

STAFF REPORT

DATE: March 3, 2015

TO: City Council

FROM: Rob White, Chief Innovation Officer
Sarah Worley, Deputy Innovation Officer

SUBJECT: Draft Yolo Broadband Strategic Plan

Recommendation

1. Receive presentation and provide comments on the Draft Yolo Broadband Strategic Plan;
2. Direct staff to:
 - a. Conduct further outreach with community stakeholders to hear community ideas for increasing local/county-wide options for internet service, including provision of fiber or other internet related infrastructure (Wifi antennas etc.); and
 - b. Update City Council and present broadband implementation recommendations for Davis, for approval.

Fiscal Impact

The City of Davis contributed staff resources to participate in the collaborative Yolo Broadband Strategic Plan process. Providing comments on the Yolo Broadband Strategic Plan (YBSP) has no direct fiscal impacts.

Council Goals:

Ensure fiscal resilience
Pursue environmental sustainability
Drive innovation and economic vitality
Build and promote a vibrant downtown
Fund, maintain and improve infrastructure

Discussion

In May 2013 the Yolo Local Agency Formation Commission (LAFCo) hosted a Yolo Leaders Forum focused on the critical importance of broadband infrastructure in Yolo County. Many of the elected and appointed community leaders in attendance at the forum expressed interest in a collaborative effort to address broadband needs of Yolo communities. As a result, the jurisdictions of Yolo (including the County, Davis, Woodland, West Sacramento and Winters) requested that Yolo LAFCo coordinate a collaborative planning process aimed at determining how Yolo's public organizations could participate in the development of broadband infrastructure through the utilization of public policy tools, grant opportunities, public-private partnerships and public investment in broadband infrastructure.

In October 2013 the LAFCo Commission approved a contract with Magellan Advisors to develop a broadband strategic plan for the Yolo community, and LAFCo staff convened a Broadband Working Group composed of representatives from each of the five jurisdictions to guide the planning process.

Objectives of the Yolo Broadband Strategic Plan

The objectives of the YBSP were to:

1. Identify short, mid and long-term broadband policies and initiatives that agencies countywide can develop to facilitate a unified broadband policy and direction;
2. Identify broadband capacity, equity, access and affordability gaps with a goal of achieving consistent broadband services for all businesses, residents and visitors;
3. Positively affect how broadband infrastructure and services are likely to develop countywide over the next 10 years;
4. Positively impact the adoption of broadband services across our communities;
5. Identify key strategic broadband investments that could improve our communities' access to and competitiveness in the digital economy;

The consultants used extensive community outreach, an in-depth needs assessment, and a countywide market analysis to identify key broadband issues facing each of Yolo's communities.

YBSP Findings

The Draft YBSP explains that broadband supply and demand varies widely across Yolo County, with some communities being well served through modern infrastructure and multiple providers while others have no broadband services available and are forced to use satellite or dial-up services.

The strategic plan includes background on what broadband is, why it is so important and an overall discussion regarding the state of broadband countywide. The County is divided into 5 communities (one for each city and unincorporated areas) and each profile includes a discussion regarding the unique issues in each jurisdiction, concluding with a list of recommended strategies and action items for each agency to implement. The action items include some strategies common to all agencies, plus several that are unique to each agency's particular situation.

The strategies common to all agencies include General Plan Amendments to create a policy framework to promote broadband deployment in public and private projects by incorporating broadband into local policies, codes and standards as a public utility. Strategies also include coordination with other local agencies to leverage opportunities for joint projects, reducing individual agency costs.

Each agency has somewhat unique issues as well. In West Sacramento and Woodland, both cities have segments of city owned fiber already that can be potentially extended to help areas with poor internet speeds. In Davis, there is an existing franchise agreement with Comcast that currently provides free fiber to the city, public schools and county buildings that is set to expire in 2018, which creates issues that need to be addressed. Winters is interested in assessing the feasibility of financing and constructing a city-owned fiber network. Yolo County has a network that links many of the county buildings, but more infrastructure is needed. Many communities in

the County could potentially qualify for grant funding as well. For more information see Attachment B -YBSP Executive Summary.

The key findings for Davis include:

- In 2005, the City of Davis renewed a franchise agreement with Comcast to provide the services, facilities and equipment to meet the cable related needs of the community. This agreement is effective until October 1, 2018. The provisions of this agreement created the Institutional Network (I-Net), a private communication network that currently provides free fiber and internet access to the city, public schools and county buildings, and cannot be used for any commercial purposes. The costs of a new agreement are not yet known. Changes in State law in 2006 (Assembly Bill 2987) now require the California Public Utilities Commission to approve these types of franchise agreements.
- AT&T, Comcast, Omsoft, and Davis Community Network are the city's main internet providers;
- Some areas in the community are still not connected to broadband or have limited options available;
- Survey responses from Davis reported that the current provision of service was inadequate both in available options and level of service (download and upload speeds) for both residential and business customers.

Additional findings relevant to Davis include:

- Exponential increase in internet use (internet of things, big data, cloud) is shifting communications industry to use of higher capacity fiber vs. cable or copper;
- Access to robust, reliable, broadband capacity and service has become an essential utility for residents; schools; community anchors; and businesses, particularly innovation companies reliant on rapid communication technology and transfer of "big data" files; and
- Broadband access is of critical importance to Economic Development, Commerce, Digital Literacy & Equity, Healthcare, Public Safety, Government Services, Agriculture, Schools/Homework, Adult Education & Training, Entertainment, and Telecommuting.

For more information on broadband access and needs in the City of Davis see Attachment A – Community Profiles - Davis. A web link to the full Draft YBSP report is provided as Attachment C.

The following Yolo County web link provides more information about the history of the YBSP process:

<http://www.yolocounty.org/general-government/yolo-lafco/shared-services-initiative/yolo-broadband>

YBSP Recommended Actions

Based on the issues identified, the YBSP outlines several distinct recommended actions for each jurisdiction, as well as several common actions to be taken by all the jurisdictions. In general these recommendations include:

- Adopt broadband infrastructure policies and broadband engineering standards (dig once, joint trenching agreements, costs higher for Davis because it is essentially built out);
- Incorporate installation of conduit fiber in CIP projects where possible;
- Streamline permitting process;
- Pursue funding grants and collaborative partnerships;
- Educate residents and businesses about service options.

Request for Expressions of Interest in Providing Broadband Fiber in Davis

In May of 2014, the City of Davis issued a Request for Expressions of Interest (RFEI) in providing broadband fiber in the City of Davis. This request was issued in part as a response to one company's proposal to deploy broadband fiber throughout the City using the City's existing wastewater lines, and City's interest in learning if there were other companies also interested in submitting proposals. The City received six responses, with only one, the original company, that included a specific proposal for installation of broadband fiber in the City. The City determined not to pursue further action until the Yolo Broadband Strategic Plan was completed.

Next Steps

The City Manager's Office will act as lead in conducting further outreach to community stakeholders and developing Davis specific implementation recommendations for the City Council to consider; with the Departments of Public Works, Community Development and Sustainability and City Attorney providing support.

Attachments

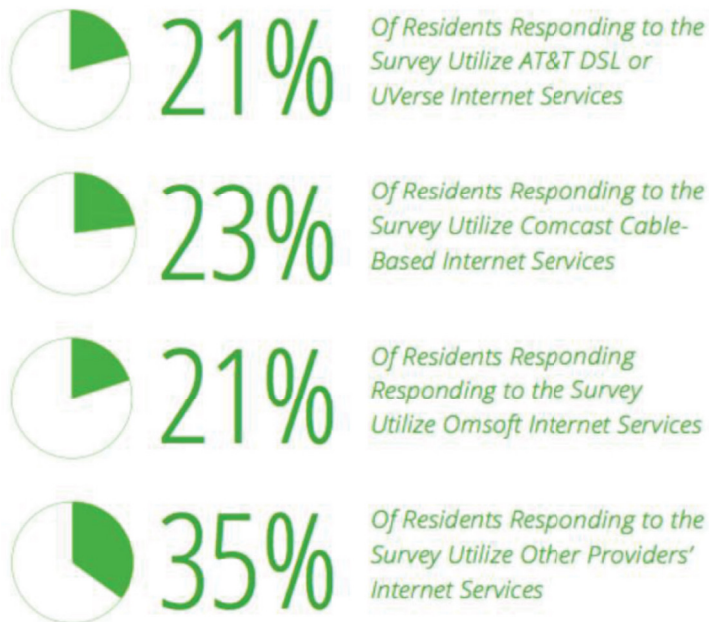
- A. YBSP Community Profiles - Davis
- B. YBSP Executive Summary
- C. Draft Yolo Broadband Strategic Plan
<http://www.yolocounty.org/general-government/yolo-lafco/shared-services-initiative/yolo-broadband/download-the-draft-plan>

4. Broadband Community Profiles Davis



A. Residential

The residential broadband market in Davis is served by multiple providers including AT&T of California, Comcast, Omsoft, and Davis Community Network. Fixed wireless providers also have coverage in Davis including DigitalPath and Winters Broadband. Of 290 respondents, 65% of residential subscribers utilize three providers for their broadband Internet services. Approximately 35% of respondents utilize fixed wireless, satellite, and other competitive providers. From the research conducted, wireline residential broadband services are generally provided via copper broadband infrastructure either through copper cable plant owned by the local exchange carrier or coaxial cable plant owned by the local cable company. Wireless services are provided through terrestrial fixed wireless systems and 3G and 4G mobile wireless carriers¹¹.



Broadband Internet download and upload speeds reported by the majority of residents surveyed were satisfactory for some but a significant amount of respondents noted issues with their current services. Some 39% of respondents reported download speeds greater than 10Meg. These speeds were generally reported in the most urbanized areas that had a high density of single-family or multi-dwelling units. Some 44% of respondents reported download speeds less than 6Meg. Upload speeds were found to be considerably lower than download speeds; consistent with asymmetrical DSL and cable

¹¹ AT&T Mobility, Verizon Wireless, T-Mobile, MetroPCS and Sprint

broadband services. Some 58% of respondents reported speeds of less than 1.5Meg. This was unexpectedly high given the 39% of download speeds above 10Meg. In general, higher upload speeds should correspond to higher download speeds, but in the case of these respondents, there was little positive correlation between higher download speeds and higher upload speeds. A significant number of respondents reported issues with their broadband services. Key issues included speeds that were inconsistent, speeds that never achieved their stated bandwidth tiers with service providers and reliability issues with residents' current services. A total of 41% of the respondents reported that their services were moderately to highly reliable while 30% felt that their services had sufficient speed. Some 30% reported that services were unreliable and 60% reported that they did not have sufficient speed.

Measuring the pricing for services against the speeds of services that residents received indicated that there was a direct correlation between the price paid for services and the amount of bandwidth ("speed") received by residents. The following chart illustrates the price of services subscribers in Davis pay and the realized download and upload speeds they experience. The general trend was that higher prices equaled faster speeds and at the highest price tier, residents were receiving up to 20Meg downloads and 5.77Meg uploads for between \$100 and \$124 per month. These prices are significant for residential Internet services and although Davis prices are competitive to similar communities, the realized speeds are much lower than communities where fiber broadband services have been deployed.

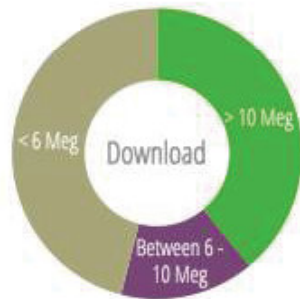
Actual speeds recorded may be different from the speeds residents purchase from service providers in the area. In general, DSL and cable broadband services are sold with speed increments that define a maximum speed for the service such as "Up to 10 megabits down and up to 1.5 megabits up." Actual speeds vary depending on the physical location of the service and how many subscribers are concurrently on the system. The "maximum advertised speed" should not be construed to mean a sustained maximum but instead the top speed of the service which may be considerably lower over long periods of time. However, there is a relationship between the price Davis residents pay for their services and the speeds they realize, as demonstrated through this data.

Analysis of the services available in the area indicates that providers are offering packages in some areas of up to 105Meg download and 20Meg upload on cable-based networks, and 45Meg download and 5Meg upload on DSL based networks. Broadband coverage data also shows this availability. Through deeper analysis into Davis' neighborhoods, these services were found to be available in some communities while others lacked access to these services. In addition, some residents reported upgrading to these higher speed services but did not feel that they were getting the speeds advertised. Results of the survey data validated speeds up to 57Meg in areas reported where these services were offered however, the majority of survey respondents recorded significantly lower speeds. Even at the highest price point paid by the subscribers the median speed was 80% less than the advertised speed.

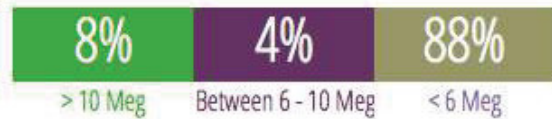
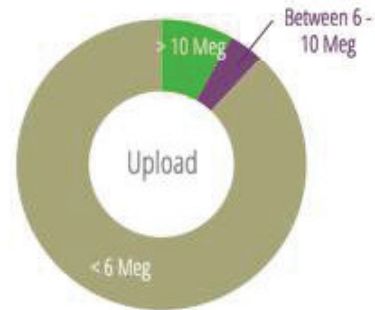
Even at the highest price point paid by residential subscribers, median speeds were 80% less than advertised speeds, which generally indicates highly oversubscribed services

Residential Broadband Services - Davis Survey Data

Residential Broadband Download Speed Test Results



Residential Broadband Upload Speed Test Results



Reliability of Current Broadband Services



Speed of Current Broadband Services

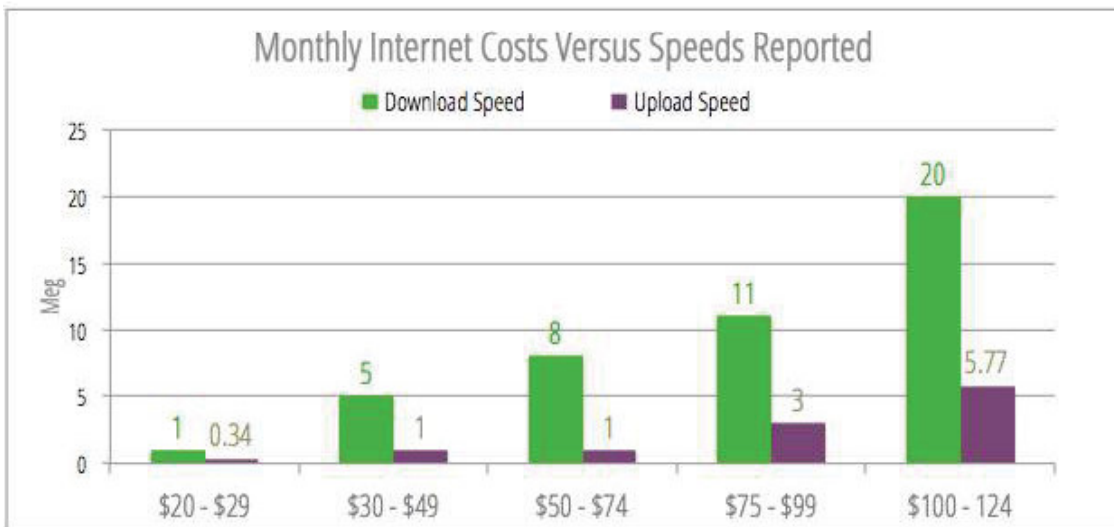


Figure 4.1: Residential Broadband Coverage in Davis (Download Speeds Only)

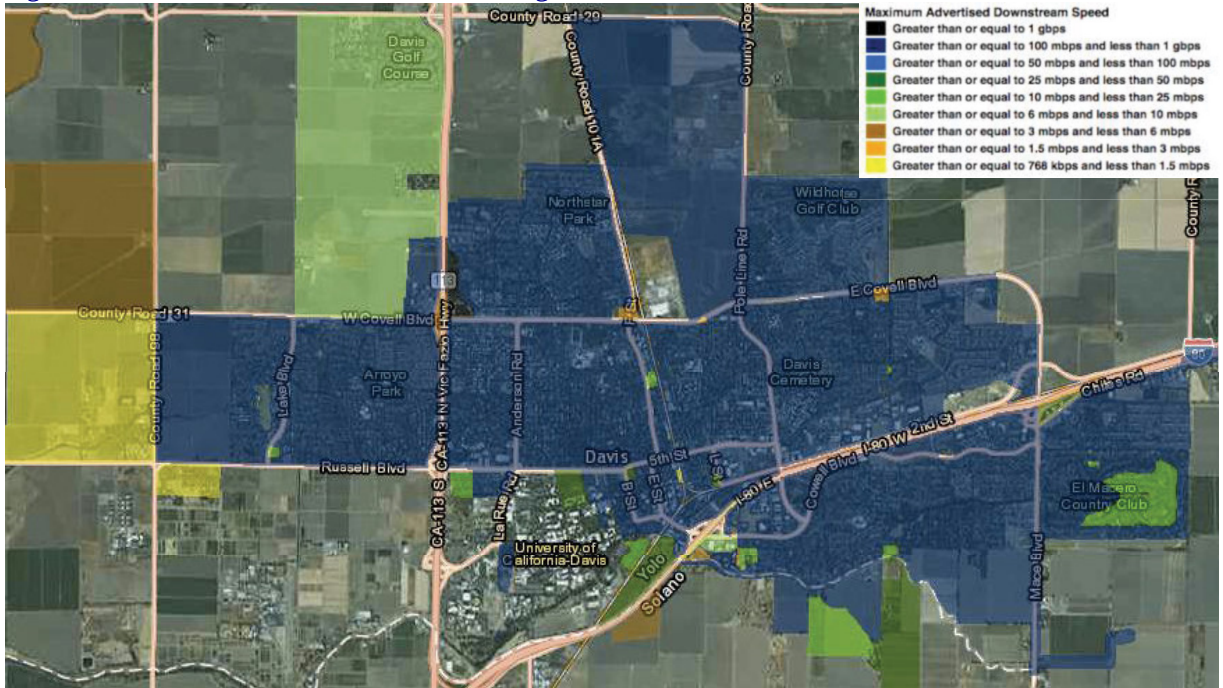
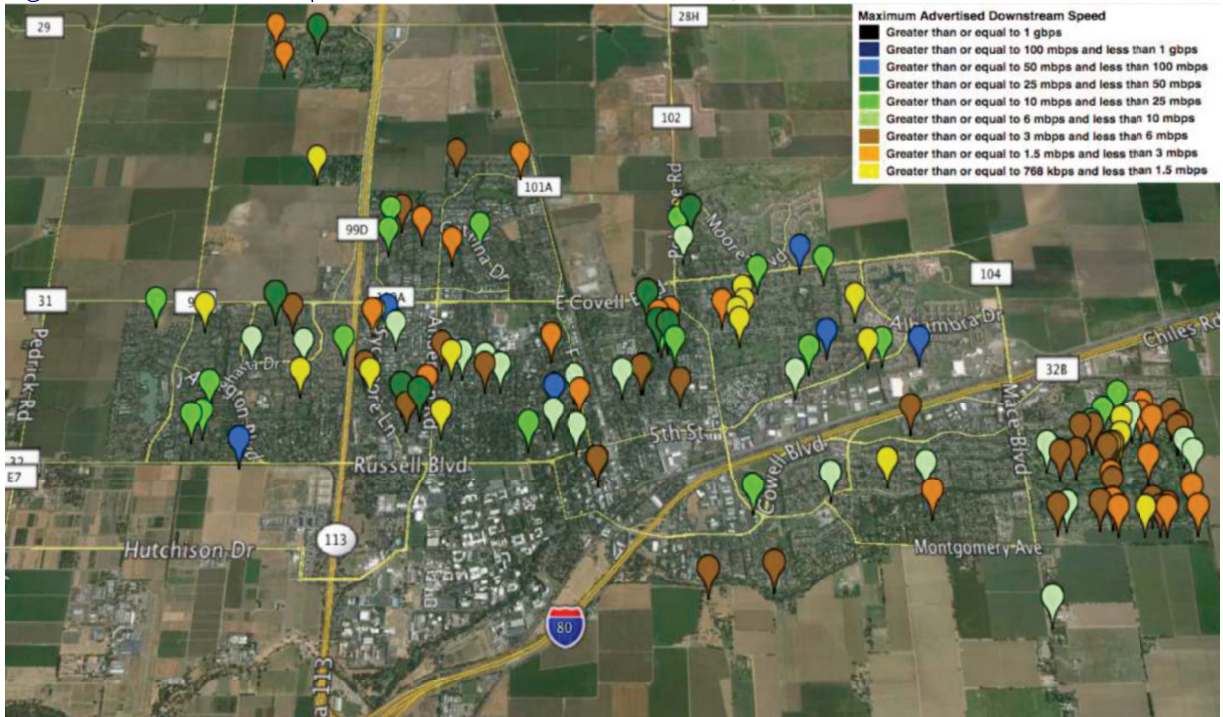
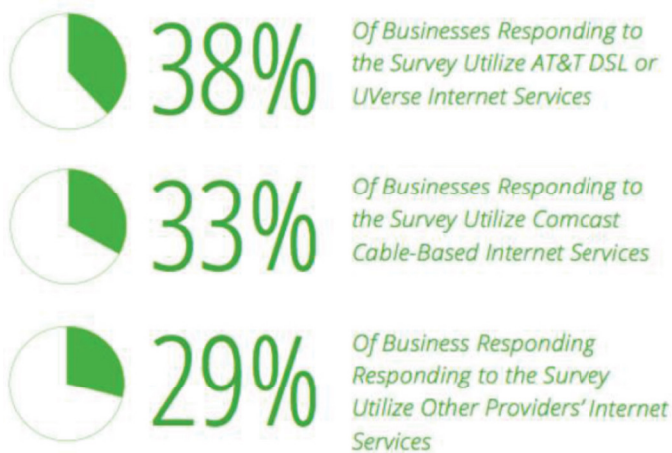


Figure 4.2: Residential Speedtest Results (Download Speeds Only)



B. Business

46 businesses in Davis responded to the business survey. Businesses in Davis subscribe to a mix of wireline providers and resellers including AT&T of California, Comcast, and Omsoft. A few businesses also reported utilizing fixed wireless providers including DigitalPath, Inc. and Succeed.net. In general, these services are branded as “business class” and come with a higher quality of service that prioritizes business services over residential services that run across the same physical infrastructure. Pricing for DSL and cable based services were found to range from \$39.99 for the lowest speed service to \$249.99 for the highest speed service.



For businesses included in the assessment, 62% reported receiving download speeds of 10Meg or above. Some 24% reported download speeds of less than 6Meg. Upload speeds were commensurate with DSL and cable broadband services with the majority of businesses, 66%, reporting less than 3Meg upload. Businesses reported moderate issues with their current broadband Internet services as 33% of respondents indicated that their current services were not sufficient to meet their business needs. Another 33% reported that they were unsure whether their Internet services were sufficient for their needs.

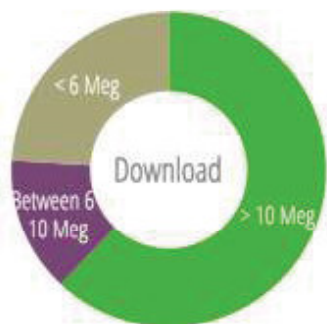
Local businesses cited numerous examples of the issues they faced with their existing broadband services. Big Data companies provided evidence of how their broadband services were inadequate to process the large amounts of data needed to run their operations. Some businesses have considered relocating to other cities that have affordable next-generation broadband; several companies have already done so. Many companies are small in terms of employees but have large data needs since they utilize significantly more bandwidth than larger companies in other industries. The University also spawns a significant amount of new startups in Davis. As these startups move from the University setting to “off campus,” they encounter a significant reduction in broadband capabilities. For these small businesses, three options exist: (1) live with the issues, (2) pay significantly higher costs for next-generation broadband or, (3) relocate to a community where these services are available and affordable.

Only two business reported utilizing a fiber-optic broadband connection in Davis, Breyta, Inc. and an anonymous response. These businesses received direct fiber connectivity providing speeds in range from 20 Meg to 100Mbps. Breyta, Inc. reported that the reliability was low and the price was too high. The vast majority of businesses responding to the survey utilized DSL and cable services because they

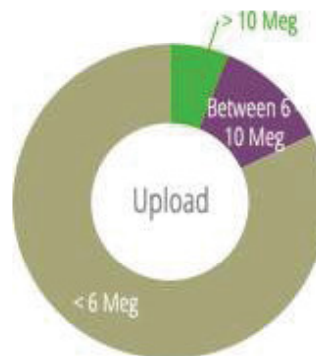
could not afford other services or the services were not available in the area. Apart from these few organizations, use of fiber-optic broadband was not reported by Davis' businesses. One potential reason for these high prices is the lack of available distribution of fiber infrastructure in the Davis area. In many communities, providers are beginning to equip business and residential areas with fiber-to-the-premise infrastructure by overbuilding their existing DSL and cable infrastructure. This fiber distribution infrastructure is specifically designed to deliver high-speed, reliable fiber broadband services to residents and businesses at lower costs than are available today. This study did not find any fiber distribution infrastructure in the Davis area that was available to business customers.

Business Broadband Services - Davis Survey Data

Business Broadband Download Speed Test Results



Business Broadband Upload Speed Test Results



Reliability of Current Broadband Services



Speed of Current Broadband Services



Why Haven't Businesses Upgraded



One third of the businesses surveyed had not upgraded their services because of cost and 30% had not upgraded because services were not available in their area. Demand for higher speed, higher reliability service necessitates a less costly, more accessible solution for Davis' businesses. New businesses that are cultivated require these services to become mature. Davis' high-tech focus, thriving Seed Tech industry and high concentration of startups need a foundation of next-generation broadband to grow. Big Data driven companies that may be small in employee size but large in their broadband needs must have access to affordable, scalable broadband services that exceed the capabilities of traditional the traditional small business DSL and cable broadband services.

Small companies that have an international presence also require affordable, enhanced broadband services to connect to international branch offices and partners. General businesses would also benefit from these services as they begin to utilize more online applications that improve productivity and competitiveness. Davis should implement a broadband strategy that includes both the heavy users of broadband services but also those that do not have such high demand for bandwidth, but instead need reliable, stable broadband. Many of Davis' small businesses need consistent broadband service, regardless of the amount of bandwidth.

Comments from Businesses in Davis:

Home-Based Web Development Firm – “Must have guaranteed bandwidth. Only way to achieve this was through expensive bonded T-1's which theoretically should provide 3Meg but need much higher speed...”

Property Management Company – “Frequent drop-outs and slowdowns even though we clocked a fast speedtest.”

Small Tech Business – “We are forced to use the University's connectivity for our online data processing research, our office connection is way too slow”

C. Community Anchors

Education

The Davis Unified School District is supplied with fiber-optic connectivity via the local I-Net that was provisioned as part of the City of Davis Franchise Renewal Agreement with Comcast of California Inc. The I-Net enables high-bandwidth interconnection between schools. Internet connectivity is supplied through a second fiber connection to the Board of Education that provides 250Meg of Internet to the district's schools in the area. The majority of the District's schools are connected however there are several smaller sites that receive lower speed access; particularly with Fairfield Elementary School and those in south Davis where schools maintain 1.5Mbp T1 services for their broadband needs. As online education grows for school districts, the importance of their broadband services becomes even more important to deliver a blended curriculum to their students. As new testing requirements from California's Common Core State Standards take effect this year, districts will rely on their broadband connectivity for more advanced online testing programs. Therefore, the long-term broadband needs of the Davis Joint Unified School District should be considered as a part of Davis' broadband development efforts.

University of California at Davis has significant broadband capabilities on campus and to some of the University's off-campus locations within the city. 10Gbps connections to the Internet, research, and education networks all provide immense connectivity to students, faculty, and staff, however; there are some off-campus locations for which Davis does not currently have high-speed connectivity. In addition, several off-campus housing facilities could potentially benefit from expanded broadband services, enabling students to maintain the same quality and speed as when they are on-campus. Furthermore, the University's needs for expanded broadband reach into the residential areas of Davis and greater Yolo County. Faculty, staff, and students all live in the vicinity of the University and need high-speed, reliable connections back to the University.

Los Rios Community College maintains a presence on the UC Davis Campus. Los Rios reported that data needs for the college continues to increase exponentially and current bandwidth levels are insufficient and are currently constrained due to cost of services. Los Rios would welcome new cost effective methods for providing connectivity to its various sites.

Healthcare

Healthcare organizations in Davis could derive significant benefit from expanded broadband capabilities. Several organizations have expressed issues with existing broadband connectivity and are looking for solutions to "keep up" with the latest electronic health technologies. These organizations serve Davis and its surrounding communities. They need broadband connectivity between one another that allows them to use the latest technologies to deliver quality patient care. CommuniCare locations across Yolo County (Davis Community Clinic) still utilize T1 technology to interconnect with the California Telehealth Network, which delivers a suite of Telehealth, telemedicine, and health information exchange services. A T1 connection for these services is barely enough bandwidth to enable these facilities to take advantage of new electronic health services that will be transported

across these connections. CommuniCare is looking for options to upgrade these current T-1 services to fiber in order to have access to more online telehealth applications.

Local Government

The City currently maintains fiber-optic connectivity between its major sites as part of its renewed cable services Franchise Agreement with Comcast, Davis' local cable provider. The franchise agreement was renewed on October 1, 2005 and expires on September 30, 2018 (13 years). The Franchise Agreement details the services, terms, conditions and payments that will be made between the City of Davis and Comcast. As part of the negotiated agreement, Comcast has provided 6-strands of fiber to 22 "Major Facilities" throughout the city. It also connects three Yolo County facilities that are within the City of Davis, which provides interconnection with the greater Yolo County fiber network. The Comcast network, known as the "I-Net" or Institutional Network, enables the city to provide connectivity for municipal operations, utilities, public safety, and general administration. The I-Net also serves 17 schools with fiber connectivity. Covenants in the Franchise Agreement limit the use of this network for institutional purposes only. The City is prohibited from any "non-commercial applications and purposes and shall not lease, resell or grant access privileges to I-Net capacity or services to a third party."¹²

Although this agreement will remain in force for the next several years, the City should begin considering the implications of a potential non-renewal of this agreement. Cable television franchising has been migrated to the State of California, managed by the California Public Utilities Commission by way of the Digital Infrastructure and Video Competition Act of 2006 (DIVCA). Prior to DIVCA, cable television franchises were issued by cities and counties individually. DIVCA replaces the local franchising system with one in which video franchises are now issued by the CPUC, rather than these local entities. In many cases, this has negatively affected local municipal power to negotiate favorable terms and conditions of service in their communities. As a result, many I-Nets and municipal networks that were negotiated between municipalities and cable companies have been threatened and cable companies have either discontinued municipal use of these networks or have charged prohibitively high fees for continued access.

For Davis, this is an issue that could have significant financial impacts to the City, County and Davis Joint Unified School District (DJUSD) beginning in 2018. If Davis is unsuccessful in renegotiating similar terms of use of the I-Net, it could mean an ongoing operational cost for the City, County, UC Davis and DJUSD, as all entities utilize the I-Net for fiber connectivity. Based on the original Franchise Agreement (dated Oct. 1, 2005) 39 sites were to be connected to the I-Net dark fiber network as follows:

- City of Davis Sites: 16
- Yolo County Sites: 3
- Davis Joint Unified School District Sites: 17
- UC Davis Sites: 1

¹² Franchise Renewal Agreement Between The City of Davis and Comcast of California X, Inc. Accessed June 2014.

D. Strategies & Action Items

Recommendation 1: Pursue viable options to mitigate the impending expiration of the Comcast I-Net agreement and additional costs the City may incur:

- a) Identify potential partnerships with other broadband providers that may provide a means to replace the current I-Net agreement and support stakeholder needs for broadband;
- b) Consider conducting a feasibility study to develop the business case for a community broadband network. This feasibility study should include:
 - (1) What organizations and service providers are anticipated to use the network;
 - (2) An engineering design for the network;
 - (3) An estimated timeline for construction of the network;
 - (4) Cost estimates, financial plan and financing options for the network;
 - (5) A plan for managing the network's operations and maintenance; and
 - (6) Community benefits to be gained from a network; and,
- c) Should the City seek renegotiation of the expiring Comcast agreement, ensure that negotiations are not delayed such that it jeopardizes the City's strategic options

Timing: The City should agree on the terms of the renegotiation with Comcast or plan to utilize another network (which may include building its own community broadband network) no later than September of 2016.

Common Action Items

Recommendation 2: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the City's specific needs and adopt them into local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);
- b) Incorporating broadband in the City's Development Impact Fee program and the City's Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;
- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;

- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the City builds out its network, maintaining broadband infrastructure in the City's GIS system, requiring GIS-based as-builts and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The City should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 3: Coordinate with other agencies with facilities in the City (i.e. DJUSD, UC Davis, Unitrans, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and
- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The City should develop these collaborative programs with other public agencies over the next 3 months.

Yolo Broadband Strategic Plan

Version: 0.1 (Draft)
Release Date: December 3, 2014

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1. Executive Summary

A. A Broadband Plan is Critical for Yolo

Broadband is a term used to identify high-speed data transfer and access on the Internet. Broadband allows Internet users to access a variety of information using a range of technologies. Broadband is essential for such activities as online video, streaming media, voice over Internet phone service, interactive websites and secure business applications. Broadband differs from dial-up Internet access in speed, capacity and the ability to provide uninterrupted service when in use. It supports a wide variety of online applications in business, education, healthcare, public safety, government and entertainment which has made access to these broadband services important **as part of daily life**.

Broadband is a vital element of Yolo's economic sustainability that will keep our community competitive, locally and globally. Where our road systems provide the infrastructure necessary to connect our communities physically, broadband provides the digital infrastructure necessary to connect our communities virtually to the rest of the electronic world. As more of our everyday lives are lived online, broadband has become a fundamental need for our homes, businesses, and communities. Broadband reaches many facets of everyday life by improving the delivery of healthcare services, enriching the educational experiences of children and adults, aiding in the management and conservation of energy resources, assisting public safety personnel in the performance of their duties, and facilitating citizen interaction with our government agencies. Broadband is a driving force behind the competitiveness of our businesses, fostering innovation, productivity and access to the global economy. Affordable, available access to broadband **means the difference between thriving in the new economy and becoming obsolete**.

Objectives of the Yolo Broadband Strategic Plan

- 1. Identify short, mid and long-term broadband policies and initiatives that agencies countywide can develop to facilitate a unified broadband policy and direction*
- 2. Identify broadband capacity, equity, access and affordability gaps with a goal of achieving consistent broadband services for all businesses, residents and visitors*
- 3. Positively affect how broadband infrastructure and services are likely to develop countywide over the next 10 years*
- 4. Positively impact the adoption of broadband services across our communities*
- 5. Identify key strategic broadband investments that could improve our communities' access to and competitiveness in the digital economy*

The Yolo Broadband Strategic Plan provides a roadmap to understand our local broadband environment and forge strategies that will ensure our communities are prepared to thrive in the digital economy. In 2012, about 70% of Yolo households maintained some type of broadband connection, 6%

lower than California’s statewide average of 76%. The fundamental goal of this Strategic Plan is to increase access, availability and adoption of broadband to support our community’s long-term prosperity, including our residents, our businesses, our agriculture, our schools, our hospitals and our overall quality of life. This Plan provides an action oriented roadmap to meet broadband needs based on an understanding of each community and how our local government organizations can utilize effective public policy, strategic partnerships and key investments to positively influence broadband in Yolo. The Plan sets forth achievable short, mid and long-term strategies for Yolo County and each city to achieve in order to meet the broadband requirements of their communities.

| Broadband’s Impact on Yolo’s Critical Community Functions | |
|---|---|
| Economic Development | <ul style="list-style-type: none"> • Businesses are more reliant on broadband to maintain competitiveness, productivity and efficiency • High-quality, affordable broadband is becoming increasingly critical to attract new business and retain existing business |
| Agriculture | <ul style="list-style-type: none"> • Seed technology and farming are utilizing more broadband on a widespread basis • Agricultural organizations access global data to support locally-grown products |
| Education & Training | <ul style="list-style-type: none"> • A quality education is increasingly reliant on access to the Internet and online applications • Modern educational technologies depend on high-quality broadband services, at school and at home |
| Digital Literacy & Equity | <ul style="list-style-type: none"> • Increasing broadband adoption will improve the competitiveness of the workforce • Access to broadband increases opportunities for non-English speaking residents |
| Healthcare | <ul style="list-style-type: none"> • The quality of patient care is directly tied to the sufficiency of broadband services • Healthcare organizations increasingly need to connect with patients virtually; broadband is critical for these organizations and at home |
| Public Safety | <ul style="list-style-type: none"> • First responders rely on high-quality, reliable access to reduce response times during emergencies • Mobile and fixed broadband are key to delivering the right information to the right personnel |
| Government Services | <ul style="list-style-type: none"> • Broadband improves capabilities, increases security and reduces cost for public organizations • Increasing access provides more opportunities to interact with citizens |

B. Broadband Issues Facing Yolo's Communities

Yolo contains a mix of urban, rural, and remote communities across a diverse demographic profile and varied geographic terrain. Due to these features, broadband supply and demand varies widely across the County. Some communities are well served with more modern infrastructure and multiple providers while others do not currently have any broadband services available and are forced to use satellite or dial-up to receive their Internet services.

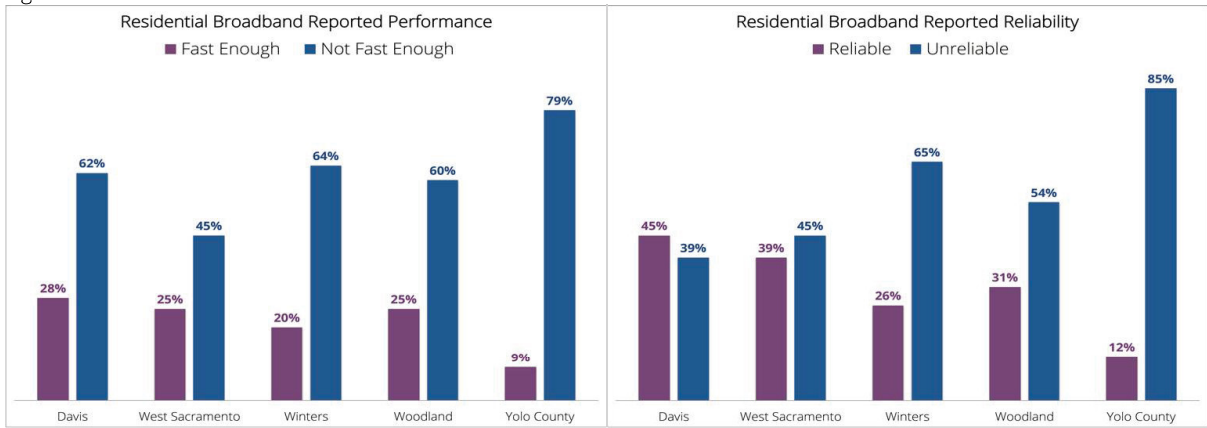
In rural and remote communities, a serious lack of broadband availability exists. Within the unincorporated county, residents are generally limited to low-speed connections that prevent these users from accessing the majority of online content. Using the Internet for anything but simple web browsing is a challenge in these communities, limiting their access to most modern Internet applications. Watching YouTube videos, making Skype calls or participating in online education is a significant challenge in these communities. The lack of broadband impedes home-based businesses from accessing their files and healthcare clinics from treating patients. Broadband adoption is also low in the rural communities, which may be attributable to affordability, the relevancy of broadband to specific users or a combination of both.

Yolo's agricultural populations are challenged as well, particularly in the farming and seed technology areas. Farms, which represent both residential and business subscribers, cannot gain access to suitable broadband services to meet their needs. With the technological revolution occurring in agriculture, these users need reliable broadband to connect their local farms with global data that helps them achieve greater productivity, and better management of their natural resources.

Yolo's cities generally have greater broadband availability and choice of providers. They don't face the critical infrastructure issues as the rural communities, and broadband providers maintain networks that provide coverage to the vast majority of residential and business addresses in each city. The challenge in each city is that in some cases, current services are not keeping up with subscriber demand. In many cases, residents and businesses need greater speeds and more reliability at prices they can afford.

Fifty four percent of Yolo's residents who participated in a recent countywide survey reported having at least 5 devices at home connecting to the Internet such as including laptops, phones and tablets. Each of these consumes a portion of the home Internet connection; a particularly large portion when they are streaming video such as Netflix, YouTube, and Hulu. However, home Internet services are used for more than entertainment; they support home-based businesses, videoconferencing and home security services. And, as more devices access more applications, residential demand for bandwidth will continue to grow. Figure 1.1 shows satisfaction levels with current residential broadband services as reported by approximately 900 residents across the 4 cities and unincorporated Yolo County. Many of Yolo's communities reported performance and reliability issues with their current services.

Figure 1.1: Broadband Satisfaction Levels in Yolo Communities



Small and medium businesses across the cities have significant need for expanded broadband services. In most cases, they utilize the same cable and DSL services that are provided to residents; however, providers generally offer greater support and performance in these “business class” packages. Across each city, these businesses report the need for higher speed and greater reliability. Larger businesses have procured fiber-optic services from local providers, however; the costs of these services are prohibitively expensive for the majority of Yolo’s business community. In most cases, a significant pricing gap exists between the services they currently have and the services they need.

Community anchors across Yolo are mixed in terms of their broadband issues. Yolo’s schools must meet the State’s Common Core¹ criteria for online testing and curricula, which mean that they will need additional broadband capabilities to meet these requirements. Yolo Office of Education and the individual School Districts are concerned that students in low-income neighborhoods will not have adequate Internet services at home to support the transition to more online education. Healthcare organizations also experience broadband availability issues. CommuniCare facilities need expanded access to telehealth services to serve patient needs. Winters Healthcare Foundation cannot treat patients when their Internet is down, which has occurred frequently. Improved access to these services is critical for these organizations as more healthcare services are carried out online.

C. Strategies to Resolve Broadband Issues

The County and the cities have the opportunity to positively impact the availability, affordability and adoption of broadband in their region. Doing so involves a multi-faceted approach that will be carried out over different timescales; however, positively changing Yolo’s broadband environment will take time. The process begins now and there are immediate steps laid out for the County and each city to take to shape how broadband will progress in Yolo. A summary of the Action Items for each community follows.

¹ Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school. www.cde.ca.gov/re/cc/

City of Davis Action Items:

Recommendation 1: Pursue viable options to mitigate the impending expiration of the Comcast I-Net agreement and additional costs the City may incur:

- a) Identify potential partnerships with other broadband providers that may provide a means to replace the current I-Net agreement and support stakeholder needs for broadband;
- b) Consider conducting a feasibility study to develop the business case for a community broadband network. This feasibility study should include:
 - (1) What organizations and service providers are anticipated to use the network;
 - (2) An engineering design for the network;
 - (3) An estimated timeline for construction of the network
 - (4) Cost estimates, financial plan and financing options for the network;
 - (5) A plan for managing the network's operations and maintenance; and
 - (6) Community benefits to be gained from a network; and,
- c) Should the City seek renegotiation of the expiring Comcast agreement, ensure that negotiations are not delayed such that it jeopardizes the City's strategic options.

Timing: The City should agree on the terms of the renegotiation with Comcast or plan to utilize another network (which may include building its own community broadband network) no later than September of 2016.

Common Action Items

Recommendation 2: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the City's specific needs and adopt them into local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);
- b) Incorporating broadband in the City's Development Impact Fee program and the City's Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;
- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;

- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the City builds out its network, maintaining broadband infrastructure in the City's GIS system, requiring GIS-based as-builts and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The City should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 3: Coordinate with other agencies with facilities in the City (i.e. Davis Joint Unified School District, UC Davis, Unitrans, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and,
- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The City should develop these collaborative programs with other public agencies over the next 3 months.

City of West Sacramento Action Items:

Recommendation 1: The City should continue to develop its broadband infrastructure to reduce internal costs, expand capabilities and protect against future cost increases by:

- a) Developing a GIS-based map that identifies the City locations that should be interconnected including the City's current infrastructure;
- b) Installing conduit with all public projects;
- c) Expanding the City's capability in negotiating agreements for private providers to utilize the City's infrastructure for public benefit; and,

- d) Coordinating with other local public agencies (i.e. WUSD, Los Rios Community College District, Yolo County Transportation District, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) as potential users of the City's infrastructure.

Timing: The City should begin the process of identifying areas for direct and joint investment in broadband infrastructure with other public agencies over the next 12 months.

Recommendation 2: The City needs to work with local broadband providers to ensure business corridors are equipped with the necessary broadband services to support the City's economic development needs as follows:

- a) Actively market and make any City-owned infrastructure available for use by broadband providers;
- b) Equip business corridors with City-owned broadband infrastructure in the areas identified in the Demand Areas for Expanded Broadband Services, as detailed in the West Sacramento Community Profile;
 - (1) Developing relationships with broadband providers who will utilize City-owned infrastructure; and,
 - (2) Making this infrastructure available to broadband providers on a non-discriminatory basis.

Timing: The City should work internally to institute the processes to incorporate broadband infrastructure into its planning over the next 12 months.

Common Action Items

Recommendation 3: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the City's specific needs and adopt them into local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);
- b) Incorporating broadband in the City's Development Impact Fee program and the City's Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;
- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;

- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the City builds out its network, maintaining broadband infrastructure in the City's GIS system, requiring GIS-based as-builts and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The City should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 4: Coordinate with other agencies with facilities in the City (i.e. WUSD, Los Rios Community College District, YCTD, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and,
- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The City should develop these collaborative programs with other public agencies over the next 3 months.

City of Winters Action Items:

Recommendation 1: Conduct a study to determine the feasibility of constructing a citywide broadband network that can serve the needs of Winters' residents, businesses and community anchors. The feasibility study should:

- a) Determine the physical network required to serve the City's needs;
- b) Identify the best business model for Winters to utilize to meet the broadband needs of the community, retail, wholesale or infrastructure-only;
- c) Incorporate the broadband needs of other public agencies that have offices in Winters into the study;

- d) Determine the role local service providers will play in the development of this network, including potential public-private partnerships;
- e) Assess the financial feasibility and funding requirements for the network, including potential federal and State grant opportunities; and,
- f) Develop an action plan and timeline for buildout of the network.

Timing: The City should consider conducting the feasibility study within the next 12 months and implement any action plan per its timelines.

Recommendation 2: To improve local broadband conditions, the City needs to help key community anchors get the broadband services they need, by:

- a) Focusing on community anchors described in the Winters Community Profile that are currently not receiving adequate broadband service;
- b) Developing a broadband construction fund (via Development Impact Fees or other mechanism) that will allow the City to jointly fund construction of broadband infrastructure to these anchors, in cooperation with local service providers;
 - i) Finance the upfront costs for “last mile” connection fees to get community anchors the services they need; and,
 - ii) Work with local providers to jointly build this infrastructure and ensure that the City maintains rights to install additional conduit and fiber-optic cable in these projects.

Timing: Ongoing until broadband has been extended throughout the community.

Common Action Items

Recommendation 3: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the City's specific needs and adopt them into local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);
- b) Incorporating broadband in the City's Development Impact Fee program and the City's Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;

- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;
- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the City builds out its network, maintaining broadband infrastructure in the City's GIS system, requiring GIS-based as-builts and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The City should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 4: Coordinate with other agencies with facilities in the City (i.e. WJUSD, Yolo County, Yolo County Housing, Yolo County Office of Education, PG&E, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and,
- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The City should develop these collaborative programs with other public agencies over the next 3 months.

City of Woodland Action Items:

Recommendation 1: The City should continue to develop its broadband infrastructure to reduce internal costs, expand capabilities and protect against future cost increases by:

- e) Developing a GIS-based map that identifies the City locations that should be interconnected including the City's current infrastructure;
- f) Installing conduit with all public projects;

- g) Expanding the City's capability in negotiating agreements for private providers to utilize the City's infrastructure for public benefit; and,
- h) Coordinating with other local public agencies (i.e. WJUSD, Woodland Community College, YCTD, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) as potential users of the City's infrastructure.

Timing: The City should begin the process of identifying areas for direct and joint investment in broadband infrastructure with other public agencies over the next 12 months.

Recommendation 2: The City needs to work with local broadband providers to ensure business corridors are equipped with the necessary broadband services to support the City's economic development needs as follows:

- a) Actively market and make any City-owned infrastructure available for use by broadband providers;
- b) Coordinate with Yolo County to identify infrastructure to serve agricultural businesses surrounding Woodland, potentially using wireless to reach these organizations;
- c) Equip business corridors with City-owned broadband infrastructure in the areas identified in the Demand Areas for Expanded Broadband Services, as detailed in the Woodland Community Profile;
 - (1) Developing relationships with broadband providers who will utilize City-owned infrastructure; and,
 - (2) Making this infrastructure available to broadband providers on a non-discriminatory basis.

Timing: The City should work internally to institute the processes to incorporate broadband infrastructure into its planning over the next 12 months.

Common Action Items

Recommendation 3: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the City's specific needs and adopt them into local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);

- b) Incorporating broadband in the City's Development Impact Fee program and the City's Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;
- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;
- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the City builds out its network, maintaining broadband infrastructure in the City's GIS system, requiring GIS-based as-builts and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and,
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The City should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 4: Coordinate with other agencies with facilities in the City (i.e. WJUSD, Woodland Community College, YCTD, Yolo County, Yolo County Housing, Yolo County Office of Education, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and,
- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The City should develop these collaborative programs with other public agencies over the next 3 months.

Yolo County Action Items:

Recommendation 1: The County should continue to develop its broadband infrastructure to reduce internal costs, expand capabilities and protect against future cost increases by:

- a) Developing a GIS-based map that identifies the County locations that should be interconnected including the County's current infrastructure;
- b) Installing conduit with all public projects;
- c) Expanding the County's capability in negotiating agreements for private providers to utilize the County's infrastructure for public benefit; and,
- d) Coordinating with other local public agencies (i.e. cities, school districts, UC Davis, YCTD, Yolo County Housing, YCFCWCD, Yolo County Office of Education, etc.) as potential users of the County's infrastructure.

Timing: The County should begin the process of identifying areas for direct and joint investment in broadband infrastructure with other public agencies over the next 12 months.

Recommendation 2: The County needs to develop additional broadband infrastructure in cooperation with cities, other local agencies and local broadband providers by:

- a) Working with each County and other public agencies to build a map of locations where these organizations jointly need broadband connectivity by:
 - i) Developing a GIS-based map illustrating these locations by utilizing the existing Yolo GIS Cooperative;
 - ii) Incorporating County and County CIP projects onto this map to identify the companion projects and joint build opportunities;
 - iii) Sharing maps and data between organizations; and,
 - iv) Making sure the maps are updated at least annually.
- b) Coordinating with broadband providers on specific broadband infrastructure projects in communities described in the Critical Unserved and Underserved Communities in Yolo County's Community Profile:
 - i) Identifying infrastructure routes that the County needs;
 - ii) Identifying infrastructure routes that the broadband providers need;
 - iii) Sharing information between organizations for joint build opportunities;
 - iv) Developing a joint build agreement with local broadband providers that allows each organization to install their own broadband infrastructure in these projects; and,
 - v) Identifying resources that would be available to fund these projects, including internal County funds and/or available grant or loan programs as described in Recommendation 3.
- c) Coordinating with public agencies and private broadband providers to use broadband infrastructure, towers and other resources to expand wireless coverage into agricultural areas, by:

- i) Working with broadband wireless providers to make access available to County-owned tower infrastructure, ground space at the base of towers and rooftops, ensuring compliance with legislative and security requirements governing access to these resources;
 - ii) Collaborating with other agencies with physical assets in the rural areas such as Yolo County Flood Control and Water Conservation District, Yolo County Transportation District, Yolo County Housing and UC Davis to leverage joint opportunities to expand wireless access in the rural areas of the county;
 - iii) Developing agreements for lease or in-kind exchange of these County-owned assets by broadband wireless providers; and,
 - iv) Where feasible, interconnecting County-owned fiber-optic networks with these assets to provide fiber backhaul to broadband wireless providers.
- d) Developing agreements with each County and broadband providers for joint use of broadband infrastructure by:
- i) Strengthening the current MOU to include joint use agreements that allow sharing of infrastructure between the County and the cities;
 - ii) Actively marketing and identifying opportunities to expand infrastructure with broadband providers.

Timing: The County should accelerate the process of coordinating with other public agencies and broadband providers over the next 12 months and identify opportunities to leverage public broadband infrastructure continuously as a County-level initiative.

Recommendation 3: Target specific State and federal grant and loan programs that will provide funding for Yolo County's unserved and underserved communities by:

- a) Through the Tactical Plan, designating a resource at the County that will develop, apply for and manage broadband grants;
- b) Building on the initial grant analysis completed in this Plan for the County to pursue CASF funding (and other programs defined in Appendix D) for these communities;
- c) Developing relationships with broadband providers that define how grant funds will be received and managed and how broadband services will be provided to these communities; and,
- d) Applying for CASF grant funding to expand wireless and broadband services in Yolo County Public Housing facilities;

Timing: The County should immediately identify an internal resource to manage the broadband grant efforts on behalf of the County.

Common Action Items

Recommendation 4: Adopt General Plan policies that incorporate broadband as a public utility and create a policy framework to promote its deployment in public and private projects as appropriate. This includes:

- a) Tailoring the sample policies and standards (included in the appendix) to the County's specific needs and adopt them into the Tactical Plan, local policy, codes and standards (including policies, dig-once, joint trenching, engineering standards, etc.);
- b) Incorporating broadband in the County's Development Impact Fee program and Capital Improvement Plan (CIP) as appropriate and make a commitment to fund broadband infrastructure;
- c) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;
- d) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- e) As the County builds out its network, maintaining broadband infrastructure in the County's GIS system, requiring GIS-based as-builts, and implement any other means for accurate documentation;
- f) Evaluating ways to streamline the broadband permitting processes within public rights of way to ensure broadband providers do not face unnecessary obstacles to building infrastructure; and,
- g) Evaluating fees levied to broadband providers for constructing broadband infrastructure to ensure they do not discourage broadband investment.

Timing: The County should adopt General Plan policies and implementing codes and standards over the next 12 months. Implementation should be ongoing.

Recommendation 5: Coordinate with other agencies with facilities in the County (i.e. cities, school districts, UC Davis, YCTD, Yolo County Housing, YCFCWCD, Yolo County Office of Education, etc.) on a regular basis to leverage opportunities to reduce broadband construction costs by:

- a) Reviving the regular Utility Coordination Meeting attended by the cities/County (and potentially add the public agencies listed above) to facilitate the long-term planning of broadband infrastructure; and,

- b) Coordinating on a regular basis to identify opportunities for joint construction, use and broadband infrastructure sharing between local agencies to lower costs and maximize public benefit.

Timing: The County should develop these collaborative programs with other public agencies over the next 3 months.