

6. Broadband Community Profiles Woodland



A. Residential

The residential broadband market in Woodland is served by two primary providers, AT&T of California, the incumbent local exchange carrier and Wave Broadband, the local cable provider. Fixed wireless providers also provide coverage in Woodland, including DigitalPath and Winters Broadband. 184 residential responses were received in the survey. Initial data collected from surveys indicates that 85% of residential customers utilize either the local exchange carrier or the cable company for their broadband Internet services. Approximately 15% of residential customers utilize fixed wireless, satellite and other competitive providers. From the research conducted, it appears that all wireline residential broadband services are 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 carriers¹⁶.

Broadband Internet download and upload speeds reported by the majority of residents surveyed were commensurate with cable and DSL services in the region. Samples were collected from residential broadband subscribers across Woodland. A total of 47% 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 40% of respondents reported download speeds less than 6Meg. Upload speeds were found to be considerably lower than download



Of Residents Responding to the Survey Utilize AT&T DSL Internet Services



Of Residents Responding to the Survey Utilize Wave Cable-Based Internet Services



Of Residents Responding to the Survey Utilize Other Providers' Internet Services

¹⁶ AT&T Mobility, Verizon Wireless, T-Mobile, MetroPCS and Sprint

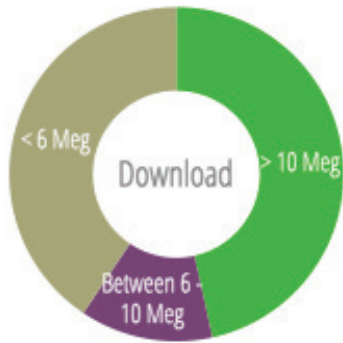
speeds, consistent with asymmetrical DSL and cable broadband services. Some 45% of respondents reported speeds of less than 1.5Meg and another 35% reported upload speeds of less than 3Meg. Respondents reported general satisfaction with the speed and reliability of their broadband Internet services, however, many residents felt that speeds were inconsistent and at certain times of the day, services were considerably slower than others.

A total of 59% of the respondents reported that their services were moderately to highly reliable while 50% felt that their services had sufficient speed. Some 30% reported that services were unreliable and 34% reported that they were not fast enough. Measuring the pricing for services against the speeds of services that residents received indicated that there was a direct correlation between the prices paid for services and the amount of bandwidth, ("speed"), received by residents. The chart below illustrates the price of services residents in Woodland pay for services and the corresponding download and upload speeds for these services. It is important to note that the speeds reported are actual speeds recorded, which may be different from the speeds residents buy 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.

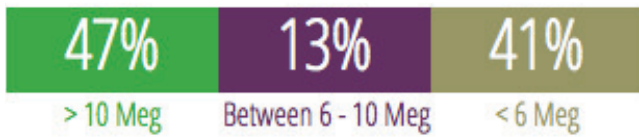
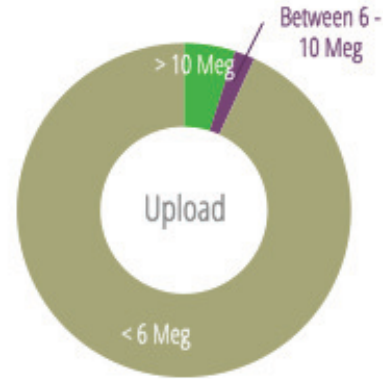
The majority of the urban areas in Woodland are served by DSL and cable infrastructure supporting speeds between 10Meg and 25Meg download and 3Meg and 6Meg upload. These are the maximum advertised wireline speeds offered in the area. Results of the survey data validated speeds up to 25Meg in areas reported where these services were offered; however, the majority of survey respondents recorded significantly lower speeds, as shown in the chart below. This issue was evident in respondents' answers to many of the survey questions as well. Many residents reported significant issues with speed and overall reliability of their home Internet services citing daily "slowdowns" and "drops" in their service. A recurring comment described the lack of consistency in service during certain times of the day, mainly afternoons and evenings.

Residential Broadband Services - Woodland Survey Data

Residential Broadband Download Speed Test Results



Residential Broadband Upload Speed Test Results



Reliability of Current Broadband Services



Speed of Current Broadband Services

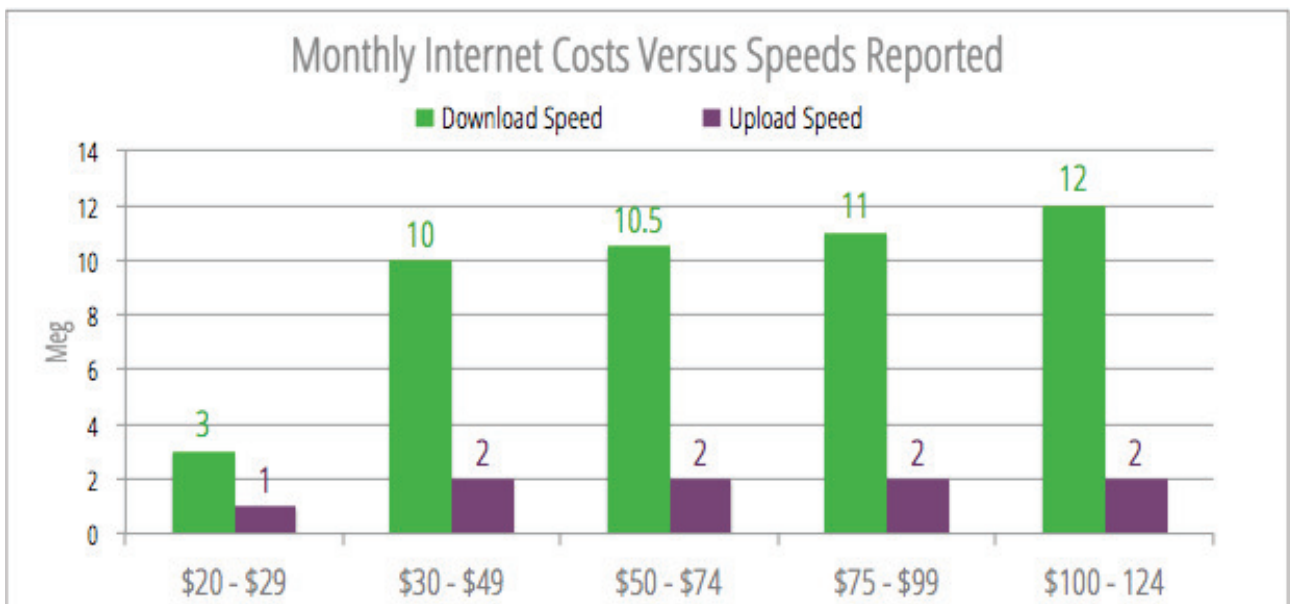


Figure 6.1: Residential Wireline Broadband Availability By Speed (Download Speeds)

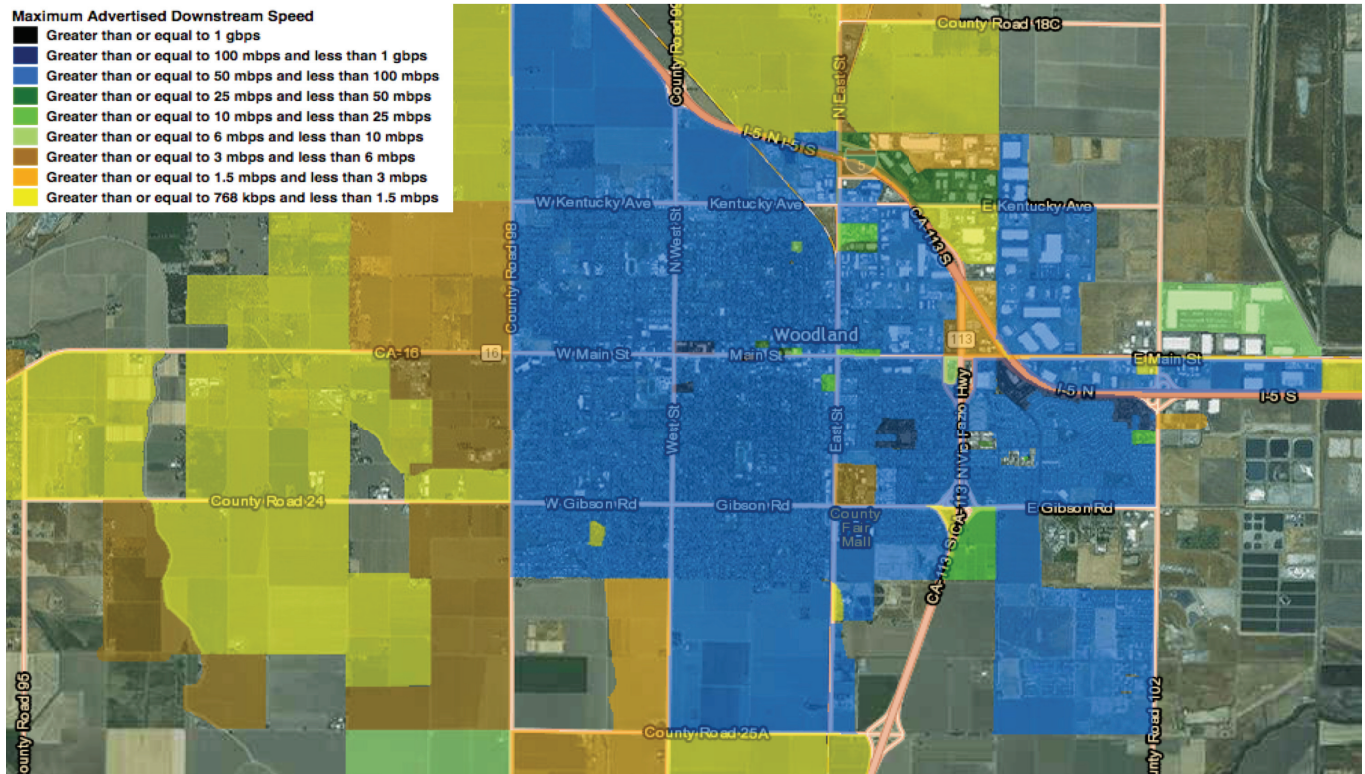


Figure 6.2: Residential Wireline Speed Test Results (Download Speeds)

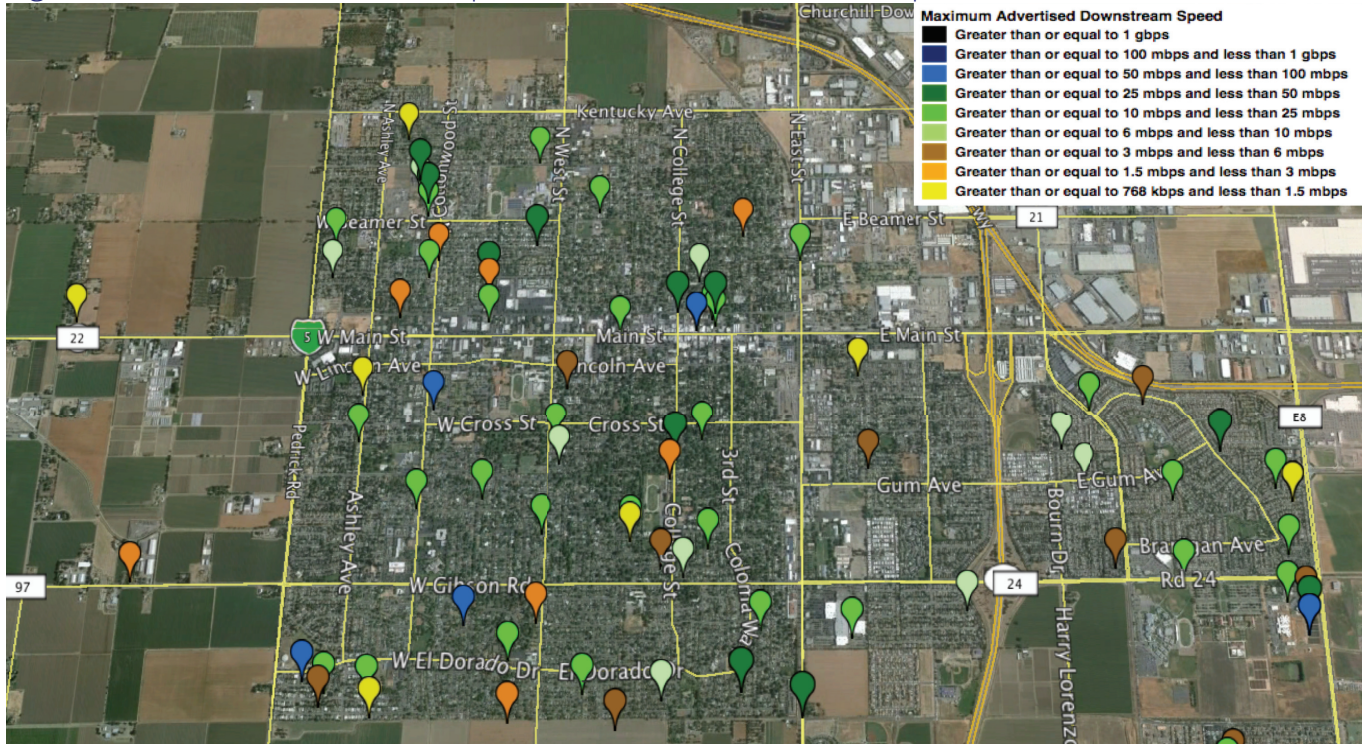
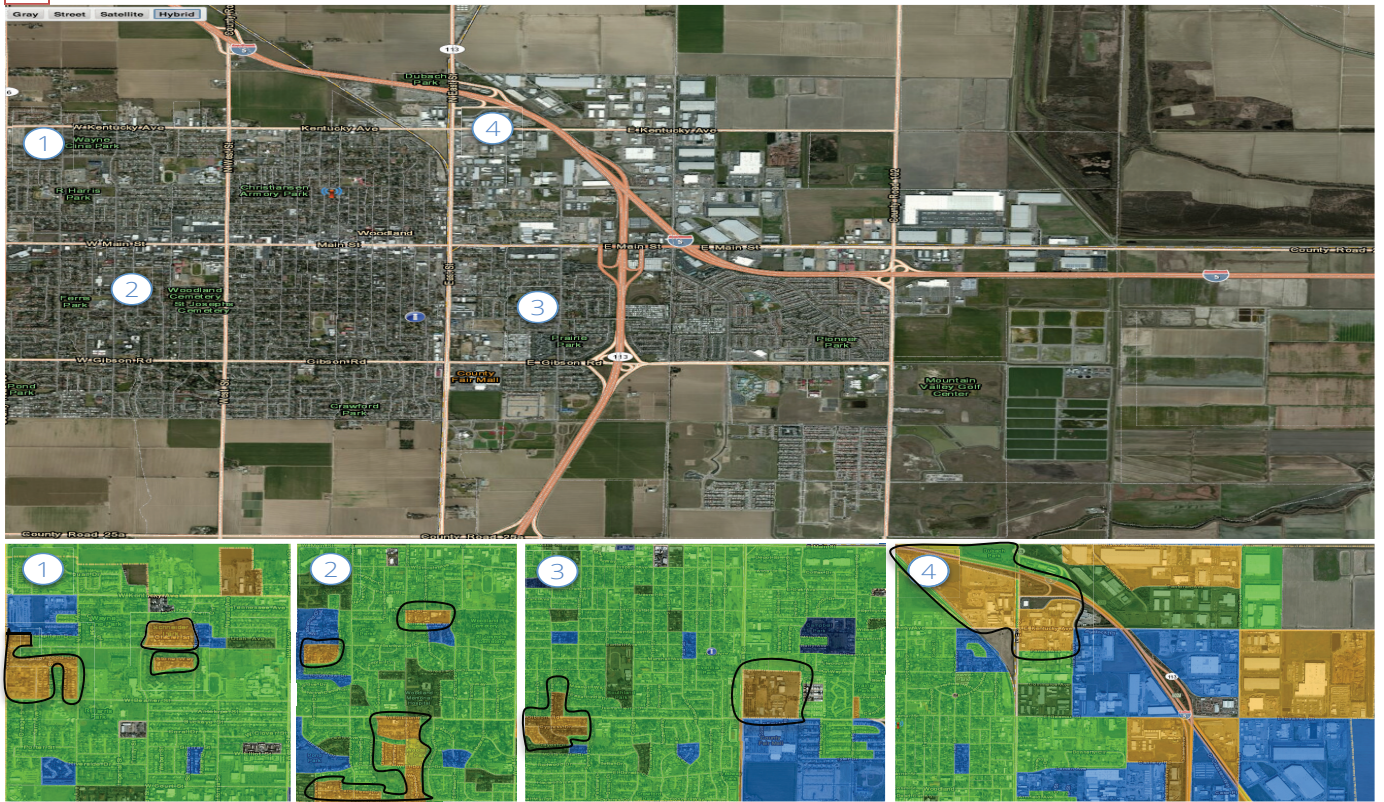


Figure 6.3: Underserved Wireline Residential Broadband



1

Northwest Woodland – Population – 621, Households - 158

Small segments of underserved households in a residential area. No reported residential cable provider although residents reported available Wave Broadband services. Maximum advertised download speed greater than or equal to 1.5Meg and less than 3Meg. Maximum advertised upload speed greater than or equal to 200K and less than 768K. Fixed wireless available via DigitalPath, Inc. greater than or equal to 6Meg and less than 10Meg download.

2

Southwest Woodland – Population – 1,044, Households - 418

Moderately sized residential underserved area. No reported residential cable provider however residents reported available Wave Broadband services. Maximum advertised download speed greater than or equal to 1.5Meg and less than 3.0Meg. Maximum advertised upload speed greater than or equal to 200K and less than 768K. Fixed wireless available via DigitalPath, Inc. greater than or equal to 6Meg and less than 10Meg download.

3

Southeast Woodland – Population – 100, Households - 33

Small residential underserved area. No reported residential cable provider. Maximum advertised download speed greater than or equal to 1.5Meg and less than 3Meg. Maximum advertised upload speed greater than or equal to 200K and less than 768K. Fixed wireless available via DigitalPath, Inc. greater than or equal to 6Meg and less than 10Meg download.

4

Northeast Woodland – Population – 120, Households - 35

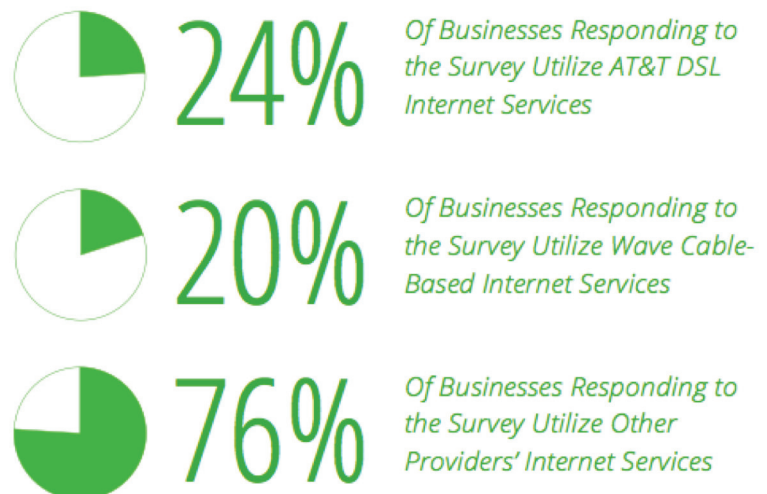
Moderately sized residential underserved area. No reported residential cable provider. Maximum advertised download speed greater than or equal to 1.5Meg and less than 3Meg. Maximum advertised upload speed greater than or equal to 200K and less than 768K. Fixed wireless available via DigitalPath, Inc. greater than or equal to 6Meg and less than 10Meg.

B. Business

Businesses in Woodland subscribe to a mix of wireline providers and resellers, including AT&T of California, Wave Broadband, AFES Wireless Network Services, and Omsoft. A few businesses also reported utilizing fixed wireless providers including Winters Broadband and DigitalPath, Inc. 25 businesses responded to the business survey. A total of 24% of respondents reported utilizing AT&T DSL services for their businesses while 20% of respondents reported utilizing Wave Broadband cable services. The remaining businesses utilize alternative wireline providers, fixed wireless providers or 3G/4G providers. 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. In general, pricing for DSL and cable based services ranges from \$49.99, for the lowest speed service to \$199.99 for the highest speed service in the DSL and cable business broadband services.

For businesses included in the assessment, 13% reported receiving download speeds of 10Meg or above. Some 87% reported download speeds of less than 6Meg. Upload speeds were commensurate with DSL and cable broadband services, with the majority of businesses, 76%, reporting less than 6Meg upload. Businesses reported key issues with their current broadband Internet services, as 47% of respondents indicated that their current services were not sufficient to meet their business needs. The majority of businesses cited speed and reliability of their current services as challenges to their daily operations. Some 60% of businesses reported speed as the key issue with their current service and cited access to online applications such as cloud data storage, videoconferencing, security monitoring, online video training and scientific research (specifically noted by the seed technology and agricultural businesses) as critical applications that are often affected by their broadband Internet services.

Several of the seed technology and agricultural businesses provided information on their broadband services as well. Most of the respondents utilized DSL or cable services and two of the organizations utilized satellite Internet. All of these organizations reported that their services were insufficient for their current needs and that unreliable service was the number one issue. When asked why they haven't upgraded their services to something that meets their business needs, each organization reported that services were not available in their area. None reported costs as a significant factor of why they



had not upgraded their service.

Only two businesses reported utilizing fiber-optic broadband services in Woodland. Based on an infrastructure analysis of Woodland’s key business corridors, limited fiber broadband services are available to businesses at reasonable costs. In these corridors, providers do maintain fiber-optic cable plants that connect end users; however, these plants are not typically utilized for providing a low-cost option to the majority of businesses in Woodland. If a business wants fiber, a provider will build off of its existing fiber-optic cable plant to the subscriber using an “Individual Case Basis,” or ICB pricing model. Each fiber connection built by the provider will result in a different cost to the end user, depending on the proximity of the provider’s existing cable plant to the subscriber. In these cases, costs for fiber broadband are very often high and for most small businesses, unaffordable. Pricing for fiber was found to be over \$1,000 for a 50 Meg connection in Woodland, from survey data collected. In cases where fiber broadband service is available, affordability is a key issue and as a result, businesses utilize lower costs DSL and cable broadband. Some 40% of businesses surveyed report that their current services are insufficient for their business needs yet they have no alternative to their current services due to a lack of affordable options.

Comments from Businesses in Woodland:

Agricultural Business – “Costs are extreme for reliable services and we cannot afford it.”

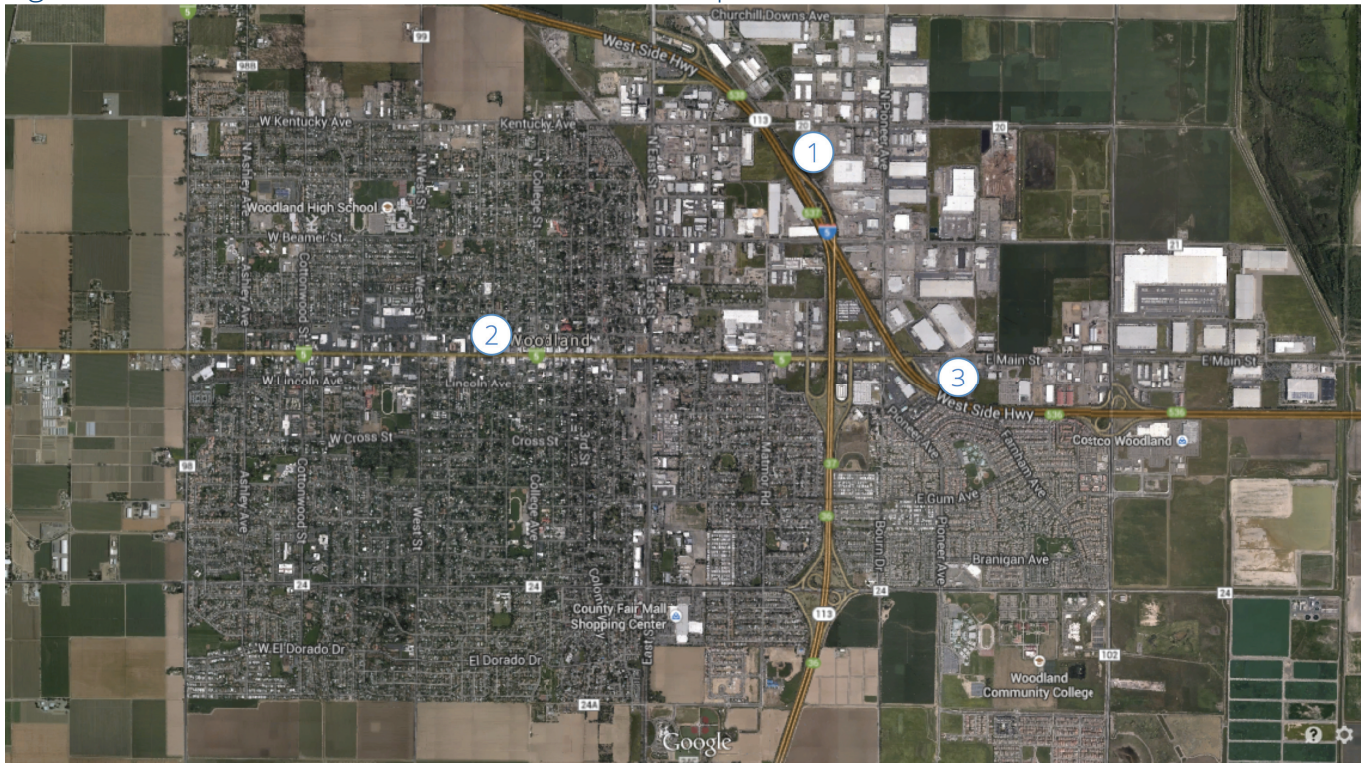
Manufacturing Business – “Severe disruptions hinder our ability to update database systems in the cloud.”

One potential reason for these high prices is the lack of available distribution fiber infrastructure in the Woodland area. In many communities, providers are beginning to equip business and residential areas with fiber-to-the-premise (“FTTP”) infrastructure, overbuilding existing copper cable plants. This fiber distribution infrastructure is specifically designed to deliver high-speed, reliable fiber broadband services to businesses at costs similar to DSL and cable broadband prices. This study did not find any fiber distribution infrastructure in the Woodland area that was available to business customers. When asked why these businesses haven’t upgraded their services, a significant amount of businesses cited price as the number one reason, accounting for 47% of respondents. A total of 30% of the businesses stated that other services are not available in their area.

Demand for higher speed, higher reliability service necessitates a less costly solution than is currently available. Businesses from various geographic locations in the city all report the same issue. They desire higher speed and higher reliability services, their options too costly. The only fiber broadband customers identified in the Woodland area included a few large businesses, city and county facilities

and the school district. In some cases, businesses could utilize a fixed wireless solution instead of fiber; however, only 2 businesses in Woodland reported using this service currently.

Figure 6.4: Demand Areas for Fiber Broadband Expansions in Woodland



1

Northeast Woodland

Adjacent to Interstate 5 is a heavy concentration of warehousing, transportation, logistics and several seed tech/agricultural businesses. Businesses in this area reported issues with current services and may benefit from upgraded broadband infrastructure. This area is a focal point for larger organizations in Woodland who may require significantly more broadband capacity in the future. If future development occurs in this area, it could also facilitate low cost construction of broadband infrastructure in conjunction with capital projects. It could also become a tool for economic development to utilize to attract more business to the area, in conjunction with the City's current service providers.

2

Downtown Corridor

The downtown corridor houses a large concentration of businesses across most sectors and is a key focus for next-generation broadband services. Some 70% of Woodland businesses that responded were located in this area and currently utilize either DSL or cable broadband services. A significant number expressed the need for more speed and reliability. This area contains a high concentration of "power users," among the professional, scientific and technical business sector. It also contains a high concentration of multi-dwelling unit commercial parcels that could benefit from direct fiber broadband connectivity.

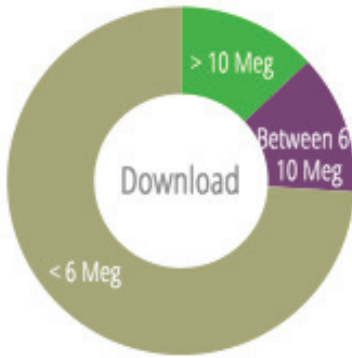
3

East Woodland

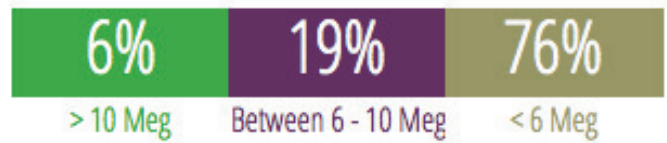
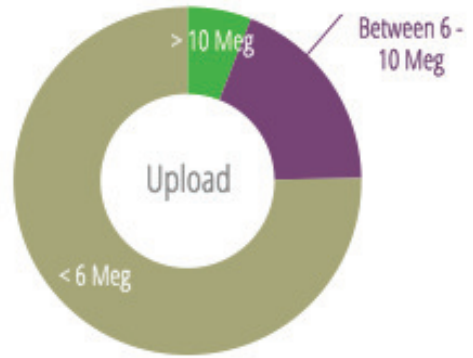
Adjacent to Interstate 5 is a heavy concentration of warehousing, transportation, logistics and several seed tech/agricultural businesses. Several businesses in this area reported issues with current services and may benefit from upgraded broadband infrastructure. Similar to the Northeast area, this area could be utilized to deploy lower cost broadband to current and prospective businesses, in conjunction with the City's economic development strategies.

Business Broadband Services - Woodland 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



C. Community Anchors

Education

Woodland's schools are interconnected to one another through fiber-optic connectivity provided by AT&T. Generally these schools are equipped with the high-speed, reliable services they need to deliver online educational programs to their students. Several of the school district's sites are not connected to this network though, and may require upgraded connectivity to ensure that their students receive the same educational experiences as the schools connected through AT&T fiber. As school systems move toward more blended curricula, meaning traditional learning, online programs and self-study, broadband becomes a critical foundation to ensure that students receive the best educational experience across all three types of curricula. For Woodland's schools, it is important that students have access to high-speed broadband in the classroom and also at home. In many cases, the student's experience is not effective across classroom and remote learning because they do not have access to high-speed broadband at home. Therefore, broadband in the educational realm is a community-wide issue that impacts residents directly.

Woodland Community College uses CENIC (Corporation for Education Network Initiatives in California) and has access to the bandwidth and services needed to support current operations. Woodland Community College did not report any specific needs for additional broadband services.

Healthcare

Healthcare organizations in Woodland could derive significant benefit from expanded broadband capabilities. Woodland Memorial is a critical healthcare resource in the County and maintains connectivity to other hospitals and clinics throughout California. The hospital currently maintains fiber connectivity through AT&T OptiMan service for transport back to the main data center in Rancho Cordova and for local Internet service. The hospital utilizes MobileMD as its health information exchange and does not currently maintain connectivity to the California Telehealth Network (CTN). The Hansen Family Health Center, a member of the CommuniCare clinics utilizes T1s to CTN for connectivity to telehealth services. CommuniCare has been working to upgrade these low-speed links to fiber.

CTN has expressed significant access and cost obstacles in upgrading their services to local Yolo healthcare facilities. CTN utilizes last-mile providers, including local exchange carriers and cable companies to extend their network to these customers. Due to the high cost of doing so, several healthcare providers in Yolo remain on low-speed T1 connections to CTN; such is the case with the Hansen Family Health Center.

Local doctors' offices and clinics reported several issues with existing broadband services. As healthcare organizations move more of their operations online, broadband becomes a critical part of their daily business. Electronic health records, Telehealth and virtual imaging all require high-speed,

reliable broadband services. Organizations that utilize standard broadband connections provided through DSL and cable infrastructure may experience issues where this infrastructure is not robust enough to support high-bandwidth applications. Reports from local several local healthcare organizations have indicated that they are using these types of applications in Woodland.

Local Government

The City utilizes a combination of fiber and wireless connections for its municipal operations. These services provide connectivity between municipal facilities to connect departmental resources to a common network. The City maintains a small amount of its own fiber segments throughout the community and continues to build new fiber in conjunction with other capital projects that allow conduit to be installed for low costs. As more of these projects are completed, it allows the City to connect segments to one another to form a larger municipal network that can be utilized to interconnect its facilities. Doing so permits the City to reduce its telecommunications costs and expand the bandwidth as its connectivity needs grow. The City would benefit from developing a master plan for this fiber network in conjunction with the Yolo Community Broadband Network. This would allow the City to continue to build out local infrastructure in targeted areas, which could be used to reduce costs, create new opportunities for government collaboration and provide a new source of fiber to local service providers. These activities would assist Woodland in promoting the expansion of broadband and potentially wireless services in key areas of the community, including the downtown corridor.

Yolo County maintains many sites within the City of Woodland, including County Administration Building, Department of Agriculture, County Courts, District Attorney, Public Defender, Department of Employment and Social Services, General Services, County Health, Planning, Public Works & Environmental Health, Library, Sheriff-Coroner and County Jail. The County maintains fiber connectivity to these sites through the County's fiber-optic network that traverses downtown Woodland.

D. Strategies & 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:

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

- f) Actively market and make any City-owned infrastructure available for use by broadband providers;
- g) Coordinate with Yolo County to identify infrastructure to serve agricultural businesses surrounding Woodland, potentially using wireless to reach these organizations;
- h) 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:

- o) 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.);
- p) 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;
- q) Identifying opportunities to install broadband infrastructure in conjunction with public and private construction projects as appropriate;
- r) Developing a process so that Planning and Public Works coordinate with IT to identify projects that could install this infrastructure at reduced costs;
- s) 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;
- t) 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
- u) 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:

- e) 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
- f) 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.