



A Proposal Submitted to:

The U.S. Department of Commerce Economic Development Administration for designation as an Investing in Manufacturing Communities Partnership (IMCP); Central Valley AgPlus Food and Beverage Manufacturing Consortium.

Submitted by:

- Office of Community and Economic Development (OCED) at California State University, Fresno
- Center for Economic Development (CED) at California State University, Chico
- Tuolumne County Economic Development Authority (TCEDA), on behalf of the Central Sierra Economic Development District (CSEDD)
- Valley Vision (VV)

April 1, 2015



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March 17, 2015

Matt S. Erskine
Deputy Assistant Secretary for Economic Development
U.S. Economic Development Administration
1401 Constitution Avenue, NW
Room 71014
Washington, D.C. 20230

Re: Federal Interagency Competition, FY 2015 Investing in Manufacturing Communities Partnership

Dear Deputy Assistant Secretary Erskine:

This proposal is being submitted by the **Office of Community and Economic Development (OCED)**, an on-campus division of California State University, Fresno, on behalf of a consortium representing California's Central Valley. OCED will serve as the Lead Applicant for this proposal and collaborate with the **California State University, Fresno Foundation (Fresno State Foundation)**, the university's Fiscal Agent, in administering funds and activities associated with an Investing in Manufacturing Communities Partnership (IMCP) Manufacturing Community designation. The Fresno State Foundation is a 501 (c) (3) non-profit organization with rigid guidelines, procedures and policies in place for compliance with all grants and fiscal expenditures. With oversight from the Executive Director, the proposal's Point of Contact, OCED's Associate Director – Funding and Finance Director will correspond regularly with staff from all consortium members to monitor the progress of proposal activities. An effective communication process is in place that allows the progress of proposal activities to be understood and tracked by the Fresno State Foundation.

The following individual is authorized to negotiate with the U.S. Economic Development Administration concerning the FY 2015 IMCP Manufacturing Community designation proposal:

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The undersigned, attests that Michael Dozier is authorized to submit proposals on behalf of the California State University, Fresno Foundation under the Office of Community and Economic Development.



Ellen Shimakawa, Ph.D., Director
Office of Research and Sponsored Programs

17 March 2015

Date

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THE CALIFORNIA STATE UNIVERSITY

AGPLUS GEOGRAPHIC SCOPE

List all counties included in your proposed Manufacturing Community (Please note that geographic regions listed should reflect the top-third KTS requirement):

Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Kings, Madera, Mariposa, Merced, Nevada, Placer, Plumas, Sacramento, San Joaquin, Sierra, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba

Describe the regional boundaries of the consortium:

The geographic scope of Central Valley AgPlus region includes 28 of California's 58 counties. Known as the Great Central Valley, the region extends from Bakersfield, Kern County in the south, to Redding, Shasta County in the north, bounded by the foothills of the Sierra Nevada range to the east and the Coastal range to the west.

The Valley is drained by several major river sheds which converge at the western edge of the Valley near the cities of Sacramento and Stockton, forming the Sacramento-San Joaquin River Delta, one of the West's largest estuaries. The Delta, a rich agricultural area, is considered the nexus of California's statewide water system. More than 23 million Californians and millions of acres of farmland rely on the Delta for all or part of their water supply, and countless species depend on it for their habitat. The region is a major goods movement corridor, with Interstate 5 running north-south the length of the Valley on the west and Highway 99 on the east, intersected by Interstate 80 running east-west, and major ports in West Sacramento and Stockton which connect with the port of Oakland.

Thus, while a large region, the Central Valley AgPlus region has a shared geography, economy and labor market sheds, transportation system, water system and agricultural heritage. The map describing the Top Third KTS (Key Technologies and Supply Chain) requirement shows the concentration of food and beverage manufacturing establishments across the Valley, which comprise the region's manufacturing ecosystem.

TOP THIRD JUSTIFICATION

The industries of focus are food and beverage manufacturing. The Central Valley ranks in the top third for six of the nine 4-digit NAICS codes under 3-digit NAICS code 311 Food Manufacturing. The region also ranks in the top third for 4-digit NAICS code 3121 Beverage Manufacturing. As shown in Exhibit #1, food and beverage manufacturing industries are heavily concentrated in the Central Valley, with location quotients greater than one, and in four instances greater than two or three.

Exhibit #1. Industry Sector and Establishment Location Quotients for Central Valley

NAICS Code	Industry Sector	Central Valley Establishment LQ*	Establishment LQ Cutoffs**
3111	Animal Food Manufacturing	1.81	1.42
3112	Grain and Oilseed Milling	2.30	1.23
3114	Fruit and Vegetable Preserving and Specialty Food Manufacturing	3.89	1.04
3115	Dairy Product Manufacturing	2.04	1.04
3118	Bakeries and Tortilla Manufacturing	1.10	1.00
3119	Other Food Manufacturing	1.83	1.02
3121	Beverage Manufacturing	2.17	1.00
*Calculated using U.S. Census Bureau, County Business Patterns: http://www.census.gov/econ/cbp/ **Source: "Top-Third Ranked Location Quotients for Establishments and Employment by 4-digit Manufacturing NAICS Codes" published by EDA: http://www.eda.gov/challenges/imcp/toolkit.htm .			

There are a total of 1,659 food and beverage manufacturing establishments in the Central Valley. As demonstrated by Exhibit #1, establishments are clustered along State Route 99 which serves as the region's primary trade corridor. Concentration also exists along Interstates 5 and 80. The Port of Oakland serves as the principle export point for the region's food and beverage manufacturing industries.

Exhibit #1. Location of Food and Beverage Manufacturing Firms in the Central Valley



Central Valley AgPlus Assessment of Local Industrial Ecosystem and Implementation Strategy

OVERVIEW

The **goal** of the Central Valley AgPlus Food and Beverage Manufacturing Consortium (AgPlus Consortium) is to advance the region's agriculture-related manufacturing economy, targeting industries in the food and beverage manufacturing sector whereby raw agricultural goods are transformed into value-added products by core manufacturing activities.



The **mission** of the AgPlus Consortium is to foster the growth and creation of food and beverage businesses and middle-skills manufacturing jobs in the Central Valley. The AgPlus Implementation Strategy will build upon the Central Valley's unique asset base, committed partnerships and networks to:

- Capture more value-added cluster manufacturing and supply chain activity within the region, including to meet new demand for local specialty products such as through Farm to Fork efforts;
- Provide the workforce with needed skills through successful career pathways models;
- Accelerate the development and adoption of innovative technologies so the Central Valley's food and beverage manufacturing industry is the most efficient, safe, healthy, viable and sustainable nationally and a global center of innovation for next generation processing and supply chains;
- Facilitate the transformation of the industry to adapt to the short and long-term impacts of the drought, now in its fourth year, and climate change; and,
- Strengthen business operations and access to capital.

Consortium members represent major Central Valley public and private institutions from the education, business, economic and workforce development and civic sectors. AgPlus leverages the assets of its universities, especially UC Davis, the world's top ranking university in agriculture and the nation's top ranking university in agricultural sciences, food science and nutrition.¹ California State University, Fresno is globally recognized for its expertise in water technologies, agriculture and food processing.

California plays a critical role in the U.S. food system. It is the largest agricultural economy in the U.S, and among the top ten globally. The Central Valley, comprised of 28 counties located in California's heartland, plays a dominant role in this economy as America's Farm to Fork Capital. **Production agriculture** has been the Central Valley's mainstay and competitive advantage, yielding:

- A farm gate value of \$40.7 billion in 2013 - 68% of California's total farm gate value (greater than the value of 19 U.S. states combined).²
- \$11 billion worth of agricultural commodities exports to foreign markets in 2011.³

Production in the agriculture sector fuels growth in the food manufacturing sector as these industries are part of a highly integrated supply chain. Claiming more value from agricultural production through the **food processing industry**, along with its supply and distribution chains, is the Central Valley's opportunity and challenge. Food processing is California's third largest manufacturing sector and a key driver of its economy. It produced nearly \$105 billion in economic output in 2012, and was responsible for over 198,000 jobs tied directly to manufacturing. Indirect economic and employment impacts are even greater.⁴

Reflecting the comparative advantage of the food processing industry in the Central Valley, six of the region's nine major food manufacturing industries and the beverage manufacturing industry ranked in the top third for IMCP requirements. These top third industries:

¹ UC Davis College of Agricultural and Environmental Sciences, <http://www.caes.ucdavis.edu/about/overview/facts>

² USDA, National Agricultural Statistical Service, 2014

³ USDA, National Agricultural Statistical Service, 2014

⁴ Richard J. Sexton, Josue Medellin-Azuara, and Tina L. Saitone. The Economic Impact of Food and Beverage Processing in California and its Cities and Counties. Prepared for the California League of Food Processors, p.4. January 2015.

- Include more than 1,650 food and beverage manufacturing business establishments.
- Account for 88% of the Central Valley's total food and beverage manufacturing output - \$37.9 billion out of \$43.2 billion in 2013.⁵

Yet, although the Central Valley provides 68% of California's overall farm gate, only about 40% of the state's food and beverage manufacturing output is produced in the Central Valley.⁶ Data indicate significant amounts of leakage, where value is added after agricultural products leave the region. This economic loss can be seen as a contributing factor to the Central Valley's chronic and persistent high levels of poverty and unemployment. The region's unemployment rate in February 2015 was 9.4%, compared to 6.8% for California and 5.5% nationally. Half of the region's counties had double-digit unemployment rates, with the highest at 22.7%.⁷

Unemployment and hardship is expected to increase as California enters its fourth year of drought. On February 4, 2015, USDA designated all 28 Central Valley AgPlus counties as primary natural disaster areas due to damages and losses caused by ongoing drought conditions. These conditions impact food and beverage manufacturing and threaten the national food supply. As President Obama noted during a February 14, 2014 visit to the Central Valley: "California is our biggest economy, California is our biggest agricultural producer, so what happens here matters to every working American, right down to the cost of food that you put on your table."

The agricultural manufacturing ecosystem includes a value chain of affiliated and interdependent manufacturing and support activities such as production of packaging materials, production of agricultural equipment, distribution, agricultural technology and bioenergy (i.e., waste-to-energy and biofuels), food safety, nutrition, food waste and water technology. All are areas of vitally important emerging technologies that are being incubated and deployed in the Central Valley, especially through the research and technology commercialization flowing from UC Davis, Fresno State and Chico State. They include the development of new agricultural technologies to monitor and manage the use of resources more efficiently. These technologies will drive increased productivity and competitiveness for manufacturing establishments and supplier chains, provide solutions to global challenges, and increase prosperity and sustainability for the region, California and the nation.

Global challenges with the food supply affect us all. World population will increase from 7 billion people today to 9 billion people in 2050.⁸ We need to build a better, healthier, safer, bigger food supply system to meet this need while dealing with increasing resource scarcity, especially with water supply and quality. Globally, food production consumes 70% of fresh water resources. The Central Valley and California have the potential to develop short and long-term solutions to the drought and other resource scarcity challenges.

INDUSTRIAL ECOSYSTEM ASSESSMENT

The following data-driven assessment outlines current capabilities, current institutions for improving capabilities, identified gaps within the Central Valley's manufacturing ecosystem, and steps that will be taken to mitigate shortcomings and capitalize on emerging opportunities across the six pillars of the ecosystem. The section which follows the Assessment – the AgPlus Implementation Strategy – provides the detail on the specific plans for each pillar including the role of implementation partners, timeframe, activities and milestones.

PILLAR 1. WORKFORCE AND TRAINING (Priority Area – Bonus Weight Element)

Labor market information shows strong long-term job growth potential and jobs currently going unfilled due to job-skills mismatches. This creates an opportunity to develop a talent pipeline of Central Valley workers through

⁵ Number of Establishments – County Business Patterns, U.S. Census Bureau, 2014; Economic Output - 2013 IMPLAN Analysis, Center for Economic Development, California State University, Chico, March 2015.

⁶ Estimates are calculated based on the Central Valley's share of the State's food processing industry economic output, for 2013 data for the Central Valley Chico State IMPLAN analysis, compared to the 2013 data for the California IMPLAN analysis conducted for the California League of Food Processors.

⁷ California unemployment rates: California Employment Development Department, Labor Market Information Division, March 2015. U.S. unemployment rate: U.S. Department of Labor, Bureau of Labor Statistics, March 2015.

⁸ UC Davis World Food Center, Symposium on Water and Energy Efficiency in the Food System, May 22 2014.

innovative education and training programs, both for new and replacement jobs. This is an opportunity to create more manufacturing establishments and well-paying jobs to fill this gap and also leverage opportunities for new food and beverage processing capacity and market channels to meet the growing demand for locally sourced and value-added food products.

1. Current Capability

Employment in the food and beverage manufacturing KTS is strong in the Central Valley. As noted above, a recent analysis by the California League of Food Processors estimated there were approximately 198,000 jobs in the food and beverage processing in 2012. The Center for Economic Development at Chico State estimated there were 67,800 food and beverage processing jobs in the Central Valley KTS in 2013, accounting for approximately 34% of all California food and beverage manufacturing jobs.⁹

Several studies have defined the requisite skills and average compensation for employees in fields relevant to food and beverage manufacturing KTS. A study prepared for the San Joaquin Valley for its IMCP planning grant shows example occupations with regional average annual wages (Q1 2013), and general education and on-the-job training requirements.¹⁰ The [Environmental Scan, Agriculture Value Chain California](#) conducted by the Center of Excellence at Modesto Junior College in 2011 has a comprehensive list of agriculture processing occupations with average hourly wages, required education levels, and requisite skills, abilities and tasks. Many of these occupations are in well-paying middle-skill jobs. The range is from a regional annual average wage of \$90,363 for Industrial Production Managers to an average annual wage of \$36,220 for Inspectors, Testers, Sorters, Samplers and Weighers. The range of required general education and on-the-job training is highest for Industrial Production managers, and First-Line Supervisors of Production and Operating Workers (making \$57,182 annually), who are required to have a Bachelor's Degree and one to five years of on-the-job training. It is lowest for Inspectors, Testers, Sorters, Samplers and Weighers and a couple of other occupations, which are required to receive a High School Diploma and do short-term on-the-job training¹¹.

Projected food and beverage manufacturing job openings for the time period 2012 – 2022 show almost 52,000 jobs—24,240 new jobs and almost 27,700 replacement jobs to fill the gaps due to baby boomer retirements and other labor market changes, in a wide range of occupations. Table #1 shows the job potential for the most high-demand occupations in this industry. Assuming a similar occupational profile, additional jobs could be added if some leakage gaps were filled, whereas currently many job openings are filled by workers from outside the region due to job-skills mismatches within the region.

Table #1. Projected Job Openings in Food and Beverage Manufacturing, Most In--Demand Occupations

SOC Code	Occupation Description	New Jobs 2012-2022	Replacement Needs	Total Job Openings
00-0000	Total	24,240	27,660	51,900
51-9111	Packaging and Filling Machine Operators and Tenders	980	2,290	3,270
53-7061	Cleaners of Vehicles and Equipment	1,290	2,350	3,640
51-9199	All Other	570	610	1,180
51-9061	Inspectors, Testers, Sorters, Samplers and Weighers	1,280	1,440	2,720
49-9041	Industrial Machinery Mechanics	1,800	1,540	3,340
51-3092	Food Batchmakers,	420	880	1,300
53-7064	Packers and Packagers, Hand	2,520	4,740	7,260
53-3031	Drivers/Sales Workers	1,410	1,260	2,670
53-3032	Heavy and Tractor-Trailer Truck Drivers	7,090	6,030	13,120
11-1021	General and Operations Managers	6,880	6,520	13,400

Source: CA Employment Development Department, Labor Market Information Division. Analysis: Center for Economic Development, CSU Chico, March 2105.

⁹ IMPLAN Analysis, conducted for the IMCP application, Center for Economic Development, Chico State, March 2015.

¹⁰ "Snapshot of the Agricultural Manufacturing Ecosystem in the San Joaquin Valley," Collaborative Economics, March 14, 2014, p.

14. ¹¹ Ibid, pg. 14

2. Current Institutions for Improving Capability

The AgPlus region has many institutions and programs that specialize in the KTS or could develop relevant and needed specialties and more coordinated linkages within and across education and training systems. In addition, several programs have been initiated in the Central Valley with a new state initiative - Career Pathways Trust - to fund the development of career pathways programs and linkages with employers, K-12 and community colleges. Eleven programs in the Central Valley received more than \$67 million, with many programs focused agriculture, food sciences and advanced manufacturing, in close partnership with employers.

The region's two University of California (UC) campuses and five California State University (CSU) campuses play a vital role in producing a pipeline of high-skill researchers, engineers, scientists, and an overall labor force needed by a wide range of manufacturers. As noted, UC Davis (UCD) is the number one ranked university in the world for teaching and research in agriculture and forestry; number one nationally in agricultural sciences, food science and nutrition, and environment/ecology; and number two in agricultural engineering. Fresno State and Chico State have deep assets in agricultural technologies/manufacturing, water technologies, renewable energies and entrepreneurship. An illustrative summary highlights some of the region's key education and workforce institutions. The California Community Colleges and most of the Workforce Investment Boards have regional consortia or collaborations and work in a network structure enabling greater coordination and cohesion.

Institution/ Program	Description/Examples
California Community Colleges – 28 colleges	Education/training for regional manufacturing industries' workforce needs; credentials and pathways for continuous learning. System-wide connection to industry businesses with workforce resources. Example: Central/Mother Lode Regional Consortium (CRC) (12 community colleges, 16 counties) has Central CA Community Colleges Committed to Change (C6) Consortium via \$19.9 million Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Dept. of Labor.
Local Workforce Investment Boards (WIBS) – 15 WIBs	Partners with employers, community colleges, K-12 and other partners to develop career pathways for industry clusters including food and ag and advanced manufacturing, through consortia primarily. Also participate on regional economic development boards.
UC Davis	College of Agriculture and Environmental Sciences (CAES) has 6,200 undergraduate students in 27 majors and 1,000 graduate students. College of Engineering partners with CAES on research and education in the production, processing and distribution of products.
UC Merced	Newest UC Campus. Engineering and Science Schools focused on water, climate change, solar and renewable energies; UCMERI (UC Merced Research Institute) and multi-campus UC Solar driving nexus between renewable energies and agriculture.
California State University, Fresno	Applied research and learning on water and energy sustainability applied to agriculture and manufacturing. Global leader in water technology innovations, has International Center for Water Technology and incubator. University Center to Advance Manufacturing (UCAM) enables students to engage with manufacturers in agriculture. Partners with UC Merced on iHub. Lyles Center for Innovation and Entrepreneurship and a 1,100 acre University Farm Laboratory. Jordan College of Agricultural Sciences houses seven departments.
California State University, Chico	Serves Northern California. Leader in sustainability and entrepreneurship. Has College of Agriculture with undergraduate and graduate programs; Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing. Is a partner with North State iHub and regional cluster efforts. Hosts Center for Economic Development which manages SBDC Northern California and North State broadband consortia.
California State University, Sacramento	Undergraduate and graduate programs with 2,500 students in civil, electrical and electronic, and mechanical engineering. Has formed new Institute for Water, Energy and Sustainability and Technology.
Central Valley Higher Education Consortium (CVHEC)	Non-profit partnership of 27 accredited public and private colleges, universities, and community colleges enhances cooperation between 2-year and 4-year institutions to increase the student transfer rate, provide programs to meet needs of regional employers.
NextEd	Non-profit employer-education organization. Established the Capital Region Academies for the Next Economy (CRANE), a region-wide system of support for existing and new high

Institution/ Program	Description/Examples
High Schools, Professional Associations/Non- Profits	school career academies, linking with clusters. Partnership with 21 school districts and county offices of education. Received \$21 million for Career Pathways, including \$8.2 million for Agribusinesses and Advanced Manufacturing. Several career academies, several relevant manufacturing and vocational/trade academy programs. Associations such as California League of Food Processing offer training, workshops and educational programs, along with the Center for Land Based Learning, Soil Born Farms and others. MANEX is a key resource.

3. Gaps

In February 2015 approximately 322,000 Central Valley residents were unemployed. Unemployment is expected to worsen with the fourth year of the drought affecting the growing season, wherein growers have fallowed thousands of acres of land. Many workers are long-term unemployed with low skill and educational attainment levels and other barriers to employment. The recent estimated unemployment rate for workers with the educational attainment level required for most KTS occupations is 17.5 percent¹².

Currently: The region needs: increased investment and collaboration with industry to develop career pipelines and identify occupational needs and training opportunities; faster curriculum development and more standardized curricula across schools; new skills standards designed for additional occupations; increased mentoring, internships, and career awareness; and business and management training for Spanish-speaking foremen. Challenges require a workforce strategy to better identify cluster occupational needs and career pathways, and in-depth analysis of existing programs, gaps and needed programs.

Long-term: Projected manufacturing job openings for the KTS for the time period of 2012 to 2022 show almost 52,000 projected job openings. Employers must often recruit for these types of positions from outside the Central Valley, and even outside the U.S. Regional demand is high for trained/skilled food manufacturing workers such as machinists, electricians, and maintenance mechanics but many educational institutions (K-14) have eliminated or reduced their training programs. There is a critical Latino education achievement gap that needs to be addressed.

4. Plans

AgPlus will help align the CV's many cluster-related education and training assets to ensure that the workforce is prepared to fill projected job openings in food and beverage manufacturing. The strategy will create stronger linkages between employers, labor unions and educational institutions to develop training programs that equip youth with the interest and skills necessary to acquire good-paying jobs in manufacturing industries that are desperately looking for young talent. There are two implementation strategies in this Pillar: expand the availability of career pathway programs, building on existing innovative models such as Linked Learning training for existing and new career pathway programs, and mentoring and career awareness programs to create the pipeline of workers. The Sacramento Area Council of Governments is conducting a major analysis of the food and ag cluster which will provide up to date information of occupational demand and job opportunities.

AgPlus partners are working closely with state partners on workforce and economic development initiatives for career pathways, skills standards, curriculum development and coordination. These partners include the Governor's Office of Business and Economic Development (GO-Biz), the Chancellor's Office of the California Community Colleges, and the California Workforce Investment Board, as well as the California Department of Food and Agriculture and the California Health and Human Services Agency.

PILLAR 2. SUPPLIER NETWORKS

1. Current Capability

Supplier networks for the Central Valley's manufacturing ecosystem are large and generally interrelated, although there is significant opportunity for greater integration and in-sourcing. Within the San Joaquin Valley alone, there were more than 30,700 business establishments in 2012 involved in the agricultural manufacturing value chain, with nearly 1, 400 in core agricultural manufacturing. While there is a large number of supply chain companies

¹² California Employment Development Department. Analysis: Center for Economic Development at CSU Chico, 2014.

within the Central Valley, it is estimated that only 15 percent of the value of inputs for agricultural packaging/processing in the San Joaquin Valley were sourced from within the region in 2010.¹³ The section on Gaps indicates where significant parts of the supply chain are located outside of the region.

The Central Valley's industry clusters initiatives, iHubs, Small Business Development Centers (SBDCs), Centers for International Trade and Development (CITD), Economic Development Corporations, chambers of commerce, city initiatives like the city of West Sacramento Global Food Hub and the city of Fresno's food processing industry effort, and professional associations connect firms on issues such as new technologies, workforce strategies, capital needs and regulatory impacts. Key associations and networks are: the Manufacturers Council of the Central Valley, North State Manufacturers Association, Seed Central, the Almond Board, California League of Food Processors, California Farm Bureau Federation, California Rice Commission, Western Growers, and California Association of Winegrape Growers. Sacramento, as the headquarters for many of these associations, and the San Joaquin Valley, host many national/global events and expos that connect firms with suppliers.

Incubators and Entrepreneurship Programs connect firms with supplier networks. The Water, Energy and Technology Center at Fresno State (WET) hosts the International Center for Water Technology's testing facilities and the Claude Laval WET Incubator. The WET connects resources for entrepreneurs, innovators and start-ups looking to accelerate the commercialization of their innovations. SARTA's TechCon Showcase, which featured its AgStart, drew nearly 700 attendees and 88 exhibitors. SARTA and UC Davis programs foster access to research facilities and capital, commercialization of technologies, and mentoring.

Central Valley manufacturers are continually innovating and launching new products. Demand for locally sourced food products is a major market driver along with food safety and traceability. Food manufacturers are responding with Farm-to-Fork efforts; niche markets have emerged and inspired products such as gluten-free rice buns, almond milk, and non-meat protein alternatives. New products and services are being developed by supply chain companies to improve the sustainability of the manufacturing process and help companies comply with increasingly demanding safety and environmental regulations. Gaps will be narrowed through more efficient supplier networks.

2. Current Institutions for Improving Capability

Key institutions supporting supply chain suppliers and networks include:

- The Northeastern California and UC Merced Small Business Development Center Networks (SBDCs) collectively oversee the provision of technical assistance, training and services to entrepreneurs and small businesses from 10 service centers and 32 outreach locations within the CV. Both provide clients with capital acquisition, procurement, contracting, product development and technology commercialization.
- Economic Development Corporations (EDCs) assist the region's manufacturing firms in connecting to suppliers that help them meet their product demand, and target supplier firms to fill gaps in the supply chain. Several of these organizations align with five Federally-recognized Economic Development Districts (EDDs): 1) 3CORE EDD; 2) Central Sierra EDD; 3) Sierra EDD (SEDCorp); 4) Superior California EDD; and 5) Yuba-Sutter EDD.

As one example, through the [Blue Tech Valley](#) initiative, San Joaquin Valley institutions are helping the region become a globally-recognized Water Hub, attracting North American headquarters for two of the world's largest micro-irrigation manufacturers, Jain and Netafim; Grundfos, the world's largest water pump manufacturer; and LAKOS Separators and Filtration Systems, a world leader in water filtration systems manufacturing. In one of the world's most important and productive agricultural regions requiring water and energy efficiency, their emerging research and technology has global applicability.

3. Gaps

Short-term gaps: Need for additional market information on supplier networks; comprehensive mapping effort is needed. Additional resource sharing (facilities, equipment, etc.) within the region has the ability to promote additional supply chain connections.

Long-term gaps: The high level of leakage in the region presents major challenges as well as opportunities for the supplier networks. It is not realistic to fill all the leakage gaps. The AgPlus strategy will focus on industries which present positive opportunities for start-ups, expansion of existing firms, and attraction of new firms that will also

¹³ "San Joaquin valley Regional Industry Cluster Analysis and Action Plan," per Dr. Antonio Avalos, Applied Development Economics, September 2012, p. 55

help increase the manufacturing base in the Central Valley. Additional analysis is needed to identify the best targets to close supplier chain gaps and develop strategic action plans. The regional clusters need to connect small businesses within their industries with assistance in acquiring trainings and certifications that remove procurement and supplier barriers, and increase the participation of minority-owned and women-owned small businesses.

4. Plans

The AgPlus Strategy will include a comprehensive mapping of supplier networks in the CV with identification of target priorities to address leakage gaps. Implementation Strategy Partners (ISPs) leading cluster initiatives will organize forum where firms can connect with one another, not as competitors but as collaborators within a mutual supply chain. The AgPlus Strategy will foster local/regional sourcing among industries as a more widespread business practice. Small business service providers' staff need additional training to accommodate opportunities for suppliers, including certification requirements for procurement and contracting (e.g., ISO). AgPlus will connect manufacturing small business suppliers to the services and resources of MEPs, SBDCs and others.

PILLAR 3. RESEARCH AND INNOVATION

1. Current Capability

The table below provides a sample of AgPlus university/research assets. A foundational asset is UC Davis; the Office of Research catalyzes research and technology transfer, industry-driven partnerships, patents, licensing and IP management. It received more than \$750 million in research awards in 2011-2012.

Name	Focus Areas
World Food Center at UC Davis	Collaborative and strategic research; tech transfer and intellectual property; innovative industry-university partnerships; policy coordination
California Institute of Food and Agricultural Research, UC Davis	Agri-food systems technologies; applied research: food science, biomass, water-energy nexus, health
Child Family Institute for Innovation and Entrepreneurship at UC Davis (CFIIE), Sustainable Ag Tech Innovation Center	Technology commercialization; intellectual property rights; small business/start-up services; angel capital access. Proof of Concept Center, prototype fund to test market, technological feasibility of prototypes
Seed Biotechnology Center at UC Davis	Industry-university research: breeding tools, novel traits, seed quality and technology, commercialization
Sacramento Regional Technology Alliance (SARTA)	Technology commercialization; intellectual property rights; business expansion; small business/start-up services; technology showcases, AgStart
CSU Sacramento	IWEST, Center for Entrepreneurship
Center for Sustainable Manufacturing at Chico State	Multi-disciplinary program; hands-on technology education; industry support; career guidance; paid internships
Innovate North State iHub	Manufacturing, clean tech, agricultural technologies
Center for Irrigation Technology, Fresno State	Irrigation technology; water/energy management practices; equipment standards; industry testing
University Ctr. to Advance Manufacturing, Fresno State	Research; workforce development; testing; networking; student mentoring
International Ctr. for Water Technology, Fresno State	Water use efficiencies, prototypes, commercialization of technology
Lyles Center for Innovation and Entrepreneurship, Fresno State	Technology commercialization; tech transfer; small business/start-up services; intellectual property rights; venture capital access; New California Ventures, LLC
UC Merced Energy Research Institute	Applied research: energy efficiency; thermal science; power transmission; biofuels
University of California Advanced Solar Technologies Institute at UC Merced, UC Davis	UC Solar Industry Consortium; technology transfer; applied research: solar energy system efficiency and affordability; solar system integration at residential, utility and industrial scale; solar energy economics
Industry and Utility Research Centers, Incubators	In-house research labs, process-related engineering for new products and production efficiency, e.g. Blue Diamond Innovation Center, E&J Gallo

Although limited, the Central Valley does have examples of shared facilities such as incubator space and research centers that support the regional ecosystem. The WET Center at Fresno State provides the ecosystem with a

20,000-square foot, state-of-the-art water and energy laboratory and a low-risk, high-return incubator for small businesses and startups. SARTA's Sacramento Venture Lab is a university-industry technology development center for sustainable technology-based businesses, providing incubation services to small businesses and startups while providing links to research centers and laboratories at CSU Sacramento and UC Davis.

2. Current Institutions for Improving Capability

Local institutions' research and commercialization programs are relevant to the Central Valley's food and beverage manufacturers, developing new technologies that help businesses achieve higher profit margins, efficiencies, and sustainability, in the areas of agriculture, food processing, water usage and energy consumption. Revenue models for the region's R&D institutions are evolving. New California Ventures, LLC was established at Fresno State, for example, to create a revolving fund that can assist university commercialization projects while sustaining itself through equity investments it makes on start-ups it helps launch. Similar models are in place at Davis Roots (Sacramento Region) and Chico Start (North State) where mentoring, incubation space and commercialization are provided. Other start-up incubators include and The Knowledge Lab (Central Sierra).

The Central Valley has many entities that work with new and existing firms to promote innovation, including: Manufacturers Council of the Central Valley, Innovate North State, CFIIE, SATIC, SARTA, the Lyles Center, the Solano Center for Business Innovation, California League of Food Processors and North State Manufacturers Association. Industry and academia integration can be improved. Although there is a healthy amount of R&D activity between industry, UC Davis and USDA laboratories in the Central Valley, the need for water and energy efficiencies in the region offers ample opportunities for universities, industry and other Federal Laboratories to partner.

3. Gaps

Research and technology from the Central Valley's universities and businesses has global applicability. Despite this, the region is underperforming. Filing of new overall patents is an indicator of how much innovation is happening. On an annual basis, the region was well below the U.S. average, benchmarked at 100, showing only 34.2 patents per 100,000 population.¹⁴ Agricultural and water technology patents increased in the San Joaquin Valley between 2007 and 2011. Biofuels and biomass emerged as sectors with successful patent registration for the first time in 2011. Though increasing, the San Joaquin Valley's patent registrations represented a small share of agricultural-related patenting activity in California – 4% from 2011-2012¹⁵. In the Sacramento Region, 36 patents were issued in the Ag and Food Cluster 2006-2010¹⁶.

The region showed higher overall growth than the U.S. in innovation and research-related establishments (computer, science and engineering firms) from 2001 through 2011, due to high growth in the Sacramento Region. In 2013, the overall percentage of research-related establishments in 2013 was much closer to the U.S. average, at 86.6 for the region. The Business Startups Index shows the Central Valley below the U.S. average in 2013, at 85.¹⁷ Many start-ups incubated in the region leave to find capital, low-cost space, mentoring support and supplier networks elsewhere.¹⁸

Short-term research challenges: lack of a regional inventory cataloging prospective technology transfer projects within Central Valley universities. Industry adopts a modest level of technology developed at R&D laboratories within the region's universities. The region's universities must promote themselves better as R&D partners to industry and become problem-solvers for regional bio-based manufacturers.

Long-term research challenges: establishing more robust R&D partnerships between university researchers, and Federal Labs; and attracting higher levels of venture capital, particularly angel investments, to fund early-stage and commercialization activities for new technologies in the region.

¹⁴ Source: U.S. Patent and Trademark Office. Analysis: Center for Economic Development, CSU Chico

¹⁵ [Snapshot of the Agricultural Manufacturing Ecosystem in the San Joaquin Valley](#), Collaborative Economics, March 2014, p. 17.

¹⁶ [Next Economy Capital Region Prosperity Plan Research Plan](#), Research Report, Center for Strategic Economic Research, March 2012, p. 29.

¹⁷ Source: Dun & Bradstreet, Inc. Analysis: Center for Economic Development, CSU Chico.

4. Plans

The UC Merced SBDC Network and the Northeastern California SBDC Network will connect and enhance regional iHubs by building additional capacity among small business consultants to enhance the region's capacity to deliver Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) grant assistance to firms. The Northeastern California SBDC Network was a prior recipient of this grant in 2010. These activities will expedite the implementation of a regional technical assistance corps to assist Central Valley small, high-tech manufacturing businesses with SBIR/STTR proposals, intellectual property rights, and commercialization.

AgPlus also will leverage the networks of State of California-Designated Innovation Hubs (iHubs) to promote and implement additional technology transfer and commercialization activities in the region. The 5 Central Valley iHubs provide an advantage to Californian firms through the introduction of new technologies, processes, research and development solutions into existing industry practices and linkages to investment capital for inventors who want to commercialize their concepts into products, so that the eventual manufacturing occurs within the California economy.

PILLAR 4. INFRASTRUCTURE/SITE DEVELOPMENT

1. Current Capability

Key infrastructure for the Central Valley includes major goods movement corridors; watersheds and water projects that supply water for most of California; new supplies and transmission of renewable energies; developed industrial sites and facilities, and broadband networks. Logistics/goods movement is a major economic engine in the region. The region has sophisticated, logistical services at ports, airports, industrial parks, and agricultural/processing operations. There are vacant ag-related industrial facilities given shifts in agricultural production practices, and opportunity to repurpose existing packing, distribution and manufacturing facilities for more regionally-focused food system manufacturing and supply chain networks.

Transportation. In the statewide [Goods Movement Action Plan](#), the California Department of Transportation designated the Central Valley as one of State's four major international trade corridors. The Central Valley has a diverse internal economy and plays a major role in the distribution of agricultural products, processed food, and energy products throughout California, the United States, and world. People and goods movement utilizes four major modes of transportation: truck, railways, water, and air¹⁹.

Water and Energy Capacity and Systems. Water is the lifeblood of agriculture. The vast Sierra Nevada watershed that flows into the Sacramento-San Joaquin Delta is the hub of California's two largest water systems serving the entire state — the Federal Central Valley Project and the State Water Project. Current drought conditions, population growth, ecosystem conditions, climate change impacts, and operational and regulatory decisions have exacerbated water availability and environmental sustainability statewide. Central Valley is a leader in generation of renewable energy sources from wind, solar, biomass, and co-generation, and transmission of energy through the development of Smart Grid technologies.

Broadband. There have been new broadband infrastructure projects in both rural and urban areas that have greatly improved capacity and speeds. Broadband is a critical 21st century infrastructure and a core enabling technology for agricultural technology, which is one of the fastest growing technology areas, especially as agriculture moves into the era of "big data."

Land Use/Sprawl/Pollution. Conversion of agricultural lands to urban and others uses is a strong concern. The CV's combined 15 MPOs (Metropolitan Planning Organizations) and regional [Councils of Governments \(COGs\)](#), along with local jurisdictions, created Regional Blueprint Plans for more sustainable growth patterns to preserve farm lands and working landscapes and support agriculture and rural economies. The plans direct infrastructure investments to priority growth areas. Due to the CV's poor air quality, particularly in the San Joaquin Valley, there are tight restrictions on greenhouse gas emissions. Manufacturing is subject to stringent environmental standards. Since the passage of AB 32 in California, firms have implemented efforts to reduce their carbon footprint. Many jurisdictions have directed the development of manufacturing sites to existing industrial zoned areas or agricultural land that is no longer in production.

¹⁹ [San Joaquin Valley Goods Movement Plan, Final Report, August 2013.](#)

2. Current Institutions for Improving Capability

Between the CV's MPOs/COGs, EDCs and local jurisdictions there is capacity for on-going mapping and analysis to identify appropriate sites for new manufacturing activity, and the investments needed to make them "implementation ready." The cost and status of prospective sites varies across the Central Valley. Many are located along major transportation corridors (i.e. SR-99, I-5, I-80) where logistics and distribution infrastructure is established. There are many sites across the region can be made "implementation ready" by resolving important reuse issues and infrastructure gaps (i.e. water/wastewater capacity, broadband, roadway upgrades, etc.) with targeted investments. They are a mix of publicly owned (i.e. former military bases) and privately owned sites. A new opportunity, as documented by the Sacramento Area Council of Governments, is smaller scale food hubs and processing facilities that have a smaller environmental footprint and are more agile in terms of responding to fast growing market demands to have more locally grown foods reach local and regional markets.

3. Gap

Whether urban or rural, there are not enough "implementation ready" sites in the Central Valley. For example, in transportation there is a need for increased short-haul investments, funding to improve rail corridor infrastructure, rural road conditions and movement of rural goods from ports. There are similar infrastructure gaps in sites and facilities; water; broadband; and energy. These gaps range from lack of shovel ready development sites, challenges with water availability, lack of business-grade broadband speeds throughout the region, high costs of electricity for manufacturers throughout the region, and more.

Additionally, the SACOG Rural-Urban Connections Strategy (RUCS) identified a major barrier in increasing the sourcing and delivery of locally grown foods into local market channels. At present, only two percent of the 1.9 million pounds of food consumed in the region is grown in the region, in spite of the incredible richness of the region's agricultural bounty. The barrier is the lack of mid-level aggregation, processing and distribution facilities, including food hubs, and the infrastructure and sites on which to locate them. There is a major opportunity to fill this gap.

4. Plans

Major plans are being implemented for projects that will contribute to the economic competitiveness of the region and U.S. as a whole by improving efficiency, reliability, sustainability and/or cost-competitiveness in the movement of workers and goods, and creating jobs in the KTS. Examples are site development planning that will improve capacity in existing urbanized areas that have infrastructure, utilities, transportation access, and can serve as centralized hubs, while also contributing to the economic revitalization of the region's rural communities. AgPlus will support the development of capacity and valuable planning and business development tools through the development and deployment of SACOG's Rural-Urban Connections Strategy (RUCS) project. This project will greatly improve the capacity of the region to respond to market opportunities and for communities to be prepared for economic development projects, including food hubs with specialized processing.

PILLAR 5. TRADE AND INTERNATIONAL INVESTMENT

1. Current Capability

The estimated value of value of AgPlus region agricultural products was \$11 billion in 2011²⁰. In 2012, agricultural manufacturing in the San Joaquin Valley accounted for the second highest level of exports of all industries in the region, at \$2.24 billion. Almost 40 percent of all regional exports derived from the overall value chain cluster totaled about \$7 billion. Ag manufacturing exports grew at a rate of 84 percent from 2003 to 2012, the second highest growth rate in the top ten export states. Export growth between 2010 and 2012 was 17 percent.²¹ In 2012, the total value of exports from the Sacramento region was \$7.42 billion or 7 percent of all output. This ranked the region 48th out of 100 metro areas on the total value of its exports and 95th on export intensity.²² While it is difficult to identify a specific number of international KTS firms, major exports include commodities and processed products such as rice, walnuts, almonds, other nuts. There is a strong and growing demand for California products. Major Pacific Rim markets include Mexico, Canada, China, Japan, South Korea and emerging markets in countries such as India. Several Japanese food processing companies have their U.S. headquarters in the Sacramento Region, a growing magnet for investment by international companies.

²⁰ USDA National Agricultural Statistics Services, 2011.

²¹ Snapshot of The Agricultural Manufacturing Ecosystem, Collaborative Economics, March 2014, p. 9.

²² California Capital Region Metropolitan Export Plan Fact Sheet, information from Center for Strategic Economic Research.

2. Current Institutions for Improving Capability

The Centers for International Trade Development (CITD) provide a full range of trade assistance services to companies and individuals. Free or low-cost programs and services include one-on-one technical assistance and consulting, market research, training and educational programs, trade leads and special events. CITDs also offer international inbound and outbound trade missions with representatives from around the world. There are 4 CITDs located in the Central Valley (Fresno, Merced, Sacramento and Shasta Counties).

The Fresno County-based CITD is the statewide trade hub for food and agriculture. Its California Agricultural Export Training Program (CalAgX) benefits the producers, processors and marketers of California grown or processed specialty crops. U.S. Export Assistance Centers (EACs) help U.S. based businesses develop and expand their revenue streams from potential foreign markets. They assist small-to-medium sized firms that have the capabilities to export a product and/or service. There are 3 EACs in the CV (Bakersfield, Fresno and Sacramento) that provide assistance with global market research; international sales channel development and management; global promotion and advertising; export and trade finance; foreign government regulations; and international documentary requirements.

The Northern California World Trade Center serves firms stretching from the Central Valley to Napa-Sonoma, Sacramento Region, and Bay Area Foreign Trade Zones. Services include: education and training on issues such as rules and regulations; interactions with Foreign Consulates and commerce officials from California's largest trading partners; trade missions; import-export webinar series; international trading; financial and global banking services; logistics and legal services; market research; and others. The Center was the lead organization in the region's participation in the Brookings Institution's Global Cities Initiative through which the Capital Region Export Plan was developed. The City of Fresno is also participating in the Global Cities Initiative.

The California Asian Chamber of Commerce helps manufacturers to access international markets in Asia, primarily China. Its [International Business Exchange Program \(IBX\)](#) includes training on bid and procurement processes, web-based supplier diversity, outbound trade missions, and foreign direct investment. It also sponsors the California Center in Shanghai, China and has plans of adding a second center in Chongqing, China. The Chamber has developed a technology platform for customized and culturally sensitive outreach to communities of color and disadvantaged business enterprises.

3. Gaps

The Capital Region Export Plan revealed that the region is dramatically under exporting. The plan outlines strategies to streamline and enhance the international trade ecosystem and the exporting capacity of mid-sized goods producers. There are many barriers to increasing exports. Ensuring that value-added processing occurs in the Central Valley will provide more products for export. The existing Foreign Trade Zones are under-utilized. Overall, additional training and capacity with businesses, especially small businesses, in trade and exporting and opportunities to connect with global markets are needed. The Central Valley needs a cohesive strategy to attract and monitor foreign direct investment (FDI) activity into the region.

4. Plans

AgPlus will increase trade literacy among KTS businesses in the Central Valley by expanding existing training models and services in the entire region through the CITDs, expanding its CalAgX training program to other community colleges. The Northern California Trade Center and the CalAsian Chamber of Commerce will develop resources such as international business mentoring programs and online platforms to facilitate export promotion and expand markets.

AgPlus will offer to host a 'Made in Rural America' export-focused regional forum to help its rural businesses take advantage of new market opportunities, providing training from experienced exporters and federal officials on the basics of exporting, accessing federal support, and participating in major trade events and trade shows across the country, as well as overseas trade missions. Additional export counseling and training, including information on the BusinessUSA online platform, will be delivered to rural business through collaboration with U.S. Export Assistance Center and USDA field staff. Promotional efforts of CV rural-produced goods and services at promotion events will be enhanced, with focus given to biofuels and food manufacturing.

PILLAR 6. OPERATIONAL IMPROVEMENT AND CAPITAL ACCESS

1. Current Capability

The Central Valley has several utilities and financing entities that are proactively partnering with companies to help them reduce business operational costs while maintaining or increasing performance, and accessing capital. Other financing and business support operations are discussed under the Research and Innovation discussion. Local Institutions/Programs for Operational Costs Capital include: Pacific Gas and Electric (PG&E); Sacramento Municipal Utility District (SMUD); The Southern California Gas Company; Fresno Community Development Financial Institution; AgTech Innovation Fund; Central Valley Fund; San Joaquin Angels; 530 Angels Network; CaliforniaFIRST; California Air Resource Board; and California Local Air District/Air Pollution Control District.

2. Gaps

A major gap is comparatively low levels of investment in the Central Valley although there are many viable investment opportunities. California attracts the bulk of global venture capital (VC) investment in most technology areas but the Central Valley only attracts a very small percentage. The San Joaquin Valley does outperform many U.S. states in terms of securing investment in start-up companies in agricultural technology, which includes bioenergy, water technology, and “smart” agricultural technology. The majority of the investment has been in bioenergy. However, it accounts for only seven percent of total investment in California start-up companies in this area.²³ Between 2005 and 2010, the Sacramento region captured only 0.5 percent of all venture capital investment in the State; there were 10 venture capital deals in the ag and food cluster.²⁴ The elimination of Enterprise Zones and Redevelopment Agencies in California removed major economic development assistance tools. Better information on existing institutions available to assist businesses with operational improvements and financing is needed.

3. Plans

The AgPlus Implementation Strategy will include assessing the feasibility of developing a regional finance fund for businesses and infrastructure in the region with a focus on supporting food and ag enterprises. Valley Vision has initiated a planning process to assess the feasibility and is working with USDA Rural Development California, investment banks, SARTA and other fund developers on the possible design of a fund.

CENTRAL VALLEY AGPLUS IMPLEMENTATION STRATEGY

The Central Valley’s food and beverage processing manufacturing KTS has strong growth potential but many gaps to be addressed. Food and beverage manufacturing methods in the 21st century are increasingly automated, with processes requiring a higher skilled workforce that is both mechanically and technologically proficient. Establishments nimble enough to capitalize on new technologies will become more competitive in the global market by reducing inefficiencies, operating costs, and detrimental environmental impacts.

In the Central Valley, a significantly larger pool of qualified workers must be trained to supply food and beverage manufacturers with the talent pipeline of workers they need. New market and regulatory needs require strategic development and redevelopment of land, facilities and infrastructure. Academia and industry partnerships are needed to develop, fund and commercialize a greater number of technologies that support operational improvements and create new business opportunities. Capacity must be built enabling small to medium-sized manufacturers to participate up and down the supply chain as integrated value chain partners and help reduce industry manufacturing output leakage. Lastly, trade literacy efforts must expand to capacitate businesses in their ability to successfully access foreign markets.

The AgPlus Implementation Strategy is a set of eight integrated strategies and proposed catalytic public and private investments across the Six Pillars, targeted to improve key gaps and maximize the potential for businesses to generate greater output value, create well-paying jobs, and attract private investment. They will leverage existing assets to accelerate investment in the development and application of cutting-edge technologies that will make the Central Valley food and beverage manufacturing KTS uniquely competitive. This in turn will advance

²³ “Snapshot of the Agricultural Manufacturing Ecosystem in the San Joaquin Valley,” Collaborative Economics, March 2014, p. 16.

²⁴ “Next Economy” Research Report,” Center for Strategic Economic Research, March 2012, p. 29.

regional prosperity and the Central Valley's role as a center of innovation and leadership for food and beverage manufacturing competitiveness and sustainability.

AgPlus Consortium members will lead these strategies and engage their rich network of partners, businesses, and state and federal agencies in a coordinated and collaborative process of implementation, building upon innovative regional partnership initiatives already underway. Each strategy identifies leads and partner organizations, and an implementation plan with time frame, activities and milestones.

Strategy 1: K-16 Food and Beverage Manufacturing Career Pathways

Pillar: Workforce and Training

The AgPlus Consortium will leverage new state investments in 11 Central Valley Career Pathways Trust projects, as well as existing models, to develop more aligned and fully integrated career pathways in food and beverage manufacturing industries, connecting businesses, K-12 schools and community colleges. Components include a stronger focus on Career Technical Education (CTE) in K-12 education and earn and learn models, focusing on STEM-related curriculum development and successful student transition to higher education, and replicating paid internship and career awareness models across the region.

The models include the Valley Industry Partnership (VIP) internship programs and Careers in Manufacturing. The VIP program is a partnership at Fresno State between leading companies including food processors and the Lyles College of Engineering, providing paid internships. AgPlus will explore the opportunity to move the program from four year to two year institutions. Careers in Manufacturing is a partnership program of the Manufacturers Council of the Central Valley, with employers, educators and workforce development professionals. It is designed to increase the number of young people considering and training for careers in manufacturing and fill current and projected job openings, using outreach programs, employment and incentives for students to pursue additional education.

Co-Leads: Next-Ed, Center for Land-Based Learning

Partners: Central Valley Career Pathways Trust projects, Manufacturers Council of the Central Valley, Local Workforce Investment Boards, Los Rios Community College District, Central Region Consortium, North/Far North Region Consortium, Fresno State, UC Davis, Chico State, PackageOne, Inc., Chancellor's Office of the California Community Colleges, the California Workforce Investment Board (CWIB)

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (Short term)	- Convene Workforce and Training Working Group to determine the framework and work plan - Convene Central Valley Career Pathways Trust programs to identify program focus, areas of commonality, and gaps - Define full food manufacturing career pathways - Work with community colleges to assess potential for VIP program to move to 2 year institution - Identify potential replication sites for Careers in Manufacturing Program and VIP program - Coordinate with UC Davis to further map pathways, especially on food science programs	- Lead and partners confirmed - Inventory and gap identification of existing food manufacturing pathways programs - Definition of food manufacturing pathways - Identification of possible pilot sites for replication of VIP program and Careers in Manufacturing Program - Added higher ed pathways defined - One new program each of VIP and Careers in Manufacturing programs is put into place
3-5 Years (Mid-term)	Expand VIP and Careers in Manufacturing Programs to other campuses	Pilot site in place for expanded food manufacturing pathways project

5-10 years (Long Term)	Support VIP and Careers in Manufacturing Programs across the region	Increased amount of pathways programs aligning elementary to higher education VIP and manufacturing pathways
Long term outcome: Decrease the unemployment rate		

Strategy 2: Community College-Industry Curriculum and Training Alignment

Pillar: Workforce and Training

AgPlus Consortium community college members will collaborate across the region on aligning their food and beverage manufacturing training curricula to begin producing a standardized supply of labor for KTS businesses throughout the Central Valley. With assistance from their Advanced Manufacturing Deputy Sector Navigators, the 13 member colleges of the Mother Lode/Central Region Consortium (ML/CRC) and the 15 member colleges of the North/Far North Regional Consortium (N/FNRC) will engage KTS businesses in developing standardized courses, degrees and certificate training programs that meet the needs of the Central Valley's food and beverage manufacturers. The AgPlus Consortium will work with the Chancellor's Office of the California Community Colleges to ensure policy and resource alignment, and implementation support.

The ML/CRC and N/FNRC also will develop additional industry-vetted skill standards guides for a series of occupations within the KTS. Skills standards provide ways to upgrade skills, target education and training resources, shape curricula, and provide workers with portability of skills. The first skill standards guide was produced by the ML/CRC in 2013 through the Central Region Consortium's C6 pilot, focused on food manufacturing maintenance mechanics. Additional guides will focus on selected high demand KTS occupations such as programmable logic controller (PLC) technician, machinist, and filling machine operator. Other occupations will be added as the Strategy is implemented.

Leads: West Hills Community College District, Mother Lode/Central Region Consortium and North/Far North Regional Consortium

Partners: Advanced Manufacturing Deputy Sector Navigators (California Community Colleges), regional Workforce Investment Boards, Manufacturers Council of the Central Valley, California League of Food Processors, California Manufacturing and Technology Association, JBT FoodTech, PackageOne, Inc., Chancellor's Office of the California Community Colleges, California Workforce Investment Board

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (Short term)	- Convene Workforce and Training Working Group to determine framework and work plan - Develop and disseminate curriculum alignment framework - Identify funding sources - Vet initial alignment pilot(s) with industry and determine sites(s); prepare TAACT application - Determine occupation for second and third Skill Standards Guide - Expand standardized training programs and curriculum to additional colleges in region	- Curriculum alignment framework confirmed - Lead and partners confirmed - DOL TAACT application submitted - Initial alignment pilot(s) launched - Additional colleges adopt training programs and curriculum alignment - Second and Third Skill Standards Guide produced with industry input
3-5 Years (Mid-term)	- Expand standardized training programs and curriculum to additional colleges in region - Determine occupation for fourth Skill Standards Guide	- Additional colleges adopt training programs and curriculum alignment - Fourth Skill Standards Guide produced with industry input
5-10 years (Long term)	Disseminate best practices	Standardized training programs and curriculum institutionalized

	Expand standardized training programs and curriculum to remaining colleges in region	
Long term outcomes: Workforce trained for middle skill jobs Reduce the import of workers into the region		

Strategy 3: Supplier Mapping and Match-Making

Pillar: Supplier Networks

The AgPlus Consortium will conduct a thorough KTS supplier chain mapping project to identify additional opportunities for value chain integration, output leakage reduction and improved infrastructure. This effort will be led by Co-Applicants with assistance from region's EDCs, the Northeastern California (NEC) and UC Merced (UCM) SBDCs and the two MEPs (Manufacturing Extension Partnerships) in California—Manex and CNMI. The Co-Applicants will exercise the option to commission a specialized firm in supply chain mapping such as Supply Chain Visions ®.

The AgPlus Consortium will leverage supply chain mapping to facilitate match-making opportunities between KTS businesses, SMMs, investors (both foreign and domestic) and researchers. Consortium members, especially the SBDCs, EDCs, the Chambers of Commerce, and city and county economic developer leads will identify priority targets for business expansion, attraction and start-ups to fill gaps in the supply chain. Match-making will occur via showcase events such as the Fresno Food Expo and future expanded events. Opportunities for new business development will be connected to other AgPlus assets including strategies for commercializing technologies, workforce development and capital access.

Leads: Co-Applicants

Partners: Economic Development Corporations (EDCs), NEC SBDC, UCM SBDC, City of Fresno, City of Sacramento, City of West Sacramento, City of Sonora, City of Chico, and Manufacturing Extension Partnerships (MEPs), SacMetro Chamber of Commerce, CalAsian Pacific Chamber of Commerce, Davis Chamber of Commerce, PackageOne, Inc., the California League of Food Processing, California Manufacturing and Technology Association (CMTA), GO-Biz

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (Short term)	- Convene the Supplier Network Work Group, Leads and Partners to confirm framework and strategy - Issue RFP for supply chain mapping consultant (2 year contract) - Identify funding sources for match-making events - Leads and Partners facilitate supply chain mapping consultant access to KTS businesses, SMMs, partners - Leads and Partners organize food and beverage expo in region	- Schedule of implementation confirmed - RFP issued - Multiple funding applications submitted - Supply chain mapping consultant selected and begins scope of work - Funding source is secured - Supply chain mapping consultant produces preliminary findings - Annual food and beverage expo launched in City of Sacramento
3-5 years (Mid-term)	- Leads and Partners continue to facilitate Central Valley forums for consultant to deliver final findings to AgPlus Consortium and KTS - Leads and Partners plan and organize additional food and beverage expos in region - AgPlus utilizes supply chain mapping to reduce leakage and create value chain integration opportunities for KTS SMMs; map is updated	- Supply chain mapping consultant produces final findings in report format and presentation(s) - Annual food and beverage expo launched in City of Chico and City of Sonora - Central Valley AgPlus output leakage is reduced by at least 5%

5-10 years (Long Term)	AgPlus continues to use supply chain mapping to reduce leakage and create value chain integration opportunities; map is updated	Central Valley AgPlus output leakage is reduced by at least 10%
Long term outcome: Reduce Central Valley AgPlus output leakage by at least 10%		

Strategy 4: Central Valley AgPlus University Research Partnership

Pillar: Research and Innovation

This strategy will strengthen collaboration among the Central Valley's top research universities and industry. It includes a partnerships between UC Davis's World Food Center and Fresno State to launch a new University/Industry Collaborative Research Center with food companies to develop technology solutions to improve the water and energy efficiency of our food industries. This partnership will strengthen the research nexus between the two areas and provide KTS businesses in the Central Valley (and elsewhere) with greater solutions to their production, operational costs and sustainability challenges through a region-wide university-industry network focused on identifying new research priorities and technology transfer opportunities shaped by their input.

In addition, more research and innovation showcase events will be organized to facilitate more sustained connections between university faculty, national laboratories, KTS businesses, global technology companies, and investors, within the region and beyond. The World Food Center and SARTA will partner to host quarterly regional networking events to connect entrepreneurs to support industries and mentors. The World Food Center also will host an annual national agriculture and food technology showcase event to highlight emerging technologies, companies and investment opportunities in the region. Regional showcase events will be replicated across the region.

Leads: UC Davis World Food Center, International Center for Water Technology at Fresno State

Partners: UC Merced Research Institute (UCMERI), UC Davis Graduate School of Management, Chico State, Sacramento Area Regional Technology Alliance (SARTA) and iHubs, AgTech Innovation Fund, California League of Food Processors, California Rice Commission and other industry associations such as the Almond Board, GO-Biz, California Department of Food and Ag

Implementation Plan		
Time Frame	Activity	Milestone
0-2 Years (short term)	- Convene the Research & Innovation Work Group, Leads and partners around framework and strategy - Identify funding sources (e.g., NSF Industry/University Cooperative Research Centers (I/UCRC) grant) - Identify intra-university research project opportunities - Leads and Partners plan and host national and regional innovation showcase events in two years - Intra-university research project development continues	- Schedule of implementation and partnership agreements confirmed - Funding applications submitted - First intra-university research project developed - Annual national innovation showcase events hosted - Additional intra-university research projects developed - Funding source secured - Annual innovation showcase event launched in Fresno
3-4 years (mid-term)	- Leads and Partners plan and organize additional innovation showcase event - Intra-university research project development continues	- Annual innovation showcase events launched in Merced and Chico - Additional intra-university research projects developed
5-10 years (Long term)	- Leads and Partners continue planning and organizing of annual innovation showcase events - Intra-university research project development continues	Annual innovation showcase events in Sacramento, Fresno, Merced and Chico are 50% self-sustainable with KTS business investments

		• At least 10 intra-university research projects completed and 4 technology transfer projects
Long term outcome: Increase resource efficiency and sustainability of manufacturing and increase private sector investment		

Strategy 5: Central Valley Innovation Hub (iHub) Network

Pillar: Research and Innovation

The AgPlus Consortium will leverage existing California Governor's Office of Business and Economic Development (GO-Biz) designated iHubs to expand the availability of Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) training and technical assistance to Central Valley KTS businesses, university faculty and researchers. Together the NEC SBDC and UCM SBDC provide coverage to the entire Central Valley AgPlus region. These two organizations, one of which is administered by Co-Applicant the Center for Economic Development at Chico State (the NEC SBDC), will connect and enhance regional iHubs by building additional capacity among small business consultants to assist with SBIR/STTR applications. SBIR/STTR application training workshops will increase from the current 2 per year in order to enable a greater number of SMMs to commercialize new technologies and expand into new markets.

Leads: Northeastern California SBDC Regional Network (NEC SBDC) and UC Merced SBDC Regional Network (UCM SBDC)

Partners: California Network for Manufacturing Innovation (CNMI) iHub, Central California iHub, iHub San Joaquin, Innovate North State iHub, and Sacramento iHub (SARTA), Solano SBD, UC Davis Venture Catalyst, Sacramento SBDC, GO-Biz

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (short term)	• Convene Research & Innovation Work Group, Leads and partners around framework and strategy • Identify funding sources • Provide SBIR/STTR training workshops to iHub, NEC SBDC and UCM SBDC small business consultants • Provide SBIR/STTR training to SMMs • Provide SBIR/STTR application consultations to SMMs	• Additional small business consultants in region equipped with SBIR/STTR application capacity • SBA Regional Innovation Clusters Program grant submitted • Additional SBIR/STTR applications submitted by regional SMMs • 4 annual application training workshops are provided in year 1, 6 provided in year 2
3-5 years (mid-term)	• Continue providing SBIR/STTR training to SMMs • Continue providing SBIR/STTR application consultations to SMMs	• Additional SBIR/STTR applications are submitted by regional SMMs • 7 annual SBIR/STTR application training workshops are provided • A minimum of 4 SBIR/STTR grants are awarded to SMMs in region
5-10 years (Long term)	• Continue providing SBIR/STTR training to SMMs • Continue providing application consultations to SMMs	• A minimum of 8 SBIR/STTR grants are awarded to SMMs in the region
Long term outcome: Increase resource efficiency and sustainability of manufacturing and Increase private investment in manufacturing		

Strategy 6: Rural-Urban Connections Strategy (RUCS) Planning Tools

Pillar: Infrastructure/Site Development

The AgPlus Consortium will facilitate the ability of communities throughout the region to utilize the planning and business tools developed by the Sacramento Area Council of Governments (SACOG) for its award winning work through Rural-Urban Connections Strategy (RUCS). The planning tools help determine alternatives for land use including varied cropping patterns; site development capacities for mid-scale agricultural infrastructure for manufacturing and value-added facilities such as food hubs, culinary kitchens and food processing incubators; and required infrastructure improvements for manufacturing sites and transportation corridors to get agricultural products to the marketplace.

The tools promote more sustainable land use patterns to keep farmlands in production, support more cost-effective infrastructure investments, and promote rural economic development. They include feasibility studies and business plans for mid-scale food hubs with niche food processing facilities, geared to move more locally products into the local market place. These facilities can be developed at a variety of scales throughout the region, feeding into larger distribution channels. The project includes case studies for counties and communities to apply the tools. Models quantify the costs of transportation and other needed infrastructure improvements. This project will assist communities and Councils of Governments (COGs) in the use of the planning tools.

Leads: Sacramento Area Council of Governments (SACOG)

Partners: Councils of Governments (COGs), cities of Chico, Davis, Fresno, Merced, Sacramento, Sonora, West Sacramento, Winters and others; Sacramento County, Yolo County, Sacramento Housing and Redevelopment Agency, and others, EDCs, California Department of Food and Ag, GO-Biz, California Health and Human Services Agency, USDA Rural Development California

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (Short term)	• Convene Infrastructure/Site Development Work Group, Leads and partners to confirm framework and strategy • Work with regional councils of governments and jurisdictions to identify potential locations for development of customized planning tools • Prepare funding proposal • Identify locations for case studies within the Sacramento region and elsewhere across the Central Valley and customize business tools • Gather data and conduct analysis for next RUCS scenarios planning site locations • Conduct two case studies across the Central Valley	• Potential communities of interest identified across the region • One new case study site within the Sacramento identified and two sites identified across the region • Data gathered for site location study • Sacramento region case study and two Central Valley case studies are completed • Capacity building provided
3-5 years (Mid-term)	• Gather data and conduct analysis for next RUCS scenarios planning site locations • Conduct two case studies across the Central Valley • Update RUCS planning tools	• Two Central Valley case studies are completed • Capacity building provided • Updates completed
5-10 years (Long-term)	• Complete development and delivery of planning tools and capacity building	• Central Valley COGs have RUCS planning tools in place
Long term outcome: Create more value add processing in the Central Valley		

Strategy 7: Central Valley Export Training Program

Pillar: Trade and International Investment

The AgPlus Consortium will increase trade literacy among KTS businesses in the Central Valley by expanding existing training models and services to the entire region. There are 4 CITDs in the Central Valley residing at community colleges in the Cities of Fresno, Merced, Redding and Sacramento. The Fresno CITD is the statewide food and agricultural hub. It currently offers its 6-session California Agricultural Export (CalAgX) training program to KTS businesses concurrently in the Cities of Fresno and Sacramento. Through the California State

Trade and Export Promotion (California STEP) project, the AgPlus Consortium will expand the Fresno CITD CalAgX training program to other community colleges in the Central Valley including the CITD in Redding. Los Rios' CITD's USDA grant will be leveraged to provide regional ag export business and workforce training. The Northern California World Trade Center will develop an international business mentoring program, expand on Exporter Roundtable Series, and develop an online platform for easy access to export information and resources. Among other activities, the CalAsian Chamber of Commerce will provide customized and culturally sensitive outreach to communities of color and disadvantaged business enterprises (DBEs) in the Central Valley. These effort will facilitate export promotion and expand markets, particularly to Pacific Rim Trade countries in Asia, for a greater number of KTS businesses. Along with learning about the requirements for exporting, KTS businesses, including SMMs, will be able to take part in inbound and outbound trade missions and foreign direct investment opportunities such as the EB-5 visa program.

Leads: Centers for International Trade Development (CITDs), CalAsian Chamber of Commerce, Northern California World Trade Center

Partners: GO-Biz, SBDC networks, Davis Chamber of Commerce, U.S. Commercial Service

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (Short term)	• Convene Trade and International Investment Working Group, Leads and Partners to confirm framework and strategy • Identify funding sources • Participate in Fresno or Sacramento CalAgX training program, and plan and organize additional CalAgX training program with CITD in Redding • Provide training for rural ag-related businesses	• Schedule of implementation confirmed • Funding applications submitted, including USDA Rural Business Development Grant • Training provided • Funding source secured
3-5 years (mid-term)	• Plan and organize additional CalAgX training programs with Butte and Columbia Colleges • Identify additional funding sources for expansion and sustainability • Plan and organize additional CalAgX training programs • Identify additional funding sources for expansion and sustainability	• CalAgX training program with CITD in Redding launched • CalAgX training program with Butte and Columbia Colleges launched • Additional funding sources secured, including investments from KTS businesses
5-10 years (long term)	• Additional funding sources identified for sustainability	• A total of 8 CalAgX training programs established in Central Valley AgPlus region • All training programs sustainable from KTS business investments
Long term outcome: Grow the number of jobs in the food and agriculture manufacturing sector		

Strategy 8: Regional Finance Fund (Fund of Funds)

Pillar: Operational Improvement and Capital Access

The AgPlus Consortium will explore the feasibility of setting up a regional finance fund to provide a new financing vehicle for those who want to invest in regional businesses, social enterprises and infrastructure projects, including in the food and ag industry cluster, and provide new financing resources for businesses and infrastructure projects in the region, especially those facing constraints in accessing capital. The fund could be an aggregator of funds with different streams of funding, including a revolving loan fund that could be set up through the region's CDFIs, of which there are only a few. It would include opportunities for high net worth individuals, unaccredited investors, and those interested in social impact investing.

Valley Vision and other regional partners have been working with the California Financing Opportunities Roundtable (CalFOR) convened by USDA Rural Development California and a wide network of partners and financial institutions, and will lead the process to assess the feasibility of designing and setting up a regional

finance fund. A focus will be to leverage pension funds and other investment resources, including increasing the amount of CDFI funding available in the region. The process also will identify new investment funds in the region so as to better target gaps. The project will leverage a significant investment by the California Endowment through the creation of the California Freshworks Fund (for food-related ventures) and the new SlingShot project funded by the California Workforce Investment Board wherein regional partners will identify capital access gaps in the innovation ecosystem.

Leads: Valley Vision, Central Valley Fund, 3CORE

Partners: SARTA, Investment bankers, AgTech Innovation Fund, SlingShot partners including local Workforce Investment Boards, jurisdictions, UC Davis Sustainable Ag Tech Innovation Center, GO-Biz, USDA Rural Development California, SBA regional office

Implementation Plan		
Time Frame	Activity	Milestone
0-2 years (short term)	• Convene Operational Improvement and Capital Access Work Group, Leads and partners to confirm framework and strategy • Convene stakeholders to assess interest in participation • Conduct inventory of other regional funds • Identify potential funding sources to conduct the feasibility assessment, due diligence and design phases • Conduct research on fund design alternatives, including consultation with subject area experts, state pension funds • Prepare draft fund design and cost estimates • Identify potential investors and sources of capital for the fund • Set up fund, conduct legal due diligence • Identify funding strategies to capitalize the fund and secure fund administrator	• Potential commitments identified • Funding sources secured for full planning and feasibility/design process • Draft design study completed • Design completed and fund set up
3-5 years (mid-term)	• Begin operations of the Fund • Fund fully operational, continue to capitalize fund	• Fund initiated • Fund fully operational
5-10 years (long term)	• Fund fully operational	• Fund fully operational
Long term outcome: Fund supports regional businesses, social enterprises and infrastructure projects		

The cost benefit analysis, demonstrating how the proposed public good investments exceed the project costs, is included in our Performance Measurement and Impact Evaluation Plan section because it relates directly to our project metrics.

Central Valley AgPlus Food and Beverage Manufacturing Consortium Performance Measurement and Impact Evaluation Plan and Project Cost Benefit Analysis

The AgPlus Implementation Strategy is a set of eight integrated strategies and proposed catalytic public and private investments across the Six Pillars, targeted to improve key gaps and maximize the potential for businesses to generate greater output value, create well-paying jobs, and attract private investment. They will leverage existing assets to accelerate investment in the development and application of cutting-edge technologies that will make the Central Valley food and beverage manufacturing KTS uniquely competitive. This in turn will advance regional prosperity and the Central Valley's role as a center of innovation and leadership for food and beverage manufacturing competitiveness and sustainability.

This document presents the Performance Measurement and Impact Evaluation and Project Cost Benefit Analysis for the Central Valley Ag Plus Food and Beverage Manufacturing Consortium in this section of the IMCP application as the two components of the project are linked.

Performance Measurement and Impact Evaluation Plan

Our region's long term outcomes, as identified by our implementation plan are:

- **Decrease the unemployment rate**
- **Train workforce for middle skill jobs**
- **Reduce the import of workers into the region**
- **Reduce Central Valley AgPlus output leakage by at least 10%**
- **Improve environmental quality, including increased resource efficiency and sustainability of manufacturing**
- **Increase private investment in manufacturing**
- **Create more value add processing in the Central Valley**
- **Increase product exports**
- **Grow the number of jobs in the food and agriculture manufacturing sector**

The strategies that we will employ to achieve these outcomes include measureable milestones and benchmarks along the way that connect our current conditions to our desired outcomes.

The following table summarizes key milestones and associated metrics that AgPlus will use over ten years to measure the success of proposed "catalyst" projects in addressing ecosystem gaps and contributing to achievement of long-term goals. Targets will be identified upon *Manufacturing Community* designation.

Strategy	Key Milestones	Metric
1: K-16 Food and Beverage Manufacturing Career Pathways	• Inventory and gap identification of existing food manufacturing pathways programs • Pilot site in place for expanded food manufacturing pathways project • Increased amount of pathways programs aligning elementary to higher education VIP and manufacturing pathways • Decreased unemployment rate¹	• Inventory and gap identification complete • # programs in place • # of students served, completing program, gaining employment • # of apprenticeships • # who received an increased wage • Unemployment rate (monitored annually, source: Federal Bureau Labor Statistics)
2: Community College-Industry Curriculum and Training Alignment	• Initial alignment pilot(s) launched • Skill Standards Guides produced with industry input • Additional colleges adopt training programs and curriculum alignment • Standardized training programs and curriculum institutionalized • Workforce trained for middle skill jobs • Reduce the import of workers into the region	• # colleges adopting training programs and curriculum alignment • Uniform curriculum across colleges • # of veterans, long-term unemployed, disadvantaged served, placed • # of apprenticeships • # who received an increased wage (monitored annually, U.S. Economic Development Department) • # workers from outside region (monitored annually, American Community Survey and On the Map, American Census Bureau)
3. Supplier Mapping and Matchmaking	• Annual food and beverage expos launched in City of Sacramento, Chico, Sonora • Use supply chain mapping to reduce leakage and create value chain integration opportunities; map is updated • Reduce Central Valley AgPlus output leakage by at least 10%	• # of food processing companies incubated at commercial kitchens • # of companies trained in small business procurement • # of women-owned companies enrolled in Women-Owned Small Business Federal Contract Program • Increase in # of supply chain firms • Value of supply chain leakage reduced in key target areas (IMPLAN analysis) (monitored annually, source: IMPLAN)
4. Central Valley AgPlus University Research Partnership	• Annual national innovation showcase events hosted • Intra-university research projects developed • Funding source secured • Annual innovation showcase events launched and 50% self-sustainable with KTS business investments • At least 10 intra-university research projects completed and 4 technology transfer projects • Improved environmental quality, including increase	• Annual average new patents per 100,000 population • Overall # of start-ups stemming from University R&D • Increase in # of research partnerships with federal labs • # technologies commercialized • Water intensity per unit of production (monitored annually, U.S. Department of Water Resources and U.S. Agricultural Department)

¹ **Bold** indicates long term outcome and metric associated with that outcome. More detailed information about timeframe, frequency and data source is offered. The metric structure is: Metric Name (frequency, data source).

Strategy	Key Milestones	Metric
	resource efficiency and sustainability of manufacturing • Increase private investments	• Energy intensity per unit of production (monitored annually, U.S. Department of Energy and U.S. Agricultural Department) • Capital invested (monitored annually, Federal Reserve Bank)
5. Central Valley Innovation Hub (iHub) Network	• SBIR/STTR applications submitted by regional SMMs • Increased annual application training workshops are provided • A minimum of 8 SBIR/STTR grants are awarded to SMMs in the region • Improve environmental quality including increase resource efficiency and sustainability of manufacturing • Increase private investment in manufacturing	• # of SMM receiving technical assistance • # of companies incubated at iHubs and other incubator facilities across region • # of high tech manufacturing companies trained, submitting SBIR/STTR proposals • Water intensity per unit of production (monitored annually, U.S. Department of Water Resources and U.S. Agricultural Department) • Energy intensity per unit of production (monitored annually, U.S. Department of Energy and U.S. Agricultural Department) • Capital dollars invested (monitored annually, Federal Reserve Bank) • # of energy efficient investments (monitored annually, Federal Reserve Bank)
6: Rural-Urban Connections Strategy (RUCS) Planning Tools	• One new case study site within the Sacramento identified and four sites identified across the region • Capacity building provided • Central Valley COGs have RUCS planning tools in place • Create more value add processing in the Central Valley	• # of shovel ready sites, acres • Funding for infrastructure improvements • Funding for goods movement corridors • Companies locating in industrial space, sq. ft. of new/expanded manufacturing • Amount of biomass cleared from foothills, mountains • Advanced manufacturing businesses by NAICS code (monitored annually, NAICS, U.S. Census Bureau)
Strategy 7: Central Valley Export Training Program	• A total of 8 CalAgX training programs established • Additional funding sources secured, including investments from KTS businesses in Central Valley AgPlus region • All training programs sustainable from KTS business investments • Increase product exports	• # trainings offered to manufacturers • Amount of private sector investment • # regional firms participating in international trade (monitored annually, International Trade Development, Northern CA Trade Center) • Value of goods exported (monitored annually, Northern CA Trade Center)
Strategy 8: Regional Finance Fund (Fund of Funds)	• Draft design study completed • Design completed and fund set up • Fund initiated • Fund fully operational • Grow the number of jobs in the food and agriculture manufacturing sector	• Venture capital investments • Funding amount/#of revolving or other loans made to manufacturers • # of investment matches made, \$ amounts • # of energy efficient investments • Capital dollars invested (monitored annually, Federal Reserve Bank) • # of ag manufacturing businesses by NAICS code (monitored annually, NAICS, U.S. Census Bureau)

AgPlus is very experienced working with high quality data sets and capable of tracking progress on AgPlus metrics. Many rigorous data sources and analytic techniques were used to prepare this application. The Center for Economic Development, Chico State has extensive economic research and GIS mapping expertise; it prepares county economic profiles every year for all Northern California counties, as well as research such as the North State Innovation Index. Fresno State's Office of Community and Economic Development tracks a core set of economic and other indicators annually for the San Joaquin Valley. Regional partners also have strong capacity in research, modeling and metrics. Valley Vision has an experienced evaluator on staff. AgPlus will evaluate progress of each ecosystem's individual metrics, but also for overall metrics including changes in the regional and sub-regional unemployment rates.

The AgPlus team will create a Steering Committee to review progress towards outcomes. In order to monitor our rate of improvement, we will set a baseline, set (at least annual) benchmarks toward our progress, and use data to monitor our progress.

The Steering Committee will determine specific targets for each pillar, and gather and review data on an annual basis. Benchmarks will be set to monitor and evaluate progress towards outcomes. The Steering Committee will take a participatory approach towards setting and evaluating benchmarks – collaboration within sub regions and throughout the region as a whole will inform the evaluation. Data collection will be both quantitative and qualitative and tools that will be used to analyze and communicate progress include:

Data Collection, Analysis, Communication and Reporting Methods	
Data Collection: • Establish baseline • Quantitative data collection as needed • Qualitative data collection, including interviews, surveys, and/or focus groups as needed	Data Analysis: • Quantitative data analysis of appropriate data sources using IMPLAN and other analysis tools • Geographic Information Systems (GIS) • NVivo qualitative data analysis software
Data Communication: • Sub-regional dissemination of progress through presentation, promotion, and circulation of reports • Annual production of data display showing benchmarks, key accomplishments and activities	Data Reporting: • Fulfillment of required data reporting • Annual Benchmark Reports • Final Project Report and presentations

The evaluation process will enable the Steering Committee to make adjustments to correct course throughout the project duration.

Project Investment/Cost Benefit Analysis

Table 1 provides a list of proposed AgPlus Implementation Strategy Investment Projects (strategies) with potential federal funding sources and project assumptions for the AgPlus Cost Benefit Analysis (CBA). The CBA is based on expected costs and outcomes of projects described in the Implementation Strategy. The projects include the six pillars of the manufacturing ecosystem, and will leverage existing federal, state, regional and local investments, as well as new resources committed by Consortium members, especially to scale innovative local and regional models through replication and capacity building. Each project is shown with estimated project costs, identification of potential federal funding sources, and assumptions used. Assumptions are based on near to mid-term investments and outcomes.

Table 1. Implementation Strategy Investment Projects (Strategies)

Pillar/Strategy/Federal Funding Source	Project Assumptions
1. Workforce and Training: <i>K-16 Food and Beverage Manufacturing Career Pathways:</i> U.S. Department of Education, NSF Advanced Technology Education (ATE), Department of Labor (DOL)	PRIORITY AREA. Will leverage new state investments in 11 Central Valley Career Pathways Trust projects – estimate at least \$15 million (of \$63 million) is in ag-food production and manufacturing. Will replicate/expand existing models (VIP Partnership and Careers in Manufacturing) for paid internships, mentoring, etc. which have funding from business and local educational institutions for more fully integrated pathways and stronger focus on CTE.
2. Workforce and Training: <i>Community College-Industry Curriculum and Training Alignment:</i> (DOL Trade Adjustment Assistance Community College Center Training (TAACCT), other DOL funds	PRIORITY AREA: Will replicate and expand the C6 Consortium program of the San Joaquin Valley to region-wide. Based on the success metrics from C6, a \$15 federal investment will be matched by \$10 million in local public funding and \$5 million in private funding.
3. Supplier Networks: <i>Supplier Mapping and Match-Making:</i> EDA, USDA, SBA Accelerator Program for procurement, including for economically disadvantaged	Will do supply chain mapping and facilitate match-making opportunities at showcase expos and other events launched across the region, creating value chain integration opportunities. Assumes \$500,000 for new expos and supply chain mapping; expos generate fees. Target - output leakage reduced by 5% by year 5.
4. Research and Innovation: <i>Central Valley AgPlus University Research Partnership:</i> NSF Industry/University Cooperative Research Center, USDA	Total budget \$1.5 million annually; \$250,000 UC Davis investment, \$550,000 in private sector match, and \$950,000 in federal grants. Also support from Fresno State.
5. Research and Innovation: <i>Central Valley Innovation Hub (iHub Network):</i> SBA, Regional Innovations Cluster Program	Will leverage funding from SBDCs and Chambers of Commerce and business and other sponsorships. Based on past performance of the technology transfer program, it is expected that \$300,000 in investment will drive \$23,117,180 in capital infusion. ²
6. Infrastructure/Site Development: <i>Rural-Urban Connections Strategy (RUCS) Planning Tools:</i> HUD Economic Resilience Planning and Investment Grants, EDA, USDA, EPA Brownfields (possibly)	Tools planning grant/capacity building project estimated at \$3 million for first three years; assumes \$250,000 in private investment, balance a combination of federal, state and local government sources. Hub business plan estimates cumulative capital cost of \$6.4 million by year 6. Assumes financing of 80% of capital cost. Hub breaks even in year 6; positive ROI in year 8 - 35 full time employees. Cities will provide infrastructure impact fee deferments and improvements; state will provides manufacturing tax credits; utilities will provide rebates and incentives.

² Average Phase 1 recipient in California received capital infusion of \$130,502 and average Phase 2 recipient received \$783,845 in 2013.

7. Trade and International Investment: <i>Central Valley Export Training Program:</i> USDA, SBA, EDA	Will expand existing CITD, CalAsian Chamber and Northern California World Trade Center programs and leverage grants and private investments, including investments from KTS businesses. In the long-term, the training programs will be self-sustaining.
8. Operational Improvement and Capital Access: <i>Regional Finance Fund (Fund of Funds):</i> USDA, EDA, U.S. Department of Energy	Will leverage private sector and other public funding to explore the feasibility of creating a regional finance fund; could include a revolving loan fund. Little direct impact in short-term but very large impact if the fund is created.

Table 2 presents the estimates of the CBA for the 8 proposed investment projects. The analysis compares the total public cost to direct and indirect business revenue, employment and tax benefits. The IMPLAN Input-Output model was used to estimate business revenue and tax impacts. Direct federal investment was not considered as a net local business revenue benefit. It is assumed that if this project was not chosen for federal investment, the money would be spent elsewhere in the U.S. Private, state, and local investment used to match federal investment was considered. Net benefit is calculated as business revenue impacts, plus tax impacts, minus federal investment.

Table 2. AgPlus Cost Benefit Analysis (in \$1,000's)

Project	Federal Costs	Other Public Costs	Private Investment	Direct Jobs created (not in 1,000's)	Total region business revenue impact	Federal, state local, tax impacts	Net benefit
1. Career Pathways	\$25,000	\$15,000	\$10,000	852	\$84,656	\$12,713	\$72,369
2. Skills Standards	\$15,000	\$10,000	\$5,000	321	\$50,999	\$7,332	\$43,331
3. Supply Chain Mapping	\$200	\$150	\$150	9	\$890	\$124	\$814
4. I/U Partnership	\$950	\$250	\$550	9	\$3,094	\$376	\$2,520
5. SBIR/STTR Training	\$150	\$75	\$75	98	\$41,548	\$4,945	\$46,344
6a). RUCS - tools	\$1,500	\$1,250	\$250	56	\$5,340	\$743	\$4,583
6b.) RUCS-hub	\$2,000	\$1,000	\$3,400	120	\$11,392	\$1,584	\$10,976
7. Export Training	\$300	\$200	\$300	16	\$1,389	\$199	\$1,288
8. Regional Fund	\$300	\$350	\$350	10	\$1,977	\$192	\$1,869
Total	\$45,400	\$28,275	\$20,075	1,491	\$201,286	\$28,208	\$184,094

Source: Valley Vision, Center for Economic Development, California State University, Chico

It is estimated that approximately \$45 million in federal investments would leverage \$28 million in other public investments and \$20 million in private investment, with a direct job creation impact of approximately 1,491 jobs and a net benefit of almost \$184.1 million. Business training and capacity building projects, as well as infrastructure and site planning capacity building, will likely not generate much employment directly initially, but will catalyze strong job creation in the mid to long-term as these

efforts accelerate business and growth as a result of services delivered, business networks and trade increased, and sites made ready for development.

All told, as reflected in the letters of commitment provided by the Consortium members, their current investment in the manufacturing ecosystem is estimated at more than \$149,878,860, contributed in large part by the Central Valley's education and training institutions, for education and workforce development, research, commercialization of technologies, business services and accelerators, entrepreneurship programs, and industry/university partnerships. Chambers of commerce, trade-related organizations and other economic development groups are investing in business and partner capacity building for commercializing new technologies, supplier chain development, and export potential to reach new markets. Consortium member future commitments for AgPlus projects related to potential federal funding was estimated at \$5,987,900. Most commitments were for education and workforce programs, business capacity building and trade literacy, and support for the regional finance fund.

Estimated non-federal investments shown in Table 2 reflect investments that are currently being made by AgPlus partners and others, in addition to Consortium members. Estimated non-federal investments also include funding sources which the Consortium members will seek as part of the Implementation Strategy.

Letters of Commitment:

1. California State University, Fresno
2. California State University, Chico
3. Tuolumne County Economic Development Authority
4. Valley Vision
5. University of California, Davis
6. AgTech Innovation Fund
7. CalAsian Pacific Chamber of Commerce
8. Center for Land-Based Learning
9. Central/Mother Lode Regional Consortium
10. City of Avenal
11. City of Davis
12. City of Fresno
13. City of Sacramento
14. City of Winters
15. California State University, Fresno Water, Energy, and Technology Center
16. Davis Chamber of Commerce
17. Fresno Community Development Financial Institution
18. JBT FoodTech
19. Los Rios Community College District
20. NextEd
21. Northern California World Trade Center
22. PackageOne, Inc.
23. Sacramento Area Council of Governments
24. Sacramento Employment and Training Agency
25. Sacramento Metropolitan Chamber of Commerce
26. Solano Economic Development Corporation
27. University of California, Merced Small Business Development Center