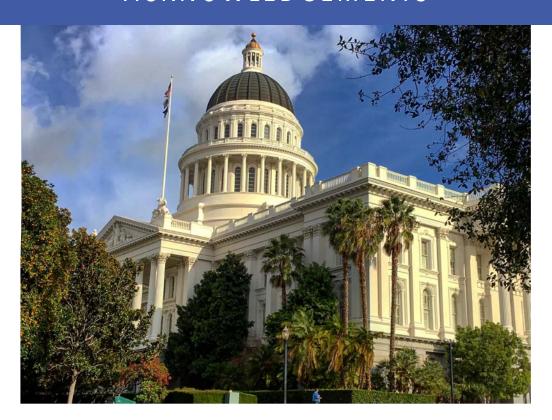


ACKNOWLEDGEMENTS



The Greater Sacramento Region, home to the Capital of the fifth largest economy in the world, has a persistent Digital Divide crossing geographies and economic sectors, worsened by the pandemic. In response, Valley Vision received an economic recovery grant from the U.S. Economic Development Administration (EDA) to prepare the region's first-ever Broadband for Business plan and resource guide.

This report documents broadband gaps for businesses throughout the region, which call for our collective attention and action. The report also includes a wealth of resources for businesses and those serving businesses and workers.

We are grateful to the many business owners and operators, local jurisdictions, organizations, and partners that gave generously of their time, expertise, and stories for this project. Thanks to Michael Anderson of Clientworks, Inc., and Athol Smith of Makwara Solutions, LLC, for their valuable technical expertise. As always, we thank EDA for its continued investment in the well-being and prosperity of our region. We are committed to ensuring that our businesses and communities have the connectivity and resources they need to thrive.

Project Team: **Trish Kelly**, Valley Vision Managing Director; **Navreet Hundal**, Valley Vision Project Coordinator; **Deb Kollars**, Project Consultant; **Jim Schneider**, Right Angle Design

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EXECUTIVE SUMMARY



Valley Vision was awarded a grant by the U.S. Economic Development Administration (EDA) to develop a business broadband research project designed to improve broadband Internet access and usage for businesses in the Capital Region. The project encompasses four counties – Sacramento, Sutter, Yolo and Yuba – within the Connected Capital Area Broadband Consortium, which Valley Vision manages.

The project grew out of concerns – spotlighted by the COVID-19 pandemic in 2020 – that businesses did not uniformly have access to reliable and affordable broadband service, nor the digital skills and training needed to thrive and function optimally.

<u>Valley Vision</u> is a nonprofit civic leadership organization that has managed numerous projects to advance economic vitality in the Sacramento Capital Region over nearly three decades. Closing the Digital Divide and accelerating broadband access and adoption is a key element of this work. Since 2012, Valley Vision has managed the <u>Connected Capital Area Broadband Consortium</u>, which is funded by the California Public Utilities Commission and serves as a resource hub and catalyst for broadband solutions. Valley Vision also has served as the convener and organizer of the <u>Capital Region Coalition for Digital Inclusion</u>.

Under the EDA grant, Valley Vision focused particularly on smaller businesses, women-owned and minority-owned businesses, aging commercial corridors, and rural and agricultural areas – all of which tend to face the greatest challenges in having access to reliable, affordable high-speed Internet and the digital skills necessary to take full advantage of Internet resources.

Digital equity was a key area of inquiry because digital inequities fall disproportionately on people of color, those who are low-income, those with less education, and those living in rural areas.¹

Economic resilience was also a key focus, given the explosive growth of technology for businesses and the challenges businesses faced in transitioning to online operations during the pandemic. A primary goal of this project was to support building resiliency among businesses during and after disasters and disruptions from economic shocks.



THE CAPITAL REGION

The region served by this project contains a rich tapestry of urban, suburban, and rural communities, with a large portion of the geography dedicated to working landscapes and open space.

The study region is home to the City of Sacramento and California's Capitol; 15 incorporated cities; small towns and communities scattered from the Sierra Foothills to the Sacramento-San Joaquin Delta; industrial corridors and the thriving Port of West Sacramento; historic and tourist amenities including the Old Sacramento waterfront; and farms, vineyards, orchards, and agricultural operations of all sizes.

The population is diverse, with a broad range of cultures, languages, incomes, and educational levels.

Nearly 2 million people live in the four counties that make up the study area. The Greater Sacramento region, home to the Capital of the fifth largest economy in the world, is centered around the City of Sacramento. Government is a primary employer. In addition, more than 77,000 businesses of all sizes are found in the four-county region, along with a business workforce of nearly 900,000 people.

High-speed broadband, which is another name for Internet access, is essential for businesses to be able to function optimally in the modern world. In 2018, nearly three-quarters of jobs in the region required high or medium levels of digital skills.²

That number has only grown. Five years later, in 2023, the National Skills Coalition concluded that nine out of 10 jobs (92 percent) in the nation now require digital skills.³





^{2.} The Prosperity Strategy, The Greater Sacramento Region's Comprehensive Economic Development Strategy (CEDS) 2020-2025. https://www.valleyvision.org/wp-content/uploads/Greater-Sacramento-CEDS-May-2020.pdf

^{3. &}quot;Closing the Digital Skill Divide," National Skills Coalition, 2023. https://nationalskillscoalition.org/wp-content/uploads/2023/02/NSC-DigitalDivide report Feb2023.pdf

"High-speed broadband and access to technology are critical foundations for the smart,

connected,

sustainable

and equitable

communities

of the

future."

– The Prosperity Strategy

ALIGNMENT WITH THE PROSPERITY STRATEGY

The work of this project is an outgrowth of the Greater Sacramento Region's Comprehensive Economic Development Strategy (CEDS) for 2020–2025, known commonly as The Project is a response to the needs identified within The Prosperity Strategy that were exacerbated by the COVID-19 pandemic, which laid bare the gaps. The project represents an effort to support economic recovery.

The Prosperity Strategy, released in May 2020, covered six counties: Sacramento, Sutter, Yolo, Yuba, El Dorado, and Placer. It was designed to create a more robust and inclusive regional economy, and identified three promising business clusters to advance this goal:

- Food and agriculture
- Life sciences and related agricultural sciences
- Future mobility with a focus on clean energy

All of these require robust broadband infrastructure and a digitally adept workforce. In new research emerging through the "We Prosper Together" regional economic development initiative, new areas of the economy, such as precision manufacturing, have been identified that similarly require high levels of broadband access along with digital workforce skills.⁴

The Prosperity Strategy specifically called out "disparate broadband coverage" in the region as negatively impacting business opportunities, workforce participation and training, and public safety and emergency services.⁵

This was an important finding. Research and policy work surrounding broadband and digital equity often tend to be framed in terms of household and residential access and adoption. While valuable research and policy work also are occurring with regard to businesses, 6 this work is sometimes less apparent than the more common residential focus.

This study represents a first-ever look at business-centric broadband conditions and resources for the Capital Region, and can serve as a roadmap not only for the region, but elsewhere.

^{4.} We Prosper Together is a community-led approach to economic development, encompassing eight counties in the Capital Region. More information can be found here: https://www.weprospertogether.org/about-us/

^{5.} The Prosperity Strategy, The Greater Sacramento Region's Comprehensive Economic Development Strategy (CEDS) 2020-2025. https://www.valleyvision.org/wp-content/uploads/Greater-Sacramento-CEDS-May-2020.pdf

^{6.} See, for example, the U.S. Small Business Administration's "Digital SBA" initiative and strategy, https://www.sba.gov/about-sba/open-government/digital-sba



BROADBAND FOR BUSINESS: A PATH FORWARD FOR THE CAPITAL REGION

This report consists of three sections:

- Existing Conditions in the Capital Region
- Challenges and Needs in the Capital Region
- Strategies, Tools, and Resources

The first section, "Existing Conditions in the Capital Region," provides an understanding of business broadband services and training needed to help businesses thrive and grow, and a description of the existing business broadband and technology landscape in the region.

The second section, "Challenges and Needs in the Capital Region," provides a gap analysis based on a survey of businesses in the region; mapping of unserved and underserved commercial, industrial and manufacturing areas in the region; research and literature reviews; and numerous interviews and case studies.

The final section, "Strategies, Tools, and Resources," provides guidance on ways to enhance business broadband access and adoption. These Strategies, Tools and Resources are broken down by four implementing groups: Governments, businesses, entities serving businesses, and Internet service providers.





To develop this document, Valley Vision conducted research at the national, regional, and local levels and engaged with numerous regional and local partners, including the following. (A full listing can be found in Appendix 1.)

- Government representatives from Sacramento, Sutter, Yolo and Yuba counties and all incorporated municipalities therein
- Regional and local Chambers of Commerce
- Farm Bureaus in the four counties and the Delta Protection Commission
- Leaders and staff within Property and Business Improvement Districts (PBIDs)
- Nonprofit entities that serve businesses and economic development entities
- Internet service providers
- Workforce development entities

The report focuses on three essential broadband "pillars" to assess broadband conditions for businesses. All three must be available and robust for businesses to thrive and grow:

Infrastructure and service access

o What connectivity options are available?

Affordability, reliability, and adequate speeds

o Are available service options affordable and adequate to get the job done?

Digital skills and training

o Are strong education and training tools and programs available to enable businesses and employees to take full advantage of the Internet's resources?

Voices of Businesses

In addition to formal research and engagement with government, civic, and private sector partners, the experiences and voices of business people were crucial to informing this report.

This was achieved through a Business Broadband Survey that was widely distributed across the four counties and in-person interviews with business owners and entities that serve them. These interactions were invaluable in understanding the varied and nuanced connectivity challenges facing businesses.

While many businesses, particularly those that are larger and well-resourced, have adequate broadband, many smaller businesses, rural and agricultural operations, and businesses located in aging commercial corridors as well as in newer commercial areas are struggling with Internet connectivity and usage.

Here is a glimpse into those on-the-ground realities, with more detail provided later in this report.

"Sometimes it's just too slow to keep things running."

Farmers in Sacramento County must provide pesticide and other compliance data electronically to the State. Broadband access is sparse on their lands, which means they frequently must drive to coffeeshops and public places with Internet service. Farmers in every county of the study region reported broadband hardships, including operating precision irrigation systems and updating software on their "smart" tractors. "Our coverage is terrible," said one pear, wine grape, and row crop farmer in Sacramento County. He echoed the voices of many.





The owner of a popular coffee shop in Winters, a small city in Yolo County, described her frustration in having to close early on a Sunday afternoon and turning away people waiting for tables because her Internet service went down. It prevented staff from being able to complete broadband-dependent point-of-sale transactions. It was not an isolated incident. "This is a real problem," she said.

The co-owner of a small hotel in Yuba County described losing customers because the business can't get fast enough Internet service to cover rooms or even handle bookings. "Please help us," he wrote in response to the survey. "We are losing our business due to poor Internet."

"I can't even tell you the thousands of ways this has been disruptive for us."



At a growing food-tech startup in West Sacramento in Yolo County, broadband service is so weak and limited that the executive vice president of business operations routinely sends employees home to work on days when more bandwidth is needed to run the equipment that produces the plant's meatalternative products. "I can't even tell you the thousands of ways this has been disruptive for us," she said.

At a veteran-owned solar installation company in Sutter, a small community in Sutter County, insufficient broadband routinely requires a staff member to start and restart the software-based engraving equipment, which is used to apply customized warnings and safety information on utility facilities at installation sites. "Sometimes it's just too slow to keep things running," she said.



An agri-business consultant in Sutter County, who also farms with her family, reported Zoom meetings crashing and printers losing connectivity frequently in the middle of her busy working days due to unstable broadband connections. Company employees carry multiple cell phones to cover the dead zones in the area, known by locals as "Bermuda Triangles." "We have horrible Internet service. It is not fun," she said.

KEY FINDINGS

Conditions vary widely. Many businesses are well-served. Larger businesses, for example, with Information Technology staffs and financial capacity, have access to robust networks and business technology. But others struggle with lack of providers, slow speeds, outages, high costs, and a lack of digital education and training. This is particularly true for smaller businesses; women-owned, minority-owned, and veteran-owned businesses; enterprises along aging commercial corridors and within older historic districts; and rural and agricultural operations.

Getting accurate information about available services can be difficult. Information about providers and products can be difficult to access. Information contained in public maps and data sources is often unreliable, while proprietary data is not available to businesses or public entities. Officials from one city in Sacramento County, for example, believed they had three or four available Internet providers until professional consultation and proprietary databases showed there were 13 available fiber carriers. Likewise, navigating specific business broadband solutions, services, and plans can be confusing for business owners.

More choices and competition are needed. The lack of choice and competition for broadband providers was cited by many businesses and public officials as a serious concern. Many are hopeful, however, that new infrastructure funding opportunities, especially from the State of California, will help deploy more broadband services in more locations.

Service is often unreliable and speeds are often too slow for business needs. Many businesses reported frustration with their service. One, for example, described being unable to run critical applications at the same time, such as security cameras and point-of-sale transactions, while another described being unable to use more than one or two computer terminals on the company's network at the same time, especially when large files are shared or certain applications are running.

Much of the need is hidden. Business owners are busy people, often overwhelmed with the day-to-day pressures of running their businesses. They may not have the time to invest in solutions or be able to afford enhanced broadband service and technologies. Those who are older or have limited English speaking skills may have challenges tapping into technology. At the same time, groups that traditionally serve businesses, such as Chambers of Commerce and Property and Business Improvement Districts, often are balancing other priorities including security issues, vandalism, and crime.

Businesses need more digital training and education. Even where adequate broadband service is available, business owners often lack the training and skill to use technology optimally. One Chamber of Commerce in a smaller municipality in Sacramento County reported that 40 percent of its member businesses do not have websites, do not use social media, and are otherwise not online, thereby missing out on important avenues for marketing and conducting business. This hurts not only the businesses, but overall economic health of the community.

Promising strategies, tools, and resources are available. As Section 3, "Strategies, Tools, and Resources," explains, numerous options exist to advance broadband solutions for businesses, ranging from funding opportunities for infrastructure deployment to digital education programs. Governments, businesses, Chambers of Commerce and other business service organizations, and Internet technology providers all have unique roles to play in advancing solutions.

RECOMMENDED STRATEGIES, TOOLS, AND RESOURCES

As noted above, everyone has a part to play in addressing broadband gaps and challenges for businesses in the Capital Region. Based on the research, outreach and interviews, survey responses, and mapping analysis that informed this project, the following strategies have been identified for improving broadband Internet access and adoption for businesses across the four-county region.

These strategies are presented in summary here and discussed more deeply in Section 3, "Strategies, Tools, and Resources."

BUSINESS BROADBAND STRATEGIES

Partner in Solutions	Solution Opportunities
Governments (Counties, cities, public utilities, other public entities)	• Identify infrastructure gaps through technical and mapping tools, consultation with business community, and Internet service providers and technical experts.
	• Understand funding opportunities for infrastructure projects, including federal and state grant opportunities, special district financing tools, and private capital sources.
	• Explore deployment alternatives, such as public-private partnerships and development of municipally owned and operated open-access fiber networks.
	• Streamline government processes to facilitate efficient and cost-effective permitting for deployment, including within public rights of way and facilities.
	• Lead and partner on digital education and training with the business community, jurisdictions, providers, and the Connected Capital Area Broadband Consortium; include disaster and emergency preparedness.
Businesses	• Seek assistance on broadband needs through research, contacting providers and governments, and networking within the business community.
	• Advocate by identifying key broadband needs and conditions of the business.
	• Develop the right Tech Stack and Connectivity by aligning business functions with software applications and platforms and connecting to the Internet; seek professional technical assistance if needed.
	• Access digital training opportunities, which are widely available.

BUSINESS BROADBAND STRATEGIES

Partner in Solutions	Solution Opportunities
Business Organizations (Chambers of Commerce, Farm Bureaus, PBIDS, Economic Development organizations)	 Check in on businesses about digital and broadband needs, which are not always obvious. Support broadband infrastructure deployment by governments and Internet service providers. Problem-solve with businesses and advocate on their behalf on the three critical Internet quality measures – reliability, speed, and affordability – as well as emergency preparation via back-up systems and redundancy. Collaborate on digital training and education by disseminating information, and leading and partnering with governments, local workforce boards, community organizations, business groups, tech experts, and anchor institutions such as schools, universities, and libraries.
Internet Service Providers	 Engage with businesses and groups that support them, such as Chambers of Commerce and Farm Bureaus, to understand business-specific and sector-specific needs. Partner with governments to streamline regulatory and permitting programs affecting deployment and seek input and support for deployment plans. Align operations to ensure business customers get clear, reliable, and consistent information from websites, sales staff, and technical implementing staff. Innovate to help provide digital education and training for businesses.



1. EXISTING CONDITIONS IN THE CAPITAL REGION



The business community in the four-county region is vast and diverse, ranging from large health care systems and manufacturing plants, to small "mom and pop" enterprises, to farming and agricultural operations of all sizes. The Sacramento Metropolitan Chamber of Commerce has identified the following data on number of businesses, workforce size, and dominant industries for the region.







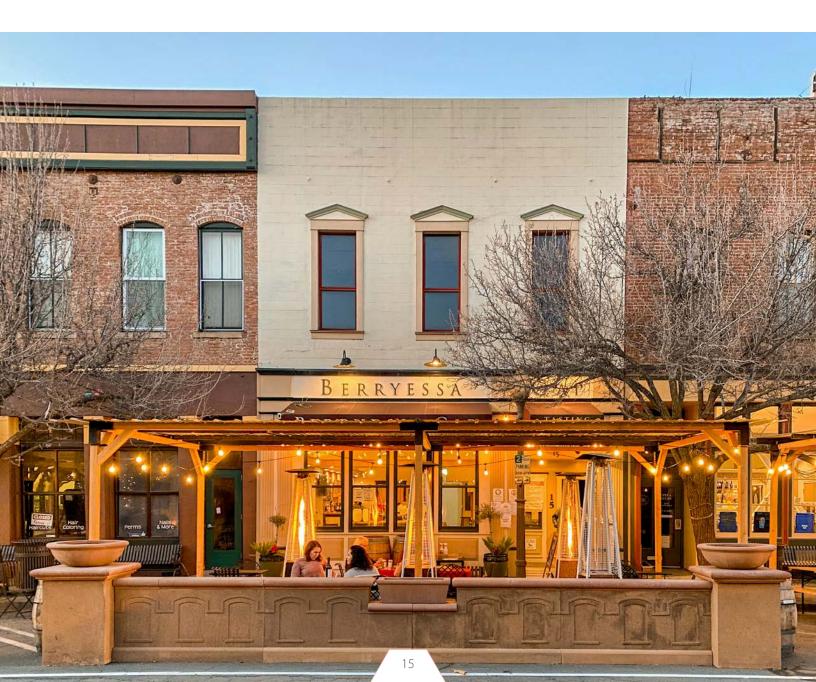
In addition to the top industries in each county, the Capital Region is home to a rich and varied array of businesses. They are found on historic downtown main streets, in high rises that can be seen for miles, along major highways and arterials, in gritty industrial areas, and tucked away in neighborhoods.

Within just a few miles of municipalities can be found vast tracts of farmland, fruit and nut orchards, and vineyards, as well as agricultural businesses that serve these working lands. Wineries and farm stands are popular destinations here as well.

The Capital Region is branded as "America's Farmto-Fork Capital," and with good reason. The Region has a well-established food and agriculture industry cluster engaged in food production, processing and manufacturing, packaging and distribution, and wholesale and retail sales, with an increasing affiliated emphasis on agritourism and an aspiring restaurant scene.

The region features Michelin-class restaurants, down-home diners, and a burgeoning craft brewery industry; major national retailers and small boutique stores; industrial manufacturing and distribution facilities; health and medical providers; construction and engineering companies; artistic and musical enterprises; applied science and technology firms; and professional services providers of all types.

All need sufficient broadband to thrive and grow.





HIGH-SPEED BROADBAND IS CRITICAL FOR BUSINESSES

The importance of high-speed broadband for businesses cannot be overstated. Today, businesses depend on reliable high-speed Internet to manage nearly every aspect of their operations including:

- Internal functions such as accounting and human resources
- Managing the production of end products, whether a service or a physical product
- Marketing, e-commerce, and sales
- Employee training and supporting remote workers
- Government compliance requirements

As the U.S. Department of Agriculture has stated:

"In today's information-driven global economy, high-speed broadband isn't just an amenity, it's essential to safeguarding America's economic competitiveness, and to ensuring all citizens equal access to opportunity." ⁷

The Shift to Digital Technology

In recent years, consumer behavior and the business environment have been altered dramatically by digital technology. Consumers now expect to engage with businesses through online channels. Using digital tools enables businesses to increase their connection with consumers.

Among small businesses, those that are digitally advanced experience significant benefits in terms of revenue, job creation, and exporting opportunities. Yet, 80 percent of U.S. small businesses were found not fully taking advantage of digital tools such as data analytics and online tools.⁸

During and after the COVID-19 pandemic – which caused massive shutdowns of businesses starting in March 2020 – many businesses in the Capital Region and elsewhere made successful adjustments by increasing their web presence and developing online marketing and sales processes.

But research, interviews, and surveys, including the Business Broadband Survey for this report, showed that broadband challenges still exist for many businesses, especially smaller, women- and minority-owned businesses, those in aging commercial corridors as well as newer commercial areas, and those in rural and agricultural areas. These needs are discussed further in Section 2, "Challenges and Needs in the Capital Region."

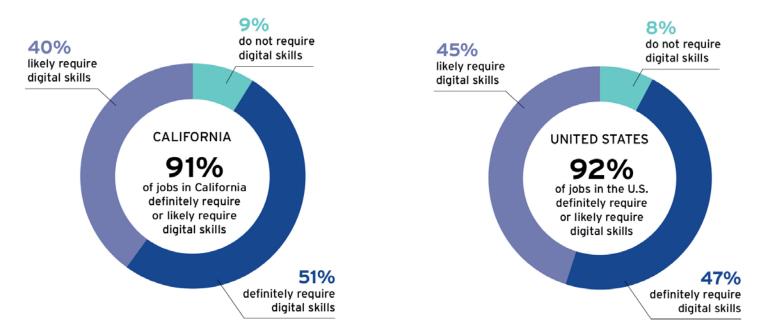
^{7.} Broadband Resources for Rural America, USDA Rural Development Innovation Center, revised 2021. https://www.rd.usda.gov/sites/default/files/508_rd_broadband_usda_guide_2021_102621.pdf

^{8. &}quot;Connecting Small Businesses in the US," prepared by Deloitte, commissioned by Google, 2018. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-connected-small-businesses-Dec2017-old.pdf

High Speed Internet and Digital Skills Are Critical for Businesses

The price is high when businesses and their employees do not have reliable high-speed Internet or the skills to use it. The California Department of Technology, in its 2024 Digital Equity Plan, noted that the "lack of broadband infrastructure presents a barrier to accessing workforce opportunities, prevents business and economic development, and limits small business growth." This is especially true for rural areas.

91% OF CALIFORNIA JOBS REQUIRE DIGITAL SKILLS, CLOSE TO THE U.S. AVERAGE



According to the National Skills Coalition, 92 percent of jobs in the United States and 91 percent in California require digital skills, while one-third of workers do not have the foundational digital skills needed to enter and thrive in today's jobs. Taken together, this represents a "significant digital skill divide." The conclusion applies to businesses of all sizes and types, not just tech firms.¹⁰

Building the digital skills of workers can result in measurable monetary benefits in terms of employee earnings, benefits to the overall economy, and business turnover costs.¹¹

^{9.} California Digital Equity Plan, California Department of Technology, 2024. https://broadbandforall.cdt.ca.gov/wp-content/uploads/sites/19/2024/04/California-State-Digital-Equity-Plan-04.04.2024-Remediated-Version.pdf

^{10. &}quot;Closing the Digital Skill Divide," National Skills Coalition, 2023. https://nationalskillscoalition.org/wp-content/uploads/2023/02/NSC-DigitalDivide report Feb2023.pdf 11. lbid.

Broadband: A Driver for Economic Development

Broadband is a critical driver for local and regional economic development and resiliency. A recent broadband study in Yuba County highlighted this importance:

"Improved access to broadband can also facilitate economic development by connecting, attracting, and retaining businesses. Small, local establishments increasingly rely on online advertising to reach customers and cloud-based applications to support productivity. When evaluating locations to establish new facilities, many larger employers in industries including logistics and manufacturing require that suitable connectivity is already present. These industries rely on speeds capable of supporting large file transfers and near-continuous updates to internal databases. Broadband is therefore critical to both retaining local businesses and attracting new employers." 12

The Yuba County study also highlighted the importance of adequate broadband for education, remote work, public safety, local government functions, smart transportation applications, natural resource management, utility operational efficiency, and healthcare.

Adequate broadband is a prominent regional concern for business communities. The United Chamber Advocacy Network (UCAN), which

represents the interests of local Chambers of Commerce, identified Critical Infrastructure including High Speed Internet as a significant legislative priority for 2023, based on survey responses from members.¹³

Workforce Investments Are Critical

Looking to the future, businesses nationwide are expected to increasingly adopt automation and artificial intelligence, which are reshaping workplaces, shifting worker roles, and increasing the need for employee training.

In the Capital Region, nearly one third of all jobs were found to be at risk of automation, according to a 2020 study. In this study, the "Capital Region" included nine counties – the four covered by this report (Sacramento, Sutter, Yolo, Yuba) as well as Alpine, Colusa, El Dorado, Glenn, and Placer counties. It found that women, historically minoritized workers and those with less education are most at risk of being impacted and displaced. The pandemic accelerated these trends.

To prepare for these changes, the report made recommendations about education and training needs, including the need for employers to invest in workforce training and for workers and businesses alike to "adopt and promote a constant learning mindset." Digital technologies will play a critical role in delivering such training and upskilling.



^{12.} Yuba County Broadband Planning and Feasibility Study, Tilson, 2023.

^{13.} State Policy Agenda 2023, United Chamber Advocacy Network (UCAN), including El Dorado County Chamber of Commerce, El Dorado Hills Chamber of Commerce, Elk Grove Chamber of Commerce, Folsom Chamber of Commerce, Lincoln Chamber of Commerce, Rancho Cordova Chamber of Commerce, Rocklin Chamber of Commerce, Roseville Area Chamber of Commerce, Shingle Springs/ Cameron Park Chamber of Commerce, and Yuba-Sutter Chamber of Commerce. https://eldoradohillschamber.org/wp-content/uploads/2023-UCAN-State-Policy-Agenda-FINAL.pdf

^{14. &}quot;Automation Risk for Jobs in the Capital Region," North/Far North Center of Excellence, Los Rios Community College District, March 2020. https://www.valleyvision.org/wp-content/uploads/Automation-Risk-for-Jobs-in-the-Sacramento-Capital-Region_COE_VV_FOW_FINAL.pdf

The need for digital training was underscored in another 2020 workforce assessment for the region's food and agricultural production sector.¹⁶ The report noted that technology "is transforming agriculture, manufacturing, and the overall food system."

Such technological advancements range from ag biotechnology to agribusiness marketplaces to farm management software to innovative food developments. Digital literacy for employees in middle-skill level and high-skill level jobs was identified as a "must-have" and a prerequisite for hiring.

At the same time, the lack of adequate broadband infrastructure was identified as one of the top three threats to the region's "Food and Ag Cluster," along with the need for skilled employees and the lack of technical training and job readiness of potential workers.¹⁷

Broadband and Clean Energy Solutions

Broadband connectivity also plays a role in clean energy solutions for businesses. The Sacramento Municipal Utility District (SMUD), for example, has adopted an ambitious 2030 Clean Energy Vision with a goal of eliminating 100 percent of its greenhouse gas emissions from its electric generation.

As one element of this "Zero Carbon Plan, 18 SMUD is partnering with local Chambers of Commerce and Property and Business Improvement Districts to help commercial customers electrify equipment such as HVAC systems, cooking and processing equipment, and vehicle fleets. Reliable Internet connectivity is an increasingly important and integrated component of such conversions, such as using "smart" thermostats to regulate temperatures, said Zach Lawrence, SMUD Program Manager for the Complete Energy Solutions Program.



16. Greater Sacramento Region's Food & Ag Cluster AgTech Workforce Assessment: Skills for the 21st Century Digitalization Era, Valley Vision, July 2020. https://www.valleyvision.org/wp-content/uploads/Ag-Tech-Industry-Final-FINAL-Report-8-24-20.pdf

^{17.} Ibid.

^{18.} More information about SMUD's Zero Carbon Plan can be found here: https://www.smud.org/en/Corporate/Environmental-Leadership/2030-Clean-Energy-Vision



UNDERSTANDING BUSINESS BROADBAND NEEDS

Technology needs and solutions can be more complex for businesses than residences. Depending on the size and nature of a business, successfully navigating these issues may be achieved by business owners or staff members. Or it may require outside expertise.

Businesses generally need to address three distinct but interconnected technological pathways. At the same time, digital connectivity must be robust in three distinct ways:

Business Path to Digital Connectivity

- Identify Business Functions. Examples: Producing products or services; internal operations such as accounting, payroll, banking; marketing and sales (online or bricks and mortar); employee needs.
- Build the Right "Tech Stack." Secure the equipment and software applications necessary to accomplish the business's identified functions.
- Connect to the Outside World. Establish connectivity through the Internet and establish cyber-security protections.

Three Pillars of Robust Connectivity

- Infrastructure and Service Access
 - o What connectivity options are available?
- Affordability, Reliability, and Speed
 - o Are available service options affordable, reliable, and fast enough to get the job done?
- Digital Skills and Training
 - o Are education and training tools and programs available to enable businesses and employees take full advantage of the Internet's resources?

Increasingly, Information Technology (IT) systems for businesses are being operated "in the cloud," meaning over the Internet. Meanwhile, a multitude of ever-changing technology products are available commercially. At the same time, businesses need to address cybersecurity protections, as well as redundant service options to ensure business continuity in emergencies. These issues are discussed further in the Section 3 discussion on Strategies, Tools, and Resources for businesses.



BROADBAND TECHNOLOGIES

Broadband, also known as high-speed Internet access, allows users to tap into the Internet through continuous and much faster transmission technologies than dial-up internet services of the past. The transmission is digital, which means sound, text and images are all transmitted as bits of data.

The Federal Communications Commission provides basic broadband information, distilled below, at this site: https://www.fcc.gov/consumers/guides/getting-broadband-qa.

Broadband is delivered through two primary transmission technologies – **wireline** and **wireless**. Wireline uses a physical means of transmission (think: wired), while wireless transmits data via electromagnetic waves in the air.

Wireline technologies

- **Digital Subscriber Line (DSL)** transmits data over traditional copper telephone lines.
- Cable Modem enables cable companies to provide broadband using the same coaxial cables that deliver television content.
- **Fiber Optic (Fiber)** converts electrical signals carrying data into light, which is then sent through thin transparent glass fibers. According to the FCC, fiber speeds far exceed cable modem and DSL speeds. Many consider fiber the optimal broadband deployment solution as a future-proof technology that can deliver speeds necessary to support current and future business, residential, and government needs.

Wireless technologies

- Wireless Fidelity (WiFi) uses short-range wireless technology to connect devices to the Internet, enabling them to be moved around within homes and businesses. WiFi also serves public "hot spots."
- **Fixed Wireless** uses longer range directional equipment to provide broadband (for example, from a tower to homes and businesses), often in sparsely populated areas.
- **Mobile Wireless** broadband services are widely available from cellular service providers, covering wider areas than WiFi networks.
- **Satellite** services are increasingly being used in remote areas to deliver broadband.



Broadband Speeds

Broadband speeds are generally measured in megabits per second (Mbps) or gigabits per second (Gbps). In March of 2024, the Federal Communications Commission (FCC) adopted a minimum standard for high-speed fixed broadband of 100 Mbps per second download speed and upload speeds of 20 Mbps (100/20 Mbps), marking a notable increase from the 25/3 Mbps benchmark set by the Commission in 2015.¹⁹

Many broadband consumers and experts believe even faster speeds are needed for modern uses and applications, especially when running businesses. In its annual assessment adopted in March of 2024, the FCC set a 1 Gbps/500Mbps long-term goal for broadband speeds.

Under recent state and federal broadband infrastructure deployment funding initiatives, locations deemed unserved (below 25/3 Mbps) or underserved (below 100/20 Mbps) may be eligible for funding and any new funded projects must deliver speeds of at least 100/20 Mbps.²⁰ These programs are further described in Section 3," Strategies, Tools, and Resources."



BROADBAND PROVIDER CHOICE AND COMPETITION

Many Internet service providers provide both residential service plans and business-tier services. Many smaller businesses, particularly home-based, subscribe to residential tier Internet service, which may be sufficient when there are few employees and devices. Others opt for business-tier services, which can include not only Internet service but also security applications, backup technologies, and customerservice add-ons.

Based on interviews and research, it is fair to state that most larger businesses with robust Information Technology departments and ample resources are able to design and secure the networks and resources they need to support business operations.

For smaller businesses in the Capital Region, it is a different story, with the three prongs of connectivity all coming into play:

- First, depending on a business's location, broadband service may or may not be available.
- Second, if service is available, it may not be affordable (often because of lack of competition), reliable, or fast enough to support business functions.
- Finally, even if affordable, reliable, fast service is available, a business owner may not have the digital skills necessary to use broadband optimally.

Section 2, "Challenges and Needs in the Capital Region," provides survey data, respondent comments, and case studies showing some of the on-the-ground realities and challenges surrounding these issues.

^{19. &}quot;FCC Increases Broadband Speed Benchmark," Federal Communications Commission News Release, March 14, 2024. https://www.fcc.gov/document/fcc-increases-broadband-speed-benchmark

^{20.} For example, under the federal Infrastructure Investment and Jobs Act of 2021, which allocated \$42.54 for broadband deployment to the states through the Broadband Equity, Access and Deployment (BEAD) Program, unserved locations are those with no service offerings at or above 25/3 Mbps, and underserved locations are those with at least 25/3 Mbps but less than 100/20 Mbps. Any funded deployment projects must deliver 100/20 Mbps in service speeds. "Internet for All Frequently Asked Questions," BEAD Program, National Telecommunications and Information Administration. https://broadbandusa.ntia.doc.gov/sites/default/files/2022-09/BEAD-Frequently-Asked-Questions-%28FAQs%29_Version-2.0.pdf

The City of Sacramento's recently developed Broadband Strategic Plan provides a helpful overview of broadband service availability within City limits. It is relevant to both residential and business customers. The extensive study provided a Market Analysis that documented offerings by incumbent Internet service providers, including pricing, service tiers, access, and market division. It was based on public data, previous studies and reports, carrier websites, and the consultant's own database and knowledge of the broadband environment.

This Market Analysis section highlighted the lack of competition among providers in the City, which can lead to affordability and equity challenges. The Market Analysis concluded with three key findings. Together, they painted a succinct picture of the existing market in the Capital City:

- "Most of the City is subject to a telecom duopoly with limited gigabit options." (Comcast/Xfinity and AT&T)
- "There is no disruptor in the gigabit market." (In other words, there is little variability in price for desirable gigabit speeds.)
- "There are large disparities in price and speeds for residential customers." (Finding: "... residents with lower income and from more disadvantaged neighborhoods are paying significantly more for their internet access which creates more equity challenges and exacerbates the Digital Divide.")²²

Earlier research by Valley Vision, which analyzed the Internet service market within the four-county region covered by this report, underscored the importance of expanding providers in the Capital Region to provide more competition, choices, and affordability for subscribers. This study found that in the four-county region, 74.5 percent of the population (three out of four locations) had access to two or fewer

Internet service providers offering service at any speed, even very low speeds.²³

This Valley Vision study, like many broadband studies, focused on residential service, but its findings are relevant to business communities.

A 2021 study for Yuba County noted that redundancy of mediums, which includes multiple Internet and communications providers, is critical when disasters occur and Internet, electricity and phone systems go down.²⁴

The California Digital Equity Plan, released in spring 2024, sounded a similar concern over the need for greater choice and competition in the broadband provider market. According to this statewide plan, the lack of competition among providers "limits consumer choice and negatively impacts costs for Californians."²⁵

These research findings surrounding choice and competition echo the lived experiences of many businesses in the Capital Region, especially smaller businesses with tight resources, as shown by interviews and by the Business Broadband Survey undertaken for this report.

"Having only two options for Internet in Woodland is very limiting for our business. We'd like fiber internet at our store since we are heavily reliant on the Internet for our pharmacy operations."

- Yolo County survey respondent

^{21.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

^{23. &}quot;Internet Service Competition in California and the Capital Region: Is the Internet Service Market Competitive?", David Espinoza, Valley Vision, July 2021. https://www.valleyvision.org/resources/internet-service-competition-in-ca-and-the-capital-region-2021/

^{24.} Yuba County Strategic Master Broadband Plan, Valley Vision, September 30, 2021. https://cms7files.revize.com/yubaca/Planning%20Department%20Documents/Yuba%20County%20Broadband%20Master%20Plan.pdf

^{25.} California Digital Equity Plan, California Department of Technology, 2024. https://broadbandforall.cdt.ca.gov/wp-content/uploads/sites/19/2024/04/California-State-Digital-Equity-Plan-04.04.2024-Remediated-Version.pdf



A number of interviewees and survey respondents indicated they were satisfied with their broadband choices and services. Others raised concerns, such as this business owner in Yolo County who responded to the survey: "Having only two options for Internet in Woodland is very limiting for our business. We'd like fiber internet at our store since we are heavily reliant on the Internet for our pharmacy operations."

The lack of competition and its impacts can be especially challenging for small businesses with limited resources. As Deborah Muramoto, President and CEO of California Capital Financial Development Corporation, explained: "Digital access for small businesses is directly related to bringing in revenue and income. Yet, they may not have access. And they may not be able to afford it."

These conditions are further explored in Section 2, "Challenges and Needs in the Capital Region."

INTERNET PROVIDERS IN THE REGION

A range of Internet service providers serve the four counties of this study region. They offer differing types of technology, including wireline and wireless services as described above.

As of 2023, Yuba County, for example, was served by at least 11 providers. ²⁶ In the City of Sacramento in Sacramento County, the dominant providers include Comcast, AT&T, Consolidated Communications (Fidium), and Frontier Communications. ²⁷ The City of West Sacramento in Yolo County is served by two primary carriers, AT&T and Astound.

Respondents to the Business Broadband Survey that informed this study listed 20 different carriers as their service providers across the four-county region, with Comcast far and away the most prevalent, followed by AT&T, Astound, Succeed. Net, Verizon, and Starlink. One respondent from Sutter County said during an interview that her company is served by Race Communications through a limited pilot program.

In short, available providers vary, depending on the business's location.

These 20 companies were listed by respondents to this report's Business Broadband Survey as their Internet carriers: Comcast (Xfinity), AT&T, Astound/Wave, Succeed.net, Starlink, Verizon, T-Mobile, Hughes, WiLINE, Omsoft, Consolidated, Teal, California Broadband, Sonic, Esparto Broadband, Frontier, Cal.net, unWired Broadband, Digital Path, and AFES.

^{26.} Yuba County Broadband Planning and Feasibility Study, Tilson, 2023. The listed providers included: AT&T Inc., Cal.net, Corridor Wireless LLC, DigitalPath, Inc., GeoLinks, Skyhi Broadband, Inc., SmarterBroadband, Succeed.Net, T-Mobile US, Verizon, and Xfinity (Comcast).

^{27.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

Many companies provide basic information about their business-tier products and plans on their websites, which can be difficult for businesses to navigate because pricing plans can change and often come with challenging fine print provisions.

Other companies require filling out information requests and individual consultations. The reason, according to providers, is that businesses are so varied in their sizes and needs that it takes one-on-one interaction to get to the right products.

Some companies provide a good deal of service and pricing information online. Comcast, for instance, provides online information about six levels of "Comcast Business Internet." In Spring 2024, Comcast pricing for business services in the City of Sacramento ranged from \$50.00 monthly to \$345.00 monthly, with many caveats and nuances related to speed limitations, contract lengths, equipment fees, connection fees, additional services, promotional offers, and phone-bundling options.

At the low end, the least expensive Comcast business package offered up to 50 Mbps download speeds capable of supporting "about three devices." At the upper end were "Gigabit Extra" packages offering up to 1.25 Gbps download speeds capable of supporting an unlimited number of devices, according to the website.

Many smaller businesses tap business technology consultants to help them navigate Internet service decisions and technological set-ups. Other helpful resources also are available.

FUTURE DEPLOYMENT AND DIGITAL EQUITY SUPPORT

Major new state and federal broadband deployment and digital equity initiatives are unfolding, which are expected to spur expansion of service by existing carriers, draw new market entrants, and enhance digital equity programming across the state. They include the following, which are discussed further in Section 3, "Strategies, Tools, and Resources."

- SB 156 Broadband Middle-Mile build-out (\$3.75 Billion) and Last-Mile Federal Funding Account infrastructure grants (\$2 Billion)
- The Broadband Equity, Access and Deployment (BEAD) Program, which will bring \$1.86 billion in federal broadband infrastructure grant funds to California, to be administered by the California Public Utilities Commissions (CPUC)
- California Advanced Services Fund (CASF)
 Infrastructure Account Grants, being administered by the CPUC
- Digital Equity Plan grant program, administered by the California Department of Technology and the federal National Telecommunications and Information Administration.



2. CHALLENGES AND NEEDS IN THE CAPITAL REGION

BACKGROUND

Development of this business broadband project surfaced many challenges and needs facing businesses in the Capital Region of Sacramento, Sutter, Yolo and Yuba counties, particularly those that are smaller, women- and minority-owned, and located in aging commercial areas or in rural areas.

It also brought to light many efforts and initiatives under way to improve Internet connectivity and digital capacity for residents and businesses alike.

Research included:

- Distribution and analysis of a Business Broadband Survey.
- Data-based mapping and analysis of unserved and underserved locations in commercial, industrial, and agriculturally zoned areas in the four-county region using publicly available service maps and open-source zoning information.
- Research at the local, regional, state, and national levels regarding broadband services for businesses.
- Review and analysis of existing broadband and economic development plans in the region and beyond.
- Outreach, communications, and interviews with business owners, government leaders and representatives, service providers and technical consultants, and entities serving businesses including local and regional Chambers of Commerce, Farm Bureaus, Property and Business Improvement Districts (PBIDs), and economic development organizations.

BUSINESS BROADBAND SURVEY

Background

During 2023 and the first quarter of 2024, Valley Vision worked in partnership with many government, civic, and business organizations to distribute a survey to businesses in the four-county region. Outreach and partnership included these entities:

- County executives and staff responsible for broadband development, economic development, and digital equity
- Executives and staff within incorporated cities
- Local and regional Chambers of Commerce
- County Farm Bureaus
- Nonprofit economic development organizations

These partners distributed the survey through their communications channels, including print and electronic newsletters, list serves of members and business licensees, websites, and social media.



The survey was available in five languages – English, Spanish, Chinese, Vietnamese and Hmong – and took about four minutes to complete. It was designed as a means of gathering as many data points as possible and not as a statistically formalized instrument.

One telling challenge in circulating the survey was noted by the Yolo County Farm Bureau: "Not all of our businesses have email."

Survey Results in General

The business broadband survey received 125 responses from a wide range of business types in the four counties – from food service and accommodations, to healthcare, to agriculture. The majority of respondents – 68 percent – had 10 or fewer employees. In terms of location, slightly more than one-third were in commercial/office spaces, with the rest relatively equally distributed among

commercial/retail, industrial, agricultural, residential areas, and other types of locations.

Only one respondent had no access to the Internet, two were unsure, and the remainder – 98 percent – had access to the Internet. The largest group – 43 respondents – reported subscribing to Comcast/ Xfinity, followed by 21 who use AT&T, 14 with Astound/Wave, and 10 with Succeed.net. Sixteen other providers were being used by one or more businesses. The majority – 59 percent – reported paying between \$100 and \$500 monthly for their service or services.

Taken together, the responses to the Survey's 15 questions helped to paint a picture of the region's remarkable diversity among businesses, as well as the challenges businesses are having with broadband and Internet service and adoption.

Here are insights from several key survey questions and responses. The full survey and responses are provided in the Appendix 3.



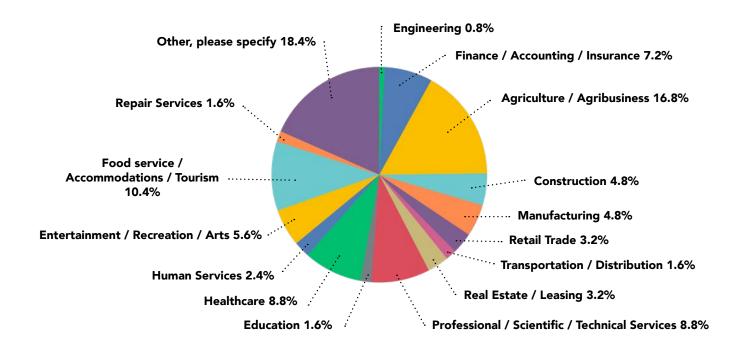
Business Broadband Survey: A Diverse Range of Business Respondents

Question: What industry or business sector do you serve?

Respondents to the Business Broadband Survey provide a wide variety of business services in the region. Among respondents, the most common categories chosen were: Agriculture (16.8 percent), food service/ accommodations / tourism (10.4 percent), healthcare (8.8 percent), and professional/ scientific/ technical services (8.8 percent).

When asked to identify the industry or business sector they serve, respondents were given 16 choices, including an option for "other" that generated a range of unique answers, including a museum, electricity generation, garment decoration, funeral services, general aviation, marketing agency, veterans' services, summer camp operation, and beauty services.

The wide variety of responses speaks to the rich and diverse contributions of businesses serving the Capital Region.



Business Broadband Survey: Satisfaction With Internet Service Is Mixed

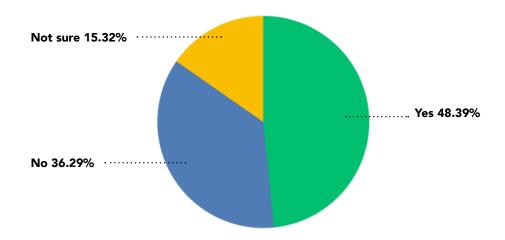
Question: Are you satisfied with your current Internet service for your business needs?

Taken together, the responses to the survey reveal a compelling "have and have not" story. Many businesses are satisfied with their providers and technological capacities. "I don't think our business is held back by the quality of our current Internet provider," wrote one respondent from Yolo County who indicated being in the "Professional / Scientific / Technical Services" sector.

Others are struggling. Respondent Jason Steenbergen, who owns a screen printing and embroidery business in Davis in Yolo County called Ink Monkey Graphics, described having inadequate broadband service and resulting financial hardship for his business in his response to the survey:

"Our hardline service comes from old phone lines and is extremely slow," Steenbergen wrote. "We have had to go to cellular internet, which is also slow and unreliable. Faster internet would save thousands per year in employee productivity."

In all, 60 respondents – 48 percent – said they were satisfied with their Internet service. Forty-five respondents – 36 percent – were not satisfied, and the rest said they were not sure.



Business Broadband Survey: Multiple Concerns with Service

Question:

If you answered "No" or "Not sure" [regarding satisfaction with Internet service], please indicate how your Internet service is insufficient for your business needs.

Among respondents who answered either "No" or "Not sure" about their satisfaction with their Internet service, many checked multiple responses when asked how their Internet services were insufficient for their business needs.

The top concern was lack of reliability and outages, followed by speeds, service and product options, technical support and customer service, and cost.

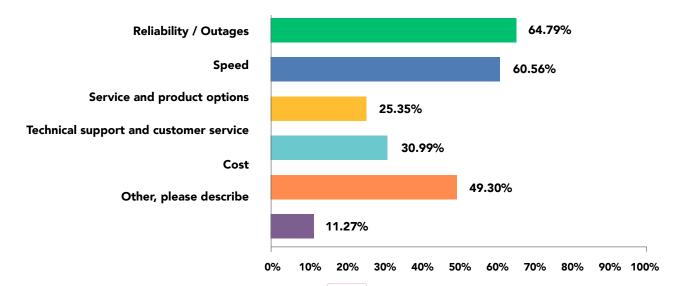
Among those who answered "No," the stated concerns were varied and nuanced, depending on the size of businesses, types of business functions, location, and available providers.

This response from a respondent with a small business (1-10 employees) in the "Finance / Accounting / Insurance" sector in Yolo County demonstrated the complexity of the issues – here it was the hard trade-offs between using residential service versus business-tier service:

"If you go on an account for typical business that works off the same old lines as residential, you get better service when things go wrong but horrible issues with reliability and outages," the respondent wrote. "If you go business fiber, you get absolutely no tech support. That's fine for a larger business – maybe they have someone who does that on staff, but for smaller businesses, we just don't have anyone and the carrier refuses to provide any support. It's a lose/lose predicament."

For a large and growing health care company in Yuba County, different challenges were noted. This respondent, whose business has more than 500 employees, indicated being satisfied with the current Internet provider but described a frustrating problem with ramifications for customer service, employee hiring and training, and the bottom line:

"The main issue we encounter is the time it takes to get Internet installed at a new location. Usually once we place the order, it takes 90 – 180 days for service. It's hard to set go-live dates for new facilities when it takes this long to get data."



Business Broadband Survey:

The Business Need for Competition Among Providers

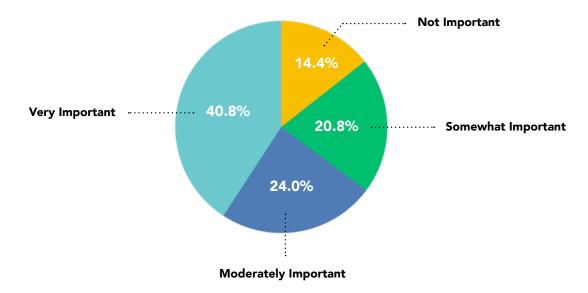
Question:

How important is it to you to have multiple Internet service providers available to serve your business?

The lack of competition and choice among providers was a potent concern of respondents, with 65 percent responding that it was moderately important or very important to have multiple providers available to serve their businesses. Another 21 percent said this was somewhat important, with just 13 percent saying it was not important.

(See discussion in Section 1 above about the importance of having multiple providers to ensure affordability and choices in service products.)

As one Yolo County respondent in the agricultural sector explained in the survey: "Competitive options to improve service while keeping pricing reasonable is key to me."



Business Broadband Survey: Why Robust Broadband Matters to Businesses

Question:

How would improved broadband access or Internet service quality improve your business?

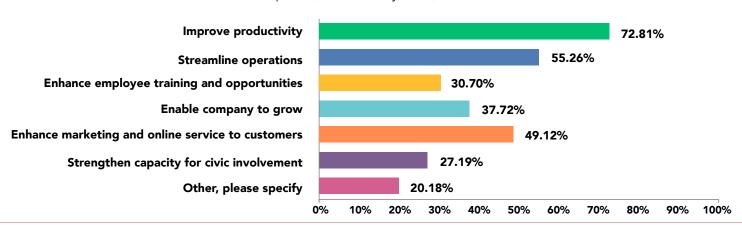
The Business Broadband Survey provided a window into the importance of robust and affordable Internet connectivity to the day-to-day functions and growth potential of businesses:

- Three-quarters of respondents said better broadband access and service would improve their productivity.
- More than half said it would help streamline their operations and enhance marketing and online service to customers.
- Forty percent said it would enable their company to grow.
- Roughly one-third said it would enhance employee training and opportunities and strengthen capacity for civic engagement.

When asked if there were other benefits to better service, seven respondents said they were happy with their service, while 11 called out such concerns as high costs, low employee morale when Internet service fails, challenges with interacting with other businesses and keeping deadlines, and reducing frustration and stress.

This was consistent with other business broadband surveys and studies. Within the City of Sacramento, for example, most business respondents to the community survey in the City's Broadband Strategic Plan stated that digital technologies were highly important to many business functions, including management, hiring employees, buying materials and inbound logistics, production of goods and services, outbound logistics, sales and marketing, and support and maintenance.²⁸

Likewise, in a Yuba County broadband study, just over half of respondents to a business broadband survey reported that Internet service was insufficient for business and organizational needs, with most reporting speeds were not fast enough. Additionally,15 of 18 respondents to a Farm and Agriculture Broadband Business Survey said Internet service was insufficient due to low speeds, unreliability, cost, and other concerns.²⁹



^{28.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

^{29.} Yuba County Strategic Master Broadband Plan, Valley Vision, September 30, 2021. https://cms7files.revize.com/yubaca/Planning%20Department%20Documents/Yuba%20County%20Broadband%20Master%20Plan.pdf

Business Broadband Survey: Desired Digital Education and Training Opportunities

Question:

Are there any educational or training programs that would help you use the Internet for your business more effectively?

Digital equity for businesses does not stop with sufficient speeds, reliability, and affordability. Digital education and training are also critical. Among survey respondents, two-thirds indicated they desired more digital education and training opportunities.

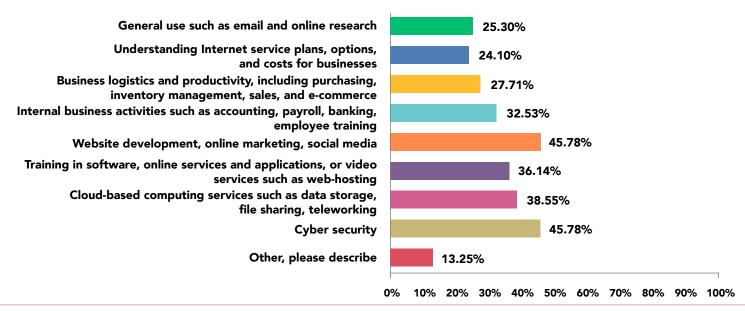
This question offered eight possible areas of need ranging from simple email and research tasks to more complex issues involving cloud-based computing services, business operations and logistics, marketing via the Internet, and cybersecurity. Most respondents chose multiple answers or all answers.

The two top areas of need for nearly half of respondents were training in cybersecurity (46 percent) and website development, online marketing and social media (46 percent). One in four respondents (25 percent) indicated they needed training and education with basic email and research activities.

One small business owner in the finance/accounting/insurance sector in Davis noted an area of need not called out in the survey's list of answer options: "Understanding bandwidth and trouble-shooting beyond just starting a router."

It was a simple answer to a challenging problem that other businesses also cited during interviews: They want to better understand the underlying technologies of Internet service so they can problem-solve when adding new hardware or software and when unexpected interruptions, slow-downs, and shut-downs arise.

As highlighted in Section 1 of this report, more than nine in 10 jobs in California and the United States now require digital skills, while one-third of workers do not have the foundational digital skills needed to enter and thrive in today's jobs. This digital skill divide applies to businesses of all sizes and types.³⁰



LOCAL AND REGIONAL BUSINESS BROADBAND NEEDS

In addition to the Business Broadband Survey, extensive research, literature reviews, interviews, and data and mapping analysis were conducted to identify local and regional business broadband needs. This work is described below.

"We Prosper Together" Capital Region Economic Assessment

In December 2023, a significant regional economic assessment placed broadband squarely in the realm of essential infrastructure needed for a resilient Capital Region economy³¹ by stating: "Healthy regional economies need efficient and accessible transportation options, **global broadband connectivity**, reliable power, and other infrastructure fundamentals. Regular maintenance of these assets ensures area residents and businesses have the built environment they need to participate in the regional economy."

The study went on to describe the existing inequitable situation:

"Major infrastructure projects, if well-designed and resourced, have the ability to boost economic activity and improve quality of life for residents. However, despite unprecedented federal and state infrastructure spending, certain parts of the region are finding it difficult to secure the resources they need. When forced to compete with the more heavily populated urban and suburban parts of the region, rural communities and other historically disinvested areas often come up short.

"Broadband connectivity is a case in

point. A great deal of legwork has gone into bringing broadband to California's rural areas. Opportunities for agrifoodtech adoption, remote work, online education, and business operations make these investments imperative. Historically Internet service providers have underinvested in rural areas, citing the high costs and limited return from investments in low-density areas. The pandemic revealed the need for broadband infrastructure in older urban and suburban neighborhoods as well. To make matters worse, state and federal funding for broadband has fallen well short of regional needs." – Capital Region Economic Assessment, We Prosper Together.32

This economic assessment noted the need for jurisdictions and anchor institutions throughout the region to work collaboratively on joint use opportunities, efficient permitting processes, and stronger relationships with relevant agencies – themes that are discussed in Section 3, "Strategies, Tools and Resources."

Coordinated Rural Opportunities Plan (CROP)

The Coordinated Rural Opportunities Plan (CROP), developed in Spring of 2024, highlights the economic power and potential of the Capital Region's growing food and agriculture industry cluster, as well as its infrastructure needs including broadband. The program is funded by the California Department of Conservation's Sustainable Agricultural Lands Conservation Program, and is a joint effort between Valley Vision and the Sacramento Area Council of Governments.³³

^{31.} Capital Region Economic Assessment prepared in partnership for California Jobs First (Regional Plan Part 1; Valley Vision, California Jobs First, Cities GPS and Community Strong Strategies; December 31, 2023.) https://www.weprospertogether.org/wp-content/uploads/2024/03/WPT-Capital-Region-Economic-Assessment-V3.16.24.pdf

^{33.} CROP is the next phase of SACOG's groundbreaking Rural-Urban Connections Strategy (RUCS) to enhance rural economies and the natural assets that drive them across the six-county Sacramento region: El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties. Valley Vision's landing page for the program is here: https://www.valleyvision.org/projects/coordinated-rural-opportunity-plan/

The program spotlights the Capital Region's position as America's "Farm to Fork Capital," and notes that the food and agriculture cluster is one of the core priority clusters in the region's Prosperity Strategy.

CROP provides county and regional leaders the opportunity to address infrastructure challenges and come together on solutions, including policies and investments, to support the region's agricultural sustainability and long-term economic health and resiliency.

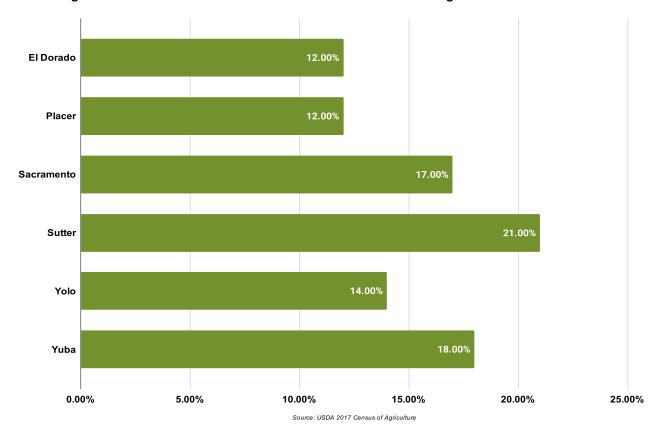
During the study, broadband turned up, again and again, as a priority gap area, described as follows:

"There is a persistent, long-term, and well-documented lack of broadband infrastructure connectivity in the region's rural areas and agricultural communities. Broadband is a critical enabling technology for competitive business operations and global trade; adoption of agrifood technologies – especially those generated

by UC Davis and regional technology entrepreneurs – to better manage resources such as water and energy, reduce chemical inputs, and address workforce shortages; for mandated reporting; for health and safety, including for emergency preparedness and recovery such as from wildfires and floods, and also for on-farm health issues such as from accidents; and for forest resilience. The strong need for improved broadband and also cell phone coverage was raised in every county."³⁴

CROP includes a comprehensive profile of each county that identifies priority areas for infrastructure investments and programs to strengthen the region's food and agricultural cluster. The profiles include examples of innovative models that can be leveraged across the region for shared solutions and potential resources to meet vital infrastructure needs.³⁵

Percentage of Farms That Lack Access to Internet in the Sacramento Region



^{34.} Sacramento Region Profile, Sacramento Region Coordinated Rural Opportunities Plan, Valley Vision and SACOG, March 2024, https://www.valleyvision.org/wp-content/uploads/Sacramento-Region CROPreport.pdf

^{35.} The county profiles can be found here: https://www.valleyvision.org/projects/coordinated-rural-opportunity-plan/

CPUC Federal Funding Account Broadband Applications

One clue to the high number of businesses in need of improved broadband service in the Capital Region can be gleaned from local applications submitted to the CPUC's Last Mile Federal Funding Account (FFA) grant program, which were under review by CPUC during the spring of 2024.³⁶ The City of Sacramento, for example, submitted a grant funding proposal that would provide new or improved service to unserved households (4,620), public safety locations (22), anchor institutions (30), and a large number of businesses (7,582).

Applications to the same program by the Golden State Connect Authority tell a similar story. Golden State Connect Authority is a Joint Powers Authority representing 40 rural counties, including Sutter, Yolo and Yuba Counties included in this business broadband study.³⁷ Golden State Connect Authority is seeking funding assistance through FFA to bring broadband service to numerous residences and businesses in these rural counties, including to 361 businesses in Sutter County, 153 businesses in Yolo County, and 105 businesses in Yuba County.

Other pending applications by service providers also identify numerous businesses that would benefit from enhanced broadband service.

Mapping and Research Analysis by Jurisdictions

Broadband access varies widely for businesses in the Capital Region, with many enjoying reliable, affordable high-speed Internet service while others are struggling. As noted, among policy-makers and researchers, most of the focus on broadband equity has tended to be expressed in terms of residences or locations of all types that are unserved. To achieve a closer look at broadband conditions for businesses in the Capital Region, Valley Vision studied "Unserved Locations," as defined by the CPUC,³⁸ within three primary zoning categories where businesses are commonly found:

- Commercial
- Agricultural
- Industrial

This data and mapping overlay work was done for the following:

- Sacramento, Yolo, Sutter and Yuba Counties (Maps 3 through 6)
- Fifteen incorporated cities within those counties (Maps 7 through 21)
- Eighteen 18 Property and Business Improvement Districts (PBIDs)³⁹ located in the City and County of Sacramento (Maps 23 through 40).

This mapping work is consistent with data analysis that Valley Vision has provided over the years to the jurisdictions within the Connected Capital Area Broadband Consortium.

The county maps are presented below. The City and PBID maps are included in the Appendix 2, and are discussed further in Section 2 below.

Taken together, the maps paint a picture of the divergent broadband conditions for businesses located within these zoning areas.

In short, many areas zoned for agricultural, commercial, and industrial uses have unserved locations that could – and should – be receiving adequate broadband service to better serve businesses.

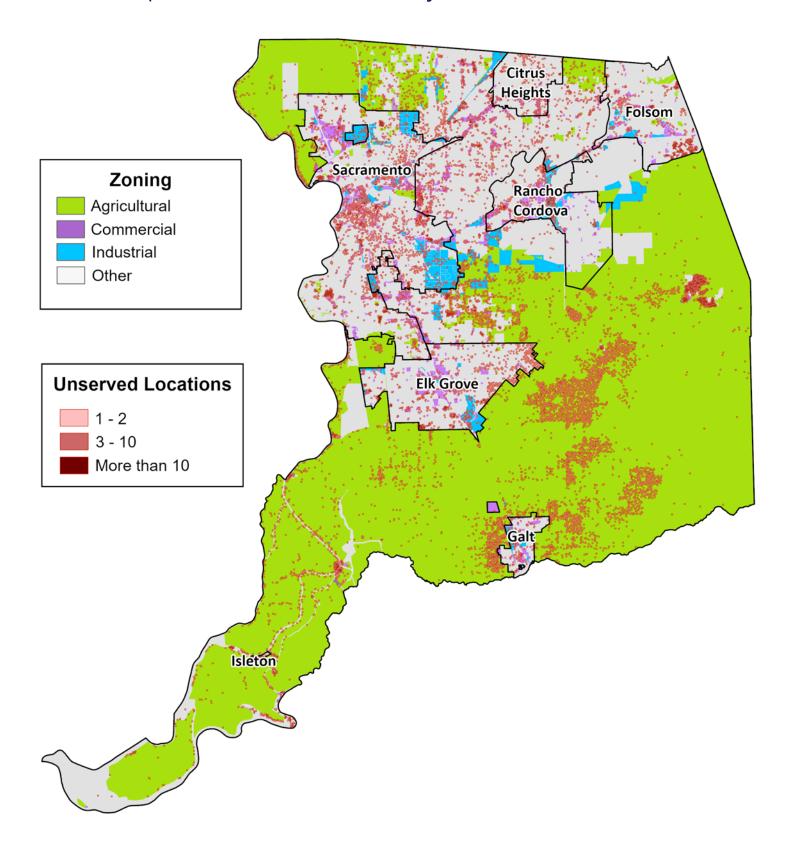
^{36.} More information can be found here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account

^{37.} Golden State Connect Authority, website landing page, https://goldenstateconnect.org

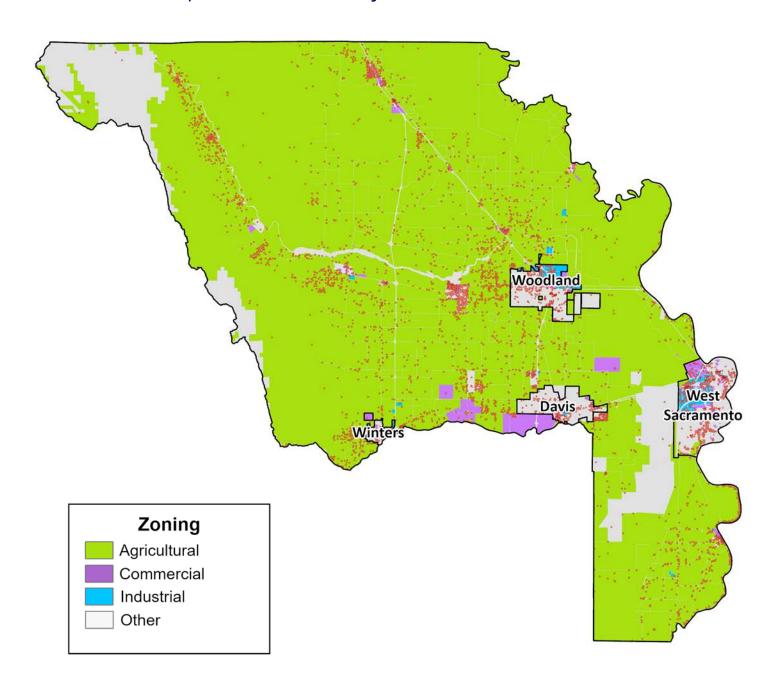
^{38.} See Appendix 2, Mapping Methodology.

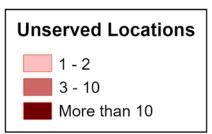
^{39.} PBIDS are geographically defined special assessment districts, allowable by state and local law. This Sacramento County memorandum provides helpful background information: https://economic.saccounty.gov/IncentivePrograms/Documents/PBID FormationIncentive-ExecutedBoardMaterial.pdf

Map 3 Sacramento County Unserved Locations

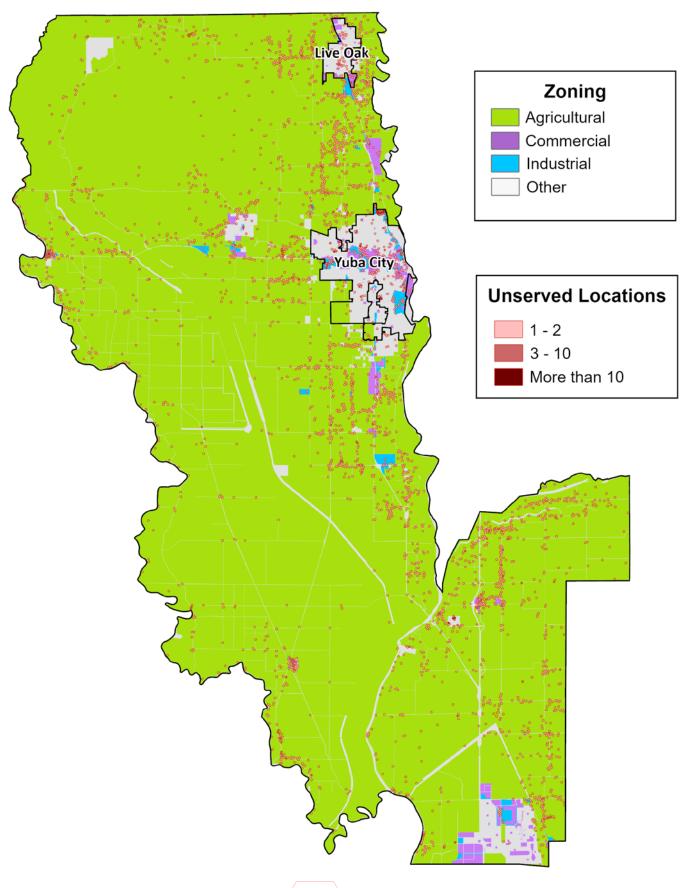


Map 4 Yolo County Unserved Locations

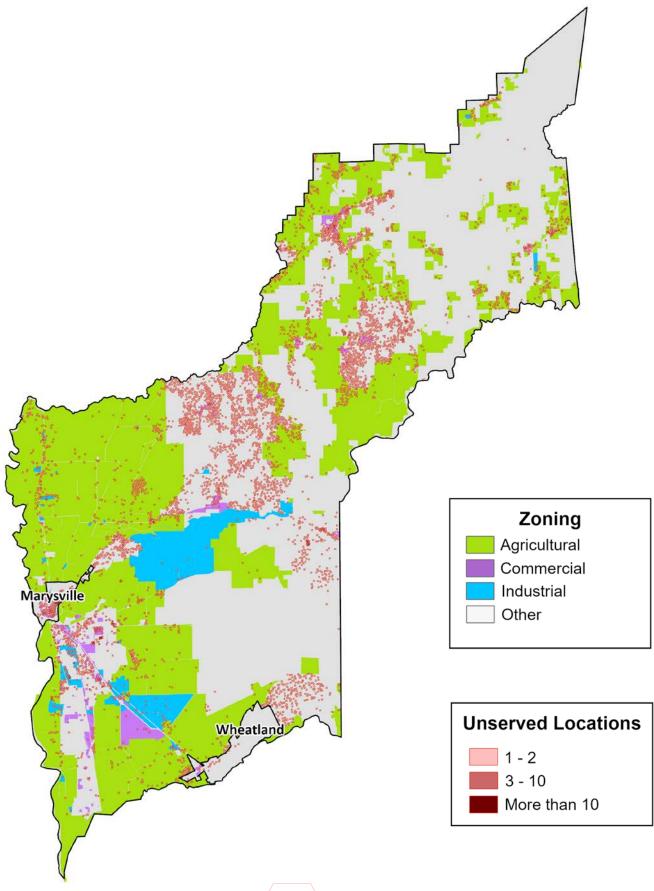




Map 5 Sutter County Unserved Locations



Map 6 Yuba County Unserved Locations



The service gaps highlighted in the data and mapping analysis for this project are underscored by research and initiatives undertaken by counties, cities, and communities in the Capital Region. Although not all have conducted formal studies, for those that have, all have concluded that improvement in broadband access is needed, as well as digital education and training.

In all cases, digital equity is a longstanding concern, even where broadband conditions generally are more robust.

These localized studies in large part tend to focus on residential needs and unserved and underserved locations generally, but business conditions are closely related.

Deeper discussion about all of this research follows for Sacramento County, for Yolo County, for Sutter and Yuba Counties, and for the Sacramento-San Joaquin Delta.





In all cases, digital equity is a longstanding concern, even where broadband conditions generally are more robust.





Sacramento County, Its Cities, and Property and Business Improvement Districts

Sacramento County includes a diverse mix of urban, suburban, and rural communities. It has a population of 1,572,453, with 62 percent living in unincorporated areas that include suburbs, urbanizing areas near incorporated cities, and agricultural areas. 40 The county has seven incorporated cities, including the cities of Sacramento, Elk Grove, Folsom, Rancho Cordova, Citrus Heights, Galt, and Isleton.

Based on a review of existing studies, responses to the Business Broadband Survey, mapping research and interviews, broadband conditions vary widely for businesses in Sacramento County. Many businesses are well-equipped to function in the modern digital era. But others are not, particularly those that are smaller, minority-owned, or located in rural areas and aging commercial corridors.

Mapping research for this project – which analyzed locations that are considered unserved by broadband within agriculturally, commercially, and industrially zoned areas in the County – showed unserved locations scattered widely in business-oriented zones. (See Map 3 above for the County of Sacramento.)

City of Sacramento

The City has a population of 518,000 and is the urban hub of the Capital Region, serving as home to the State Capitol and governing center of California. Its downtown core features architecturally striking highrises that are visible for miles, riverfront proximity, historic building stock dating back to the Gold Rush, and a vast array of businesses from all sectors.

The City of Sacramento is prioritizing digital equity for residents, businesses, and government institutions. The City's recently developed Broadband Strategic Plan contains a wealth of information on broadband conditions and needs within city limits, and found that broadband access and adoption among households and businesses varies widely.⁴¹

The City of Sacramento study included a "Wireless Field Survey" that analyzed signal strengths and download and upload speeds for wireless services provided by AT&T, Verizon, and T-Mobile. All three carriers were tested simultaneously with uniform methodology and assumptions. Major road arterials and corridors were surveyed in the North Area, Business District (Downtown), and South Area.



40. Sacramento County Profile, Sacramento Region Coordinated Rural Opportunities Plan, Valley Vision, March 2024. https://www.valleyvision.org/wp-content/uploads/Sacramento-County_CROPreport.pdf

^{41.} As noted elsewhere in this report, the City of Sacramento has applied for a \$38.7 million grant from the CPUC's FFA Last Mile initiative to fund a buried fiber network through a public-private partnership that would serve residences, businesses, and public institutions; see also City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

This Wireless Field Survey study found large differences among each of the three mobile carriers, with all showing average download speeds below 25 Mbps during the testing periods. The Downtown Business District was particularly constrained in download and upload speeds, "with more than 2/3 of the area receiving less than 25 Mbps download, and less than 2% exceeding the state minimum." 42

City of Sacramento business voices punctuated the findings in the City of Sacramento Broadband Strategic Plan. One survey respondent wrote: "Oak Park near Alhambra and Broadway coverage is spotty at best. It would be nice to have better coverage in areas of lower income that have businesses in the area."

A nonprofit organization wrote: "Better broadband would mean more accessible and better connectivity for business meetings. ... [our organization] has awful connections when they are trying to zoom and they miss out and are disconnected quite frequently. We have a hard time connecting when the cell system is high usage and it limits our team when they need to access our server or data bases."

The mapping and data analysis work of this project punctuates and illuminates these pain points. The City of Sacramento has numerous "Unserved Locations" spread throughout City limits, including within many areas where businesses are located. (Please see Sacramento County Map 3 above, City of Sacramento Map 7 in Appendix 2, and PBID Maps 23-40 in Appendix 2.)

To address many of the gaps in service, in 2023 the City of Sacramento applied for grant funding through the CPUC's Last Mile Federal Funding Account (FFA) program⁴⁴ for a \$38,696,843 public-private partnership broadband deployment project. It would provide new or improved service to 7,582 unserved businesses, as well as 4,620 households, 22 public safety locations, and 30 anchor institutions. CPUC award decisions in this highly competitive program were expected during 2024.

City of Isleton

In the City of Isleton, Sacramento County's smallest incorporated city, significant broadband and Internet challenges exist. (See Map 8 in Appendix 2, showing much of the city and all of its commercial and industrial areas populated with unserved locations.)

This small rural community has a population just under 800 people, and is situated along the Sacramento River in southern Sacramento County within the Sacramento-San Juaquin Delta. Agricultural operations and tourism based on water-related activities on the River and the Delta help fuel the local economy.

Businesses here, as well as Isleton's public sector operations, struggle mightily due to a lack of adequate broadband service, said Mayor Pamela Bulahan. "Terrible service everywhere," was her blunt assessment.

Isleton's remote location and small population have made finding willing providers a challenge. As a result, Bulahan said, businesses often find it difficult to conduct essential activities. During the recent pandemic, she said, a professional consultant who lived in the community had to sell his home and move away because he was unable to work remotely due to the lack of broadband.

In recent years, assisted by Valley Vision and the Delta Protection Commission, the City of Isleton has worked with various Internet providers to solve its severe broadband gaps. At the time this report was prepared, a new Internet provider in the area, unWired Broadband, was working with the City to provide enhanced wireless Internet service.

"Terrible service everywhere."

– Isleton Mayor Pamela Bulahan

^{42.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

^{43.} Ibid.

^{44.} More information can be found here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account

City of Elk Grove

In Sacramento County, the City of Elk Grove is an example of a community that has made digital equity and "Smart City" planning – including for businesses – a priority over the past several years.

Elk Grove is located in a fast-growing area in the southern portion of Sacramento County. The City's "Connected Elk Grove Smart City Plan" was adopted in January 2022.

According to a September 2023 City Council staff report, "One of the key tenets of the document was the need to ensure equitable access to digital technology for all. This builds on the Elk Grove City Council's high-priority project to facilitate improved telecommunications / broadband access for residences and businesses and recognizes that equitable access to fast, reliable, and affordable broadband service is critical to success now and into the future."

According to the Plan, most of Elk Grove has higher than average access to high-speed Internet, but this is not true for all areas and the Plan seeks to address the disparities. (See Map 10 in Appendix 2, which shows many unserved locations in areas zoned for commercial and industrial uses.)

Elk Grove is focusing on providing infrastructure (including a new municipal network), training, and hardware particularly to areas with poor access, including industrial areas and disadvantaged communities.

During interviews for this project, City staff noted that a later survey for a 2023 "Digital Access Report" tapped the views of both residents and businesses. It revealed strongly held concerns about the lack of competition and service choices in the City and outcomes such as higher prices.

Further, businesses in some areas such as Elk Grove's Old Town area on the eastern side of the city have extremely limited services.

"It's 2024 and dial-up is their only option. You can't operate nowadays as a business without a reliable Internet connection," said Carrie Whitlock, Strategic Planning and Innovation Program Manager for the City of Elk Grove. (See the Case Study in Section 2 about struggles in this area.)

In particular, Whitlock said, the City is looking at developing a municipal network to expand broadband service through a public-private partnership.

Mapping and data analysis work for this study show that the areas zoned for commercial and industrial uses in the City of Elk Grove have numerous areas where locations are lacking adequate broadband and are considered "unserved" for CPUC grant funding eligibility purposes. (See Map 10 in Appendix 2.)



45. Connected Elk Grove: A Smart City Plan, January 2022, https://www.elkgrovecity.org/sites/Departments/SPI/SmartCity/Connected Elk Grove_SCP_final_2022-01.pdf; see also City of Elk Grove Digital Access Report, July 2023, https://www.elkgrovecity.org/sites/default/files/city-files/Departments/strategic_planning/broadband/elk-grove-ca-digital-access-report-final.pdf

Cities of Rancho Cordova and Folsom

Like the Cities of Sacramento and Elk Grove, the cities of Rancho Cordova and Folsom along Sacramento County's Highway 50 corridor are moving forward with economic development efforts to promote tech-driven development consistent with and complementary to their existing business communities.

Folsom, for example, has long been home to Intel's Folsom campus, a major tech employer, while Solidigm, a global semiconductor conductor, named Rancho Cordova its global headquarters in 2023.

The two cities, along with the City of Placerville in El Dorado County, established a formal partnership of government and business interests called The 50 Economic Alliance. The Alliance works to support companies expanding, relocating, and creating new jobs within a 60-mile corridor along Highway 50.

The two cities also have plans under way to develop municipal fiber networks in partnership with a private provider, SiFi Networks. The goal is to enhance broadband for residents, businesses, and public institutions.

The City of Rancho Cordova is located along a six-mile stretch of the American River and Highway 50. It is a major job center, including government, with a proactive approach to economic development. The city characterizes itself as "an emerging urban center with a small-town feel," with assets including bike and pedestrian trails, a growing arts scene, and numerous free community events.

Rancho Cordova has entered into a city-wide developer agreement with SiFi Networks and work is under way to install nearly 500 miles of fiber network to connect all homes and businesses in the city with fiber Internet service. The project will function as an open network that can be leased to other Internet service providers, said Dalia Fadl, principal engineer in the City's Public Works Department.

The hope, Fadl said, is to bring in new providers and foster competition and options for consumers, including businesses.

A similar effort with SiFi Networks has been proceeding in the City of Folsom.⁴⁶

Data and mapping analysis for this business broadband study indicates numerous locations within commercially and industrially zoned areas of Rancho Cordova with unserved locations that will benefit from these efforts. (See Map 11 in Appendix 2.) The same is true for commercially-zoned locations within the City of Folsom. (See Map 12 in Appendix 2.)

Research and outreach did not turn up significant broadband problems in Folsom for businesses. However, anecdotal information indicated that the community is not immune from challenges. (See, for example, the Case Study in Section 3, "Resources, Tools, and Strategies," describing the difficult Internet journey at the historic Granite School, which has been turned into a tech innovation hub for businesses.)



46. See Gold Country Media, April 14, 2022, https://goldcountrymedia.com/news/216025/folsom-council-approves-17m-in-tax-bonds-for-folsom-ranch-infrastructure/ (documenting City Council actions including execution of a fiber optic network contract with SiFi Networks); see also https://sifinetworks.com/residential/cities/folsom-fibercity-ca/

City of Citrus Heights

Citrus Heights was a predominantly rural area of northern Sacramento County until the 1970s. At that time, suburban development began moving at a rapid pace, with the area becoming an important retail destination for the region with the addition of Sunrise Mall. The City of Citrus Heights incorporated in 1997.

Today, economic development and the business climate are priorities for the City. In particular, the City has adopted the Sunrise Tomorrow Specific Plan to revitalize the 100-acre Sunrise Mall property with mixed use development.

During outreach for this study, elected officials noted that broadband connectivity is problematic in residential areas of the city, which are extensive, as well as business corridors. Service gaps have had an impact on the workforce in the area, they said.

Data and mapping analysis bears this out. (See Map 13 in Appendix 2.) The Map shows many unserved locations scattered throughout City limits including along busy business corridors.

City of Galt

In Galt, a small city in southern Sacramento County, civic and business leaders cited concerns around the need for more digital training and education. The Galt Chamber of Commerce has just over 200 members, most of them small "mom and pop shops," said Kat Seabolt, community relations director for the Chamber.

Mapping work for this study shows multiple locations within commercially and industrially zoned areas with inadequate broadband availability. (See Map 9 in Appendix 2.) In addition, according to Seabolt, as many as 40 percent of Galt member businesses are not connected to the Internet, and thus are not using websites and social media to advertise and help their businesses thrive. This, in turn, affects the business climate of the city.

In recent months, the Chamber and the City of Galt have worked together to address these and other business needs through a Memorandum of Understanding that will allocate federal American Rescue Plan Act funds to a variety of programs and activities to be undertaken collaboratively.

Those activities include a \$15,000 funding allocation to provide business marketing workshops, led by a professional expert, to help Galt's small businesses leverage social media, build online presence, and develop customer attraction strategies.

Galt businesses, themselves, are also taking steps to become more digitally connected. (See the Case Study in Section 3, "Strategies, Tools and Resources," about a small family-owned business entering the modern digital world.)

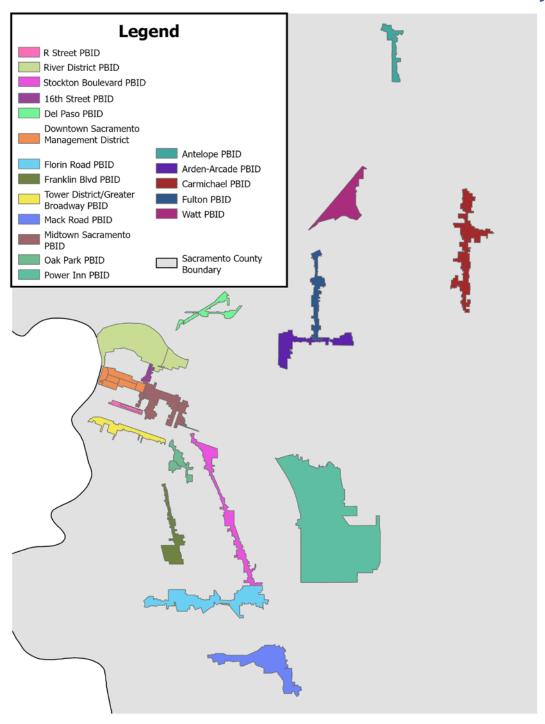


Property And Business Improvement Districts (PBIDs)

Another window on business broadband health in Sacramento County can be found in Property and Business Improvement Districts (PBIDs), explained earlier in Section 2 and further discussed in Appendix 2.

Significantly, every PBID analyzed for this project through data and mapping analysis turned up clusters, chains, or sprinklings of Unserved Locations – shown as colored hexagons at three levels of unserved severity – within areas with commercial and industrial uses.

Map 22 Property and Business Improvement Districts (PBIDs) in Sacramento County





In interviews for this project, PBID executives noted that their primary day-to-day priorities revolve their public safety mandate – managing and reducing vandalism, trespassing, property crimes, and shoplifting. These issues have become increasingly demanding and require a great deal of time and energy, both for businesses and PBID executives. Thus, they said, broadband was not a commonly cited problem raised by their businesses.

Several PBID executives assisted this project by distributing the Business Broadband Survey to their businesses through their newsletters and other communications channels.

Several PBID executives who were interviewed noted that even where broadband access is sufficient, they were still concerned about business owners and employees who need more digital education and training to help them make full use of the Internet to strengthen their marketing, operations, and overall functionality.

For example, the **Del Paso Boulevard Partnership** serves 340 businesses located in a relatively low-income neighborhood with two large throughways – Arden Way and Del Paso Boulevard. The businesses are predominantly small and independent, said Executive Director Daniel Savala. While some are tech-savvy, many others are not taking advantage of the Internet for e-commerce or web marketing because they lack the digital skills to do so.

"Every business needs good Internet service," Savala said. "We have to prepare our existing businesses for the digital age." He noted, for example, that restaurants that are not using Internet-based promotional applications may be losing out on business opportunities. "For a new restaurant opening for the first time, Door Dash is a deal breaker. If you don't have that capacity, you're in a tough spot," he said.

Other PBID representatives said the same, particularly along older business corridors, where businesses tend to be small, independent, and often owned by individuals with limited English skills.

The Franklin Boulevard Business District,

for example, covers a compact and tightly-knit community between 12th Avenue and 47th Street with Franklin Boulevard serving as the core artery. More than 500 businesses operate in this working-class neighborhood, nearly all small, with many run by Latino, Hmong and Slavic owners.

The Franklin Boulevard Business District area originally had a concentration of automotive-based businesses, and has changed with time to include other businesses such as clothing shops, bars and night clubs, insurance offices, and more.

Michael Bokan, Executive Director, and Kendra Macias Reed, Deputy Director, said that while roughly one-third of the businesses are tech-savvy, the remainder are not using digital technology. Some do not use email, run their operations on their phones, and are still conducting transactions in cash.

The Tower District, a PBID serving businesses along the Broadway commercial corridor near downtown, contains the iconic art deco Tower Theater and serves an eclectic and diverse collection of about 250 businesses. The district generally has adequate access to Internet services, said Joan Borucki, Executive Director.

But although many owners are adept with digital business applications, others struggle, she said, noting that during the pandemic, the City's Inclusive Economic Development Collaborative took important steps to assist businesses in getting online, building websites, and using digital services to function during shut-downs.⁴⁷

Taking advantage of all the Internet has to offer can be critical to business success, she said.





47. More information can be found here: https://www.sacasiancc.org/wp-content/uploads/2023/08/2022-23-City-of-Sacramento-MBARK-ARPA-Program-Report_FINAL-10.pdf



Sacramento County Rural Challenges

The Sacramento County Farm Bureau, with offices in the Old Town area of Elk Grove, has 400 members who are agricultural producers and another 800 resident members who are retired farmers, who run hobby farms, or who otherwise support the Bureau's activities. Many are located in the southern portion of Sacramento County in the Delta.

Top-producing commodities for Sacramento County Farm Bureau members include grapes, pears, cattle and dairy, cherries, row crops, fisheries with caviar and sturgeon, and nuts.

The lack of adequate broadband access in Sacramento County's rural farmlands is a widespread and longstanding problem, both for residential and family needs as well as agricultural operations, said Amber McDowell, Executive Director of the Sacramento County Farm Bureau.

High-speed Internet is needed to operate hightech machinery and precision irrigation systems, to upload reports to the government about everything from pesticide usage to irrigated lands requirements, and to handle day-to-day business operations such as managing supplies and training employees.

"The need for Internet is really becoming critical for agribusiness compliance," McDowell said. "Throughout the Delta, it is a huge issue."

During a January 2024 meeting of the Sacramento County Farm Bureau's board of directors, the question, "How is your Internet?" unleashed a wave of comments around the large conference table. Directors ticked off a litany of challenges they face on a daily basis because of spotty or unavailable broadband service.

"Our coverage is terrible," said Russell van Loben Sels, who is based in Courtland and grows wine grapes, pears and row crops. "You get out in an orchard with a phone and you might as well be 100 miles from anywhere."

Sacramento County has vast areas of agricultural land (shown in green on Map 3 in Section 2), with many locations deemed unserved by the CPUC. In some areas the unserved locations – which are shown as hexagons in three deepening peach-reddish tones that indicate increasing severity – are dense and spread over large tracts, including within the Sacramento-San Joaquin Delta, surrounding the City of Galt, and east of the City of Elk Grove.

Please see related discussion below regarding the Sacramento-San Joaquin Delta, a portion of which is found within Sacramento and Yolo Counties.

"You get out in an orchard with a phone and you might as well be 100 miles from anywhere."

- Russell van Loben Sels



Yolo County

Yolo County is a largely rural county bordered by the Sacramento River on its eastern edge. Yolo County has a population of 220,880 people, with most living in the four incorporated cities: Davis, West Sacramento, Winters and Woodland. Valley Vision has a long history of working with the county and its cities on broadband, food, and agriculture initiatives.

More than 90 percent of the land in Yolo County is dedicated to agricultural production or open space. Based on a review of existing studies, responses to the Business Broadband Survey, mapping research, and interviews, broadband access and adoption vary widely, with many unmet needs for businesses as well as residents.

Mapping data research for this report – which analyzed locations that are unserved by adequate broadband within agriculturally, commercially, and industrially zoned areas in the County – showed many unserved locations in traditional business-oriented zones within the four city limits, as well as in the expansive agricultural areas of Yolo County.

In rural agricultural areas, needs are particularly acute in areas west and northwest of Woodland, including the community of Esparto and the wine-producing regions of the Capay Valley and Dunnigan Hills, as well as southern portions of Yolo County located within the Sacramento-San Joaquin Delta. (See Map 4 above for the County of Yolo.)

These findings mirror needs identified in a county-wide broadband study conducted in 2015, many of which still persist. Please see related discussion below regarding the Sacramento-San Joaquin Delta, a portion of which is found within Sacramento and Yolo Counties.



City of Winters

The City of Winters lies in the rural western side of Yolo County. It is home to a thriving downtown business community with historic building stock, popular restaurants, and businesses dedicated to nearby wine-growing operations.

Unfortunately, the downtown suffers from inadequate broadband service with low bandwidth and frequent outages, which negatively impacts business operations and has led downtown business owners to band together in search of work-arounds and solutions.

"It's a real problem," said Carla Wroten, owner of Steady Eddy's Coffee Shop. She cited times when the restaurant has come to a complete standstill because of unstable Internet connectivity.

Owners operating businesses both downtown and on nearby agricultural operations are working closely with city and county representatives and Internet service providers to resolve the problems. Solutions have proven elusive. For example, they recalled getting their hopes up when working with sales departments of potential Internet providers, only to learn later from the providers' technical staff that the proffered solutions were technically not feasible.



48. Yolo County Profile, Sacramento Region Coordinated Rural Opportunities Plan, Valley Vision, March 2024. https://www.valleyvision.org/wp-content/uploads/Yolo-County_CROPreport.pdf

^{49.} Yolo Broadband Strategic Plan, Magellan Advisors, March 26, 2015. https://www.yololafco.org/files/cbeb23541/YoloLAFCoBroadbandStrategicPlanFINAL+03.26.15.pdf



"Businesses feel left alone trying to figure it out," said Emarie VanGalio, chief operating officer of Buckhorn Café, Inc. in Winters. (See related Case Study in Section 2 regarding the challenges faced by downtown Winters businesses.)

Unserved locations are scattered throughout the City of Winters, based on data and mapping analysis for this project. (See Map 14 in Appendix 2.)

City of Davis

The City of Davis, located near Interstate 80 in Yolo County, is home to the University of California, Davis. It is a quintessential college town with a thriving small business community.

The University campus, a major employer and incubator for business growth, met its broadband Internet needs long ago.⁵⁰ But business broadband service elsewhere is still subpar in places, based on survey results, interviews, and research.

Mapping and data analysis show the CPUC-deemed unserved locations within the City's key business areas, as well as residential areas. (See Map 15 in Appendix 2.)

"Faster internet would save thousands per year in employee productivity."

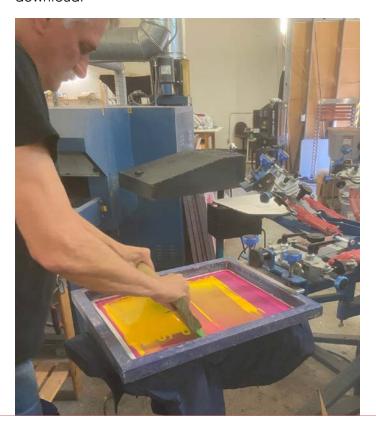
- Jason Steenbergen, Ink Monkey Graphics

Ink Monkey Graphics is a case in point. Owner Jason Steenbergen wrote in his response to the Business Broadband Survey: "Our hardline service comes from old phone lines and is extremely slow. We have had to go to cellular Internet which is also very slow and unreliable. Faster internet would save thousands per year in employee productivity."

In an interview, Steenbergen explained that he runs a screen printing and embroidery business in a repurposed steel galvanizing plant in Davis. Housing units and development are all around, yet he is left with an old-fashioned AT&T copper phone line for running Internet service; it provides 3 megabits (Mbps) per second download speeds, which are too slow to keep up with his business needs.

Steenbergen has contracted with another cellular provider, Verizon, which is now his source for Internet service and Voice Over Internet Protocol phone service. The new service is faster, but still slows during the week to the 3 Mbps levels, which in turn slows his working operations.

"It becomes a drag when we are waiting for things to download," he said. "It would be amazing if we had consistent speeds of even 20 megabits per second download."



City of West Sacramento

The City of West Sacramento is a growing city along the Sacramento River in eastern Yolo County. It is home to Sutter Health Park where the Sacramento River Cats minor league baseball team plays and where the Oakland A's major league baseball team will take up temporary residence soon.

Businesses run the gamut and include large international retailers such as Ikea, major industrial operations at the Port of West Sacramento, the expanding grocery chain Raley's, professional services of all types, and numerous small businesses.

Based on research, interviews, and mapping results, larger business operations generally are able to meet their digital and technical requirements through inhouse technical staff and procurement of the Internet service they need. (See Raley's Case Study in Section 3, "Strategies, Tools, and Resources.")

Meanwhile, smaller enterprises struggle.

The Better Meat Company in West Sacramento, for example, struggles to keep its product production processes going – which depend on the Internet – while at the same time keeping all the other necessary Internet-dependent business operations running simultaneously. (See Case Study in Section 2.)

The Better Meat Company is not alone. Data and mapping analysis for the City of West Sacramento shows many unserved locations throughout the city, including in many areas zoned for commercial and industrial uses. (See Map 16 in Appendix 2.)

The City of West Sacramento is currently in the midst of updating its earlier broadband assessments.⁵¹ A 2017 broadband infrastructure assessment for the City provides a helpful overview of conditions there.⁵²

That study found the city had generally average primary broadband infrastructure available for home use and for small- to mid-size businesses, though household adoption or usage of broadband was inconsistent, with lower-income households subscribing and using the Internet at lower rates.

The 2017 study found the city has superior industrial broadband infrastructure with several east-west and north-south transcontinental fiber routes crossing the city, two large data centers, and other notable fiber assets. This excellent infrastructure, however, was found to not be developed to its full potential. The study explained the significance of this finding as follows:

"This deficit reduces the value of the City's commercial real estate inventory by making it less attractive to relocating or expanding businesses. It is a common problem among Californian cities, particularly those with older industrial areas. High technology businesses will not locate or expand where broadband service is insufficient to their needs, leaving property owners with fewer options for tenants and cities with reduced revenue from jobs, sales and economic growth.⁵³

The West Sacramento study also explored business conditions and perceptions through a workshop and survey tools, and found that businesses viewed broadband as an essential utility, yet generally felt the Internet service they received did not meet their needs in terms of speed, reliability and customer service. Cost was another cited concern. At the time of the 2017 study, businesses generally contracted with either Wave or AT&T, the dominant providers in the market at the time⁵⁴ and currently.

^{51.} Valley Vision is assisting this effort for the City.

^{52.} City of West Sacramento Broadband Infrastructure Assessment and Action Plan, Tellus Venture Associates, March 17, https://www.tellusventure.com/downloads/bank/west_sacramento_broadband_infrastructure_assessment_and_action_plan_30mar2017.pdf

^{53.} Ibid.

City of Woodland

The City of Woodland is the county seat of Yolo County and is located about 15 miles northwest of the City of Sacramento. It features well preserved historic buildings, as well as modern developments.

The business community includes sizeable retail distribution centers and manufacturers, medical facilities, professional services, farm machinery and other agriculture-serving businesses, and a host of other mid-sized and small businesses.

Staff members within the City of Woodland, like many municipal leaders, have tried to stay abreast of the rapidly changing broadband and Internet landscape on behalf of their residents, businesses, and government operations. It is not easy, with many new statewide and federal funding streams and subsidy programs, complex broadband service maps, and the proprietary nature of providers.

At the City level, officials said they had not heard a lot from businesses about broadband needs. But they are aware that data suggests parts of Woodland are underserved and they are trying to keep up with the flow of information and identify any target areas of need.

Those instincts are well supported. Data and mapping analysis shows that Woodland has locations that are considered "unserved" by the CPUC within both residential and business areas. (Map 17, Appendix Section 2.)

Rural Needs in Yolo County

Much of Yolo County is rural and devoted to agricultural production. Like other rural communities in the region, the Yolo County farming community shares similar broadband concerns and hardships related to operating high-tech equipment and precision irrigation, managing electronic reporting requirements to the government, and running day-to-day operations.

Mapping research for this report – which analyzed locations that are unserved by broadband within agriculturally, commercially, and industrially zoned areas in Yolo County – showed that outside of municipal limits, there are vast tracts of agricultural land, with many deemed unserved by the CPUC. (See Map 4 in Section 2 for the County of Yolo.)

In rural agricultural areas, needs are particularly acute in areas west and northwest of Woodland, including the community of Esparto and the wine-producing regions of the Capay Valley and Dunnigan Hills, as well as southern portions of Yolo County located within the Sacramento-San Joaquin Delta.

Please see related discussion below regarding the Sacramento-San Joaquin Delta, a portion of which is found within Sacramento and Yolo Counties.



Yuba and Sutter Counties

Yuba County and Sutter County sit side by side north of Sacramento County and share many of the same landscape features, business community make-ups, broadband challenges, and institutional connections.

Yuba County is a largely rural county with a diverse landscape including the Sierra Nevada foothills and the Yuba River Watershed. It has a population of more than 82,600 and includes two incorporated cities, Marysville and Wheatland, as well as smaller communities and Beale Air Force Base. 55 Beale Air Force Base is one of the largest industries in Yuba County, along with agriculture.

Sutter County's population is slightly larger at 95,952 and it also has two incorporated cities, Yuba City and Live Oak. One of Sutter County's claims to fame is being home to the "world's smallest mountain range," the Sutter Buttes, which are surrounded by miles of farmland and open spaces.⁵⁶

In Sutter County, agriculture and food production by more than 2,100 producers represents a major industry, comprising 20 percent of Sutter County's overall economic output.⁵⁷ Broadband access and adoption vary widely across these two counties, according to a review of existing studies and initiatives, responses to the Business Broadband Survey, mapping research, and interviews. Areas where businesses operate have many unserved locations, based on data and mapping analysis showing unserved locations in areas zoned for agricultural, commercial, and industrial uses. (See Maps 5 and 6 above and Maps 18, 19, 20, and 21 in Appendix 2.)

Generally, conditions are better within city limits versus outside city limits, said Brynda Stranix, President of the Yuba Sutter Economic Development Corporation. Where broadband and other necessary infrastructure is sparse, it inhibits economic development.

"We have companies that would like to come and we can't site them here because we don't have the infrastructure," Stranix said, noting that water and wastewater facilities, as well as broadband are persistent concerns.



55. Yuba County Profile, Sacramento Region Coordinated Rural Opportunities Plan, Valley Vision, March 2024. https://www.valleyvision.org/wp-content/uploads/Yuba-County CROPreport.pdf

57. Ibid.

^{56.} Sutter County Profile, Sacramento Region Coordinated Rural Opportunities Plan, Valley Vision, March 2024. https://www.valleyvision.org/wp-content/uploads/Sutter-County_CROPreport.pdf

Data and mapping analysis for this study show that Wheatland in Yuba County has fewer unserved areas in commercially zoned areas, while Marysville (Yuba County), Yuba City (Sutter County) and Live Oak (Sutter County) have more such areas. (See Maps 18-21 in Appendix 2.)

In the vast majority of Yuba County's foothills communities, broadband service and cellular phone service are barely available if at all, said Rachel Downs, Yuba County's Business Engagement Manager. "Ten minutes past Marysville ... you have zero connectivity," she said, noting that at best, "it's dial-up circa-1995."

For businesses in these areas, which tend to be small and independently owned, this poses hardships ranging from not being able to run standard Internet-based accounting software to not being able to have a web presence that can help draw customers and visitors.

A further indicator of business broadband conditions in Yuba and Sutter counties is the United Chamber Policy Network's (UCAN) 2023 policy agenda for the Sacramento region. Through this network, local Chambers of Commerce in the region, including the Yuba-Sutter Chamber of Commerce, work together to advocate at the state level on behalf of members' shared interests. UCAN includes 10 Chambers of Commerce in the Sacramento region, representing more than 6,000 member businesses and organizations.⁵⁸

The 2023 UCAN policy agenda includes six priorities, including reducing homelessness and building a skilled trained workforce. Also on the list: Funding and completing critical infrastructure, including transportation, water and forest health, energy, and high-speed internet.⁵⁹

According to Christine Ivory, past president of the Yuba-Sutter County Farm Bureau, rural and agricultural areas are especially impacted. Even where service is available, she said, it is a patchwork from one location to another.

For example, near Ivory's family farm in Sutter County, AT&T provides service to a large peach cold storage and receiving company five miles north of Yuba City, but her family's ranch one-quarter mile away – which produces peaches, prunes, walnuts and rice – cannot get this service. "It doesn't make sense," she said.

At Ivory's home office, where she works remotely as an executive for Blue Diamond based in Sacramento, she often loses Internet and routinely finds herself dropped from Microsoft Teams virtual meetings.

"We all struggle," Ivory said. Similar challenges are commonplace in this productive farming region, as well as its smaller populated communities.

A 2023 study of telecommunications and broadband service in Yuba County identified broadband needs within the county. Under eligibility definitions for the federal Broadband Equity, Access and Deployment (BEAD) program, Yuba County had 2,636 households (9.3 percent) classified as unserved because they lack 25/3 Mbps service and 1,733 households (6.1 percent) classified as underserved because they have service over 25/3 but under 100/20 Mbps. A total of 993 locations (3.5 percent) were found to be critically unserved – lacking any reported service meeting even a very minimal 10/1 Mbps service level.⁶⁰

Yuba County, as well as incorporated cities in Yuba and Sutter counties, are attempting to find solutions, including working with SiFi Networks to build fiberoptic networks to enhance broadband service.

"Ten minutes past Marysville ... you have zero connectivity.

It's dial-up circa-1995."

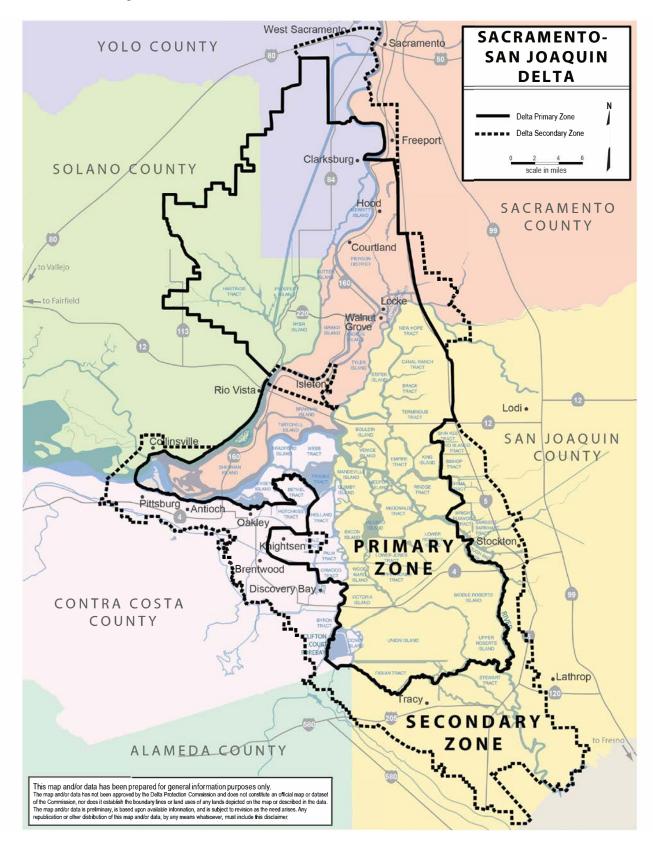
- Rachel Downs, Yuba County

^{58. 2023} State Policy Agenda, United Chamber Advocacy Network, https://irp.cdn-website.com/ff44e796/files/uploaded/2023-ucan-state-policy-agenda-final.pdf
59. Ibid

^{60.} Yuba County Broadband Planning and Feasibility Study, Tilson, 2023.

The Sacramento-San Joaquin Delta

The Sacramento-San Joaquin Delta includes roughly half a million acres of waterways and farmed lands across six counties – two of which (Sacramento and Yolo) are within this business broadband research area. It is a central water hub serving much of the State of California.



The Delta is a high-producing agricultural region, where a variety of farms, orchards, and vineyards are cultivated. Modern-day farming depends on broadband and Internet access to support numerous necessary technologies.

Yet, according to a 2019 study, the region does not have reliable, available high-speed Internet in many places because of remote and rugged terrains and a lack of sufficient population concentrations to support Internet provider investments.⁶¹

The study documented the extreme lack of broadband service needed for the communities and businesses within the Delta:

"Households and businesses within the legacy communities have no fiber optic options, only one (and in some cases no) digital subscriber line (DSL) provider option, limited fixed wireless options which are entirely dependent on place of residence/business, and two satellite options. Most of the options that do exist are inadequate... Broadband quality and access challenges in the Delta are exacerbated by limited provider investment and physical terrain barriers.

The underinvestment from service providers can be linked to return on investment.
Generally, the internet service providers (ISPs) look for evidence that costs will be recovered, and ultimately, profit will result from their infrastructure investments.
Achieving return on investment in rural communities is a tall order, which may necessitate supplemental resources."62

As part of this Delta broadband study, concerns for non-English speakers, older Californians, and low-income households were identified, as well as general public safety concerns related to flood and earthquake risks.⁶³ Public safety is a concern for business owners and residents of the Delta, where levees are abundant and pose flooding risks from large storms or potential earthquakes.



61. Connecting the Delta: Broadband Action Plan, Valley Vision and Delta Protection Commission, August 2019. https://delta.ca.gov/wp-content/uploads/2021/01/2019-09-19-Broadband-Action-Plan_508.pdf

62. Ibid.

63. Ibid.



CASE STUDIES

CASE STUDY:

The Better Meat Company, West Sacramento

The Better Meat Company is not standing still. The food tech start-up pioneered a game-changing meat alternative ingredient, gathered investors, launched its production facility five years ago in West Sacramento in Yolo County, and made its mark. In March of 2024, Time Magazine named The Better Meat Company one of the top green-tech companies in the nation in its inaugural ranking.⁶⁴



Behind the scenes, insufficient broadband access has been an unexpected, difficult challenge.

The company developed a method of fermentation that transforms microscopic fungi into a high-quality meat alternative ingredient that other companies use as an ingredient with animal-free meats or to enhance animal meat texture, price, and sustainability. The fermentation process requires

maintaining a controlled environment within reactors, much like a brewery, explained Doni Curkendall, Executive Vice President for Business Operations.

Those reactors require monitoring and sensors that rely on the Internet. So does everything else about operating a company like this – from running payroll to ordering supplies to handling product distribution systems.

As the company grew from nine to two dozen employees, the available Internet service grew increasingly insufficient. The Better Meat Company took the usual troubleshooting steps of adding router devices and extenders to the WiFi system, but it hasn't been enough. Curkendall was informed that a fiber connection would entail exorbitant costs.

Curkendall has found herself sending employees home to work remotely on days when she knows the broadband system won't meet company capacity, using her own personal hotspots to handle business operations, and apologizing to board members when remote meetings with investors inconveniently drop off.

"Last week, I tried to run payroll and the Internet kept kicking me off," Curkendall said. "I can't even tell you the thousands of ways this has been disruptive for us."



Doni Curkendall,
 The Better Meat Co.



CASE STUDY: Farming in Sutter County

Kelli Evans farms with her family in Sutter County on land

purchased by her grandfather in 1948. Their company, Evans

"We're trying to be wise with our water, but it's difficult when we have spotty service and can't access the data."



A third-generation Hispanic farmer, Evans also started her own ag-related firm, Evans Ag Consulting in 2018. She works from an office in Live Oak in Sutter County helping clients find funding for sustainable agriculture and upgrading equipment.

Unreliable Internet service is a major problem for these enterprises, bringing frequent slowdowns and interruptions, especially during rainy

weather or high heat. At Evans' consultancy, it can turn basic business activities such as virtual meetings and running printers into exercises in frustration.

Family farm operations also are impacted. Evans Farming uses modern computer-based machinery, equipment, and management tools, ranging from tractors with touch screens to moisture-sensing technologies for irrigation.

"The Internet is required to run these. It's GIS-based, precision ag," Evans explained. Farm employees use cell phones to run the equipment in the fields, but when software updates are needed, they must move the machinery, sometimes many miles, to tap into adequate broadband.

Making optimal use of precision-irrigation systems also is difficult due to poor cell service in the fields. "We're trying to be wise with our water," Evans said, "but it's difficult when we have spotty service and can't access the data."

Cell service is so spotty that family members and employees all carry two phones from different providers to help navigate dead zones, including areas the locals refer to as "Bermuda Triangles" in and around the Sutter Buttes. In all, the farm company pays three different carriers for 14 separate mobile phone lines to keep eight Evans Farming people communicating. All carry two-way radios for further back-up and security.

"We can't move the mountains," Evans said resolutely, "so we just try to make do."

"We can't move the mountains so we just try to make do."

– Kelli Evans, Evans Ag Consulting





CASE STUDY:

Businesses in Downtown Winters

Downtown Winters in Yolo County is a charming place with historic buildings, restaurants and wine tasting rooms, and music and arts venues. Business owners are close-knit and supportive of one another and their community.

They enjoy their town, their work, their customers. But not their broadband situation.

Some businesses near Main Street have reliable Internet service thanks to an AT&T underground fiber upgrade, while others cannot access it and rely on old copper lines or wireless. The businesses have been patching together service solutions through various carriers. Outcomes are spotty.

Take Steady Eddy's Coffee Shop, co-owned by Carla Wroten and her husband. The restaurant is open seven days and enjoys a loyal customer base. On a recent Sunday, Wroten had to close early. Customers were waiting to get in, but the Internet had gone down along with Internet-based applications including her ordering and point-of-sale system. She lost roughly \$400 in business.



It wasn't the first time. "This is a real problem," she said. "We can't take money. We can't take orders. We can't get into our cash registers. We can't do business."

Other area business owners had similar frustrations. In one of many examples, Corinne Martinez, Co-owner and President of Berryessa Gap Vineyards, buys Internet service through multiple accounts with different providers to ensure back-up for the times when service fails.

The Winters business owners do what they can to cooperatively troubleshoot. One restaurant owner, for example, found a way to bounce her service via antenna to help support another nearby business owner, who summed up the situation wryly:

"So my internet provider is the restaurant next door."

"This is a real problem. We can't take money. We can't take orders. We can't get into our cash registers. We can't do business."

– Carla Wroten, Steady Eddy's



ADAMSIC

"It's a tourist district. You want people to be able to take pictures and stream video."

- Shira Lane, Atrium 916



CASE STUDY:

Artists Marketplace in Historic Old Sacramento Waterfront

The Old Sacramento Waterfront is a tourist destination and point of pride for the City of Sacramento – and the Capital Region – as a registered National and California Historic Landmark.

It is also home to a strikingly diverse business community with 64 percent of businesses being women- and minority-owned. The business mix includes



restaurants and small shops typical of tourist locations, but also many other small and mediumsized businesses such as professional services and tech enterprises.

Over the years, the City has worked to support these businesses through events programming, marketing, and waterfront improvements.

One improvement that has

so far been elusive has been robust broadband service, according to City Economic Development staff. Many of the challenges are physical, such as bringing modern technology to an area filled with historic buildings and brick-covered streets.

Additionally, many businesses do not have websites or online activities – signaling a need for digital education and training.

Among those struggling has been Atrium 916, a nonprofit marketplace for local artists with an inspiring motto: "Building a kind, creative, and sustainable circular economy."

Atrium 916 operates in a city-owned building that was constructed in the 1970s and stood dormant for years until the artists marketplace moved in post-pandemic, according to Shira Lane, Founding Director and CEO. The existing provider's broadband was so limited that virtual meetings were a struggle and security cameras had to be turned off when point-of-sale applications were running.

"We had to do a lot of our work from elsewhere," Lane said. In late 2023, Lane's team switched to T-Mobile for cellular Internet service, which works better though is still weaker than needed.

Businesses aren't the only ones who need good Internet in Old Sacramento, Lane said. Visitors do too. "It's a tourist district. You want people to be able to take pictures and stream video."

Despite the frustrations, Lane is optimistic about Atrium 916's potential for supporting artists and hopeful that better broadband will one day come to Old Sacramento.



CASE STUDY: Solar Panel Installations, Sutter County

Just outside the small town of Sutter, a business owned by a service-disabled veteran is helping California meet its climate goals with cutting edge solar technology, yet cannot get adequate broadband to run its equipment.

Safe Haven Solar has been installing solar energy panels for residential and commercial uses since 2018. The company in Sutter County has a busy schedule, seven employees, seven computers, and no Information Technology staff.

Yet technology is critical to this business. Monica Frere, who leads marketing at Safe Haven Solar, said she is not a technical expert and has no idea what download or upload speeds she is receiving from her Internet service. But she does know one thing: "The Internet goes down a lot."

Like many small businesses serving specialized sectors, Safe Haven Solar has unique Internet-based needs. One of those is engraving the 6-inch by 6-inch metal placards that must be placed on utility boxes at installation sites (think: engraved metal placards on kids' sports trophies) with warnings and customized safety information to inform responders in case of an emergency.

When the Internet fails, so do Safe Haven's Internet-dependent engraving tools. "Sometimes it stops every 12 or 13 seconds or so, and I have to stand there and push the button again and again," she said.

She is not sure why it happens: "The network just seems to get weighed down."

It is a mystery and a burden that Safe Haven Solar weathers, but would certainly prefer a solution.

"Sometimes it stops every 12 or 13 seconds or so, and I have to stand there and push the button again and again."

> – Monica Frere, Safe Haven





"We are in a pocket that basically has no access to broadband Internet."

– John Shea, Universal Signs



CASE STUDY: Universal Signs in Elk Grove

Universal Signs is a full-service creative studio that serves commercial businesses with their signage needs, both interior and exterior. Two years ago, President and CEO John Shea, a long-time Elk Grove resident, hung his shingle in the Old Town area of Elk Grove, which is in southern Sacramento County.



When he executed his lease, Shea assumed he could get cable or fiber to serve his business needs. Then reality set in: "We are in a pocket that basically has no access to broadband Internet," he said.

Shea contacted fellow business owners in his complex to ask: How are you coping Internet-wise? Many, he learned, were on slow old-school DSL lines.

He researched and called providers without success. He finally engaged with AT&T to purchase wireless broadband, assisted by a router.

"It's not horrible," he said of his current service. But digital logjams are common.

Shea and his employees must

engage in work activities that require a lot of bandwidth from the Internet, such as transferring large digital files. If at the same time, an employee is using the Internet for certain activities such as a training video, everyone else's speeds are sapped and they are effectively "down."

Shea said he became something of a squeaky wheel for a time, raising his frustrations in settings where City officials were present.

As it turned out, his concerns fell on interested ears. At the same time, the City of Elk Grove was exploring ways to improve broadband service and digital equity within its growing community.

Plans are now under way to develop a municipal fiber network that may help businesses such as Universal Signs, said Carrie Whitlock, Strategic Planning and Innovation Program Manager for the City.



"State, regional, and local solutions must be pursued concurrently, in an 'all hands on deck,' multipronged approach."

- CETF

OVERVIEW

Broadband and digital equity needs for businesses in the Capital Region are widespread, varied, and nuanced. This section provides Strategies, Tools, and Resources that can help fill the needs and gaps.

Everyone has a role to play: Governments, businesses, organizations serving businesses, and technology providers.

As the California Emergency Technology Fund (CETF) has explained:

"There is consensus about the value of broadband access to individuals and their communities, but multiple barriers remain, including insufficient speeds, costs and pricing, lack of competition, and regulatory processes, among others. ... State, regional, and local solutions must be pursued concurrently, in an 'all hands on deck,' multi-pronged approach."

^{1. &}quot;Getting Connected, A Broadband Deployment and Adoption Resource Guide for Local and Regional Governments," California Emerging Technology Fund and Valley Vision, March 2021, https://www.cetfund.org/wp-content/uploads/2021/04/Getting-Connected-A-Broadband-Deployment-and-Adoption-Resource-Guide-For-Local-and-Regional-Government-Leaders.pdf

BUSINESS BROADBAND STRATEGIES

Partner in Solutions	Solution Opportunities
Governments (Counties, cities, public utilities, other public entities)	• Identify infrastructure gaps through technical and mapping tools, consultation with business community, and Internet service providers and technical experts.
	• Understand funding opportunities for infrastructure projects, including federal and state grant opportunities, special district financing tools, and private capital sources.
	• Explore deployment alternatives, such as public-private partnerships and development of municipally owned and operated open-access fiber networks.
	• Streamline government processes to facilitate efficient and cost-effective permitting for deployment, including within public rights of way and facilities.
	• Lead and partner on digital education and training with the business community, jurisdictions, providers and Connected Capital Area Broadband Consortium; include disaster and emergency preparedness.
Businesses	• Seek assistance on broadband needs through research, contacting providers and governments, and networking within the business community.
	 Advocate effectively by identifying key broadband needs and conditions of the business.
	• Develop the right Tech Stack and Connectivity by aligning business functions with software applications and platforms and connecting to the Internet; seek professional technical assistance if needed.
	Access digital training opportunities, which are widely available.
Business Organizations (Chambers of Commerce, Farm Bureaus, PBIDS, nonprofit Economic Development organizations)	• Check in on businesses about digital and broadband needs, which are not always obvious.
	• Support broadband infrastructure deployment by governments and Internet service providers.
	• Problem-solve with businesses and advocate on their behalf on the three critical Internet quality measures – reliability, speed, and affordability – as well as emergency preparation via back-up systems and redundancy.
	• Collaborate on digital training and education by disseminating information, and leading and partnering with governments, local workforce boards, community organizations, business groups, tech experts, and anchor institutions such as schools, universities, and libraries.

BUSINESS BROADBAND STRATEGIES

Partner in Solutions	Solution Opportunities
Internet Service Providers	• Engage with businesses and groups that support them, such as Chambers of Commerce and Farm Bureaus, to understand business-specific and sector-specific needs.
	• Partner with governments to streamline regulatory and permitting programs affecting deployment and seek input and support for deployment plans.
	 Align operations to ensure business customers get clear, reliable, and consistent information from websites, sales staff, and technical implementing staff.
	• Innovate to help provide digital education and training for businesses.



GOVERNMENTS: STRATEGIES, TOOLS, AND RESOURCES

Identify Service Gaps

One of the biggest challenges in remedying broadband gaps is understanding where those gaps actually exist.

Make Use of Public Maps

The California Public Utilities Commission (CPUC) and Federal Communications Commission (FCC) offer public maps showing unserved and underserved locations. The data for these maps is largely based on information from providers, and is not always complete or accurate. Both agencies have been working to improve the maps.

With the help of staff trained in data analysis, outside experts or both, government entities can use these maps to better understand local broadband gaps. According to Esri, a large global software company that helps clients handle GIS (Geographic Information System) data, jurisdictions nationwide are leveraging such tools to develop more accurate broadband service information as they tap new funding opportunities.² For local jurisdictions that already subscribe to Esri, it is important to explore and make use of these assets.

The California Department of Technology released a valuable resource, the "California Local Jurisdiction Broadband Permitting Playbook," in 2023. It covers many topics, including an extensive section, "Strategies for creating equitable access to information," with guidance on using public GIS data sets, documenting fiber assets and public conduit assets, and coordinating telecommunications infrastructure mapping across permitting agencies. It can be found here: https://broadbandforall.cdt.ca.gov/wp-content/uploads/sites/19/2024/05/CDT-Playbook_04222024.pdf

Connect with the Community

According to information technology consultants, governments can also take a lead in asking residents and businesses to run and report live speed tests showing the actual download and upload speeds being delivered to them.

In 2022, for example, El Dorado County led an initiative for all residents and business owners to self-report Internet speeds at home, work, and places where they are connected to the Internet, thus identifying areas without broadband service.³ Many governments statewide and nationwide have organized such initiatives as a way to document broadband conditions and advocate for improvements.

Meeting with businesses and learning about their place-specific and sector-specific needs is another solution space.

In an example of collaborative problem-solving, for example, government representatives from Yolo County, the City of Winters, the local school district, and the area's state Assembly representative's office met with local Winters business owners whose broadband was so spotty it shut down operations at times. The meeting left people feeling energized and committed to resolving the problems.



^{2. &}quot;Why GIS is a Part of Every Broadband Conversation," Esri Industry Blog, August 25, 2022, https://www.esri.com/en-us/industries/blog/articles/gis-broadband-conversation/

^{3.} Sacramento Region Coordinated Rural Opportunities Plan, Sacramento Region Profile, Valley Vision, March 2024, https://www.valleyvision.org/wp-content/uploads/Sacramento-Region CROPreport.pdf

Tap Other Data Sources

Another option for cities or counties is to subscribe to receive speed test data about their communities from companies such as Ookla Research, which aggregates speed tests nationwide.

It is also important for governments to know about the available fiber assets and data centers (public and private) within their jurisdictions, said Athol Smith, principal and co-founder of Makwara Solutions, LLC. In communities with built environments, there are often numerous fiber carriers with infrastructure within the community that governments may not be aware of.⁴

Beyond publicly available maps, information about such broadband assets is available through proprietary maps and informational products. Professional consulting firms can help with these types of inquiries and assessments.

The county, city, and PBID maps in this study (see Section 2 and Appendix 2) could be a starting point for analyzing business broadband access because they overlay areas with commercial types of zoning with data showing unserved broadband locations. Sharing the maps with the local business community and gathering further on-the-ground data about service and speeds could lead to an even fuller picture.

Plan for Disasters

In any analysis, an assessment of disaster risks should be included to promote redundant systems and back-up service in case of emergencies.

Work with Providers and Developers

Because broadband delivery is, for the most part, market-driven, governments can work to develop relationships with Internet providers to learn about their service areas and future deployment plans. Many Internet providers welcome such conversations, which can serve as a starting point for partnering on solutions.

Additionally and importantly, governments should engage with developers of new commercial, retail and industrial projects and make sure high-speed broadband infrastructure is being incorporated.

Economic Development and Prosperity

"Broadband increases innovation and productivity. This in turn attracts capital investments and talent, thereby accelerating job creation in the community, along with equity, as it also can support smaller, minority and women-owned businesses with e-commerce. It is a core enabling technology for multiple industries, including: agri-food tech; smart manufacturing; future mobility (i.e., EV infrastructure, autonomous vehicles, etc.); e-health; ICT; and sustainability."⁵

- California Emerging Technology Fund

^{4.} For further guidance and strategies, see "California Local Jurisdiction Broadband Permitting Playbook," prepared by the California Department of Technology in partnership with several other entities, May 2023, https://broadbandforall.cdt.ca.gov/wp-content/uploads/sites/19/2024/05/CDT-Playbook 04222024.pdf

^{5. &}quot;Getting Connected, A Broadband Deployment and Adoption Resource Guide for Local and Regional Governments," California Emerging Technology Fund and Valley Vision, March 2021, https://www.cetfund.org/wp-content/uploads/2021/04/Getting-Connected-A-Broadband-Deployment-and-Adoption-Resource-Guide-For-Local-and-Regional-Government-Leaders.pdf

Understand Funding Opportunities

Public Grant Funding Opportunities

Broadband Equity, Access, and Deployment (BEAD) Program. An unprecedented funding source for new broadband projects is coming to California and the nation through the Broadband Equity, Access, and Deployment (BEAD) program. This is a significant opportunity where governments can help lead, partner, and support projects funded by this program.

The <u>federal government</u> has awarded California \$1.86 billion in federal BEAD funding, out of \$42.25 billion available nationwide. The funding will be used to build broadband infrastructure in rural and historically underserved communities. The California Public Utilities Commission (CPUC) is administering the program.

BEAD funding will be prioritized as follows:

- Unserved locations that do not have access to Internet service speeds greater than 25/3 Mbps (25 megabits per second downstream / 3 megabits per second upstream) are the top priority.
- **Underserved locations** with Internet service between 25/3 Mbps and 100/20 Mbps are the next priority and will receive funding after unserved areas are connected.
- Community Anchor Institutions with Internet service under 1 Gbps (gigabits per second) symmetrical are the next priority after all unserved and underserved locations are connected.

During summer 2024, CPUC will begin a <u>BEAD</u> <u>Challenge Process</u> to ensure the accuracy of the current Federal Communications Commission <u>National Broadband Map</u>, which will be used to determine eligible locations for funding. During this process, certain entities including governments

Valley Vision and the Connected Capital Area Broadband Consortium serve as resource hubs for information requests on funding sources, connections with funders, and potential projects and strategies.

can submit input and evidence to the CPUC demonstrating that broadband serviceable locations on the map should or should not be designated for BEAD funding eligibility.

Following the challenge process, CPUC will manage a competitive sub-granting process. Competition is expected to be intense. Across the state, governments and Internet service providers are gearing up. This is an opportunity to keep the needs of businesses, along with residences and community institutions, at the forefront of the planning.

Federal Funding Account. The Federal Funding Account (FFA) Last Mile program⁶ is administered by CPUC. The FFA program has \$2 billion available in state and federal sources for last mile broadband deployment. CPUC accepted funding applications in 2023 and will finalize awards in 2024.

When the projects start proceeding, governments can support them by ensuring local regulatory and permitting processes are as streamlined as possible because the sooner the build-outs occur, the sooner businesses and residents will be served.

California Advanced Services Fund. The CASF⁷ program, also run by CPUC, is funded through telecom surcharges on customer bills. It provides an ongoing source of grant funding for infrastructure projects. The next round of grant funding is currently on hold, pending the BEAD process. But governments should become informed and engaged in these processes to help elevate the needs of both businesses and residents and encourage local grant applications for future rounds of funding.

^{6.} More information on the CPUC Federal Funding Account (FFA) is here: https://www.cpuc.ca.gov/federalfundingaccount and in this Valley Vision Memo: https://www.valleyvision.org/resources/connected-capital-area-broadband-consortium-memo-july-2023/

^{7.} More information on the CPUC California Advanced Services Fund (CASF) program is here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/california-advanced-services-fund

Statewide Middle-Mile Network. Local governments also should monitor development of the state-owned Open Access Middle-Mile Network⁸ as a potential resource for last-mile projects to connect individual businesses, homes and institutions. In a nutshell, governments should follow the path of implementation through the Capital Region, know where the Middle-Mile network is being deployed locally, and engage to ensure that last-mile projects are fully leveraging this new statewide asset.

Digital Adoption and Training. The California Department of Technology (CDT) is administering a new Digital Equity Plan, which will include opportunities to apply for a portion of \$70 million in federal funds available to California for Digital Equity work.

Additionally, the CPUC administers separate CASF accounts offering grants to serve specific needs including digital literacy and broadband access.¹⁰

Staying Connected. The digital equity programs described above provide opportunities for governments to lead, support, or partner with community-based organizations on grants that could have positive impacts for businesses and residences.

- Governments typically place responsibility for broadband issues in a particular department such as Public Works, Information Technology, or Economic Development, but should try to coordinate and liaison with other departments that are already engaging with nonprofits or community groups that could become digital equity partners.
- Governments should sign up for the list-serves on the public programs identified above because CPUC and CDT regularly send out updates, notices of grant opportunities, and invitations to informational webinars.
- Staying engaged with local workforce investment boards is also crucial. (See discussion below under "Lead and Partner on Digital Education and Training.")

 The Connected Capital Area Broadband Consortium (CCABC) managed by Valley Vision monitors these initiatives and welcomes engagement and partnering.

Other Public Funding Resources

In addition to the public resources above, several federal funding sources are potentially available to support target priority areas and businesses including:

- Downtown areas
- Underserved suburban corridors
- Commercial and industrial areas
- Rural areas including:
 - o Farms, orchards, ranches, and vineyards
 - o Processing and distribution facilities
 - o Small businesses serving rural communities

Resources include:

- The California Broadband for All Portal lists federal and state resources to support a range of broadband deployment, adoption, and digital literacy planning and implementation needs: https://broadbandforall.cdt.ca.gov/funding/
- The California Governor's Office of Emergency Services prepared a funding guide in August 2023 covering federal and state broadband infrastructure funding sources: https://www.caloes.ca.gov/wp-content/uploads/2023/09/Broadband-Resource-Guide-8-3-23.pdf
- The National Telecommunications and Information Administration offers an interactive guide and a search tool to learn about more than 70 funding sources across several federal agencies: https://broadbandusa.ntia.doc.gov/funding-programs

^{8.} More information on the state's Middle-Mile Network can be found here: https://middle-mile-broadband-initiative.cdt.ca.gov

^{9.} More information on CDT's Digital Equity Plan and grant funding opportunities can be found here: https://broadbandforall.cdt.ca.gov/state-digital-equity-plan/

^{10.} Information on these CASF programs can be found here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/california-advanced-services-fund

- o Many of these resources are provided through the U.S. Department of Agriculture for unserved and underserved rural areas, and are described here: https://www.rd.usda.gov/sites/default/files/508_rd_broadband_usda_guide_2021_102621.pdf
- The Economic Development Administration (EDA) is another potential funding source for broadband-related economic development projects.
 - o Resources are available for both planning and implementation of projects specifically geared to business and economic development through EDA's regular programs, including planning, local technical assistance, and public works funding: https://www.eda.gov/funding/programs
 - These funds can be an asset for commercial corridor redevelopment that includes deployment of telecommunications infrastructure.

Municipal Financing Tools

Local jurisdictions have access to municipal financing tools that can be used for broadband deployment in targeted geographic areas. Models include **Technology Enterprise Funds** and special taxing districts such as an **Enhanced Infrastructure Financing Districts** (EIFD).

An EIFD is a type of special financing district. It uses a portion of tax increment revenue from a specific area to finance capital facilities or other specified projects of community-wide significance that provide benefits to the area within the EIFD or the surrounding community. EIFDs can be used to fund public facilities and public infrastructure improvements. Cities such as Sacramento and West Sacramento have EIFDs in place.

EIFD informational resources:

 The California Association for Local Economic Development (CALED) has a useful guide on how to set up an EIFD: https://caled.org/how-to-create-an-eifd/

- Other CALED resources include:
 - o California Rural Infrastructure Finance Guidebook: https://caled.org/how-to-create-an-eifd/
 - Tax Increment Financing Primer (which includes EIFDs): https://caled.org/tax-increment-financing-primer/

A Technology Enterprise Fund may be another option. The City of Sacramento's Broadband Strategic Plan¹¹ suggested this tool as a broadband solution and described it as follows:

"Many cities create dedicated funds for revenues generated from leases of City assets by private telecommunications companies. A dedicated fund with ongoing revenues – separate from the General Fund - prioritizes new City / public technology deployment for future build opportunities (locating new smart city devices concurrent with expansion of private wireless connectivity, or funding for fiber network expansions through incremental builds / joint trench coordination). Creating a fund in the early stages helps plan strategically for the years to come when use of public assets / ROW will increase, creating significant new City revenues.

Additionally, the unscheduled nature of joint trench / dig once opportunities means cities need a dedicated funding source outside of the normal budgeting process to take advantage of open trenches to further the broadband plan. Cities often will ensure ongoing resources by dedicating any revenues received through the license of City assets or lease of City land to private telecom for the placement of cell towers, antennas, or revenues received as payments for conduit occupancy rights or dark fiber leases."¹²

Other alternative funding mechanisms cited by the City of Sacramento Broadband Strategic Plan included Special Taxing Districts, Community Service Districts, and Community Facilities Districts.¹³

^{11.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

^{12.} Ibid

^{13.} Ibid.

Explore Deployment Alternatives

Broadband infrastructure deployment can take many forms, from private sector projects to wholly owned public networks, to hybrid public-private initiatives. Finding the best and right-sized solutions for any given community or landscape requires research and engagement with potential partners, including new private sector entrants to the marketplace.

To engage in this work, it is important for governments to:

- Know where service gaps exist for businesses
- Engage with active Internet providers as well as potential market entrants
- Understand different broadband technologies and where and how they can be used
- Explore how providers and governments can work together on deployment projects.

Engage Proactively

Given the historic level of public broadband infrastructure funding currently unfolding, governments should proactively engage with providers and encourage them to plan new projects where needs are greatest. Governments can also support providers applying for grant funding by assisting with information needs or providing letters of support.

Explore Public-Private Partnerships

Public-private partnerships represent an important solution space. For example, as discussed in Section 2, the City of Rancho Cordova has entered into a city-wide developer agreement with SiFi Networks and work is under way to install nearly 500 miles of fiber network to connect all homes and businesses in the city with fiber Internet service. The project will function as an open network that can be leased to other Internet service providers.

The City of Sacramento has also embarked on a public-private partnership approach. In 2023, the City applied for grant funding through the CPUC's Last Mile Federal Funding Account (FFA) program¹⁴ for a \$38,696,843 deployment project. The proposed project envisioned an RFP process to identify a private provider partner, and would provide new or improved service to 7,582 unserved businesses, 4,620 households, 22 public safety locations, and 30 anchor institutions. CPUC award decisions were expected during 2024.

Broadband Partnering in Placer County

Placer County has been working for several years to bridge the Digital Divide through annual countywide surveys; assessment and mapping of gap areas; identification of project priorities; and investment in three broadband expansion projects with Internet service provider Astound. Since 2021, more than \$35 million in funding has been allocated using collective funding including the federal CARES Act and American Rescue Plan Act (ARPA), County sources, and private sector investment.¹⁵

^{14.} More information on the City of Sacramento's application can be found here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account

^{15.} Sacramento Region Coordinated Rural Opportunities Plan, Sacramento Region Profile, Valley Vision, March 2024, https://www.valleyvision.org/wp-content/uploads/Sacramento-Region_CROPreport.pdf

Coordinate When Planning

Thinking practically, creatively, and across departmental or jurisdictional lines is essential. Governments should keep broadband top of mind when new development is being planned, or when teeing up utility and public infrastructure improvements, especially when they involve excavation.

Coordination across government departments is also important to ensure that government decision-makers and implementers in different divisions and roles are considering broadband in the context of their work. Under the "dig-once" concept, many types of construction projects can provide opportunities for incorporating broadband infrastructure, including:

- New urban infill or suburban development projects
- Roadway, sidewalk, or utility repairs or improvements
- New public amenities such as bike trails or bridges that may extend across multiple jurisdictions.

Such construction activities also offer an opportunity to document assets already in the ground.

Jurisdictions can leverage assets such as rights of way, antennas, utility poles, and other publicly owned facilities to deploy broadband infrastructure. Collaboration with local transportation agencies, including the Sacramento Area Council of Governments (SACOG) and Caltrans, along with other entities such as municipal utility districts, can be a fruitful way to explore opportunities for joint-use, dig-once/dig- smart transportation and broadband projects.

Other deployment solutions may involve reviewing and streamlining government permitting and regulatory processes (discussed next) to help providers get shovels in the ground faster or leases of public facilities sooner.

Streamline Regulatory and Permitting Processes

One of the most important actions that local governments can undertake to ensure timely deployment of broadband infrastructure is to review, revise, update, and promote effective permitting and regulatory processes.

Technology is changing rapidly, and jurisdictions often lag in adopting state-of-the-art methods for moving broadband infrastructure projects through the government pipeline. Having an "Are We Ready?" mindset is essential.

Several resources have been developed by federal, state, regional, and nonprofit partners to encourage deployment efforts at all levels. This will be critical for jurisdictions as the state of California deploys the new Middle-Mile Open Access network in the Capital Region, which will facilitate faster network access for last-mile projects funded by the state and federal funding initiatives cited above, as well as private sector and other investments.

The California Department of Technology (CDT) Broadband For All portal (https://broadbandforall.cdt.ca.gov/planning/) contains links to many useful resources, including the following:

- California Local Jurisdiction Broadband
 Permitting Playbook developed by CDT
 and the Governor's Office of Business and
 Economic Development (GO-Biz). The
 Playbook includes best practices, policy
 examples, and a checklist to streamline the
 deployment process.
- Examples and Best Practices of Streamline
 Permitting, Permitting Needs Assessment
 checklist, and other resources including for
 federally funded projects developed by the
 National Telecommunications and Information
 Administration (NTIA).

- Getting Connected, A Broadband
 Deployment and Adoption Resource Guide for Local and Regional Governments, including case studies, sample model policy, and sample resolution prepared by the California Emerging Technology Fund and Valley Vision.
- Handbook on Infrastructure Deployment on <u>Tribal Lands</u> – prepared by the Native Nations Communications Task Force.
- Local Government Checklist for Digital Equity – prepared by the California Emerging Technology Fund.

Recent state legislation (SB 378, Gonzalez) enacted the Broadband Deployment Acceleration Best Practices Act of 2021. This Act requires local governments to allow micro-trenching for the installation of underground fiber optic equipment.

Micro-trenching requires significantly less excavation than traditional open trenching and can be performed more quickly, saving time and money for installers and causing less disruption to residents and businesses. Several cities have already implemented micro-trenching ordinances.

A new permit streamlining report is being prepared by the Southern California Association of Governments (SCAG) and San Diego Association of Governments (SANDAG) in partnership with the California Emerging Technology Fund that will be a valuable resource for the Sacramento Area Council of Governments (SACOG) and local jurisdictions in the Capital Region. It will be available through the Valley Vision website.

Broadband Streamlining in El Dorado County

El Dorado County has had a proactive broadband strategy since 2017, working with consulting firm NEO Connect to complete its 2019 Broadband Strategic Plan. In 2022, the County led an initiative for all residents and business owners to self-report Internet speeds at home, work, and places where they are connected to the Internet, thus identifying areas without broadband service.

The County developed a priority areas map to direct funding and has been awarded several grants of more than \$4.5 million for projects in nearly half of the top priority unserved and underserved communities. It is working on a programmatic EIR (Environmental Impact Review) for the entire county as a streamlining measure and has earmarked \$5 million in federal American Rescue Plan Act (ARPA) funds to design and engineer broadband networks. The programmatic EIR will expedite approval of such projects.¹⁷

Lead and Partner on Digital Education and Training

In addition to advanced broadband networks, businesses also need access to a local workforce with strong digital skills. This is critical to the recruitment, growth, and retention of businesses, which, in turn, helps build strong local economies.

If jurisdictions are engaged in strategic planning for expanding fiber and broadband infrastructure, that is also a good time to make sure the digital training and education needs of the community are being studied and addressed.

Digital access and adoption go hand in hand. Just as it is important to have adequate infrastructure, it is also critical that people have the skills to be able to make optimal use of the Internet, including in businesses.

Many organizations serving the business community are important conduits for digital skills building. Governments can use their expertise, resources, systems for serving the public, and communications channels to lead and partner with these groups on digital training programs.

The Capital Region's four workforce investment boards, for example, are dedicated to meeting workforce needs of businesses and building the skills of the workforce, including those with barriers to employment. They include:

- Yolo County Workforce Innovation Board, serving Yolo County
- North Central Counties Consortium, serving Sutter, Yuba, Colusa and Glenn counties
- <u>Sacramento Works Employer Services</u>, serving Sacramento County
- Golden Sierra Job Training Agency, serving Placer, El Dorado and Alpine counties

Valley Vision serves as the regional convenor for the four workforce investment boards and also organizes regular industry advisory meetings for community college districts, which bring together colleges, workforce investment boards, K-12 career pathways program, adult education, community-based organizations, and employers to identify skills gaps and priority investment opportunities for education and workforce programs.

Community-based organizations and business development organizations also offer digital training and education programs for workers and businesses and are described further below.



BUSINESSES: STRATEGIES, TOOLS, AND RESOURCES

Seek Assistance on Broadband Needs

One of the most important steps a business owner can take in addressing broadband and Internet challenges is to embrace this mantra: **Don't go it alone.**

Government is there to help.

So are groups that serve businesses, including:

- Chambers of Commerce
- Farm Bureaus
- Property and Business Improvement Districts (PBIDs)
- Economic development organizations

Fellow business owners can be a source of information.

And finally, there is the private sector, including broadband and Internet service providers and business technology consultants.

Outreach to Governments

Many governments are actively involved in finding broadband infrastructure solutions for their communities, while others may be less engaged. In either case, businesses should start with the incorporated city where they are located, or with the county if conducting business within an unincorporated area.

Governments vary in how they assign responsibility for broadband issues within their organizations. Some embed broadband in Public Works or Information Technology Departments. Others choose Economic Development or Community Development. In smaller jurisdictions, broadband may be under the purview of the City Manager or it may be a pet concern of a particular City Council member. If it is not clear, a good starting point is to start with Economic Development staff.

It may take general Internet research, research on a government website, or making phone calls to track down someone who can help. In the four-county Capital Region, Valley Vision and the <u>Connected Capital Area Broadband Consortium</u> are a resource and can help find the right contacts.

Outreach to Business Organizations

Many organizations serve business interests, and can be contacted for help with broadband issues. Among them:

- Chambers of Commerce in the four-county region offer a meaningful way to network with other businesses and engage with staff on problem-solving. They include:
 - o The <u>Sacramento Metropolitan Chamber</u> of <u>Commerce</u>
 - o Regional chambers dedicated to particular groups including the Sacramento Asian Pacific Chamber of Commerce, Sacramento Black Chamber of Commerce, Sacramento Hispanic Chamber of Commerce, Slavic American Chamber of Commerce, and Sacramento Rainbow Chamber of Commerce
 - o Nearly all incorporated cities have Chamber of Commerce organizations
- Farm Bureaus, including the <u>Sacramento</u> <u>County Farm Bureau</u>, <u>Yolo County Farm</u> Bureau, and Yuba-Sutter Farm Bureau
- Property and Business Improvement Districts (PBIDs) within Sacramento County and the City of Sacramento, which are identified in Appendix Section 2. They generally have websites and staff members who are ready to engage with businesses in their districts.

- Workforce investment boards offer programs and initiatives to enhance the digital skills of workers, as discussed above. Those serving in the four-county region covered by this study include:
 - Yolo County Workforce Innovation Board, serving Yolo County
 - North Central Counties Consortium, serving Sutter, Yuba, Colusa and Glenn counties
 - Sacramento Works Employer Services, serving Sacramento County
- Economic Development Organizations, including:
 - o Greater Sacramento Economic Council
 - o <u>Yuba-Sutter Economic Development</u> <u>Corporation</u>
 - o <u>California Capital Financial Development</u> <u>Corporation</u>
 - Sacramento Valley Small Business
 Development Center
 - Women's Business Center
 - U.S. Small Business Administration,
 Sacramento District

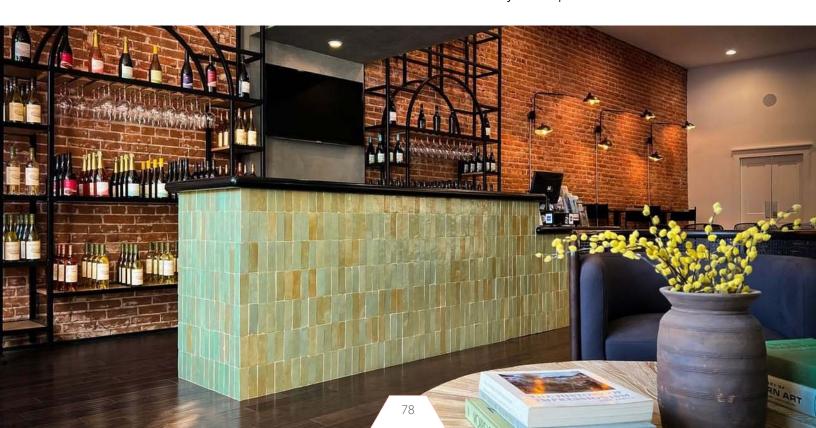
Outreach to Internet Service Providers

Different Internet service providers serve different areas. Comcast and AT&T are major providers in the Capital Region, particularly in heavily populated areas.

Respondents to the Business Broadband Survey for this study identified 18 other providers serving in Sacramento, Yolo, Yuba and Sutter Counties. They included: Astound/Wave, Succeed.net, Starlink, Verizon, T-Mobile, Hughes, WiLINE, OmSoft, Consolidated, Teal, California Broadband, Sonic, Esparto Broadband, Frontier, Cal.net, unWired, Digital Path, and AFES.

The broadband service world is dynamic, often with new or established companies entering new markets. They often show their presence – and interest in serving customers – through old-fashioned marketing techniques such as ground signs and leave-behind literature including mailings and door hangars.

Some providers offer information on their websites about their business-related service plans, while others require interested businesses to call or provide their contact information. Navigating broadband service plans can be complex; the explanatory technological information in this report's Section 2 may be helpful.



Be Ready to Advocate

To be an effective self-advocate on broadband needs, smaller businesses with fewer IT resources or staff should be prepared to communicate about the following baseline issues:

Who is the Internet provider where the business is operating?

✓ While this may seem like a simple matter, this information may not be known by businesses leasing space. It is key information when working with governments or others in problem-solving.

What services is the business paying for, and how much?

✓ This information may not be readily available to a building tenant. Or a business owner may not have taken the time to review a service agreement or monthly bills. Knowing the details will help in problem-solving.

What download and upload speeds is the business actually receiving?

✓ It is easy to find free and easy speed tests online, including the popular test offered by Ookla. When businesses run a speed test on a computer, it is important to take a screen shot to record it.

What reliability issues is the business having?

Document slow-downs and outages and, importantly, their impact to the business bottom line.

What technical and digital needs does the business have?

- ✓ Are Internet-based tasks and operations sluggish because of slow speeds?
- ✓ Does the business need more affordable Internet?
- ✓ Does it need software to help with business operations?
- ✓ Does the business need training to develop a website, conduct online marketing, manage operations, or other needs?
- Are business technology operations sufficiently backed up in case of emergency?



Develop the Right Tech Stack and Connectivity

Technology needs and solutions can be more complex for businesses than residences. Businesses generally need to address three distinct but interconnected technological elements, according to Michael Anderson, CEO of Clientworks Inc., a Nevada City Internet technology consultancy. They include:

- Identify Business Functions. These include production of products or services, internal management operations, marketing and sales, and much more.
- **Build the Right "Tech Stack."** Here, businesses must secure the equipment and software applications needed to achieve the functions of the business.
- Connect to the Outside World. This involves establishing connectivity through the Internet to run the Tech Stack and make sure the system is secure from cyber-security threats.

Depending on the size and complexity of the business, successfully navigating these steps may be achieved by individual business owners or members of their staffs. Or it may require outside technical expertise.

Identify Business Functions

The first step is to identify all the functions of the business, internal and external. The idea is to break down the functions so that the right hardware, software, and connectivity can be secured to support the functions. Potential functions include:

- Production of either products or services
- Internal operations including accounting, payroll, banking
- Marketing and sales (either online or in a physical location)
- Employee management and training
- Managing product supply chains, warehousing, and distribution
- Other functions unique to the business.

Develop the Right Tech Stack

Informational Technology (IT) systems for businesses are increasingly operated "in the cloud," meaning over the Internet.

For example, a decade ago, grocery stories commonly had point of sale terminals connected to a local server at each store. But today, such businesses are using hardware differently and more efficiently by using cloud service providers. The largest are Amazon Web Services, Microsoft Azure, and Google.

An array of ever-changing technology products are on the market. Approaches for solutions vary:

- Business owners and their staffs may be able to navigate solutions on their own. (See the Case Study below about the Galt Sign & Screenprinting company's experience in southern Sacramento County.)
- When owners or staff members are less comfortable with technology or don't have the time to invest in finding solutions, experts and consultants are available to help businesses establish technology systems, and may be worth the investment.
- Entities that serve businesses often offer trainings on how to set up websites, conduct e-commerce, ramp up social media advertising, and more. The Sacramento Valley Small Business Development Center, for example, offers training on business technology issues, including using businessbased software applications. See website at https://www.sacramentovalleysbdc.org.
- Internet service providers also frequently offer trainings and informational materials.

Connect to the Outside World

To run an effective "Tech Stack," businesses need to connect to the outside world through the Internet and protect business functions through adequate cyber-security measures. Here are strategies, steps, and best practices to consider:

- When leasing property for a business, be sure to ask about the Internet provider and available broadband services. Often businesses assume adequate service will be available, just like water and electricity, only to learn after signing a lease that Internet service is limited or not a match for business needs.
 - o Be wary of a landlord who does not want to be responsible for telecommunications.
 - A good landlord will provide the information and explain how other tenants are using the service.
- In an already established business location where Internet service does not meet the three essential pillars – reliability, adequate speed, and affordability – business owners can take steps to look for options:
 - o Run free speed tests on computers to determine actual download and upload speeds being delivered. Options are available by conducting simple word searches for "free speed tests."
 - o Research Internet service providers and reach out to them with questions. Pricing will generally be "take it or leave it," but sometimes negotiation can be effective.
 - o Contact the local Chamber of Commerce, entities that serve small businesses such as the federal Small Business Administration, and local governments for advice.
 - Take the old-fashioned approach of walking the streets nearby and asking other business owners about how they resolve their broadband needs.

- o Be wary of companies that aggregate and publish lists of available providers in an area. Often these are not independent or neutral and may contain inaccurate information. "We see lots of information out there that's patently false," Michael Anderson, CEO of Clientworks, said.
- Get educated about what the future might hold, particularly when communities or providers are making plans to install or activate fiber service in an area. This is a superior means of broadband delivery and worth tracking.
- o Businesses will differ on the amount of speed they need. Online browsing, using email, and basic Internet research require lower speeds, while videoconferencing and streaming, moving large files, conducting multiple point-of-sale transactions at once, heavy online back-ups, and constant cloud-based computing will require much higher speeds.
- When establishing Internet connectivity, businesses should focus on cyber security measures because of the threat of data breaches, which unfortunately are commonplace. Having a sufficient back-up system and redundant service options also are critical for ensuring business continuity in emergencies.



Access Digital Training Opportunities

Many digital education and training programs for businesses and employees are available through educational and other types of organizations. A key bridge is the region's workforce investment boards.

Businesses seeking such opportunities should check with local government jurisdictions, Chambers of Commerce, Property and Business Improvement Districts, and other organizations dedicated to business development and support.

As noted above, the Capital Region's four workforce investment boards are dedicated to meeting workforce needs of businesses and building the skills of the workforce, including those with barriers to employment. They include:

- Yolo County Workforce Innovation Board, serving Yolo County
- North Central Counties Consortium, serving Sutter, Yuba, Colusa and Glenn counties
- <u>Sacramento Works Employer Services</u>, serving Sacramento County
- Golden Sierra Job Training Agency, serving Placer, El Dorado and Alpine counties

These boards are core partners in the <u>Capital Region</u> <u>Coalition for Digital Inclusion</u>, and have adopted the use of Northstar Digital Literacy Assessment resources to assist jobseekers in acquiring digital skills. The free set of assessments includes self-guided modules for essential computer skills, essential software skills, and using technology in daily life.

Many community organizations offer computer classes aligned with the Northstar Digital Literacy Standards. The tools can be accessed on-line or through the workforce board employment centers. More information on the Capital Region's workforce investment boards can be found here: https://capitalregionworkforceboards.com/about

Other resources for businesses include:

- Valley Vision serves as the regional convenor for the four workforce investment boards and also organizes regular industry advisory meetings for community college districts, which bring together colleges, workforce boards, K-12 career pathways program, adult education, community-based organizations, and employers to identify skills gaps and priority investment opportunities for education and workforce program.
 - Several advisories have focused on digital skills, such as upskilling existing workers through short-term certificate programs, and can serve as resources.
 - o Valley Vision links for resources on the Information and Communications Technology industry and other industries, as well as digital skills across all industry sectors, can be found here: https://www.valleyvision.org/projects/developing-a-ready-workforce/.
- The California Department of Technology Broadband For All portal has links for digital skills training tools, including:
 - o The framework and self-assessment tools developed by the California Emerging Technology Fund (CETF)
 - o The California State Library's Career Pathways learning platforms (including access to the Northstar digital literacy assessments and courses)
 - o Access the portal here: https://broadbandforall.cdt.ca.gov/planning/

- The Sacramento Valley Small Business Development Corporation provides an array of services and training opportunities to businesses in Sacramento, Sutter, Yuba and Yolo Counties. The organization is funded through the federal Small Business Administration and the California Governor's Office of Business and Economic Development. More information is here: https://www.sacramentovalleysbdc.org
- The Yuba- Sutter Economic Development Corporation is dedicated to helping businesses in the Yuba-Sutter region to thrive and succeed. It provides a range of services to businesses of all sizes, including workforce development and marketing and promotion. More information can be found here: https://www.chooseyubasutter.com/about-us

The Small Business
Digital Alliance (SBDA) is a
public-private co-sponsorship
between the U.S. Small Business
Administration and Business
Forward, Inc. It provides resources
through a publicly available resource
library.

Resources include tools to help develop a digital presence, reach new markets, manage growth, hire employees, improve operation, conduct e-commerce, and raise capital. To learn more about the SBDA and the digital tools library, businesses can visit: www.smallbusinessdigitalalliance.com



CASE STUDY:

The Granite School Innovation Hub in Folsom



Finding an Internet solution at the Granite School in Folsom was a long process with an important takeaway: Hang in there and don't give up.

The property is a designated historical landmark that now serves as a tech and innovation hub for small businesses, mostly start-ups. It was built in 1915 and served as a

school until 1966, when classrooms were converted to school district office uses.

In 2021, the Folsom Economic Development Corp. bought the building and now leases space to business tenants. The building is also home to "Choose Folsom," a collaborative effort of the Folsom Economic Development Corp., the Folsom Chamber of Commerce, and the Folsom Tourism Bureau.

"We went from 40 or 50 megabits per second to 600 megabits per second."

> – Michael Aubry, project manager

Until recently, Jenn Jiminez was Choose Folsom's Operations Director. As the Granite School site was being developed and more tenants arrived, she worked to upgrade the broadband service. It took time, persistence, and an appetite for learning.

For a while, Jiminez tried to troubleshoot by using existing data lines and adding data access points. She also researched potential upgrades that unfortunately had high costs and construction-related barriers. "I was told no a lot," she recalled.

Finally one day, Jiminez noticed some equipment and outlets in a classroom. Their purpose was unclear. She investigated further and learned the outlets were "hot" and connected to a still functional dedicated line of AT&T fiber to the building.

"The fiber was already there," she said, "which meant no digging up." The Choose Folsom team upgraded equipment and began using the fiber optic line, which is a superior way to deliver broadband.

With AT&T as its Internet provider, Choose Folsom now shares the service publicly throughout the building through WiFi, said Michael Aubry, the project manager who oversaw the building's remodel and office conversion. The improvement was significant. "We went from 40 or 50 megabits per second to 600 megabits per second," Aubry said.

The process has taught Jiminez a lot about the Internet. And about perseverance.

Looking back, if she hadn't been curious about the old equipment she found in the classroom, the Granite School innovation hub might still be struggling to find a good broadband solution.

Galt Sign & Screenprinting: Going Digital



Bringing a small, family-owned business into the modern digital world is not always easy, as Colton Newell, General Manager of Galt Sign & Screenprinting discovered.

Besides figuring out the technology, he found himself facing an even bigger challenge: Persuading his parents, who had owned and run the business for 28 years, that it was time give up some old ways of doing things.

"It was an uphill battle," Newell recalled. "My parents are in their 60s and what they knew was pen and paper. But I knew we needed to be more digital if we wanted to grow."

The biggest change, Newell said, was installing and using Customer Relationship Management (CRM) software – technology that enables a business to manage interactions with present and future customers from first contact to product delivery.

The business had been accustomed to traditional practices, such as jotting down names and numbers when potential customers called and writing out paper orders. Under Newell's leadership, the company was growing fast and the paper system was leading to communication breakdowns and finished products that weren't coming out as customers wanted.

Now, orders and customer interactions are handled digitally from start to finish, with customers able to review artwork and pricing on their smart phones and provide digital approvals.

"It allows us to communicate better with the customer, and it has literally saved us thousands of dollars in avoiding repeat work," Newell said. In addition, the company now has a website, is exploring social media for marketing, and offers customized online "stores" with products for specific events and sports teams.

In the end, Newell said, his parents became fans of the digital transformation.

It wasn't so much due to Newell's personal persuasive powers. Rather, it was hearing from satisfied customers that sold them on going digital.

"It allows us to communicate better with the customer, and it has literally saved us thousands of dollars in avoiding repeat work."

- Colton Newell, Galt Sign &. Screenprinting

CASE STUDY:

Raley's: Emergency Preparedness and Internet Redundancy



The Raley's Companies is a family-owned grocery and retail firm founded in 1935 and headquartered in West Sacramento in Yolo County. The widely respected company has grown to include more than 235 locations across eight states. For a company this large, it goes without saying that its broadband network and technology systems must be well designed, reliable, and secure.

"Between our headquarters and stores, we have a very robust network," Brently Davis, Director of IT, Strategic Planning and Transformation, confirmed. Generally, he said, it is safe to conclude this is true for most larger businesses, which typically have information technology departments and resources to develop strong networks.

Davis could not provide many details about the Raley's network and technology structure for security reasons. But he noted the company recently encountered – and overcame – broadband challenges involving its purchase of Bashas' supermarket chain with stores in New Mexico and Arizona.

Nine of the Bashas' stores were on Native American tribal lands with very limited broadband. They relied on a "T-1" network line – an old technology using a pair of twisted copper lines. The stores had extremely slow download speeds of only 1.5 Mbps and high costs – from \$13,000 to \$32,000 per month.

By helping the stores switch to a local direct satellite service, Raley's helped deliver stronger bandwidth at a fraction of the cost – \$525 a month per store. The experience provides a lesson for businesses of any size: "There are always alternative options you could investigate," Davis said.

Davis also was eager to discuss another aspect of Raley's approach to broadband, especially if it can help smaller businesses: The importance of redundancy and back-up sources of service.

Currently, all Raley's stores (in California and Nevada) have generators if power outages occur. And all are interconnected with broadband via a sophisticated AT&T MPLS network system, he said. In the rare chance this service might be interrupted, Raley's entire network would go down. So Raley's invests in a second redundant line to all stores as back-up. In addition, the company is moving toward Starlink satellite service for all stores. This involves installing a dish antenna at \$2,500 each, and monthly costs from \$140 to \$500, depending on location.

These multiple layers of back-up and redundancy constitute a reasonable business investment, Davis said. He encourages businesses of any size to look for similar, right-sized options to secure their own redundancy peace of mind.

"There are always alternative options you could investigate."

– Brently Davis, Raley's

BUSINESS ORGANIZATIONS: STRATEGIES, TOOLS, AND RESOURCES

Check In with Businesses on Digital Needs

Organizations that support businesses – including Chambers of Commerce, Farm Bureaus, Property and Business Improvement Districts (PBIDs), and Economic Development Organizations – have big jobs helping businesses thrive and succeed.

Often, issues such as regulatory challenges, public safety concerns, or access to financial solutions take center stage, leaving broadband and digital equity challenges in the wings.

It is important for such groups to recognize that Internet access and digital capacity are critical to the bottom line of businesses – and to equity.

Such service cannot occur if groups serving businesses are not aware of the unmet digital needs of businesses.

Tips for checking in and helping businesses:

- Explicitly ask about broadband. It is not always the first item on a list of concerns.
 - o Share anecdotal information from other businesses to encourage dialogue.
 - o Consider a survey of members, or a focused convening.
- ✓ Understand that those with the most needs may be the least vocal or able to communicate their needs.
 - o Communicate in-language and with cultural sensitivity.
- Engage with Internet providers on behalf of businesses and give voice to business concerns.
 - o Facilitate meetings with businesses and Internet providers to help communication and solutions.
- ✓ Raise business-specific broadband issues with local governments and partner and follow-up to encourage solutions.

"It's about equity."

The COVID-19 pandemic helped to spotlight the digital needs of businesses, said Cathy Rodriguez Aguirre, President and CEO of the Sacramento Hispanic Chamber of Commerce. The Chamber has 550 paid business members and serves 2,500 to 3,000 businesses a year, the majority small with 10 or fewer employees.

During the pandemic, she said, many small businesses faced a pivotal moment where they had to turn to online solutions – which often represented uncharted territory – to save their businesses.

"We found during the pandemic that there were so many gaps," Rodriguez Aguirre said. "It took resiliency. The businesses didn't have a choice. This is how they support their families. They had to find a way to stay open."

Businesses that were accustomed to operating only with cash and without even having an email address suddenly had to learn how to procure Internet service, set up digital applications, and engage with online emergency loan programs.

"Serving these businesses requires being willing to think about things in a different way," Rodriguez Aguirre said. "It's about equity."

Support Infrastructure Deployment

This is a time of historic investment and activity to deploy new broadband infrastructure, which is critical to businesses being able to thrive and grow. (See Governments discussion above for details about the programs.) Many governments and Internet service providers are in the process of developing projects and applying for grant funding to develop new broadband projects.

Groups that support businesses can check in with elected officials, local governments, and Internet service providers about pending projects and support them by providing helpful information or letters of support.

In short, it is important to ask questions and be a part of this infrastructure deployment conversation to give voice to the needs of businesses.



Problem-Solve and Advocate

There are three critical Internet quality measures for businesses – reliability, speed, and affordability. Businesses need all three to be able to thrive and grow, as well as be ready for disasters.

Organizations that serve businesses can encourage and assist their members and constituents in documenting, sharing, and communicating broadband gaps and needs. This problem-solving and advocacy could take many forms:

- ✓ **Inviting** dialogue about broadband and Internet challenges of businesses through newsletters, surveys, and networking events.
- ✓ **Communicating** needs to government representatives at local as well as state and Congressional levels and industry representatives.
- ✓ Hosting "meet the providers" events where businesses and Internet service providers can connect and communicate.
- ✓ **Offering** educational forums about different Internet technologies and solutions ranging from internal business operations to connecting to the external world through websites, online marketing, and digital communications.
- ✓ **Sharing** information about how to conduct live Internet speed tests.
- ✓ **Disseminating** information about digital training and education and hosting learning opportunities.
- ✓ Assisting businesses with language or other barriers in engaging with their providers on solutions.
- Providing information about local disaster risks to constituents and encouraging strategies for preparedness.

Collaborate on Digital Training

It is crucial to have a workforce with the skills to support business growth through adoption of new technologies, including e-commerce, marketing, cybersecurity, and management of business operations. Skills building also is vital for retention, income and career mobility for workers, including those experiencing language and other barriers.

An analysis by the National Skills Coalition in 2023 found that 91 percent of California jobs require some level of digital skills, across all types of industries and both small and large businesses. ¹⁸ Full digital equity requires an investment in digital skills building and training.

The need for digital skills was heightened during the pandemic, given the sudden transition to remote work, impacts on businesses dependent on customer interactions, and tasks required at places of work. The pandemic accelerated adoption of digital skills throughout the economy.

Digital skills also are critical for getting businesses up and running again after an emergency and should be a core part of a business's disaster readiness planning.

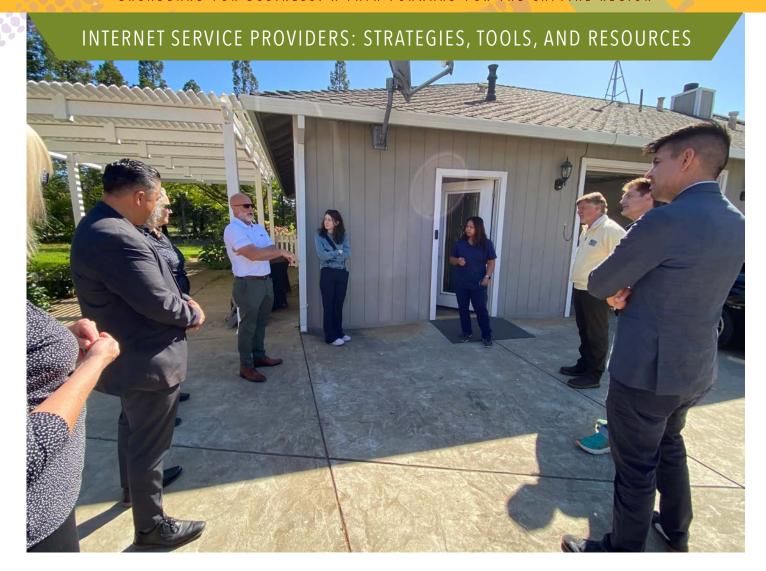
The National Skills Coalition analysis identified California's most in-demand foundational digital skills, as well as examples of in-demand industryspecific skills. Foundational skills include:

- Computer literacy
- Data entry
- Proficiency in Microsoft Excel and Outlook
- Typing
- Word processing
- Proficiency with Google Suite

The discussions above describe many available digital education and training resources.

Organizations serving businesses – including Chambers of Commerce, Farm Bureaus, Property and Business Improvement Districts, and economic development organizations – can share and promote these resources and connections through communications and convening channels.





Engage with Businesses

One of the key findings of this study is that it can be difficult for businesses to get clear and accurate information about available broadband service availability, as well as Internet service provider products, prices, and plans.

It is understandable that private sector Internet service providers have competitive and proprietary considerations driving their business decisions. Businesses seeking reliable, affordable, high-speed Internet service would be the first to appreciate such bottom-line considerations.

But they would also welcome and benefit from a more accessible, transparent, and business-friendly flow of information about Internet services being offered, functionality and speed, and costs. One way for providers to accomplish this is through greater engagement with the business community, including the boots-on-the-ground organizations that serve businesses. That includes Farm Bureaus, local Chambers of Commerce, Property and Business Improvement Districts, and economic development organizations.

Some Internet providers already engage through Chamber of Commerce memberships, and have found these relationships valuable. Benefits can include hearing from businesses first-hand about their Internet needs and fostering a better understanding of business-specific and sector-specific infrastructure and service needs.

Engaging directly with businesses is another ideal pathway. This was demonstrated in early 2024 when representatives from unWired Broadband, a new market entrant Internet provider offering advanced wireless technology in the Sacramento region, met with the owner of a business that provides residential care homes for people in need in Elk Grove. The owner noted that the on-site and personal interaction provided by unWired made all the difference in resolving her broadband needs.



The district offices of City Council and County Supervisor elected representatives represent another ripe area for engagement because such officials often hear about challenges and needs firsthand from their constituents and are eager to facilitate solutions.

Just as governments should study publicly available broadband service maps, Internet service providers should do the same and

correct inaccuracies to ensure locations that are unserved or underserved get the resources and attention they deserve.

Partner with Governments

The California Emerging Technology Fund in 2021 issued a valuable resource guide, "Getting Connected, A Broadband Deployment and Adoption Resource Guide for Local and Regional Governments." This guide, prepared for local and regional government leaders, included findings gathered from several Internet service providers about recommended policies and best practices for governments that could facilitate broadband infrastructure and deployment.

These industry priorities included:

- Conduct a complete and up-to-date asset inventory, possibly as part of a Broadband Master Plan.
- Update ordinances to reflect differences in modern technologies for fixed wireless deployment.
- Develop streamlined and efficient permitting, including more certainty and shorter wait times.
- Provide clear permit application processes and efficient online tools.
- Establish policies that support high-capacity fiber backbone.
- Support broadband coverage validation by the State, including widespread use of the CalSPEED application by businesses and residents.

Many of these issues are discussed above under strategies for Governments. Businesses also can partner on these strategies through proactive communication and engagement with governments.

Regulatory Streamlining

As one example, government streamlining is one of the most important actions local governments can undertake to ensure timely deployment of broadband infrastructure. This includes reviewing, revising, and updating local permitting and regulatory processes to promote efficient deployment of infrastructure.

Here, governments need Internet service providers to be partners by advising about changing technologies and on-the-ground deployment realities. Providers should be on the look-out for digonce, joint-use opportunities with governments, as well as leveraging Rights of Way and public facilities to facilitate deployment projects.

Partnering collaboratively with governments to streamline regulatory and permitting programs affecting deployment is also important.

^{19. &}quot;Getting Connected, A Broadband Deployment and Adoption Resource Guide for Local and Regional Governments," California Emerging Technology Fund and Valley Vision, March 2021, https://www.cetfund.org/wp-content/uploads/2021/04/Getting-Connected-A-Broadband-Deployment-and-Adoption-Resource-Guide-For-Local-and-Regional-Government-Leaders.pdf

Communicate on Deployments

When Internet service providers are developing infrastructure project plans, informing local governments and seeking input on those plans can help to accelerate deployment.

Without such open communication, opportunities available through governments may go untapped, such as leveraging Rights of Way or taking advantage of "dig-once" opportunities when public improvement projects are in the pipeline.

Likewise, on the provider side, beneficial partnering with governments on funding or policy approaches may be missed. When jurisdictions have unserved or underserved locations, governments want to see projects deployed and may be willing to provide support on grant applications or serve as strategic partners.

The bottom line:

When providers and governments cooperate, engage, and strategize together on infrastructure deployment, it can create a "virtuous circle" where everyone benefits, including providers, business and residential customers, and the overall community.

Align Operations to Serve Businesses

Based on inputs to this study, Internet service providers should consider examining and aligning internal business practices to ensure the needs of smaller businesses are served. Some business owners who were interviewed for this study reported hopeful interactions with company sales representatives who promised solutions to broadband access gaps, only to be told later by the same company's technology experts that the solution was not available.

Additionally, just as governments should study publicly available broadband service maps, Internet service providers should do the same and assist in correcting inaccuracies to ensure locations that are unserved or underserved get the resources and attention they deserve.

Innovate on Digital Training and Education

Internet service providers are important partners in closing the Digital Divide for businesses not only through provision of adequate, reliable and affordable service, but also in partnering on digital training and education opportunities.

Some providers already offer digital educational tools online for businesses. The Sacramento Hispanic Chamber of Commerce, for example, has included information in its regular newsletter to businesses about small business digital training resources offered by Verizon.²¹

In a national trend, other companies have also shown commitment to communities in need through digital equity investments and grant-making.²²

The many workforce training and digital education programs and resources above for Governments, Businesses, and Business Organizations offer opportunities for Internet service providers to also engage, innovate, and partner in helping businesses access digital training. This is especially relevant for smaller businesses, those that are minority- and women-owned, or are located in remote rural areas or aging urban and suburban commercial areas.

^{21.} More information is here: https://digitalready.verizonwireless.com/?utm_source=awbc&utm_medium=partner&utm_campaign=digital-ready_national-partner_california-capital_sacrament

^{22. &}quot;Much Better Days: ISPs, Advocates Team Up on Digital Equity," Zack Quaintance, Government Technology, July 18, 2023, https://www.govtech.com/network/much-better-days-isps-advocates-team-up-on-digital-equity (describing the importance of new investments in digital equity initiatives by ISPs including Comcast and AT&T).

Appendix 1: Outreach Methodology

Outreach Methodology

As explained in the Executive Summary, Valley Vision conducted extensive research, outreach, and interviews to understand regional business broadband conditions, assets, challenges, and opportunities and to develop this report and its recommendations.

In addition to engaging with individual business owners, whose voices and experiences are reflected throughout the report, the following organizations, governments, and entities played a critical role in informing this project:

- Leaders, staff, and elected officials from the four counties in the study region (Sacramento, Yolo, Sutter and Yuba) and the incorporated cities therein.
 This outreach included consultation with representatives within economic development, community development, public works, technology and agriculture departments to learn about county and city business broadband challenges and opportunities. (See Appendix 3 for governments that assisted with distribution of the Business Broadband Survey for this project.)
- Executive directors of Property and Business Improvement Districts (PBIDs) within the City of Sacramento and County of Sacramento. (See Appendix 3 for PBIDs that assisted with the Business Broadband Survey for this project.)
- The Sacramento Metropolitan Chamber of Commerce, Sacramento Asian Chamber of Commerce, Sacramento Hispanic Chamber of Commerce, and local Chambers of Commerce. (See Appendix 3 for Chambers that assisted with the Business Broadband Survey for this project.)
- Greater Sacramento Economic Council

- Yuba-Sutter Economic Development Corporation
- Delta Protection Commission
- Community Strong Strategies
- California Capital Financial Development Corporation and Sacramento Valley Small Business Development Center
- U.S. Small Business Administration, Sacramento District
- Gold Country Broadband Consortium
- Internet Service Providers in the Capital Region
- Sacramento Municipal Utility District
- Sacramento County Farm Bureau, Yolo County Farm Bureau, and Yuba-Sutter Farm Bureau
- Sacramento Area Council of Governments
- Technology consultants including Makwara Solutions, LLC, and Clientworks
- University of California Agriculture and National Resources (UC ANR)/Cooperative Extension
- California Emerging Technology Fund
- California Manufacturing and Technology Association
- California Dept. of Food and Agriculture
- California Dept. of Technology
- California Public Utilities Commission
- Governor's Office of Business and Economic Development (GO-Biz)
- Office of Congresswoman Doris Matsui
- U.S. Economic Development Administration
- National Telecommunications and Information Administration
- USDA Rural Development
- National Skills Coalition

Appendix 2: Mapping Methodology and Maps

Mapping Methodology and Maps

To study broadband availability for businesses in the region, Valley Vision used location data collected and displayed by the California Public Utilities Commission (CPUC) on its interactive Federal Funding Account Public Map. The Public Map enables prospective applicants to view, evaluate, and develop project areas for funding applications.

The interactive map and information about it can be found here: https://www.cpuc.ca.gov/industries-and-topics/internet-and-phone/broadband-implementation-for-california/last-mile-federal-funding-account/ffa-public-map

This Public Map shows "Mass Market Unserved Locations," which are described as follows by the CPUC:

"Shows the range of the number of unserved mass market locations lacking access to wireline 25 Mbps downstream and 3 Mbps upstream excluding legacy technology (e.g. Digital Subscriber Line (DSL) and Cable DOCSIS 2.0 or older) using a GIS technique known as 'feature binning.' Individual unserved locations are aggregated into hexagonal container bins of more than one unserved location, where one hexagon represents an area approximately 1/10th of a square kilometer. The hex bin approach is designed as equally sized and scalable geometric bins for summary, display, and comprehension of large datasets."

On the map, the hexagons are broken down into three levels of Unserved Locations: one to two, three to 10, and more than 10.

Valley Vision overlaid this CPUC Unserved Location data over zoning data for (a) each of the four counties in the study region, (b) all incorporated cities within those counties, and (c) 18 Property and Business Improvement Districts located within the City and County of Sacramento. The data was acquired from county open data portal datasets (for the county analyses) and the California State Geoportal (for the municipal analyses).

The datasets were filtered to highlight three categories of zoning where businesses are commonly found: Commercial, Industrial, and Agricultural. It should be noted that businesses can also be found on other types of zoned land, such as residential, mixed-use, special planning areas, and other types of zoning.

The dataset portals can be accessed through these links:

- California State Geoportal https://gis.data.ca.gov/datasets/
 e448c1c8eb374246aceeda148a727244_0/explore
- Sacramento County: https://data.saccounty.gov/maps/c93dfff02b3241f6aea0783a4ad2ee46
- Sutter County: https://opendata-suttercounty.hub.arcgis.com/datasets/517985664cb54fa98f111e5ad0fedd2b_0/explore?location=39.019057%2C-121.679898%2C10.07
- Yolo County: https://hub.arcgis.com/datasets/8aacaba54d98482
 c930d4c665dd6a275_2/explore?location=38.625903%2C-121.920580%2C10.36
- Yuba County: https://www.yuba.org/departments/information_technology/geographic_information_systems_(gis)/gis_data_catalog.php#outer-2222

On the maps, the zoning was depicted as follows: Green for agricultural, purple for commercial, turquoise for industrial, and light gray for all other zoning.

Because of page size limitations, maps vary in scale, causing the Unserved Locations hexagons (covering 1/10th of a square kilometer each) to appear as tiny dots in larger geographic areas, while in maps of smaller geographic areas, the Unserved Locations hexagons appear larger.

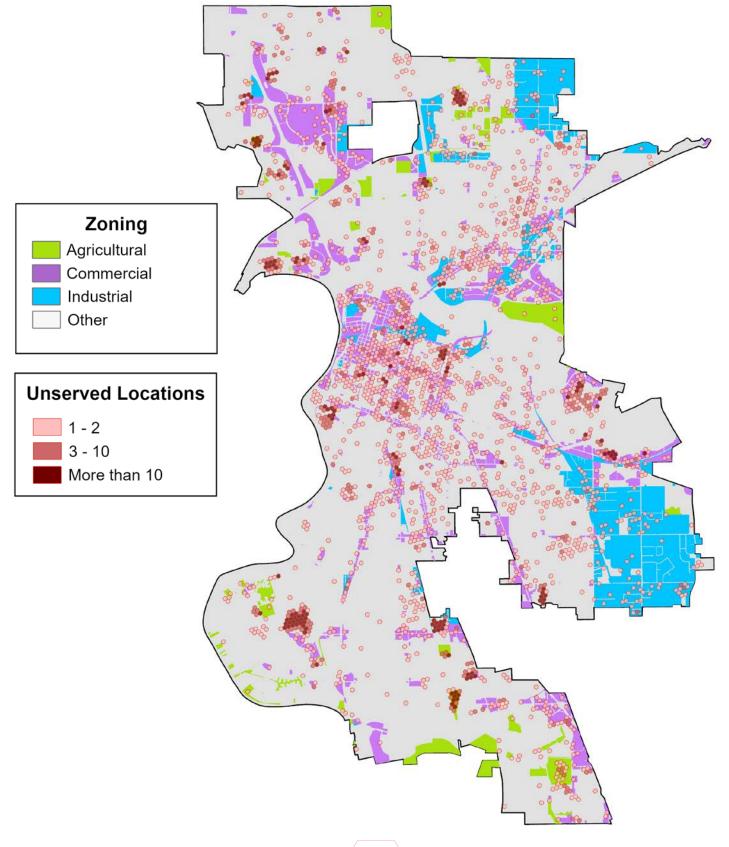
It is important to note that the CPUC's Unserved Location data is supplied by Internet service providers. Broadband stakeholders and researchers have concluded that broadband service maps based on such data and developed by both state and federal officials are not always accurate, and in many cases understate the needs and realities on the ground.

The CPUC and the Federal Communications Commission (FCC) have been working to improve the accuracy of the data in the maps they use. At the time this research project was being conducted, the CPUC's Federal Funding Account Public Map was being employed as the best available data to inform Federal Funding Account project applications and grant award decisions.

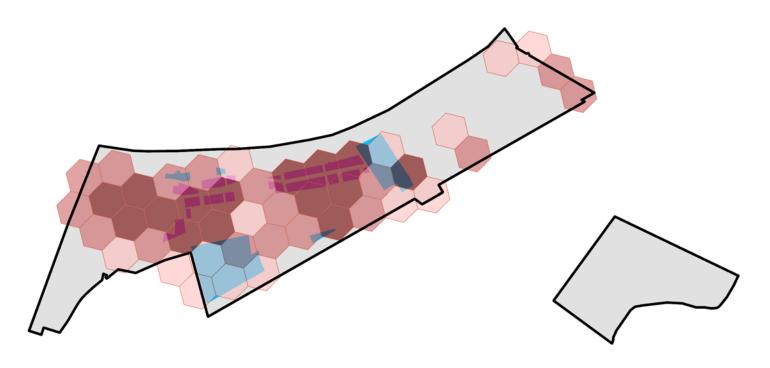
Section 2, "Challenges and Needs in the Capital Region," includes a discussion of broadband service gaps identified in the maps prepared for this project, and provides a map for each County in the study area (Maps 3, 4, 5, and 6). Below are maps with the same data for each of the incorporated cities, and each of the Property and Business Improvement Districts.

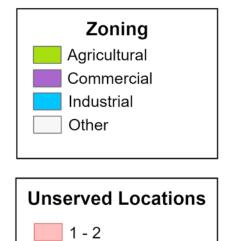
^{1.} See, for example, "The FCC Broadband Maps: Meet the New Maps, Same as the Old Maps," Electronic Frontier Foundation, January 31, 2023, https://www.eff.org/deeplinks/2023/01/fcc-broadband-map-has-problems; "Achieving Universal Broadband in California," Public Policy Institute of California, March 2023, [Among the takeaways: "State and federal maps overstate how many households have access to broadband"], https://www.ppic.org/publication/achieving-universal-broadband-in-california/

City Maps: Sacramento County Map 7 City of Sacramento



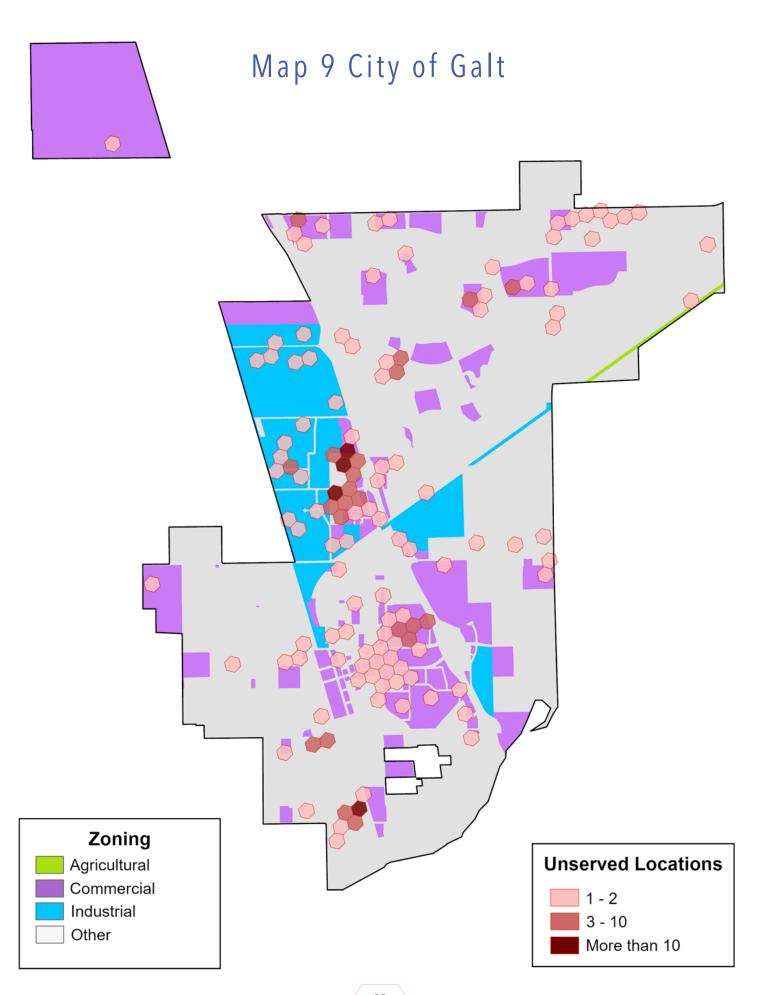
Map 8 City of Isleton



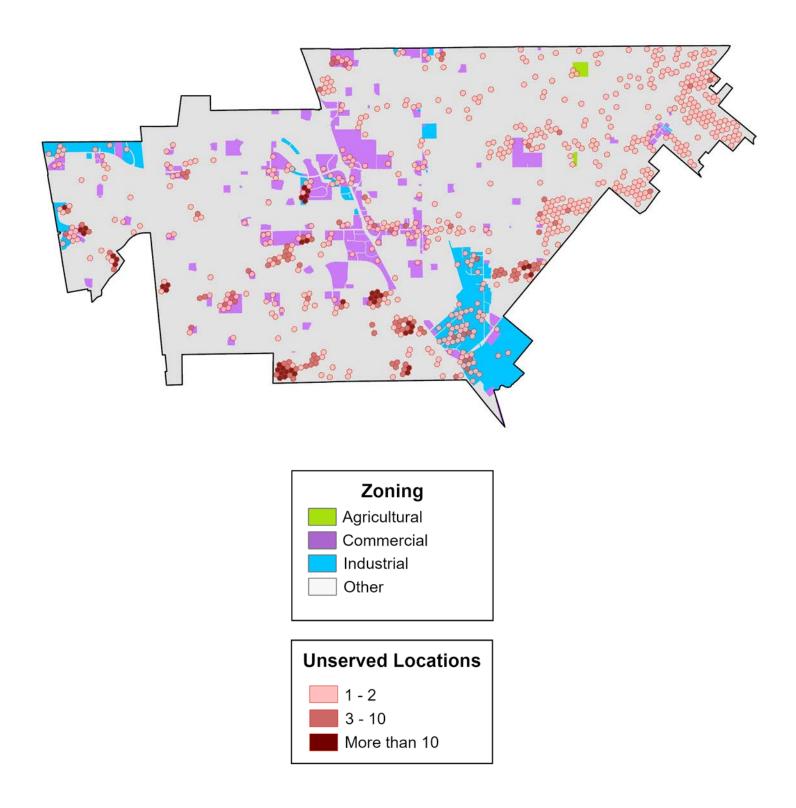


3 - 10

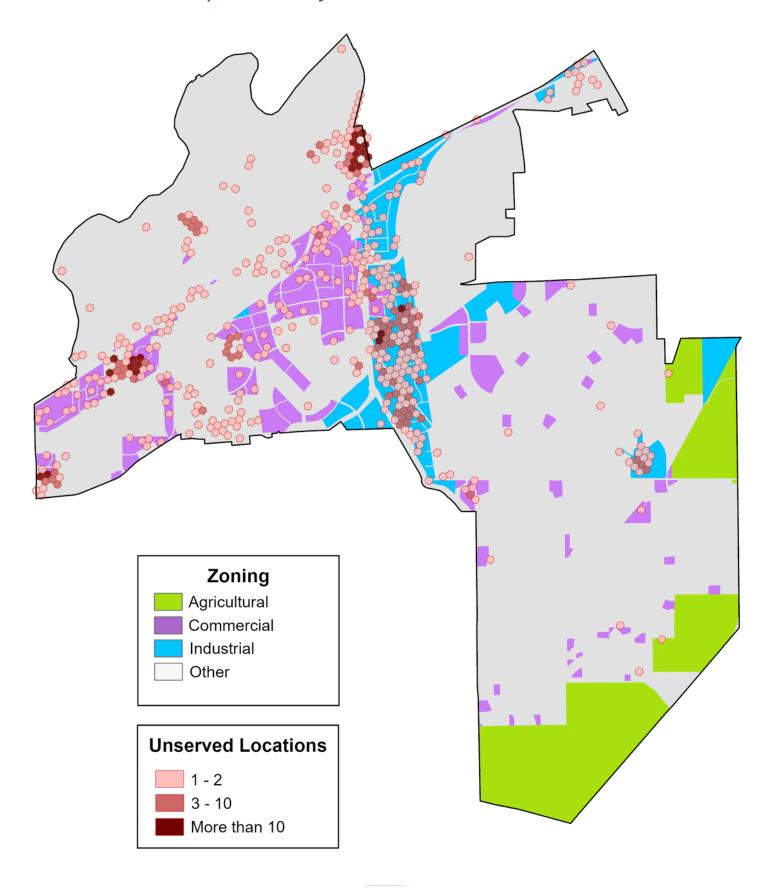
More than 10

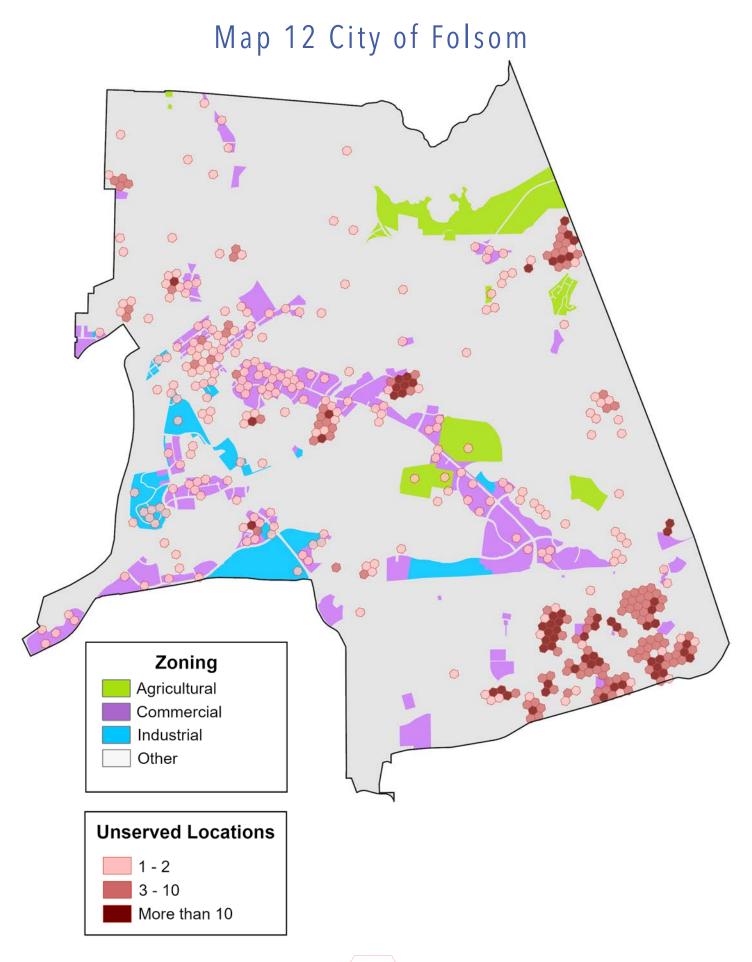


Map 10 City of Elk Grove

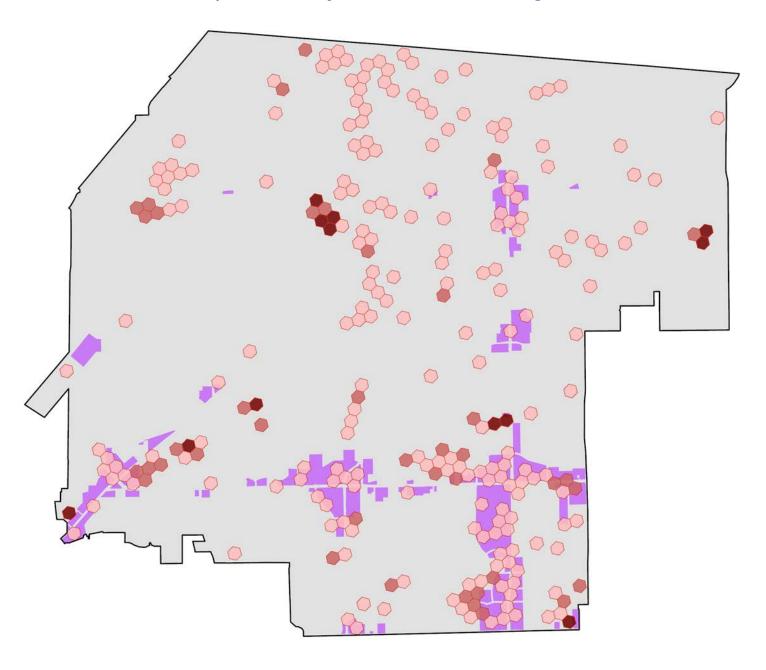


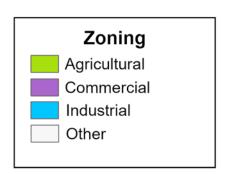
Map 11 City of Rancho Cordova

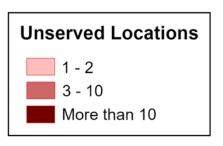




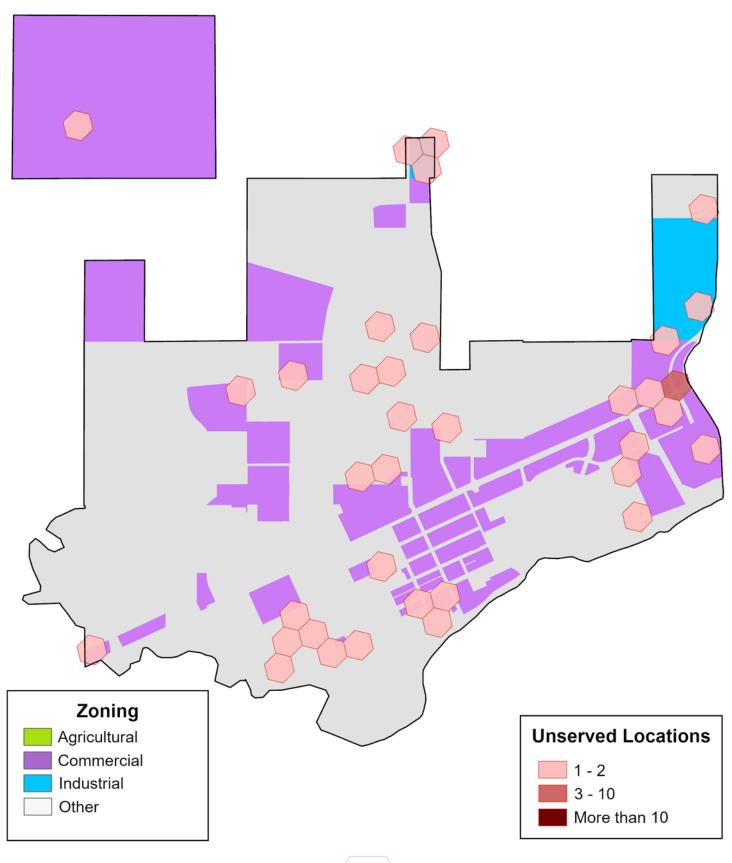
Map 13 City of Citrus Heights



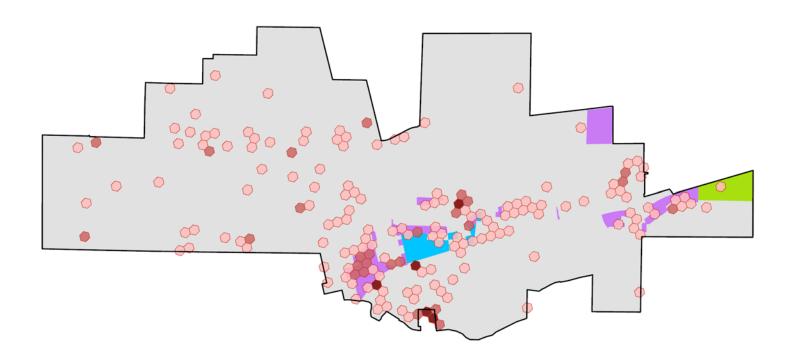


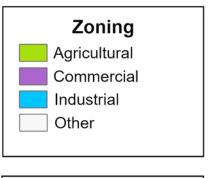


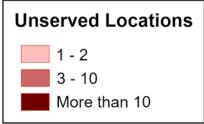
City Maps: Yolo County Map 14 City of Winters



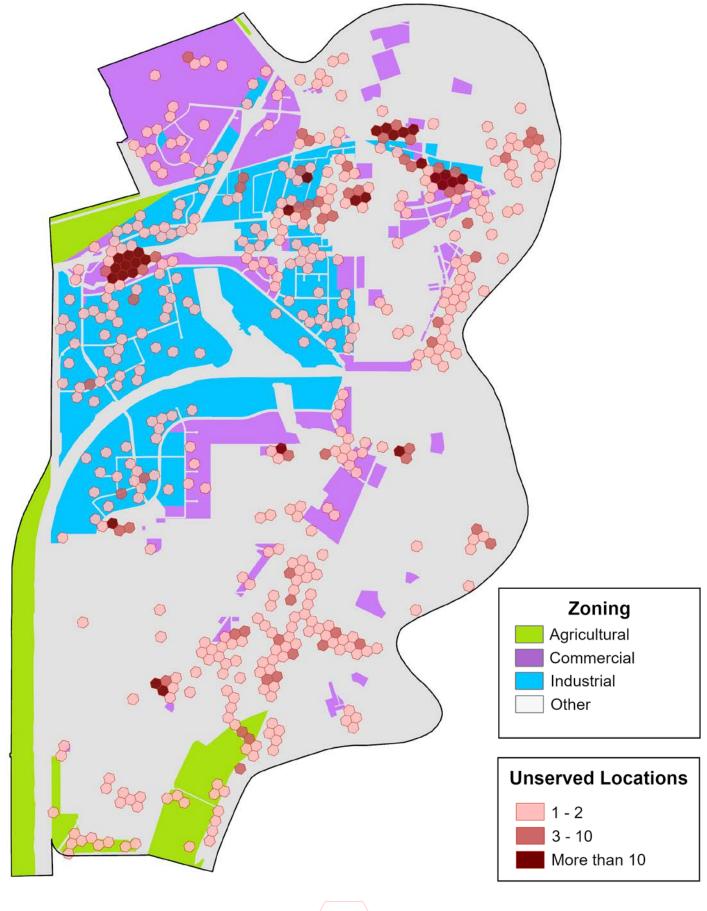
Map 15 City of Davis



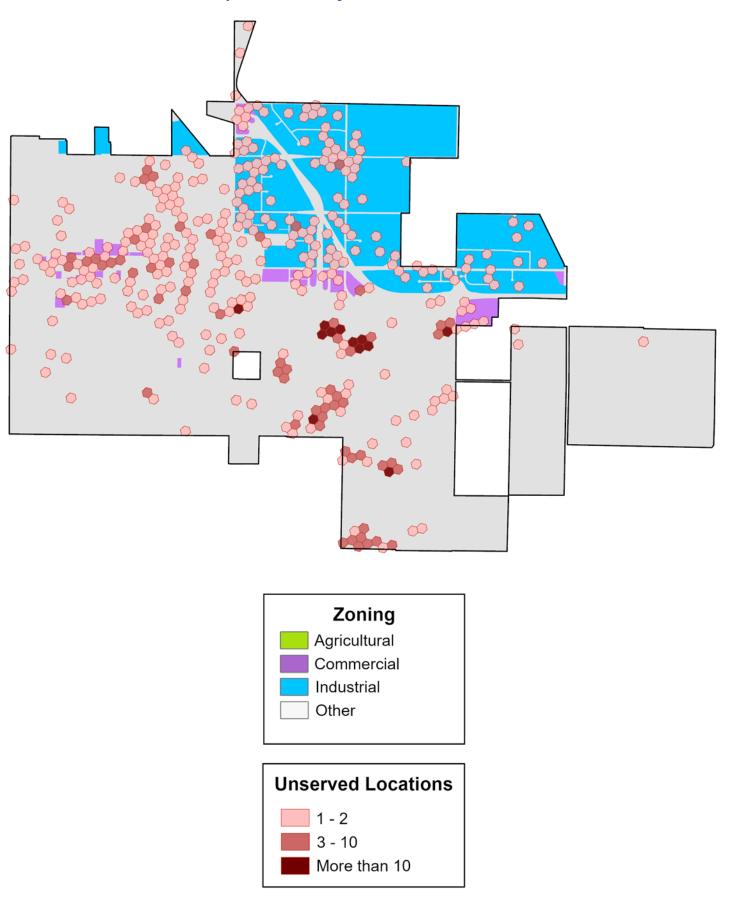




Map 16 City of West Sacramento

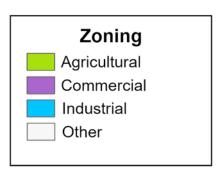


Map 17 City of Woodland

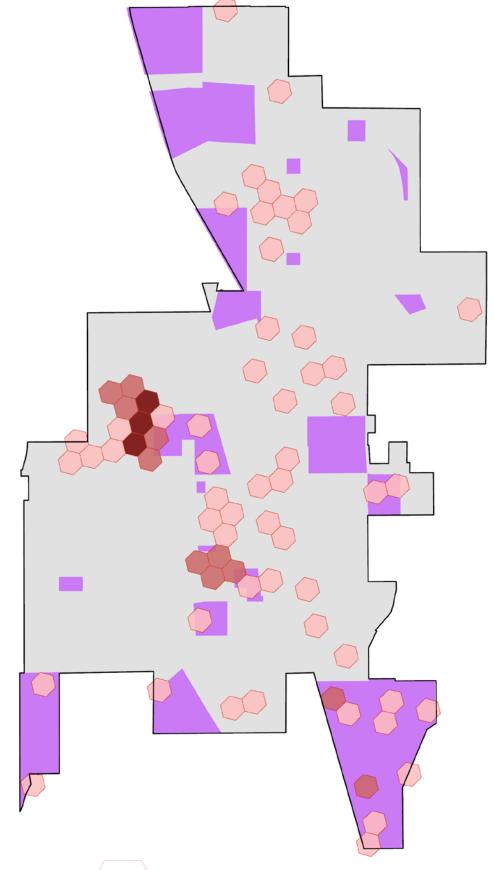


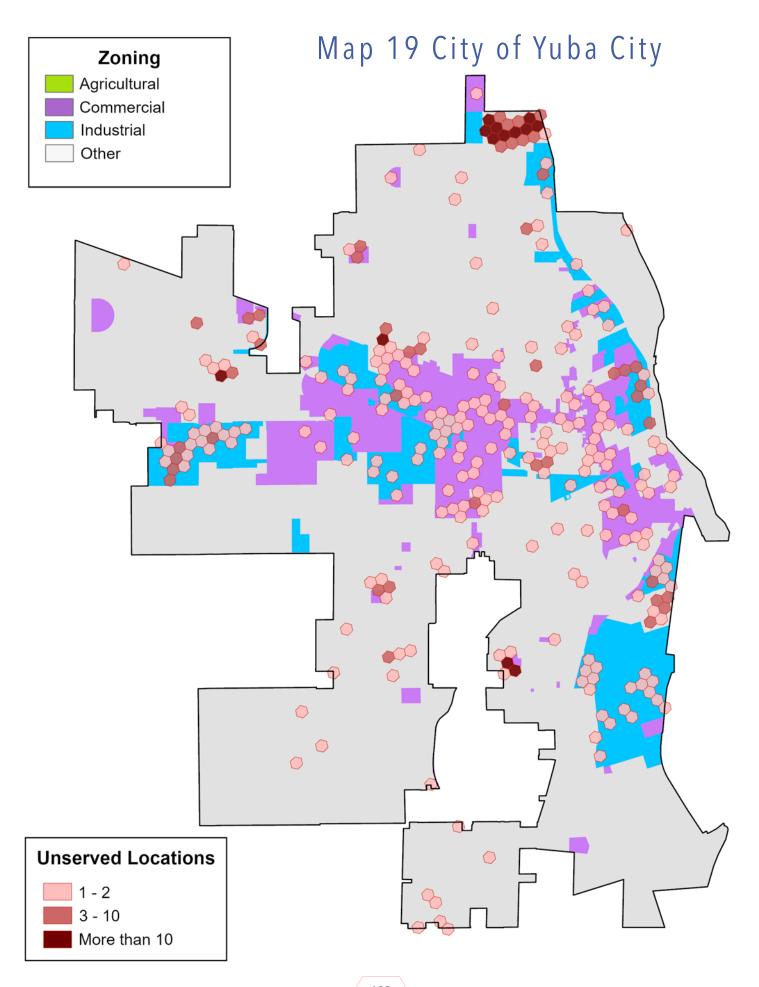
City Maps: Sutter County

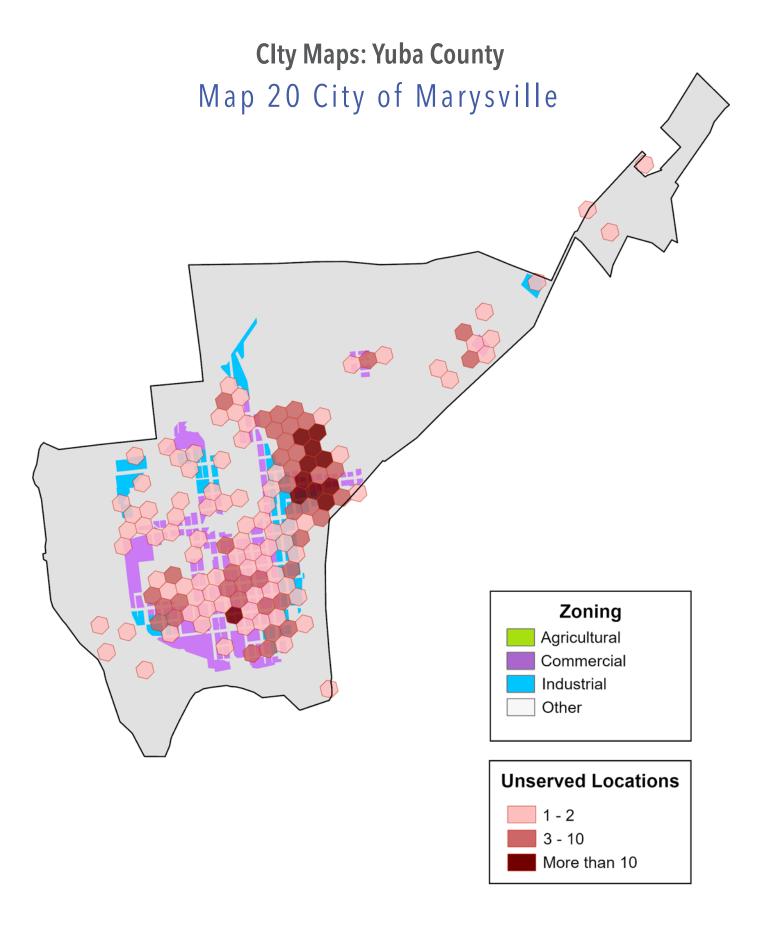
Map 18 City of Live Oak



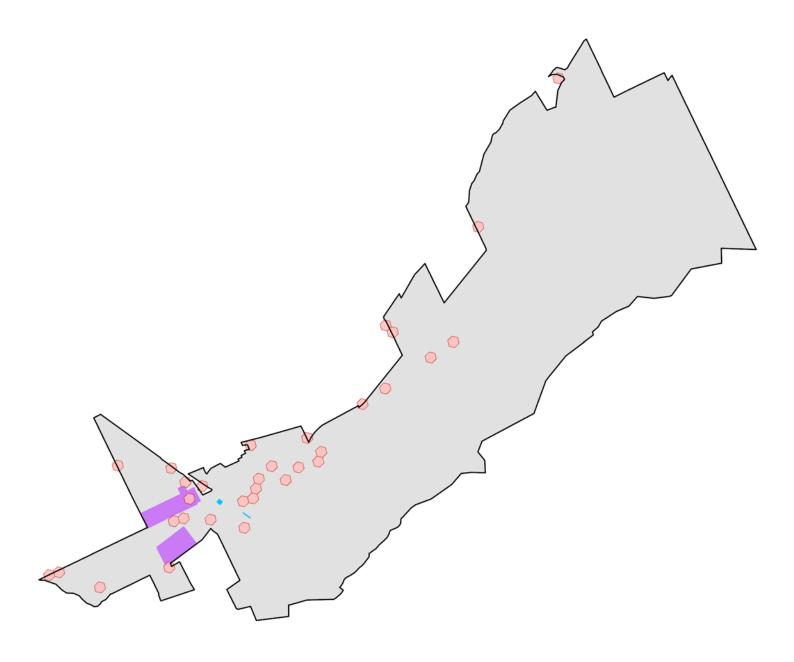
Unserved Locations 1 - 2 3 - 10 More than 10

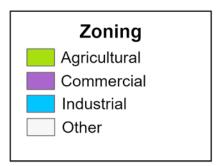


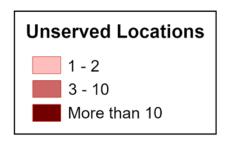




Map 21 City of Wheatland



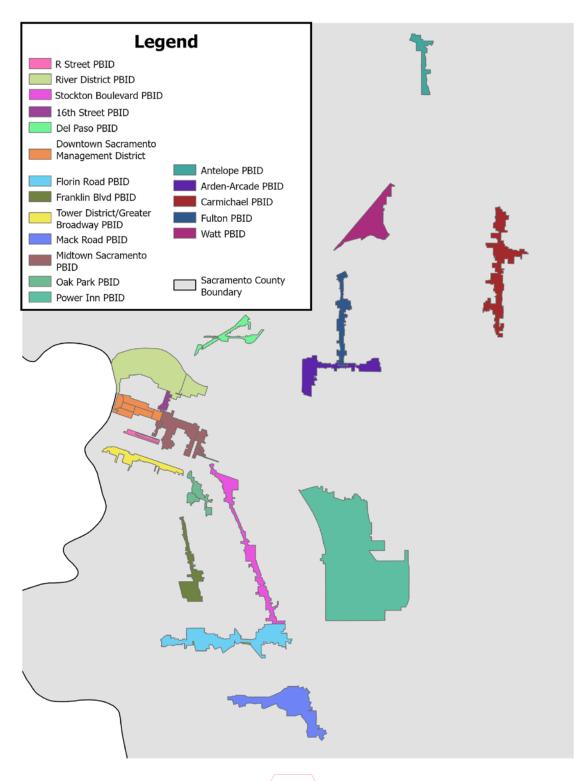




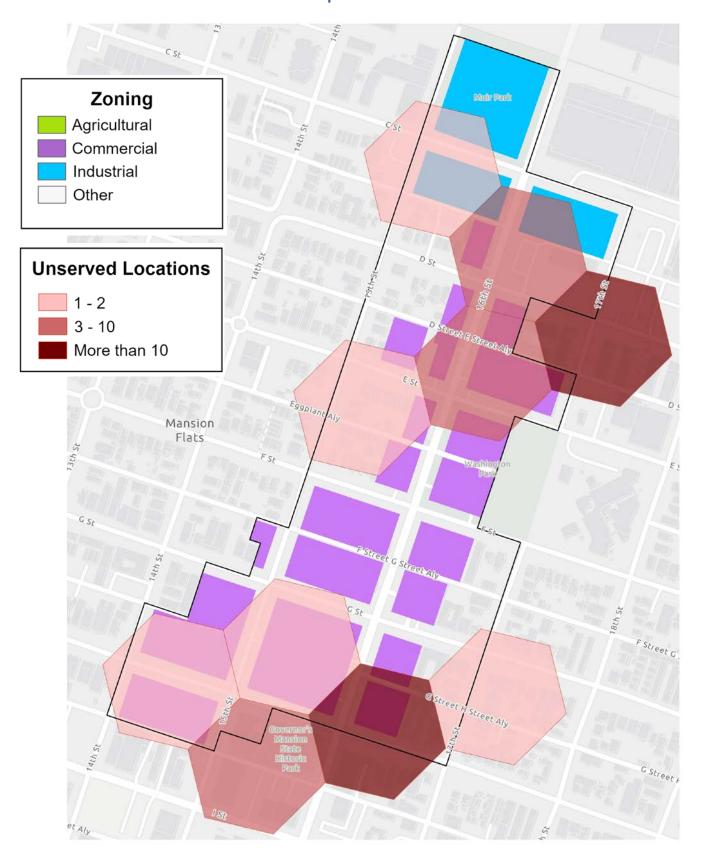
Property and Business Improvement District (PBID) Maps

Below is the same zoning and broadband service data for 18 individual Property and Business Improvement Districts (PBIDs) located within the City of Sacramento and the County of Sacramento.

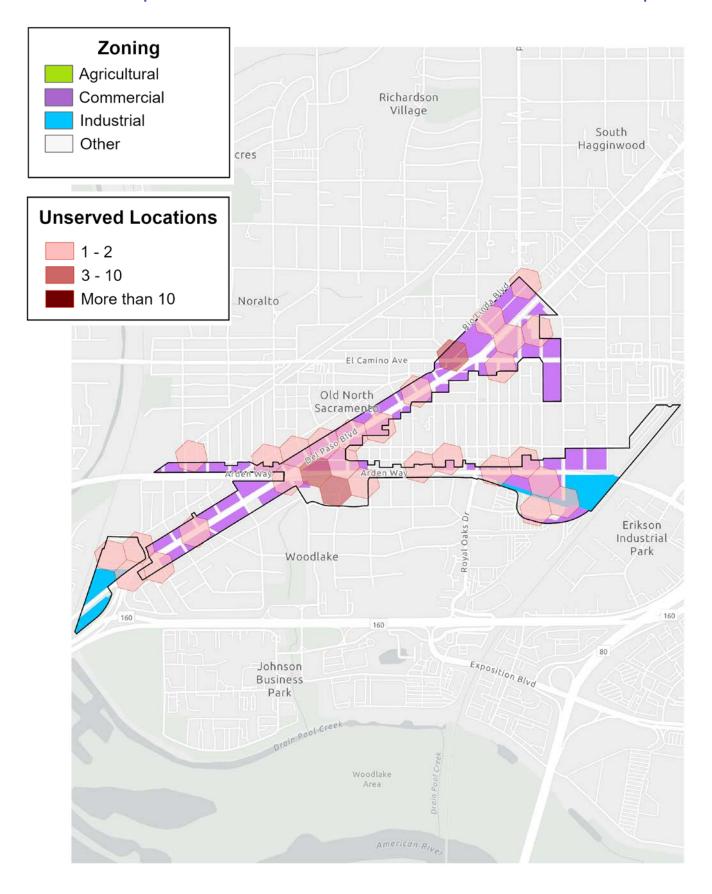
Map 22 Property and Business Improvement Districts (PBIDs) in Sacramento County



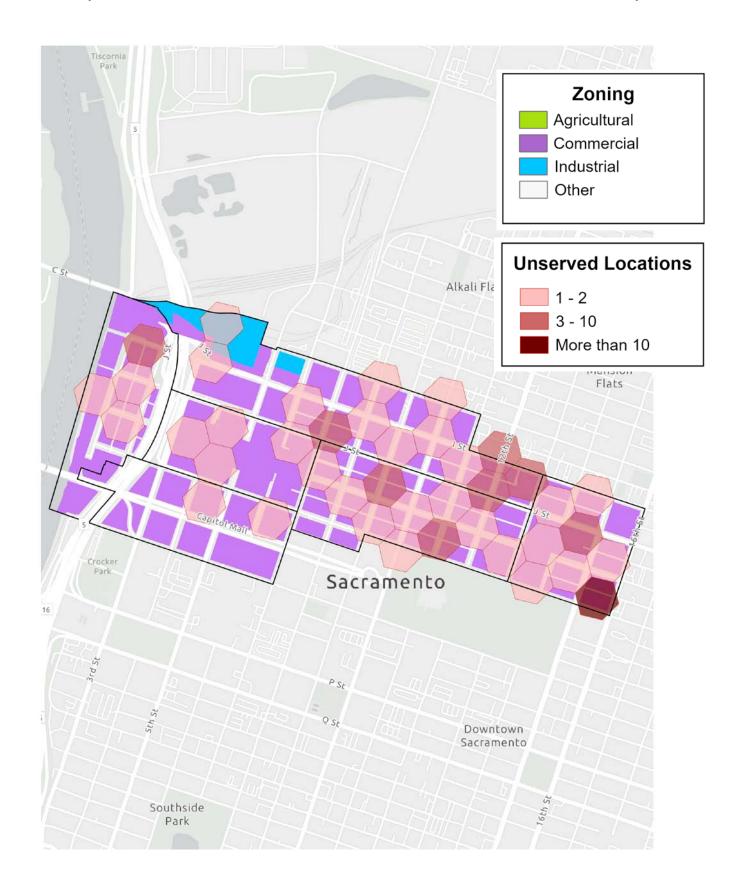
Map 23 16th Street Property and Business Improvement District



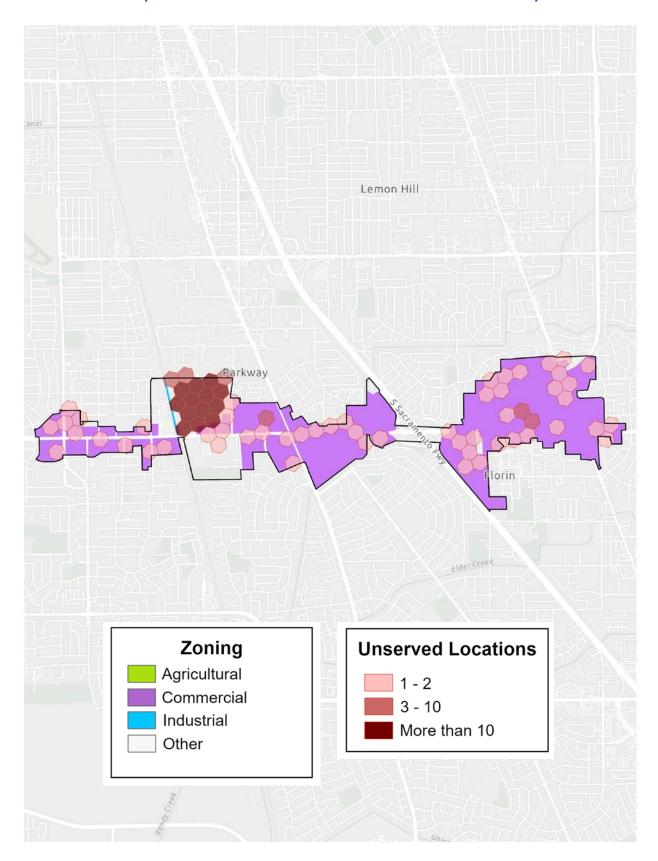
Map 24 Del Paso Boulevard Partnership



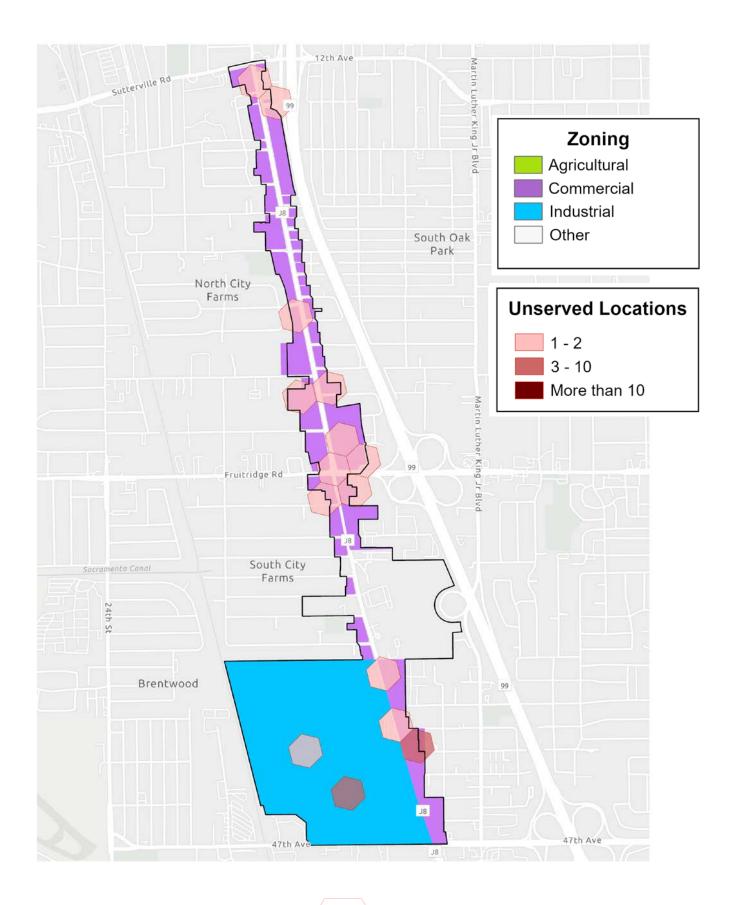
Map 25 Downtown Sacramento Partnership



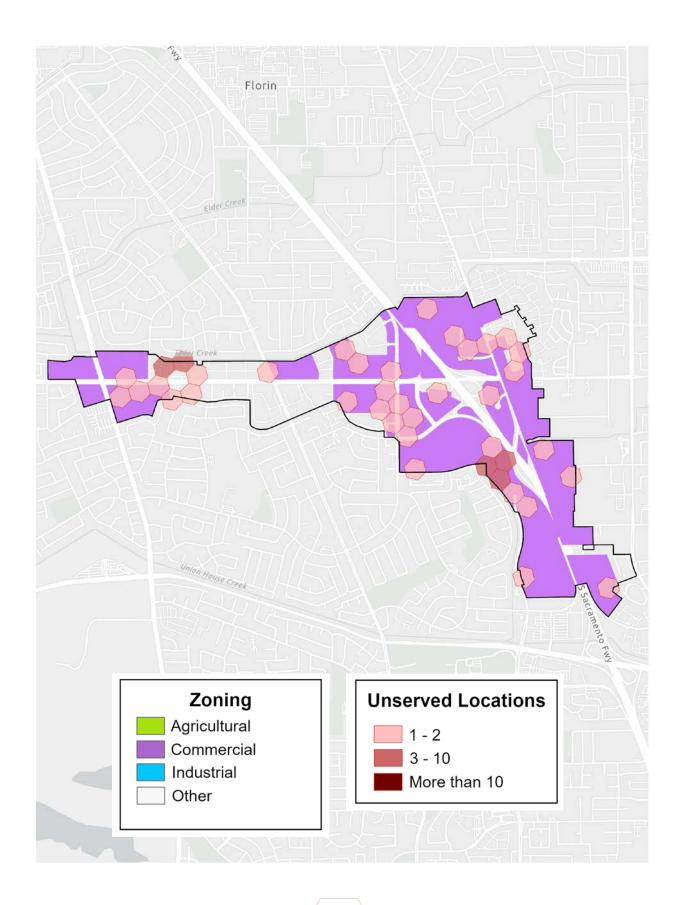
Map 26 Florin Road Partnership



Map 27 Franklin Boulevard Business District



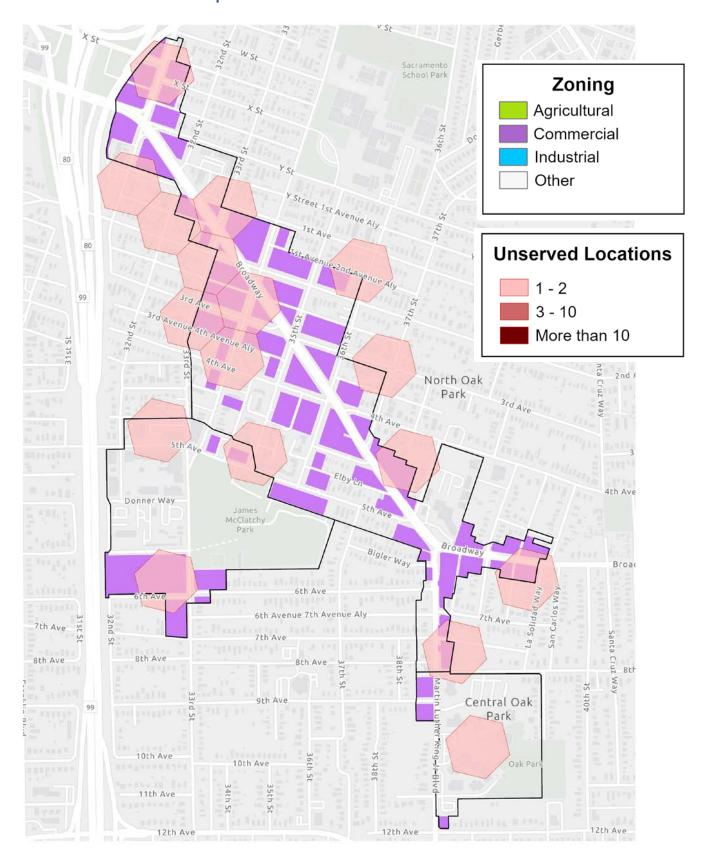
Map 28 Mack Road Partnership



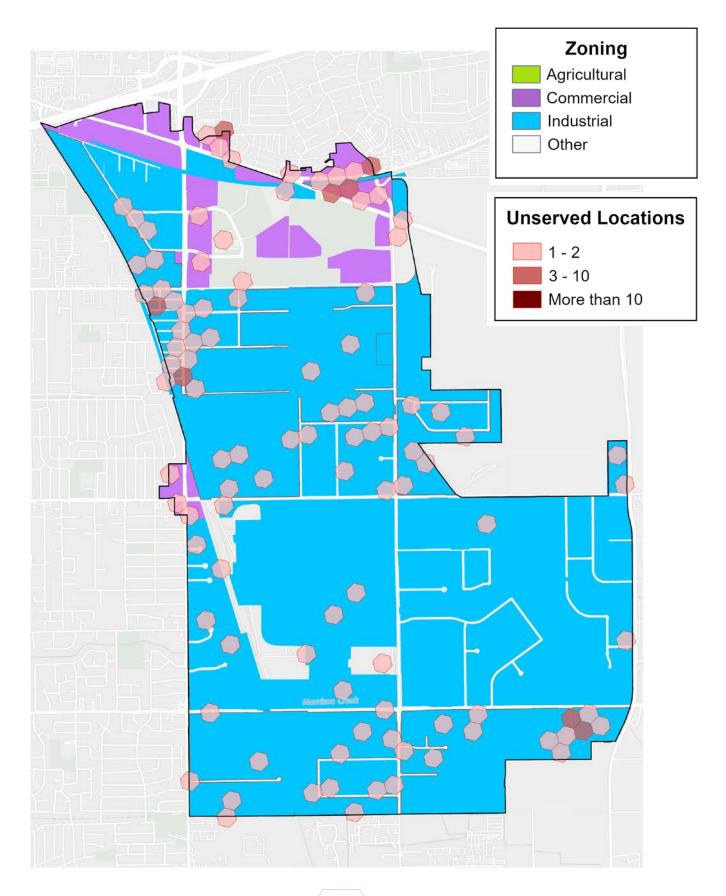
Map 29 Midtown Association



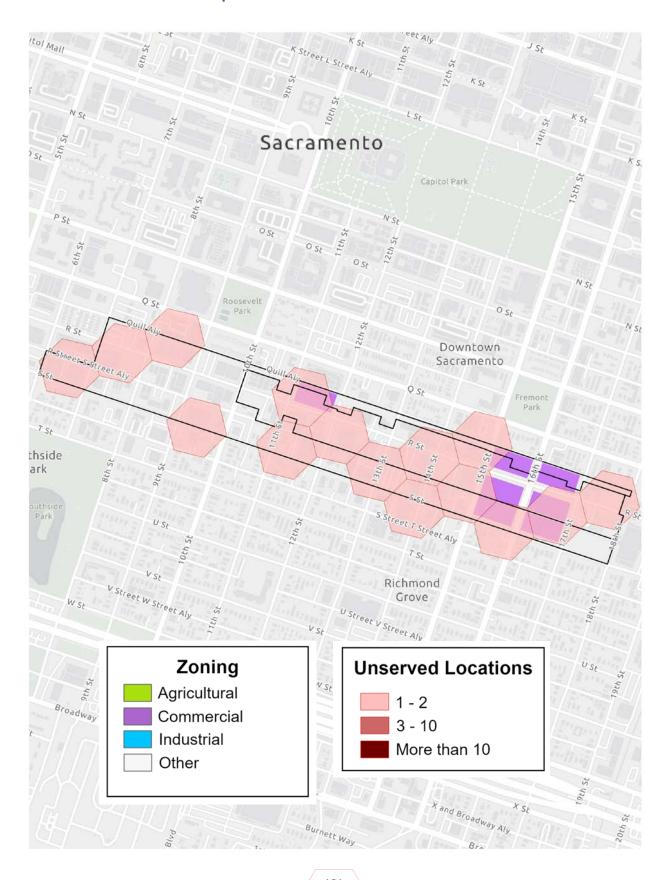
Map 30 Oak Park Property and Business Improvement District



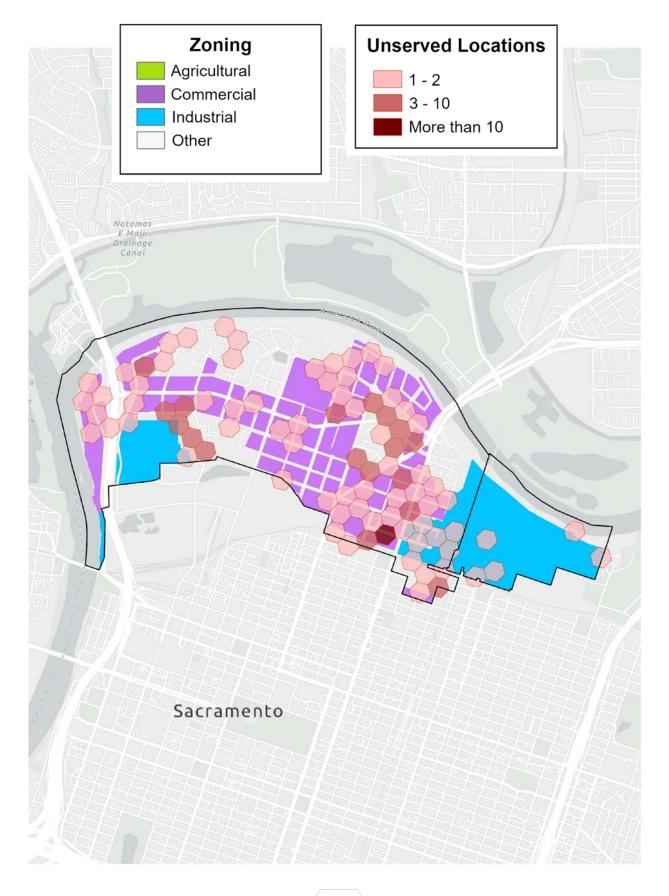
Map 31 Power Inn Alliance



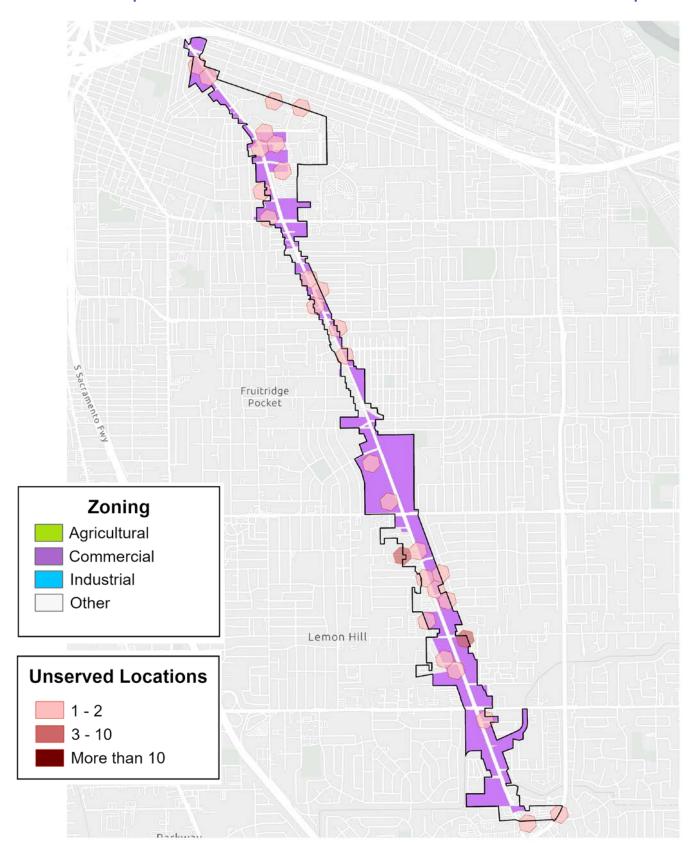
Map 32 R Street Property and Business Improvement District



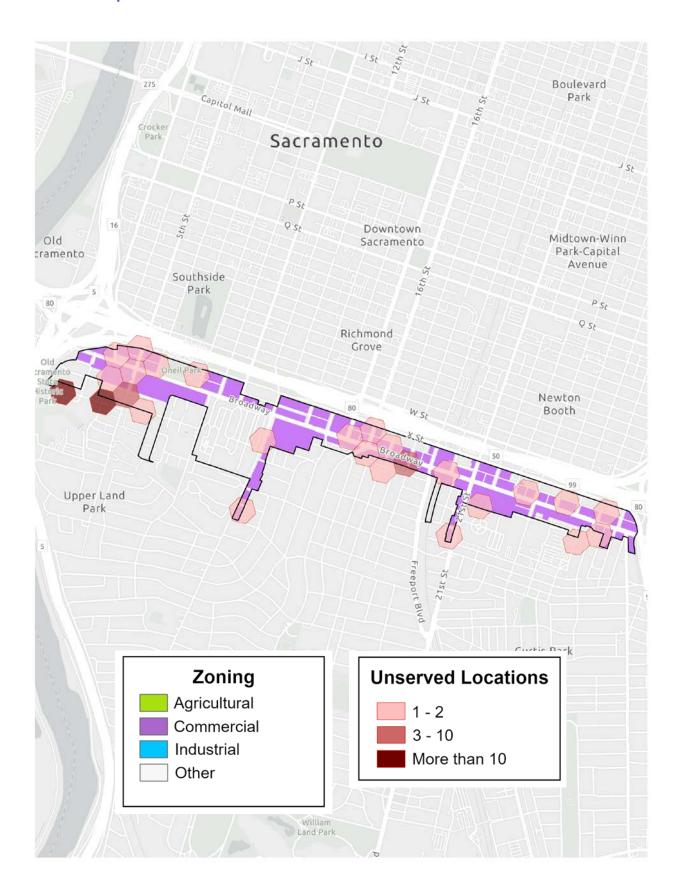
Map 33 The River District



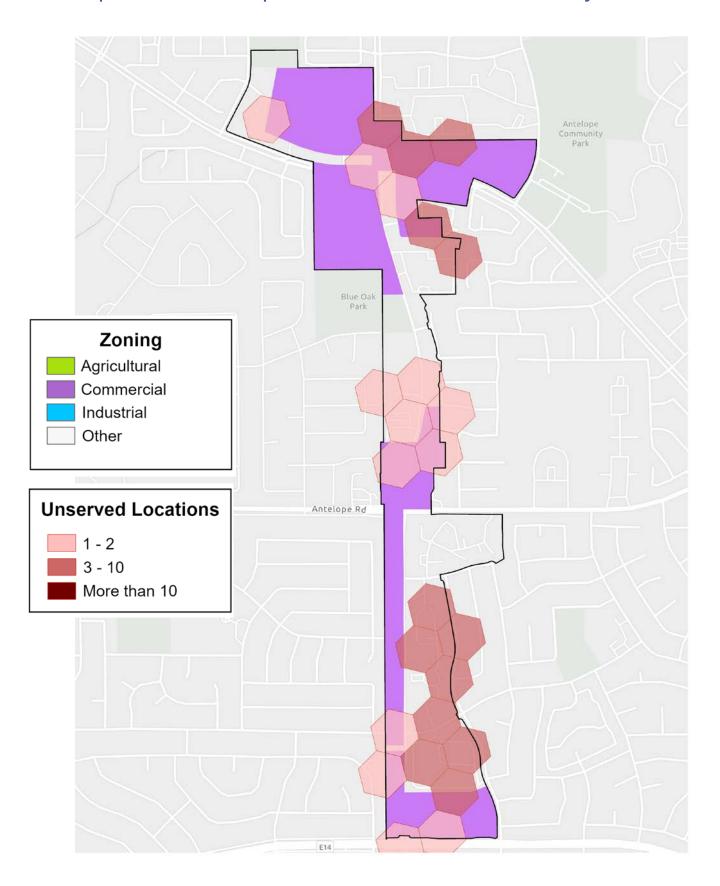
Map 34 Stockton Boulevard Partnership



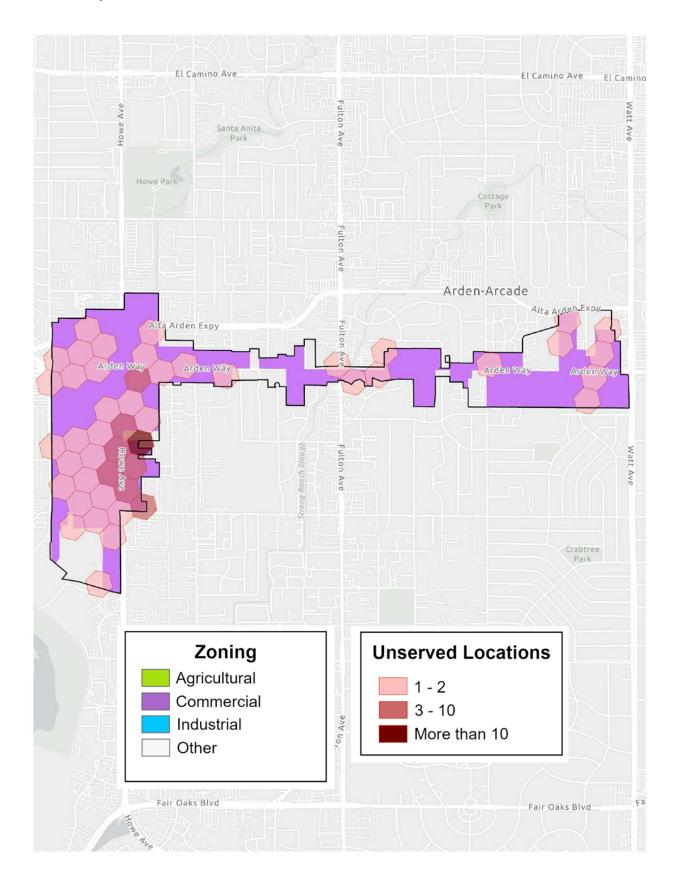
Map 35 The Tower District Sacramento



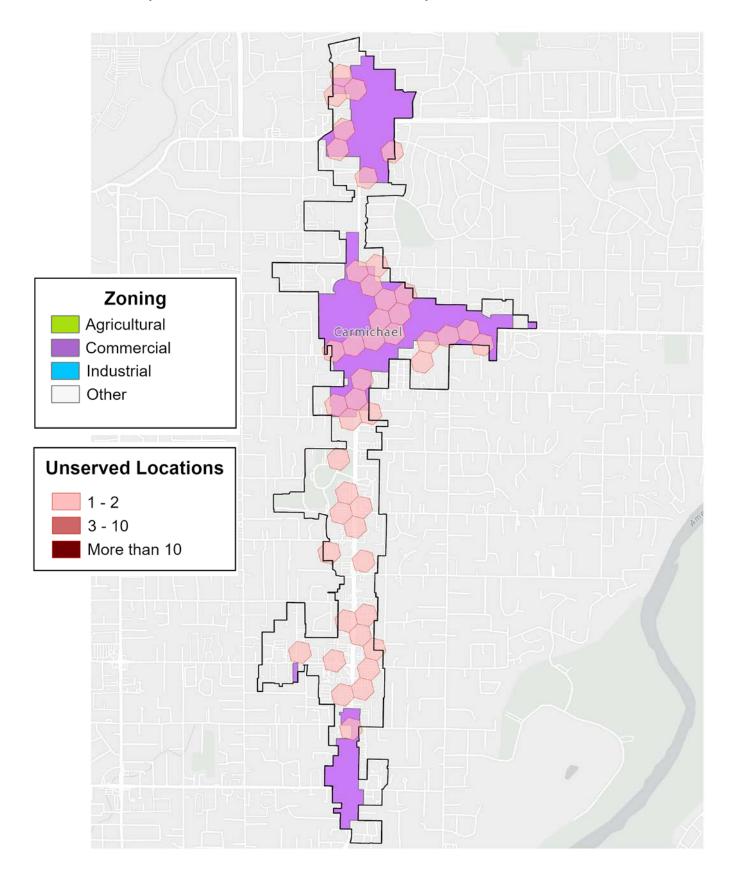
Map 36 Antelope Business Community District



Map 37 Arden + Howe Business Alliance

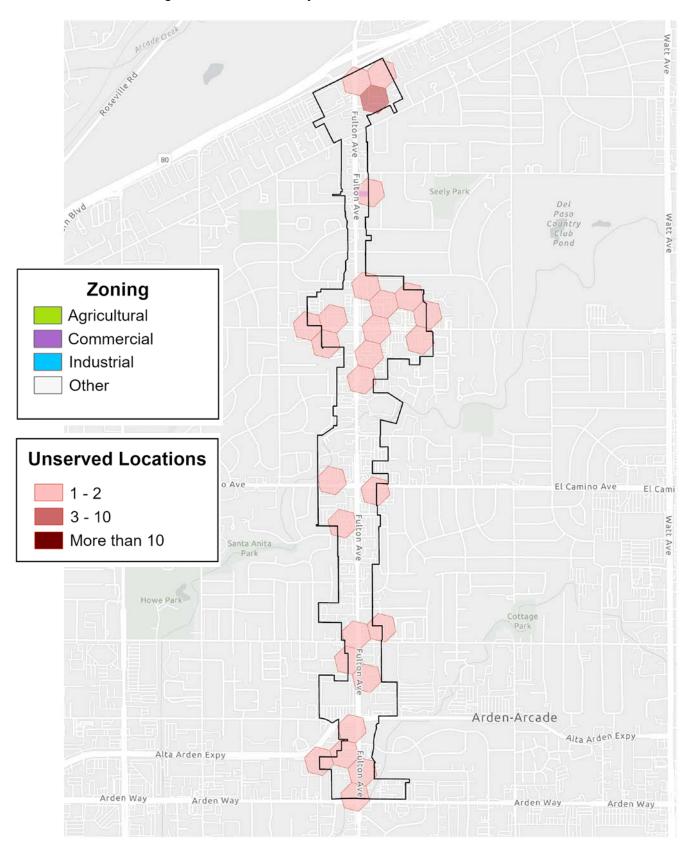


Map 38 Carmichael Improvement District

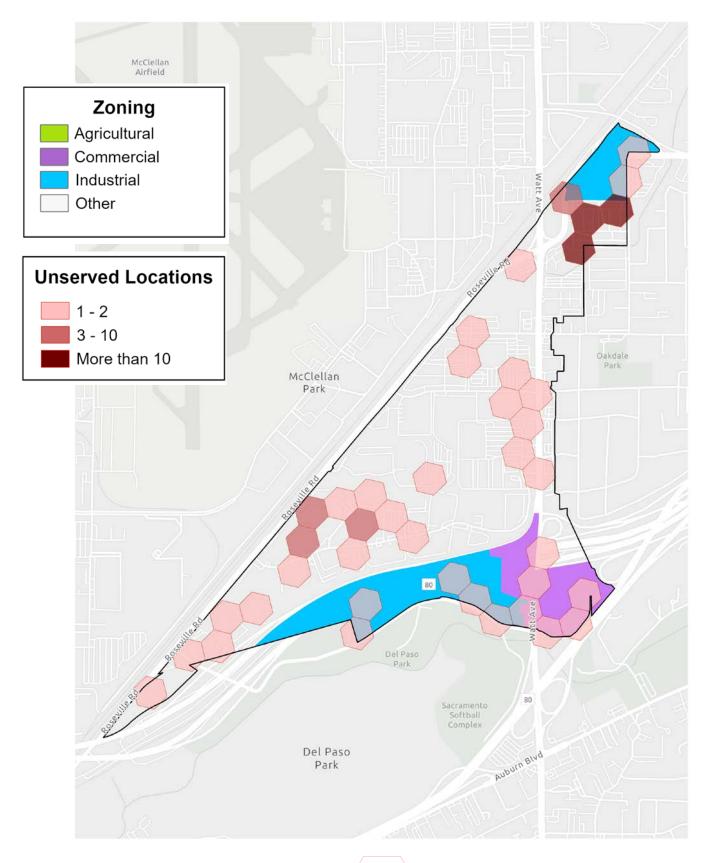


Map 39 Fulton Avenue Association

This PBID is located within a special Planned Use zone, and does not contain commercial or industrial zoning. However, it is heavily commercial in nature.



Map 40 80 Watt Property Business Improvement District



Appendix 3: Business Broadband Survey

Business Broadband Survey

Methodology

The Business Broadband Survey conducted for this project is discussed in Section 2, "Challenges and Needs in the Capital Region." The survey was developed using the SurveyMonkey platform, which allowed respondents to complete it on a computer, laptop or other devices such as a smart phone, with an average completion time of four minutes. It was also possible to print hard copies of the survey.

Valley Vision used professional translation services to make the survey available in five languages: English, Spanish, Chinese, Hmong, and Vietnamese. The survey was designed as a means of gathering as many data points as possible and not as a statistically formalized instrument.

Listed below are the jurisdictions and entities that distributed the electronic survey through their newsletters, websites, social media, and other communication channels in January, February and March of 2024. Valley Vision is grateful for their support and help with this distribution.

Arden-Howe Business Alliance

California Asian Pacific Chamber of Commerce

City of Elk Grove

City of Rancho Cordova

City of Sacramento

City of West Sacramento

City of Winters

City of Woodland

Davis Chamber of Commerce

Davis Downtown Business Association

Downtown Sacramento Partnership

Folsom Chamber of Commerce

Franklin Boulevard Business District

Galt Chamber of Commerce

Sacramento County Farm Bureau

Sacramento Hispanic Chamber of Commerce

Sacramento Metropolitan Chamber of Commerce

Sacramento Valley Small Business Development Center

Steady Eddy's Coffee House (Distributed to Winters Business Community)

Stockton Boulevard Partnership

The River District

The Tower District Sacramento

Yolo County

Yolo County Farm Bureau

Yuba County

Yuba-Sutter Chamber of Commerce

Yuba-Sutter Economic Development Corporation

Yuba-Sutter Farm Bureau

West Sacramento Chamber of Commerce

Woodland Chamber of Commerce

80 Watt Property Business Improvement District

Business Broadband Survey Results

The Business Broadband Survey received 125 responses from a wide range of business types in Sacramento, Sutter, Yuba and Yolo counties. The relatively low response rate was likely due to the busy schedules of business owners, proprietary and security concerns of businesses about technology, and general survey fatigue.

The response rate was on par with other similar regional business broadband surveys. For example, a Broadband Planning and Feasibility Study for Yuba County, prepared by Tilson in 2023 as part of a broader research consultation, was distributed to a wide variety of businesses in 22 counties in Northern and Central California and generated 184 responses from 16 of those counties.² A Broadband Strategic Plan for the City of Sacramento, completed in 2023, conducted a community survey, which received 789 responses from residents and 35 responses from businesses, government organizations, or non-profit organizations.3 A Business Broadband Survey conducted for a Yuba County Strategic Master Broadband Plan in 2021 was answered by 35 businesses, and a separate Farm and Agriculture Broadband Business Survey had 18 respondents.4

The full survey and responses follow.

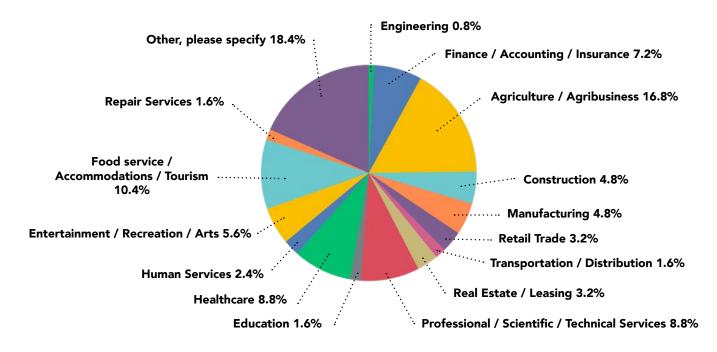
^{2.} Yuba County Broadband Planning and Feasibility Study, Tilson, 2023.

^{3.} City of Sacramento, California, Broadband Strategic Plan, Final Report, Magellan, October 7, 2023.

^{4.} Yuba County Strategic Master Broadband Plan, Valley Vision, September 30, 2021, https://cms7files.revize.com/yubaca/Planning%20Department%20Documents/Yuba%20County%20Broadband%20Master%20Plan.pdf

Q1: What industry or business sector do you serve?

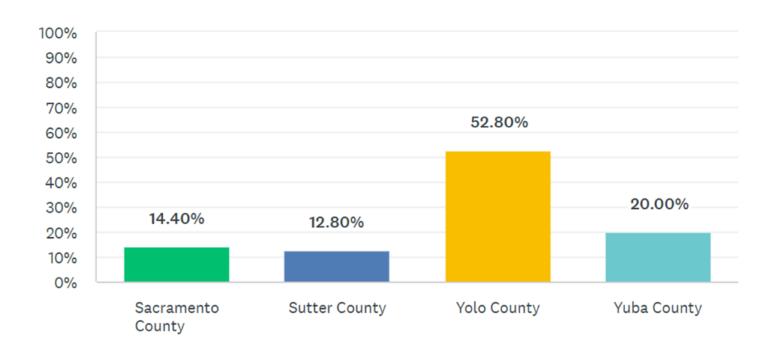
Answered: 125 Skipped: 0



ANSWER CHOICES	RESPONSES	:
Engineering	0.80%	1
Finance / Accounting / Insurance	7.20%	9
Agriculture / Agribusiness	16.80%	21
Construction	4.80%	6
Manufacturing	4.80%	6
Retail Trade	3.20%	4
Transportation / Distribution	1.60%	2
Real Estate / Leasing	3.20%	4
Professional / Scientific / Technical Services	8.80%	11
Education	1.60%	2
Healthcare	8.80%	11
Human Services	2.40%	3
Entertainment / Recreation / Arts	5.60%	7
Food service / Accommodations / Tourism	10.40%	13
Repair Services	1.60%	2
Other, please specify	18.40%	23
Total Respondents		125

Q2: In what county is your business located?

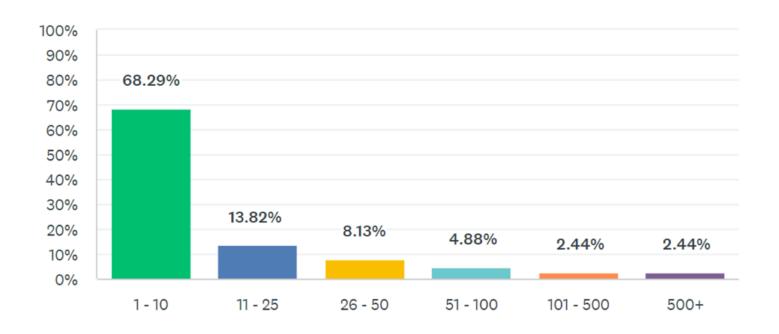
Answered: 125 Skipped: 0



ANSWER CHOICES	RESPONSES	
Sacramento County	14.40%	18
Sutter County	12.80%	16
Yolo County	52.80%	66
Yuba County	20.00%	25
Total Respondents		125

Q3: Counting yourself, how many employees (full- and part-time) does your business have?

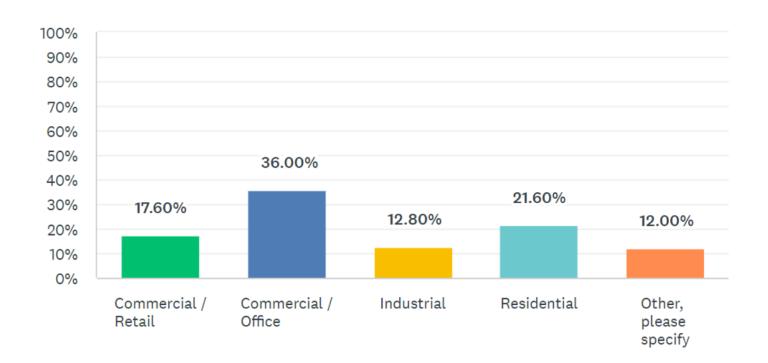
Answered: 123 Skipped: 2



ANSWER CHOICES	RESPONSES	
1 - 10	68.29%	84
11 - 25	13.82%	17
26 - 50	8.13%	10
51 - 100	4.88%	6
101 - 500	2.44%	3
500+	2.44%	3
Total Respondents		123

Q4: In what type of building or location does your business operate?

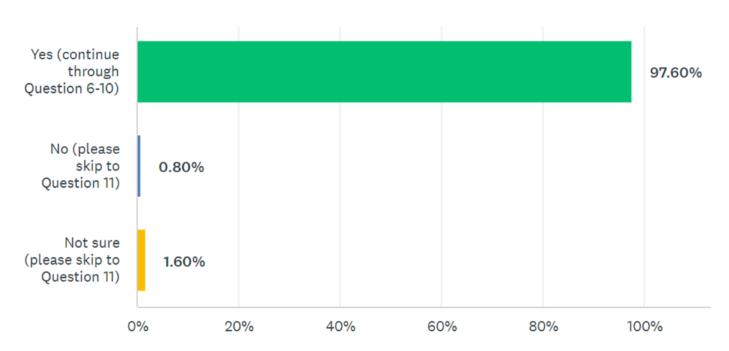
Answered: 125 Skipped: 0



ANSWER CHOICES	RESPONSES	
Commercial / Retail	17.60%	22
Commercial / Office	36.00%	45
Industrial	12.80%	16
Residential	21.60%	27
Other, please specify	12.00%	15
Total Respondents		125

Q5: Does your business have access to an Internet connection?

Answered: 125 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes (continue through Question 6-10)	97.60%	122
No (please skip to Question 11)	0.80%	1
Not sure (please skip to Question 11)	1.60%	2
Total Respondents		125

Question 6

Who is your broadband internet service provider for your business?

Business respondents in the four counties listed 20 different providers in all to this write-in question. Comcast was far and away the most prevalent, followed by AT&T, Astound, Succeed.Net, Verizon, and Starlink. Responses included:

Comcast (Xfinity) Consolidated

AT&T Teal

Astound/Wave California Broadband

Succeed.Net Sonic

Starlink Esparto Broadband

Verizon Frontier

T-Mobile Cal.net

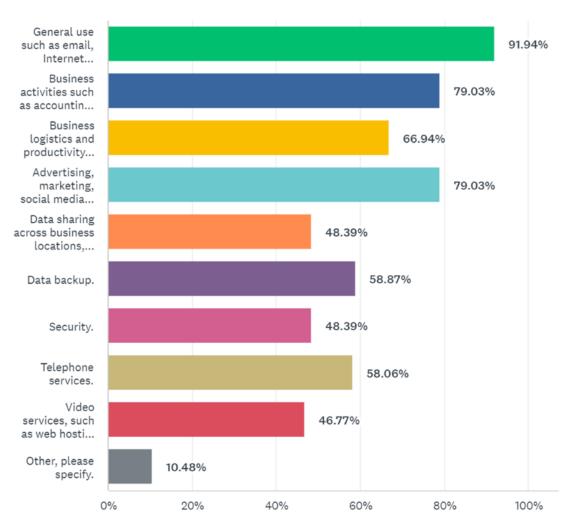
Hughes unWired

WiLINE Digital Path

OmSoft AFES

Q7: How does your business use the Internet? Please check all that apply.

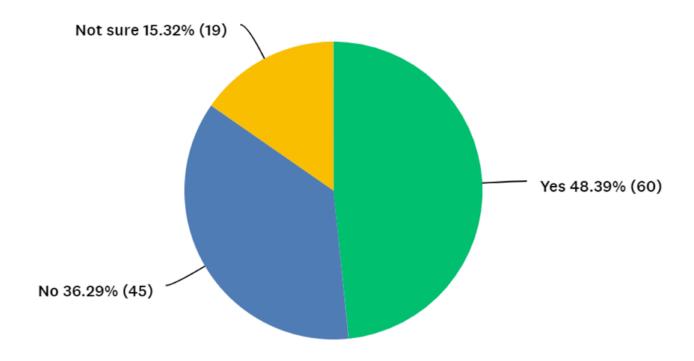




ANSWER CHOICES	RESPONS	SES
General use such as email, Internet browsing, online research.	91.94%	114
Business activities such as accounting, payroll, banking, employee training, cloud computing.	79.03%	98
Business logistics and productivity, including purchasing, managing inventory, sales, and e-commerce.	66.94%	83
Advertising, marketing, social media, website.	79.03%	98
Data sharing across business locations, employees teleworking, file-sharing.	48.39%	60
Data backup.	58.87%	73
Security	48.39%	60
Telephone services.	58.06%	72
Video services, such as web hosting and training.	46.77%	58
Other, please specify.	10.48%	13
Total Respondents		124

Q8: Are you satisfied with your current Internet service for your business needs?

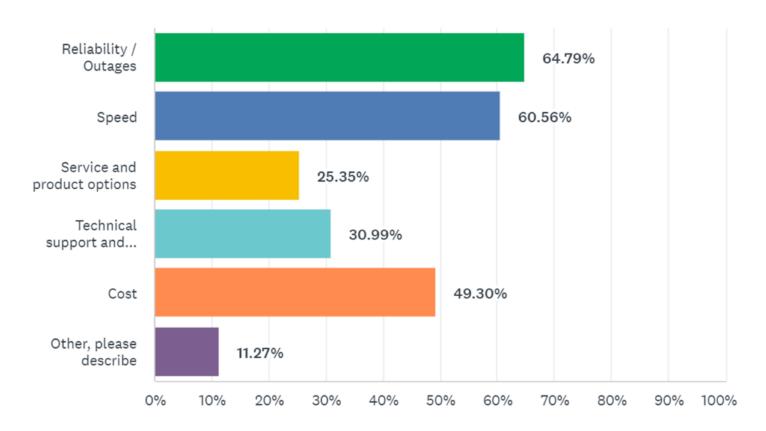
Answered: 124 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	48.29%	60
No	36.29%	45
Not sure	15.32%	19
Total Respondents		124

Q9: If you answered "no" or "not sure" to Question 8, please indicate how your Internet services are insufficient for your business needs. Check all that apply.

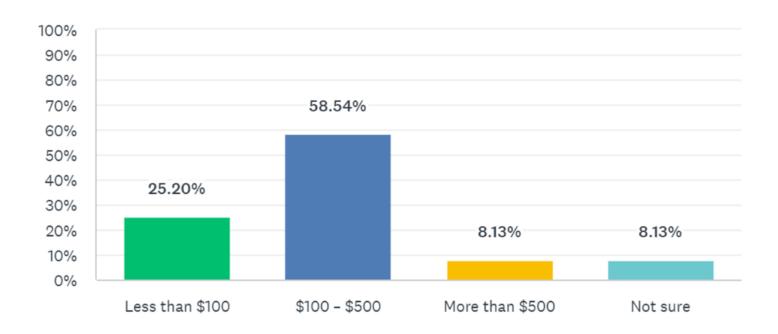
Answered: 71 Skipped: 54



ANSWER CHOICES	RESPONSES	
Reliability / Outages	64.79%	46
Speed	60.56%	43
Service and product options	25.35%	18
Technical support and customer service	30.99%	22
Cost	49.30%	35
Other, please describe	11.27%	8
Total Respondents		71

Q10: How much do you currently pay monthly for Internet service for your business?

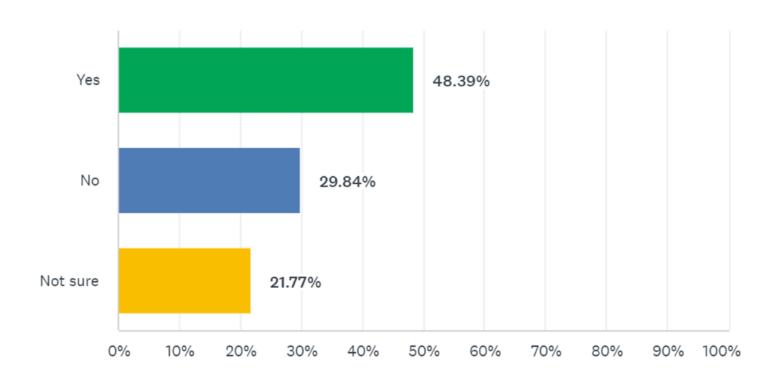
Answered: 123 Skipped: 2



ANSWER CHOICES	RESPONSES	
Less than \$100	25.20%	31
\$100 – \$500	58.54%	72
More than \$500	8.13%	10
Not sure	8.13%	10
Total Respondents		123

Q11: At your business location, do you have access to more than one potential Internet service provider?

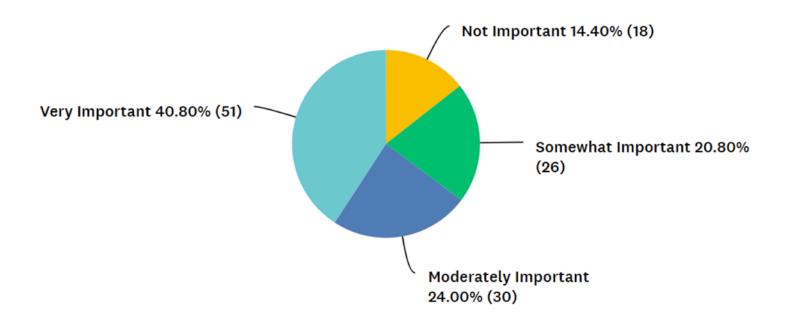
Answered: 124 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	48.39%	60
No	29.84%	37
Not sure	21.77%	27
Total Respondents		124

Q12: How important is it to you to have multiple Internet service providers available to serve your business?

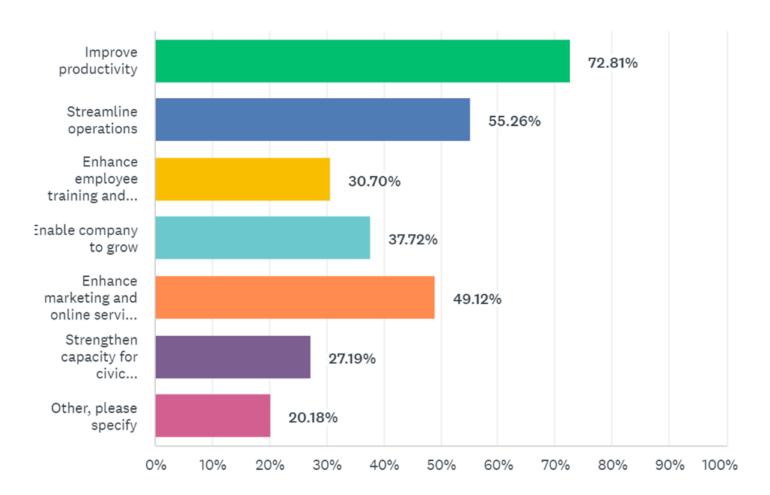
Answered: 125 Skipped: 0



ANSWER CHOICES	RESPONSES	
Not Important	14.40%	18
Somewhat Important	20.80%	26
Moderately Important	24.00%	30
Very Important	40.80%	51
Total Respondents		125

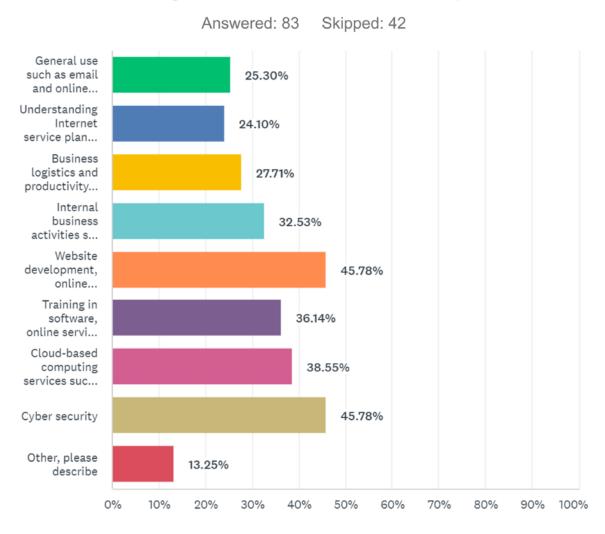
Q13: How would improved broadband access or internet service quality help your business? Check all that apply.





ANSWER CHOICES	RESPONSES	
Improve productivity	72.81%	83
Streamline operations	55.26%	63
Enhance employee training and opportunities	30.70%	35
Enable company to grow	37.72%	43
Enhance marketing and online service to customers	49.12%	56
Strengthen capacity for civic involvement	27.19%	31
Other, please specify	20.18%	23
Total Respondents		114

Q14: Are there any educational or training programs that would help you to use the Internet for your business more effectively? Please check all types of digital training or education that would be helpful



ANSWER CHOICES	RESPONSES	
General use such as email and online research	25.30%	21
Understanding Internet service plans, options, and costs for businesses	24.10%	20
Business logistics and productivity, including purchasing, inventory management, sales, and e-commerce	27.71%	23
Internal business activities such as accounting, payroll, banking, employee training	32.53%	27
Website development, online marketing, social media	45.78%	38
Training in software, online services and applications, or video services such as web-hosting	36.14%	30
Cloud-based computing services such as data storage, file sharing, teleworking	38.55%	32
Cyber security	45.78%	38
Other, please describe	13.25%	11
Total Respondents		83

Question 15

This question asked respondents to share any other comments. Thirty-five respondents provided input. A cross-section of the answers follows:⁵

"I would very much like to see civic/community broadband in Yolo County, both for residential and commercial use."

"If you go on an account for typical business that works off the same old lines as residential, you get better service when things go wrong but horrible issues with reliability and outages. If you go business fiber, you get absolutely no tech support. That's fine for a larger business – maybe they have someone who does that on staff, but for smaller businesses, we just don't have anyone and the carrier refuses to provide any support. It's a lose/lose predicament."

"Our hardline service comes from old phone lines and is extremely slow. We have had to go to cellular internet which is also very slow and unreliable. Faster internet would save thousands per year in employee productivity."

"Cellular data had been the only way I could access the internet until Starlink came along...I have to stay connected to Starlink's WiFi to get any kind of service."

"Cyber security is extremely important and how to eliminate spam would be great."

"Competitive options to improve service while keeping pricing reasonable is key to me."

"Our rural area is very poorly served by internet as well as other (landline and cellular) providers."

"ATT pulled fiber to our location in rural Yolo County and we moved out of the "dark ages" into the future. We got rid of libraries of aviation maintenance manuals and into all cloud training and documents. Without this fiber installation I would have considered moving to another location."

"Although pleased with current provider ... this is a very recent switch. Many neighbors ...have poor access to internet and even a reliable land line telephone. Better service to our Capay Valley CA area is needed." "Please keep the community posted on your progress with the program and grant application. Thank you."

"Sacramento's River District service is severely underserved in this area with horrible connection to both the internet and power."

"The map is false and we are down a lot. We need better internet in Winters."

"Having only two options for internet in Woodland is very limiting for our business. We'd like fiber internet at our store since we are heavily reliant on the internet for our pharmacy operations."

"Very satisfied with the AT&T Fiber 1GB circuit. Handles network, security cameras and all other devices. Much better than the cable service it replaced and better pricing."

"We have several apps to manage business, inventory, and marketing. It is critical to have consistent service. We have had to change ISPs due to unreliable service."

"Thanks for your concern regarding building reliable business internet access and use."

"AT&T is phasing out landlines, meaning cell phones only for voice communication. Due to the lack of such service in the foothills, there is a concern being voiced. Perhaps the county can help with this by subsidizing cell phone coverage."

"The main issue we encounter is the time it takes to get internet installed at a new location. Usually, once we place the order, it takes 90-180 days for service. It's hard to set go-live dates for new facilities when it takes this long to get data."

"Farm family uses a lot for personal necessities that are not being asked or able to record in this survey such as education for our kids."

"We have had such terrible internet service for years. Now that I have Starlink, I do not see myself changing providers."



PHOTO CREDITS

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