workforce developments (job quality, equity, and climate and environmental sustainability), including as envisioned by CA Jobs First priorities in line with California's Workforce Innovation and Opportunity Act and the 2024-2027 Unified Strategic Workforce Development Plan.⁷⁸

Supportive of the 2024-2027 Unified Strategic Workforce Development Plan,⁷⁷ this strategy area advances training programs that are opportunity and demand-driven, responsive to skills gaps, coordinated by collaborative partnerships, inclusive of earn and learn apprenticeships and wraparound services for individuals with barriers to employment (e.g., immigrants, limited English proficiency (in line with the spirit of California's Dymally-Alatorre Bilingual Services Act), justice-involved, homeless and housing insecure, and youth), and accessible, thereby promoting diversity in high-road occupations throughout the region. This strategy area supports the creation of high-quality, sustainable jobs and promotes inclusive growth, contributing to the overall socio-economic development, equity, and environmental sustainability of the NSJV region, especially disinvested communities.

Strategy Area Four: Climate Smart Infrastructure

Investing in climate-smart infrastructure can significantly boost resilience and public health, reduce vulnerability to flooding, drought, reduced water availability, extreme heat, and create high-quality jobs. The NSJV region currently faces high risks due to outdated infrastructure, including susceptibility to flooding, loss of agricultural land, surface and groundwater issues, and limited access to parks and open spaces. To address these challenges, we propose expanding nature-based flood protection and habitat restoration, developing multi-benefit land use strategies to repurpose agricultural land, advancing water protection and development, and increasing access to parks and open spaces.

Cross Cutting Issue Definition and Profile

Climate smart infrastructure refers to the broad set of physical infrastructure investments and actions that increase the region's resilience to climate risks while also utilizing "nature-based solutions". Nature-based solutions (NBS), as defined in California's Natural and Working Lands Climate Smart Strategy, describe actions that work with and enhance nature to help address societal challenges. This term is used globally to refer to various methods that safeguard, sustainably manage, and restore natural environments to achieve multiple objectives, such as tackling climate change, enhancing public health, promoting equity, and preserving biodiversity. Ultimately, these solutions enhance nature to address societal challenges, covering ecosystem-related approaches for multiple outcomes.

For the NSJV, the identification of "climate smart infrastructure" as a cross-cutting issue recognizes how a climate friendly approach to physical infrastructure helps solve multiple issues – increasing the region's economic resilience and reducing climate impacts, creating high quality jobs through the building, maintenance and redesign of existing systems, strengthening and protecting existing vulnerable communities and populations, and creating regional assets out of current risks.

Problem Statement

The region's infrastructure was built in a way that reshaped nature for yesterday's climate

Historically, the NSJV has built infrastructure – such as dams, levees, canals – that reshaped the natural environment to create an economy built around resource extraction. Levees protected (at least for a time) low lying farmland from flooding. Canals moved water around cities to allow industry to flourish along rail lines and former sloughs. The region (like much of California) also prioritized car mobility and invested heavily in highways and roadways, some through historic neighborhoods.

The NSJV's long growing seasons, fertile soil and access to surface and groundwater supplies have made it ideal for agriculture. To reduce groundwater pumping and land subsidence, extensive irrigation systems were developed, including large-scale water projects like the Central Valley Project (CVP) and the State Water Project (SWP). These projects diverted water from rivers and reservoirs to irrigate millions of acres of farmland but did not reduce groundwater pumping, enabling the growth of water-intensive crops. Water projects that allowed substitution from river watersheds to offset groundwater overdraft have had significant negative impacts on the Sacramento-San Joaquin Delta (Delta) region, including harm to watershed fisheries and ecosystems. These impacts have also affected the region's economy and various socioeconomic factors.

But the region faces new and growing impacts from climate change

The NSJV now faces critical and growing climate risks which may overwhelm and impact the region's outdated infrastructure.

The region's specific climate risks include:

- extreme heat, which can strain energy systems and impact public health;
- increasing fire vulnerability from dry conditions, threatening lives and economic development;
- reduced water availability, higher water demands and drought, threatening agriculture, ecocultural resources for tribes, fisheries and water supplies;
- flood vulnerabilities, risking agriculture, property, and infrastructure damage.

Temperatures in the NSJV are projected to rise through the century under both medium and high emissions scenarios, leading to more extreme heat days, higher average annual temperatures, and

warmer nights. The region will face prolonged severe droughts, which can damage transportation infrastructure, increase erosion and dust, and exacerbate air quality issues. These droughts will also threaten water supplies, harm agriculture, and cause ground subsidence, damaging infrastructure and buildings. As temperatures continue to rise, warmer water temperatures may pose a serious threat to the health of the watershed, impacting fisheries and species, while also promoting the growth of toxic algal blooms, which endanger public air and water quality

Additionally, the NSJV is also facing both higher water demands and reduced water availability, which will pose challenges to both the agricultural industry and already disinvested communities outside anticipated drought periods. The NSJV has extreme flood vulnerability due to its proximity to the Delta and major rivers, with many disinvested communities near floodplains and levees lacking resources to respond to severe flooding events from extreme precipitation and sea level rise.

Regional climate and environmental vulnerabilities threaten the existing infrastructure, significant portions of which are old and outdated.

Infrastructure vulnerabilities include:

- outdated and vulnerable levee systems,
- degraded floodplains and riverways in need of restoration,
- roads, rails and regional infrastructure highly vulnerable to damage from extreme heat and land subsidence, and
- regional energy grids, power infrastructure, and water systems.

Some of these risks have been made worse by historic activities in the region such as groundwater overdraft from agricultural practices that overdrew groundwater and prevented ongoing recharge. Corporate farmland consolidation and a decline in small farms may further negative impacts on environmental health and sustainability. Looking ahead, reaching groundwater sustainability requirements under the Sustainable Groundwater Management Act (SGMA) will reduce over pumping in irrigated lands and require close to 500,000 acres of intensive agricultural land to be taken out of production so that the rest of the San Joaquin Valley can have a sustainable future.

Agriculture in areas where groundwater basins are overdrafted will be less able to draw on surface water supplies and will be at increased risk of land retirement and fallowing.

Opportunity Statement and Regional Assets

Investing in climate-smart infrastructure can build resilience, create jobs, and reduce long-term costs

Investing in climate smart infrastructure enhances the region's resilience to flooding, drought, and extreme heat, while also creating jobs in green infrastructure, restoration, and sustainable farming. By taking a holistic approach to climate smart infrastructure, the region can also save long term costs in infrastructure maintenance and repair.

Specific opportunities include:

- Nature-based solutions protect communities and infrastructure from flooding and can keep cities and communities cooler.

- Land repurposing to provide alternative and economically viable land uses for agricultural land as it is fallowed, retired or moved out of production.
- Incentives in regenerative agriculture, agroecology, and less water intensive crops can sustain the agricultural economy by helping farmers move away from more conventional farming practices and manage reduced water availability.
- Innovations in the water sector, like managed aquifer recharge, or forecast informed reservoir operations can increase water reliability for agriculture and communities and increase water security.
- Building new and enhanced parks and open spaces improves quality of life as well as health and well-being.

Ultimately, updating existing infrastructure will be critical to meet the evolving impacts and demands of climate change. Climate-smart infrastructure involves not just the construction of new facilities, but also the adaptation and enhancement of current systems to function effectively in the face of changing conditions. This includes rethinking the operation and maintenance of essential infrastructure like reservoirs, irrigation canals, and energy systems. For example, this could include updating reservoir release protocols to leverage advanced technologies that offer improved weather pattern predictions, ensuring water management aligns with the realities of today's climate rather than outdated assumptions. By modernizing the management and operation of existing infrastructure, underserved communities and resources are better protected in an increasingly unpredictable climate.

Climate smart infrastructure is a growing area of investment and support at the State Level

California has prioritized nature-based solutions to address climate change due to their ability to provide multifaceted benefits that align with the state's environmental and policy goals. NBS can enhance natural processes, offering ecological advantages such as carbon sequestration, biodiversity conservation, and improved water quality. These solutions also support climate mitigation and adaptation by creating resilient landscapes and infrastructure that can better withstand climate impacts like floods and droughts. Furthermore, NBS generate economic opportunities, especially in rural and underserved communities, through job creation in conservation and restoration projects. Aligning with these state priorities will create greater funding opportunities, regulatory support, potential for collaborative partnerships and scaling impact for NVT projects.

Support for these strategies and solutions is also growing within the NSJV Region

Projects like the San Joaquin River Restoration Program, Tuolumne River Restoration Project, Stanley Wakefield Wilderness Area Salmonid Habitat Restoration project, Merced River Instream and Off Channel Habitat Restoration Project, Mormon Slough Restoration Project, Black Rascal Creek Flood Control Project, and Dos Rios Ranch Preserve exemplify successful nature-based solutions. These projects, supported by federal and state legislation, local irrigation districts, government agencies, and conservation groups, provide a foundation for NVT collaborative efforts. Leveraging these initiatives involves building upon established partnerships and engaging with irrigation districts for water management, agencies like California Department of Fish and Wildlife for regulatory support, and organizations such as River Partners, Merced Streams Group, and Restore the Delta for habitat restoration expertise.

The region's diversity of landscapes and conditions provides a template for a wide range of climate smart infrastructure solutions

The NSJV has significant natural resources that can be leveraged as assets, including major rivers such as the Stanislaus, Calaveras, Tuolumne, San Joaquin, Merced, and Chowchilla, along with waterways interconnected with the Delta and extending to Stockton, and associated wetlands and floodplains. Existing agricultural land is also a key asset for developing groundwater basin recharge areas.

The NSJV also presents significant opportunities for conservation efforts due to its relatively low percentage of conserved acres. For example, only 2.1% of total acres in San Joaquin County, 8.3% in Stanislaus County, and 16% in Merced County are conserved. This indicates a substantial amount of work ahead but also highlights a tremendous opportunity within the framework of California's 30x30 strategy. The 30x30 initiative aims to conserve 30% of California's land and coastal waters by 2030 with three main objectives: conserving and restoring biodiversity, expanding access to nature, and mitigating and building resilience to climate change. This initiative emphasizes voluntary, collaborative action with partners across the state, making the San Joaquin Valley a critical area for achieving these ambitious conservation goals.

The region has many existing programs, grass roots organizations, community groups and nonprofits that can be leveraged for research and collaboration

This includes conservation and restoration groups, local government agencies, tribal entities, and agricultural cooperatives who are already deeply engaged in this work. The presence of these organizations provides NV THRIVE with a robust network of experienced and engaged partners to leverage in strategy implementation and development.

Investment strategies

Strategy 4.1 Expand Nature-based Solutions to Prepare the Region for Climate Impacts

Expand existing use of nature-based solutions to respond to climate risks and address flooding, reduced water availability, drought, extreme heat and habitat loss while creating jobs and promoting the sustainable environmental management work of existing agencies.

Action Plan/Suggested Tactics:

- Conduct a baseline assessment of priority floodplain restoration areas along rivers and streams in the NSJV based on flood risk and ecological value.
- Convene regional partner agencies such as the Merced, Modesto and Turlock Irrigation Districts, the River Partners, Restore the Delta, the Delta Conservancy and Merced Streams Group to evaluate opportunities and assess priority areas.
- Consider a process to support expansion of the Delta Conservancy jurisdiction, (a California state conservancy) to include Merced and Stanislaus counties, providing a framework to support regional projects, and drive ecosystem restoration and climate resilience efforts across a broader geography.
- Develop a regional flood protection strategy to build resilience, habitat restoration, and open space.
- Reclaim degraded floodplain areas through vegetation restoration, erosion control, and land-use planning that discourages development in flood-prone zone.
- Support efforts that re-wet deeply subsided peat soils in the Delta through conversion to rice

cultivation or managed wetlands, to stop ongoing subsidence and related CO2 emissions.

- Establish strategic partnerships to utilize biomass feedstock from re-wetted Delta lands, fostering job creation in biochar, biofuels, and biomedical.
- Expand flood control projects to serve as demonstration sites that integrate community open space, habitat restoration, and flood control, turning climate vulnerabilities into assets. For example, transforming Mormon Slough in Stockton, currently a flood risk area housing many unhoused individuals, into a climate and recreational amenity can restore its historic flood protection role and native habitat.
- Implement flood mitigation strategies that incorporate carbon sequestration and ground elevation to address subsidence.
- Conduct economic multiplier analyses of regional investments in nature-based climate solutions to better evaluating how NBS and investments not only create direct jobs but also stimulate broader economic growth, benefiting service industries, local businesses, and community infrastructure across the region.
- Enhance regional tree canopy to address heat resilience.
- Prioritize the involvement of disinvested communities in the planning, decision-making, and implementation of nature-based solutions to ensure that flood mitigation, climate adaptation, and access to green spaces directly benefit underserved and marginalized populations.
- Collaborate with community organizations to reduce environmental disparities, promote equitable resource distribution, and develop culturally specific outreach and education programs that engage local residents in restoration efforts, fostering inclusive and resilient communities.

Partnerships:

Collaborate with local government agencies, tribal entities, water districts, conservation groups, NGOs, agricultural cooperatives, and federal agencies like the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers. Regional educational institutions can offer expertise in water management, agriculture, and environmental science. While not a comprehensive list, the following are examples of regional programs and organizations:

- San Joaquin River Restoration Program/Central Valley Flood Protection Board
- Tuolumne River Restoration Project/ Central Valley Flood Protection Board
- Stanley Wakefield Wilderness Area Salmonid Habitat Restoration Project/DWR + City of Oakdale
- Merced River Instream and Off Channel Habitat Restoration Project/Merced Irrigation District
- Mormon Slough Restoration Project/Restore the Delta
- Black Rascal Creek Flood Control Project/Merced Streams Group
- Delta Carbon Program/The Delta Conservancy
- Rice Farming in the Delta/Restore the Delta
- Delta Stewardship Council
- Levitree Inc.

Strategy 4.2 Expand sustainable land practices and alternative land uses to manage agricultural land retirement, promote sustainable agriculture and achieve 30x30 goals

To address drought, water availability and increased demand, groundwater overdraft, agricultural land retirement, land repurposing, crop transitions, and the challenges and opportunities small farms face

under SGMA, leverage and expand existing efforts to transition agricultural land to alternative uses, enhancing both water security and improving socioeconomic and environmental conditions.

Action Plan/Suggested Tactics:

- Address loss of agricultural land by establishing a regional multi-benefit cropland repurposing framework to transform agricultural land and enhance environmental, economic, and social benefits.
- Prioritize the creation of buffer zones to serve as pesticide drift buffers and accessible community spaces, integrating these green areas into urban and rural settings to promote environmental justice, community well-being, and economic development.
- Leverage the state's Multi-benefit Land Repurposing Program (MLRP) to plan and implement projects aimed at reducing regional groundwater demand and repurposing formerly irrigated farmland.
- Provide financial incentives and technical assistance to growers for voluntarily transitioning their land to alternatives, such as habitat restoration, community parks, floodplain restoration, multi-benefit groundwater recharge areas, dryland crops, managed rangeland, or low-impact solar installations.
- Prioritize alternative sustainable ways of growing food such as agroecology and regenerative agriculture mixed with less water-intensive crops to assist farmers in transitioning away from conventional agriculture.
- Repurpose underutilized urban land into productive urban farming spaces, transforming idle areas into vibrant agricultural hubs that contribute to local food systems and community resilience.
- Leverage newest California state park (Dos Rios Ranch Preserve) as a demonstration project illustrating the economic and sustainability benefits of transforming former agricultural land for public use, conservation, and floodplain restoration.
- Identify new areas for regional multi-benefit development. For example, prioritize restoration efforts at Hidden Valley Ranch and ongoing efforts to connect it to nearby Dos Rios Ranch – efforts that would add 380 acres of floodplain and other habitat to the 1,600 acres at Dos Rios.
- Explore potential and placement of utility-scale solar photovoltaic development on agricultural lands.
- Establish an agricultural cooperative incubator and accelerator to support the transition of small, local farms toward sustainable practices and alternative land uses under SGMA, reducing the risk of corporate farm consolidation while promoting equitable land repurposing and community resilience.
- Enhance land repurposing efforts by providing targeted technical assistance and educational programs to county planning departments. Partner with local governments to build capacity and understanding of advanced land-use strategies, ensuring that planning processes are well-informed and effectively support sustainable development and floodplain management.
- Conduct an inventory of industrially zoned land to assess supply and potential demand. Use this data to guide decisions on land use, including repurposing surplus land for sustainable activities like solar projects or agricultural preservation. Implement GIS-based monitoring to ensure land transitions support economic growth and environmental stewardship, balancing industrial expansion with ecosystem protection.
- Ensure that land repurposing and sustainable agricultural practices prioritize disinvested

communities by actively involving them in decision-making processes, providing access to financial incentives, delivering technical assistance and enhance both environmental and socioeconomic resilience through sustainable land transitions.

Partnerships:

Collaborate with local government agencies, tribal entities, water districts, conservation groups, NGOs, agricultural cooperatives, regional education institutions and federal agencies like the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers. While not a comprehensive list, the following are examples of regional programs and organizations:

- Conservation and restoration groups such as The River Partners (managing Dos Rios Ranch Preserve/Hidden Valley Ranch/Grayson Riverbend Preserve), Restore the Delta, the Delta Conservancy, Tuolumne River Trust, East/West Stanislaus Resource Conservation District, Grassland Resource Conservation District, East Merced Resource Conservation District, and San Joaquin County Resource Conservation District.
- Research and educational institutions such as the University of California's Cooperative Extension in San Joaquin County offers expertise and support for agricultural and environmental projects.
- The Cosumnes River Preserve model for land lease and wildlife friendly agricultural practices.
- Agricultural and farming organizations such as the Community Alliance with Family Farmers, American Farmland Trust, Cortez Growers Association, Stanislaus Grown and the California Center for Co-operative Development work to support local farmers, promote sustainable agriculture, and enhance food systems in the region.
- The Cooperative Extension Office of University of California, San Joaquin County.

Strategy 4.3 Advance innovation in protecting and developing sources of water

In response to anticipated challenges in water availability and quality, prioritize strategies that address groundwater replenishment. Support efforts to create intermittent wetlands to mitigate ecological impacts on groundwater and river ecosystems, reduce agricultural water use, and ensure equitable access to and quality of water in affected communities. Additionally, focus on water innovation and the adaptation of both new and existing infrastructure to ensure that water management practices are aligned with the latest environmental data.

Action Plan:

- Leverage Flood Managed Aquifer Recharge (Flood MAR) and the ongoing work of the Merced Irrigation District, CA Department of Water Resources, and UC Merced – Water Systems Management Lab to identify priority locations such as agricultural fields or other managed lands for groundwater recharge.
- Promote water innovation and the adoption of advanced technologies to improve water use, storage and conservation practices, acknowledging that water availability is a critical limiting economic factor. This includes the deployment of real-time monitoring systems, water meters, smart irrigation, and adaptive management strategies. Focus on optimizing both new and existing infrastructure, such as reservoir releases and irrigation canals, by integrating technologies that account for current and future climate realities.
- Recognizing that regional water trading systems may develop independently, promote informed regional discussions to address and minimize potential economic impacts on small growers and vulnerable communities, particularly under drought conditions when water may be traded for high-

value commodities. By fostering collaboration and providing a platform for stakeholders, NV THRIVE can encourage the state to evaluate and mitigate the risks of exacerbating economic disparities, particularly for small farms that may face unsustainable costs.

- Act as a regional partner to educate stakeholders on ways to minimize equity concerns in water banking programs and projects. Convene discussions that emphasize the importance of equity and environmental stewardship, ensuring that any future water banking project is developed with clear legal and regulatory safeguards to mitigate the risks to vulnerable populations and protect disinvested communities from adverse impacts.
- Create systems of intermittent wetlands through expanded dedicated recharge areas.
- Facilitate regional discussions on the historical injustices tied to water rights and land acquisition, promoting a deeper understanding of how these legacies impact current water rights distribution and land ownership, and exploring pathways for more equitable reforms.
- Address the safe drinking water crisis by integrating small water systems with larger ones or forming new institutional structures to group smaller systems together to achieve economies of scale and facilitate the sharing of technical, financial, and managerial resources for disinvested communities.

Partnerships:

Collaborate with local government agencies, tribal entities, water districts, conservation groups, NGOs, agricultural cooperatives, and federal agencies like the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers. Regional educational institutions can offer expertise in water management, agriculture, and environmental science. While not a comprehensive list, the following are examples of regional programs and organizations:

- Water management and conservation projects include the Merced River Watershed Flood-MAR Reconnaissance Study by the Merced Irrigation District and CA Department of Water Resources, the San Joaquin Valley Land and Water Conservation Collaborative, the Acampo Area Drainage Project by San Joaquin County, and the Delta Rice Conversion Program in Staten Island Wetland Restoration led by The Nature Conservancy.
- Research and educational institutions include UC Merced's Water Systems Management Lab
- Resource conservation districts encompass the East Stanislaus Resource Conservation District and the East Merced Resource Conservation District.

Strategy 4.4 Create more accessible parks and outdoor spaces

Invest in regional parks and green spaces to enhance community well-being, environmental sustainability, resilience, and prioritize public land and water access.

Action Plan:

- Build multi-benefit parks and amenity rich places along rivers in region (downtown Stockton and Modesto).
- Emphasize public access as a central framework in regional planning, highlighting the critical role of conservancies, land trusts, and community land trusts in stewarding lands that support parks and recreational spaces.
- Encourage public access in multi-benefit land repurposing projects by exploring and implementing feasible opportunities for the public to engage with repurposed lands. This could include creating

pathways around recharge basins or other accessible features like canals and waterways that support the 'Access for All' initiative, providing spaces for recreation, education, and community engagement while maintaining the primary environmental and agricultural goals of the land.

- Conduct a needs assessment to identify strategic sites along regional rivers for park development, focusing on areas with high community need and ecological value.
- Incorporate green infrastructure elements like rain gardens, bioswales, and permeable pavements to manage stormwater, reduce flood risk, and improve water quality.
- Integrate job creation with park development to enhance quality of life, attract a stable workforce, and ensure communities have access to nature and outdoor recreation as part of a comprehensive strategy for regional well-being.
- Support the development of park-based educational programs, such as guided tours and nature walks, to help students and communities connect with and value the region's natural resources, fostering a generation that is informed, engaged, and committed to environmental stewardship.
- Support and prioritize urban land stewardship. For example, collaborate with cities in the region to encourage projects like the replacement of turf lawns with water-permeable, low-water-use alternatives, or efforts to promote the planting of native species to reduce water consumption and create habitat for beneficial insects and wildlife.
- Collaborate with local governments, community organizations, and residents to ensure park designs meet the needs and desires of the community.
- Focus on creating parks and outdoor spaces that directly benefit disinvested communities by prioritizing their access to green spaces, recreational areas, and public lands.

Partnerships:

Collaborate with local governments, tribes, conservation groups, NGOs. While not a comprehensive list, the following are examples of regional programs and organizations: The Trust for Public Lands; Homegrown National Park; The Wildlife Foundation; The River Partners (Dos Rios Park and Hidden Valley Ranch); Greater Valley Conservation Corps; Little Manilla Rising; Black Urban Farmers Association; Delta Aquatic Center; Restore the Delta, and the Delta Conservancy.

Alignment with Guiding Principles

- **Job Quality:** These strategies support the CA Jobs First goals for job quality by generating diverse employment opportunities in ecological restoration, land management, and water conservation, supporting stable and meaningful job growth. They also foster economic growth by attracting investments in green technologies and sustainable practices, promoting technical and research jobs, and creating roles in park development and maintenance. By prioritizing nature-based solutions and equitable access, these initiatives not only meet climate objectives and protect vulnerable communities but also contribute to a robust and inclusive job market, as outlined in key state initiatives and policy. For more details about alignment with state strategies, see Appendix 6A and for alignment with select federal strategies see Appendix 6B.
- **Equity:** These strategies support the CA Jobs First goals for equity through alignment with state policies that prioritize environmental justice and the protection of vulnerable communities. These initiatives ensure that flood mitigation, climate adaptation, and access to green spaces benefit underserved and marginalized populations, addressing disparities in environmental impacts and

resource distribution. By involving local communities in planning and decision-making processes, these strategies can empower residents and promote inclusive development. They improve air and water quality, enhance resilience to climate impacts, and provide equitable access to recreational areas, fostering healthier and more resilient communities. For more details about alignment with state strategies, see Appendix 6A and for alignment with select federal strategies see Appendix 6B.

- **Climate and Resilience:** These strategy supports the CA Jobs First goals for climate and resilience enhancing natural ecosystems' ability to buffer against climate impacts such as flooding, drought, reduced water availability, and heatwaves. By transitioning to sustainable land uses and developing resilient water systems, these strategies improve ecosystem health and water security, addressing extreme weather events and resource scarcity. Increasing accessible parks contributes to urban resilience by mitigating the heat island effect and providing spaces for community education on climate adaptation. These efforts are in line with key state policies such as AB 1757, California's Nature-Based Solutions Climate Targets Plan, the Climate Adaptation Strategy, and the State's Water Resilience Portfolio, ensuring comprehensive climate resilience and environmental sustainability. For more details about alignment with state strategies, see Appendix 6A and for alignment with select federal strategies see Appendix 6B.

Strategy Area Five: Placemaking, and Amenities

The North San Joaquin Valley (NSJV) region is often perceived as lacking in entertainment, cultural, and recreational amenities. However, there are several opportunities to change this by leveraging the region's key assets, including its cultural diversity, moderate climate, and central location between California's iconic mountains and coastline. The main challenge lies in the limited support and planning for the sustainable growth of the region's arts and creative economy, which hinders the development of quality jobs, diminishes entertainment and recreational options, and limits awareness of and access to the region's unique assets.

To address these challenges and enhance the region's quality of life and sense of place, it is proposed to develop both an arts, culture, and creative economy plan and a strategy for packaging existing and emerging cultural and natural amenities in the region. While the plan and strategy have distinct foci, together they create a cohesive strategy area for regional placemaking that enhances amenities, bolsters the local economy, and improves the quality of life by strengthening regional connectivity and promoting economic vitality across all three counties.

Cross Cutting Issue Definition and Profile

Placemaking involves regional self-determination toward a sense of place. According to Collins Dictionary, placemaking consists of "designing or redesigning public places to be more useful, communal, safe, etc., especially with input from the communities using them." In the case of the NSJV, placemaking involves collaboratively conveying a sense of place by coordinating existing and emerging assets.

The region boasts a rich cultural history, a variety of natural amenities, a central location and transportation hub, and a diverse population, supported by key institutions such as local organizations dedicated to art, culture, history, music, food, dance, and other creative arts and humanities. Rather than being viewed as an isolated industry, creative industries are increasingly recognized as necessary infrastructure for developing crucial innovation-related abilities and attracting and enhancing employers

with quality jobs. These innovation-related skills, which include creative thinking, cognitive flexibility, social wellbeing, and resilience, are becoming valuable across all sectors of the economy. This shift in recognition represents a growing acknowledgment of the creative field's potential to nurture talents that are essential in today's rapidly changing society. By doing so, it positions creativity as a key factor in the region's workforce and overall culture, which could benefit from recognizing and leveraging the diverse cultural and natural influences that drive entrepreneurship and innovation.

Leveraging existing assets and establishing a regional future rich in creativity requires diverse strategies that encompass strategic investment, education, research, comprehensive planning, entrepreneurship and business innovation, as well as coordination of the region's cultural and natural assets. By enhancing and sustainably supporting creative economy jobs and skills, the region can potentially trigger far-reaching improvements in overall wellbeing. A healthy workforce is a strong one. In addition to direct and indirect economic benefits, this strategy aims to foster a population that experiences greater joy, improved health, stronger social bonds, and enhanced resilience. The goal is to nurture a region that is not only more productive but also more fulfilled, equitable, sustainable, and adaptable to change and innovation.

The strategy area of placemaking and amenities encompasses the development and strengthening of a creativity infrastructure, including culturally relevant entertainment and recreational assets, events, and programs that enhance the region's quality of life while leveraging key regional assets and sustainably supporting quality jobs and the overall creative economy. This includes initiatives aimed at attracting and supporting quality jobs in the creative economy while creating and enriching cultural and creative assets, public spaces, and community events that reflect the community's diverse heritage, local culture, natural environment, key assets (e.g., waterways, parks, agriculture, athletics), and values.

Problem Statement

Community conversations highlight that many artists and creative professionals struggle to secure living wages, affordable spaces, and sustainable sources of support for their work, which leads to instability in careers and property ownership, as well as a lack of stable and sustainable creative industries and infrastructure for the region. As a result, the NSJV experiences a consistent leakage of artists and creative professionals, as well as the products and lifestyle enhancements they produce and the direct and indirect revenue they generate. Further, while the region's central location serves as a "Gateway to Yosemite" and Pinnacles national parks and numerous waterways and other natural amenities, as well as the state capital to the north and the San Francisco Bay Area to the west, it lacks intentional integration of these amenities into a cohesive sense of place and coordinated experiences. Indeed, the region lacks a comprehensive strategy to sustainably and equitably integrate arts, culture, entertainment, and recreation, including related amenities, with regional planning and development to support quality jobs and security for artists and creative professionals, to grow and attract businesses, and to promote wellbeing for residents and tourists.

This lack of intentional regional planning, public-private partnerships, coordination of amenities, and adequate support for quality jobs in the arts and creative economy leads to instability in related careers and a lack of sufficient culturally relevant amenities and events, as well as widespread unawareness of and lack of access to those that do exist. Resultantly, the region misses an opportunity to enhance community engagement, creative inspiration, cultural healing, soul building, and regional attractiveness. According to the baseline assessment for the region and its socioeconomic summary, despite possessing a diverse social, natural, and cultural foundation, the NSJV region ranks 11th lowest among the 13 California Jobs First regions in terms of arts vibrancy (arts spending, providers, and government support).

The relatively low-level of public and private support for the creative economy occurs alongside rising costs and regulatory barriers that further limit private engagement, activity, stability, and growth in this area. The deficiency in placemaking and amenities hinders socio-economic growth by making the area less appealing and inspiring to potential and current residents and businesses, including those in creative industry and those that directly or indirectly benefit from it.

The lack of regional planning and investment likely reflects a lack of understanding of the value of creativity infrastructure. Creativity infrastructure not only supports quality jobs in creative industry, but it also attracts and supports residents, tourists, and businesses with quality of life and quality of jobs while generating tax revenue and indirect revenue for other businesses. Further, it promotes innovation, health, and wellbeing for the population. Despite this general recognition, the region lacks key information regarding these benefits, such as the following:

1. the service area of the region's creative industries,
2. available venues,
3. regional assets and opportunities to collaborate and to develop packaged experiences that leverage multiple assets and industries (e.g., downtowns, parks, waterways and waterbodies, agritourism and nature-based opportunities, recreational sports and youth sports opportunities, food opportunities),
4. barriers to engagement for creative professionals, consumers (residents and tourists), community-based organizations, and businesses (e.g., cost, language, and regulatory barriers, lack of childcare and eldercare, need for transportation and accessibility).

Better understanding these issues will help inform decisionmakers and advocates to provide intentional support for artists and creative professionals while enabling them to support regional socio-economic development for residents, tourists, and businesses alike.

Opportunity Statement and Regional Assets

This strategy area draws inspiration from groundbreaking work done in creative placemaking, particularly through initiatives such as Sacramento's Creative Edge plan, ArtPlace America, and the National Endowment for the Arts' Our Town program. These endeavors demonstrate the viability of significant progress in integrating artistic practices with fair and inclusive community design and growth strategies through intentionality, collaboration, investment, and planning. Further, these efforts highlight the crucial role artists and creative professionals play in fostering community progress and wellbeing, as well as the need to collaboratively coordinate existing and emerging amenities to create a cohesive sense of place.

The NSJV's central location and transportation infrastructure (e.g., waterways, airport, train stations) provides accessibility and convenience, making the region a natural hub for travelers seeking both alpine adventures and coastal escapes. This geographical advantage can stimulate further investment in infrastructure, land development, transportation, and services, bolstering local economies in the region through increased tourism, improved connectivity and collaboration, and thriving creativity, entertainment, recreation, tourism, and hospitality industries. Together, these elements can create a sustainable and prosperous ecosystem, while preserving and celebrating the region's unique cultural and natural heritage, supporting the arts and creative professionals, and enhancing overall health and wellbeing.

Existing regional assets include local artists, cultural and linguistic diversity, historical sites, distinctive downtowns, farms and agritourism, wineries, educational institutions, transportation infrastructure, museums, libraries, art galleries, dance studios, music groups, poetry and storytelling groups, and

other culinary arts, performing arts, visual arts, media, faith-based, sports, environmental, and cultural organizations, as well as existing community centers, entertainment venues, recreational activities (e.g., youth sports), and other public spaces (e.g., parks, waterways and waterbodies) that can be leveraged for events and programs. Local schools, universities, and colleges also offer resources and expertise in related fields of cultural studies, art, music, humanities, and local history.

Further, the region houses numerous other environmental amenities, such as the Sacramento-San Joaquin Delta National Heritage Area, multiple national wildlife refuges (San Luis National Wildlife Refuge, Merced National Wildlife Refuge, San Joaquin River National Wildlife Refuge), ten state parks and recreation areas, and many other venues that provide a foundation for enhancing the regional sense of place and packaged experiences. In addition to the region's amenities, the NSJV benefits from a multimodal transportation hub and access to a variety of assets in the broader Northern California Megaregion. Fostering private-public partnerships between these regional and interregional assets can coordinate and increase the scale of investment, as well as activate places and spaces throughout the region.

As a strong foundation to further enhance going forward, the regional Arts, Entertainment, and Recreation industry posted \$220,384,093 in earnings in 2022, including \$26,483,059 in exports to other California counties, according to the baseline assessment. Further, the industry employed 8,787 people in 2022, which represents a 12% increase since 2012 according to the baseline assessment. In addition to these economic indicators, arts, culture, entertainment, and recreation provide the opportunity for people to digest and respond to what has happened, as well as to creatively envision something different. In this way, the creativity infrastructure provides a foundational element for a thriving innovation ecosystem.

Developing a vibrant creative economy through intentionality of planning, investment, and collaboration can enhance the region's quality of life, attracting and retaining talent and employers with quality jobs while fostering community pride, healing, innovation-related skills, and broader socio-economic development. Leveraging the NSJV region's diverse socio-cultural and natural assets in tandem with its central location to world-class mountain and ocean-side experiences presents an opportunity for robust socio-economic development. By embracing and celebrating the rich tapestry of cultures, traditions, natural resources, and talents within the region, businesses can tap into a vibrant labor pool and create authentic, immersive tourism, entertainment, recreational, and hospitality offerings of benefit to residents and tourists alike.

Investment strategies

Strategy 5.1 Develop an Arts, Culture, and Creative Economy Plan.

Collaborate with creative professionals, local government agencies, arts organizations, educational institutions, community groups, business leaders, and other stakeholders to create a plan for the development of cultural amenities and economic growth in the creative sector.

Action Plan:

Explore engaging and convening local artists and creative professionals, arts and cultural organizations, educational institutions, residents, businesses, industry leaders and other stakeholders in collaborative plan development.

Conduct comprehensive studies to equip stakeholders and rightsholders with data on best practices for securing sustainable quality jobs, the economic impact of creativity infrastructure, spending leakage, available venues, collaboration opportunities, barriers to engagement, an arts and culture needs assessment, and an actionable plan to support socio-economic development and job creation within the creative economy. Such studies include the following:

- the supports needed and best practices available for artists and creative professionals to secure sustainable quality jobs,
- the primary service area of the NSJV's regional creativity infrastructure,
- the return on investment and revenue generated by the creative economy (e.g., tax revenue, indirect revenue for other businesses, direct revenue, incomes of related jobs),
- the leakage of spending to other regions and the amount that could be retained with support,
- the venues and assets available for coordination and packaged experiences (e.g., downtowns, parks, waterways and waterbodies, galleries, studios, theatres, wineries, farms, agritourism and nature-based opportunities, sports facilities, recreational sports and youth sports opportunities, libraries, community centers, places of worship, museums, food establishments),
- best practices and opportunities to collaborate and to leverage resources and funding streams, such as transportation funding,
- barriers to engagement (e.g., cost, language, and regulatory barriers, lack of childcare and eldercare, need for transportation and accessibility), and
- a plan of action to address the findings of the aforementioned studies, including in an Arts, Culture, and Creative Economy Plan

As part of the Arts, Culture, and Creative Economy Plan,⁷⁹ the collaborative effort could engage in the following:

- Develop and complete a community engagement plan
- Launch a regional marketing campaign that not only promotes cultural events and amenities but also highlights the region as a hub for creative businesses, attracting investment and fostering business growth.
- Ensure that the plan facilitates accessibility by providing childcare, linguistic representation, sliding scale fees, and transportation options to and from events to make it easier for all community members to participate and benefit economically.
- Collaboratively create a comprehensive plan, similar to Sacramento's Creative Edge plan, with clear goals, strategies, and actions for investing in cultural equity and creativity infrastructure, place healing, place keeping, and placemaking.
- Ensure access to cultural amenities that resonate with the region's diverse population.
- Encourage participation in arts and cultural activities as a means of building social cohesion and enhancing the overall quality of life in the region.
- Infuse arts and cultural elements into public spaces, transforming them into vibrant hubs of activity that reflect the region's unique identity and history.
- Use public art, performance spaces, and cultural programming to create memorable and engaging experiences.
- Leverage transportation infrastructure and park investments
- This plan should prioritize job creation by leveraging key regional assets (e.g., downtowns, parks, agritourism and nature-based opportunities, recreational sports and youth sports opportunities, food opportunities) and supporting local artists, designers, and cultural entrepreneurs (e.g., spaces, resources, projects)⁸⁰

. Key actions include expanding opportunities for local art in public spaces, integrating art into decision making processes, and developing culturally relevant art and amenities that drive regional socio-economic development with a particular focus on creating quality jobs and improving overall well-being, especially in disinvested communities.

- Establish partnerships with local businesses, chambers of commerce, and industry associations to identify ways to integrate arts and culture into economic development strategies, such as creating business incubators, job training programs, and mentorship opportunities in creative fields.

Partnerships:

Public-private partnerships can be leveraged to collaboratively work toward development, implementation, evaluation, and continuous improvement of the Arts, Culture, and Creative Economy Plan, with a specific focus on equity, sustainability, economic growth, and high-quality job creation. For example, this could involve strengthening partnerships between government, local businesses, industry associations, artists, creative professionals (e.g., media arts, performing arts, visual arts), and arts and cultural organizations (e.g., art councils, Cultural Heritage Council of San Joaquin County, Faith in the Valley, HATCH Workshop, San Joaquin Urban Native Council).

Partnerships should involve community leaders, urban planners and economic development professionals, chambers of commerce and tourism organizations, transportation agencies, educational institutions, and community leaders in the plan's development. Further, partnerships should include venue representation by working to engage venues (e.g., downtowns, parks, waterways and waterbodies, galleries, studios, theatres, wineries, farms, agritourism and nature-based opportunities, sports facilities, recreational sports and youth sports opportunities, libraries, community centers, places of worship, museums, food establishments), while emphasizing the importance of aligning the creative economy with broader regional and interregional economic strategies, especially in disinvested communities.

Strategy 5.2 Package and market the region's cultural and natural amenities to grow the experience economy

Engage a diverse group of stakeholders and rightsholders, including local destination marketing organizations, tribal partners, economic development agencies, community groups, small business representatives, environmental organizations, key venues, and other relevant parties. Work together to develop a shared vision for the region as a desirable destination. Collaboratively create comprehensive, packaged experiences that enhance connectivity, promote sustainable growth, and boost economic vitality, all while advancing the experience economy across the region and megaregion.

Action Plan:

To enhance the region's experience economy, the region should explore the creation of packaged cultural and recreational entertainment experiences, which is related to, but distinct from the Arts, Culture, and Creative Economy Plan.

Explore engaging and convening rightsholders and stakeholders in the collaborative development of packaged experiences and to help ensure cohesive planning and development efforts across the region's three counties.

A Request for Proposals (RFP) can be issued to lead the effort to develop comprehensive packaged experiences that prioritize job creation, equity, sustainability, and economic development while

considering the following:

- Utilize findings from prior studies, including those conducted with the Arts, Culture, and Creative Economy Plan and Sacramento's Creative Edge plan, to develop packaged experiences to integrate and coordinate natural amenities and creativity infrastructure, including alignment with transportation and economic development investments and strategies.
- Develop and implement an asset mapping process, including identifying environmental amenities and spaces for arts and cultural events, as well as potential business opportunities. This might include actions such as developing a listing of arts, cultural, and environmental organizations and amenities, creating a directory and interactive map, and fostering the coordination of events and programs to maximize socio-economic impact.
- Promote a shared regional identity that celebrates the unique cultural, historical, and environmental amenities of the NSJV.
- Engage communities across the region in placemaking initiatives that reflect local values and enhance quality of life.
- Leverage the region's locational advantages while fostering high-road growth opportunities in technology, logistics, and priority sectors.
- Attract businesses and services that align with the region's identity, support local employment, and provide amenities that enhance daily life, while fostering community cohesion through activities and events that bring people together.
- Support small businesses and startups that enhance local amenities and contribute to the regional economy.
- Leverage transportation investments in the region by identifying opportunities to develop or locate investments near rail stations (e.g., HSR/ACE/Valley Link), as well as by integrating cycling infrastructure and pedestrian pathways investments to reduce car dependency and increase accessibility across counties.
- Develop transportation and utility networks that not only connect key nodes and corridors as packaged experiences but also enhance the public realm with walkable streets, green spaces, and vibrant public plazas designed to promote social interaction and community engagement.
- Identify specific actions to enhance nodes, including through public improvements, greater connectivity and accessibility, coordination, public-private partnerships, marketing, and business support.
- Strategically plan mixed-use developments that blend residential, commercial, and recreational spaces, ensuring environmental sustainability and creating attractive destinations that strengthen the region's sense of place.
- Consider adoption of some of the applicable strategies of Sacramento's Edge Plan, such as packaged cultural experiences to create a seamless process that integrates accommodations, food, entertainment/recreation, childcare, linguistic representation, and transportation, artist-designed neighborhood markers to further enhance the sense of place and to identify amenities with cultural responsiveness, coordinated neighborhood cultural events to celebrate the culture of communities, a regional arts transportation program and a youth culture pass to engage youth in regional creativity infrastructure and natural amenities, a regionwide culture pass to foster further engagement in the region's amenities while coordinating marketing and transportation, and convening and networking events to connect stakeholders and rightsholders.

Partnerships:

Partners for this strategy largely overlap with the partners envisioned for the development of the overall Arts, Culture, and Creative Economy Plan, which can collaboratively work toward development, coordination, implementation, evaluation, and continuous improvement of packaged experiences.

Alignment with Guiding Principles

This strategy aligns with the state's goals for equitable economic development. It supports quality job creation in the arts and cultural sector while promoting equity by ensuring culturally diverse representation in public spaces and events with a focus on disinvested communities. Further, this strategy aligns with several potential funding opportunities, such as the following:

1. National Endowment for the Arts: Our Town Grants
2. National Endowment for the Arts: Grants for Arts Projects (GAP)
3. National Endowment for the Humanities: Public Humanities Projects
4. Transportation and infrastructure funding, such as Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grants, National Infrastructure Project Assistance (Mega) Program grants, Safe Streets and Roads for All (SS4A) grants, USDOT Transportation Alternatives Set-Aside Program, Better Utilizing Investments to Leverage Development (BUILD) grants, California Active Transportation Program (ATP), and the California Local Partnership Program

Strategy Area Six: Generational Well-Being

The region is currently facing an issue with insufficient availability of care and support services across all age groups. The core problem stems from limited awareness, access, and availability of such services, particularly in areas like health, behavioral health, childcare, and eldercare. To address this, it is proposed to expand childcare and eldercare opportunities while simultaneously enhancing awareness and access through culturally and linguistically appropriate community health services.

Cross Cutting Issue Definition and Profile

This cross-cutting issue focuses on increasing generational wellbeing for the North San Joaquin Valley (NSJV) region by developing and coordinating the regional caring economy of childcare providers, eldercare providers, and Community Health Workers/Promotores/Representatives. Thus, this strategy focuses on fostering small business and entrepreneurship opportunities, creating promising jobs with career advancement paths, and building the necessary support infrastructure. The goal is to address inequities in the social drivers of health, improve public health outcomes, and attract and uplift residents and businesses.

Generational wellbeing is an outcome achieved through a robust community of support, which includes provision of care and support services to individuals of all ages, focusing on culturally and linguistically responsive health, behavioral health, childcare, and eldercare. Such provision of care requires awareness of and access to services in culturally and linguistically responsive ways. Generational wellbeing involves a holistic balance of health and occupational, financial, and social wellbeing, which requires creating a supportive environment for all community members, from children to elders, enhancing awareness of and access to health services, human-centered processes, intentionality in the mitigation of health inequities, and attention to addressing social drivers of health, especially in disinvested communities.

Key institutions include healthcare providers and insurers, behavioral health centers, childcare and eldercare providers, educational institutions and training providers, workforce development

organizations, and community health organizations. For an example of a similar regional strategy involving workforce development in the healthcare sector, HealthForce Partners Northern San Joaquin Valley is a collaborative initiative spanning the healthcare sector across San Joaquin, Stanislaus, and Merced counties. These types of partnerships act as bridges between educational institutions, workforce development agencies, and community organizations. By facilitating coordination, these kinds of collaborations aim to strengthen the regional workforce ecosystem.

Thus, in addition to health equity goals, another primary goal of this strategy area is to synchronize efforts to support caregivers and quality care, to free up time for residents caring for children and/or elders, to foster entrepreneurship, and to meet the staffing needs of a variety of employers while simultaneously expanding service capacity and broadening career opportunities for individuals. Promoting generational wellbeing with a robust childcare and eldercare ecosystem will benefit from a comprehensive and collaborative regional approach toward workforce development and entrepreneurship support, coupled with developing awareness of and access to related services through culturally and linguistically proximate guidance and education bridging the divide between community and institutions.

Problem Statement

The NSJV region faces challenges in providing comprehensive, quality care and support services across all age groups, particularly in health, behavioral health, childcare, and eldercare. For example, regarding childcare, costs have outpaced already high levels of inflation in the NSJV. While governmental subsidies provide some funding, such as the Alternative Payment Program and California Work Opportunity and Responsibility for Kids (CalWORKs) Child Care assistance, there remains a mismatch between need and supply.

Still, many subsidies go unutilized for a variety of reasons (e.g., ineligibility, difficult application processes, lack of suitable childcare opportunities even with a subsidy). Even for the small fraction securing support after challenging application processes and waitlists, more people have vouchers and subsidies than there are slots in locations and times needed (e.g., spaces only accommodate about 20% of NSJV children). Further, subsidies are not high enough for many providers and consumers even when secured. Thus, the NSJV includes childcare deserts, along with less mental health providers, primary care physicians, other primary care providers, and dentists per capita than California and the United States. Indeed, while there is a licensed childcare space for only 1 in 4 children in California, there is a licensed childcare space for only 1 in 5 children in the NSJV.

Similarly, a recent study of childcare facilities and eldercare facilities in the NSJV conducted by researchers at UC Berkeley found that there is an undersupply of both in the region. Indeed, approximately 50 census tracts in the NSJV lack access to licensed childcare resources, with the majority of the census tracts without childcare facilities located near urban areas in the central area of the NSJV. Further, the study found that the few census tracts housing eldercare facilities were concentrated in the urban corridor of the region, with about 50 mostly large and rural census tracts housing no eldercare facilities. Demonstrating the pressing need to address care shortages, the California Department of Aging anticipates that the elderly population will grow by over 200% between 2010 and 2060 in Merced and San Joaquin counties and between 150% and 199.9% in Stanislaus County. As the NSJV population continues to age, the shortage of eldercare facilities, as well as their inequitable geographic distribution, will become more acute, which will place more burden on NSJV residents.

Even when care providers seek to expand to increase capacity, some struggle to fill job vacancies due to lack of prepared workforce and competing employment opportunities. Without quality childcare and

eldercare employees to fill job vacancies, the number of facilities cannot likely expand to meet needs, even with greater subsidies. Without suitable care spaces to meet needs, people responsible for care cannot likely increase educational attainment and fill quality job opportunities in the NSJV, including those in the care industry in need of trained employees. Without the ability to fill vacant jobs, it likely becomes more difficult to grow new and existing high-road businesses in the NSJV. Further, with a shortage of licensed childcare and eldercare options, many people leave the workforce or turn to more informal, unlicensed care options that are not inspected for safety or quality and that often lack trained professionals. Additionally, the NSJV's diversity of cultures and languages requires culturally and linguistically proximate care resources, as well as awareness of these resources. While Community Health Workers/Promotores/Representatives help connect residents to such resources, the region lacks a coordinated model of care to promote systemic cohesion in this regard, and there is a need for more Community Health Workers/Promotores/Representatives. This situation puts NSJV children and elders at risk for receiving subpar or even unsafe care— and these risks likely get distributed in inequitable ways across the region.

Indeed, the shortage of care services produces disparities. For example, childcare deserts impact lower income families, BIPOC families, mothers, people with disabilities, immigrants, people with limited English proficiency, single parents, and parents of infants and toddlers most of all. Even when care is available, many people lack awareness of and access to such opportunities, and the resources are not shared in a way that reaches all residents, which further contributes to inequities. In addition to negatively impacting NSJV residents who provide and receive care, the insufficient care infrastructure also harms businesses and socio-economic development efforts. Without an adequate community of support, residents and businesses may not choose to locate or remain in the region. Thus, these inequitable gaps affect community well-being, workforce participation, and employer support and attraction.

While Stanislaus 2030 provides a strong foundation for addressing childcare needs, Merced and San Joaquin counties also face significant childcare deserts that hinder residents' ability to enhance educational attainment, pursue careers, and engage in activities beneficial to their health and wellbeing:

- Like Stanislaus County, childcare deserts in Merced and San Joaquin counties impact residents' ability to pursue education and careers.
- Approximately 50 census tracts across all three NSJV counties lack access to licensed childcare resources.
- Parents and guardians often have to stay home involuntarily or rely on unlicensed childcare, which may not offer the quality and opportunities of licensed care.

The current situation in the childcare and eldercare sectors exemplifies a market failure whereby a predominantly private market is left to provide the services at prices often beyond the means of both the consumers and the businesses offering it. Further, the lack of suitable eldercare and childcare options, coupled with inequitable public health outcomes and lack of awareness of available care resources, puts stress on families and support systems, which contributes to lower educational attainment (high school and college completion), social associations, voter turnout, and educational performance levels (math and reading scores), as well as higher rates of children in poverty, physical inactivity, disconnected youth, unemployment, and other social drivers of health. As a result, the workforce becomes less prepared, which makes it more difficult to attract and support opportunity employers that could expand both regional care capacity and access to high-road, quality jobs. Thus, the region's ecosystem of care and support services has wide-ranging impacts on community health, education, workforce development,

and socio-economic development, which must be addressed to advance generational wellbeing for the NSJV.

Opportunity Statement and Regional Assets

In this environment, many advocate for permanently removing costs for care, increasing the number of government-subsidized care openings to accommodate all, streamlining licensing and financial assistance processes, fostering greater awareness of opportunities and linkages between potential consumers and providers, and ensuring care professionals receive compensation that allows them to maintain a reasonable standard of living while attracting more to join the care workforce. Expanding and improving care and support services can enhance community health, increase workforce participation, support and attract employers, and create high-road, quality job and entrepreneurship opportunities in the healthcare and care services sectors. Regional assets include existing care providers, educational institutions, workforce development organizations, insurers, and community health organizations, as well as the existing efforts in the region and state.⁸¹ Additionally, Public funding for such services has increased, including \$1 billion for childcare with the 2024 LHHS.

Focusing on enhancing childcare and eldercare services, including awareness of and access to them through culturally and linguistically proximate guidance and education, can enhance job opportunities for residents, increase capacity for employers, attract and grow businesses, and support residents otherwise responsible for providing such services. Job and business opportunities in the care sector present relatively low barriers to entry, aside from the lengthy and complicated licensing processes. Further, with the support of quality childcare and eldercare services that meet resident needs, residents can join the workforce, increase educational attainment, start a business, and better care for themselves, which may further improve public health, socio-economic development, and wellbeing across multiple generations.

Investment strategies

Strategy 6.1 Expand the Supply of Accessible Childcare

Increase the awareness, availability, capacity, quality, and coordination of childcare services in the region, especially in disinvested communities.

Action Plan:

Explore convening a representative group of stakeholders to align and coordinate components of the childcare ecosystem and to consider implementing childcare strategies of California's Early Childhood Policy Council and Stanislaus 2030's Child Care Report at a regional level,⁸² as well as to consider the feasibility and desirability of completing the following:

- Conduct a collaborative regional needs assessment to identify gaps and opportunities in childcare services, including barriers to entry and challenges for providers and consumers, as well as potential service linkages, which may involve scaling up the analyses completed for Stanislaus 2030's Child Care Report.
- Scale up the 10-year implementation plan of Stanislaus 2030's Child Care Report for the region to realize quality, accessible childcare that allows parents and guardians to work and enhance educational attainment while helping to support business profitability, including through the following activities:
 - Incubate new businesses
 - Develop business expansion course

- Align subsidy system
 - Raise implementation funds
 - Continuously evaluate outcomes
 - Engage in policy advocacy
 - Improve job quality and access to benefits, retirement, and wealth building opportunities (e.g., homeownership)
- Ensure relevant training is culturally and linguistically relevant for the region.
 - Explore integration with public workforce system and engagement of employers for site-based models of childcare such as employee-focused childcare,⁸³ as well as opportunities to coordinate and/or co-locate with eldercare facilities for intergenerational care and programming.
 - Reduce time to establish licensed childcare providers and to expand quality service capacity of existing providers for example from a lower capacity to a higher capacity, especially focused on home-based providers.⁸⁴
 - Provide grants and subsidies to support new and existing childcare centers, home childcare providers, and consumers at a variety of income levels.
 - Encourage childcare providers to accept subsidies to increase access and revenue to support higher pay for workers.
 - Provide technical assistance, including assistance to childcare providers with nutrition such as the Child and Adult Care Food Program (CACFP) and with conducting small upgrades to their home to assist more children in home-based childcare.
 - Assist care providers with wealth building strategies, including assistance or cross-training with regard to achieving home ownership and developing financial literacy.
 - Explore, increase awareness of, and provide financial and technical assistance for the development of equitable and sustainable worker cooperatives for support and stability.⁸⁵
 - Create an online platform and/or app to encourage and support entrepreneurship and collaboration in this area, with trusted community organizations to increase access, awareness, and digital literacy.⁸⁶ Such a platform could offer resources such as business support, training, licensing assistance, and financial aid, aiming to expand childcare capacity and improve quality.
 - Evaluate the online platform for connecting providers and consumers at Mychildcareplan.org and determine how to improve and/or better utilize a similar platform such as the local 211 service.
 - Utilize Community Health Workers/Promotores/Representatives to raise awareness and access to childcare services in culturally and linguistically responsive ways.

Partnerships:

Collaborate with local planning councils and resource and referral agencies (for example Child Abuse Prevention Council, the Family Resource Center, San Joaquin County Council for Quality Education and Care of Children, Stanislaus Child Development Local Planning Council, and the Merced County Collaborative for Children and Families), other government agencies (for example First 5 programs, Head Start programs, county offices of education), education providers, employers and public workforce system, childcare consumers and providers (for example parents, Central California Child Development Services, Inc., child development centers, Nurture) , and workforce development boards.

Strategy 6.2 Investigate Opportunities and Needs to Develop Eldercare Pathways

Enhance understanding of the needs and opportunities for eldercare services, including assisted living facilities and in-home care, with a focus on disinvested communities in the region.

Action Plan:

Explore convening a representative group of stakeholders to study and enhance understanding of the regional eldercare ecosystem, as well as to consider aligning and coordinating components of it at a regional level while exploring the feasibility and desirability of the following:

- Conduct a collaborative regional needs assessment to identify gaps and opportunities in eldercare services, including barriers to entry and challenges for providers and consumers, as well as potential for collaborations with childcare for intergenerational care and programming.⁸⁷
- Develop or expand culturally and linguistically relevant training and certification programs for eldercare specialists.
- Provide technical assistance to eldercare providers, including with nutrition such as CACFP.
- Explore, increase awareness of, and provide financial and technical assistance for the development of equitable and sustainable worker cooperatives for support and stability.⁸⁸
- Create an online platform and/or app to encourage and support entrepreneurship and collaboration in this area, with trusted community organizations to increase access, awareness, and digital literacy.⁸⁹ Such a platform could offer resources such as business support, training, licensing assistance, and financial aid, aiming to expand eldercare capacity and improve quality
- Evaluate the online platforms and local service platforms, such as 211, for connecting providers and consumers.
- Utilize Community Health Workers/Promotores/Representatives to raise awareness and access to eldercare services in culturally and linguistically responsive ways

Partnerships:

Collaborate with local government agencies, educational institutions, eldercare providers and consumers, workforce development boards, healthcare providers, senior centers, and community organizations (for example DRAIL).

Strategy 6.3 Facilitate Culturally and Linguistically Proximate Health in the Communities

Develop regional Community Health Workers/Promotores/Representative (CHW/P/R) collaborations that provide culturally and linguistically appropriate care, especially in disinvested communities (for example a regional Community Care Hub or Pathways Community HUB model).

Action Plan:

North Valley Thrive (NVT) can explore convening a representative group of stakeholders to align and coordinate components of the regional CHW/P/R ecosystem, as well as to consider the desirability and feasibility of the following:

- Conduct a collaborative regional needs assessment to identify gaps in CHW/P/R services in the region, including barriers to entry and challenges for providers and consumers, as well as to explore the use of the Community Care Hub model and inclusion of an outcomes-based model to study innovative service delivery in the region
- Establish a backbone entity that could assist with:
 - centralize contracting, administrative function, and/or operational infrastructure for Medi-Cal direct service providers
 - align the community and health delivery system,
 - develop, implement, enhance, and expand culturally and linguistically relevant training and

- certification programs for CHW/P/Rs in the region,
 - further the CHW/P/Rs workforce and foster a sustainable financial model with higher pay and benefits for CHW/P/Rs (for example work with health plans to be reimbursed for helping people navigate the system),
 - enhance regional care coordination by place-based CHW/P/Rs,
 - develop key infrastructure needed between traditional healthcare systems and the social service sector to effectively address community health-related social needs (HRSNs),
 - streamline resources to organizations providing community care,
 - provide infrastructure and capacity-building support to CBOs/Nonprofits to become self-sufficient Medi-Cal providers,
 - address personally modifiable risk factors and braid economic development and healthcare funding to create a financially sustainable population health approach focusing on those at greatest risk for poor outcomes, and
 - For unmet needs that existing resources cannot meet, the backbone entity could convene stakeholders to create solutions through programming, policy change, and securing needed resources
- Explore, increase awareness of, and provide financial and technical assistance for the development of equitable and sustainable CHW/P/R worker cooperatives for support and stability.⁹⁰
 - Consider creation of an online platform and/or app to connect CHW/P/R providers with consumers and employers, as well as to encourage and support entrepreneurship and collaboration in this area, with trusted community organizations to increase access, awareness, and digital literacy.⁹¹ Such a platform could offer resources such as business support, training, licensing assistance, and financial aid, aiming to expand eldercare capacity and improve quality.
 - Utilize CHW/P/Rs to raise awareness and access to the variety of services (e.g., 211), subsidies, and resources available in culturally and linguistically responsive ways while focusing on providing outcome-oriented care coordination, particularly for populations experiencing inequities, including in disinvested communities

Partnerships:

Partner with local health departments and providers, community organizations (for example Asian Pacific Self-Development And Residential Association (APSARA), Wide Horizons, SOMOS, El Concilio, InnerG, Líderes Campesinas, Valley Onward, West Modesto Community Collaborative, statewide and county United Way groups, including San Joaquin's Nonprofit Capacity Building Program), community health organizations (e.g., Community Health Leadership Council, Community Care Hub or Pathways Community HUB (examples in Fresno and in San Joaquin)), insurers, educational institutions and training providers (such as community colleges, CSU Stanislaus, Central Valley Opportunity Center, Community Health Training Initiative, HealthForce Partners Northern San Joaquin Valley), workforce development boards, and cultural organizations to expand access to CHW/P/Rs, the CHW/P/R workforce, 211, and a coordinated hub of care..

Alignment with Guiding Principles

- **Job quality:** This strategy aligns with state goals for equitable workforce development. It aims to create high-quality job opportunities in the childcare, eldercare, and CHW/P/R sectors while addressing health disparities. Jobs in these sectors present relatively low barriers to entry, which makes them accessible to more people. People entering these fields also benefit from career

ladders and pathways into higher paying jobs, such as careers in healthcare, education, and social work.

- **Equity:** This strategy supports the CA Jobs First goals for equity by specifically focusing on increasing healthcare access and addressing health disparities within disinvested communities. It supports equity by improving access to quality childcare and eldercare for working families, with a focus on disinvested communities, through culturally proximate community health infrastructure.
- **Climate:** This strategy does not have any disproportionate impact on the natural environment. Additionally, having more secure childcare and eldercare options within existing communities and homes will reduce the need for people to travel longer distances to secure this care, thereby reducing vehicle miles traveled.
- **Scoping Plan:** The Scoping Plan requires a reduction of 25% vehicle miles traveled by 2030 to meet climate goals. By having more care within existing communities, this strategy helps advance the Scoping Plan climate goals.
- Enhancing regional childcare aligns with California’s Master Plan for Early Learning and Care, and enhancing regional eldercare aligns with California’s Master Plan for Aging.
- Enhancing culturally and linguistically proximate community health work aligns with several state strategies, including the California Wellness Plan that calls on regions “to create a systems approach to improving patient and community health”, to “increase the number of employed community health workers in California”, and to “increase the number of healthcare payers that cover and reimburse” for community health worker visits.

Strategy Area Seven: Regional Coordination and Alignment

The strategy aims to elevate both the regional coordination and alignment across existing institutions and governments in the three county North San Joaquin Valley (NSJV). The outcome of this will not only result in an increase in regional identity but also in more resources targeted towards shared regional priorities. Internally, this involves leveraging North Valley THRIVE’s investments and initiatives to enhance regional coherence and support for the implementation of a unified operational plan. This includes fostering collaboration across institutions in the North San Joaquin Valley region and coordination around regional infrastructure plans. Externally, the strategy seeks to establish and then strengthen the NSJV’s regional identity as part of the Northern California megaregion by promoting it as a gateway for economic opportunities and increased coordination around transportation, housing, and infrastructure. This external identity will also be developed through inter-regional engagements on key issues such as infrastructure investments, housing, transportation, as well as megaregional economic development initiatives (such as the relocation of climate forward industrial activity).

Cross Cutting Issue Definition and Profile

The NSJV must develop a distinct regional identity and operational structure to address its unique challenges and opportunities. Historically grouped within the broader San Joaquin Valley Region, the NSJV now experiences unique socio-economic dynamics due to its proximity to and growing connections

with the San Francisco Bay Area and Sacramento regions. This shift necessitates fostering a cohesive regional identity and operational framework tailored to the NSJV's specific needs and opportunities.

Problem Statement

The NSJV currently has limited coordination and alignment across the existing organizations and institutions working in the region, with most organizations focused on a narrower geography, generally within the boundaries of each county. The region has three councils of government, one for each county, where each COG conducts a separate Regional Transportation plan and Sustainable Communities Strategy. The region has three workforce investment boards and separate economic development organizations

The siloed nature of the existing organizations creates significant challenges across environmental, social, economic, and workforce domains. In the NSJV, the lack of coordinated environmental policies and actions increases vulnerability to over-exploitation and depletion of vital like surface and ground water resources. The absence of cohesive land-use planning may also be contributing to habitat fragmentation and loss of biodiversity. The lack of a three-county regional planning structure reduces the capacity to collectively solve major issues around housing location and affordability, long-travel distances and congestion, and shifting travel patterns to more sustainable modes. Furthermore, without a regional approach, the NSJV may struggle to achieve state goals around climate and equity and implement effective climate adaptation and mitigation strategies, exacerbating its environmental vulnerabilities.

Limited coordination and alignment can also perpetuate regional inefficiencies through redundant infrastructure projects and inefficient resource use. Currently, economic development efforts are fragmented and less effective than regional initiatives, leading to slower growth and missed opportunities. The lack of a clear, cohesive regional development strategy deters potential investors, further hindering economic progress.

In terms of workforce and skills development, a lack of regional policy and system coherence can contribute to a mismatch between available workforce skills and employer needs due to fragmented development efforts. It may also propagate persistently high unemployment rates persist because of a lack of coordinated job creation and workforce training initiatives. Additionally, the lack of regional coordination tends to hinder labor mobility, limiting job opportunities and economic mobility for workers within the region.

In contrast, the Sacramento region has a six-county council of government (SACOG) that manages regional transportation planning while the Bay Area has a nine-county metropolitan planning organization (MTC/ABAG) that manages its regional transportation planning, housing, and climate adaptation efforts. Both Sacramento and the Bay Area regions also have multi-county workforce investment boards and economic development organizations. This contrast not only means the institutions within the NSJV have fewer resources and are more prone to duplication with their neighboring jurisdictions, but also means it is harder to speak in one common voice on behalf of the unique attributes of the 3 county NSJV. While the NSJV does coordinate with the San Joaquin Policy council (8 counties) and is part of an 8-county air district covering all of the San Joaquin Valley, there is no longstanding institution working solely at the scale of the emerging three county NSJV region.

Opportunity Statement and Regional Assets

As an area with a newly emerging regional identity, developing internal and external coordination and

alignment in the NSJV can create numerous opportunities across various domains and foster sustainable growth and development. Internally, enhanced coordination ensures the efficient use of resources, as streamlined planning and implementation reduce redundancies and optimize infrastructure investments. This results in cost savings and more effective deployment of public funds, allowing the region to address critical needs and invest in long-term projects that drive economic growth. Additionally, a cohesive internal strategy enables the creation of comprehensive policies that tackle environmental challenges, ensuring sustainable resource management and climate resilience.

Externally, alignment with neighboring regions and broader economic networks opens avenues for increased trade, investment, and collaboration. By presenting a unified regional identity and strategy and speaking in one voice, the newly emergent region can have a bigger impact politically as well as secure resources from both public and private sources. The unity makes the region more attractive to investors who seek stability and clear strategic direction. This can lead to inflows of capital, boosting local businesses, and attracting new enterprises. Furthermore, external alignment facilitates the integration into larger economic corridors and supply chains, enhancing market access for local products and services, and fostering economic diversification.

Socially, coordinated efforts can address disparities and promote equity, ensuring that all communities within the region benefit from development initiatives. Improved access to healthcare, education, and transportation services results from integrated planning and resource allocation. This not only enhances the quality of life for residents but also builds a sense of regional identity and community cohesion, which is crucial for long-term social stability and resilience.

Workforce development stands to gain significantly from internal and external coordination. By aligning educational institutions, training programs, and employers' needs, the region can cultivate a skilled workforce that meets the demands of local industries. This reduces unemployment and underemployment, fostering economic mobility and personal growth. Moreover, partnerships with neighboring regions can facilitate labor mobility, allowing workers to access broader job markets and opportunities, which further stimulates economic activity and regional prosperity.

Investment strategies

Strategy 7.1 Improve Coordination, Alignment, and Linkages of Regional Systems

Leverage opportunities and investments to further coordinate regional activities in economic, innovation, workforce, skills, and infrastructure development.

Action Plan:

- *Establish Regional Governance and Unified Vision.* Use the North Valley THRIVE investments and engagement to establish a regional governance structure based on collaborative participation by local governments, businesses, educational institutions, and community organizations. Additionally, develop and seek to institutionalize a clear, shared vision and strategic goals for the NSJV to ensure alignment across local plans, integrating key areas such as economic development, infrastructure, environmental sustainability, and social services.
- *Enhance Communication, Collaboration, and Resource Management.* Building on efforts such as the establishment of a *Regional Research and Policy Consortium*, foster open communication

through regular meetings, workshops, and forums, and create platforms for sharing data, best practices, and resources. Similarly, investigate using the regional conversations and forums to align infrastructure projects and environmental policies across jurisdictions to optimize resource use, prevent redundancies, and address regional challenges sustainably.

- *Promote Regional Economic and Workforce Development.* Leverage the Baseline Assessment, this Strategic Plan, and forthcoming investments during the Catalyst Phase to support and grow priority sectors and other key economic clusters. This should also encompass other cross cutting enabling strategies, such as those targeting development of the regional innovation, small business, and entrepreneurial ecosystems. Similarly, efforts should be made to build on regional investments under North Valley THRIVE to better align educational curricula and training programs with local industry needs, foster partnerships for internships and job placements, and implement job creation initiatives. Regional equity should also be developed with efforts being made to ensure access to essential services exists across all of the region's communities, necessary support systems are developed for the regions disinvested communities, and regional promotion of social cohesion through targeted community development programs.

Partnerships:

- City councils and county boards within the NSJV to ensure local policies and initiatives are aligned with regional goals.
- Economic development organizations such as Opportunity Stanislaus and the San Joaquin Partnership focused on regional economic growth and business development as well as chambers of commerce and regional economic development corporations.
- Higher and continuing educational institutions in the NSJV to align training programs and foster innovation.
- Local non-profits and community groups to ensure inclusive economic growth and address social equity issues.
- Local businesses and industry leaders who can provide insights into industry needs and help drive innovation and production systems.

Strategy 7.2 Improve Coordination, Alignment, and Linkages with the Northern California Megaregion and other Regions

Foster inter-regional sustainable socio-economic development by coordinating efforts with other regions in sustainable technologies and resilient infrastructure and promoting inclusive economic growth. Focus on strengthening connections with the Northern California Megaregion while also exploring opportunities to align efforts with other regions.

Action Plan:

- *Develop Inter-Regional Partnerships and Networks and Create a Megaregional Brand.* Establish partnerships with neighboring regions across the Northern California Megaregion, such as the San Francisco Bay Area and Sacramento, to facilitate collaboration on shared interests and challenges. Develop and promote a cohesive regional brand that highlights the unique strengths and opportunities of the NSJV, raising awareness and attracting investment, tourism, and new residents.
- *Expand the existing Northern California megaregion workgroup to include Stanislaus and*

Merced Counties. There is currently an ongoing workgroup between the Bay Area, Sacramento, and San Joaquin Counties to coordinate on megaregional issues such as Northern California goods movement and travel flows on Altamont Corridor (Highway 580), Highway 80, and other interregional corridors.⁹² That working group should also include the other two counties in the NSJV.

- *Enhance Inter-Regional Infrastructure and Environmental Coordination.* Explore opportunities to coordinate with neighboring regions to enhance transportation networks, including road, rail, and public transit systems, to improve regional connectivity and accessibility. Also evaluate opportunities for collaboration in implementing coordinated environmental policies and programs to address shared challenges such as air and water quality, climate change, and conservation, thereby promoting inter-regional sustainability.
- *Align Workforce Development and Inter-Regional Knowledge and Production Systems.* Investigate opportunities to develop an inter-regional workforce strategy by collaborating with educational institutions and workforce development agencies to align training programs with broader labor market needs, thereby facilitating employment opportunities across the Northern California Megaregion. Enhance the inter-regional innovation and production ecosystems by coordinating with neighboring regions, such as the San Francisco Bay Area, to leverage the complementary strengths of each area's innovation and production systems.

Partnerships:

- Neighboring governments and economic development agencies in the San Francisco Bay Area, Sacramento, and other parts of the Northern California Megaregion to facilitate collaboration and coordinate regional efforts.
- California state agencies, including the Governor's Office of Business and Economic Development (GO-Biz) and the California Department of Transportation (Caltrans), for support in infrastructure and policy alignment.
- Regional Transportation Authorities such as the Metropolitan Transportation Commission (MTC) and the Sacramento Area Council of Governments (SACOG) to coordinate transportation networks and improve connectivity.
- Regional and state environmental agencies, such as the California Environmental Protection Agency (CalEPA), to collaborate on coordinated environmental policies and sustainability initiatives.
- Regional workforce development boards and agencies in the Northern California Megaregion to align workforce training programs with broader labor market needs.
- Research institutions and innovation hubs in neighboring regions to leverage complementary strengths in innovation and production systems.
- Regional and state tourism and investment promotion agencies to develop and promote the NSJV's regional brand.

Alignment with Guiding Principles

- **Job Quality:** This effort will strengthen job quality through coordination with adjacent regions looking for investment opportunities. In particular, if through these megaregional partnerships there is an increase in Bay Area firms who cite high wage production facilities in the NSJV, it will improve job quality while also increasing the competitiveness of both region's economies. Additionally, coordination at a larger regional scale can also result in more consistent local policies that could have a positive impact on job quality. For example, through increasing connection with

the Bay Area, certain labor standards (e.g. higher minimum wages, project labor agreements) could become more of the norm in the NSJV and thereby in an increase in job quality.

- **Equity:** Key solutions to the pollution burden facing the NSJV as well as other barriers (educational outcomes and wage levels) require access to state programs and resources. Working at the megaregional scale will not only help bring in more resources to the region (such as from Philanthropy which has historically underinvested in inland CA) but also can lead to more direct public funding and success in securing major public grants (such as from State agencies like the Strategic Growth Council or Federal agencies like the EPA).
- **Climate:** Greenhouse gas reduction efforts are far more effective when matched to the geography of the issue. A notable portion of the housing demand in the NSJV has been historically filled by Bay Area residents looking for lower cost housing. Those residents in turn commute back over the Altamont Pass, increase GHG and putting stress on themselves, their families, and communities. Improving job prospects within the NSJV and identifying more investment towards public transportation solutions to driving alone will improve climate outcomes by reducing vehicle miles driven.



Chapter 7:

What happens next: How will we sustain our collaborative going forward?



Collaborative Leadership

This Strategic Plan goes far in describing the ways in which North Valley THRIVE's actualization of California Jobs First has been catalytic. Among these is its commitment to collaborative, representative leadership. Consider the role of convener held by the Merced County Workforce Development Board – itself a collaborative body serving the smallest and most rural – arguably the most marginalized – county in the region. NVT Leadership has been shared by the workforce board director and two partners in Stanislaus and San Joaquin Counties: strategy director at Stanislaus Equity Partners CDC and executive director of the University of the Pacific's Center for Business Policy and Research, leading communications/administration and research/strategy, respectively. A set of advisory groups has also helped guide the work, namely: (a) regularly convened group of the three County CEO/CAOs and their economic development deputies; (b) a collaborative of the three workforce development boards; and (c) a group of the four community foundations serving the regions. Additionally, the effort has included subgroups of the region's leading economic development/innovation initiatives, including leaders of Stan2030, BEAM, and Edge Collaborative, and other initiative leaders.

The governing body of North Valley THRIVE is its Steering Committee (previously listed as its High-Road Training Collaborative, or HRTC). The Steering Committee includes 29 seats (one vacancy as of this writing), organized into the following representative blocks: Community Leadership (regional and county-specific community organizations, and independent leaders of cultural or issue-based constituencies); Education (community-college, 4-year university, and K-16 CERF); Climate and the Environment (advocacy and "Just-Transition"); Workforce and Labor (workforce board, labor, apprenticeship and workers' rights organizations); Native Representation; and Industry (agricultural representative, minority chamber of commerce, innovation organizations). This diverse group (gender, ethnicity and county origin closely traces regional demographics) has assembled a number of committees focused on governance and access, Catalyst and Implementation, and Community Funding.

These layers of collaboration – from backbone leadership to working groups to the Steering Committee – bodes well for the transformative work North Valley THRIVE looks to undertake in the Implementation and Catalyst Phases. An additional advisory group, "Future Scope," pull leaders from each of these layers to focus on the next phase of North Valley THRIVE, beyond the structural funding that California Jobs First has provided, to imagine a regional entity with the sustainable capacity to advance the long-term goals described in this plan.

A Future North Valley THRIVE

The establishment of an enduring North Valley THRIVE is vital to enhancing regional coordination across the seven strategic areas critical to the development and prosperity of the Northern San Joaquin Valley (NSJV). Beyond these strategies, there is additional work to be done and coordinated to move the whole of the regional economy forward and to ensure community voice has a rightful place in that dialogue. To help define what the role and mission of an enduring NVT might look like, this body has begun to examine the existing landscape of organizations and initiatives with relationship to proposed strategy areas.

Considering the advancement of cross-cutting enabling strategies, a variety of organizations currently operate within the region in these spaces. For example, California provides for economic development corporations (EDCs) and a variety of tax increment financing districts that operate at different geographic levels, including community revitalizations and investment authorities (CRIAs), enhanced infrastructure financing districts (EIFDs), and climate resilience districts (CRDs). Regional innovation is housed across several institutions of higher education within the NSJV. These institutions, in partnership with initiatives like BEAM/CBIO, and various industry associations, labor unions, economic development agencies,

and workforce development boards, contribute to a burgeoning regional innovation ecosystem. In small business and entrepreneurship, a network of small business development centers (SBDCs), chambers of commerce, community development corporations (CDCs), public-private partnerships, joint powers authorities (JPAs), community development financial institutions (CDFIs), and community financial institutions (CFIs) operate within the region. In skills and talent development, adult education providers, community college and four-year educational institutions, support services and community organizations, labor organizations, employers, business and industry associations, and workforce development boards are all active in this environment. The same level of engagement and diversity is true for climate smart infrastructure, ranging for environmental justice organizations to water boards to “just transition” groups, and for every one of the strategy areas identified herein.

However, as asset rich as the landscape is, it is also fragmented. The environment is ripe for a central coordinating body, one that has developed trust and consensus through an articulated process like California Jobs First, one with deep investment from government, grassroots, and industry leaders, one capable of fostering collaboration, aligning efforts, and maximizing the collective impact of these diverse stakeholders.

Luckily, a variety of models exist on how to move this work forward. Examples of successful regional coordination in other areas of California such as the Bay Area Council Economic Institute, the Monterey Bay Economic Partnership, the Regional Economic Action Coalition (REACH), San Diego Regional Economic Development Corporation (EDC), SPUR (San Francisco Bay Area Planning and Urban Research Association), Valley Vision, and the Los Angeles County Economic Development Corporation offer valuable lessons. Each carves out a different role, relies on different strengths and works to solve different problems. North Valley THRIVE, led by its Future Scope Advisory Group and guided by an external facilitator, has outlined a process to weigh options and define its future.

It is also understood that the teams that have developed this Strategic Plan – from backbone convener to advisory to Steering Committee – are not necessarily the team that will lead this future scope beyond Implementation Phase. New needs and opportunities, and an enhanced mission may require different skill sets, additional leaders, and new structures.

North Valley THRIVE is now presented with the flexibility to decide how it shape-shifts and grows to meet the opportunity uncovered in this Strategic Plan. It can now explore who it wants to be, borrowing from existing models to create its own silhouette of leadership in the most catalytic part of the State. What is cemented, however, is who North Valley THRIVE will be for. Core to the work of today and the portfolio of tomorrow is a commitment to bringing marginalized communities into the center of prosperity – centered in the benefits that come from it and centered in the decision-making that creates it. North Valley THRIVE is at a critical point in this journey. The two years behind it have built up the well of research and understanding to justify the course laid out in this Strategic Plan, as well as coalition development to chart that course together. The two years ahead of it will be fueled by the diversity of thought, voice, and expertise assembled during this Planning Phase.

The view from the mountaintop is certainly enjoyable. But real work is done in the Valley. And this coalition is ready to thrive.

Appendices

Appendix 1: Data Sources for “What is the North San Joaquin Valley?”

Center for Business and Policy Research (CBPR). (2022). NSJV Population Projections, Released March 2022.

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Appendix 4A: NAICS Codes Definitions

These NAICS codes definitions and their incidence rates were determined through an iterative process. First, the research team leveraged existing resources to identify key industries and activities within each sector, then labels were established for each NAICS code (belonging within that sector/not belonging). The US Department of Energy (DOE)'s definition was used as the definition for clean energy, and this definition took priority over the other sectors. For example, if a NAICS code was included in both the carbon management and the clean energy definition, employment allocation would first go to clean energy, since that industry is already rigorously studied by DOE.

Establishing incidence rates for each NAICS code differed by sector. Employment at the technology level was allocated to a set of NAICS codes, and employment was proportion from there. The rate of clean energy jobs per industry divided by the total number of jobs in that industry then provided the incidence rate. For carbon management, the research team reviewed websites or online information about each company classified under these NAICS codes using DataAxel. Companies were identified as having relevant activities or not, and then incidence was proportioned by total employment at companies within that sector over employment for that industry overall. Advanced Manufacturing employment was defaulted to 100% incidence of employment within identified industries, less the incidence rate of the other three sectors.

Carbon Management

CodE	Description	Incidence Rate
111998	All Other Miscellaneous Crop Farming	0.3%
113310	Logging	0.3%
115310	Support Activities for Forestry	0.0%
211120	Crude Petroleum Extraction	10.6%
211130	Natural Gas Extraction	10.6%
213111	Drilling Oil and Gas Wells	10.6%
213112	Support Activities for Oil and Gas Operations	10.6%
221210	Natural Gas Distribution	10.6%
237120	Oil and Gas Pipeline and Related Structures Construction	0.3%
325193	Ethyl Alcohol Manufacturing	0.3%
333131	Mining Machinery and Equipment Manufacturing	10.6%
333132	Oil and Gas Field Machinery and Equipment Manufacturing	10.6%
541360	Geophysical Surveying and Mapping Services	0.3%
541370	Surveying and Mapping (except Geophysical) Services	0.3%
541380	Testing Laboratories and Services	0.3%
541511	Custom Computer Programming Services	0.3%
541512	Computer Systems Design Services	0.3%
541513	Computer Facilities Management Services	0.3%
541519	Other Computer Related Services	0.3%
541611	Administrative Management and General Management Consulting Services	0.3%
541620	Environmental Consulting Services	0.3%
541690	Other Scientific and Technical Consulting Services	0.3%
541713	Research and Development in Nanotechnology	0.3%
541714	Research and Development in Biotechnology (except Nanobiotechnology)	0.3%
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	0.3%
562111	Solid Waste Collection	10.6%
562112	Hazardous Waste Collection	10.6%
562119	Other Waste Collection	10.6%
562211	Hazardous Waste Treatment and Disposal	10.6%
562212	Solid Waste Landfill	10.6%
562213	Solid Waste Combustors and Incinerators	0.3%
562219	Other Nonhazardous Waste Treatment and Disposal	10.6%
562910	Remediation Services	10.6%
562920	Materials Recovery Facilities	10.6%
562991	Septic Tank and Related Services	10.6%
562998	All Other Miscellaneous Waste Management Services	10.6%

Clean Energy

Code	Description	Incidence Rate
111191	Oilseed and Grain Combination Farming	92%
111199	All Other Grain Farming	92%

111991	Sugar Beet Farming	0%
111998	All Other Miscellaneous Crop Farming	92%
113110	Timber Tract Operations	92%
113310	Logging	92%
211120	Crude Petroleum Extraction	61%
211130	Natural Gas Extraction	61%
213111	Drilling Oil and Gas Wells	61%
213112	Support Activities for Oil and Gas Operations	61%
213113	Support Activities for Coal Mining	61%
221111	Hydroelectric Power Generation	100%
221112	Fossil Fuel Electric Power Generation	61%
221113	Nuclear Electric Power Generation	100%
221114	Solar Electric Power Generation	100%
221115	Wind Electric Power Generation	100%
221116	Geothermal Electric Power Generation	100%
221117	Biomass Electric Power Generation	100%
221118	Other Electric Power Generation	100%
221121	Electric Bulk Power Transmission and Control	100%
221122	Electric Power Distribution	100%
221210	Natural Gas Distribution	61%
221330	Steam and Air-Conditioning Supply	61%
236115	New Single-Family Housing Construction (except For-Sale Builders)	36%
236116	New Multifamily Housing Construction (ex- cept For-Sale Builders)	36%
236117	New Housing For-Sale Builders	36%
236118	Residential Remodelers	36%
236210	Industrial Building Construction	36%
236220	Commercial and Institutional Building Con- struction	36%
237110	Water and Sewer Line and Related Structures Construction	100%
237120	Oil and Gas Pipeline and Related Structures Construction	92%
237130	Power and Communication Line and Related Structures Construction	100%
237210	Land Subdivision	36%
237310	Highway, Street, and Bridge Construction	36%
237990	Other Heavy and Civil Engineering Construc- tion	36%
238110	Poured Concrete Foundation and Structure Contractors	0%
238120	Structural Steel and Precast Concrete Con- tractors	0%
238130	Framing Contractors	0%
238140	Masonry Contractors	0%

238150	Glass and Glazing Contractors	0%
238160	Roofing Contractors	0%
238170	Siding Contractors	0%
238190	Other Foundation, Structure, and Building Exterior Contractors	0%
238210	Electrical Contractors and Other Wiring Installation Contractors	0%
238220	Plumbing, Heating, and Air-Conditioning Contractors	0%
238290	Other Building Equipment Contractors	0%
238310	Drywall and Insulation Contractors	0%
238320	Painting and Wall Covering Contractors	0%
238330	Flooring Contractors	0%
238340	Tile and Terrazzo Contractors	0%
238350	Finish Carpentry Contractors	0%
238390	Other Building Finishing Contractors	0%
238910	Site Preparation Contractors	0%
238990	All Other Specialty Trade Contractors	0%
324110	Petroleum Refineries	61%
325110	Petrochemical Manufacturing	61%
325120	Industrial Gas Manufacturing	61%
325193	Ethyl Alcohol Manufacturing	92%
325199	All Other Basic Organic Chemical Manufacturing	92%
326140	Polystyrene Foam Product Manufacturing	36%
327993	Mineral Wool Manufacturing	36%
332312	Fabricated Structural Metal Manufacturing	36%
332321	Metal Window and Door Manufacturing	36%
332322	Sheet Metal Work Manufacturing	36%
332410	Power Boiler and Heat Exchanger Manufacturing	100%
332420	Metal Tank (Heavy Gauge) Manufacturing	100%
332991	Ball and Roller Bearing Manufacturing	100%
333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	36%
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing	36%
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	36%
333611	Turbine and Turbine Generator Set Units Manufacturing	100%
333613	Mechanical Power Transmission Equipment Manufacturing	100%
333618	Other Engine Equipment Manufacturing	100%
333912	Air and Gas Compressor Manufacturing	100%

333914	Measuring, Dispensing, and Other Pumping Equipment Manufacturing	18%
334413	Semiconductor and Related Device Manufacturing	18%
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	18%
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	18%
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	18%
334514	Totalizing Fluid Meter and Counting Device Manufacturing	18%
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	18%
335131	Residential Electric Lighting Fixture Manufacturing	36%
335132	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	36%
335139	Electric Lamp Bulb and Other Lighting Equipment Manufacturing	36%
335210	Small Electrical Appliance Manufacturing	36%
335220	Major Household Appliance Manufacturing	36%
335311	Power, Distribution, and Specialty Transformer Manufacturing	100%
335312	Motor and Generator Manufacturing	100%
335910	Battery Manufacturing	100%
335931	Current-Carrying Wiring Device Manufacturing	18%
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	18%
336510	Railroad Rolling Stock Manufacturing	0%
423130	Tire and Tube Merchant Wholesalers	0%
423330	Roofing, Siding, and Insulation Material Merchant Wholesalers	36%
423520	Coal and Other Mineral and Ore Merchant Wholesalers	61%
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	36%
423620	Household Appliances, Electric Housewares, and Consumer Electronics Merchant Wholesalers	36%
423690	Other Electronic Parts and Equipment Merchant Wholesalers	36%

423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	36%
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers	36%
424690	Other Chemical and Allied Products Merchant Wholesalers	100%
424710	Petroleum Bulk Stations and Terminals	61%
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	61%
457210	Fuel Dealers	92%
523150	Investment Banking and Securities Intermediation	18%
523160	Commodity Contracts Intermediation	18%
523210	Securities and Commodity Exchanges	18%
523910	Miscellaneous Intermediation	18%
523940	Portfolio Management and Investment Advice	18%
523991	Trust, Fiduciary, and Custody Activities	18%
523999	Miscellaneous Financial Investment Activities	18%
541110	Offices of Lawyers	18%
541191	Title Abstract and Settlement Offices	18%
541199	All Other Legal Services	18%
541211	Offices of Certified Public Accountants	18%
541213	Tax Preparation Services	18%
541214	Payroll Services	18%
541219	Other Accounting Services	18%
541310	Architectural Services	18%
541320	Landscape Architectural Services	18%
541330	Engineering Services	18%
541340	Drafting Services	18%
541350	Building Inspection Services	18%
541360	Geophysical Surveying and Mapping Services	18%
541370	Surveying and Mapping (except Geophysical) Services	18%
541380	Testing Laboratories and Services	18%
541511	Custom Computer Programming Services	18%
541512	Computer Systems Design Services	18%
541513	Computer Facilities Management Services	18%
541519	Other Computer Related Services	18%
541611	Administrative Management and General Management Consulting Services	18%
541612	Human Resources Consulting Services	18%
541613	Marketing Consulting Services	18%
541614	Process, Physical Distribution, and Logistics Consulting Services	18%
541618	Other Management Consulting Services	18%

541620	Environmental Consulting Services	18%
541690	Other Scientific and Technical Consulting Services	18%
541713	Research and Development in Nanotechnology	18%
541714	Research and Development in Biotechnology (except Nanobiotechnology)	18%
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	18%
562213	Solid Waste Combustors and Incinerators	92%
811210	Electronic and Precision Equipment Repair and Maintenance	18%
813312	Environment, Conservation and Wildlife Organizations	18%
813910	Business Associations	18%

Advanced Manufacturing

Code	Description	Incidence Rate
321215	Engineered Wood Member Manufacturing	100%
321911	Wood Window and Door Manufacturing	100%
321912	Cut Stock, Resawing Lumber, and Planing	100%
321918	Other Millwork (including Flooring)	100%
321991	Manufactured Home (Mobile Home) Manufacturing	100%
321992	Prefabricated Wood Building Manufacturing	100%
327320	Ready-Mix Concrete Manufacturing	100%
327390	Other Concrete Product Manufacturing	100%
331513	Steel Foundries (except Investment)	100%
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	100%
332311	Prefabricated Metal Building and Component Manufacturing	100%
332312	Fabricated Structural Metal Manufacturing	64%
332313	Plate Work Manufacturing	100%
332321	Metal Window and Door Manufacturing	64%
332322	Sheet Metal Work Manufacturing	64%
332710	Machine Shops	100%
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	100%
333111	Farm Machinery and Equipment Manufacturing	100%
333120	Construction Machinery Manufacturing	100%
333248	All Other Industrial Machinery Manufacturing	100%
334413	Semiconductor and Related Device Manufacturing	82%
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	100%
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	82%
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	100%
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	82%
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	82%
334516	Analytical Laboratory Instrument Manufacturing	100%
334519	Other Measuring and Controlling Device Manufacturing	100%
334610	Manufacturing and Reproducing Magnetic and Optical Media	100%
336110	Automobile and Light Duty Motor Vehicle Manufacturing	100%
336211	Motor Vehicle Body Manufacturing	100%
336212	Truck Trailer Manufacturing	100%
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing	100%
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	100%
336390	Other Motor Vehicle Parts Manufacturing	100%
336412	Aircraft Engine and Engine Parts Manufacturing	100%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	100%
336612	Boat Building	100%
336991	Motorcycle, Bicycle, and Parts Manufacturing	100%

Appendix 4B: Data Appendix for Bioeconomy

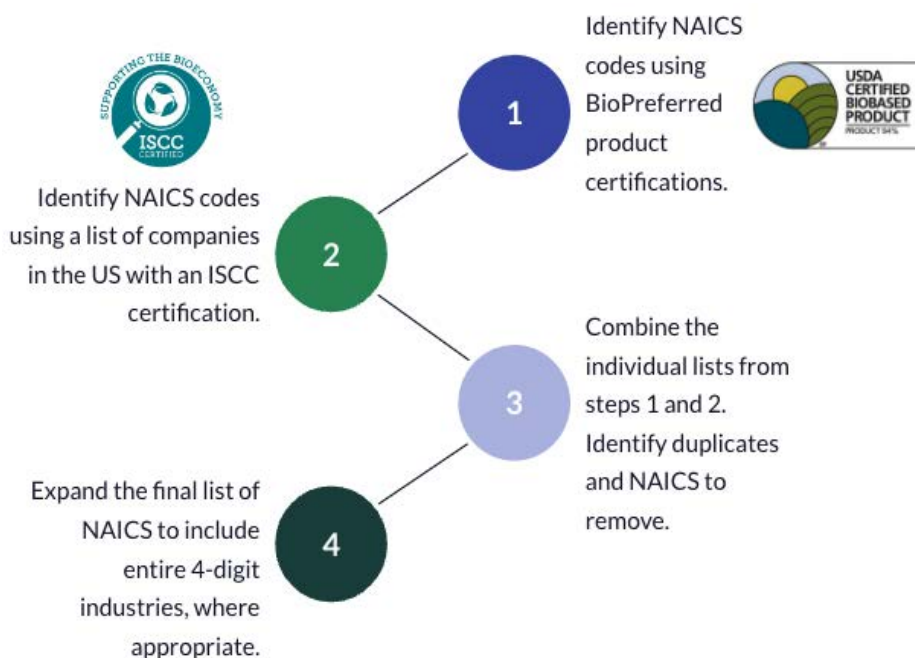
As noted in the Circular Bioeconomy sector strategy, Bioindustrial Manufacturing is defined as a collection of industries that either are or have the *potential* to do bioproduction. This is because there is no defined NAICS code for bioproduction or biomanufacturing. The NAICS codes identified to measure bioindustrial manufacturing were selected because these industries have a high potential for being part of the bioeconomy.

Looking ahead, it would be ideal if there were state support to establish consistent definitions of how to define and then track the bioeconomy and bioindustrial manufacturing. The methodology below is the one we developed as part of this process.

Across the country, some companies in these industries are already producing bio-based products. However, note that the list of NAICS codes selected will not capture bioproduction employment alone. This is because NAICS codes include employment for the entire industry, not just those companies producing bioproducts. Because NAICS codes are based on the products companies create and not the processes they use to create them, they are poorly suited for measuring process or technology innovations. This is an issue for many economic developers who want to measure “industries” such as climate tech, simulation, bioproduction, etc. This leaves practitioners with the (somewhat unsatisfying) option to approximate metrics using custom groups of NAICS codes, as shown below.

To analyze and determine the size of the bioeconomy, this analysis relied on two different sources: the BioPreferred-Daystar analysis which uses NAICS codes and the International Sustainability and Carbon Certification (ISCC) which identifies companies. This second approach was useful to uncover the industries and then companies where innovation is currently happening. The precise methodology is explained below.

This is an overview of the process:



BioPreferred-Daystar analysis

Among the entities involved in measuring the size of the US bioeconomy (which can be used to determine the size of the regional employment), only the BioPreferred-Daystar analysis uses North American Industry Classification System (NAICS) codes. While it is useful to see a definition using NAICS codes, their specific definition falls short of capturing the full range of NSJV's interests. For example, biotechnology research is not included in their definition. And the exclusion of a broader agriculture or food manufacturing segment also does not lend itself to telling a full story about the diverse feedstocks available in the NSJV, which also include forest products.

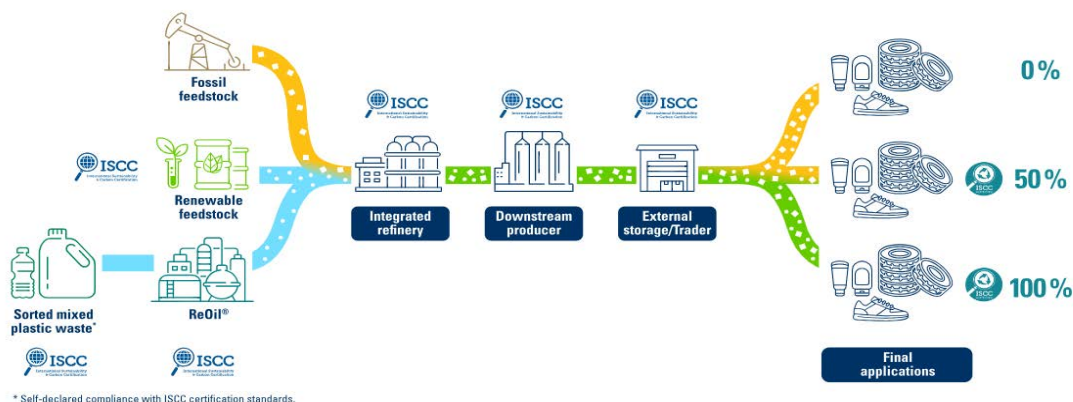
In the attempt to have a better understanding of the different economic activities classified under the NAICS codes that might capture bioindustrial manufacturing, this analysis also included a wider selection of the NAICS codes in order to further measure bioindustrial manufacturing.

Overall, these codes selected for this analysis of bioindustrial manufacturing are industries that have a high potential for being part of the bioeconomy. It is also important to understand that only a percentage of these NAICS codes will be directly involved in bioindustrial manufacturing and the cross analysis of the partial contribution of each NAICS will help to have a more precise measurement of the contributions to the economy of bioindustrial manufacturing. In other words, within the region and across the country, some companies in these industries are already producing bio-based products. But not all of them.

International Sustainability and Carbon Certification (ISCC) analysis

A second layer of analysis involved using the International Sustainability and Carbon Certification (ISCC). ISCC is an independent organization that certifies companies' products and processes for their ability to use sustainable feedstocks. From their website, "the ISCC certification system covers all sustainable feedstocks, including biomass from agriculture, forestry and aquaculture, biogenic waste and residues, non-biological renewable materials and recycled carbon-based materials and products derived therefrom. With currently over 7,000 valid certificates in more than 100 countries, ISCC is among the world's largest certification systems."

By analyzing a list of companies in the US with ISCC certifications (and capturing their related industries) this analysis resulted in a second list of NAICS codes where companies may be performing mass balancing.



Combining the approaches

The result of the BioPreferred analysis was a list of NAICS codes where the products made in those industries could be made from bio-based inputs. Some of the matching NAICS may be surprising, such as the bolt, nut, screw, rivet, and washer manufacturing or tire retreading industries. This is because the bioproducts certified on BioPreferred's website include metal coatings, adhesives, and crude/partially refined oils. According to the 2017 Economic Census companies in many different industries make these types of products. So, while bolt manufacturers make bolts, they may also make metal coatings and adhesives.

BioPreferred only certifies products that are made with 100% bio-based products This means the industry list is possibly leaving out an entire segment of the bioeconomy where bioproducts are made from a mixture of bio-based and non-bio-based content.

The following are the two lists of NAICS codes from the two different approaches:

BioPreferred - NAICS List		ISCC - NAICS List	
325312	Phosphatic Fertilizer Manufacturing	324110	Petroleum Refineries
325314	Fertilizer (Mixing Only) Manufacturing	324122	Asphalt Shingle and Coating Materials Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing	325110	Petrochemical Manufacturing
326111	Plastics Bag and Pouch Manufacturing	325130	Synthetic Dye and Pigment Manufacturing
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	325180	Other Basic Inorganic Chemical Manufacturing
326199	All Other Plastics Product Manufacturing	325193	Ethyl Alcohol Manufacturing
326212	Tire Retreading	325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing
326220	Rubber and Plastics Hoses and Belting Manufacturing	325199	All Other Basic Organic Chemical Manufacturing
326299	All Other Rubber Product Manufacturing	325211	Plastics Material and Resin Manufacturing
327991	Cut Stone and Stone Product Manufacturing	325212	Synthetic Rubber Manufacturing
331511	Iron Foundries	325220	Artificial and Synthetic Fibers and Filaments Manufacturing
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	325411	Medicinal and Botanical Manufacturing
332216	Saw Blade and Handtool Manufacturing	325520	Adhesive Manufacturing
332312	Fabricated Structural Metal Manufacturing	325620	Toilet Preparation Manufacturing
332321	Metal Window and Door Manufacturing	325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing
332323	Ornamental and Architectural Metal Work Manufacturing	326111	Plastics Bag and Pouch Manufacturing
332710	Machine Shops	326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	326160	Plastics Bottle Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	326199	All Other Plastics Product Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	326211	Tire Manufacturing (except Retreading)
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	326299	All Other Rubber Product Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	331110	Iron and Steel Mills and Ferroalloy Manufacturing
337110	Wood Kitchen Cabinet and Countertop Manufacturing	333993	Packaging Machinery Manufacturing
339950	Sign Manufacturing		

Other related industries to track

In order to capture a full picture of the bioeconomy, there are other industries where there should be interest in knowing more and they include the following:

Specialized Logistics	
48422	Specialized Freight (Except Used Goods) Trucking, Local
48423	Specialized Freight (Except Used Goods) Trucking, Long-Distance
493120	Refrigerated Warehousing and Storage
56211	Waste Collection
562211	Hazardous Waste Treatment and Disposal
562219	Other Nonhazardous Waste Treatment and Disposal
562920	Materials Recovery Facilities
Pharmaceutical Manufacturing	
3254	Pharmaceutical and Medicine Manufacturing
32519	Other Basic Organic Chemical Manufacturing
Machinery Manufacturing	
333241	Food Product Machinery Manufacturing
333248	All Other Industrial Machinery Manufacturing

NAICS for bioindustrial manufacturing from BioPreferred

325312	Phosphatic Fertilizer Manufacturing
325314	Fertilizer (Mixing Only) Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
326111	Plastics Bag and Pouch Manufacturing
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
326199	All Other Plastics Product Manufacturing
326212	Tire Retreading
326220	Rubber and Plastics Hoses and Belting Manufacturing
326299	All Other Rubber Product Manufacturing
327991	Cut Stone and Stone Product Manufacturing
331511	Iron Foundries
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)
332216	Saw Blade and Handtool Manufacturing
332312	Fabricated Structural Metal Manufacturing
332321	Metal Window and Door Manufacturing
332323	Ornamental and Architectural Metal Work Manufacturing
332710	Machine Shops
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
337110	Wood Kitchen Cabinet and Countertop Manufacturing
339950	Sign Manufacturing

NAICS for bioindustrial manufacturing from the International Sustainability and Carbon Certification (ISCC)

324110	Petroleum Refineries
324122	Asphalt Shingle and Coating Materials Manufacturing
325110	Petrochemical Manufacturing
325130	Synthetic Dye and Pigment Manufacturing
325180	Other Basic Inorganic Chemical Manufacturing
325193	Ethyl Alcohol Manufacturing
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic Rubber Manufacturing
325220	Artificial and Synthetic Fibers and Filaments Manufacturing
325411	Medicinal and Botanical Manufacturing
325520	Adhesive Manufacturing
325620	Toilet Preparation Manufacturing
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing
326111	Plastics Bag and Pouch Manufacturing
326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing
326160	Plastics Bottle Manufacturing
326199	All Other Plastics Product Manufacturing
326211	Tire Manufacturing (except Retreading)
326299	All Other Rubber Product Manufacturing
331110	Iron and Steel Mills and Ferroalloy Manufacturing

Appendix 6A: Climate Smart Infrastructure State Policy Alignment

Climate smart infrastructure is an approach that is wholly aligned with state policies and priorities. Some of the specific state initiatives and policy documents that individual strategies are most aligned with are described below:

Creating more nature based solutions aligns with state goals for prioritizing nature-based solutions to meet climate objectives, mitigate flooding, and protect vulnerable communities, as outlined in [AB 1757 - California's Nature-Based Solutions Climate Targets Plan](#), [California's Natural and Working Lands Climate Smart Strategy](#), and [EO N-82-20 30x30 Strategy, Climate Change Scoping Plan](#) recently updated [Climate Adaptation Strategy](#).

Expanding land repurposing aligns with state goals for prioritizing nature-based solutions to meet climate objectives, mitigate flooding, improve air and water quality and protect vulnerable communities, as outlined in [AB 1757 - California's Nature-Based Solutions Climate Targets Plan](#), [California's Natural and Working Lands Climate Smart Strategy](#), and [EO N-82-20 30x30 Strategy, Climate Change Scoping Plan](#) and recently updated [Climate Adaptation Strategy](#). California's Fourth Climate Change Assessment also highlights strategic land use transitions as key for adaptation and mitigation in the San Joaquin Valley.

Advancing innovation in protecting and developing sources of water aligns with the state goals for centering and prioritizing nature-based solutions to meet California's climate goals, mitigate flooding, and protect vulnerable communities as outlined in [AB 1757 - California's Nature-Based Solutions Climate Targets Plan](#), [California's Natural and Working Lands Climate Smart Strategy](#), and [EO N-82-20 30x30 Strategy](#). This strategy also aligns with goals for addressing extreme droughts, floods, rising temperatures, declining fish populations, and groundwater reliance as outlined in the State's [Water Resilience Portfolio](#), [Climate Change Scoping Plan](#) and recently updated [Climate Adaptation Strategy](#).

Increasing accessible parks strategy supports the State's goal of providing and increasing equitable parks access for all Californians as outlined in [California's 2021-2025 Statewide Comprehensive Outdoor Recreation Plan](#), as well as the 2023 [Outdoors Access for All](#) initiative.

Appendix 6B: Climate Smart Infrastructure Federal Policy Alignment

At the federal level, nature-based solutions and climate smart infrastructure have also been prioritized as a critical strategy in addressing the climate crisis. This includes the following policies, programs and funding sources:

In 2022 in Executive Order 14072, the President called for the acceleration and prioritization of nature based solutions to address climate change. Developed at the direction of this executive order and unveiled at COP27, the Biden Administration introduced the Nature Based Solutions Roadmap for America which provides a roadmap with five areas of strategic change needed to develop and implement nature based solutions across all federal bureaus.

The Department of the Interior also launched a [Nature Based Solutions Roadmap](#), and is rolling out a [policy](#) to prioritize these solutions across its bureaus, emphasizing collaboration, equity, and environmental justice.

The Office of Management and Budget (OMB) also released a [memorandum](#) in November of 2023 instructing executive branch agencies to not only consider nature based solutions but also prioritize them from the start, indicating that communities have a pathway to future investments. The memorandum also highlights the use of climate-smart infrastructure to proactively address climate change and associated risks.

In December of 2023, the White House Office of Science and Technology Policy (OSTP) and the Council on Environmental Quality (CEQ) released an updated [Nature Based Solutions Guide](#), which includes nearly 300 resources and information on 140 funding programs to support implementation of nature-based solutions.

The Council on Environmental Quality (CEQ) has also instructed federal agencies to incorporate nature-based adaptation and resilience solutions in their facilities and land and water management through their 2024-2027 Climate Adaptation Plans.

Significant funding has also been directed towards nature-based solutions, including the [EPA's \\$14 billion National Clean Investment Fund](#) and [private sector commitments](#) secured by President Biden.

For the NSJV, developing strategies around nature-based solutions and climate smart infrastructure are in alignment with federal planning and policy efforts, increasing the region's viability for federal partnerships and funding access.

Appendix: Abbreviations

AADT: Average Daily Traffic
ABAG: Association of Area Bay Governments
ABPDU: Advanced Biofuels and Bioproducts Process Development Unit
ACE: Altamont Corridor Express Train
AD: Advanced Manufacturing
AJCC: America's Job Center of California
APSARA: Asian Pacific Self-Development and Residential Association
ARCHES: Alliance for Renewable Clean Hydrogen Energy Systems
ATP: California Active Transportation Program
ABPDU: Advanced Biofuels and Bioproducts Process Development Unit
BDO Zone: Bioeconomy Development Opportunity Zone
BEAM (Circular): Bioeconomy, Agriculture and Manufacturing
BECCS: Bioenergy with Carbon Capture and Storage
BiCRS: Biomass Carbon Removal and Storage
BIPOC: Black, Indigenous or People of Color
BUILD: Better Utilizing Investments to Leverage Development
CACFP: Child and Adult Care Food Program
CalEPA: California Environmental Protection Agency
Caltrans: California Department of Transportation
CalOSBA: California Office of the Small Business Advocate
CalWORK: California Work Opportunity and Responsibility for Kids
CBA: Community Benefit Agreement
CBIO: Circular Bioeconomy Innovation Collaborative
CDC: Community Development Corporation
CDFI: Community Development Financial Institutions
CEDS: Comprehensive Economic Development Strategies
CERC: California Energy Research Center
CEQA: California Environmental Quality Act
CE: Clean Energy
CEO: County Executive Officers
CHW: Community Health Worker
CHW/P/R: Community Health Workers/Promotores/Representative
CM: Carbon Management
CNC: Computer Numerical Control
COG: Council of Governments
CSU: California State University
CVP: Central Valley Project
DAC: Direct Air Capture
DEIA: Diversity, Equity, Inclusion and Accessibility
DoD: Department of Defense
DOE: Department of Energy
DRAIL: Disability Resources Agency for Independent Living
DWR: Department of Water Resources
EPIIC: National Science Foundation's Enabling Partnerships to Increase Innovation Capacity
ESG: Environmental, Social Governance

EV: Electric Vehicle
FFAR: Foundation for Food and Agricultural Research
Flood MAR: Flood Managed Aquifer Recharge
GAP: Grants for Arts Projects
GIS: Geographic Information System
GO-Biz: Governor’s Office of Business and Economic Development
GHG: Greenhouse Gas
GWh: Gigawatt-hours
HRSN: Health-related Social Needs
H RTP: High Road Training Partnership
HSR: High Speed Rail
HVAC/R: Heating, Ventilation, Air conditioning and Refrigeration
ISCC: International Sustainability and Carbon Certification
LBNL: Lawrence Berkeley National Laboratory
LHHS: Labor, Health and Human Services
LQ: Location Quotient
MLRP: Multi-benefit Land Repurposing Program
MSA: Metropolitan Statistical Area
MTC: Metropolitan Transportation Commission
NAICS: North American Industry Classification System
NBS: Nature-based solutions
NEPA: National Environmental Policy Act
NGO: Non-governmental organization
North Valley THRIVE: The High Road for an Inclusive and Vibrant Economy
NVT: North Valley THRIVE
NSJV: North San Joaquin Valley
NSF: National Science Foundation
O&M: Operation and Maintenance
RAISE: Rebuilding American Infrastructure with Sustainability and Equity
RAP: Registered Apprenticeship Programs
RFP: Request for Proposals
R&D: Research and Development
SACOG: Sacramento Area Council of Governments
SBA: Federal Small Business Administration
SBDC: Small Business Development Centers
SCORE: Service Corps of Retired Executives
SGMA: Sustainable Groundwater Management Act
SS4A: Safe Streets and Roads for All
STEAM: Science, Technology, Engineering, Arts and Mathematics
STEM: Science, Technology, Engineering, and Mathematics
SWP: State Water Project
SWOT: Strengths, Weaknesses, Opportunity and Threats
TDS: Transmission, Distribution and Storage
TRC: Transportation Research Center
UCANR: University of California Division of Agriculture and Natural Resources
UOP: University of the Pacific
USDA: United States Department of Agriculture
USDOT: United State Department of Transportation

VESL: Vocational English as a Second Language
WEX: Work Experience Programs

Appendix: Glossary of Terms

Backbone entity: A coordinating organization or body that draws together a diversity of interested parties to facilitate coordination, alignment and creation of collaborative solutions.

Capacity Building: The process of enhancing local and regional coordination, leadership, knowledge, skills, expertise, and access to resources, enabling communities to organize and engage in inclusive economic planning, secure funding, and implement future projects. While not exclusive, capacity building activities may involve preparing for economic transitions within a region and equipping communities with tools and resources to plan for an inclusive economic future.

Carbon Neutrality: The point at which the removal of carbon pollution from the atmosphere meets or exceeds emissions.

Circular Bioeconomy: An economic model that uses biological resources (such as plants, microorganisms, or agricultural waste) to create products, services, and processes, while promoting sustainable practices by repurposing biomass residues from existing activities to minimize waste and environmental impact.

Cross-cutting Enabling Strategies: The cross-cutting enabling strategies outline the essential systems, services, and infrastructure that will support the North San Joaquin Valley's (NSJV) transition toward resilience and growth. They affect all sectors, driving investments that advance equity, sustainability, and economic growth. These strategies also enable a shift to higher-value activities and are regionally focused, ensuring that regional policies have a strong impact on infrastructure and development.

For North Valley THRIVE, these cross-cutting enabling strategies were determined through the analysis contained in the Baseline Assessment, as well as through a series of consultations with community and interested parties. They include the following seven strategy areas:

- Regional Innovation Ecosystem
- Small Business and Entrepreneurship
- Catalytic Skills and Talent Development
- Climate Smart Infrastructure
- Placemaking, and Amenities
- Generational Well-Being
- Regional Coordination and Alignment

Community Based Organization: A public or private nonprofit organization that represents a community or significant segments of a community and provides educational, programing or related services to individuals in the community.

Disinvested Communities: The California Jobs First State Guidelines defines 'disinvested communities' (DICs) as census tracts identified as 'disadvantaged' by the California Environmental Protection Agency, areas with median household incomes at or below 80% of the statewide median income, high poverty or high unemployment areas, and California Native American Tribes as defined by the Native American Heritage Commission. For a complete list of all criteria, please reference the next Appendix below.

As indicated in the NSJV Baseline Assessment, the majority of the NSJV region is considered disinvested. These communities are illustrated in Figure 2.2.1 on page 10 of the published NSJV Baseline Assessment.

While THRIVE uses the parameters set by the State of California as minimum criteria that will be used for the Catalyst project identification process moving forward, “disinvested communities” is also used in a more expansive context. The North Valley THRIVE initiative considers additional factors that determine disinvestment and challenges facing communities throughout the Northern San Joaquin Region beyond the criteria provided by the State. As such, this term also includes underserved communities, underrepresented communities, and vulnerable communities throughout the region.

Equitable/Just Transition: As defined by the Berkeley Labor Center, a “just transition” refers to integrated policy approaches offering protection, support, and compensation for displaced workers and communities in specific industries or regions. Just transition programs can offer resources for both immediate short-term assistance to workers and communities directly affected by these trends, and long-term assistance to communities and workers as they “retool” and adapt to a carbon-neutral economy.⁹³

Equity: Prioritizing equity requires identifying how the benefits and burdens of economic development, regional planning, and other relevant processes are distributed in and across communities. Equity includes “leveling the playing field” by identifying and remediating systemic barriers facing specific groups. It requires identifying present-day disparities and confronting the planning, development, and decision-making processes that keep existing barriers in place and perpetuate historical injustices. For California

Jobs First, equity means that California Jobs First Regions share the benefits and burdens of the California Jobs First Phase 1 process across all affected urban and rural communities, with targeted efforts to reach historically excluded populations and members of disinvested communities. Identifying constituent aspects of equity can help focus efforts to achieve better outcomes.

- **Economic Equity:** All people of the State, regardless of race, gender, or nativity, can contribute to and access the opportunities for a strong, resilient economy.
- **Environmental Equity:** All people of the State have equal protection from the impacts of environmental degradation and climate change impacts and equal access to natural resources and recreation opportunities in a clean, healthy environment.
- **Health Equity:** All people of the State have full and equal access to opportunities that enable them to lead healthy lives. Focusing efforts on achieving health equity can lead to significant progress in addressing the impacts of climate change, economic disruptions, and other aspects of economic recovery and transition.

High Road: As defined by the Berkeley Labor Center, a “high-road economy” supports businesses that compete based on the quality of their products and services by investing in their workforces; these businesses pay the wages and benefits necessary to attract and retain skilled workers, who in turn perform high-quality work. Significantly, this approach emphasizes an integration of demand and supply side strategies through training strategies that connect directly to the labor market, making sure to both address industry needs as well as connecting participants to actual jobs.⁹⁴

Of note, the original State guidelines for the California Jobs First effort state that regions should consider

a high-road approach to economic development to support the creation of quality jobs and equal access to those jobs. These guidelines specify that a regional high-road economy favors businesses that invest in their workforces, pay living wages, and engage in environmentally sustainable business practices.⁹⁵

Inclusive Economy: An inclusive economy creates broader opportunities for shared prosperity, particularly for those who face significant challenges in improving their well-being. Such economies are equitable, participatory, growing, sustainable, and stable. Inclusive practices ensure that historically underrepresented or underserved groups have opportunities to participate in, provide input on, and make decisions about the California Jobs First planning process, while also benefiting from its outcomes.

Marginalized communities: As defined by the National Institute of Health, marginalized communities are those excluded from mainstream social, economic, educational, and/or cultural life. Examples of marginalized populations include, but are not limited to, groups excluded due to race, gender identity, sexual orientation, age, physical ability, language, and/or immigration status. Marginalization occurs due to unequal power relationships between social groups.⁹⁶

Photovoltaics: The process of converting light (photons) into electricity (voltage).⁹⁷

Priority Sectors: The priority sectors are areas of the NSJV economy or key industries that NV THRIVE has identified as critical for investment, development, or support due to their potential for driving significant economic growth, job creation, innovation, or addressing key societal challenges. The NV THRIVE initiative has focused on four priority sectors: Advanced Manufacturing, Clean Energy, Carbon Management, and the Circular Bioeconomy.

Resilience: Resilience refers to the capacity of the Northern San Joaquin Valley to effectively respond and adapt to a variety of challenges including environmental pressures, socioeconomic barriers, and transitions within industries and employment sectors. It involves the region's ability to withstand and recover from adversities such as climate change, health crises, and economic disruptions. This concept encompasses the development of robust training systems and pathways that prepare individuals for industry transformations, ensuring communities not only survive but thrive by transforming vulnerabilities into strengths and opportunities for growth. Resilience in this context emphasizes proactive adaptation and the continuous enhancement of both infrastructural and societal systems to secure long-term sustainability and well-being.

Rightholders: Refers to individuals or groups who have specific legal, cultural, or traditional rights related to the environment or land. These rights might be rooted in law, treaties, or long-standing customs. Unlike "stakeholders," who have an interest or are affected by a project, rightholders have a recognized entitlement or claim that must be honored.⁹⁸

Socioeconomic: Socioeconomic status (SES) encompasses not only income but also educational attainment, occupational prestige, and subjective perceptions of social status and social class. SES reflects quality-of-life attributes and opportunities afforded to people within society and is a consistent predictor of a vast array of psychological outcomes.⁹⁹

Socio-cultural: Related to different groups of people in society and their habits, traditions and beliefs.¹⁰⁰

Social drivers of health: the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and

Sustainability: This concept highlights three key pillars: equity, environment, and economy, and focuses on self-sustaining, equitable economic development aimed at achieving a carbon-neutral economy. It addresses the diverse needs of all communities, including historically disinvested ones, through inclusive and participatory decision-making processes. Sustainable approaches should reduce dependence on fossil fuels, increase water and energy efficiency, and promote green jobs, local economies, and environmental justice for current and future generations.

Quality Jobs: This analysis identifies “quality jobs” that provide a livable wage and benefits, as well as “promising jobs” that offer pathways to them:

- Pay a livable wage on an annualized basis
- Provide employer-sponsored health insurance (a proxy for employee benefits)
- Are likely to continue to provide pathways to another quality job.

As a policy choice, regional leaders have defined “quality jobs” as those that would enable financial stability for a majority of children currently in working families struggling to make ends meet. Using the wage curves to balance aspirations for workers with feasibility in the economy, leaders set the wage floor for “quality jobs” at \$32.80 per hour, or \$66,900 per year.¹⁰²

As noted by a report published by the Berkeley Labor Center, while some specific definitions of quality jobs vary based on occupation, the general consensus is that “a good, family-supporting job pays a living wage; offers a stable schedule; provides benefits such as health care, retirement, paid sick days, and paid family leave; offers wage increases as skills are acquired; provides safe and healthy working conditions; and complies with all workplace laws (e.g., wage and hour, employee classification, health and safety, anti-discrimination, workers’ compensation, and right to organize laws).”¹⁰³

Wicked problem: A problem that may appear impossible or difficult to solve because there is little or no agreement on the definition of the problem, a lack of clear solutions due to the wide range of potential solutions and/or tradeoffs associated with each, and multiple jurisdictions, interested parties, regulators or implications.¹⁰⁴

Appendix: The California Jobs First Definition of Disinvested Communities

According to California Jobs First Guideline “disinvested communities” are areas with any of the following characteristics:

- Census tracts identified as ‘disadvantaged’ by the California Environmental Protection Agency under the guidelines outlined by SB 535.¹⁰⁵
- Census tracts with median household incomes at or below 80 percent of the statewide median income or with the median household incomes at or below the threshold designated as low income by the Department of Housing and Community Development’s list of state income limits adopted pursuant to Section 50093 of the California Health and Safety Code.
- ‘High poverty area’ and ‘High unemployment area’ as designated by the California Governor’s Office of Business and Economic Development California Competes Tax Credit Program.¹⁰⁶
- California Native American Tribes as defined by the Native American Heritage Commission (NAHC) Tribal Consultation Policy.¹⁰⁷

Appendix: State Content Requirements

REGIONAL PLAN PART 2, STATE REQUIREMENTS	LOCATION IN THE NORTH SAN JOAQUIN VALLEY STRATEGIC PLAN (RP2)
1. Vision and Goals Including: Relationship to Regional Plan Part 1, Summary of community input (Required)	Included: See Chapter 1, Chapter 2
2. Regional Snapshot and SWOT (Recommended)	Included: See Chapter 3
3. Regional Strategies 3a. Target Sector Strategies	Included: we called Target Sectors Priority Sectors. See Chapter 4, Chapter 5
3a.i Define Sector and Justify Prioritization (Required) 1. Sector Development (trends and projected growth that support quality jobs) a. Clear Local Market Signals b. Value Chain and Infrastructure c. Innovative Ecosystem d. Regional Assets 2. Increasing Economic Diversification and Resilience	Included: See Chapter 4
3a.ii Alignment with Job Quality & Access, Equity, and Climate (Required)	See Chapter 5, we referred to this as Alignment with Guiding Principles
3a.iii Workforce Development (Required) Include: How strategies match skills to jobs, address talent and recruitment, and facilitate strategic collaborations, etc.	See Chapter 4, Chapter 5
3a.iv Alignment with State Strategies (Required) Includes: How Target Sector Strategies align with state strategies.	See Chapter 5, we referred to this as “Alignment with Guiding Principles”
3a.v Strategy Implementation (Recommended)	Included: Each of the strategies in Chapter 5 includes a discussion of actions.
3b. Sector-Neutral and Economic Mobility Strategies	Included: In the North San Joaquin Valley Strategic Plan, we called Sector-Neutral Strategies Cross-Cutting Enabling Strategies. See Chapter 6.
3b.i and 3b.i Identify Problem and Opportunity and Assets (Required)	Included: See Chapter 6, each strategy includes key challenges, opportunities and assets.
3b.ii Increase Economic Diversification and Resilience (Required)	Included: See Chapter 6, in each strategy.
3b.iii (1-3) Alignment with Job Quality & Access, Equity, and Climate (Required)	Included: See Chapter 6, in each strategy.
3b.iv Workforce Development (Required)	Included: See Chapter 6, in each strategy.

3b.vi (1) Strategy Implementation (Recommended)	Included: See Chapter 6, in each strategy.
3c Additional Regional and Community Development Strategies (Recommended) Include: Descriptions of strategies that are critical to building resilient regions and communities but are outside of the scope such as: Housing, Transportation, Food Access and Security, Mental Health Services	Included: The North San Joaquin Valley Strategic Plan includes strategies to address Housing, Food Systems and Community Health in the Cross-Cutting Enabling Strategies section of the Plan. See Chapter 6.
4. A Path Forward: Institutionalizing Community-Led, Climate Forward Planning (Recommended)	Included: See Chapter 7

Endnotes

1 For background on the process to identify the state's 13 economic regions, see: https://edd.ca.gov/siteassets/files/jobs_and_Training/pubs/wsin21-20att1.pdf

1 Regions Rise Together, Inland California Rising description

2 See page 7 of the North Valley THRIVE Baseline Assessment (2023) for further details.

3 See page 7 of the North Valley THRIVE Baseline Assessment (2023) for further details.

4 See page 19 of the North Valley THRIVE Baseline Assessment (2023) for further details.

5 See page 63 of the North Valley THRIVE Baseline Assessment (2023) for further details.

6 See pages 140-143 of the NSJV Baseline Regional Assessment (2023) for further details.

7 See pages 241 of the NSJV Baseline Regional Assessment (2023) for further details.

8 See pages 61-62 of the NSJV Baseline Regional Assessment (2023) for further details.

9 Further details about the Stockton Diamond Grade Separation Project is available at: <https://stocktondiamond.com/>

10 JobsEQ. 2024Q1

11 Note: Based on our sector definitions, manufactured energy efficient products would fall under clean energy sector but not all product lines or employees would be classified as clean energy workers. Our methodology has accounted for this overlap in sectors to avoid double counting, but this sample company is illustrative.

12 Note: The broad manufacturing sector is also primarily a traded sector as well. For example, most of the food and beverage manufacturing in the region is sold beyond the NSJV.

13 This excludes 742 manufacturing workers who are also involved in clean energy manufacturing to avoid double counting.

14 Data from JobsEQ.

15 2020-2030 Local Employment Projections Highlights <https://labormarketinfo.edd.ca.gov/data/employment-projections.html>

16 <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/data-analytics-services/transportation-economics/socioeconomic-forecasts/2023/2023-pdf/california-2023-a11y.pdf>

17 Defined by the MIT Living Wage Calculator which accounts for local variation in costs of insurance, housing, groceries, and more. <https://living-wage.mit.edu/counties/06077>

18 Data from JobsEQ.

19 Advanced Manufacturing Sprint. <https://www.whitehouse.gov/briefing-room/statements-releases/2024/01/23/fact-sheet-biden-harris-administration-highlights-new-commitments-toward-equitable-workforce-development-in-advanced-manufacturing/>

20 Advanced Manufacturing Workforce Development Council https://cwdb.ca.gov/special_committees/advanced_manufacturing_workforce_development_counc/

21 <https://business.ca.gov/wp-content/uploads/2020/08/Manufacturing-Incentives-under20MI.pdf>

22 <https://statewide-housing-plan-cahcd.hub.arcgis.com/>

23 At the six-digit NAICS level.

24 US Bureau of Labor Statistics

25 <https://www.energy.gov/sites/default/files/2023-06/2023%20USEER%20REPORT-v2.pdf>

26 <https://cecgis-caenergy.opendata.arcgis.com/documents/CAEnergy::utility-renewable-generation-by-type-and-county-2022/explore>

27 <https://www.eia.gov/tools/faqs/faq.php?id=97&t=3>

28 <https://www.universityofcalifornia.edu/news/renewable-clean-hydrogen-power-coming-california-heres-what-you-need-know>

29 <https://www.energy.ca.gov/programs-and-topics/programs/equitable-building-decarbonization-program>

30 Source: JobsEQ®. 2023Q4.

31 Jobs within the solar industry do not consist solely of Solar Photovoltaic Installers, who are often the ones moving and mounting panels. A range of other jobs are often needed in the installation process at the utility scale, including Electricians and Electrical Power-Line Installers and Repairers, which offer considerably higher wages and can conduct a more diverse array of work.

33 https://www.energy.gov/sites/default/files/2024-07/H2Hubs%20ARCHES_Award%20Fact%20Sheet.pdf

34 <https://dot.ca.gov/programs/traffic-operations/census>.

35 <https://www.ppic.org/publication/policy-brief-the-future-of-agriculture-in-the-san-joaquin-valley/>

36 <https://cecgis-caenergy.opendata.arcgis.com/documents/CAEnergy::utility-renewable-generation-by-type-and-county-2022/explore>

37 <https://www.universityofcalifornia.edu/news/helping-build-bioeconomy-californias-northern-san-joaquin-valley>

38 <https://www.nrel.gov/gis/solar-resource-maps.html>

39 <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/program-data/cap-and-trade-program-data-dashboard>

40 For more information about industry definitions please see Appendix 4A.

41 BECCs and BiCRS are technologies that can be considered both clean energy (generation of clean fuels) and carbon management (a process that is net negative in carbon emissions). For this reason, these technologies are discussed in both sector sections.

42 <https://rhg.com/research/direct-air-capture-workforce-development/>

43 <https://www.heirloomcarbon.com/news/heirloom-unveils-americas-first-commercial-direct-air-capture-facility>

44 Authors calculations using forecasted installed capacity by 2050 and the number of jobs created from a 500,000 ton DAC plant, though economies of scale may impact these figures.

45 Data from JobsEQ. Occupations from Rhodium Group DAC Workforce Development Report

46 https://gs.llnl.gov/sites/gis/files/2021-08/getting_to_neutral.pdf

47 https://carbon-economy.llnl.gov/sites/carbon_economy/files/2020-07/003_Climate%20Factsheet_v-08.pdf

48 1) Pelican Renewables Sequestration Project in Stockton. 2) Heirloom Direct Air Capture Facility in Tracy. 3) Aemetris Carbon Capture Projects. 4) Carbon TerraVault II, III, IV, and V in San Joaquin. 5) Aemetris Bioenergy with Carbon Capture and Storage (BECCS) in Riverbank and Keyes. 6) Stockton DTE BECCS

49 <https://www.ucmerced.edu/natural-reserve-system>

50 <https://www.ucmerced.edu/sierra-nevada-research-institute>

51 <https://www.kccd.edu/crel/index.html>

52 <https://www.csub.edu/cerc/energy-innovation-building.shtml>

53 Climate and Jobs Community Survey in South Stockton: Valley Plan Report Number 1

54 Note that this analysis combines the list of NAICS from BioPreferred and ISCC and includes NAICS codes where the products made in those industries could be made from bio-based inputs. The background analysis for the identification of the sources of NAICS codes conducted by Phoebe Fleming for BEAM Circular, 2024. The updated analysis conducted as part of North Valley THRIVE update analysis.

55 See: Hodgson, A., Alper, J. & Maxon, M. E. (2022). The U.S. Bioeconomy: Charting a Course for a Resilient and Competitive Future. Schmidt Futures. <https://www.schmidtfutures.org/our-work-old/task-force-on-synthetic-biology-and-the-bioeconomy/>

56 See: White House Initiative to Advance the Bioeconomy, E.O. 14081. <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/12/executive-order-on-advancing-biotechnology-and-biomanufacturing-innovation-for-a-sustainable-safe-and-secure-american-bioeconomy/> . See also <https://www.whitehouse.gov/wp-content/uploads/2023/03/Bold-Goals-for-U.S.-Biotechnology-and-Biomanufacturing-Harnessing-Research-and-Development-To-Further-Societal-Goals-FINAL.pdf>; See: U.S. Department of Energy Sustainable Aviation Fuel Grand Challenge. Energy.gov. Available at <https://www.energy.gov/eere/bioenergy/sustainable-aviation-fuel-grand-challenge>; U.S. Department of Agriculture (2024) Building a Resilient Biomass Supply: A Plan to Enable the Bioeconomy in America. Available at <https://www.usda.gov/sites/default/files/documents/biomasssupply-Chain-report.pdf>; U.S. Department of Defense (2022) New Biotechnology Executive Order Will Advance DoD Biotechnology Initiatives for America's. Available at <https://www.defense.gov/News/Releases/Release/Article/3157504/new-biotechnology-executive-order-will-advance-dod-biotechnology-initiatives-fo/>

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61 <https://www.bcg.com/publications/2022/synthetic-biology-is-about-to-disrupt-your-industry>

62 California Department of Food and Agriculture (2024) 2022-2023 California Agricultural Statistics Review. Available at https://www.cdfa.ca.gov/Statistics/PDFs/2022-2023_california_agricultural_statistics_review.pdf

63 U.S. Department of Agriculture (2024) 2022 Census of Agriculture. Available at <https://www.nass.usda.gov/Publications/AgCensus/2022/>

64 U. S. Environmental Protection Agency (2024) Sources of Greenhouse Gas Emissions. Available at <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

65 U.S. Environmental Protection Agency (2023) Quantifying Methane Emissions from Landfilled Food Waste. Available at <https://www.epa.gov/land-research/quantifying-methane-emissionslandfilled-food-waste>

66 <https://www.energy.gov/eere/iedo/onsite-energy-program>

67 See: <https://www.trade.gov/about-ftzs>

68 See: <https://patino.fresnounified.org/>

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73 <https://www.americascuttingedge.org/rcbi-is-now-the-marshall-advanced-manufacturing-center/>

74 Note: The figures are project costs and secured investment as of June 2024. These figures are subject to change.

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76 See: <https://www.energy.gov/sites/default/files/2023-06/2023%20USEER%20EXEC%20SUMM-v2.pdf>

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