

**Public Utility District No. 1
Of
Pend Oreille County**

**Community
Network
System**

**Broadband
Survey**

December 15, 2004

Table of Contents

Executive Summary	3
Introduction	5
Problem Statement	5
Research Purpose	5
Background	5
Research Questions	6
Scope	6
Methodology	6
Findings	7
Comparisons	14
Conclusion	19
References	20
Appendix A	21
Appendix B	23

Executive Summary

On September 8, 2004, the Pend Oreille PUD board of commissioners authorized a survey to be taken of the electric system customers of the PUD as part of overall Community Network System business planning. 7,763 households received a survey included in their monthly power bill beginning September 24, 2004. 1,029 completed surveys were returned. The purpose of the survey was to answer:

- What level of demand, if any, exists for broadband services in Pend Oreille County?
- What price, if any, are customers of Pend Oreille PUD willing to pay for broadband service?

The survey covered the following general areas:

Demographics

Of those responding, 39 percent are homeowners, 26 percent retired, 19 percent employed, 6 percent business owners, 5 percent seasonal, 3 percent renters, and 1 percent unemployed. The majority, 49 percent, resides in area 99156 with the other areas somewhat equally represented.

What do our customers think of the PUD

The perception of our customers is that the District is currently offering reliable and fair cost products.

What is the current level of communication technology usage

Only 13 percent of our customers pay their electric bill online. About 66 percent have Internet access but only 8 percent have high-speed Internet access. 30 percent have Internet access at work and 21 percent have high-speed Internet access. 73 percent have an e-mail address, 59 percent have purchased online. 14 percent have a second phone line for Internet access and 16 percent would like to have a second phone line.

What are some of the possibilities of broadband communications

50 percent of our customers are aware of the PUD fiber optic system that is currently being used by retailers to provide high speed broadband to business, schools, libraries, and health care facilities. 38 percent of our customers are aware that broadband can be used to supply telephone service and 40 percent were not sure. Most, 46 percent, did not have an opinion on whether a broadband connection would make their property more valuable with 34 percent agreeing that it would. A large number, 70 percent, agree that high-speed Internet may make Pend Oreille County more attractive to business.

How do you view your current Internet capabilities

59 percent agree that Pend Oreille County needs faster Internet connections and 45 percent are not satisfied with their current Internet connection speed. 65 percent agree that high-speed Internet should be made available in all areas of the county.

Should the PUD build broadband facilities

58 percent support the PUD's effort in building broadband facilities while 29 percent are neutral. 54 percent believe the PUD should continue building broadband facilities with 29 percent neutral.

How should broadband facilities be paid for

Most respondents, 30 percent, indicated a willingness to pay up to \$25 per month for a high-speed Internet connection. 61 percent indicated they thought those who use the high-speed facilities should pay for them. Most respondents, 40 percent, would not be willing to pay anything for initial equipment requirements with 29 percent indicating they would be willing to pay up to \$100. 48 percent indicated they would not be willing to pay more even if the cost was spread over a period of months. 47 percent did not support that any of their electric rate be used to pay for high-speed Internet.

The comment questions

35 percent believe high-speed Internet access would be beneficial to all residents of the county and 26 percent felt it would be beneficial to business. 17 percent believe it to be nice but not necessary. The majority, 59 percent, believes those who use them should pay for the cost of broadband facilities.

Comparisons

All categories from retired to business owners' support the PUD continuing to build broadband facilities. Business owners show the greatest support with 73 percent agreeing that the PUD should continue. All zip code areas also support the PUD continuing to build broadband facilities. The greatest support is in zip code area 99153 with 67 percent neutral, agreeing, or strongly agreeing that the PUD should continue and the least support from zip code area 99152 with 41 percent.

Looking at those surveyed who agreed, disagreed, or were neutral that the PUD should continue building broadband facilities, what are their views on how it should be financed. 59 percent agreed the PUD should continue to build, 6 percent disagreed the PUD should continue to build, and 21 percent were neutral

As we would expect, those agreeing that the PUD should continue to build broadband facilities are willing to pay an Internet service provider more for broadband, are willing to pay more for initial equipment cost, and are more willing to have the build out financed by increased electric rates. The majority of all groups believe that those who use broadband should be the ones who pay for it.

Conclusion

A large number of our customers do not have an understanding of the services or benefits a broadband connection may bring to them. It appears one of the reasons for the gulf between "desire" for broadband and the "willingness to pay" for broadband is being unaware of some of the value that can be realized from broadband. Education may be an appropriate next step in bringing "desire" and "willingness to pay" together.

Introduction

In rural, remote Pend Oreille County, broadband is unavailable to all but a very few of its citizens. For our county to grow and prosper in the future, high-speed communications will need to be available for business and homes. In a House Committee on Small Business hearing, Mike Pence, Chairman (2001) said, “Villages in the late 1700s that were not located near a stream that could be used for steam generation missed the prosperity of the early industrial revolution. Towns in the late 1800s that were not served by railroads faced economic stagnation. Counties bypassed by interstate highways lost substantial growth opportunities as the economy moved from a rail transportation to cars and trucks. Cities without adequate air transportation links cannot attract companies in a national and global economy. Today communities that do not have broadband access to the Internet face the same barriers to economic development that communities, mostly rural, faced in previous generations when the mills, railroads, highways, and airports bypassed them” (para. 2). The District has the unique opportunity to help solve the “digital divide” problem in Pend Oreille County by leveraging the existing fiber backbone running through the county from substation to substation. The question is: Do the residents of the county want broadband and if so, what are they willing to pay?

Problem Statement

Broadband use in rural America is limited by availability, high prices, complicated installation, and lack of competition. Because of the low density of people in Pend Oreille County, telephone companies are not interested in making the investment necessary to make broadband available to our rural area.

Cost is a limiting factor. According to Forrester Research, fifty-five percent of current dial-up consumers are ready to switch to broadband the minute it becomes available. Forty-five percent of current users say they are not willing to pay more than \$25 a month for broadband. Of the non-Internet users, fifty-seven percent say they have no interest in ever going on-line (Gardyn, 2000, para. 7, 8).

The District needs to determine the level of demand for broadband and what customers here in Pend Oreille County are willing to pay for broadband.

Research Purpose

On September 8, 2004, the Pend Oreille PUD board of commissioners authorized a survey to be taken of the electric system customers of the PUD as part of overall Community Network System business planning. The surveys were mailed out in the regular electricity billing cycle beginning September 24, 2004. The primary purpose of this study is to determine the level of demand for broadband in Pend Oreille County. The study will also measure what price customers would be willing to pay for broadband service.

Background

The typical Internet experience in Pend Oreille County consists of an Internet connection through a dial-up modem, grabbing a cup of coffee and waiting for the web site to appear. Broadband is not an option for most of the residents. What do we mean by broadband? The FCC technically defines broadband as communication speeds greater than 200 kilobits per

second although FCC commissioner Michael Copps disagrees that speeds as low as 200 kilobits should be included. Copps (2004) states: “Our dated definition of broadband speed (speeds down as low as 200 kilobits) should have been dropped by the wayside long ago” (para 2). Dial up connections are limited to 56 kilobits per second, with the typical rural speed in the 19 kilobytes to 38 kilobits range. At the very low end, then, broadband is about four times faster than the fastest dial up connection. A broadband speed needed to supply voice, video, and data, though, would be in the range of ten to twenty megabits per second or about 175 to 350 times faster than the fastest dial-up connection.

“Telecom represents the single most important swing factor that can transform a rural community from a position of weakness to a position of strength. Without an adequate broadband solution, most businesses would not even consider moving to the most appealing rural area” (Cooper, 2002, para. 6). What about the businesses that are already here? Marc Huminiłowycz (2002) says, “The national fibre optic carriers have so far failed to provide what’s called last mile access, that is, service to remote customers. As a result, rural businesses have been short-changed when it comes to access to the marketplace” (para. 4). “Nationwide, rural communities didn't reap much benefit from the billions invested in high-speed Internet networks during the telecom boom because the networks are pricey, and installing them in densely populated areas was much more profitable. As a result, less than 5% of towns with fewer than 10,000 residents have access to high-speed connectivity via digital subscriber lines” (Jeter, 2003, para. 2). Broadband is a necessary component not only to attract new business but also to keep current businesses competitive and profitable. John Eger, professor of communications and public policy at San Diego State University, says, “Cities of the past were built along waterways, then highways, but today, with information highways, you can live anywhere – as long as you’re connected” (DeWitt, 2003, para. 2). Pend Oreille PUD can play a part in making that information highway available to the residents of Pend Oreille County.

Research Questions

To meet the purpose of this research we need to know if the residents of Pend Oreille County see a need for broadband availability and if so, what price they would be willing to pay. This purpose will be met by answering the following two questions:

- What level of demand, if any, exists for broadband services in Pend Oreille County?
- What price, if any, are customers of Pend Oreille PUD willing to pay for broadband service?

Scope

The total number of households in the Pend Oreille PUD service area is 7,763. All 7,763 households received a survey included in their monthly power bill beginning September 24, 2004. With a total population of 7,763, a response number of 613 would provide a ninety-nine percent confidence level and a confidence interval of +/- five (Sample Size, 2003). 1,029 surveys were returned and all will be part of the sample insuring our confidence level is greater than 99 percent. Since the total population has an equal chance of responding, this is a probability sample. A probability sample will allow generalizations to be made about the entire population (Trochim, 2002, para. 1).

Methodology

This study's research is descriptive in nature since we know the problem is a lack of availability of broadband and the goal is to obtain an understanding of our customers' desire for broadband and their willingness to pay. Surveys were included in the monthly billing and mailed to each of our customers. The survey asked for demographic data such as residence area, employment status, and housing status. The main body of the survey is composed of closed-ended questions of the category scale type. Asking reflective questions checks reliability of the questions. To insure validity, questions were worded in a manner to achieve a common understanding of the view and definition of the question being asked. Two open-ended questions finished the survey. Content analysis will be used to evaluate the responses to the open-ended questions. To insure an unbiased survey, the following procedure was followed. A small group with knowledge of broadband wrote the questions initially. The questions were then reviewed and modified by a larger group of PUD staff. This larger group was made up of people with varying views of broadband. The complete survey is included as Appendix A.

Findings

This section is devoted to graphical display of the data from each question in the survey. The graphs are not in the same order they appeared on the survey but are divided into sections of similar interest. Later we will try to define what the data means. First, let's look at some demographic data.

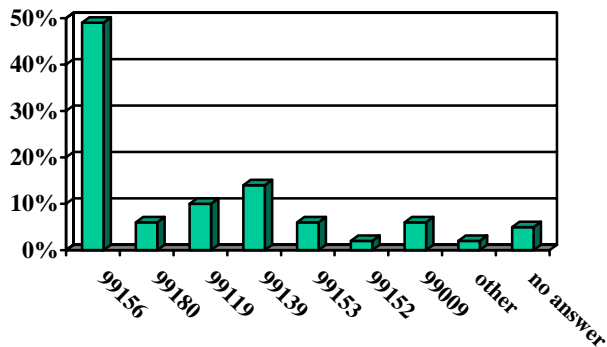


Fig 1. My Zip Code in Pend Oreille is:

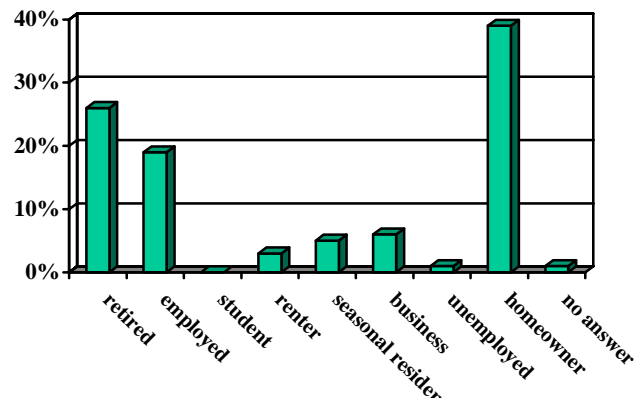


Fig 2. This survey was completed by:

We see that 39 percent are homeowners and 26 percent are retired. 19 percent are employed. The majority, 49 percent, resides in area 99156 with the other areas somewhat equally represented.

What do our customers think of the PUD?

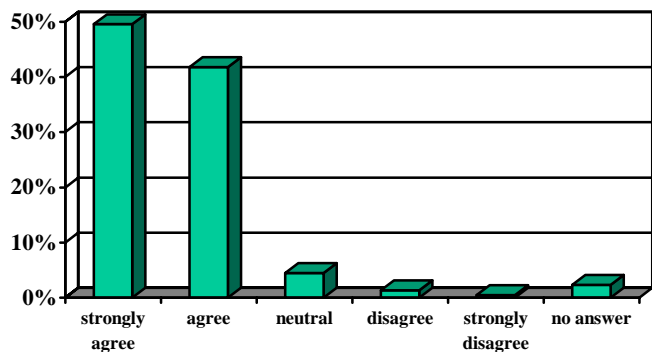


Fig 3. The PUD has been competent in providing utility services, such as electricity and water, in Pend Oreille County

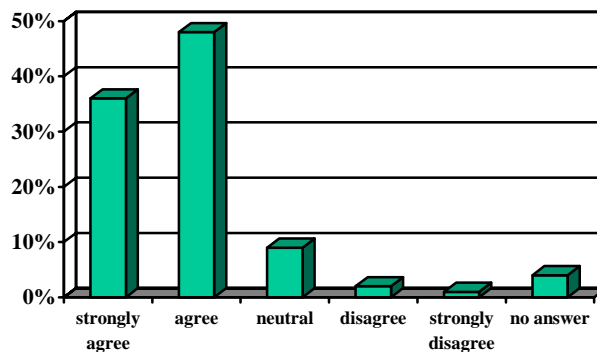


Fig 4. The is successful in providing utilities reliably and at a fair cost

Since these two questions are very similar we would expect to have very similar responses and that is what we received. The perception of our customers is that the District is currently offering reliable and fair cost products.

How are our customers currently using communication technology?

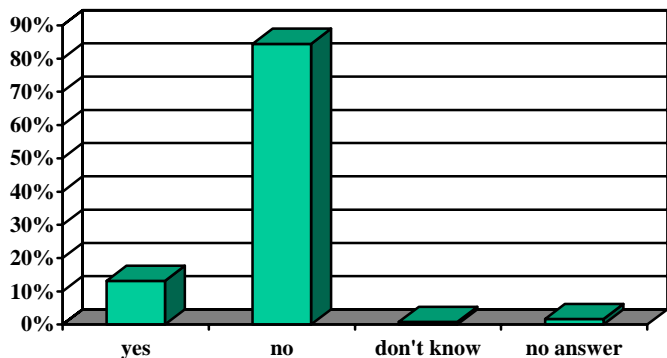


Fig 5. Do you use the PUD's on-line payment "Click to Pay", Phone to Pay, or a Credit Card to pay your utility bill?

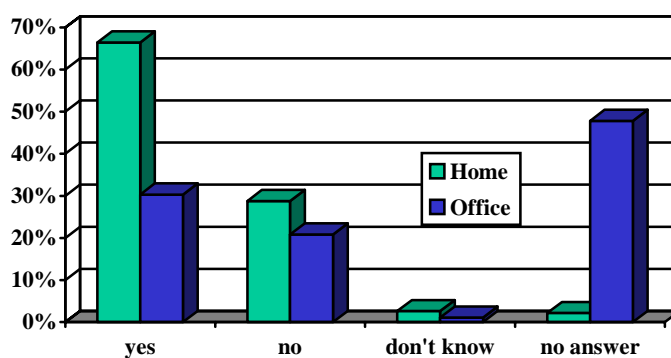


Fig 6. Do you have Internet access at your home/office?

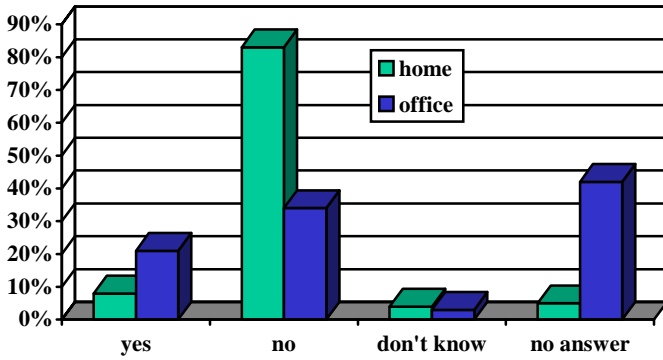


Fig 7. Do you have high speed Internet access at your home/office?

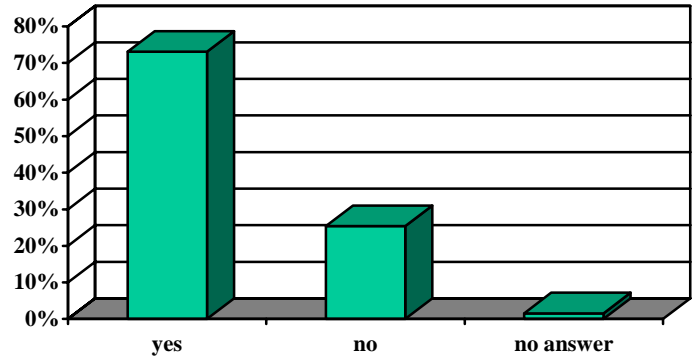


Fig 8. Do you or anyone in your household have an email address?

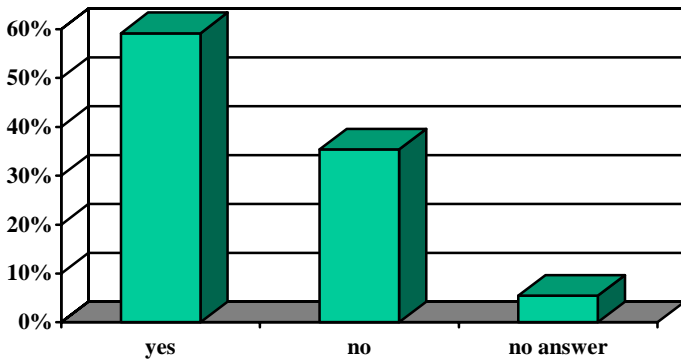


Fig 9. I have purchased one or more items on the Internet.

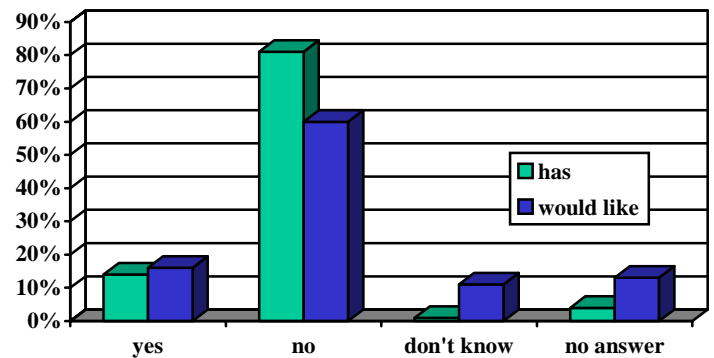


Fig 10. Our household has, or would like, a second phone line dedicated to Internet use.

Only 13 percent of our customers pay their electric bill online. About 66 percent have Internet access but only 8 percent have high-speed Internet access. 30 percent have Internet access at work and 21 percent have high-speed Internet access. 73 percent have an e-mail address, 59 percent have purchased online. 14 percent have a second phone line for Internet access and 16 percent would like to have a second phone line.

What do our customers know about some of the possibilities of broadband communications?

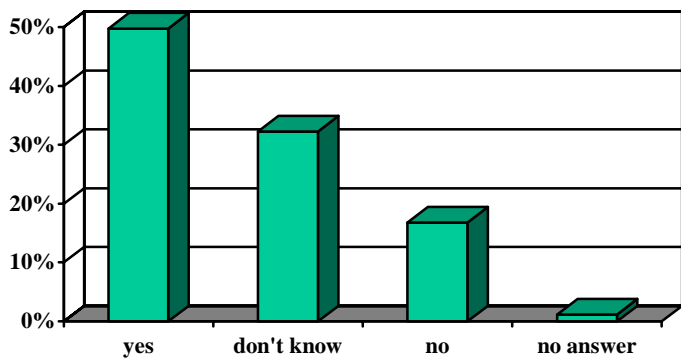


Fig 11. Are you aware that the PUD has fiber optic systems, used by retailers, who provide advanced communication services to the hospital, schools, libraries, health clinics, etc., in the community?

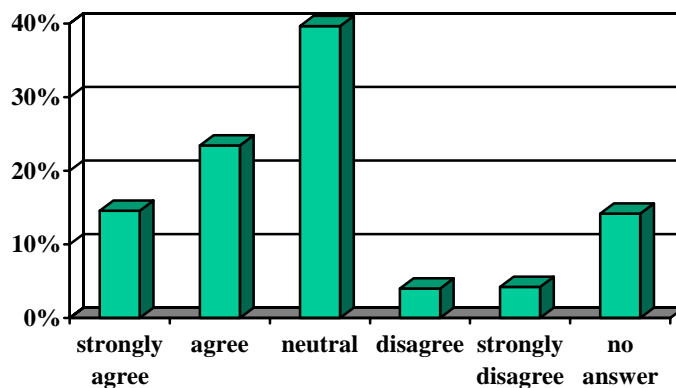


Fig 12. With certain high-speed connections, your telephone can work well using the Internet.

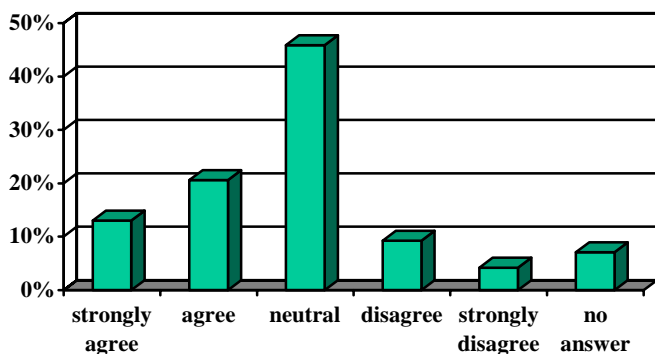


Fig 13. My property is more valuable or marketable with a high-speed Internet connection.

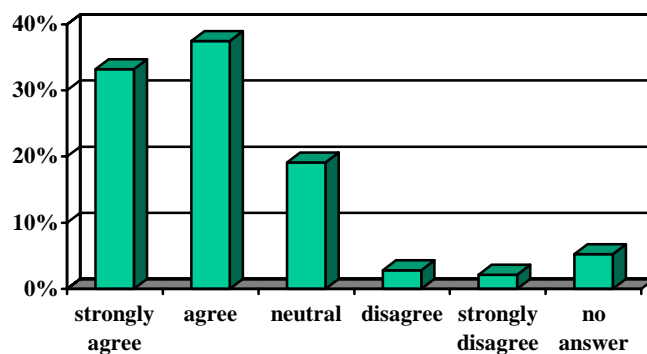


Fig 14. High-speed Internet may make Pend Oreille County more attractive to business

50 percent of our customers are aware of the PUD fiber optic system that is currently being used by retailers to provide high speed broadband to business, schools, libraries, and health care facilities. 38 percent of our customers are aware that broadband can be used to supply telephone service and 40 percent were not sure. Most, 46 percent, did not have an opinion on whether a broadband connection would make their property more valuable with 34 percent agreeing that it would. A large number, 70 percent, agree that high-speed Internet may make Pend Oreille County more attractive to business.

What do our customers think about their current Internet capabilities?

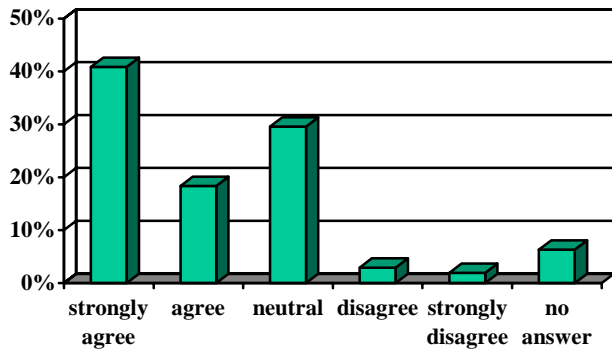


Fig 15. Pend Oreille County needs faster Internet connections.

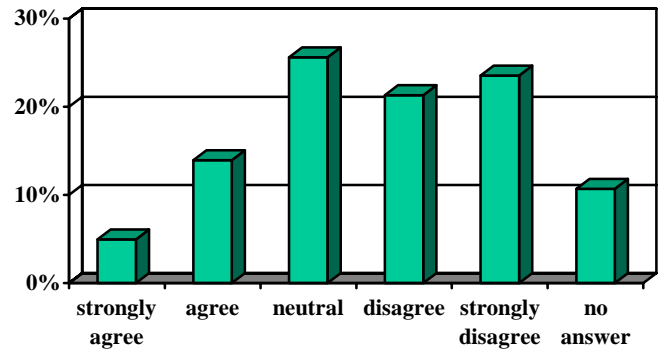


Fig 16. I am satisfied with my household's present Internet connection speed.

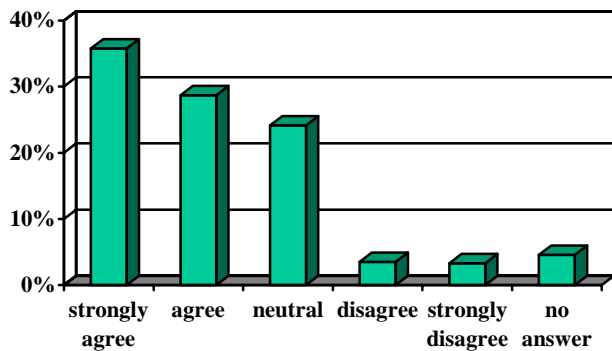


Fig 17. High-speed Internet should be made available in all areas of the county.

59 percent agree that Pend Oreille County needs faster Internet connections and 45 percent are not satisfied with their current Internet connection speed. 65 percent agree that high-speed Internet should be made available in all areas of the county.

Should the PUD build broadband facilities?

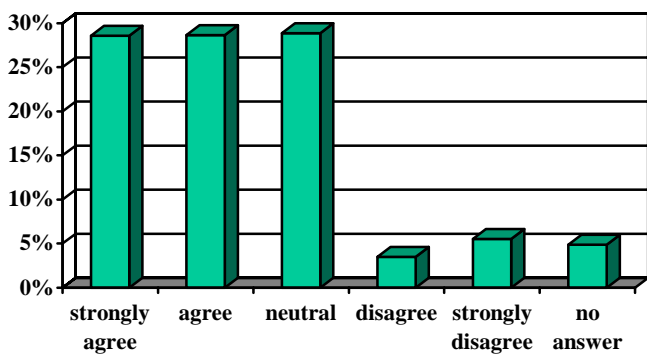


Fig 18. I support the PUD in building wholesale high-speed or broadband utilities.

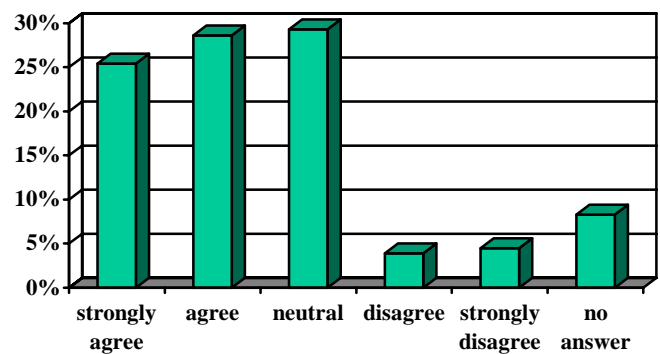


Fig 19. The PUD should continue building wholesale high-speed or broadband.

58 percent support the PUD's effort in building broadband facilities while 29 percent are neutral. 54 percent believe the PUD should continue building broadband facilities with 29 percent neutral. Since these are very similar questions we would expect similar results and that is what we received.

How should the facilities be paid for?

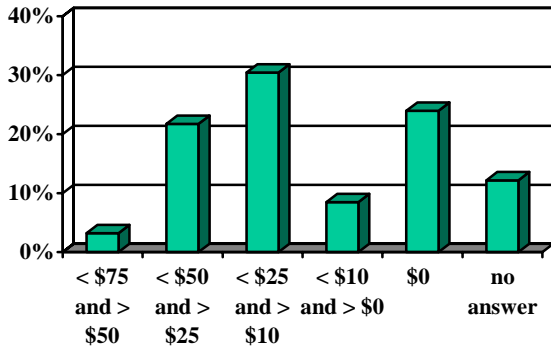


Fig 20. I am willing to pay my Internet Service Provider ___ per month for high-speed Internet services.

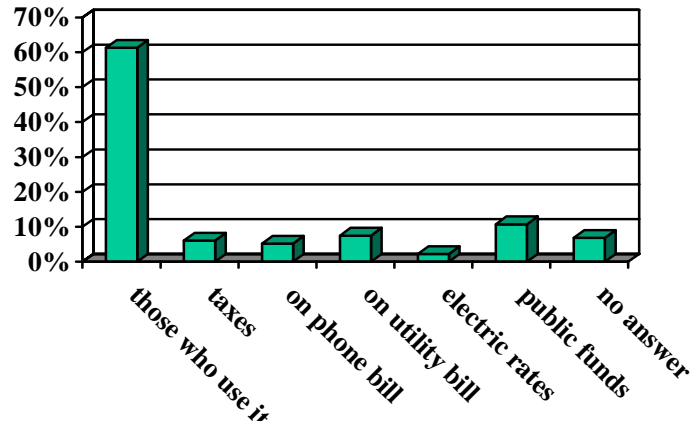


Fig 21. The facilities necessary to provide faster Internet speeds should be paid for by:

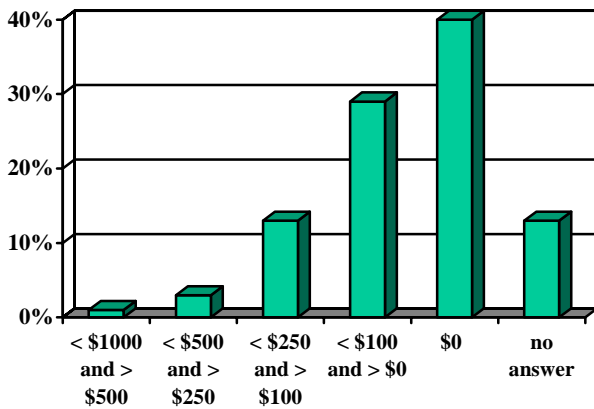


Fig 22. I am willing to pay ___ initial equipment cost to increase my Internet speed.

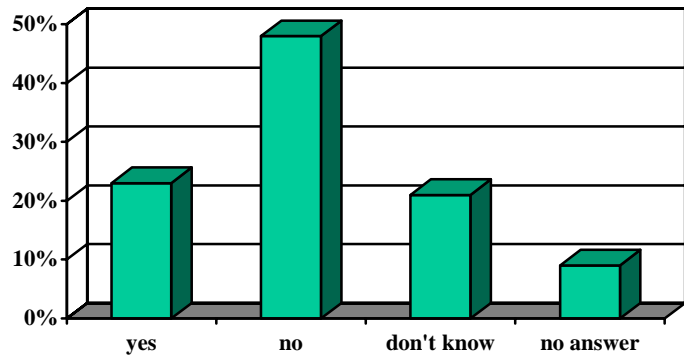


Fig 23. Would you pay more for the equipment if it could be paid in monthly installments?

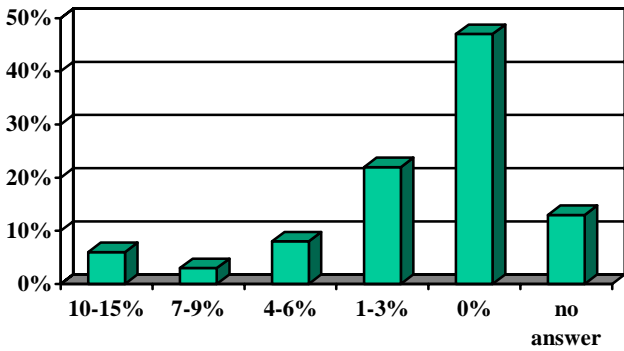


Fig 24. I would support that ____ % of my electric rate could pay for high-speed utility and Internet facilities.

Most respondents, 30 percent, indicated a willingness to pay up to \$25 per month for a high-speed Internet connection. 61 percent indicated they thought those who use the high-speed facilities should pay for them. Most respondents, 40 percent, would not be willing to pay anything for initial equipment requirements with 29 percent indicating they would be willing to pay up to \$100. 48 percent indicated they would not be willing to pay more even if the cost was spread over a period of months. 47 percent did not support the use of any of their electric rate be used to pay for high-speed Internet.

The final two survey questions were open-ended questions. The responses were categorized and the results are graphed below.

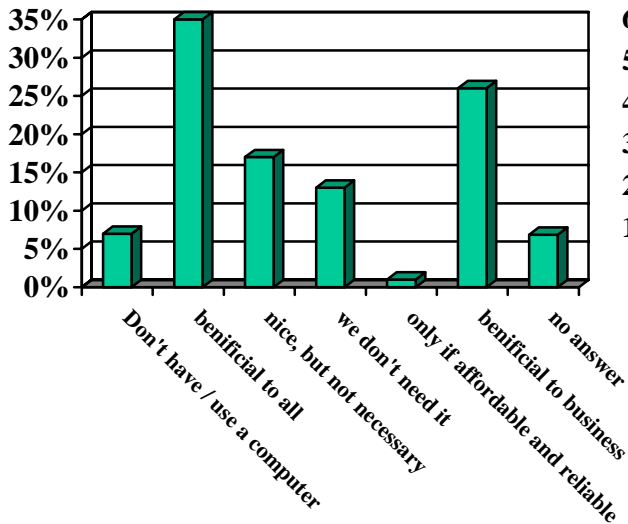


Fig 25. Do you think high-speed Internet capability is necessary for Pend Oreille County?

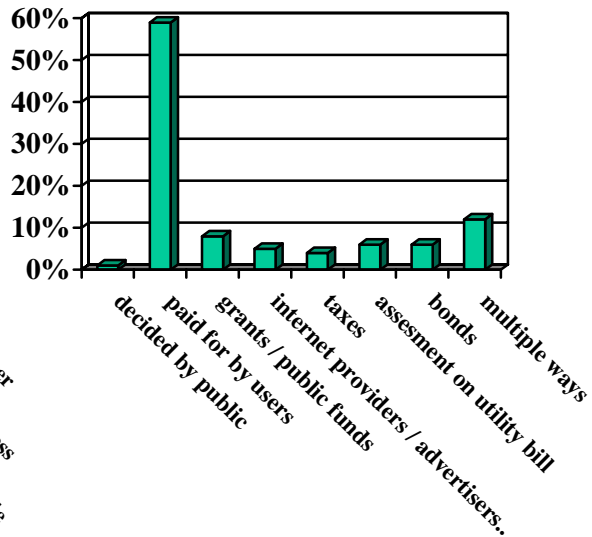


Fig 26. How best can the cost of implementing high-speed or broadband facilities be funded?

35 percent believe high-speed Internet access would be beneficial to all residents of the county and 26 percent felt it would be beneficial to business. 17 percent believe it to be nice but not necessary. The majority, 59 percent, believes those who use them should pay for the cost of broadband facilities. Actual question responses are attached in Appendix B.

Comparisons

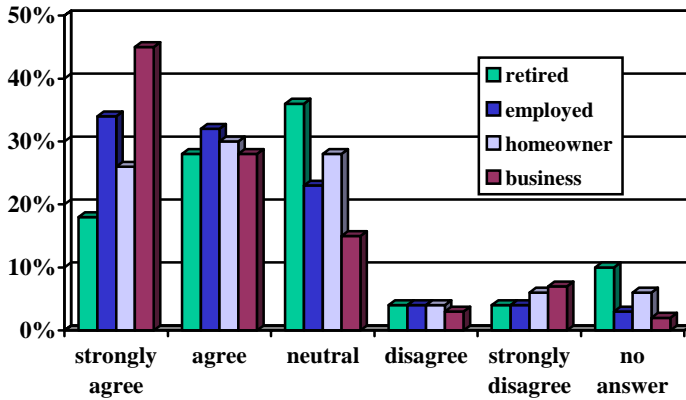


Fig 25. The PUD should continue building wholesale high-speed or broadband facilities.

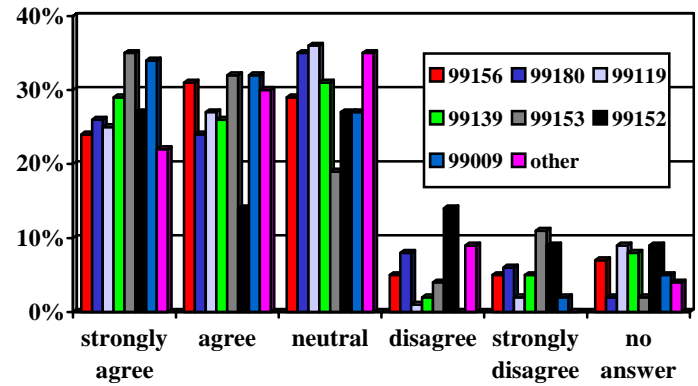


Fig 26. The PUD should continue building wholesale high-speed or broadband facilities.

All categories from retired to business owners' support the PUD continuing to build broadband facilities. Business owners show the greatest support with 73 percent agreeing that the PUD should continue. All zip code areas also support the PUD continuing to build broadband facilities. The greatest support is in zip code area 99153 with 67 percent neutral, agreeing, or strongly agreeing that the PUD should continue and the least support from zip code area 99152 with 41 percent.

Looking at those surveyed who agreed, disagreed, or were neutral that the PUD should continue building broadband facilities, what are their views on how it should be financed. (59 percent agreed the PUD should continue to build, 6 percent disagreed the PUD should continue to build, and 21 percent were neutral.)

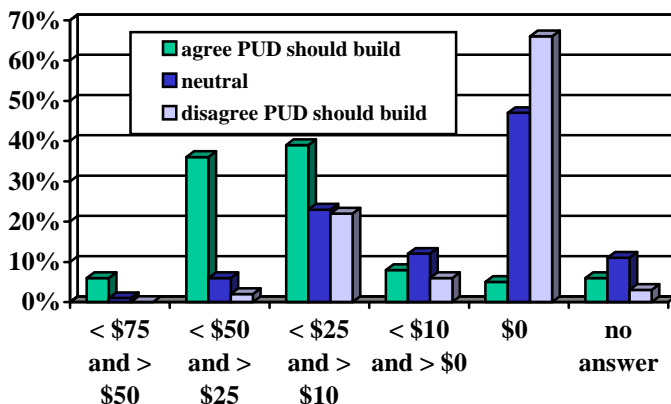


Fig 27. I am willing to pay my Internet Service Provider ___ per month for high-speed Internet services.

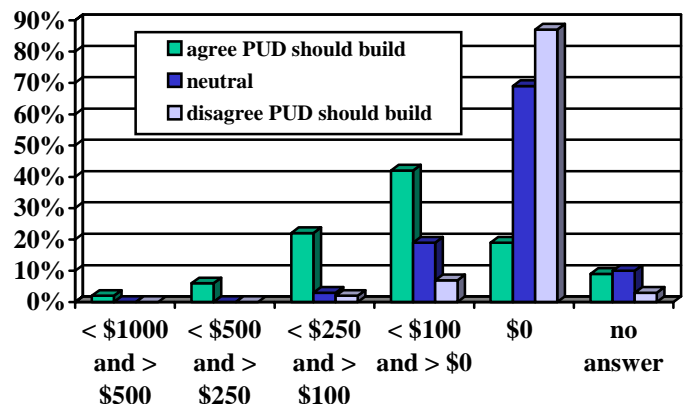


Fig 28. I am willing to pay ___ initial equipment cost to increase my Internet speed.

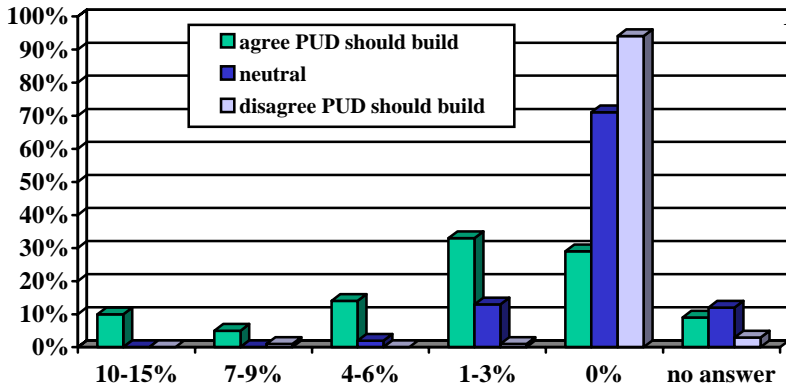


Fig 29. I would support that ____ % of my electric rate could pay for high-speed utility and Internet facilities.

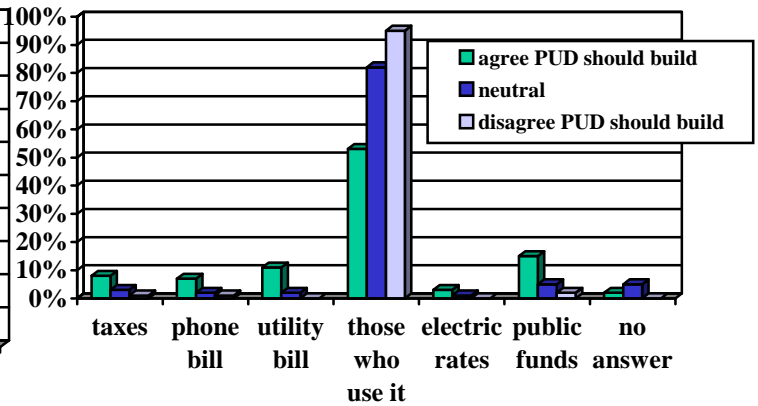


Fig 30. The facilities necessary to provide faster Internet speeds should be paid for by:

As we would expect, those agreeing that the PUD should continue to build broadband facilities are willing to pay an Internet service provider more for broadband, are willing to pay more for initial equipment cost, and are more willing to have the build out financed by increased electric rates. The majority of all groups believe that those who use broadband should be the ones who pay for it.

Next we will compare how those who have Internet access and those who don't would pay for the expansion of broadband.

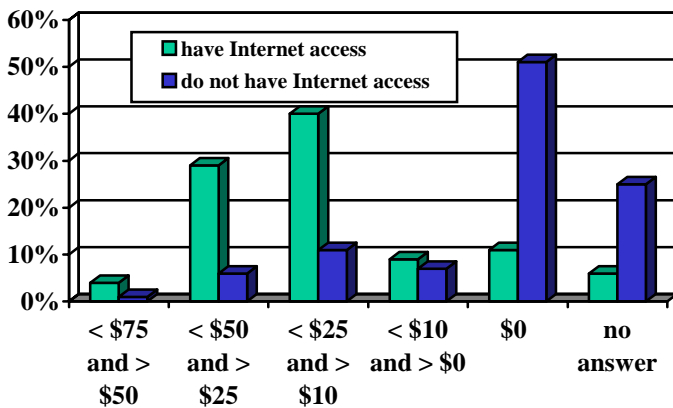


Fig 31. I am willing to pay my Internet Service Provider ____ per month for high-speed Internet services.

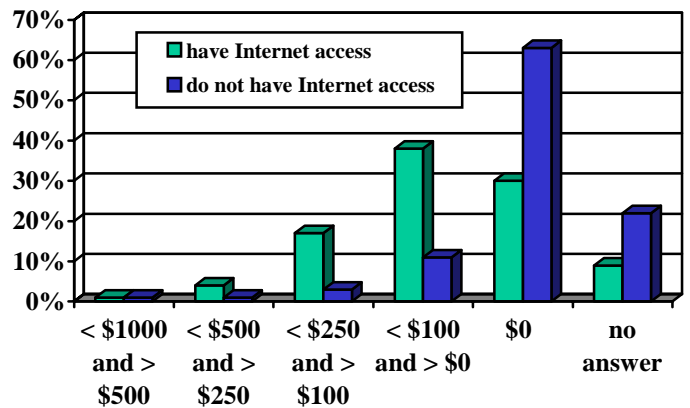


Fig 32. I am willing to pay ____ initial equipment cost to increase my Internet speed.

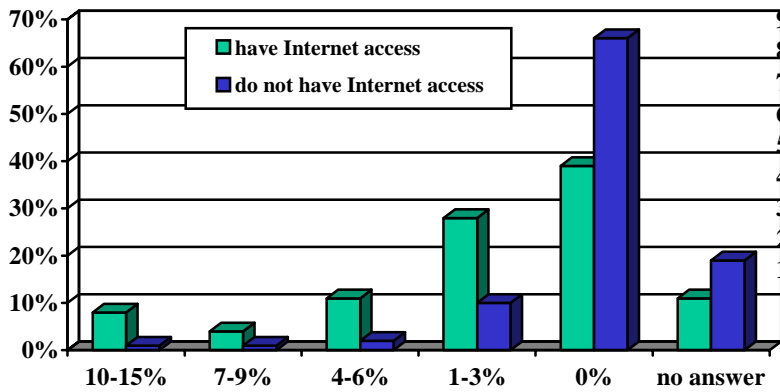


Fig 33. I would support that ____ % of my electric rate could pay for high-speed utility and Internet facilities.

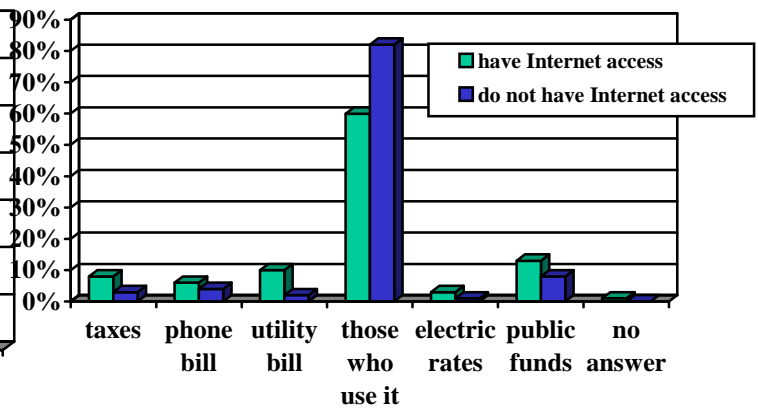


Fig 34. The facilities necessary to provide faster Internet speeds should be paid for by:

As we would expect, those having Internet access are willing to pay an Internet service provider more for broadband, are willing to pay more for initial equipment cost, and are more willing to have the build out financed by increased electric rates. Again, the majority of both groups believe that those who use broadband should be the ones who pay for it.

Following is a summary of the willingness to pay of those who agree the PUD should continue to build broadband facilities, those who disagree the PUD should build broadband facilities, those who are neutral and all respondents.

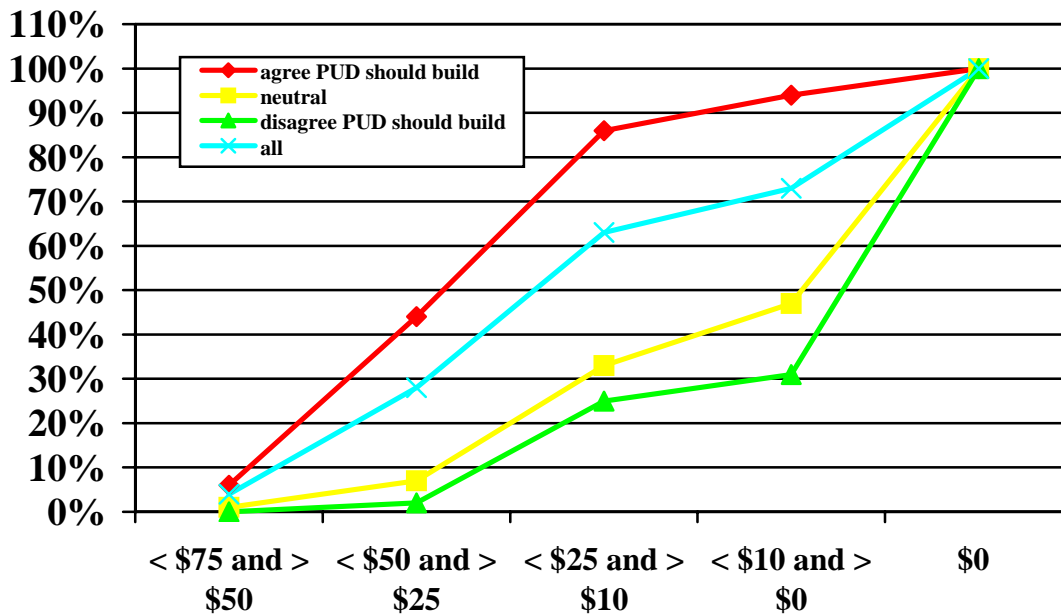


Fig 35. I am willing to pay my Internet Service Provider ____ per month for high-speed Internet services.

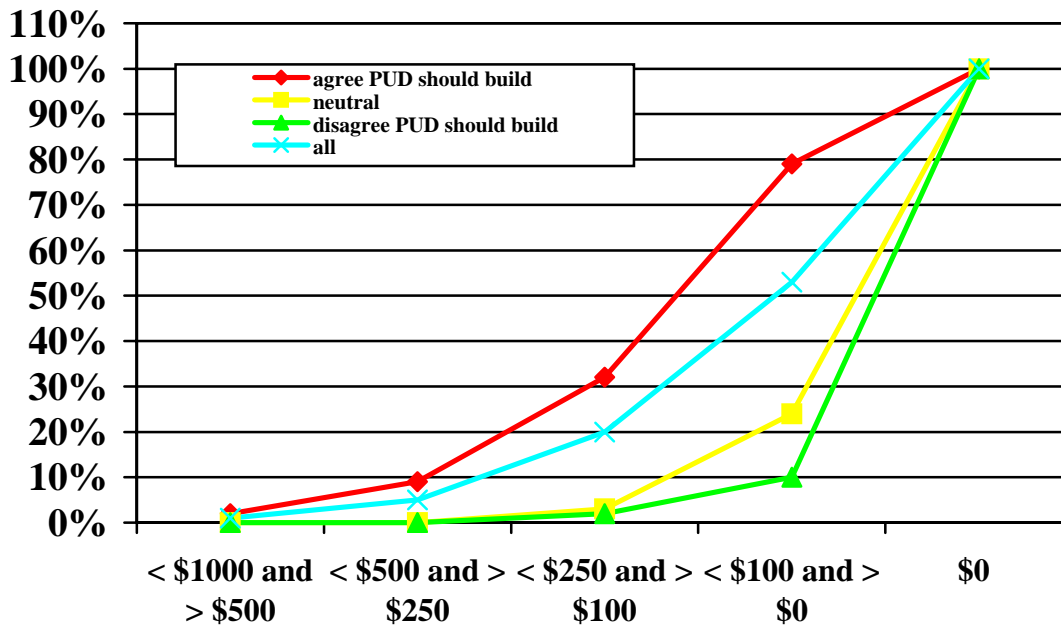


Fig 36. I am willing to pay ___ initial equipment cost to increase my Internet speeds.

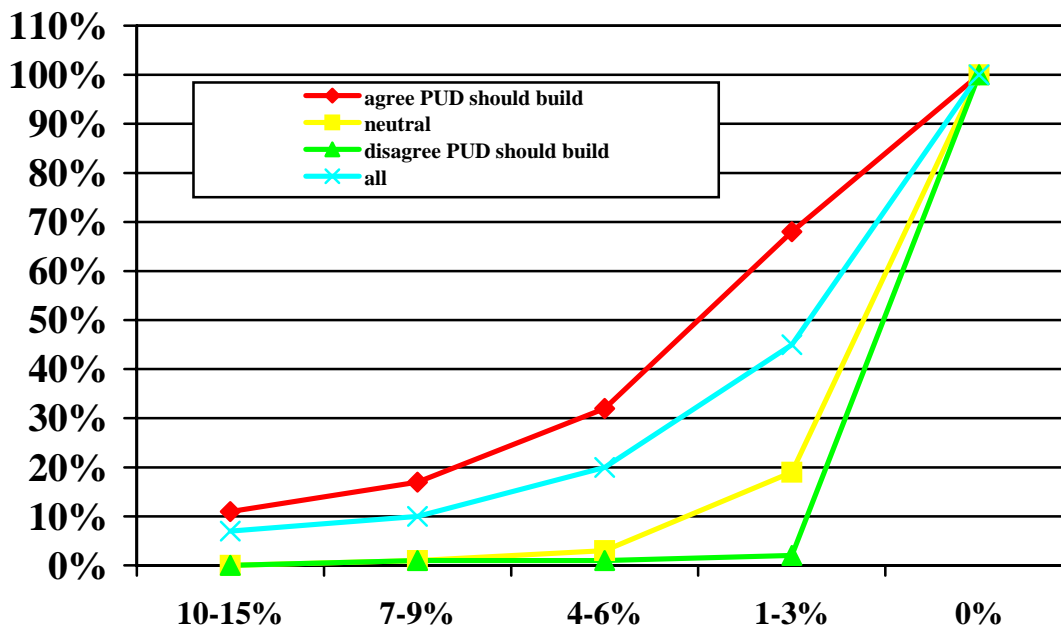


Fig 37. I would support that ___ % of my electric rate could pay for high-speed utility and Internet facilities.

Those agreeing the PUD should continue to build broadband facilities (59 percent fall in this category) are willing to pay the following for broadband:

Internet service provider per month

\$10.00 or less	94 percent
\$25.00 or less	86 percent
\$50.00 or less	44 percent
\$75.00 or less	6 percent

Initial equipment cost

\$100.00 or less	79 percent
\$250.00 or less	32 percent
\$500.00 or less	9 percent
\$1000.00 or less	2 percent

Increase in electric rates

3 percent or less	68 percent
6 percent or less	32 percent
9 percent or less	17 percent
15 percent or less	11 percent

All survey respondents are willing to pay the following for broadband:

Internet service provider per month

\$10.00 or less	73 percent
\$25.00 or less	63 percent
\$50.00 or less	28 percent
\$75.00 or less	4 percent

Initial equipment cost

\$100.00 or less	53 percent
\$250.00 or less	20 percent
\$500.00 or less	5 percent
\$1000.00 or less	1 percent

Increase in electric rates

3 percent or less	45 percent
6 percent or less	20 percent
9 percent or less	10 percent
15 percent or less	7 percent

Conclusion

Considering our two initial questions, what did we find out? Let's look at each one separately.

What level of demand, if any, exists for broadband services in Pend Oreille County?

66 percent of our customers have Internet access and 73 percent have an e-mail address. 59 percent have purchased online. Most of those are not satisfied with their current Internet access speed. 59 percent want faster Internet capability and only 19 percent are satisfied with their current Internet access speed. 65 percent think high-speed Internet should be available to all residents of the county. If we define demand as the desire to have, then there is a high level of demand for broadband.

Since there is demand, who should build? 59 percent think the PUD should build the facilities with only 8 percent saying the PUD should not build broadband facilities.

What price, if any, are customers of Pend Oreille PUD willing to pay for broadband service?

28 percent are willing to pay up to \$50 per month to an Internet service provider. 20 percent would pay up to \$250 for initial equipment needed at their location. 20 percent would be in favor of up to a 6 percent increase in electric rates to pay for broadband infrastructure.

The "willingness to pay" does not seem to follow the "desire to have". Let's look at just those who are in favor of broadband and believe the PUD should continue to build. 59 percent fall in this category. Since these are the people that want broadband and they are the majority of our customers, it is important to know what they think broadband is worth to them. The majority of them would be willing to pay somewhere between \$25 and \$50 per month to an Internet provider, and be willing to pay somewhere between \$100 and \$250 for initial equipment costs. The majority would be willing to have their electric rates increase between 0 percent and 3 percent. The majority of this same group, 53 percent, believes those who use broadband should be the ones who pay for broadband.

Why do these customers that want the PUD to build broadband facilities have a low willingness to pay for broadband? Let's look at responses to the "possibilities of broadband" group of survey questions. When asked "Are you aware that the PUD has fiber optic systems, used by retailers, who provide advanced communication services to the hospital, schools, libraries, health clinics, etc., in the community", 49 percent were not aware. 40 percent had no opinion on whether their telephone could work well using the Internet. 46 percent had no opinion on whether their property would be more valuable or marketable with a high-speed connection.

A large number of our customers do not have an understanding of the services or benefits a broadband connection may bring to them. It appears one of the reasons for the gulf between "desire" for broadband and the "willingness to pay" for broadband is being unaware of some of the value that can be realized from broadband. Education may be an appropriate next step in bringing "desire" and "willingness to pay" together.

References

- Pence, M. (2001, May 17). Broadband impact on rural business. *FDCH Congressional Testimony*. Retrieved September 30, 2003, from the EBSCO Host database.
- Cooper, D. (2002, November). DSL spells j-o-b-s for rural areas. *Telecommunications – American Edition* 36(13), 6. Retrieved September 30, 2003, from the EBSCO Host database.
- Gardyn, R. (2000, December). Broad appeal. *American Demographics*, 22(12), 30. Retrieved September 30, 2003, from ProQuest database.
- Huminiłowycz, M. (2002, August). Country connections. *Country Life* 26(165), 38. Retrieved September 30, 2003 from the EBSCO Host database.
- DeWitt, J. (2003, April). The battle over broadband. *American City & County*. Retrieved September 30, 2003, from the EBSCO Host database.
- Trochim, W. (2002). *Probability sampling*. Retrieved September 30, 2003 from Research Methods Knowledge Base Web site <http://trochim.human.cornell.edu/kb/sampprob.htm>
- Sample size calculator (2003). Retrieved October 2, 2003, from the Creative Research Systems Web site: <http://www.surveysystem.com/sscalc.htm>
- Copps, M. (2004, September). Availability of advanced telecommunications capability in the United States. *Federal Communications Commission, Forth Report to Congress* FCC 04-208, GN Docket No. 04-54

