



Local Broadband Solutions for the Greater
Harbor Springs Area:
HARBOR, Inc.'s Community Approach

Rachel Smolinski HARBOR, Inc. Executive Director

March 2015

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach-Table of Contents

I.	Executive Summary	Page 1
II.	HARBOR, Inc. Background	Page 2
III.	Area Need	Page 2
IV.	History of HARBOR, Inc. Technology Related Initiatives in the Area	Page 3
V.	HARBOR, Inc. Broadband Team Projects	Page 4
VI.	Community Support in the HARBOR, Inc. Service area	Page 7
VII.	Broadband/Internet Demand in HARBOR, Inc. Service are	Page 7
VIII.	Broadband Solutions for the HARBOR, Inc. Service Area	Page 12
IX.	Economic Impact of Broadband Expansion in the HARBOR, Inc. Service Area	Page 20
X.	Sources	Page 21

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

I. Executive Summary

Much of Emmet County continues to suffer chronic deficiency in broadband/Internet availability and service quality issues due to a lack of adequate broadband infrastructure in our most rural service areas.

This study will discuss the current status of broadband/internet availability establish the demand for services; propose potential solutions to increase broadband availability; and determine the general economic impact of an increase in broadband penetration within the residential and business sectors in the HARBOR, Inc. service area. This document may also serve as a guide to local decision makers and investors in the service area and beyond when evaluating a proposed broadband project or potential investment in a broadband project.

Over the past 8 years, HARBOR, Inc. has compiled technology related information; provided a platform for communication and coordination; implemented projects; and proposed solutions to increase broadband/internet availability within the service area. The HARBOR, Inc. Broadband Team has identified lack of adequate broadband access as a priority in the Community Technology Action Plan, which sets community wide goals to address broadband access, adoption, and usage in the service area.

HARBOR, Inc. has formed a partnership with Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and Char-Em Intermediate School District to review and evaluate opportunities for technology development and pursue collaborative projects. In addition, the technology initiatives of the Team and partnership have received widespread community support.

A broadband/internet demand survey has established that there is a substantial demand and a willingness to pay more for services that meet the needs of both the residential and business sectors of the target population. There is also a greater need for expanded internet service in the northern portions of Little Traverse and West Traverse Townships with this trend continuing northward within the HARBOR, Inc. service area.

HARBOR, Inc. has researched many different solutions for bringing reliable, quality broadband to our service area. Some of these solutions are currently functioning, but not a high enough level; some have failed; and others are yet to be implemented in the area. A number of options are available, but must be further evaluated for financial viability and feasibility of implementation. These options include: existing and proposed wireless technology to residential and business customers, fiber build out to anchor institutions, fiber build out to residential and business.

An increase in broadband availability and penetration will result in economic growth for the HARBOR, Inc. service area. Getting connected combined with the potential of job creation through broadband infrastructure or other technology related project (s) will result in a positive return on investment for decision makers and potential investors.

II. HARBOR, Inc. Background

The purpose of HARBOR, Inc. is to act as a community resource for local units of government, property owner associations and others, when decisions are made that affect the greater community. To accomplish tangible results, HARBOR, Inc. identifies key areas of interest (Strategic Initiatives) to assist with planning and implementation. Board members have established Strategic Initiatives in broad areas to allow HARBOR, Inc. to serve as a forum for community projects. Strategic Initiatives include Recreation, Trails and Open Space, Alternative Transportation, Community Engagement and Technology

Concerned local citizens formed HARBOR, Inc. in 2001 as a result of a grass-roots effort. In 2000, a community visioning program was conducted that resulted in similar recommendations and concerns as had been identified in previous visioning efforts over the past thirty years. Community leaders determined that specific actions would be required to ensure that the community vision is realized. HARBOR, Inc. has since operated with a full-time Executive Director responsible for coordinating and directing the efforts of the Board of Directors.

HARBOR, Inc. has a broad-based Board of Directors that includes the mayor of Harbor Springs and most of the area township supervisors. The board also includes prominent members in the development and preservation communities to allow for deeply insightful discussions on the issues associated with maintaining the quality of life in the Greater Harbor Springs area. This is a very active, working board that is committed to the mission of the organization and to the community.

HARBOR, Inc. serves the greater Harbor Springs area including residents and property owners of the City of Harbor Springs and the Townships of Cross Village, Friendship, Little Traverse, Pleasantview, Readmond, and West Traverse. HARBOR, Inc. has the same boundaries as the Harbor Springs School District. The HARBOR, Inc. lies within the County of Emmet.

III. Area Need

Technology plays a pivotal role in how businesses operate, where business owners choose to locate their operations, and how and where businesses obtain supporting goods and services for operations. Home-based businesses and tele-workers located within our communities would create local jobs and spur local economic growth. More importantly, according to Connect Michigan, the success of a community has become dependent on how broadly and deeply the community adopts technological resources – this includes access to reliable high-speed networks. Below are some additional points that support the need for increased access to high speed broadband:

- To be competitive, businesses need at least 10Mbps of broadband capacity to perform daily tasks effectively.
- In the HARBOR, Inc. service area, approximately 25% of households do not have access to 10Mbps; meaning essential daily business tasks cannot be performed because internet speed necessary to support the task is not available through existing infrastructure.
- Michigan home –based businesses use broadband at a similar rate as other businesses in the state:

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- 74% use broadband and 34% use mobile internet.
- Many home based businesses in Michigan realize the value of broadband and go online to seek opportunities to expand their businesses.
- In the HARBOR, Inc. service area, 29.2% of households have access to only one internet provider. Mobile (cell phone) providers do not provide adequate speeds to support daily business tasks.
- Middle mile fiber infrastructure is available from only one provider in the HARBOR, Inc. service area.

In response to the issues described above, the regional HARBOR, Inc. Broadband Team (Please refer to Appendix 1 for a complete list of Team members. has identified lack of adequate broadband access as a priority in the Community Technology Action Plan, which sets community wide goals to address broadband access, adoption, and usage in the service area. Furthermore, the Team has identified the action necessary to address this need.

IV. History of HARBOR, Inc. Technology Related Initiatives in the Area

The HARBOR, Inc. Broadband Team joined forces with Connect Michigan by enrolling in the Connected Community Certification Program, an initiative that offers a comprehensive way to bridge the digital divide impacting many communities.

The Connected Community Certification Program was designed to facilitate the building of a comprehensive action plan for developing a technology-ready community by reviewing the technology landscape, developing regional partnerships, establishing local teams, and conducting thorough community assessments.

In 2007, HARBOR, Inc. formed a High Speed Internet Committee with a mandate to:

- List and describe the different technology options
- List and describe the advantages and disadvantages of each technology
- Map existing areas with high-speed Internet access by technology
- List and describe options for future technology
- Develop a list of service providers in the HARBOR, Inc. service area

In 2008, the committee released a report outlining the regional challenges and listing recommendations for improving the areas' broadband infrastructure. Please refer to Appendix 2 for the report.

In May 2011, the broadband initiative was renewed by reforming the Broadband Team which is now comprised of volunteers from the HARBOR, Inc. board, other key stakeholders and organizations in the community with and interest in broadband and technology, and technology related service providers.

In 2012, the Team met to discuss options, review research, and determine next steps in bringing broadband access to under-served and unserved residents and businesses in the region and released their HARBOR, Inc. Community Technology Action Plan in April of 2013. The plan was designed to guides communities through an assessment of their overall broadband and technology progression, using criteria that parent organization Connected Nation has developed as a part of

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

the “community certification” model. The program helps train regional team leaders and supports the formation of community planning teams made up of various sector representatives.

However, the area did not receive a high enough score through the certification process to be a “certified connected community”. The Team continued to work with service providers and others on broadband efforts in the area and the HARBOR, Inc. area became a “Certified Connected Community” in August of 2014. Key finding of the assessment indicated that the Team had made great progress in increasing the community’s broadband access, adoption, and usage; but recommendations were outlined to help the community continue to strive for success in the area. Please refer to Appendix 3 for the complete HARBOR, Inc. Community Technology Action Plan.

V. HARBOR, Inc. Broadband Team Projects

Current Projects

The Team members, including the HARBOR, Inc. Executive Director, are responsible for the facilitation, coordination, and implementation of numerous technology related activities and projects affecting the residents of Emmet County. The following activities are currently assisting to enhance technology in the area:

- The Harbor Springs area broadband survey was launched in July in an attempt to facilitate the expansion of reliable, affordable high speed internet to residents, businesses, and visitors to the HARBOR, Inc. service area that is currently unserved or underserved as a long-time initiative of HARBOR, Inc. A small subcommittee has been meeting over the past few years to work on the initiative, and most recently has been working with a larger, regional Broadband Team to facilitate the process through the Connect Michigan Community Engagement Program. One of the projects implemented to address access is a broadband survey for residents in the service area in order to provide more information to the Team and to attract potential service providers to the area. The survey was launched in July via a mailing to over 6,600 property owners. *Status: The survey was closed at the end of September 2012. The HARBOR, Inc. Executive Director is currently working with the results and dissemination to service providers to expand and enhance their service in the area.*

- The HARBOR, Inc. Broadband Team works to increase access to broadband in unserved areas within the service area. They foster collaborative projects between technology service providers and communities within the service area. HARBOR, Inc. continues to provide liaison services to service providers looking to offer expanded service or provide service in the area. In addition, HARBOR, Inc. will connect communities and/or organizations looking for assistance with service providers. *Status: Ongoing*

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- In November of 2011, the voters of the Harbor Springs Public School approved a \$3.9 million technology and transportation bond allowing the school to install Wi-Fi in all the school facilities this fall and to launch a 1:1 iPad Initiative learning program. *Status: The school continues to implement the technology bond activities. Wi-Fi and multimedia equipment are installed and operational. The iPad initiative is moving forward with the teacher and staff training and pilot 1:1 program in classrooms; a total of 890 students have iPads or Mac Air Books. HARBOR, Inc. continues to support this initiative and actively works with school staff on broadband education and awareness related projects.*
- The implementation of digital literacy classes through the *HarborActive* program. This program is the brainchild of Rachel Smolinski of HARBOR, Inc. and Marcie Wolf of Abuzz Creative to provide lifelong learning to the community. HarborActive seminars are for Northern Michigan professionals and residents who desire a more personal and interactive learning experience. The classes will be low cost and focus on Social Media, Business Communication, Sales and Marketing, Online Reputation Management, CyberSecurity, and more. The program will partner with multiple organizations to provide specialized classes for older adults, parents, and businesses. More information is available at www.harboractive.com
- The HARBOR Inc. Broadband Team is supporting the use of the region's 911 Emergency Tower Network by private broadband providers. *Status: The director of CCE 911 participates on the Broadband Team. The HARBOR, Inc. Executive Director will continue to work with the Director to evaluate options for using existing 911 towers for broadband service in the area. HARBOR, Inc. serves as a liaison for service providers and the Director.*
- In working with the Emmet County Planning and Zoning Department, the HARBOR Inc. team helped examine the community's zoning ordinances for any unnecessary local regulatory barriers that would inhibit the expansion of broadband. *Status: HARBOR, Inc. reviewed the Emmet County ordinance related to a tower application in coordination with the Emmet County Planner, Connect MI, and the applicant. The zoning ordinance does not prohibit expansion; however, we have submitted proposed revisions of the ordinance to the Emmet County Planning Commission that will address Internet based communication towers specifically. Some of the proposed revisions were approved and the Team will continue to evaluate community zoning as relevant and necessary.*
- A vertical assets inventory will be conducted in cooperation with the LTBB Odawa GIS Department and Emmet County. The inventory will focus on structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. Structures may include towers, grain silos, and multi-story buildings. The assets will be shared with a database managed by Connected Exchange (CNX), the for-profit subsidiary of Connected Nation, who will make connections with interested service providers.

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

The preliminary inventory has been initiated by the LTBB GIS Department. Emmet County, LTBB, and HARBOR, Inc. will partner to complete the inventory.

Future Projects

- Facilitate a Digital Works Center in the Harbor Springs Area.

This partnership with Connect Michigan and Connected Nation will utilize their digital learning model to establish a Digital Works program that trains, places, and mentors high quality business candidates, connecting them to national companies looking for qualified personnel. The program will establish co-working centers in rural settings where job demand is high, few employers exist, and the cost of living is lowest. Once trained and connected with a national company, candidates may choose to work out of the Digital Works Center or out of their homes. *Status:* Submitted a HARBOR, INC. community profile to Connect Michigan; currently looking for funding to implement.

- *Develop Public-Private Partnerships to Deploy Broadband Service*

Public-private partnerships take many forms, limited only by the creativity and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network that they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

The strength of these partnerships is that each party brings something important to the table that the other does not have or cannot easily acquire. The community can offer infrastructure (publicly-owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed private-sector partners that bring network-building and operations experience.

- *Facilitate a Technology Summit*

Develop and host a technology summit for residents and businesses to increase awareness of broadband value, service options, and the potential impact on quality of life. The technology summit should facilitate community partnerships between leaders in local government and the private sector, including non-profits and private businesses in the education, healthcare, and agriculture sectors, with the goal of ensuring that residents have at least one place in the community to use powerful broadband technologies, and that this asset will be sustained over time. Further, the technology summit will highlight success stories as evidence of the impact of technology.

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

VI. Community Support in the HARBOR, Inc. Service area

HARBOR, Inc. has formed a partnership with Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and Char-Em Intermediate School District to review and evaluate opportunities for technology development and pursue collaborative projects that increase broadband access, adoption, and usage in the area. The partnership functions as a sub-committee of the HARBOR, Inc. Broadband Team.

In addition, local businesses and organizations have expressed support for technology related projects in the area. Please refer to technology initiative letters of support in Appendix 4. Businesses and organizations indicating support are: Stafford's Hospitality, Harbor Springs Library, Farming for our Future, Design Innovations, Inc., Concierge Publications, Coolhouse Labs, Connect Michigan, Northern Lakes Economic Alliance, Three Pine Studio, and Little Traverse Bay Bands of Odawa Indians. These entities are representative of various types of businesses that utilize technology in their daily operation. In addition, participating members of the HARBOR, Inc. Broadband Team and members of the partnership have pledged support of technology related initiatives in the area.

VII. Broadband/Internet Demand in HARBOR, Inc. Service area

In the summer of 2012, HARBOR, Inc. launched a survey to all property owners in the service area designed to gauge the demand for internet services. The survey was mailed to 6,600 property owners within the City of Harbor Springs and the Townships of Cross Village, Friendship, Little Traverse, Pleasantview, Readmond, and West Traverse. 830 responses were received, indicating a 12.6% response rate. Considering the targeted population of 6,600 and the response rate of 12.6%, the results are statistically significant. Please refer to Appendix 5 for a graphic of the mailed survey and Appendix 6 for the complete set of survey results.

Survey Results

Question 1

Was this mailing sent to your year round residence?		
Answer Options	Response Percent	Response Count
Yes, I am a full time resident/owner	71.8%	579
Yes, I am a full time resident, but not owner	1.1%	9
No, I am a part-time resident/owner	24.4%	197
No, I am a part-time resident, but not owner	0.1%	1
No, this is a business address	2.5%	20
<i>answered question</i>		806
<i>skipped question</i>		24

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

The results for this question determine that 72.9% of survey respondents are full time residents or owners. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 69.13% and 76.77% of the 6600 property owners surveyed are full time residents or owners or between 4,562 and 5,067 are full time residents or owners.

The results for this question determine that 2.5% of surveys were mailed to a business address. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 1.19% and 3.81% of the 6600 property owners are at a business address or between 79 and 251 businesses are located within the service area.

Question 2

Do you currently have Internet access at your Harbor Springs Area residence?		
Answer Options	Response Percent	Response Count
Yes	80.2%	647
No (if no, skip questions 3-5)	19.8%	160
<i>answered question</i>		807
<i>skipped question</i>		23

The results for this question determine that 19.8% of survey respondents do not have internet access at their residence. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 16.41% and 23.19% of the 6600 property owners do not have internet access at their residence or between 1,083 and 1,531 do not have internet access at their residence.

Question 3

What type of Internet access do you have at your Harbor Springs Area residence?		
Answer Options	Response Percent	Response Count
Cable modem/ DSL	58.3%	385
Satellite	15.0%	99
Cell phone network (mobile phone or wireless air card)	11.2%	74
Dial-up (via phone line)	10.5%	69
Other, please specify	5.0%	33
<i>answered question</i>		660
<i>skipped question</i>		170

The results for this question determine that 58.3% of survey respondents that have internet access at their residence, have Cable/DSL for their service. This indicates that of the 6600 property owners

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

sampled, we can be 99% certain that between 53.6% and 63% of the 6600 property owners that have internet access at their residence, have Cable/DSL for their service or between 3,538 and 4,158 have Cable/DSL at their residence.

The results for this question determine that 10.5% of survey respondents that have internet access at their residence, have dial up through a telephone for their service. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 7.58% and 13.42% of the 6600 property owners that have internet access at their residence, have dial up through a telephone for their service or between 500 and 886 have dial up through a telephone for service their residence.

Question 4

Does your current Internet service meet your needs?		
Answer Options	Response Percent	Response Count
Yes	65.6%	433
No	34.4%	227
<i>answered question</i>		660
<i>skipped question</i>		170

The results for this question determine that 34.4% of survey respondents that have internet access at their residence, do NOT think that current service meets their needs. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 29.87% and 38.93% of the 6600 property owners that have internet access at their residence, do NOT think that current service meets their needs or between 1,971 and 2,569 do NOT think that current service meets their needs.

Question 5

Do you use the Internet at this residence for business or professional purposes?		
Answer Options	Response Percent	Response Count
Yes, adequate for my needs	33.6%	223
Yes, but my current service prevents optimum productivity	22.3%	148
No, I don't need the Internet for these purposes	38.9%	258
No, I am unable to use the Internet for these purposes	5.3%	35
<i>answered question</i>		664
<i>skipped question</i>		166

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

The results for this question determine that 27.3% of survey respondents that have internet access at their residence, do NOT think that current service meets their business or professional needs or cannot use the internet for business purposes. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 24.09% and 30.51% of the 6600 property owners that have internet access at their residence, do NOT think that current service meets their business or professional needs or are unable to use the internet for business purposes, and between 1,590 and 2,014 do NOT think that current service meets their business or professional needs or are unable to use the internet for business purposes.

Question 6

Would you be willing to pay extra for a higher speed connection?		
Answer Options	Response Percent	Response Count
Yes	44.2%	341
No (if no, skip questions 7 and 8)	55.8%	430
<i>answered question</i>		771
<i>skipped question</i>		59

The results for this question determine that 44.2% of survey respondents are willing to pay extra for a higher speed connection. This indicates that of the 6600 property owners sampled, we can be 99% certain that between 39.86% and 48.54% of the 6600 property owners willing to pay extra for a higher speed connection or between 2,630 and 3,201 are willing to pay extra for a higher speed connection

Question 7

How much per month would you be willing to pay for a higher speed Internet connection?		
Answer Options	Response Percent	Response Count
\$20-40	57.2%	227
\$40-60	25.4%	101
\$60-80	10.8%	43
\$80-100	4.5%	18
More than \$100	2.0%	8
<i>answered question</i>		397
<i>skipped question</i>		433

The results for this question determine that 57.2% of survey respondents that are willing to pay for a higher speed connection are willing to pay \$20-40 per month. This indicates that of the 6600 property owners sampled, we can be 95% certain that between 52.48% and 61.92% of the 6600 property owners

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

are willing to pay \$20-40 per month for a higher speed connection or between 3,464 and 4,087 are willing to pay \$20-40 per month for a higher speed connection.

Question 8

If installation of high-speed Internet service requires an initial (one-time) equipment/installation charge, how much would you be willing to pay?		
Answer Options	Response Percent	Response Count
Less than \$100	52.3%	218
\$100-250	35.3%	147
\$250-500	8.6%	36
\$500-1,000	2.4%	10
\$1,000 or more	1.4%	6
<i>answered question</i>		417
<i>skipped question</i>		413

The results for this question determine that 35.3% of survey respondents that are willing to pay for a higher speed connection are willing to pay a one-time installation charge of \$100-250. This indicates that of the 6600 property owners sampled, we can be 95% certain that between 30.86% and 39.74% of the 6600 property owners are willing to pay a one-time installation charge of \$100-250 or between 2,037 and 2,623 are willing to pay a one-time installation charge of \$100-250.

Mapping of Results

Results were collected from respondents of a known address and input into Geographic Information System (GIS) software to yield maps relating the survey results to a specific area. This is beneficial to service providers in determining where there is a market demand for services. A complete collection of maps related to the questions and a comparison to total households in the area may be found in Appendix 5.

Discussion

The survey indicates a strong desire for expanded internet services within the HARBOR, Inc. service area by full time residents and businesses.

The majority of our target population within the service area are full time residents that are currently served by Cable/DSL service, but GIS mapping indicates that they are located in the southernmost portion of our service area. The survey indicates that 10.5% of our target population are currently served by dial up through a telephone line at their residence. The residences served by dial up are generally located in the Northwestern and Central area of our service area, specifically the northern portions of Little Traverse and West Travers Township with this trend continuing northward.

In many cases, our target population is left with internet service at their residence that is not adequate to meet their needs. The survey indicates that 34.4% of our target population has an unmet need. GIS mapping once again indicates that the unmet need begins at the northern portions of Little Traverse and West Traverse Townships with this trend continuing northward.

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

The survey identifies a substantial number of businesses within the service area. The survey results indicate that 27.3% of survey respondents that have internet access at their residence do NOT think that current service meets their business or professional needs or cannot use the internet for business purposes. This is approximately 1,800 individuals located within the service area that do not have an adequate internet connection for business or professional purposes.

A substantial percentage of the target population is also willing to pay more for a higher speed connection that meets their needs. The results determine that 57.2% of survey respondents that are willing to pay for a higher speed connection are willing to pay \$20-40 per month. The results for this question determine that 35.3% of survey respondents that are willing to pay for a higher speed connection are willing to pay a one-time installation charge of \$100-250 and some within the population will pay even more.

The bottom line is that there is a substantial demand and a willingness to pay more for services that meet the needs of both the residential and business sectors of the target population. There is also a greater need for expanded internet service in the northern portions of Little Traverse and West Traverse Townships with this trend continuing northward within the HARBOR, Inc. service area.

VIII. Broadband Solutions for the HARBOR, Inc. Service Area

To meet the consumer demand and economic need for broadband services, HARBOR, Inc. has researched many different solutions for bringing reliable, quality broadband to our service area. Some of these solutions are currently functioning, but not a high enough level; some have failed; and others are yet to be implemented in the area. In this section, we will discuss the existing broadband solutions and some proposed models that may be available for the service area. The following models will be discussed at a conceptual level only, and are meant to provide an overview for decision makers and entities involved in broadband development. Each conceptual model and associated network should be researched thoroughly prior to being implemented. The models include: A) Existing and proposed wireless technology to residential and business customers; B) Fiber build out to anchor institutions; and, C) Fiber build out to residential and business .

A. Existing and proposed technology to residential and business customers

Dial-Up

A technology that provides customers with access to the Internet over an existing telephone line. Dial-up is much slower and consider far inferior to other broadband and is not a viable option for most residential and business internet users. The technology is available within the service area.

Dial up service is currently the only affordable technology available to our low income, rural residents within the service area

Satellite

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas. There are currently five satellite service providers in the area: Hughes Network Systems, LLC, Star-Band Communications, ViaSat, Inc., Skycasters, and Wild Blue Exede Internet.

Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, however, satellite technology is not currently an affordable option for our low income residents within the service area.

Fixed Wireless

This technology involves operation of wireless devices or systems for broadband use at fixed locations such as homes or offices. There are currently two service providers within the area that offer fixed wireless service: Cherry Capital Connection and RACC Enterprise, LLC. Fixed wireless is a viable option for some, but may not be adequate or affordable for some residential and business purposes. This technology is available throughout a large portion of the service area.

Cable

This technology incorporates a modem that allows a user to connect a computer to the local cable system to transmit data. There is currently one cable service provider within the area: Charter Spectrum. This technology is adequate for most purposes and is a viable option, but may not be affordable for some. This technology is available in only a few areas throughout the service area.

Digital Subscriber Line (DSL)

The use of a copper telephone line to deliver "always on" broadband Internet service. There are currently three DSL service providers within the area: RACC Enterprise, LLC., AT&T Michigan, and CenturyLink. DSL is a viable option for some, but may not be adequate or affordable for some residential and business purposes. This technology is available throughout a large portion of the service area.

Mobile Wireless

This technology is delivered over the cellular network and often referred to as 3G or 4G service. Cellular is a mobile communications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communications to and from mobile users within a specified area. Service is available through a cell phone, air card, or other device. There are currently three mobile wireless service providers within the area: AT&T Michigan, Verizon Wireless, and Sprint. Mobile wireless is a viable option for some, but may not be adequate or affordable for some residential and business purposes. This technology is available throughout a large portion of the service area.

Cyberband®

This technology utilizes a combination of high speed Internet technologies to provide its customers with fast download and upload speeds. Also known as Fiber to the Copper (FTTC), it is a blend of traditional copper wire cables and fiber optic cable. The technology utilizes the fiber optic cable right up to the street cabinet (usually gray or green cabinets on the street house broadband equipment).

CyberBand may be a viable option for some, but may not be adequate or affordable for some residential and business purposes. Beginning in the summer of 2015, CyberBand® may be available to many homes and businesses within the service area from Air North CyberBand.

Fiber to the Home (FTTH)

This technology is named for fiber to the premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds. This technology is adequate for all purposes, but may not be affordable for most. FTTH is not currently available within the service area. Potential option for developing this technology will be discussed in Section C.

B. Conceptual models for fiber build out to anchor institutions

Within the service area, there are several anchor institutions that are clustered within a 5 mile area and could be connected, and share data through a fiber network.

The institutions include:

- Crooked Tree Alternative School
- Emmet County Road Commission
- Harbor Light Christian School and Library
- Emmet County Sheriff Department,

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- Northwest Michigan Community Health Agency
- Emmet County governmental offices
- Little Traverse Township Hall
- Harbor Springs Airport
- Little Traverse Bay Bands of Odawa Indians (LTBB) Administration Buildings
- LTBB Library and Education Department
- LTBB Community Center
- City of Harbor Springs City Hall and Police Department
- Harbor Springs Area Chamber of Commerce
- Harbor Springs Library
- Harbor Springs Public Schools (City campus)
- West Traverse Township Hall,
- Pleasantview Township Hall

The potential members of a consortium include:

- Harbor Springs Public Schools or CharEm Intermediate School District (ISD)
- Emmet County
- Northwest Michigan Community Health Agency
- Little Traverse Township
- LTBB Odawa Indians
- Harbor Springs Airport Authority
- City of Harbor Springs
- Harbor Springs Area Chamber of Commerce
- West Traverse Township
- Pleasantview Township
- Harbor Area Regional Board of Resources, Inc. (HARBOR, Inc.)

The models below will discuss potential options for building out a fiber network to these institutions with the involvement of the aforementioned jurisdictions or entities.

1. Merit Model

In 2010, MERIT Network received \$33.3 million from the National Telecommunications and Information Administration (NTIA) which was used to expand the “middle mile” broadband network capacity in northern Michigan, including Emmet County. Completed in 2013, this network connects rural areas of Michigan to a middle-mile broadband fiber backbone. The next step to provide broadband access in remaining unserved areas is to implement an affordable means to tie into this fiber.

- Consortium of participating entities will be formed based upon the institutions to be served by the fiber
- Each participating entity will be responsible for a connection fee to pay back the initial investment and provide ongoing monthly revenue

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- Option 1: MERIT may own the fiber run and laterals and would be responsible for contactors, permitting, maintenance and support
- Option 2: Consortium will own a portion or all of the fiber run, but is responsible for contractors, permitting, maintenance, and support

Advantages

- A Consortium shares costs for initial investment and ongoing services (maintenance and support)
- Provides shared capacity through a secure network
- There is potential to provide regional coverage through collaboration
- The network will exist for the public good without regard for private for-profit interests

Disadvantages

- Initial investment is large and may be challenging for participating entities
- It will take time to form the consortium as a legal entity and work through a detailed business plan
- This model will require extensive collaboration along with numerous complex decisions of how the system will function, therefore, slowing the process
- As a Section 501(c)(3) non-profit corporation, Merit is required to provide service through another non-profit entity and the details of that relationship are unclear
- Entities may need to apply for funding separately because consortium may not be eligible for funding.

2. Private Entity Model

There are a number of private entities available in the area to build out fiber. Although the 2012 HARBOR, Inc. survey has indicated a need, the market has not yet yielded the private investment. The MERIT model could potentially be duplicated in the private sector at a lower initial investment.

- A Consortium of participating entities will be formed based upon the facilities to be served by the fiber.
- The Consortium will secure funds for the initial investment for fiber build out.
- The Consortium will contract with a service provider to build out, operate, and maintain the network by issuing a Request for Proposals to qualified service providers

Advantages

- The network will exist for the public good without regard for private for-profit interests
- The consortium controls the network and has the option to operate and maintain the network at any time
- The consortium receives use of the network and/or partial revenue from the network
- The consortium is NOT responsible for the day to day operation and maintenance of the network

Disadvantages

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- Initial investment is large and may be challenging for participating entities
- The consortium must contract with a private entity and does not receive full revenue from the network

3. Regional Government Based Model

The build out of a fiber network within the service area may require a regional approach; therefore, it may become necessary that an entity with a large jurisdictional coverage or territory take on the task of fiber build-out in the area.

Emmet County and the LTBB Odawa Indians are both governmental entities that serve large, regional populations. In addition, each entity operates and maintains potential anchor institutions within the service area serving large populations.

- Option 1: Emmet County or LTBB will build out, operate, and maintain a fiber network. The government-based fiber network would also have full control of access, priorities, security, bandwidth, revenue/expenditures, and any public use.

Advantages

- There is potential to provide regional coverage to numerous institutions as determined by the governmental entity
- The network will exist for the public good without regard for private for-profit interests
- The governmental entity keeps any revenue generated from network
- Emmet County or LTBB may have access to funds or grant dollars NOT available to other entities

Disadvantages

- Initial investment is large and may be challenging for participating entities
 - Emmet County or LTBB are responsible for administration and maintenance of network incurring additional costs
 - The governmental entity is open to criticism and or legal action for taking business opportunity away from the private sector.
- Option 2: Emmet County or LTBB would own the network and contract with a private entity to build, maintain and operate the network.

Advantages

- There is potential to provide regional coverage to numerous institutions as determined by the governmental entity
- The network will exist for the public good without regard for private for-profit interests

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

- Emmet County or LTBB may have access to funds or grant dollars NOT available to other entities
- The governmental controls the network and has the option to operate and maintain the network at any time
- The governmental entity receives use of the network and/or partial revenue from the network
- The governmental entity is NOT responsible for the day to day operation and maintenance of the network

Disadvantages

- Initial investment is large and may be challenging for participating entities; potential use of governmental funds
- The governmental entity must contract with a private entity and does not receive full revenue from the network

The governmental entities may also find it challenging to convince the public that the build out of a fiber network is a good use of governmental funds or tax payer dollars. It may also be beneficial in this model to begin the process with a pilot project to demonstrate to the public that this type of project is feasible and an appropriate use of governmental funding.

C. Fiber build out to Residential and Business

1. Developing an Open Access Network

The development of an Open Access Network (OAN), utilizing infrastructure from build out of fiber through implementation of one or more of the models discussed in section VI may be combined with existing technology such as copper lines and wireless to bring quality reliable broadband services to residents and businesses.

In an OAN, the owner or operator of the network does not provide services for the network; rather the OAN provides a common service platform at the last mile which enables integration and delivery of multiple service providers to the subscribers. Through this platform, any subscriber is free to select any service provider on the network; and any subscriber and any service provider should be allowed to add access points to the network and anyone should be allowed to extend the shared part of the network.

The OAN concept is discussed at length by Andrew Cohill in *Broadband for America: The Third Way*. The chart included with this discussion describes the legacy approach of bringing broadband services to a rural area versus the Open Access Network approach.

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

Why The Third Way Works		
Features	Legacy Approach	Open Multi-Service
Basic Concept	Three separate services (voice, video, data) with little or no sharing of network infrastructure.	Very high efficiency achieved by end to end automated service provisioning. All providers share capacity on a single high performance network.
Owner/ Operator Involvement	Network owner/ operator decides where and when to offer services. Some areas get little or no service.	Owner/operator provides universal access to all locations and transport to any service provider at published rates. Owner/ operator provides high performance digital road system that benefits all public and private users. Buyers have a rich set of choices.
Governance	Owned by a private company. Community must accept whatever services are offered.	May be owned by local government, by a community enterprise like a broadband authority or coop, or by a private sector firm. Wide variety of services sold by many private sector companies on the network.
Competition	Little or none in most areas. Cartel-like pricing keeps prices high.	Level playing field creates robust competition. Service providers compete, driving down costs and providing great service to get customers.
Service Options	Limited. Providers typically offer only triple play.	Unlimited. Low cost of market entry and high level of service automation attracts service providers and encourages innovation.
Revenue	Limited by low returns on just a few services.	Unlimited. Revenue directly linked to demand. Increased revenue provides income to maintain the network and increase capacity as demand rises.
Service Area Expansion	Limited to high density population areas. Rural areas at a structural disadvantage.	Unlimited. Expansion completely supported by revenue sharing. Open services networks can become financially sustainable relatively quickly.

Broadband for America: The Third Way Copyright © 2010-2013 Andrew Cohill All rights reserved.

The OAN concept is appropriate for both fiber and WiFi access networks, especially where exclusivity cannot be allowed. The shared maintenance costs make it appropriate for rural areas, where traditional Internet service providers may be reluctant to provide a service due to low return on investment. Open access networks are also viewed as a feasible way of deploying Next Generation Access (next-generation broadband) networks in low population density areas where service providers cannot obtain a sufficient return on investment to cover the high costs associated with trenching, right-of-way encroachment permits, and the requisite network infrastructure.

2. Fiber To The Home

FTTH is a pure fiber-optic cable connection running from an Internet Service Provider directly to a user's home or business. FTTH may be more expensive to install currently, but offers significant savings in terms of maintenance when compared to copper alternatives.

A key benefit to FTTH -- also called FTTP, for "fiber-to-the-premises" broadband -- is that it provides for far faster connection speeds and carrying capacity than twisted pair conductors, DSL or coaxial cable. For example, a single copper pair conductor can carry six phone calls. A single fiber pair can carry more than 2.5 million phone calls simultaneously [source: [Federal Communications Commission](#)].

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

When combined with an Open Access Network provided through the build-out of fiber infrastructure in our service area, FTTH can provide access to multiple services to the user including telephone, video, and data. Experts at the [FTTH Council](#) say fiber-to-the-home connections are the only technology with enough bandwidth to handle projected consumer demands during the next decade reliably and cost effectively.

IX. Economic Impact of Broadband Expansion in the HARBOR, Inc. Service Area

According to Connect Michigan, increasing broadband access, adoption, and usage within the service area will help households save money or earn income in excess of what they have to pay to get connected. If getting connected to the internet at your residence or business results in this type of increase, then there is a positive return on the investment for getting connected. Beyond direct economic benefits to the “connected” resident; access to quality, reliable high speed internet creates opportunities for e-learning, online-sales and shopping, real-time communication, and more.

In 2013, it was estimated that 69%, at least 2 out of 3 U.S. entrepreneurs start their businesses at home. According the 2012 broadband/internet demand survey conducted by HARBOR, Inc., approximately 56% of respondents or 3,696 individuals use the internet at their residence for business or professional purposes indicating that a large number of individuals within the area may have a home-based business. If we compare this to the U.S. average, we are 13% below the nation. If we break down that percentage a bit further, over 22% or 1,452 individuals say that their connection “prevents optimum productivity”. With increased broadband penetration into the HARBOR, Inc. service area, we could increase the access to quality, reliable high speed internet by home-based businesses and entrepreneurs that would in turn increase economic output.

In order to quantify the economic impact of broadband, it was estimated by Connect MI that each percentage point increase in broadband penetration in an area in Michigan results in a 0.593 increase in employment. In another study by the Brookings Institute, it is estimated that for every percentage point increase in broadband penetration in a state, broadband employment is projected to increase by 0.2 to 0.3 percent per year.

In the 2012 HARBOR, Inc. Internet Demand Survey, question 2 indicated that 19.8% of survey respondents (over 1,000 residents) do not have internet access at their residence. Utilizing 100% as our target for penetration of broadband in the HARBOR, Inc. Service Area, we can deduce that we would see an approximate increase of 19.8 percentage points in penetration if all of our target population in the service area had internet access at their residence. If we use a multiplier resulting from the 2007 Connect Michigan study, we would see an increase in employment of approximately 11.7% within in the service area if there is 100% broadband penetration. If we utilize the Brookings multiplier for states, the increase in employment is 3.96 to 5.94 % within the service area if there is 100% broadband penetration.

We may assume that broadband penetration will have a greater impact in a rural area such as the HARBOR, Inc. service area located within Emmet County as it is dependent on base jobs, which are jobs that create income and wealth for the community and serve as the “base” of the local economy. Base

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

jobs are supported predominantly by sales to out-of-county customers. In Emmet County our base jobs come from small manufacturing, McLaren Northern Michigan hospital, Odawa, Casino, Boyne USA, and other similar businesses. Economic developers often use job multipliers to predict the job creation potential of one project or a group of related projects. According to *Michigan Multipliers*, the multiplier for Emmet County is 1.35. For example, if we create 100 direct jobs through the implementation of a broadband infrastructure project, then we can estimate that the project(s) will create 135 total jobs. This includes the 100 direct jobs and 35 “spin-off” jobs. Utilizing this line of reasoning, we would calculate that any broadband infrastructure or other technology related project or group of related projects that creates 100 direct job will create 35 additional jobs for a total of 135 jobs.

It stands to reason that a net increase in income for getting connected and the potential of job creation through broadband infrastructure or other technology related project (s) will result in a positive return on investment for decision makers and potential investors

X. Sources

- *2014 Measuring Broadband America: Fixed Broadband Report: A Report on Consumer Fixed Broadband Performance in the U.S.*
Federal Communications Commission
- *Action Plan for Deploying Broadband Internet to Michigan Local Governments*,
Michigan Department of Information Technology
- *Community Fiber Networks Boost Economic Development September 2014*
<http://bbcmag.epubxp.com/i/438104Nov-Dec.2014>
- Cohill, Andrew Michael, Ph.D. *The Current Broadband Business Model is Broken: Broadband for America: The Third Way*. 2010-2013.
- *A solution design session for HARBOR Inc. and interested parties*
Powerpoint. www.merit.edu
- Chik, Dr. Razmi, Ismail, Zahid. *Improving the Quality of User Experience by Deploying an Open Access Network Framework in a Fiber-to-the-Home Environment in Malaysia*.
ICBER Paper format 14-16 March 2011
- *Broadband's Economic Impact in Michigan*, Connectmi.org, March 2013
http://www.connectmi.org/sites/default/files/connected-nation/Michigan/files/mi_economic_impact_final.pdf
- *Technology Use among Home-Based Businesses: Michigan Entrepreneurs Use Technology to Thrive*, Connectmi.org, December 2013

Local Broadband Solutions for the Greater Harbor Springs Area: HARBOR, Inc.'s Community Approach

http://www.connectmi.org/sites/default/files/connected-nation/Michigan/files/mi_home_business_final.pdf

- *Broadband: Empowering Small Businesses to Grow and Thrive*
Connectmi.org, May 2012
http://www.connectmi.org/sites/default/files/connected-nation/Michigan/files/mi_small_biz_final.pdf
- *Teleworking in Michigan – Empowering Workers through Broadband*, Connectmi.org,
December 15, 2011
- *Connect Michigan 2013 Business Survey.pdf*, Connectmi.org
- *Michigan Multipliers*, Spring 2013, montgomeryconsultinginc.com
- *Michigan Telecommunications Act*, Act 179 of 1991
<http://www.legislature.mi.gov>
- Open-Access Network, www.wikipedia.org
- What's the Difference Between FTTC and FTTP, and Why Should You Care?
<http://makeuseof.com/tag/whats-difference-fttc-ftp-care>, February 1, 2015
- Small Business Trends, <http://smallbiztrends.com/2013/07/home-based-businesses-startup.html>

**All sources are available in hard copy at the HARBOR, Inc. office at 210 E. Main St.
Harbor Springs, MI. 49740**

APPENDIX 1

HARBOR, Inc. Broadband Team

Local Broadband Solutions for the Greater Harbor Springs Area:

HARBOR, Inc.'s Community Approach

March 2015

HARBOR, Inc. Broadband Team

Rachel Smolinski	HARBOR, Inc.	Executive Director/Champion
Bill Dohm	Little Traverse Township	Supervisor
Gordon Kruskie	Readmond Township	Supervisor
Bob Sandford	West Traverse Township	Supervisor
Fred Troup	Friendship Township	Supervisor
Bill Wiechmann	Pleasantview Township	Supervisor
Gene Reck	Cross Village Township	Supervisor
Al Dika	City of Harbor Springs	Mayor
Tom Richards	City of Harbor Springs	City Manager
Kathy Breighner	HARBOR, Inc.	Chair of Board/Exec Com.
Mark Tracy	LTBB Odawa	IT Director_Govt. Operations
Julie Kauppila	LTBB Odawa	Grants Office
Alberty Colby	LTBB Odawa	Tribqal Administrator
Jim Keiser	LTBB Odawa	GIS Dept.
Daniel DeWindt	Harbor Springs Chamber of Commerce	Executive Director
representative	Northern Michigan Hospital	representative
Chris Cerrudo	Harbor Springs High School	IT Director
David Boring	North Central Michigan College	IT Director
Cameron Brunet-Koch	North Central Michigan College	President
Mark Tompkins	Harbor Springs Public Schools	Superintendent
Ann Chastain	MSU Extension	Local Extension Office
Scott Kendzierski	Northern MI Community Health Agency	Director of Env. Health Services
representative	MI Representative	State Representative
resrepresentative	MI Senate	State Senator
Katie Parr	Perry Farm Villages	Wellness Director
Mary Catherine Hanna	Perry Farm Villages	Development Director
Michael Johnson	City of Harbor Springs Harbor Master	Harbor Master
Charles O'Neill	Harbor Light Newspaper	Director
Dan Branson	City Of Harbor Springs Public Safety	Chief of Police
Matt McCauley	Northwest Michigan Council of Governments	Director of Regional Planning and Com. Development
Bethany Paeardon	Northern Lakes Economic Alliance	Economic Development Specialist
Tammy Doernenburg	Emmet County Planning	Planner
Larry Cassidy	Emmet County	Commissioner
Charles MacInnis	Emmet County	Commissioner
Casey Adams	Harbor Springs Library	Executive Director
Sara Hollister	MI Works	Career Advisor
Bob Bradley/Greg Clar	Emmet County	CCE 911

APPENDIX 2

HARBOR, Inc. High Speed Internet Committee Report

Local Broadband Solutions for the Greater Harbor Springs Area:

HARBOR, Inc.'s Community Approach

March 2015

Harbor Inc

**High Speed Internet - Broadband Information
Committee Report**

**An Informal Report on Current Broadband Services, Future
Technologies and Possible Action Plans**

September 17, 2008

Harbor Inc High Speed Internet Committee Report

Statement of the Problem

Reasonably priced high-speed Internet (broadband) is not adequately available in Emmet County and specifically, within the Harbor Inc's geographical boundaries. The economic and social growth of the Emmet County community is hampered by the lack of broadband access to the Internet.

Committee Objective

The executive board of Harbor Inc recognizes the value of having reasonable access to high-speed or broadband Internet available to the Emmet County region. Ostensibly, the board members understand the Internet's important role in our society; the report by the committee was not expected to provide information that would convince the board of the obvious.

The Harbor Inc Executive Board formed a committee of citizens to assist the organization in deciding how Harbor Inc could best facilitate the spread of broadband Internet access in Emmet County. The board requested the committee to report to the board the following:

- Define broadband Internet in common, layperson's terminology.
- The current services available in Emmet County, regardless of cost, technology or coverage.
- Future (near term) innovation or technology that may be available within three to five years.
- Provide common terminology and verbiage, outlining the advantages and disadvantages of the different technologies for Internet connection that are available.
- Map, if technologically feasible, the current high speed Internet coverage areas and combine that data onto GIS maps available to Harbor Inc.
- Summarize and present the data to the board in a written and verbal report.

The committee was not expected to engage in any arrangements with companies regarding implementation of service.

The committee report is not intended to be an in-depth, detailed and referenced analysis. Rather, it is an informal gathering of information that is presented in a concise and useful manner for Harbor Inc to use to develop an action plan (for example; possibly initiating a Request for Proposal process or identifying a small pilot project) for Broadband service implementation in the Harbor Inc area.

There are three reports in the appendix that are more detailed and referenced. A Michigan Department of Information Technology report titled, “Action Plan for Deploying Broadband Internet to Michigan Local Governments”, a white paper by Charles Scott of the Northern Michigan Broadband Cooperative (and of Gaslight Media) titled, “A Cooperative Solution to Rural Broadband in Northern Michigan” and a US Department of Agriculture report titled, “Bringing Broadband to Rural America” are excellent sources of background information and resources on broadband in rural areas as well as possible processes to undertake to implement broadband.

The appendix also has several other documents that underscore different scenarios that communities are using to improve the expansion of broadband. For example, an article on how Wal-Mart and Hughes.net are working together to bring broadband satellite to more citizens highlights business collaboration while an article on the State of Kentucky’s initiative, provides insights on governments facilitating the expansion. A thorough glossary is also included.

The committee attempted to summarize what role Harbor Inc can realistically play in facilitating, encouraging and managing the expansion of broadband into the Harbor Inc area. The committee did not find a quick fix or a process template for broadband implementation that could easily be replicated. The unfortunate reality may be that Harbor Inc does not have the financial wherewithal or the organizational structure in place to be an impact on a scale that would result in a significant broadband implementation area-wide.

Although implementing projects was not an objective of the committee, the committee members have been actively involved in two projects that will be discussed in more detail (committee members did not act in the capacity as Harbor Inc representatives). These two small Internet access networks are based on the same technology – a leased high-speed access line being the foundation for a small network of wireless receivers / transmitters. One of the projects is implemented and working, the other is in the beginning stages with financing being secured and hardware installation ordered.

These two smaller projects provide an opportunity for Harbor Inc to have an impact, albeit on a much smaller scale. However, success with these two projects can establish Harbor Inc as a credible organization for Internet Service Providers to consult and collaborate with on broadband implementation in the Harbor Inc area.

The committee members thank the Harbor Inc board for an opportunity to present this information and for the organization’s desire to see the area improve through the timely development of broadband service.

Richard Rule - Chair / Pleasantview Twp
Chris Herron - Good Hart
Gene Reck - Cross Village
Bill Perry - Pleasantview Twp

Introduction to the Internet and Broadband

Although most readers will find a review of the Internet unnecessary, a short introduction was deemed appropriate for the report.

What is the Internet?

The Internet is a global network of computer networks. Thousands of networks are linked together forming a worldwide network. The Internet was initially a network of government and college computers that has expanded limitlessly amongst citizens around the globe. The Internet utilizes a complex connection of different type of infrastructure systems; both wired and wireless, to move data between computers that are spread across the world.

This network makes it possible for millions of people to communicate, to share information about common interests and to work on the same documents in a multi-media format. This network is also another way that business can operate and reach new customers outside of their typical geographical boundaries.

What is the World Wide Web?

The World Wide Web (www or commonly called the “the web”) is an enormous collection of multi-media based web sites that give Internet user access to a variety of text, video and audio documents and applications. The web is the facility that brought the sudden popularity to the Internet.

What is a web site?

Web sites are electronic documents (files) that are stored on computers (servers) all over the world. The documents are written in a special programming language called hyper text markup language (HTML), which are read using navigational software such as Microsoft's Internet Explorer, Netscape Navigator (Mosaic) or Mozilla's Firefox to name a few.

A web site, also called a Web page, (a “home” page if it is the main page that links to other web pages within an organization) can have formatted text, images, animation, sound, music, movies, and more. With more and more sophisticated and easy-to-use Web browsers, an Internet user can access many documents with a mouse click.

How Are Connections to the Internet Made?

To gain access to the Internet, users may connect through a variety of means. Some users will access the Internet from their computer via the telephone and a modem connection. There are several different methods that the phone lines can be configured to give users different access speeds. Some will make a connection through their cable company, whether over existing cable wires or new fiber. These two connections are the common “wired” options.

There are also wireless options available. The Internet is accessible via a satellite dish connection, similar to the dish system used for television reception as well as through a variety of systems that employ infrastructure such as radio transmitters and receivers to cover areas with signals that users can capture if their computers are properly configured.

A more detailed explanation of the various services, to include their advantages and disadvantages is explained later. At this point it is important to understand that the basic difference in the types of access is the speed or capacity and the amount of time it takes to communicate that capacity over the network.

Think of the various access technologies as different sized pipelines; some pipelines, such as cable and fiber are larger and can more efficiently handle large amount of data flowing within the pipe than the phone pipeline that is much narrower, restricting data and, taking more time. In most cases, even users of the slowest access pipe will obtain the information; however, this is not effective use of the Internet.

At first glance it would seem that the only difference in access is the amount of time one has to wait, since even those on a slower phone line based system complete their transactions over time. As more sophisticated applications are integrated into the Internet to allow complicated banking transactions, the transmittal of sensitive and secure information and, as web pages are packed with interactive videos, mapping and other data laden activities, users of slower or outdated technology are prevented from access as the smaller (slower) pipeline cannot carry the data demanded, in essence, clogging the pipeline.

The Internet connections with the larger pipelines are commonly called broadband Internet. The term broadband stems from bandwidth and simply, a broader bandwidth allows for more data to transfer along the connection.

Connection Types - Detailed

There are basically three types of connections to the Internet: wired, wireless and fiber optics. Each of these connects the user to the Internet through an Internet Services Provider, who could be a small local firm like Gas Light Media or RACC200 or, large national firms like Alltel, AT&T, Centurytel or Verizon. Unfortunately, the Harbor Inc area does not have all of these service options available area-wide.

The three basic connection types can be further broken down as follows:

1. Wired (copper)
 - a. Ordinary phone lines, which are the same we use every day for, voice communications (usually referred to as 'dial up').
 - b. An Integrated Services Digital Network (ISDN) that utilizes existing phone lines. This is better than a dial up but less capacity than a Digital Subscriber Line (DSL). This is not considered broadband.
 - c. The phone companies offer Digital Subscriber Line to customers within limited range of the phone company central office. This offers a faster connection than ISDN and is considered at its slowest connection, broadband. There are wide ranges of DSL packages available depending on the area.
 - d. Cable Internet is available from the local cable TV providers.
 - e. Special data only lines often referred to by the telecomm companies as T-1 or T-3 (commonly known as "leased lines or DS-1).
2. Wireless
 - a. Low power unlicensed signals much like the WiFi used in homes or businesses but with greater range. This is often combined with 'repeaters' on homes and structures, which relay the signal to other users on the 'mesh'.
 - b. Satellite Internet service, similar to television service is available from several vendors.
 - c. Cellular data connections from Alltel, Verizon and AT&T.
3. Fiber optics
 - a. Verizon now connects some of its customers directly to the Internet using fiber optics to the home (FTTH). In this case, Verizon runs a glass fiber from a distribution point directly to home. (Fiber capacity is nearly limitless)
 - b. AT&T also allows provides fiber service but only to the neighborhood. The connection to the home is then through copper.
 - c. Cable companies are employing fiber within their infrastructure to improve capacity and allow more robust applications.

Very large capacity fiber optic connections can also be installed for businesses, governments and hospitals.

Defining Broadband or High-Speed Internet by Transfer Speed

Having explained the basic technology of the Internet and the manner in which users gain access, it is important to establish what the committee defined as “high-speed” access to the Internet prior to any discussion about broadband in general. As users of the Internet expect and demand more of the Internet, as web sites are packed with more information and activity, as business begin to push more customer activity onto the Internet, the demand for access speed increases as well. There is a two-pronged request of the Internet; carry more information on the network and have it transmitted faster.

As with any technology, improvements are happening at a tremendous pace. Access speeds to the Internet that were once touted as “fast” a year or two ago may be considered slow or unacceptable today depending on the use. What is high-speed Internet or Broadband? These are common questions that are many times answered differently depending on who you ask. If you ask a business person who sends detailed drawings over the Internet how much access speed is needed, you will get a completely different answer from the resident who does occasional banking, basic emailing or shopping on-line.

Broadband and high-speed Internet, for this report, will be considered synonymous – they both describe the movement of data or information at higher speeds than the phone dial-up access or ISDN phone configurations. What the minimum connection/transfer speed above dial-up that is to be considered high-speed, is debatable, again, based on what the Internet is being used for.

For this report, the committee determined that broadband will be used as the common term and minimum speed is at 256kbps, common speed of a Digital Subscriber Line (over the phone). This is based on governmental reports that use the 256kbps as standard broadband. This baseline was established several years ago and has not been updated by governmental agencies. However, it would be reasonable to expect that it will, as end-users are demanding much higher capacities than the minimum.

Broadband – Defined in Technical Terms

The committee was asked to explain broadband in layperson terminology. The committee veered away from technically laden information as it can overwhelm the reader with information that is not relevant. However, the committee felt it important to have a review of the basic understanding of how computer information is packaged and delivered along the network, which required some basic technical information.

Broadband in telecommunications is a term that refers to a signaling method that includes or handles a relatively wide range of frequencies, which may be divided into channels. Broadband is always a relative term, understood according to its context. The wider the bandwidth, greater is the information carrying capacity. In radio for example, a very narrow-band signal will carry Morse code; a broader band will carry speech; a still broader band is required to carry music without losing the high audio frequencies required for realistic sound reproduction. A television antenna described as "normal" may be capable of receiving a certain range of channels; one described as "broadband" will receive more channels.

As previously described, the speed and capabilities of a computer connecting to the Internet may be best thought of as end user on a water system; the larger the diameter the pipe at the end, the more volume of water that can be delivered or in the case of the Internet, the more volume of information that can pass amongst the network.

To understand how information is passed along the Internet pipeline, one must have an understanding of how data is packaged and delivered on the network. It is important for one to understand the basics of electronic transmission of data when discussing broadband development; by having a working knowledge of what is taking place when a connection is made and what is being transferred amongst the network, one can better understand broadband applications.

Computers utilize a binary or a two number system of just zeros and ones – our number system for reference is based on a ten number (zero to nine) system. Computers store all data in an array of these zero and ones. The smallest data unit of measurement is called a **bit**, which is either a zero or a one. A **byte** is eight **bits** that can represent 256 different possibilities. When we see a detailed photo, x-ray or a web page displayed on a computer screen, the computer processes or sees these same objects as a complex and dynamic combination of bits and bytes.

The data transfer capacity on an electronic communication system is called its bandwidth (hence the term broadband) and is measured in bits per second (bps). One thousand bits per second is also defined as a kilobit, or 1 Kbps. One million bits per second is 1 megabit or Mbps, and one billion bits per second is 1 Gbps (1 giga bit per second). Telecommunications and computer data file sizes (the number of bits per second) are measured using different, yet very close measuring systems of capacity.

To understand this in more relative terms, the following tables show typical sizes of various activities done over the Internet and how much computer processing time is needed to complete the transaction.

Internet Connection Speed	Time to load a typical web page (assuming 100 kilobytes of data)	Time to download a typical 5-minute song (assuming a 5 megabyte MP3 file)	Streaming Video Quality
56K dial-up modem	14 sec	12 min 30 sec	
256K broadband	3 sec	3 min	Low Quality
512K broadband	1.6 sec	1 min 30 sec	
1Mb broadband	0.8 sec	41 sec	
2Mb broadband	0.4 sec	20 sec	Medium Quality
4Mb broadband	0.1 sec	5 sec	
6Mb broadband	Instantaneous	Instantaneous	
8Mb broadband	Instantaneous	Instantaneous	TV Quality

Note: all figures are approximate and represent best-case download speeds. Actually speeds will generally be lower.

The next table shows typical activities and whether the various access speeds can handle the transmissions. The table underscores the importance for broadband, as some applications require more bandwidth than others. For example:

Activity	Bandwidth	Dialup	Satellite	Cell	DSL	Cable	Fiber
Normal email	10 Kb	Yes	Yes	Yes	Yes	Yes	Yes
Music download	200 Kb	No	Yes	Yes	Yes	Yes	Yes
Telephone	2 Mb	Yes	No	Yes	Yes	Yes	Yes
Teleconferencing	4 Mb	No	No	No	No	Yes	Yes
Television	10 Mb	No	No	No	No	Yes	Yes
TV on demand	100 Mb	No	No	No	No	No	Yes

* There are additional tables in Appendix B – within the reports by MDIT and Charles Scott,

Local Access to the Internet

Current High Speed Internet Services Available in the Harbor Inc Service Area

There are several companies in the Harbor Inc area advertising access to the Internet at a rate considered to be broadband. The table below outlines the basic services provided by carriers known to do business in the Harbor Inc area.

Company	Access Speed	Type of Access	Monthly Package Price	Misc Notes
Alltel (other cell carriers offer similar packages – Alltel is the main provider)	400Kbps to 3.1Mbps (coverage is sketchy)	Cell Phone or Air Card (uses cell service)	\$60.00	Two year contract with hardware and software components are required for additional fees.
Charter Cable	5Mbps to 16Mbps (16Mbps may not be available county wide)	Cable – Copper and Fiber	\$55 - \$60.00	Limited service in Harbor Inc area – mostly in southern portion. Requires one other Charter product (bundle) or \$10 increase in monthly fee
Centurytel	256Kbps to 15Mbps (15Mbps is fiber optic)	Digital Subscriber Line – over phone lines.	\$32 for 256Kbps to \$52.00 for 15Mbps	Coverage limited to small areas at east boundary of Emmet. Fiber not available everywhere
Dish / Hughes	1Mbps to 5mbps	Satellite	\$60 for 1mbps to 350 for 5mbps	Two year contract required. Installation fees and equipment fees (specials may reduce startup
Direct TV/Wild Blue	Up to 1.5Mbps	Satellite	\$40.00 and up	Direct TV and AT&T have a DSL association.
Northern Lights Media	500Kbps – 2Mbps	Radio Receiver/Transmitters connected to T-1	\$49.00	Currently available at CVGC – NLM has folded.
RACC 2000	256 Kbps and up for DSL and 384Kbps for wireless	DSL from phone services & RACC2000 Wireless	Typical DSL packages. Wireless is \$40 per month	DSL not prevalent in Harbor Inc area. Wireless requires line of sight, one year advance payments/contract and \$400 hardware plus \$99.00 installation.

Actual Coverage of Services in Harbor Inc:

The committee attempted to verify the coverage area by the various broadband services in an effort to map the coverage. By mapping the coverage with some degree of certainty, the committee wanted to be able to identify areas in critical need or identify possible pilot projects based on proximity to known services, regardless of the medium.

The committee sent each company listed in the chart known to be operating in the area a letter that identified the committee's objectives and solicited responses to a series of questions. A copy of the letter is in the appendix. The committee requested company's assistance in mapping coverage, identifying the services provided and, most importantly, identify what Harbor Inc could do to assist the companies expanding to the area.

Only one company, Northern Lights Media, initially responded to our inquiries for information. Ironically, Northern Lights Media has folded and is no longer in business. The NLM response is in the Appendix.

This lack of response from companies can somewhat be explained by their wanting to protect proprietary information as companies want to maintain a competitive advantage by protecting their improvement, expansion and investment plans. Charter Cable, the only cable service provider in the Harbor Inc area, after a dogged effort by the committee and the Executive Director, responded with the a simplistic map highlighting the areas of service. The map is in the Appendix. The map confirmed what the committee and others knew – cable is located around the City of Harbor Springs, US-31 and a couple of spurs on Pleasantview and North Conway roads.

However, a total disregard of our request for inquiry, with not even a professional response advising us of their concerns of disclosure could not be explained. Companies may have felt that Harbor Inc did not have a credible plan in place to expend their company time on. Companies may have ignored the Harbor Inc area because the customer base does not meet their return on investment benchmarks or, the committee did not contact the best person to respond.

Even after the committee made direct contact with the government relation's executive at Charter Communications for this area and an agreement to send the committee the coverage map, there was no follow-up response to the survey. Committee contact with Charter's executives identified information that would be beneficial to the committee if provided in an official statement (the cost of wire, the cost of implementation, typical customer base needed).

It was clear that what was preventing expansion of the cable broadband service was the number of customers and the return on investment. Anecdotally, the committee determined that the larger wired companies covering this area compete internally within their organizations for their limited investment dollars. This is based on informal conversations with the company representatives.

Northern Lights Media, a small business that has since closed its doors, was the first one to respond and the only one to complete the survey. They were pursuing a wireless grid or mesh system utilizing a T-1 (a high grade phone line capable of handling 1.5 megabytes) as the foundation and connecting a small community of neighbors at Chestnut Valley Golf Course. Northern Lights Media had the system up and running with general satisfaction by most of the users, however, the company folded, leaving the neighborhood community in a state of limbo.

Cherry Capitol Connections, a local ISP from Elk Rapids, has indicated a desire to bring a wireless network to Emmet County. CCC presented a possible proposal for a section of the Harbor Inc area – Cross Village, Readmond and Friendship Townships. The proposal requested a significant financial commitment upfront of \$35, 000 and commitment by the townships to be involved in the projects for set periods of time as CCC was going to invest heavily in infrastructure (towers etc.) No action was taken by any governmental entity and the committee is unaware of any recent discussion taking place.

RACC2000 an ISP from the Alanson area provides DSL service to the east of the Harbor Inc area and deploys wireless system similar to the other wireless providers. RACC2000 has been servicing this area for several years. They presented a project to the Chestnut Valley Golf Course community a couple of years ago. The project did not proceed past the informational stage, as there was a concern about tower placement, lack of a customer base and costs. Additionally, the uncertainty created by the foreclosure of the golf course, prevented any serious debate about a wireless project.

High Speed Internet Access Services – Advantages and Disadvantages

It is important to understand the various type of Internet Access available today. Each service has advantages and disadvantages such as implementation or infrastructure needed, service contracts, latency and most importantly, the available speed and cost.

Although the slowest service available is obviously not high-speed in a relative sense (the modem speeds today would be the envy of many ten years ago), it is important to discuss; the question of how much need is there for broadband is weighed against how many users are satisfied with their dial-up access and, maybe more important, the minimal cost.

The determination as to what is reasonable access to the Internet is determined by the customer – businesses want speed, capacity and security; a retired person with a vacation home in the area may want basic service to email and check the weather – both want “reasonable” access.

Wired Access

Dial – Up (Phone Lines Access)

This is the bare-bones minimum in Internet access. The speeds are slow in relative terms and even with software applications that offer “accelerated” processing, the maximum speeds of dial-up do not meet the government minimum (256kbps) to be identified as broadband.

Advantages:

- Anyone with a phone line can obtain this service.
- Dial up is generally reliable as the phone service.
- There are numerous services that tout low monthly fees.
- Allows for basic email service – the ability to communicate over the Internet.

Disadvantages:

- Slow speeds prevent timely accessing of most web pages (some services may actually “time out” the transaction as the information is shared at such a low speed.
- Prevents the sharing of large files or photos
- Not usable by most business applications.

Digital Subscriber Lines, Leased Lines (T-1 or T-3)

These wired services are generally the same – they all use the phone systems lines with different configurations. Leased lines are available anywhere but, are very expensive (\$400 or more per month with a three year leases). DSL lines are very limited in the Harbor Inc area.

Advantages

- Provide adequate speed capacities for both residential and business
- Allow users to access over existing phone lines while retaining the capability to make calls on the line.
- Phone companies are utilizing technology to improve capacity without having to make major infrastructure improvements – controlling costs.

Disadvantages

- DSL maximum speeds are not as fast as the cable or fiber.
- Leased lines are not reasonable options.

Cable

Advantages

- Highest capacity
- Bundled with other technologies to deliver television and telephone
- Some areas being served by fiber, creating tremendous capacity for businesses

Disadvantages

- Bundled services may require a minimum contract.
- Cost for cables minimum speed may not be “reasonable” for users looking for basic capacity.

Wireless Internet Service Providers

Satellite Dish, Open-Mesh or Grid Systems, Towers and Cellular Air Cards are types of wireless access. Other than satellite and cellular systems, wireless systems require the installation of wired technology to some central point within the network.

Advantages:

- Does not require tremendous infrastructure improvements (excluding towers) such as ditch digging and laying wire.
- Can bring service to areas underserved by wired.
- Allows for wireless movement within the network – hotspots for laptops or mobile data terminals

Disadvantages

- Coverage is dependent on topography and weather.
- Installation may require commitment or contractual terms (one to two years)
- Speed is broadband; however, not capable in most cases of achieving capacity of wired technology.
- Satellite does not have the upload speeds necessary for businesses.
- Satellite has a latency or delay that does not lend itself to interactive processes between two users

Future Technology

As the committee explored the various services available in the Harbor Inc area, the one consistent theme was the lack of any technology that was on the verge of being implemented within the next three to five years. This section will review technologies that have been proposed.

Broadband over Power Lines (BPL)

One technology that was identified as having the ability to reach the large numbers of rural residents with broadband is the use of electrical lines to carry a broadband signal. This is commonly called BPL.

Broadband over power lines (BPL), also known as power-line Internet or power band, is the use of powerline communication (PLC) technology to provide broadband Internet access through ordinary power lines. A computer (or any other device) would need only to plug a BPL "modem" into any outlet in an equipped building to have high-speed Internet access.

BPL may offer benefits over regular cable or DSL connections; the extensive infrastructure already available appears to allow people in remote locations to access the Internet with relatively little equipment investment by the utility. Also, such ubiquitous availability would make it much easier for other electronics, such as televisions or sound systems, to hook up.

But variations in the physical characteristics of the electricity network and the current lack of Institute of Electrical and Electronics Engineers (IEEE) standards mean that provisioning of the service is far from being a standard, repeatable process. And, the amount of bandwidth a BPL system can provide compared to cable and wireless is in question. The prospect of BPL could motivate DSL and cable operators to more quickly serve rural communities.

Committee contact with Great Lakes Energy identified that GLE was not pursuing this technology at this time. GLE advised that their Internet service is subcontracted to Transworld Network (TWN). TWN officials advised that there is testing going on with BPL by TWN in areas outside of Michigan; however, the testing is not yielding results that would indicate the TWN will be employing this outside of the testing area in Texas anytime soon.

The committee attempted to obtain information from Consumers Energy on their BPL efforts. In 2006 Consumers Energy was working with companies called Utility.net and the Shpigler Group (a consulting and project management company) to bring BPL over Consumer's power lines to the Grand Ledge area. Consumers Energy's website is absent any reference to this project and several attempts to obtain information from Consumers Energy through their website were made with no response.

The committee contacted Grand Ledge officials and verified that the project did not materialize as planned due to apparent technical difficulties. Contact with Utility.net, the actual company implementing the project did not result in a reply. The Shpigler Group advised that they had completed the consulting and project portion of the project. The committee did not explore the minutia of this withdrawal or the postponement of implementation as the data on BPL implementation seems evident; it is not a viable option for the Harbor Inc area.

Cable

Charter Communications is ambitiously pursuing expansion of their coverage, improvement to the capacity of the cable to carry a larger bandwidth and exploring (and installing) fiber optic technology in an effort to maintain their position as the technology with the highest broadband capacity in this area (some areas have 15mbs). Unfortunately, the Harbor Inc service area that is having the most difficulty in attracting reasonable broadband service is absent of the cable option.

The committee did not identify any cutting edge technology that will allow cable to expand rapidly into the Harbor Inc area and provide reasonably priced access to the Internet. Cable companies generally do not allow other technologies to be connected to the cable backbone (convergence) preventing a dynamic integration of different technologies into a working network.

Wireless Options

The committee could not identify any wireless technologies that would be employed in the near future. Obviously companies offering current wireless services are improving their signal strength and deploying additional satellites and towers to improve or expand service.

Cellular services such as Alltel are already offering the ability to utilize a cell phone attachment to a computer or, a separate "air card" that operates like a cell phone with a more robust connection (AT&T refers to this as a "connect card"). This technology is still dependent on the tower infrastructure and service in the Harbor Inc area is inconsistent. As the cell companies servicing the area improve their infrastructure, these options should inherently improve. The average speed connections are 400-700kbps.

The Chestnut Valley residential and golf course community recently employed an "open mesh" system. This is a system of transmitters/receivers that are placed within a coverage area and eventually connect to a T-1 line. There are several companies utilizing this technology, such as Locustworld and Meraki. The idea is that anyone or any group of individuals who have access to a T-1 line or high capacity DSL line can spread wirelessly. In effect, they can own and operate their own network or, as in the Chestnut Valley case, have a company operate the mesh.

Grants and Loans: What Options Are Available

Michigan Broadband Development Authority

The MBDA as outlined in the Northern Michigan Broadband Cooperative report has been dissolved. The Michigan State Housing Development Authority has assumed responsibility and oversight of activities undertaken by the MBDA. The loans from MBDA were generally for larger projects, whether to enhance current operations or initiating new coverage. The committee has attempted to verify the operational status of the various projects that were authorized loans without much satisfaction. The MSHDA website refers to the MBDA loans in their 2006-2007 annual report. Absent are any references to success stories.

United States Dept of Agriculture – Rural Development

The USDA underwrites/authorizes loans for economically depressed rural areas under the Rural Development project (see the USDA overview in the appendix). Unfortunately, the loans are based on demographics and financial status of the community area. An inquiry by the Harbor Inc Executive Director revealed that Emmet County does not meet the requirements to apply for this loan.

The USDA Rural Development initiated a project in the Michigan thumb area. The number of users as listed by the report is 3500 (May of 2007) with nearly a 1000 more to be added. The Harbor Inc area would not provide a large enough customer base to justify undertaking a large financial burden. An ISP provider in the area was not identified as willing to assume such a financial responsibility.

The USDA also has supported regional broadband cooperatives. The committee attended initial meetings of individuals representing businesses and government to explore this. Chuck Scott's white paper also addresses this process and possible outcomes. Although there appeared to be progress and, with the Harbor Inc Executive Director involved in the organizational structure, possible promise, the concept of having a regional cooperative has not materialized.

Cross Village – Grant Application

As this report was being finalized, the Executive Director, along with two committee members, initiated an application for a grant from the Michigan Association of Planning, a non-profit organization focused on planning concepts that materially benefit residents, such as the Safe Routes to School program that Harbor Inc is already involved with.

The objective is to implement a pilot mesh network similar to the Chestnut Valley concept in the Cross Village area. Several residents have agreed to bring a T-1 leased line into the business area while Harbor Inc has agreed to manage the initial phases, to include the installation of the various receivers/transmitters and overall operation.

The Executive Director will provide additional information on this project as it develops and in an addendum to this report. This arrangement, along with the committee members involvement in the Chestnut Valley Golf Course community network highlights a possible template for Harbor Inc – working with small neighborhood areas that demonstrate a willingness to participate and assist them in managing the startup of their network.

Harbor Inc's Next Step:

The involvement of Harbor Inc in the development of a small network in Cross Village is representative of the type of involvement Harbor Inc can undertake to facilitate the expansion of broadband to the Harbor Inc area. However, the need for broadband is area wide and will require a macro approach to be successful, whether by Harbor Inc alone, or in collaboration with other organizations, businesses and governmental entities.

What Harbor Inc should do now? The committee was unable to clearly identify the next step. The committee identified a report that was done on the broadband initiative in the State of Kentucky, called ConnectKentucky. Although the scope of the Kentucky initiative is far beyond that of any project Harbor Inc would initiate, of interesting note is that with all of the efforts by the ConnectKentucky initiative, it was determined that the improvement in the number of individuals accessing broadband over the time of the initiative was only seven percent more than what would have been expected without any facilitation by the initiative.

Harbor Inc needs to be mindful that the organization may not be able to facilitate a tremendous growth in broadband access because of so many factors outside of the organization's control (lack of population, funding, actual demand for broadband).

Harbor Inc also needs to determine its own standard of "reasonable" access, from a price point as well as capacity (speed) and, the demonstrated need for Harbor Inc to facilitate or subsidize broadband projects. The committee reminds the board that satellite services advertise broadband access for this area. With installation specials routinely eliminating the installation costs, and \$69 - \$99.00 monthly payments, some could conclude this is "reasonable" (even with the requirement of a contract period).

With "reasonable" being extremely subjective, the committee did not attempt establish reasonable access. It should be noted that other counties that have attempted to implement wireless coverage have set up a tiered system where the slowest speeds (256kbps) are free or a minimal monthly payment. These slower speeds, while acceptable for basic residential service, do not meet the capacity requirements for businesses looking to expand into the area.

During the committee's work, it was continually discussed that Harbor Inc should at some point consider a Request for Proposal from various ISP's in an effort to identify and select a specific area currently lacking viable broadband options, broadband services. The RFP in the appendix is an example of RFP to undertake a study on the broadband issue in Harbor Inc area. A RFP for a study of this nature would give the Harbor Inc board more detailed examination of the current situation than this committee was asked to undertake as the analysis would be done by contracted personnel.

Attached to this report are three references cited earlier. These reports provide Harbor Inc with information on broadband's importance to the economic viability, the processes necessary to bring Broadband to a rural area and, issues facing implementation. The sources are also appropriately referenced for the Harbor Inc board to review.

The following are facts identified by the committee:

- Large wired providers are not pursuing this area for broadband and do not appear poised to in the near future (3-5 years).
- Our population, both in the numbers and geographical spread, is challenging for companies to service – we are too spread out, the geography can be problematic and the customer potential does not justify investment (return on investment) by providers.
- There are no wireless providers with the financial capital, the background and experience, and the proven technology to provide a complete coverage package for the Harbor Inc area.
- Broadband is available in the Harbor Inc area through satellite and although with sketchy coverage, through cell carrier services.
- There is no technology on the horizon that will significantly change the positions of large ISPs – the decision will still be based on the lack of market potential to justify their investments.

Recommendations:

The Harbor Inc Broadband Committee makes the following recommendations for the Executive Board:

- Consider conducting an RFP to study in depth the issues. Imperative is to have all of the government entities of Harbor Inc committed to this process as it is their constituents who would benefit. An RFP may identify with factual certainty whether Harbor Inc can facilitate an area wide broadband development project.
- Continue to facilitate smaller projects like the installation of mesh grids at Chestnut Valley and Cross Village. Both projects will have leased lines into the neighborhood and business areas they serve. Harbor Inc can setup various funding and support mechanisms (whether payments of the lease lines during the pilot phase or providing executive oversight of management of the network). Harbor Inc will be able to identify shortfalls, effective processes and, most important, gain valuable insight on the issues facing ISP companies.
- Continue contact with the ISP services to build relationships and when possible, develop opportunities to facilitate their expansion.
- Maintain relationships with North Central Community College, the Harbor Springs Community Schools and Northern Michigan Hospital. Distant learning is essential for our youth and new graduates entering the workforce. Northern Michigan Hospital is pursuing technology to link medical facilities through the Internet, improving each hospital and facility through their collaboration. Having an effective relationship with these entities would be beneficial if Harbor Inc attempts to collaborate on a project.
- Maintain a professional relationship with the Northern Lakes Economic Alliance as the two organizations have like minded goals – improving the economic viability of the area. If a larger scale broadband project was to materialize, the NLEA would be critical in assisting Harbor Inc.

APPENDIX

- A. Glossary**
- B. Local and Rural Broadband Reports**
- C. RFP – Example**
- D. Articles**
- E. Survey Information**
- F. Committee Terms / Background**

APPENDIX 3

HARBOR, Inc. Community Technology Action Plan

Local Broadband Solutions for the Greater Harbor Springs Area:

HARBOR, Inc.'s Community Approach

March 2015

HARBOR AREA REGIONAL BOARD OF RESOURCES, INC.

TECHNOLOGY ACTION PLAN

PREPARED BY CONNECT MICHIGAN
AND THE
HARBOR, INC. BROADBAND TEAM



AUGUST 22, 2014



ACCESS



ADOPTION



USE

TABLE OF CONTENTS

INTRODUCTION	3
BACKGROUND	3
METHODOLOGY.....	4
CONNECTED ASSESSMENT	5
ANALYSIS OF CONNECTED ASSESSMENT.....	5
ITEMIZED KEY FINDINGS	7
COMMUNITY PRIORITY PROJECTS.....	9
COMPLETE LIST OF ACTION ITEMS	9
DETAILED FINDINGS	11
CURRENT COMMUNITY TECHNOLOGY DEVELOPMENTS IN HARBOR, INC.	11
HARBOR, INC. ASSESSMENT FINDINGS	13
CONNECTED ASSESSMENT ANALYSIS.....	16
ACTION PLAN	23
COMMUNITY PRIORITY PROJECTS.....	23
COMPLETE LIST OF ACTION ITEMS	30
APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND	43
STATEWIDE INFRASTRUCTURE.....	43
BUSINESS AND RESIDENTIAL TECHNOLOGY ASSESSMENTS	45
APPENDIX 2: PARTNER AND SPONSORS	46
APPENDIX 3: THE NATIONAL BROADBAND PLAN	48
APPENDIX 4: WHAT IS CONNECTED?.....	49
APPENDIX 5: GLOSSARY OF TERMS	51

INTRODUCTION

The purpose of this report is to summarize the community's assessment of local broadband access, adoption, and use, as well as the best next steps for addressing any deficiencies or opportunities for improving the local technology ecosystem.

Background

Today, technology plays a pivotal role in how businesses operate the type of service consumers expect, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has also become dependent on how broadly and deeply the community adopts technology resources – this includes access to reliable high-speed networks, digital literacy of residents, and the use of online resources locally for business, government, and leisure. As noted in the National Broadband Plan, broadband Internet is “a foundation for economic growth, job creation, global competitiveness and a better way of life.”¹

Despite the growing dependence on technology, as of 2012, 30% of Americans did not have a high-speed connection at home.² Connected Nation's studies also show that 17 million families with children do not have broadband at home – and 7.6 million of these children live in low-income households. In 2012, Connected Nation also surveyed 7,004 businesses in 9 states. Based on this data, Connected Nation estimates that at least 1.8 million businesses - 24% - in the United States do not utilize broadband technology today.³

Deploying broadband infrastructure, services, and application, as well as supporting the universal adoption and meaningful use of broadband, are challenging - but required - building blocks of a twenty-first century community. To assist communities, Connected Nation developed the Connected Community Engagement Program to help your community identify local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.⁴

1 *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010, <http://www.broadband.gov/download-plan/>

2 *Consumer Broadband Adoption Trends*, Connected Nation, Inc., March 2013, <http://www.connectednation.org/survey-results/residential>

3 Connected Nation, *Broadband and Business: Leveraging Technology to Stimulate Economic Growth*, <http://www.connectednation.org/survey-results/business>

4 Connected Nation, parent company for Connect Michigan, is a national non-profit 501(c)(3) organization that works in multiple states to engage community stakeholders, state leaders, and technology providers to develop and implement technology expansion programs with core competencies centered around the mission to improve digital inclusion for people and places previously underserved or overlooked.

Methodology

By actively participating in the Connected Community Engagement Program, the HARBOR, INC. Broadband Team is boosting the community's capabilities in education, healthcare, and public safety, and stimulating economic growth and spurring job creation. The HARBOR, INC. Broadband Team has collaborated with multiple community organizations and residents to:

1. Empower a community team leader (local champion) and create a community team composed of a diverse group of local residents from various sectors of the economy including education, government, healthcare, the private sector, and libraries.
2. Identify the community's technology assets, including local infrastructure, providers, facilities, websites, and innovative uses employed by institutions.
3. Complete the Connected Assessment, a measurement of the community's access, adoption, and use of broadband based on the recommendations of the National Broadband Plan.
4. Match gaps in the local broadband ecosystem to solutions and best practices being utilized by communities across the nation.
5. Pursue Connected Certification, a nationally recognized platform for spotlighting communities that excel in the access, adoption, and use of broadband.

CONNECTED ASSESSMENT

The Connected assessment framework is broken into 3 areas: **ACCESS**, **ADOPTION**, and **USE**. Each area has a maximum of 40 points. To achieve Connected Certification, the community must have 32 points in each section and 100 points out of 120 points overall.

The **ACCESS** focus area checks to see whether the broadband and technology foundation exists for a community. The criteria within the **ACCESS** focus area endeavors to identify gaps that could affect a local community broadband ecosystem including: last and middle mile issues, cost issues, and competition issues. As noted in the National Broadband Plan, broadband **ACCESS** “is a foundation for economic growth, job creation, global competitiveness and a better way of life.”

Broadband **ADOPTION** is important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The **ADOPTION** component of the Connected Assessment seeks to ensure the ability of all individuals to access and use broadband.

Broadband **USE** is the most important component of **ACCESS**, **ADOPTION**, and **USE** because it is where the value of broadband can finally be realized. However, without access to broadband and **ADOPTION** of broadband, meaningful **USE** of broadband wouldn't be possible. As defined by the National Broadband Plan (NBP), meaningful **USE** of broadband includes those areas of economic opportunity, education, government, and healthcare where values to individuals, organizations, and communities can be realized.

Analysis of Connected Assessment

The Community Technology Scorecard provides a summary of the community's Connected Assessment. The Connected Assessment's criteria are reflective of the recommendations made by the Federal Communications Commission's National Broadband Plan. Lower scores indicate weaknesses in the community's broadband ecosystem, but do not necessarily signify a lack of service.

- HARBOR, INC. achieved a score of 110 points out of 120 for overall broadband and technology readiness which indicates that the community is exhibiting high success in technology access, adoption, and use and has surpassed the score of 100 required for Connected certification.
- The county scored 34 out of a possible 40 points in broadband access primarily because of some gaps in broadband availability. While broadband availability is at 92.98% of households having access to 3 Mbps, HARBOR, INC. is generally consistent with the state average of 97.39%.

- HARBOR, INC. exceeded the 32 points in each focus area that are required for certification and has qualified for full certification.

While the results indicate that the community has made tremendous strides and investments in technology, this technology plan will provide some insight and recommendations that will help the community continue to achieve success.



Community Technology Scorecard Community Champions: Rachel Smolinski Community Advisor: Tom Stephenson				
FOCUS AREA	ASSESSMENT CRITERIA	DESCRIPTION	SCORE	MAXIMUM POSSIBLE SCORE
ACCESS	Broadband Availability	92.98% of homes have access to 3 Mbps	10	10
	Broadband Speeds	77.45% of households with access to less than 50 Mbps	5	5
	Broadband Competition	83.1% of households with access to more than 1 broadband provider	3	5
	Middle Mile Access	Availability of middle mile fiber infrastructure is from 5 providers	6	10
	Mobile Broadband Availability	99.83% of households with access to mobile broadband	10	10
	ACCESS SCORE			34
ADOPTION	Digital Literacy	Program grads are greater than 7 per 1,000 residents over the past year	8	10
	Public Computer Centers	500 computer hours per 1,000 low income residents per week	10	10
	Broadband Awareness	Campaigns reach 100% of the community	10	10
	Vulnerable Population Focus	At least 5 groups	10	10
	ADOPTION SCORE			38
USE	Economic Opportunity	2 advanced, 7 basic uses	10	10
	Education	4 advanced, 3 basic uses	10	10
	Government	4 advanced, 2 basic uses	10	10
	Healthcare	1 advanced, 6 basic uses	8	10
	USE SCORE			38
COMMUNITY ASSESSMENT SCORE			110	120

Itemized Key Findings

The HARBOR, INC. Broadband Team identified the following key findings (in addition to findings illustrated in the community scorecard) through its technology assessment:

ACCESS

- 19 last-mile broadband providers currently provide service in HARBOR, INC.:
 - 92.98% of households have access to 3 Mbps.
 - More than 75% of HARBOR, INC. homes have access to 50 Mbps service.
 - 83.1% of HARBOR, INC. households have access to more than 1 provider.
- Middle mile fiber infrastructure is available from 5 providers in HARBOR, INC.
- 99.83% of HARBOR, INC. households have access to mobile broadband.

ADOPTION

- 1 digital literacy program exists in the community resulting in 58 graduates over the past year.
- 4 public computer centers (PCC) with a total of 26 computers are open to the public.
- 4 broadband awareness campaigns are reaching 100% of HARBOR, INC.
- 6 organizations are working with vulnerable populations.

USE

- At least 9 uses of broadband were identified in the area of economic opportunity including 2 advanced uses and 7 basic uses.
- At least 7 uses of broadband were identified in the area of education including 4 advanced uses and 2 basic uses.
- At least 6 uses of broadband were identified in the area of government including 4 advanced uses and 2 basic uses.
- At least 7 uses of broadband were identified in the area of healthcare including 1 advanced use and 6 basic uses.

In addition to the items identified above, the HARBOR, INC. Broadband Team identified the following technology resources in the community:

Technology Providers

- 19 broadband providers were identified in HARBOR, INC.
- 2 hardware providers
- 3 network developers
- 1 web developer

Technology Facilities

- 5 public computing centers
- 11 wireless hotspots
- 0 video conference facilities

Community Websites

- 2 Business-related websites (excluding private businesses)
- 2 Education-related websites
- 10 Government-related websites
- 5 Healthcare-related websites
- 1 Library-related website
- 1 Tourism-related website
- 1 Agriculture-related website
- 1 Community-based website

Community Priority Projects

The Connected Assessment has culminated in the outlining of projects designed to empower the community to accelerate broadband access, adoption, and use. Below are six priority projects, followed by a complete list of all action items.

1. Facilitate a Technology Summit
2. Develop Free Social Media Classes and Internet Safety Workshops for the Community's Local Businesses and Non-Profits
3. Complete a Vertical Assets Inventory
4. Create Local Jobs Via Teleworking Opportunities
5. Evaluate Local Policies and Ordinances
6. Develop Public-Private Partnerships to Deploy Broadband Service

Complete List of Action Items

Below is a complete list of 12 action items proposed by the HARBOR, INC. Broadband Team to accelerate broadband access, adoption, and use. Detailed descriptions of each solution proposed by Connect Michigan can be found in the *Action Plan* section later in this report.

ACCESS

Broadband Availability

1. Perform an Analysis of Local Policies and Ordinances

Broadband Speeds – No Action Items

Broadband Competition

2. Develop Public-Private Partnerships to Deploy Broadband Service

Middle Mile Access

3. Study and Possibly Reassess Major Telecom Purchase Contracts

Mobile Broadband Availability

4. Complete a Vertical Assets Inventory

ADOPTION**Digital Literacy**

5. Distribute Digital Literacy Content

Public Computer Centers – No Action Items**Broadband Awareness**

6. Facilitate a Technology Summit
7. Develop Free Social Media Classes and Internet Safety Workshops for the Community's Local Businesses and Non-Profits

Vulnerable Population Focus – No Action Items**USE****Economic Opportunity**

8. Create Local Jobs Via Teleworking Opportunities

Education

9. Improve Education through Digital Learning

Government

10. Improve Online Business Services Offered by the Government
11. Pursue Next Generation 911 Upgrades

Healthcare

12. Promote Telemedicine in Remote Areas

DETAILED FINDINGS

Current Community Technology Developments in HARBOR, INC.

During the assessment process, the community team identified projects that are currently in development or implementation. These projects are helping to enhance technology in HARBOR, INC.:

- The Harbor Springs area broadband survey was launched in July in an attempt to facilitate the expansion of reliable, affordable high-speed Internet to residents, businesses, and visitors to the HARBOR, INC. service area that is currently unserved or underserved as a long-time initiative of HARBOR, INC. A small subcommittee has been meeting over the past few years to work on the initiative and most recently has been working with a larger, regional broadband team to facilitate the process through the Connect Michigan Connected Community Engagement Program. One of the projects implemented to address access is a broadband survey for residents in the service area in order to provide more information to the team and to attract potential service providers to the area. The survey was launched in July via a mailing to over 6,600 property owners.

Status: The survey was closed at the end of September 2012, and a summary of results including maps may be found at <http://www.harborinc.org/broadband.asp>. The HARBOR, INC. Executive Director (ED) is currently working with service providers to expand and enhance their service in the area.

- In November of 2011, the voters of the Harbor Springs Public School approved a \$3.9 million technology and transportation bond allowing the school to install Wi-Fi in all the school facilities this fall and to launch a 1:1 iPad Initiative learning program.

Status: The school continues to implement the technology bond activities. Wi-Fi and multimedia equipment are installed and operational. The iPad initiative is moving forward with the teacher and staff training and pilot 1:1 program in classrooms; a total of 890 students have iPads or MacBook Air laptops.

- HARBOR, INC. is currently conducting a feasibility study for their service area and some surrounding townships within Emmet County. This study will determine the potential economic impact of an expansion of Internet broadband infrastructure in communities within the area that are currently unserved by broadband speeds of 10Mbps or higher. The study will examine the scope of economic growth that would be made possible through the increase of low impact, high-tech home-based businesses and tele-working. Additionally,

the results from this feasibility study along with an engineering analysis (once funded) examining needed infrastructure will be utilized to pursue future funding for the installation of adequate broadband infrastructure in the area.

Status: The feasibility study is in process, with a planned completion date of December 2014. We are currently looking for funds to complete the engineering analysis.

- Digital Literacy classes at the Harbor Springs Library. The Harbor Springs Library launched a Summer Technology Series and iPad User Group where it will be hosting a series of classes about operating and maintaining computers and iPads.

Status: The Library hosted several iPad and technology classes during the summer of 2012 and 2013. It is anticipated that the classes will be offered as needed in the future.

- Increase access to broadband in unserved areas within the service area. The HARBOR, INC. Broadband Team facilitated discussions and helped to foster a collaborative project between a technology service provider and communities within the service area. HARBOR, INC. continues to provide liaison services to service providers looking to offer expanded service or provide service in the area. In addition, HARBOR, INC. will connect communities and/or organizations looking for assistance with service providers.

Status: Ongoing

- The HARBOR INC. Broadband Team is supporting the use of the region's 911 Emergency Tower Network by private broadband providers.

Status: The director of CCE 911 participates on the Broadband Team. We work with the director to evaluate options for using existing 911 towers for broadband service in the area. HARBOR, INC. serves as a liaison for service providers and the director.

- In working with the Emmet County Planning and Zoning Department, the HARBOR, INC. team helped examine the community's zoning ordinances for any unnecessary local regulatory barriers that would inhibit the expansion of broadband.

Status: HARBOR, INC. reviewed the Emmet County ordinance related to a tower application in coordination with the Emmet County Planner, Connect Michigan, and the applicant. The zoning ordinance does not prohibit expansion; however, we have submitted proposed revisions of the ordinance to the Emmet County Planning Commission that will address Internet-based communication towers specifically. The proposed revisions are now running through the County's normal process for public input and approval.

- Develop Hot Spots in the downtown area and at the township halls for both the residents and visitors.

Status: The HARBOR, INC. Broadband Team has discussed options for providing this service, and the ED has evaluated a community wireless proposal from a local service provider. It does not appear to be feasible to establish a cost-effective, sustainable community wireless network in the area; however, the Team will pursue “hot spots” in the area. Downtown businesses with existing wireless service will be encouraged to provide a guest portal for public use. The ED will also provide assistance to townships that are interested in providing a “hot spot.”

- Develop free website and social media classes and workshops for the community’s local businesses and non-profits – scheduled to be launched fall of 2012.

Status: A free social media workshop titled “Online Business Tools” was offered at the Harbor Springs Library in 2013 and 2014. It is anticipated that more specific social media clinics will be offered as needed.

- Upgrade community websites.

Status: HARBOR, INC. has launched its community website. This site serves as a conduit for community information including technology related resources. We currently host websites for several townships. Social media will be integrated into all aspects of the site.

- Facilitate a Digital Works Center in the Harbor Springs Area. This partnership with Connect Michigan and Connected Nation will utilize their digital learning model to establish a Digital Works program that trains, places, and mentors high quality business candidates, connecting them to national companies looking for qualified personnel. The program will establish co-working centers in rural settings where job demand is high, few employers exist, and the cost of living is lowest. Once trained and connected with a national company, candidates may choose to work out of the Digital Works Center or out of their homes.

Status: Submitted a HARBOR, INC. community profile to Connect Michigan; currently looking for funding to implement.

HARBOR, INC. Assessment Findings

Today, residents in the HARBOR, INC. area (or sections of the community) are served by 19 providers. Currently, broadband is defined as Internet service with advertised speeds of at least 768 Kbps downstream and 200 Kbps upstream. According to Connect Michigan’s latest broadband mapping update, the following providers have a service footprint in the HARBOR, INC. community:

Broadband Providers	Website	Technology Type
Charter Communications Inc.	www.charter.com	Cable
Parish Communications	www.parishonline.net	Cable
AT&T Michigan	www.att.com	DSL
CenturyLink	www.centurylink.com	DSL
Iserv	www.iserv.net	DSL
RACC Enterprises LLC	www.racc2000.com	DSL, Fixed Wireless
Chain of Lakes Internet	www.torchlake.com	Fixed Wireless
Cherry Capital Connection, LLC	www.cherrycapitalconnection.com	Fixed Wireless
Gaslight Media	www.gaslightmedia.com	Fixed Wireless
Lighthouse.Net	www.lighthouse.net	Fixed Wireless
miSpot	http://mispot.net	Fixed Wireless
SpeedConnect	www.speedconnect.com	Fixed Wireless
AT&T Mobility LLC	www.wireless.att.com	Mobile Wireless
Sprint	www.sprint.com	Mobile Wireless
Verizon Wireless	www.verizonwireless.com	Mobile Wireless
Hughes Network Systems, LLC	www.hughesnet.com	Satellite
Skycasters	www.skycasters.com	Satellite
StarBand Communications	http://starband.com	Satellite
ViaSat, Inc.	www.exede.com	Satellite

Below is a list of local technology companies that are providing technical services or distributing/selling technical resources.

Company Name	Website	Provider Type
Harbor Springs Computers	http://harborspringscomputers.com/	Network Integrator
Insite Technology	www.insite-tech.com/	Network Integrator
Alphageek Web Design	www.alphageekwebdesign.com	Web Developer
Donnelly Strough CO	http://donnelly-strough.com/	Hardware Provider
Watshall Computer	www.watshall.com/	Network Integrator
Mintaka Design	http://mintakadesign.com/	Hardware Provider

Below is a list of organizations that are making technological resources available to the community. These include organizations that provide videoconferencing, public computing, and wireless hotspots.

Organization Name	Website	Resource Type
-------------------	---------	---------------

North Central Michigan College-Library	www.ncmich.edu/	Public Computer Facility
NCMC Learning Support Services (LSS)	www.ncmich.edu/advising/	Public Computer Facility
North Central Michigan College SCRC	www.ncmich.edu/scrc.html	Public Computer Facility
Harbor Springs Library	www.harborspringslibrary.org/	Public Computer Facility
Cross Village Township Office	www.crossvillage.info/	Public Computer Facility
Pellston Regional Airport	www.pellstonairport.com	Wireless Hotspot
Boyne Highlands Resort	www.boyne.com/	Wireless Hotspot
Nubs Nob	www.nubsnob.com/	Wireless Hotspot
Harbor Springs Airport	www.harborspringsairport.com/	Wireless Hotspot
Northern Lights Recreation	www.northernlightsrec.com/	Wireless Hotspot
Stained Cup Coffee Co	www.stainedcupcoffee.com/	Wireless Hotspot
Vernales	http://vernales.com/	Wireless Hotspot
Compass Room	www.truenorthgolf.com/	Wireless Hotspot
Stafford's Pier Restaurant	www.staffords.com/pier	Wireless Hotspot
Polish Kitchen	www.famouspolishkitchen.com/	Wireless Hotspot
Teddy Griffin's Road House	www.teddygriffins.com/	Wireless Hotspot

Below is a list of community websites (sorted by category) designed to share and promote local resources.

Organization Name	Website	Website Category
MSU Extension	www.msue.msu.edu/	Agriculture
Harbor Area Regional Board of Resources, Inc. (H.A.R.B.O.R., Inc.)	www.harborinc.org/	Business
Northern Lakes Economic Alliance	www.northernlakes.net/	Business
Harbor Springs Area Historical Society	www.harborspringschamber.com/	Community Based
Harbor Springs Public Schools	www.harborps.org/	Education
North Central Michigan College	www.ncmich.edu/	Education
City of Harbor Springs	www.cityofharborsprings.com/	Government
Cross Village Township	www.crossvillage.info/	Government
Emmet County	www.emmetcounty.org	Government
Friendship Township	www.harborinc.org/ftwp.asp	Government
Little Traverse Bay Band of Odawa Indians	www.ltbbodawa-nsn.gov/index.html	Government
Little Traverse Township	www.harborinc.org/lttpw.asp	Government
North West Michigan Council of	www.nwmcog.org	Government

Governments		
Pleasantview Township	www.harborinc.org/pvtwp.asp	Government
Readmond Township	www.harborinc.org/rtwp.asp	Government
West Traverse Township	www.harborinc.org/wttwp.asp	Government
Bay Bluffs Emmet County Medical Care Facility	http://baybluffs.org/	Healthcare
Health Department of Northwest Michigan	www.nwhealth.org/	Healthcare
Little Traverse Primary Care	www.littletraverseprimarycare.com/	Healthcare
Perry Farm Villages	www.pvm.org/	Healthcare
United Way of Northwest Michigan	www.unitedwaynwmi.org/	Healthcare
Harbor Springs Library	www.harborspringslibrary.org/	Libraries
Harbor Springs Area Chamber of Commerce	www.harborspringschamber.com/	Tourism

Connected Assessment Analysis



Access Score Explanation

Broadband Availability (10 out of 10 Points Possible) – is measured by analyzing provider availability of 3 Mbps broadband service gathered by Connected Nation’s broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- According to the April 2014 data collected by Connect Michigan, 98.92% of HARBOR, INC. area residents had access to broadband speeds of 3 Mbps or greater.

Broadband Speeds (5 out of 5 Points Possible) – is measured by analyzing the speed tiers available within a community. Connected Nation will analyze broadband data submitted through its broadband mapping program. Specifically, Connected Nation will break down the coverage by the highest speed tier with at least 75% of households covered. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- According to the April 2014 data collected by Connect Michigan, 77.45% of HARBOR, INC. area residents had access to broadband speeds of 50 Mbps.

Broadband Competition (3 out of 5 Points Possible) – is measured by analyzing the number of broadband providers available in a particular community and the percentage of that community’s residents with more than one broadband provider available. Connected Nation performed this analysis by reviewing the data collected through the broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the April 2014 data collected by Connect Michigan, 83.01% of HARBOR, INC. area residents had access to more than one broadband provider.**

Middle Mile Access (6 out of 10 Points Possible) – is measured based on a community’s availability to fiber. Three aspects of availability exist: proximity to middle mile points of presence (POPs), number of POPs available, and available bandwidth. Data was collected by the community in coordination with Connected Nation.

- **HARBOR, INC. area is served by 5 middle mile fiber providers.**

Mobile Broadband Availability (10 out of 10 Points Possible) – is measured by analyzing provider availability of mobile broadband service gathered by Connected Nation’s broadband mapping program. In communities that may have mobile broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the April 2014 data collected by Connect Michigan, 99.83% of HARBOR, INC. area residents had access to mobile broadband service.**



Access Score Explanation

Digital Literacy (8 out of 10 Points Possible) – is measured by first identifying all digital literacy programs in the community. Once the programs are determined, a calculation of program graduates will be made on a per capita basis. A digital literacy program includes any digital literacy course offered for free or at very low cost through a library, seniors center, community college, K-12 school, or other group serving the local community. A graduate is a person who has completed the curriculum offered by any organization within the community. The duration of individual courses may vary. A listing of identified digital literacy offerings is below.

Organization Name	Program Description	Number of Grads
North Central Mich. Coll.	Business and community outreach	58
Total Graduates 2013-2014		58

Public Computer Centers (10 out of 10 Points Possible) – is measured based on the number of hours computers are available each week per 1,000 low-income residents. Available computer hours is calculated by taking the overall number of computers multiplied by the number of hours open to a community during the course of the week. A listing of public computer centers available in HARBOR, INC. area is below.

Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
NCMC	54 hours per week	20	1,080
Cross Village	56 hours	1	56
Emmet County Office	45 Hours	1	45
Harbor Springs Library	40 hours	4	160

Broadband Awareness (10 out of 10 Points Possible) – is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and then each program’s community reach is compiled and combined with other campaigns. A listing of broadband awareness programs in HARBOR, INC. area is below.

Organization Name	Campaign Description	Community Reach
NCMC	Business and community outreach	78%
Harbor Springs Library	Weekly technology class (iPads, e-mail, computer usage)	95%
The Village of Hillside	Technology class (iPads, e-mail, computer usage)	17%
HARBOR INC.	Monthly e-Newsletter	100%

Vulnerable Population Focus (10 out of 10 Points Possible) – A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc. A listing of programs focusing on vulnerable populations in HARBOR, INC. is listed below.

Organization Name	Program Description	Vulnerable Group
NCMC	Business and community outreach	Low-income and elderly
Harbor Springs Library	Technology training	Low-income, youth, seniors
The Village of Hillside	Technology training	Seniors
MiWorks	Job finding assistance	Unemployed
MiWorks- Adult Learning Labs.	Adult Learning Labs - GED, GED or high school diploma, prepare for college, or improve their reading, writing, math, and keyboarding	Low-income adults
MiWorks-Youth services	Youth skills training	Youth



Use Score Explanation

Economic Opportunity (10 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within

economic opportunity include: economic development, business development, tourism, and agriculture. Identified uses of broadband in the area of economic opportunity are listed below and identified as basic or advanced.

Application Provider	Description	Basic / Advanced
Online banking	Availability of free online banking for consumers and businesses	Basic
MiWorks-virtual employment	Virtual employment assistance programs and individualized job training	Advanced
Michigan Small Business Technology and Development	Google online - program to help small & medium businesses with technology	Advanced
Northern Lakes Economic Alliance-Business Resource Centers	(10) Business resource centers in the libraries to help start and expand businesses	Basic
1 free publicly accessible wireless hotspot available per 5,000 residents	2 free hot spots - one at the Cross Village Township hall and Harbor Springs Library and Nub's Nob and Boyne Highlands	Basic
Harbor Chamber of Commerce	100% of local attractions online	Basic
Visit Harbor Springs Michigan	Presence of an online tourism portal for the promotion of local tourism attractions and events	Basic
Service Core of retired executives SCORE/Harbor Springs	Program to help small & medium businesses with technology	Basic
MiWorks- Computer Lab	Lab - 12 public computers available for job-seekers and local businesses	Basic

Education (10 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within education include K-12, higher education, and libraries. Identified uses of broadband in the area of education are listed below and identified as basic or advanced.

Application Provider	Description	Basic/ Advanced
Char-Em	Availability of online courses for K-12 students	Advanced
Initiatives focused on elevating STEM (Science, Technology, Engineering, & Mathematics) literacy	The school districts located in Emmet County are partners with the Michigan STEM Partnership a statewide collaboration.	Advanced
Harbor Springs Schools - Destiny Online	Presence of library automation system	Basic

Harbor Springs Public Schools	100% of classrooms connected to Internet via broadband	Basic
Harbor Springs Schools - Power School	75% of schools with online interaction with parents	Advanced
Harbor Springs Schools	100% of libraries connected to Internet via broadband	Basic
Harbor Springs Schools - Power School	75% of K-12 classes with online access to curricula, homework, and grades	Advanced

Government (10 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within government include general government, public safety, energy, and the environment. Identified uses of broadband in the area of government are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
HARBOR Inc. website- plus 5 township websites	Presence of a local community website	Basic
CCE 911 system	Availability of ubiquitous, interoperable wireless public safety network	Advanced
City of Harbor Springs	Energy Smart Program- replacing old equipment with high efficient equipment	Basic
City of Harbor Springs	Applications for Zoning and Business permits, as well zoning codes, city budgets and maps are online	Advanced
City of Harbor Springs/Police Department	Public safety answering points with broadband	Advanced
Emmet County	Updated zoning ordinances on communication towers	Advanced

Healthcare (8 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies. Identified uses of broadband in the area of healthcare are listed below and identified as basic or advanced.

Application Name	Description	Basic/Advanced
McLaren Northern Michigan Hospital - website	Online listing of healthcare professionals within community	Basic
McLaren Northern Michigan Hospital	Availability of telemedicine (send or receive)	Advanced
Computer access for	2 computers at Perry Farms, 1 computer at Village of	Basic

those living in nursing homes and assisted living facilities	Hillside, and 1 computer at Harbor Springs Friendship Center and 1 computer	
McLaren Northern Michigan Hospital	Online payment of bills	Basic
McLaren Northern Michigan Hospital	Online Pre-Registration	Basic
McLaren Northern Michigan Hospital	E-Shop; employee can order uniforms and supplies online	Basic
McLaren Northern Michigan Hospital	eNewsletter- Community Health Education and Fitness Programing	Basic

ACTION PLAN

Community Priority Projects

This exercise has culminated in the outlining of projects to allow the community to continue its recognized excellence in technology and broadband planning across the community. Below are six priority projects, each describing a project plan with suggested steps. This is followed by a complete list of all action items.

Perform an Analysis of Local Policies and Ordinances

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, negatively impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights of way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way are one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ration of poles to households goes off the charts. Furthermore, the process is time consuming. "Make ready" work, which involves moving wires and other equipment attached to a pole to ensure proper spacing between equipment, and compliance with electric and safety codes can take months to complete.

Community and provider collaboration to problem solve around local pole attachment and other right of way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure.

Goal

Ensure that local policies are conducive to broadband build-out.

Benefits

1. Lowers cost barriers to improve the business case for broadband deployment.
2. Encourages good public policy and provider relations.

Action Items

1. Review local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, and right-of-way) that are conducive to broadband build-out.

2. Develop an awareness campaign targeted towards community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources that outweigh the need for some policies.

Status: In progress and successful.

Develop Public-Private Partnerships to Deploy Broadband Service

Public-private partnerships take many forms, limited only by the imagination and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network that they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

A public-private partnership should not be simply seen as a method of financing. The strength of these partnerships is that each party brings something important to the table that the other doesn't have or can't easily acquire. The community can offer infrastructure (publicly-owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed anchor tenants. Private-sector partners bring network-building and operations experience.

Goal

Fund broadband network deployment.

Benefits

1. The public sector transfers much of the risk for private investment. For example, the public sector has many funding tools available, including incentivizing continued investment through tax credits, encouraging greater availability of private capital through government guaranteed loans, or government being a direct source of capital through loans or grants.
2. The partnership can aggregate demand and reduce barriers to deployment. By working together, public and private parties can educate and build awareness needed for the public to better integrate the use of broadband into their lives, thereby improving the business case for broadband deployment.
3. A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items

1. Decide on the technology (e.g. cable, DSL, fiber, etc.).
2. Issue an RFP.
3. Develop a finance and ownership model.

Status: In progress.

Complete a Vertical Assets Inventory

Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. “Vertical assets” are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

Goal

Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

Benefits

1. The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.
2. The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items

1. Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.
2. Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.

3. Identify and map elevated structures utilizing your community's GIS resources. The resulting database should be open ended; localities should be encouraged to continuously map assets as they are made available.

Status: In progress.

Facilitate a Technology Summit

Develop and host a technology summit for residents and businesses to increase awareness of broadband value, service options, and the potential impact on quality of life. The technology summit should facilitate community partnerships between leaders in local government and the private sector, including non-profits and private businesses in the education, healthcare, and agriculture sectors, with the goal of ensuring that residents have at least one place in the community to use powerful new broadband technologies, and that this asset will be sustained over time. Further, the technology summit should highlight success stories as evidence of the impact of technology.

Goal

A technology summit should bring together community stakeholders to develop a dialogue about how public and private stakeholders can collectively improve broadband access, adoption, and use.

Benefits

1. Highlights successes, opportunities, and challenges regarding community technology planning.
2. Develops ongoing dialogue around improving broadband access, adoption, and use.
3. Unifies community stakeholders under one vision.

Action Items

1. Create community partnerships.
2. Identify funding sources and hosts.
3. Identify suitable speakers.
4. Develop relevant content.

Status: In progress.

Develop Free Social Media Classes and Internet Safety Workshops for the Community's Local Businesses and Non-Profits

Methods of implementing a small and medium business broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by

community leaders, inviting speakers to community business conferences or summits, and public service announcements. It is also important to educate local businesses about Internet tools that are available at minimum or no cost to them.

A training program, or entry-level “Broadband 101” course, could be utilized to give small and medium businesses an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, incorporate a program designed to help community members who are using the Internet to identify and avoid situations that could threaten their safety, threaten business or government networks, compromise confidential information, compromise the safety of children, compromise their identities and financial information, or destroy their reputations.

Training should include resources for non-IT staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization.

Additional training might include:

- “How-to” training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.
- Technical and professional support for hardware, software, and business operations.
- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.
- Website development and registration.
- Basic communications equipment, such as low-cost personal computers and wireless routers.

Goals

- Businesses adopt and use broadband-enabled applications, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.
- Ensure that community members are aware of how to navigate the Internet safely.

Benefits

- Provides entrepreneurial support.
- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation’s 2012 Jobs and

Broadband Report, businesses that are using the Internet bring in approximately \$300,000 more in median annual revenues than their unconnected counterparts.

- This project helps ensure that community members have a solid understanding of cyber threats.
- There are many risks, some more serious than others. Among these dangers are viruses erasing entire systems, a hacker breaking into a system and altering files, someone using someone else's computer to attack others, someone stealing credit card information, sexual predators making advances at children, and criminals making unauthorized purchases. Unfortunately, there's no 100% guarantee that even with the best precautions some of these things won't happen, but there are steps that can be taken to minimize the chances.

Action Items

- Identify federally or state sponsored business support programs (e.g. Chamber of Commerce, SBA, EDA, Agriculture, or Manufacturing extension) that include assistance with broadband or IT content.
- Identify or develop a business awareness and training program.
- Identify or develop online training modules for businesses. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National e-Commerce Extension Initiative. As the sole outlet nationally for e-Commerce educational offerings geared at Extension programming, the National e-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to e-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile e-Commerce. To see some examples, click here: http://srdc.msstate.edu/ebeat/small_business.html#.
- Partner with a local library or community center to offer security-awareness training initiatives that include classroom style training sessions and security awareness websites and information booklets.
- Awareness training can also be used to alleviate anxiety for community members who are not using the Internet because of fear of cyber threats.

Status: The HARBOR, INC. team has successfully launched a program that has hosted a series of social media and e-marketing workshops for the local businesses and non-profits in the HARBOR, INC. region. That program is being improved to incorporate training on Internet safety in future workshops to further meet the needs of its local business and non-profit community.

Create Local Jobs Via Teleworking Opportunities

Connected Nation's Digital Works program is a hybrid between an employment agency and a co-working facility that connects residents with online training courses and connections with companies that lack a physical presence in the community. The Digital Works program creates

jobs in areas facing high unemployment by leveraging broadband technology for call center and IT outsourcing. Extended training is available for HTML programming and other technical positions as well. The program is providing an avenue for communities to create a job incubator, retaining workers in the area and attracting corporate jobs while providing a pathway for improving a worker's competitive advantage in the twenty-first century workforce with specified coursework and training.

At the end of training, workers are placed in available positions that match their skills and interests. All jobs pay above minimum wage, and the training provides opportunities for placement at levels for upward mobility. This is work that can be done from home or at the Digital Works center that is provided through a partnership with the community.

Goal

Connect IT training and education with remote employment opportunities.

Benefits

1. This type of project can educate, train, employ, and has the potential to ultimately increase the productivity and economic competitiveness of your community's workforce.
2. The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.
3. Through training and work, participants will rely heavily on local ISPs, broadband technology, and emerging IT technologies to provide services to a global marketplace, in turn fostering the demand-driven strengthening of your community's physical Internet infrastructure.

Action Items

1. The Digital Works program requires a site suitable for establishing office infrastructure, educational partners to develop the workforce, and business relationships with enterprises willing to hire workers through the digital factory.
2. Identify the physical, financial, and technological resources needed to establish a digital factory.
3. Space to house workspace and training and support offices will be needed, as well as the equipment, such as computers and monitors for video conferencing and training.
4. Develop partnerships with companies who would provide contractual employment to program graduates.
5. Visit www.digitalworksjobs.com to learn more.

Status: In progress.

Complete List of Action Items

Below is a complete list of 12 action items proposed by the HARBOR, INC. Broadband Team to accelerate broadband access, adoption, and use.

ACCESS

Broadband Availability

1. Perform an Analysis of Local Policies and Ordinances

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, negatively impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights of way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way are one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ration of poles to households goes off the charts. Furthermore, the process is time consuming. "Make ready" work, which involves moving wires and other equipment attached to a pole to ensure proper spacing between equipment, and compliance with electric and safety codes can take months to complete.

Community and provider collaboration to problem solve around local pole attachment and other right of way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure.

Goal

Ensure that local policies are conducive to broadband build-out.

Benefits

3. Lowers cost barriers to improve the business case for broadband deployment.
4. Encourages good public policy and provider relations.

Action Items

3. Review local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, and right-of-way) that are conducive to broadband build-out.
4. Develop an awareness campaign targeted towards community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources that outweigh the need for some policies.

Status: In progress and successful.

Broadband Speeds – No Action Items.

Broadband Competition

2. Develop Public-Private Partnerships to Deploy Broadband Service

Public-private partnerships take many forms, limited only by the imagination and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network that they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

A public-private partnership should not be simply seen as a method of financing. The strength of these partnerships is that each party brings something important to the table that the other doesn't have or can't easily acquire. The community can offer infrastructure (publicly-owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed anchor tenants. Private-sector partners bring network-building and operations experience.

Goal

Fund broadband network deployment.

Benefits

1. The public sector transfers much of the risk for private investment. For example, the public sector has many funding tools available, including incentivizing continued investment through tax credits, encouraging greater availability of private capital through government guaranteed loans, or government being a direct source of capital through loans or grants.
2. The partnership can aggregate demand and reduce barriers to deployment. By working together, public and private parties can educate and build awareness needed for the public to better integrate the use of broadband into their lives, thereby improving the business case for broadband deployment.
3. A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items

1. Decide on the technology (e.g. cable, DSL, fiber, etc.).
2. Issue an RFP.
3. Develop a finance and ownership model.

Status: In progress.

Middle Mile Access

3. Study and Possibly Reassess Major Telecom Purchase Contracts

Demand for broadband capacity across community institutions represents a key segment of the overall demand for broadband in many communities. The purchasing power of this collective should be leveraged to help promote greater competition in the broadband market and drive increased investment in backhaul and last mile broadband capacity.

Goal

Leverage the demand for broadband across community institutions to promote competition and investment in broadband services.

Benefits

1. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community.
2. The increased backhaul capacity can in turn benefit the whole community.

Action Items

1. Develop partnerships between local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, hospital or clinics, and schools, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service.

Implementation Team

To be determined.

Mobile Broadband Availability

4. Complete a Vertical Assets Inventory

Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. “Vertical assets” are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

Goal

Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

Benefits

1. The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.
2. The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items

1. Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.
2. Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.
3. Identify and map elevated structures utilizing your community's GIS resources. The resulting database should be open ended; localities should be encouraged to continuously map assets as they are made available.

Status: In progress.

ADOPTION

Digital Literacy

5. Distribute Digital Literacy Content.

Leverage the abundant digital literacy content available online to distribute to local trainers. Currently, numerous non-profit organizations and for-profit corporations provide curriculum that can be adapted for classroom or self-paced study. Some organizations also provide additional resources for instructor use, including classroom setup information, teaching tips for

each course, additional practice, test item files, and answers to frequently asked questions. Digital literacy content can be deployed via local websites (a community portal), print material, podcasts, blogs, and videos.

Goal

Facilitate partnerships in order to provide digital literacy training.

Benefit

1. Increasing the community's digital literacy facilitates widespread online access to education and other public and government services, provides equal access to opportunities such as jobs and workforce training, enables people to find information about their health, and offers the opportunity to increase levels of social interaction and civic involvement.

Action Items

1. Develop partnerships with local organizations and equip them with digital literacy content.
2. Train staff to deliver the curriculum to potential adopters.
3. Promote local organizations as a source of broadband access and training.
4. Engage non-adopters with a comprehensive public outreach campaign, helping them understand the benefits of broadband service and inviting them to experience the value at their libraries.
5. Provide curriculum to teach computer and Internet use as well as the skills required to utilize the Internet effectively for essential services, education, employment, civic engagement, and cultural participation.
6. Offer compelling promotion to participants, giving them the opportunity to adopt the technology for everyday use in their homes.

Public Computer Access – No action items.

Broadband Awareness

6. Facilitate a Technology Summit

Develop and host a technology summit for residents and businesses to increase awareness of broadband value, service options, and the potential impact on quality of life. The technology summit should facilitate community partnerships between leaders in local government and the private sector, including non-profits and private businesses in the education, healthcare, and agriculture sectors, with the goal of ensuring that residents have at least one place in the community to use powerful new broadband technologies, and that this asset will be sustained over time. Further, the technology summit should highlight success stories as evidence of the impact of technology.

Goal

A technology summit should bring together community stakeholders to develop a dialogue about how public and private stakeholders can collectively improve broadband access, adoption, and use.

Benefits

1. Highlights successes, opportunities, and challenges regarding community technology planning.
2. Develops ongoing dialogue around improving broadband access, adoption, and use.
3. Unifies community stakeholders under one vision.

Action Items

1. Create community partnerships.
2. Identify funding sources and hosts.
3. Identify suitable speakers.
4. Develop relevant content.

Status: In progress.

7. Develop Free Social Media Classes and Internet Safety Workshops for the Community's Local Businesses and Non-Profits.

Methods of implementing a small and medium business broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and public service announcements. It is also important to educate local businesses about Internet tools that are available at minimum or no cost to them.

A training program, or entry-level "Broadband 101" course, could be utilized to give small and medium businesses an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, incorporate a program designed to help community members who are using the Internet to identify and avoid situations that could threaten their safety, threaten business or government networks, compromise confidential information, compromise the safety of children, compromise their identities and financial information, or destroy their reputations.

Training should include resources for non-IT staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization.

Additional training might include:

- “How-to” training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.
- Technical and professional support for hardware, software, and business operations.
- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.
- Website development and registration.
- Basic communications equipment, such as low-cost personal computers and wireless routers.

Goals

1. Businesses adopt and use broadband-enabled applications, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.
2. Ensure that community members are aware of how to navigate the Internet safely.

Benefits

1. Provides entrepreneurial support.
2. Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
3. Promotes business growth and workforce development.
4. Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation’s 2012 Jobs and Broadband Report, businesses that are using the Internet bring in approximately \$300,000 more in median annual revenues than their unconnected counterparts.
5. This project helps ensure that community members have a solid understanding of cyber threats.
6. There are many risks, some more serious than others. Among these dangers are viruses erasing entire systems, a hacker breaking into a system and altering files, someone using someone else’s computer to attack others, someone stealing credit card information, sexual predators making advances at children, and criminals making unauthorized purchases. Unfortunately, there's no 100% guarantee that even with the best precautions some of these things won't happen, but there are steps that can be taken to minimize the chances.

Action Items

1. Identify federally or state sponsored business support programs (e.g. Chamber of Commerce, SBA, EDA, Agriculture, or Manufacturing extension) that include assistance with broadband or IT content.
2. Identify or develop a business awareness and training program.

3. Identify or develop online training modules for businesses. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National e-Commerce Extension Initiative. As the sole outlet nationally for e-Commerce educational offerings geared at Extension programming, the National e-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to e-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile e-Commerce. To see some examples, click here: http://srdc.msstate.edu/ebeat/small_business.html#.
4. Partner with a local library or community center to offer security-awareness training initiatives that include classroom style training sessions and security awareness websites and information booklets.
5. Awareness training can also be used to alleviate anxiety for community members who are not using the Internet because of fear of cyber threats.

Status: The HARBOR, Inc. team has successfully launched a program that has hosted a series of social media and e-marketing workshops for the local businesses and non-profits in the HARBOR, Inc. region. That program is being improved to incorporate training on internet safety in future workshops to further meet the needs of its local business and non-profit community.

Vulnerable Population Focus – No action items.

USE

Economic Opportunity

8. Create Local Jobs Via Teleworking Opportunities

Connected Nation's Digital Works program is a hybrid between an employment agency and a co-working facility that connects residents with online training courses and connections with companies that lack a physical presence in the community. The Digital Works program creates jobs in areas facing high unemployment by leveraging broadband technology for call center and IT outsourcing. Extended training is available for HTML programming, and other technical positions as well. The program is providing an avenue for communities to create a job incubator, retaining workers in the area and attracting corporate jobs while providing a pathway for improving a worker's competitive advantage in the twenty-first century workforce with specified coursework and training.

At the end of training, workers are placed in available positions that match their skills and interests. All jobs pay above minimum wage, and the training provides opportunities for

placement at levels for upward mobility. This is work that can be done from home or at the Digital Works center that is provided through a partnership with the community.

Goal

Connect IT training and education with remote employment opportunities.

Benefits

1. This type of project can educate, train, employ, and has the potential to ultimately increase the productivity and economic competitiveness of your community's workforce.
2. The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.
3. Through training and work, participants will rely heavily on local ISPs, broadband technology, and emerging IT technologies to provide services to a global marketplace, in turn fostering the demand-driven strengthening of your community's physical Internet infrastructure.

Action Items

1. The Digital Works program requires a site suitable for establishing office infrastructure, educational partners to develop the workforce, and business relationships with enterprises willing to hire workers through the digital factory.
2. Identify the physical, financial, and technological resources needed to establish a digital factory.
3. Space to house workspace and training and support offices will be needed, as well as the equipment, such as computers and monitors for video conferencing and training.
4. Develop partnerships with companies who would provide contractual employment to program graduates.
5. Visit www.digitalworksjobs.com to learn more.

Status: In progress.

Education

9. Improve Education through Digital Learning

Several digital learning platforms are available for K-12 implementation. For example, CFY is a national education nonprofit that helps students in low-income communities, together with their teachers and families, harness the power of digital learning to improve educational outcomes. The organization is unique in that it operates both "in the cloud" (through PowerMyLearning.com, a free K-12 online learning platform) and "on the ground" (through its Digital Learning Program, a whole school initiative that works hands-on with all three of the constituents that impact student achievement: teachers, parents, and students).

PowerMyLearning.com is a free online educational tool that helps students, teachers and parents locate and access over 1,000 high-quality online digital learning activities — videos, simulations, and other educational software — to propel student achievement in subjects including math, English, science, and social studies. The platform features a kid-friendly design. There is a playpoint/badge feature to help motivate students. In addition, students can rate digital learning activities and share them with friends via e-mail, Facebook, and Twitter. CFY also provides onsite training to instruct teachers how to integrate PowerMyLearning into their classrooms.

Goal

Increase student attention and engagement, encourage students to take ownership of their learning, and make it easier for teachers to differentiate instruction without embarrassing students.

Benefits

1. Increase learning time by extending learning beyond the classroom walls.
2. Individualize learning and increase student engagement in school.
3. Encourage self-directed learning.
4. Enable parents to more effectively support their children at home.

Government

10. Improve Online Business Services Offered by the Government

Developing more e-Government applications not only provides value to businesses, but also allows the government to realize cost savings and achieve greater efficiency and effectiveness. Examples of activities include paying for permits and licensing, paying taxes, providing services to the government, and other operations.

Goal

Build an e-Government solution that improves the ability of businesses to conduct business with the government over the Internet.

Benefits

1. Facilitates business interaction with government, especially for urban planning, real estate development, and economic development.
2. e-Government lowers the cost to a business conducting all of its interaction with government. Further, as more businesses conduct their business with government online, their transaction costs will be lowered. The cost to a business for any interaction decreases as more technology and fewer staff resources are needed.
3. e-Government provides a greater amount of information to businesses and provides it in a more organized and accessible manner.

Action Items

1. The first step in the process of providing e-Government services to constituents is developing a functional web portal that allows businesses to have access to resources easily. Such a portal can enable outside businesses looking for new opportunities to make informed decisions about working in a certain community.
2. In addition, often overlooked in e-Government deployment are the issues of audiences and needs. Local governments must determine who will visit the website and what sort of information and services they will typically seek. A first step toward meeting general needs of constituents is to provide online access to as broad a swath of governmental information and data as is possible. The sort of information that should be included is:
 - Hours of operation and location of facilities.
 - Contact information of key staff and departments.
 - An intuitive search engine.
 - Access to documents (ideally a centralized repository of online documents and forms).
 - Local ordinances, codes, policies, and regulations.
 - Minutes of official meetings and hearings.
 - News and events.

11. Pursue Next Generation 911 Upgrades

The overall system architecture of Public Safety Answering Points (PSAPs) has essentially not changed since the first 911 call was made in 1968. These 911 systems are voice-only networks based on original wireline, analog, circuit-switched infrastructures that prevent easy transmission of data and critical sharing of information that can significantly enhance the decision-making ability, response, and quality of service provided to emergency callers. To meet growing public expectations of 911-system functionality (capable of voice, data, and video transmission from different types of communication devices), that framework should be replaced. This would require replacing analog phone systems with an Internet Protocol (IP)-based system. This system would provide an enabling platform for current technology as well as future upgrades.

For example, in January 2013, the Federal Communications Commission proposed to amend its rules by requiring all wireless carriers and providers of “interconnected” text messaging applications to support the ability of consumers to send text messages to 911 in all areas throughout the nation where 911 Public Safety Answering Points (PSAPs) are also prepared to receive the texts (which requires an IP-based system). Text-to-911 will provide consumers with enhanced access to emergency communications in situations where a voice call could endanger the caller, or a person with disabilities is unable to make a voice call. In the near term, text-to-911 is generally supported as the first step in the transition to a Next Generation 911.

Goal

Design a system that enables the transmission of voice, data, or video from different types of communication devices to Public Safety Answering Points (PSAPs) and onto emergency responder networks.

Benefits

1. Transitioning to a “Next Generation” IP-based network will enable the public to make voice, text, or video emergency calls from any communications device. With Next Generation 911, responders and PSAPs will gain greater situational awareness, which will enable better-informed decisions, resulting in better outcomes and, ultimately, a safer community. By capitalizing on advances in technologies, you are enabling:
 - Quicker and more accurate information to responders
 - Better and more useful forms of information
 - More flexible, secure and robust PSAP operations
 - Lower capital and operating costs

Action Items

1. If you're involved in PSAP decision making and are faced with replacing aging systems or purchasing new technology for the very first time, you need to consider what your most immediate requirements are and where you need to be 10 years from now. Your community can take a measured and practical approach that spreads the operational impact and costs of a Next Generation 911 transition over time. Your local agency should choose a starting point that makes the most sense and provides immediate benefits for their PSAP, responders, and communities they serve. For example, according to [Intrado, Inc.](#), a provider of 911 and emergency communications infrastructure to over 3,000 public safety agencies, local public-safety agencies can implement any of the following next-generation 911 components today, and provide immediate benefits with little to no disruption of current operations:
 - A public-safety-class, IP-based network
 - IP-based call processing equipment (CPE) in public-safety answering points (PSAPs)
 - Geographic information system (GIS) data enhancements
 - Advanced 911 data capabilities and applications

Healthcare

12. Promote Telemedicine in Remote Areas

Promote the delivery of healthcare services from a distance using video-based technologies. Telemedicine can help to address challenges associated with living in sparsely populated areas and having to travel long distances to seek medical care - particularly for patients with chronic illnesses. It also addresses the issue of the lack of medical specialists in remote areas by awarding access to specialists in major hospitals situated in other cities, states, or countries. While telemedicine can be delivered to patient homes, it can also be implemented

in partnership with local clinics, libraries, churches, schools, or businesses that have the appropriate equipment and staff to manage it. The most critical steps in promoting telemedicine are ensuring that patients and medical professionals have access to broadband service, understand the main features of telemedicine, are aware of the technologies required for telemedicine, and understand how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes [Distance Learning and Telemedicine Loans and Grants Program](#). The USDA provides loans and grants to rural community facilities (e.g. schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan.

Goal

Deliver improved healthcare services to rural residents.

APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND

Statewide Infrastructure

As part of the Michigan State Broadband Initiative (SBI), and in partnership and at the direction of the Michigan Public Service Commission (MPSC), Connect Michigan produced an inaugural map of broadband availability in spring 2010. The key goal of the map was to highlight communities and households that remain unserved or underserved by broadband service; this information was essential to estimating the broadband availability gap in the state and understanding the scope and scale of challenges in providing universal broadband service to all citizens across the state. Since the initial map’s release, Connect Michigan has collected and released new data every six months, with updates in October and April annually.

The most current Statewide and County Specific Broadband Inventory Maps released in the spring of 2014 depict a geographic representation of provider-based broadband data represented by cable, DSL, wireless, fiber, etc. These maps also incorporate data such as political boundaries and major transportation networks in the state. Vertical assets that can be utilized for broadband network facilitation or transmission will be added to the interactive mapping application in October 2012. A statewide map is found at www.connectmi.org/mapping/state. The county maps are found at http://www.connectmi.org/community_profile/find_your_county/michigan/emmet.

Table 1: Estimate of Broadband Service Availability in the State of Michigan By Speed Tier Among Fixed Platforms

SBI Download Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent Households by Speed Tier
At Least 768 Kbps/200 Kbps	37	3,836	99.05
At Least 1.5 Mbps/200 Kbps	46	3,826	98.80
At Least 3 Mbps/768 Kbps	103	3,769	97.33
At Least 6 Mbps/1.5 Mbps	251	3,621	93.52
At Least 10 Mbps/1.5 Mbps	279	3,594	92.80
At Least 25 Mbps/1.5 Mbps	515	3,357	86.70
At Least 50 Mbps/1.5 Mbps	646	3,227	83.33
At Least 100 Mbps/1.5 Mbps	647	3,226	83.30
At Least 1 Gbps/1.5 Mbps	3,867	5	0.14

Source: Connect Michigan, April 2014.

Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband service inventory (excluding mobile and satellite service) across the state of Michigan; it presents the number and percentage of unserved and served households by speed tiers. The total number of households in Michigan in 2010 was 3,872,508, for a total population of 9.88 million people. Table 1 indicates that 99.05% of households are able to connect to broadband at download speeds of at least 768 Kbps. This implies that the number of households originally estimated by Connect Michigan to be unserved has dropped from 121,701 households in the fall of 2010 to 36,603 households in the spring of 2014. Further, approximately 3,769,134 households across Michigan have broadband available of at least 3 Mbps download speeds and 768 Kbps upload speeds. The percentage of Michigan households having fixed broadband access available of at least 6 Mbps download speeds is estimated at 93.52%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.92% of Michigan households have broadband available from at least one provider at download speeds of 768 Kbps or higher and upload speeds of 200 Kbps or higher. This leaves 3,100 households in the state completely unserved by any form of terrestrial broadband (including mobile, but excluding satellite services).

As differences in broadband availability estimates between the fall of 2010 and the spring of 2013 show, additional participating broadband providers can have a large impact upon Michigan broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise that should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders identify areas where the displayed coverage is underestimated or overestimated. Connect Michigan welcomes such feedback to be analyzed in collaboration with broadband providers to correct errors identified in the maps.

In addition, the broadband availability data collected, processed, and aggregated by Connect Michigan has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Michigan's broadband availability estimates reported by the NTIA and the FCC in the National Broadband Map. The National Broadband Map can be found here: <http://www.broadbandmap.gov> and the Map's specific page for Michigan can be found here: <http://www.broadbandmap.gov/summarize/state/michigan>.

Interactive Map

Connect Michigan provides My ConnectView,TM an online tool developed and maintained by Connected Nation, intended to allow users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Michigan's citizens to take an active role in seeking service, upgrading service, or simply

becoming increasingly aware of what broadband capabilities and possibilities exist in their area, city, county, or state.

<http://www.connectmi.org/interactive-map>

For additional maps and other related information, visit: <http://www.connectmi.org/broadband-landscape>.

Business and Residential Technology Assessments

To complement the broadband inventory and mapping data, Connect Michigan periodically conducts statewide residential and business technology assessments to understand broadband demand and trends across the state. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the broadband adoption gap across the state of Michigan. Key questions the data address are: who, where, and how are households in Michigan using broadband technology? How is this technology impacting Michigan households and residents? Who is not adopting broadband service and why? What are the barriers that prevent citizens from embracing this empowering technology?

Through Connect Michigan's research, many insights are able to be collected. The most recent residential technology revealed the following key findings:

- Statewide, 71% of Michigan residents subscribe to home broadband service. Even though this represents a 10 percentage point gain from 2011, it means that more than 2.1 million Michigan adults still do not subscribe to home broadband service.
- The cost of broadband is becoming a smaller barrier among Michigan residents who do not subscribe to broadband; fewer Michiganders who do not subscribe to broadband cite cost as the main reason for not subscribing, while a larger share say they don't see home broadband service as relevant or useful.
- Broadband empowers Michigan workers to search for jobs or find better jobs. Statewide, 40% of Michigan Internet users search for jobs online, including 55% of low-income Internet users.

Additionally, an assessment on technology in businesses released in May 2012 in a report titled *Technology Adoption among Michigan Businesses* revealed the following key findings:

- Across Michigan, 69% of businesses subscribe to broadband service, representing approximately 70,000 Michigan businesses that still do not use or benefit from broadband.
- Michigan business establishments that use broadband report median annual revenues that are approximately \$300,000 higher than businesses that do not use broadband.
- Online sales in Michigan account for approximately \$9.2 billion in annual sales revenue, including nearly \$1.8 billion for small businesses with fewer than five employees and more than \$1.9 billion for rural Michigan businesses.

For more information on the statewide information described, visit the Connect Michigan website at <http://www.connectmi.org/>.

APPENDIX 2: PARTNER AND SPONSORS

Connect Michigan, in partnership with the Michigan Public Service Commission (MPSC), supports Michigan’s reinvention and technological transformation through innovation, job creation, and entrepreneurship via the expansion of broadband technology and increased usage by Michigan residents. In 2009, Connect Michigan partnered with the Michigan Public Service Commission to engage in a comprehensive broadband planning and technology initiative as part of the national effort to map and expand broadband. The program began by gathering provider data to form a statewide broadband map and has progressed to the planning and development stage. At this point, the program is expanding to include community engagement in local technology planning, identification of opportunities with existing programs, and implementation of technology projects designed to address digital literacy, improve education, give residents access to global Internet resources, and stimulate economic development.

www.connectmi.org

The **Michigan Public Service Commission (MPSC)** is the lead Michigan agency for the State Broadband Initiative that is responsible for working with Connect Michigan, overseeing the Michigan initiative, and providing direction of the project. The MPSC facilitates interactions with other state government entities, broadband providers, and other Michigan stakeholders. They view promoting broadband view Connect Michigan activities as complementary to their mission to “grow Michigan's economy and enhance the quality of life of its communities by assuring safe and reliable energy, telecommunications, and transportation services at reasonable rates.”

<http://www.michigan.gov/mpsc>

Connected Nation (Connect Michigan’s parent organization) is a leading technology organization committed to bringing affordable high-speed Internet and broadband-enabled resources to all Americans. Connected Nation effectively raises the awareness of the value of broadband and related technologies by developing coalitions of influencers and enablers for improving technology access, adoption, and use. Connected Nation works with consumers, community leaders, states, technology providers, and foundations, including the Bill & Melinda Gates Foundation, to develop and implement technology expansion programs with core competencies centered on a mission to improve digital inclusion for people and places previously underserved or overlooked.

<http://www.connectednation.org>

The **National Telecommunications and Information Administration (NTIA)** is an agency of the

United States Department of Commerce that is serving as the lead agency in running the State Broadband Initiative (SBI). Launched in 2009, the NTIA's State Broadband Initiative implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and healthcare rely not only on broadband infrastructure, but also on the knowledge and tools to leverage that infrastructure.

The NTIA has awarded a total of \$293 million for the SBI program to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. Grantees such as Connect Michigan are using this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, developing research to investigate barriers to broadband adoption, searching out and creating innovative applications that increase access to government services and information, and developing state and local task forces to expand broadband access and adoption.

Since accurate data is critical for broadband planning, another purpose of the SBI program is to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services used by community institutions such as schools, libraries, and hospitals. This data is used by the NTIA to update the National Broadband Map, the first public, searchable nationwide map of broadband availability launched February 17, 2011.

APPENDIX 3: THE NATIONAL BROADBAND PLAN

The National Broadband Plan, released in 2010 by the Federal Communications Commission, has the express mission of creating a high-performance America—a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications. The plan seeks to ensure that the entire broadband ecosystem—networks, devices, content and applications— is healthy.

The plan recommends that the country adopt and track the following six goals to serve as a compass over the next decade:

GOAL No. 1: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.

GOAL No. 2: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

GOAL No. 3: Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.

GOAL No. 4: Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.

GOAL No. 5: To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

GOAL No. 6: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

To learn more, visit: www.broadband.gov.

APPENDIX 4: WHAT IS CONNECTED?

The goal of Connect Michigan’s Connected program is to empower locally informed and collaborative technology planning that addresses each community’s need for improved access, adoption, and use of technology:

- **ACCESS** – Does your community have access to affordable and reliable broadband service?
- **ADOPTION** – Is your community addressing the barriers to broadband adoption?
- **USE** – Are residents using technology to improve their quality of life?

Connected Nation leverages state-based public-private partnerships to engage residents at the local level. Regionally based staff provide “train-the-trainer” activities to local leaders, such as librarians, school administrators, economic development professionals, and public officials, and help them organize multi-sector technology planning teams, inventory local technology resources and initiatives, assess local technology access, adoption, and use, and develop local strategies that target specific technology gaps in the community.

Connected’s community technology-planning framework is cyclical. As with other forms of community planning – and especially so with technology planning – change is the only constant. At the community level, changing technology requirements, shifting demographics, economic drivers, and workforce requirements may expose or create new digital divides. Connected’s community technology-planning framework supports a sustained effort.

Connected Planning Process

Connected’s community technology-planning framework provides a clear path for the sustainable acceleration of broadband access, adoption, and use.



Step 1: Engage. Successful strategies to bridge the local digital divide and increase broadband access, adoption, and use are predicated on broad and sustained stakeholder participation. A successful local technology planning team should include people from multiple sectors, including:

- State and Local Government
- Public Safety
- Education (K-12, Higher Ed)
- Library
- Business & Industry, Agriculture, Recreation and Tourism
- Healthcare
- Community Organizations
- Technology Providers

Step 2: Assess. The Connected planning process guides the local technology planning team through an assessment of community technology resources, strengths, assets, needs, and gaps in order to identify and develop strategies to address specific technology gaps and opportunities in the community. Bolstered by benchmarking data that had been gathered through Connect Michigan’s mapping and market research, the local technology planning team works with community members to benchmark local broadband access, adoption, and use via the Connected Assessment, which measures:

ACCESS	ADOPTION	USE
1. Broadband Availability	6. Digital Literacy	10. Economic Opportunity
2. Broadband Speeds	7. Public Computer Centers	11. Education
3. Broadband Competition	8. Broadband Awareness	12. Government
4. Middle Mile Access	9. Vulnerable Population Focus	13. Healthcare
5. Mobile Broadband Availability		

Step 3: Plan. Once community resources and needs are identified, the community planning team begins to identify local priorities and policies, programs, and technical solutions that will accelerate broadband access, adoption, and use. Connected Nation provides recommended actions based on best practices from communities across the United States.

Step 4: Act. The technology planning team works together to ensure that selected policies, programs, and technical solutions are adopted, implemented, improved, and maintained. The Connected program also provides a platform for collaboration and the sharing of best practices between communities. Connected Nation also provides communications support to raise awareness of your community’s efforts. For communities that measurably demonstrate proficiency in broadband access, adoption, and use in the Connected Assessment, Connected Nation offers Connected certification, a nationally recognized certification that provides an avenue for pursuing opportunities as a recognized, technologically advanced community.

APPENDIX 5: GLOSSARY OF TERMS

#

3G Wireless - Third Generation - Refers to the third generation of wireless cellular technology. It has been succeeded by 4G wireless. Typical speeds reach about 3 Mbps.

4G Wireless - Fourth Generation - Refers to the fourth generation of wireless cellular technology. It is the successor to 2G and 3G. Typical implementations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

A

ARRA - American Recovery and Reinvestment Act.

ADSL - Asymmetric Digital Subscriber Line - DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically thought of as a residential service.

ATM - Asynchronous Transfer Mode - A data service offering by ASI that can be used for interconnection of customers' LAN. ATM provides service from 1 Mbps to 145 Mbps utilizing Cell Relay Packets.

B

Bandwidth - The amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.

BIP - Broadband Infrastructure Program - Part of the American Recovery and Reinvestment Act (ARRA), BIP is the program created by the U.S. Department of Agriculture focused on expanding last mile broadband access.

Bit - A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approximately 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.

BPL - Broadband Over Powerline - An evolving theoretical technology that provides broadband service over existing electrical power lines.

BPON - Broadband Passive Optical Network - A point-to-multipoint fiber-lean architecture network system which uses passive splitters to deliver signals to multiple users. Instead of running a separate strand of fiber from the CO to every customer, BPON uses a single strand of fiber to serve up to 32 subscribers.

Broadband - A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g. DSL, cable Internet).

BTOP - Broadband Technology Opportunities Program - Part of the American Recovery and Reinvestment Act (ARRA), BTOP is the program created by the U.S. Department of Commerce

focused on expanding broadband access, expanding access to public computer centers, and improving broadband adoption.

C

Cable Modem - A modem that allows a user to connect a computer to the local cable system to transmit data rather than video. It allows broadband services at speeds of five Mbps or higher.

CAP - Competitive Access Provider - (or “Bypass Carrier”) A company that provides network links between the customer and the Inter-Exchange Carrier or even directly to the Internet Service Provider. CAPs operate private networks independent of Local Exchange Carriers.

Cellular - A mobile communications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communications to and from mobile users within a specified area.

CLEC - Competitive Local Exchange Carrier - Wireline service provider that is authorized under state and federal rules to compete with ILECs to provide local telephone and Internet service. CLECs provide telephone services in one of three ways or a combination thereof: a) by building or rebuilding telecommunications facilities of their own, b) by leasing capacity from another local telephone company (typically an ILEC) and reselling it, or c) by leasing discreet parts of the ILEC network referred to as UNEs.

CMTS - Cable Modem Termination System - A component (usually located at the local office or head end of a cable system) that exchanges digital signals with cable modems on a cable network, allowing for broadband use of the cable system.

CO - Central Office - A circuit switch where the phone and DSL lines in a geographical area come together, usually housed in a small building.

Coaxial Cable - A type of cable that can carry large amounts of bandwidth over long distances. Cable TV and cable modem broadband service both utilize this technology.

Community Anchor Institutions (CAI) - Institutions that are based in a community and larger user of broadband. Examples include schools, libraries, healthcare facilities, and government institutions.

CWDM - Coarse Wavelength Division Multiplexing - Multiplexing (more commonly referred to as WDM) with less than 8 active wavelengths per fiber.

D

Dial-Up - A technology that provides customers with access to the Internet over an existing telephone line. Dial-up is much slower than broadband.

DLEC - Data Local Exchange Carrier - DLECs deliver high-speed access to the Internet, not voice. DLECs include Covad, Northpoint, and Rhythms.

Downstream - Data flowing from the Internet to a computer (surfing the net, getting e-mail, downloading a file).

DSL - Digital Subscriber Line - The use of a copper telephone line to deliver “always on” broadband Internet service.

DSLAM - Digital Subscriber Line Access Multiplier - A piece of technology installed at a telephone company's CO that connects the carrier to the subscriber loop (and ultimately the customer's PC).

DWDM - Dense Wavelength Division Multiplexing - A SONET term which is the means of increasing the capacity of SONET fiber-optic transmission systems.

E

E-rate - A federal program that provides subsidy for voice and data lines to qualified schools, hospitals, Community-Based Organization (CBOs), and other qualified institutions. The subsidy is based on a percentage designated by the FCC.

Ethernet - A local area network (LAN) standard developed for the exchange data with a single network. It allows for speeds from 10 Mbps to 10 Gbps.

EON - Ethernet Optical Network - The use of Ethernet LAN packets running over a fiber network.

EvDO - Evolution Data Only - A new wireless technology that provides data connections that are 10 times faster than a regular modem.

F

FCC - Federal Communications Commission - A federal regulatory agency that is responsible for, among other things, regulating VoIP.

Fixed Wireless Broadband - The operation of wireless devices or systems for broadband use at fixed locations such as homes or offices.

Franchise Agreement - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

FTTH - Fiber To The Home - Another name for fiber to the premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds.

FTTN - Fiber To The Neighborhood - A hybrid network architecture involving optical fiber from the carrier network, terminating in a neighborhood cabinet that converts the signal from optical to electrical.

FTTP - Fiber To The Premise (Or FTTB – Fiber To The Building) - A fiber optic system that connects directly from the carrier network to the user premises.

G

Gbps - Gigabits per second - 1,000,000,000 bits per second or 1,000 Mbps. A measure of how fast data can be transmitted.

GPON - Gigabyte-Capable Passive Optical Network - Uses a different, faster approach (up to 2.5 Gbps in current products) than BPON.

GPS - Global Positioning System - A system using satellite technology that allows an equipped user to know exactly where he is anywhere on earth.

GSM - Global System for Mobile Communications - This is the current radio/telephone standard in Europe and many other countries except Japan and the United States.

H

HFC - Hybrid Fiber Coaxial Network - An outside plant distribution cabling concept employing both fiber optic and coaxial cable.

Hotspot - See *Wireless Hotspot*.

I

IEEE - Institute of Electrical and Electronics Engineers (pronounced “Eye-triple-E.”).

ILEC - Incumbent Local Exchange Carrier - The traditional wireline telephone service providers within defined geographic areas. They typically provide broadband Internet service via DSL technology in their area. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs.

IP-VPN - Internet Protocol - Virtual Private Network - A software-defined network offering the appearance, functionality, and usefulness of a dedicated private network.

ISDN - Integrated Services Digital Network - An alternative method to simultaneously carry voice, data, and other traffic, using the switched telephone network.

ISP - Internet Service Provider - A company providing Internet access to consumers and businesses, acting as a bridge between customer (end-user) and infrastructure owners for dial-up, cable modem, and DSL services.

K

Kbps - Kilobits per second - 1,000 bits per second. A measure of how fast data can be transmitted.

L

LAN - Local Area Network - A geographically localized network consisting of both hardware and software. The network can link workstations within a building or multiple computers with a single wireless Internet connection.

LATA - Local Access and Transport Areas - A geographic area within a divested Regional Bell Operating Company is permitted to offer exchange telecommunications and exchange access service. Calls between LATAs are often thought of as long-distance service. Calls within a LATA (IntraLATA) typically include local and local toll telephone services.

Local Loop - A generic term for the connection between the customer’s premises (home, office, etc.) and the provider’s serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.

Low Income - Low income is defined by using the poverty level as defined by the U.S. Census Bureau. A community’s low-income percentage can be found at www.census.gov.

M

MAN - Metropolitan Area Network - A high-speed data intra-city network that links multiple locations with a campus, city, or LATA. A MAN typically extends as far as 50 kilometers (or 31 miles).

Mbps - Megabits per second - 1,000,000 bits per second. A measure of how fast data can be transmitted.

Metro Ethernet - An Ethernet technology-based network in a metropolitan area that is used for connectivity to the Internet.

Multiplexing - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time. Multiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

NTIA - National Telecommunications and Information Administration, which is housed within the United State Department of Commerce.

NIST - National Institute of Standards and Technology.

O

Overbuilders - Building excess capacity. In this context, it involves investment in additional infrastructure projects to provide competition.

OVS - Open Video Systems - A new option for those looking to offer cable television service outside the current framework of traditional regulation. It would allow more flexibility in providing service by reducing the build-out requirements of new carriers.

P

PON - Passive Optical Network - A Passive Optical Network consists of an optical line terminator located at the Central Office and a set of associated optical network terminals located at the customer's premises. Between them lies the optical distribution network comprised of fibers and passive splitters or couplers.

R

Right-of-Way - A legal right of passage over land owned by another. Carriers and service providers must obtain right-of-way to dig trenches or plant poles for cable and telephone systems and to place wireless antennae.

RPR - Resilient Packet Ring - Uses Ethernet switching and a dual counter-rotating ring topology to provide SONET-like network resiliency and optimized bandwidth usage, while delivering multi-point Ethernet/IP services.

RUS - Rural Utility Service - A division of the United States Department of Agriculture that promotes universal service in unserved and underserved areas of the country through grants, loans, and financing.

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

SBI - State Broadband Initiatives, formerly known as the State Broadband Data & Development (SBDD) Program.

SONET - Synchronous Optical Network - A family of fiber-optic transmission rates.

Streaming - A Netscape innovation that downloads low-bit text data first, then the higher bit graphics. This allows users to read the text of an Internet document first, rather than waiting for the entire file to load.

Subscribership - Subscribership is the number of customers that have subscribed for a particular telecommunications service.

Switched Network - A domestic telecommunications network usually accessed by telephones, key telephone systems, private branch exchange trunks, and data arrangements.

T

T-1 - Trunk Level 1 - A digital transmission link with a total signaling speed of 1.544 Mbps. It is a standard for digital transmission in North America.

T-3 - Trunk Level 3 - 28 T1 lines or 44.736 Mbps.

U

UNE - Unbundled Network Elements - Leased portions of a carrier's (typically an ILEC's) network used by another carrier to provide service to customers.

Universal Service - The idea of providing every home in the United States with basic telephone service.

Upstream - Data flowing from your computer to the Internet (sending e-mail, uploading a file).

V

VDSL (or VHDSL) - Very High Data Rate Digital Subscriber Line - A developing technology that employs an asymmetric form of ADSL with projected speeds of up to 155 Mbps.

Video On Demand - A service that allows users to remotely choose a movie from a digital library and be able to pause, fast-forward, or even rewind their selection.

VLAN - Virtual Local Area Network - A network of computers that behave as if they were connected to the same wire even though they may be physically located on different segments of a LAN.

VoIP - Voice over Internet Protocol - A new technology that employs a data network (such as a broadband connection) to transmit voice conversations.

VPN - Virtual Private Network - A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable one to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

Vulnerable Groups -Vulnerable groups will vary by community, but typically include low-income, minority, senior, children, etc.

W

WAN - Wide Area Network - A communications system that utilizes cable systems, telephone lines, wireless, and other means to connect multiple locations together for the exchange of data, voice, and video.

Wi-Fi - Wireless Fidelity - A term for certain types of wireless local networks (WLANs) that uses specifications in the IEEE 802.11 family.

WiMax - A wireless technology that provides high-throughput broadband connections over long distances. WiMax can be used for a number of applications, including last mile broadband connections, hotspots, and cellular backhaul and high-speed enterprise connectivity for businesses.

Wireless Hotspot - A public location where Wi-Fi Internet access is available for free or for a small fee. These could include airports, restaurants, hotels, coffee shops, parks, and more.

Wireless Internet - 1) Internet applications and access using mobile devices such as cell phones and palm devices. 2) Broadband Internet service provided via wireless connection, such as satellite or tower transmitters.

Wireline - Service based on infrastructure on or near the ground, such as copper telephone wires or coaxial cable underground, or on telephone poles.

APPENDIX 4

Technology Letters of Support

Local Broadband Solutions for the Greater Harbor Springs Area:

HARBOR, Inc.'s Community Approach

March 2015



A regional public/private economic development organization serving Antrim, Charlevoix, Cheboygan and Emmet Counties, Michigan, USA

Rachel Smolinski, Executive Director
HARBOR, Inc.
P.O. Box 112
Harbor Springs, MI 49740

Dear Rachel:

I am writing to lend support from the Northern Lakes Economic Alliance (NLEA) for your proposed "Broadband Access Feasibility and Engineering Study" proposal to the USDA Rural Development.

We are pleased that HARBOR, Inc. is partnering with the Little Traverse Bay Bands of Odawa Indians, NLEA, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within northern Emmet County.

We recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the HARBOR, Inc. service area.

We will provide technical assistance to this project by serving on the Project Oversight Committee and other tasks, as needed. We hereby commit no less than 160 hours of our staff time to assist with implementation the "Broadband Access Feasibility and Engineering Study".

Thank you for the opportunity to participate in this important effort.

Sincerely,

Andy Hayes
President

1313 Boyne Ave / P.O. Box 8

Boyne City, Michigan 49712

Phone: 231.582.6482 - Fax: 231.582.3213

www.northernlakes.net * info@northernlakes.net

Core Partners -

CONCIÈRGE

P.o. Box 624 • Harbor Springs, Michigan 49740 • (231) 526-9422

February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Concièrge Publications supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc service area.

As a business located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

Since 1988, Concièrge has welcomed you to Northern Michigan with our three times a year publication and numerous websites employing four people in the area. This long standing and well known digest-size publication includes the north's most comprehensive calendar of events, stories, maps, and more. You can find businesses easily through sections of shopping, dining, activities, lodging, galleries, and antiques & furnishings.

Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers; therefore, bringing additional people to live, work, shop, and dine in the area. With an increase in the demand for our services and economic growth in the area as a result of increased broadband infrastructure; we anticipate adding **two** new people to our team.

In addition, I will serve as a member of the Project Advisory Team, committing 12 hours of her time to the project.

Sincerely,



Kathie Breighner, Owner
Concièrge Publications



6546 Mercantile Way, Lansing, Michigan 48911

February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Connect Michigan supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc. service area.

Connect Michigan, in partnership with the Michigan Public Service Commission, is working to ensure that all can experience the benefits of broadband. As an organization working with your regional broadband team over the past two years, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity in your area. Through our Community Engagement Program, you were able finalize a Community Technology Action Plan in 2013, and work through a set of community based strategies to increase broadband access, adoption, and use in your area improving all areas of life.

In support of your project, our Connect Michigan staff will provide technical assistance to the project as that assistance is aligned with the scope of the State Broadband Initiative. More information on our organization and activities may be found at <http://www.connectmi.org/>.

Sincerely,

Eric Frederick, AICP, LEED AP
Executive Director
Connect Michigan



February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Coolhouse Labs supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc service area.

Founded in a small resort community on the shores of Lake Michigan, we like to describe ourselves as a bit of summer camp for startups, only with fewer bug bites. Each summer we invite 5-10 technology based startups to be a part of our mentorship-driven accelerator program and employ 13 staff.

We work out of a cooperative space, connect with world-class mentors, and build awesome products that solve real problems for small businesses. Our goal is to bring together talented and creative people and create an environment where big ideas can come to life.

As a business accelerator located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers; therefore, bringing additional people to live, work, and play in the area. With an increase in the availability of high capacity broadband and economic growth in the area; we anticipate that **two** of the technology based start up businesses will locate in and around the service area.

Sincerely,

A handwritten signature in black ink, appearing to be "JB", followed by a long horizontal line extending to the right.

Jordan Breighner, Founder and CEO
Coolhouse Labs

Farming for our Future

at Pond Hill

February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Farming for our Future supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc service area.

As an organization located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

Farming for our Future currently employs an Executive Director who works with numerous entities and volunteers in the area. Our local programs include: the Harbor Springs Farmers Market, Edible Main Street, and numerous farm education opportunities. We empower individuals, groups and communities by providing resources, skills and training. Our programs go well beyond just planting, weeding and harvesting. We provide hands on education and youth leadership programs; have future plans to offer cooking and nutrition programs for the public with special programs targeting low-income families; and to expand the capacity of groups to develop school & community gardens.

Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers; therefore, bringing additional people to live and work in the community. With an increase in the demand for our services and economic growth in the area as a result of increased broadband infrastructure; we anticipate adding **one** new person to our organization.

In addition, I will serve as a member of the Project Advisory Team, committing 12 hours of my time to the project.

Sincerely,



Cyndi Kramer, Executive Director
Farming for our Future

DESIGN INNOVATIONS Inc
Product Design and Development
2997 S. Lakeshore Dr. - Harbor Springs, MI 49740

February 3, 2014

Rachel Smolinski, Executive Director
HARBOR, Inc
Harbor Springs, MI 49740

Dear Rachel:

I am writing in support of the efforts of HARBOR, Inc to seek funding for Broadband Access Feasibility and Engineering Study.

Design Innovations is a product design firm employing two people. We design products ranging from medical devices to toys and consumer products. In the course of our work, we frequently need to upload and download files of around 1 gigabyte.

Our work has been made much more difficult by the limitations of the satellite service which today seems to be our best option. We occasionally have had to resort to driving to other sites to use a broadband connection when the satellite transmittal speed is too slow, the reception is poor, or our "service" is cut off because we have used more than our data allotment. Also, the speed is too slow to use voice-over-internet technology. This prevents us from using Skype and video conferencing as a means of communication.

Having communicated with our clients and their vendors electronically for over 15 years we are well aware of the benefits of teleworking from a home-based business. We believe that having true broadband access in our area would help our business, and would be considered a necessity for other people considering teleworking here.

Best Regards,

Denise Simon

Denise Simon, owner
Design Innovations, Inc
231-526-9302

dmsimon@design-innovations.com



February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Stafford's Hospitality supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc service area.

As a business located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

For over 50 years, Stafford's Hospitality has provided premier waterfront dining and historic lodging throughout northern Michigan with 5 unique establishments, employing over 200 people in the area. Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers; therefore, bringing additional people to live, work, shop, and dine in the area. If business increases in the area, we anticipate adding **two** new people to our team at each location. The Stafford's Pier will be directly affected by economic growth as a result of increased broadband infrastructure in the area; therefore, **two** new jobs will be created.

In addition, Jody Ewbank, Chairperson of the Harbor Springs Area Chamber of Commerce Business Committee and General Manager of Stafford's Pier Restaurant, will serve as a member of the Project Advisory Team, committing 12 hours of her time to the project.

Sincerely,



Brian Ewbank, Vice President
Stafford's Hospitality



January 16, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc.):

I am writing to inform you that The Harbor Springs Library fully supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study. In addition, we are confident that HARBOR, Inc. possesses the qualifications to complete the project.

*Harbor Springs Library
Board of Trustees:*

*Sandra T. Baker
Jenny Deegan
Paul Drayer
Laura Kors
Maureen Nicholson
Michael Ossewaarde*

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc. service area.

As an entity located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

We will participate in this effort by committing whatever administrative time and resources that are reasonably available to the Harbor Springs Library to assist with implementation the Broadband Access Feasibility and Engineering Study.

As the project progresses, please keep us informed so that we may assist in these efforts and provide information to others at The Harbor Springs Library.

Sincerely,

Alexandra N. Osetek
Executive Director, Harbor Springs Library

LITTLE TRAVERSE BAY BANDS OF ODAWA INDIANS
TRIBAL ADMINISTRATION
7500 Odawa Circle
Harbor Springs, MI 49740

February 12, 2014

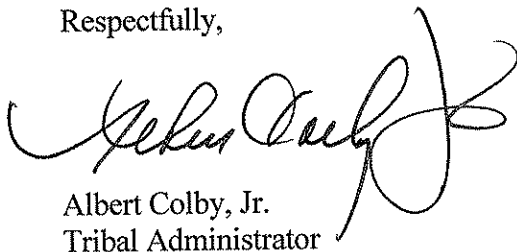
Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

The Little Traverse Bay Bands of Odawa Indians (LTBB) is committed to working with HARBOR, Inc. and Northern Lakes Economic Alliance to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the Tribal Reservation area and the HARBOR, Inc. service area. Contingent upon HARBOR, Inc. receiving funding from the U.S.D.A. for the Broadband Access Feasibility and Engineering Study, LTBB will commit to providing contributions of staff time and resources valued at approximately \$10,000. In-kind contributions of staff time will include the LTBB Management Information Systems Director, Geographic Information Systems Director, Planning Director and Grant Writer services to assist with completion and analysis of the study and provide consulting services, along with associated travel costs and office supplies needed to support the project.

As a project partner, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area. Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers, which is an ideal niche for many of our Tribal citizens. Therefore, this project will greatly improve economic development opportunities for many low-income and unemployed Tribal citizens who live in the most rural locations in our reservation. We anticipate this project to allow home-based business expansion for approximately five LTBB families, which would provide employment for an estimated ten citizens.

LTBB appreciates the time, effort and leadership HARBOR, Inc. has provided to develop this project. We are pleased to offer our continued support and commitment for the project. If you have any questions or need additional information, please do not hesitate to contact Julie Kauppila, LTBB Grant Writer, at 231-242-1560 or jkauppila@ltbbodawa-nsn.gov.

Respectfully,



Albert Colby, Jr.
Tribal Administrator

LITTLE TRAVERSE BAY BANDS OF ODAWA INDIANS
TRIBAL ADMINISTRATION
7500 Odawa Circle
Harbor Springs, MI 49740

January 28, 2015

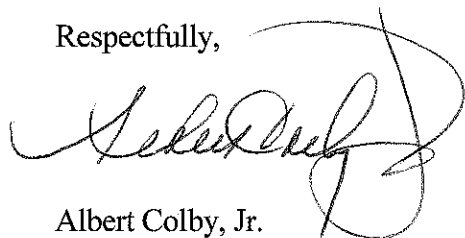
Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

The Little Traverse Bay Bands of Odawa Indians (LTBB) is committed to working with HARBOR, Inc. and Northern Lakes Economic Alliance to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the Tribal Reservation area and the HARBOR, Inc. service area. LTBB will commit to providing in-kind contributions of staff time from the LTBB Management Information Systems Director, Geographic Information Systems Director, Planning Director and Grant Writer services to assist with completion and analysis of the study and provide consulting services, along with associated travel costs and office supplies needed to support the project.

As a project partner, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our understanding that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area. Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers, which is an ideal niche for many of our Tribal citizens. Therefore, this project will greatly improve economic development opportunities for many low-income and unemployed Tribal citizens who live in the most rural locations in our reservation. We anticipate this project to allow home-based business expansion for at least five LTBB families, which would provide employment for an estimated 10 citizens.

LTBB appreciates the time, effort and leadership HARBOR, Inc. has provided to develop this project. We are pleased to offer our continued support and commitment for the project. If you have any questions or need additional information, please do not hesitate to contact Julie Kauppila, LTBB Grant Writer, at 231-242-1560 or jkauppila@ltbbodawa-nsn.gov.

Respectfully,



Albert Colby, Jr.
Tribal Administrator



Three Pines Studio

5959 W. Levering
P.O. Box 221
Cross Village, MI 49723
231 526 9447

February 14th, 2014

Dear Harbor Area Regional Board of Resources, Inc (HARBOR, Inc):

We are writing to inform you that Three Pines Studio supports your efforts to seek funding for the Broadband Access Feasibility and Engineering Study.

We are pleased that HARBOR, Inc. will partner with the Little Traverse Bay Bands of Odawa Indians, Northern Lakes Economic Alliance, and others to complete a study that determines the feasibility of economic growth through the increase of low impact, high-tech home-based businesses and teleworking as the result of the expansion of internet broadband infrastructure in communities within the HARBOR, Inc service area.

As a business located within the service area, we recognize the potential for economic growth through the expansion of technology, specifically increasing broadband capacity. It is our experience that businesses and teleworkers need at least 10Mbps of broadband capacity to perform daily tasks effectively, which is not widely available within the service area.

Three Pines is a working art studio and art gallery. My wife and I are both artist-fiber and clay respectively. We also represent about 30 other local artists and have about 120 workshops a year. As a result of these activities, we use the inter-net for image transfers, for sales, evaluations and publication preparation. It is essential to our success. Typically there are three to four employees in the summer but have had as many as five during events. Increased broadband capacity will definitely contribute to our abilities to expand.

Expanded broadband infrastructure will increase opportunities for home-based businesses and teleworkers; therefore, bringing additional people to live, work, shop, and dine in the area. With an increase in the demand for our services and economic growth in the area as a result of increased broadband infrastructure; we anticipate adding 2 new people to our team.

Sincerely,

A handwritten signature in black ink that reads "Gene Reck". The signature is fluid and cursive.

Gene Reck, Co-Owner
Three Pines Studio

APPENDIX 5

HARBOR, Inc. Broadband Internet Demand Survey

Local Broadband Solutions for the Greater Harbor Springs Area:

HARBOR, Inc.'s Community Approach

March 2015

HARBOR, INC.
P.O. BOX 112
HARBOR SPRINGS, MI 49740

PLEASE HELP US
PROVIDE THIS
IMPORTANT PUBLIC
SERVICE TO THE HARBOR
SPRINGS AREA COMMUNITY.
COMPLETE YOUR SURVEY
TODAY FOR A CHANCE
TO WIN ONE OF THREE
\$25 GAS CARDS!



Harbor Area
Regional Board of
Resources, Inc.

HARBOR, INC.
P.O. BOX 112
HARBOR SPRINGS, MI 49740

Non-Profit Org.
U.S. Postage
PAID
Harbor Springs, MI
Permit #800

THIS SURVEY OF HARBOR SPRINGS AREA RESIDENTS IS BEING CONDUCTED BY HARBOR, INC.

1 Was this mailing sent to your year-round place of residence?

- Yes, I am a full time resident/owner
- Yes, I am a full time resident but not owner
- No, I am a part-time resident/owner
- No, I am a part-time resident, but not owner
- No, this is a business address

7 How much per month would you be willing to pay for a higher-speed Internet connection? (Choose one option)

- \$20-40 \$40-60 \$60-80
- \$80-100 More than \$100

2 Do you currently have Internet access at your Harbor Springs Area residence?

- Yes No (if no, skip questions 3-5)

3 What type of internet access do you have at your Harbor Springs Area residence?

- Cable modem/DSL Satellite
- Cell phone network (mobile phone or wireless air card)
- Dial-up (via phone line) Other (specify) _____

4 Does your current Internet service meet your needs?

- Yes No

5 Do you use the Internet at this residence for business or professional purposes?

- Yes, adequate for my needs
- Yes, but my current service prevents optimum productivity
- No, I don't need the internet for these purposes
- No, I am unable to use the internet for these purposes

6 Would you be willing to pay extra for a higher-speed connection?

- Yes No (if no, skip questions 7 and 8)

8 If installation of high-speed Internet service requires an initial (one time) equipment / installation charge, how much would you be willing to pay? (choose one option)

- Less than \$100 \$100-250 \$250-500
- \$500-1,000 \$1,000 or more

Comments: _____

Dear Harbor Springs Area Resident,

We are conducting a survey to gather data relating to possible, future Internet service(s) in the greater Harbor Springs area. **Your response to this survey is critical in providing this important public service.**

HARBOR Inc. is a citizen based, non-profit, Michigan Corporation founded in 2001. We are located in Harbor Springs and our mission statement is as follows:

To bring together the Greater Harbor Springs Community by providing a platform for cooperation and communication; by encouraging participation through education and discussion; by facilitating the understanding and implementation of multiple plans and proposals; and by promoting, protecting, and maintaining the common vision for the Greater Harbor Springs Community.

Our service area includes the City of Harbor Springs and the Townships of West Traverse, Little Traverse, Readmond, Friendship, Pleasantview, and Cross Village. Our Board of Directors consists of forty-seven (47) members and the Executive Committee consisting of seven (7) members of the Board of Directors.

A sub-committee of our organization is the HARBOR, Inc. Broadband Team, which has been meeting for six years, working to increase broadband service throughout the areas noted above.

The attached survey is critical as we move forward and we greatly appreciate your time in completing it. Data will help us best analyze the current need for service throughout the area.

Your survey results will be compiled with others and may be distributed to prospective service providers.

All completed surveys will be entered into a drawing for a chance to win one of **three-\$25 gas cards**. To be eligible for the drawing, you must return the completed survey via mail by **July 31st, 2012**.

Thank you for assisting us with this important survey.

Yours Sincerely,



Rachel R. Smolinski
Executive Director
HARBOR, Inc.

APPENDIX 6

HARBOR, Inc. Broadband Internet Demand Survey Results

Local Broadband Solutions for the Greater Harbor Springs Area:

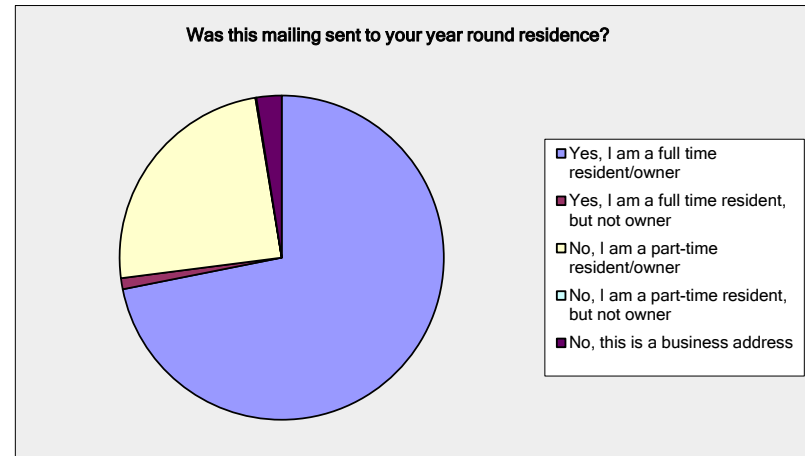
HARBOR, Inc.'s Community Approach

March 2015

HARBOR, Inc. Broadband Survey-1

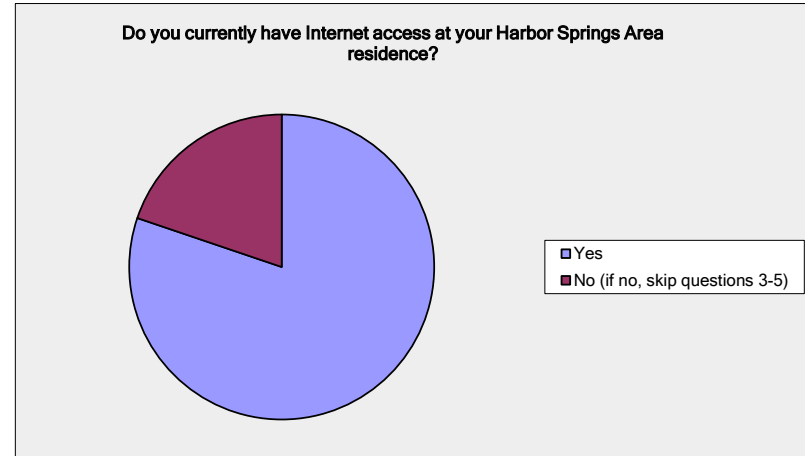
Was this mailing sent to your year round residence?

Answer Options	Response Percent	Response Count
Yes, I am a full time resident/owner	71.8%	579
Yes, I am a full time resident, but not owner	1.1%	9
No, I am a part-time resident/owner	24.4%	197
No, I am a part-time resident, but not owner	0.1%	1
No, this is a business address	2.5%	20
<i>answered question</i>		806
<i>skipped question</i>		24



HARBOR, Inc. Broadband Survey-1

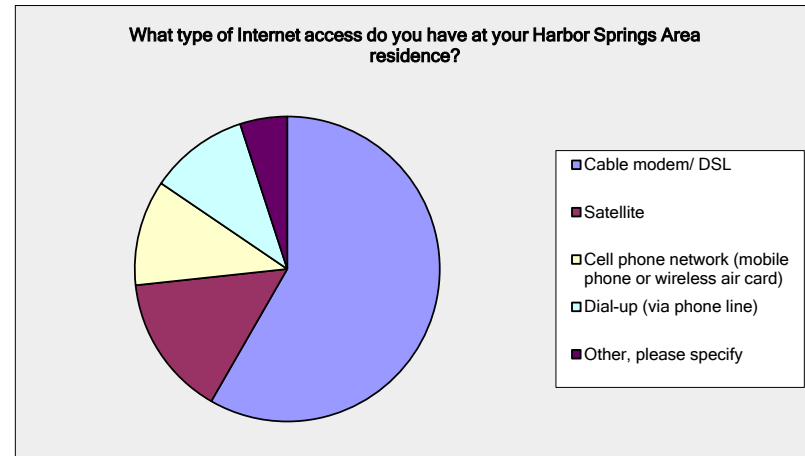
Do you currently have Internet access at your Harbor Springs Area residence?		
Answer Options	Response Percent	Response Count
Yes	80.2%	647
No (if no, skip questions 3-5)	19.8%	160
	<i>answered question</i>	807
	<i>skipped question</i>	23



HARBOR, Inc. Broadband Survey-1

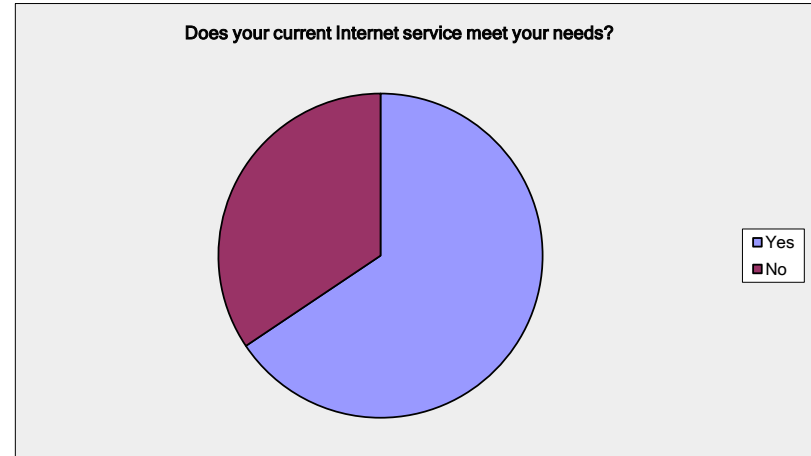
What type of Internet access do you have at your Harbor Springs Area residence?

Answer Options	Response Percent	Response Count
Cable modem/ DSL	58.3%	385
Satellite	15.0%	99
Cell phone network (mobile phone or wireless air card)	11.2%	74
Dial-up (via phone line)	10.5%	69
Other, please specify	5.0%	33
	<i>answered question</i>	660
	<i>skipped question</i>	170



HARBOR, Inc. Broadband Survey-1

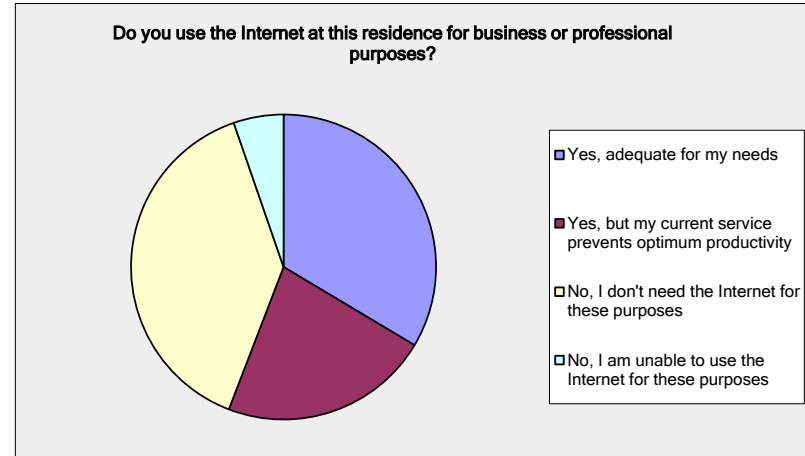
Does your current Internet service meet your needs?		
Answer Options	Response Percent	Response Count
Yes	65.6%	433
No	34.4%	227
<i>answered question</i>		660
<i>skipped question</i>		170



HARBOR, Inc. Broadband Survey-1

Do you use the Internet at this residence for business or professional purposes?

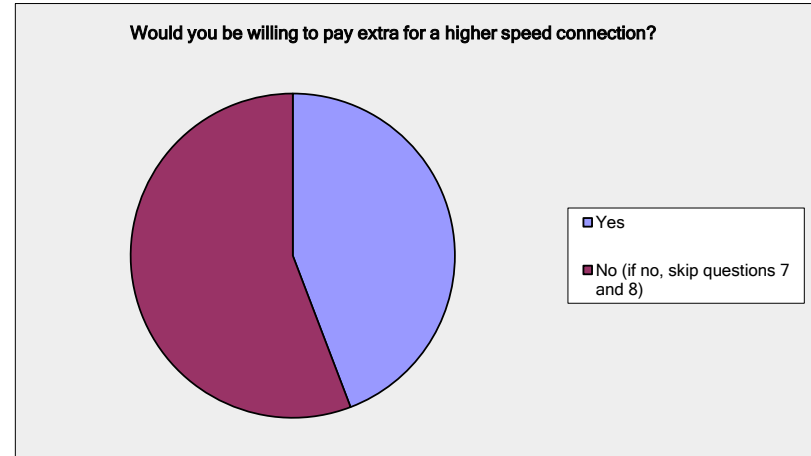
Answer Options	Response Percent	Response Count
Yes, adequate for my needs	33.6%	223
Yes, but my current service prevents optimum	22.3%	148
No, I don't need the Internet for these purposes	38.9%	258
No, I am unable to use the Internet for these purposes	5.3%	35
<i>answered question</i>		664
<i>skipped question</i>		166



HARBOR, Inc. Broadband Survey-1

Would you be willing to pay extra for a higher speed connection?

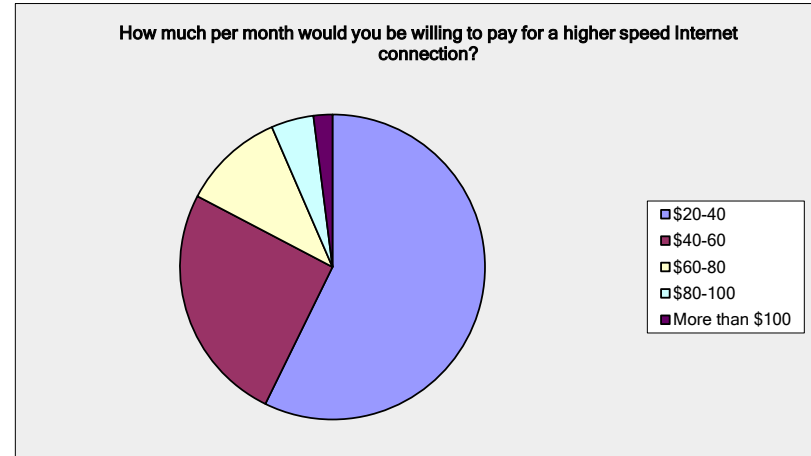
Answer Options	Response Percent	Response Count
Yes	44.2%	341
No (if no, skip questions 7 and 8)	55.8%	430
	<i>answered question</i>	771
	<i>skipped question</i>	59



HARBOR, Inc. Broadband Survey-1

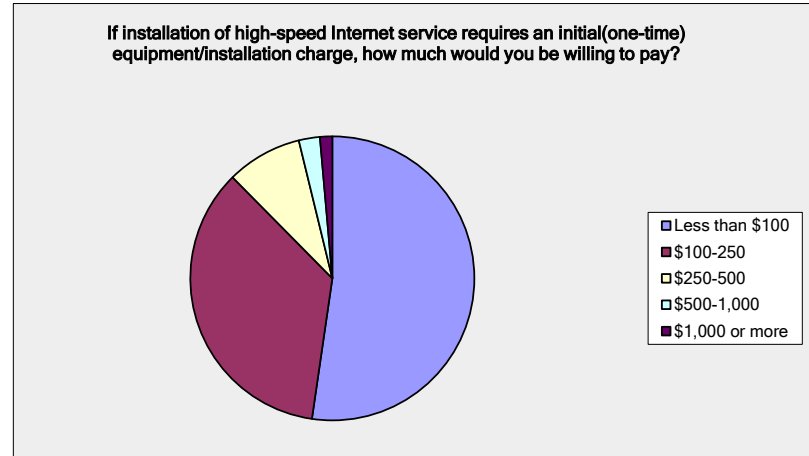
How much per month would you be willing to pay for a higher speed Internet connection?

Answer Options	Response Percent	Response Count
\$20-40	57.2%	227
\$40-60	25.4%	101
\$60-80	10.8%	43
\$80-100	4.5%	18
More than \$100	2.0%	8
	<i>answered question</i>	397
	<i>skipped question</i>	433



HARBOR, Inc. Broadband Survey-1

If installation of high-speed Internet service requires an initial(one-time) equipment/installation charge, how much would you be willing to pay?		
Answer Options	Response Percent	Response Count
Less than \$100	52.3%	218
\$100-250	35.3%	147
\$250-500	8.6%	36
\$500-1,000	2.4%	10
\$1,000 or more	1.4%	6
<i>answered question</i>		417
<i>skipped question</i>		413



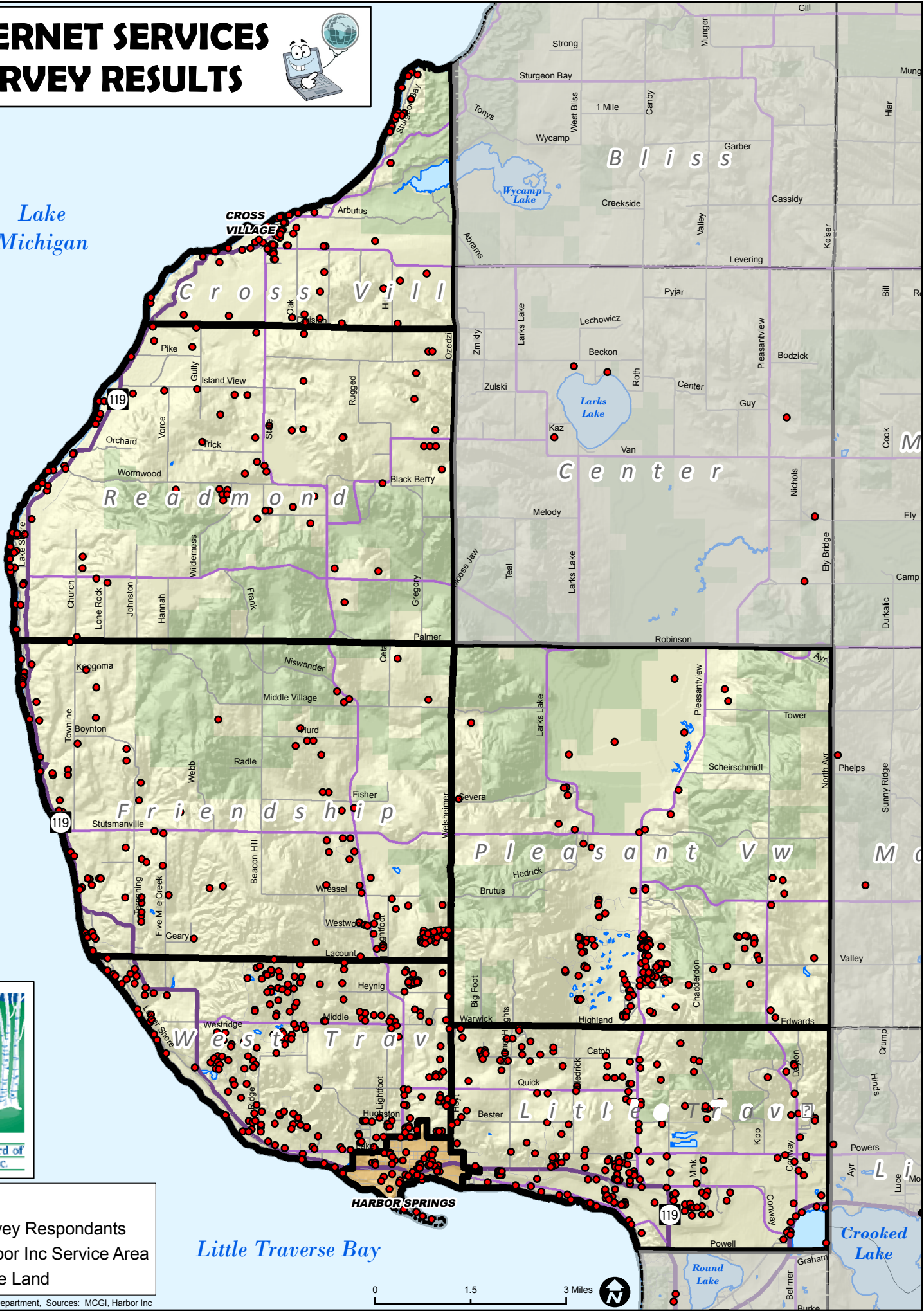
HARBOR, Inc. Broadband Survey-1

Comments	
Answer Options	Response Count
	342
<i>answered question</i>	342
<i>skipped question</i>	488

INTERNET SERVICES SURVEY RESULTS



Lake Michigan



Harbor Area
Regional Board of
Resources, Inc.

- Legend**
- Survey Respondants
 - Harbor Inc Service Area
 - + State Land

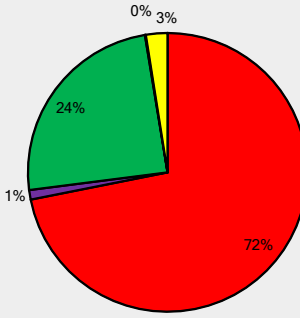
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS

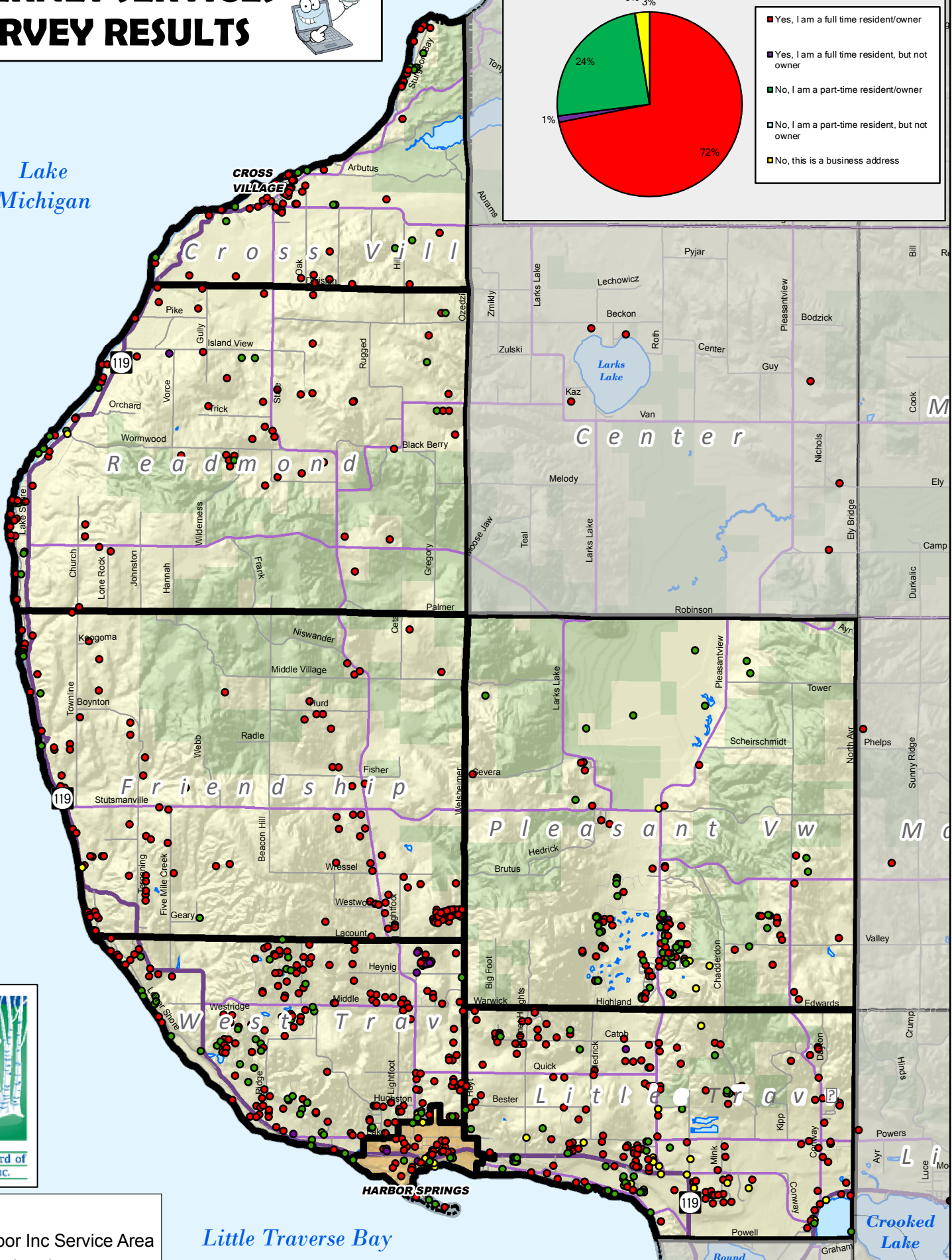


QUESTION #1 Was this mailing sent to your year round residence?



- Yes, I am a full time resident/owner
- Yes, I am a full time resident, but not owner
- No, I am a part-time resident/owner
- No, I am a part-time resident, but not owner
- No, this is a business address

Lake Michigan



Harbor Area Regional Board of Resources, Inc.

Legend

- Harbor Inc Service Area
- State Land

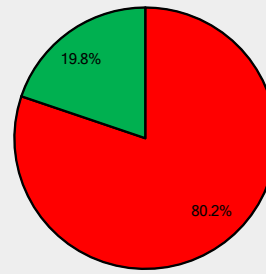
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS

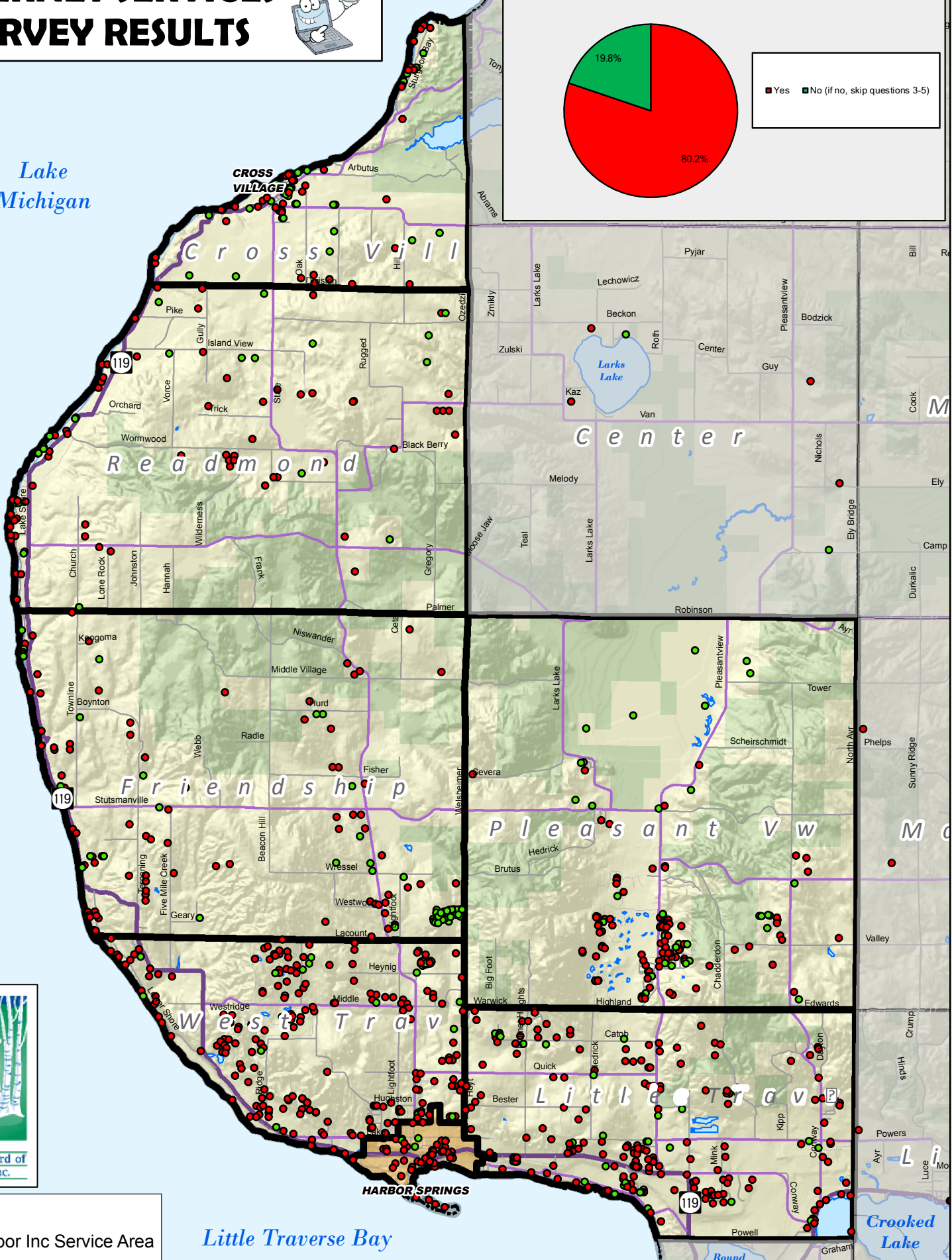


QUESTION #2 Do you currently have Internet access at your Harbor Springs Area residence?



■ Yes ■ No (if no, skip questions 3-5)

Lake Michigan



Legend
 Harbor Inc Service Area
 State Land

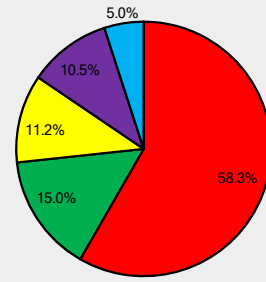
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS

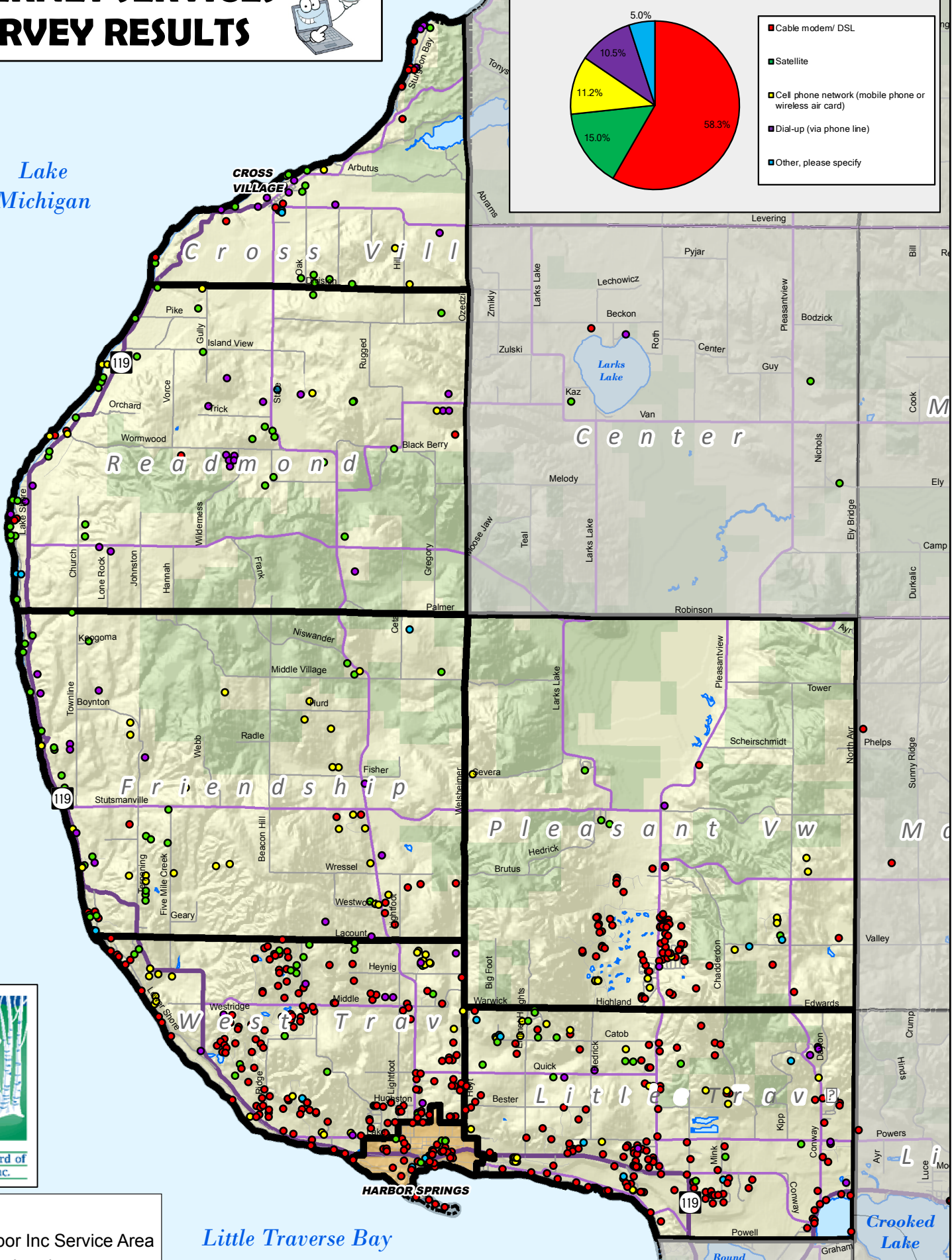


QUESTION #3 What type of Internet access do you have at your Harbor Springs Area residence?



- Cable modem/DSL
- Satellite
- Cell phone network (mobile phone or wireless air card)
- Dial-up (via phone line)
- Other, please specify

Lake Michigan



- Legend**
- Harbor Inc Service Area
 - State Land

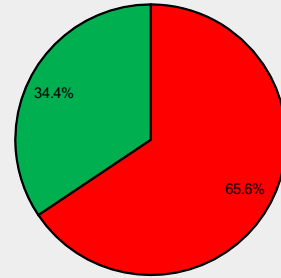
Little Traverse Bay



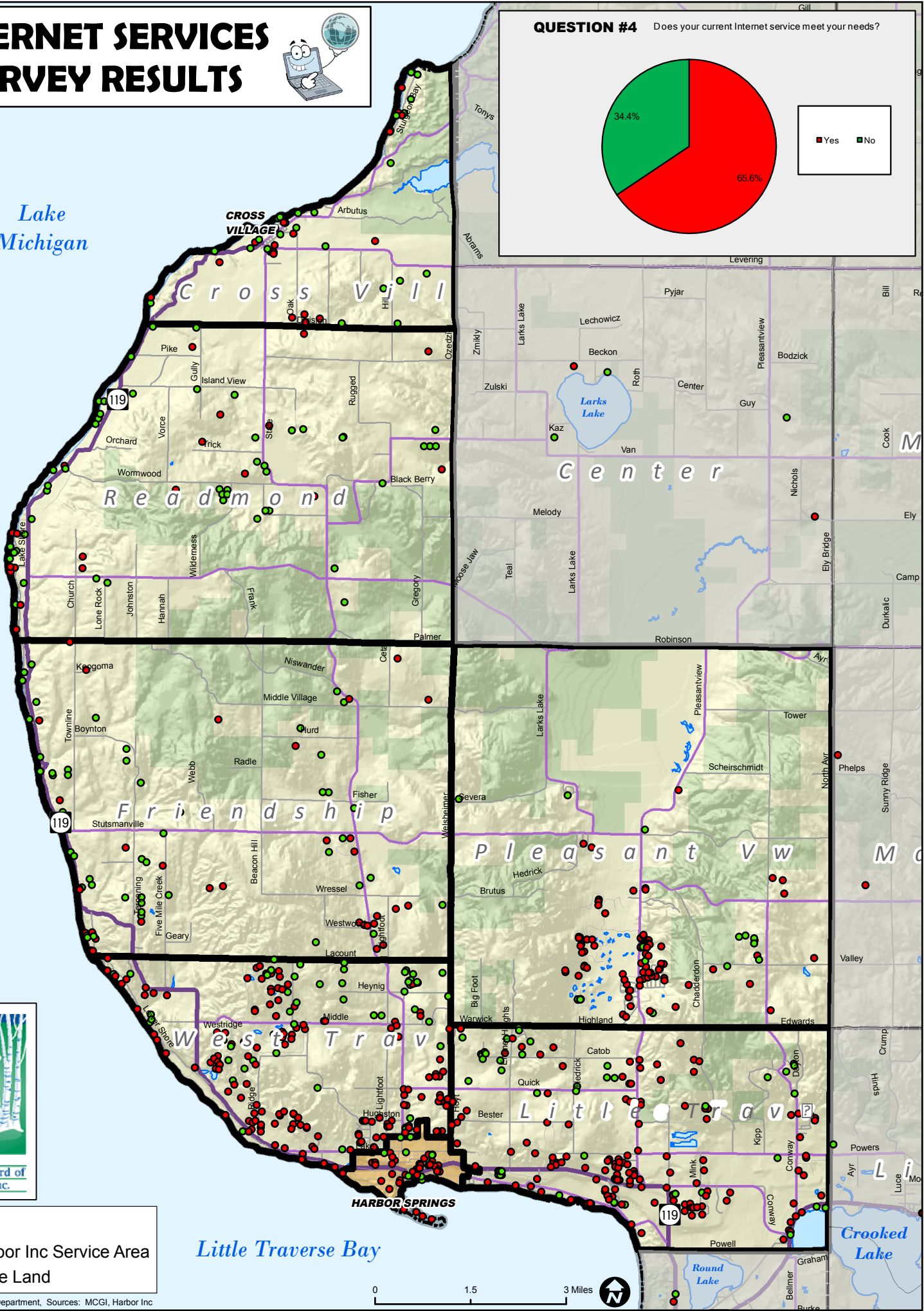
INTERNET SERVICES SURVEY RESULTS



QUESTION #4 Does your current Internet service meet your needs?



Lake Michigan



Harbor Area Regional Board of Resources, Inc.

Legend

- Harbor Inc Service Area
- State Land

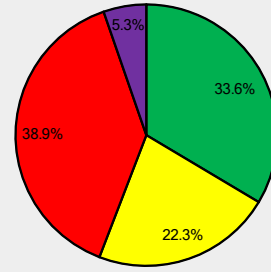
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS

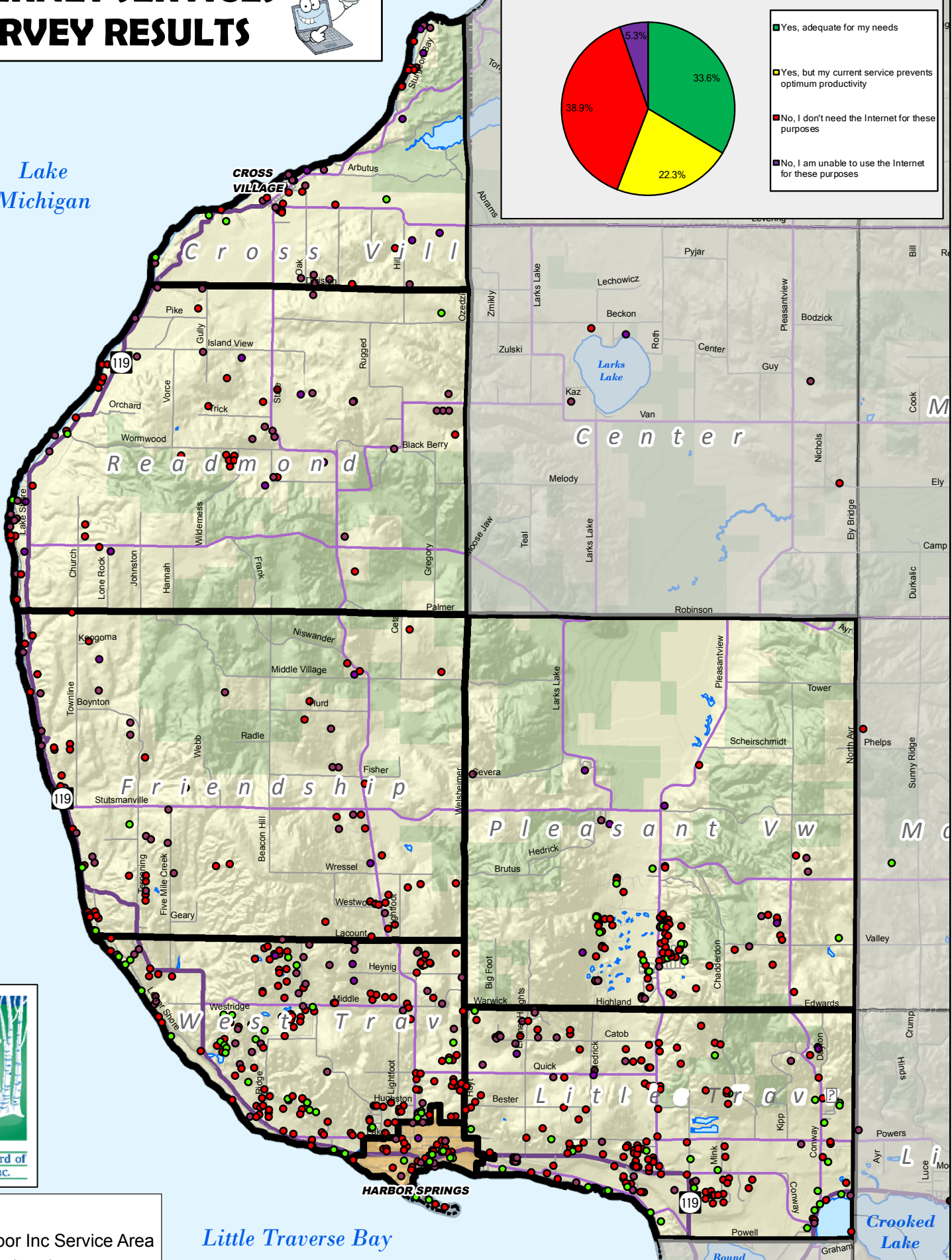


QUESTION #5 Do you use the Internet at this residence for business or professional purposes?



- Yes, adequate for my needs
- Yes, but my current service prevents optimum productivity
- No, I don't need the Internet for these purposes
- No, I am unable to use the Internet for these purposes

Lake Michigan



Harbor Area Regional Board of Resources, Inc.

Legend

- Harbor Inc Service Area
- State Land

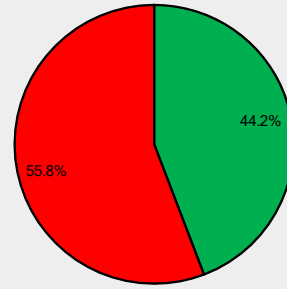
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS

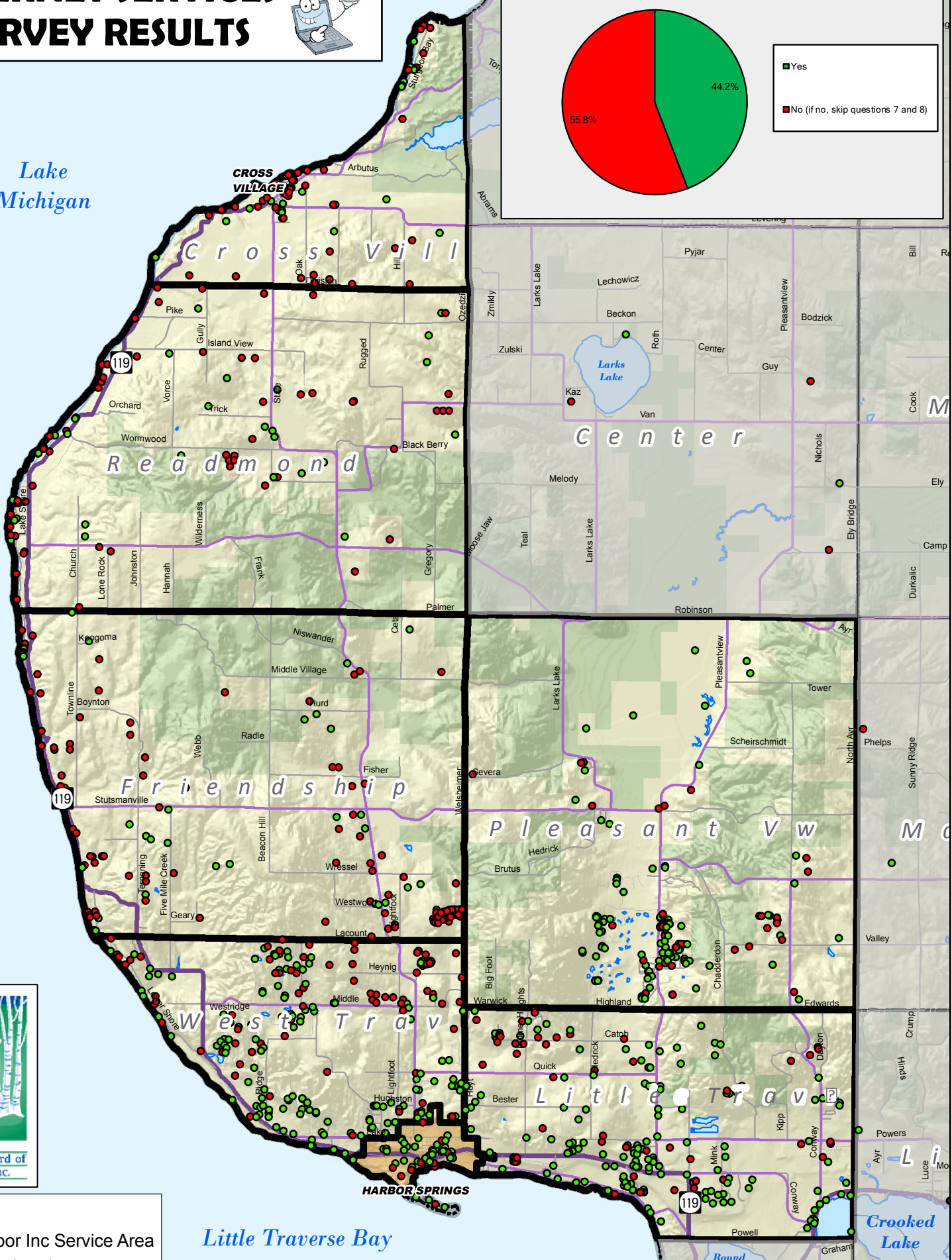


QUESTION #6 Would you be willing to pay extra for a higher speed connection?



■ Yes
■ No (if no, skip questions 7 and 8)

Lake Michigan



Harbor Area
Regional Board of
Resources, Inc.

Legend

- Harbor Inc Service Area
- State Land

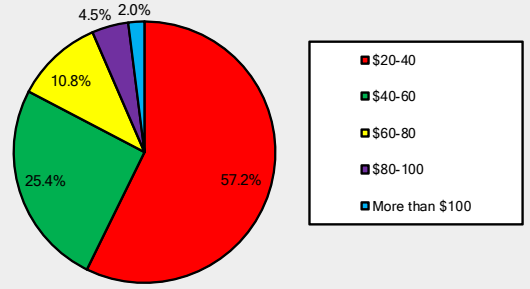
Little Traverse Bay



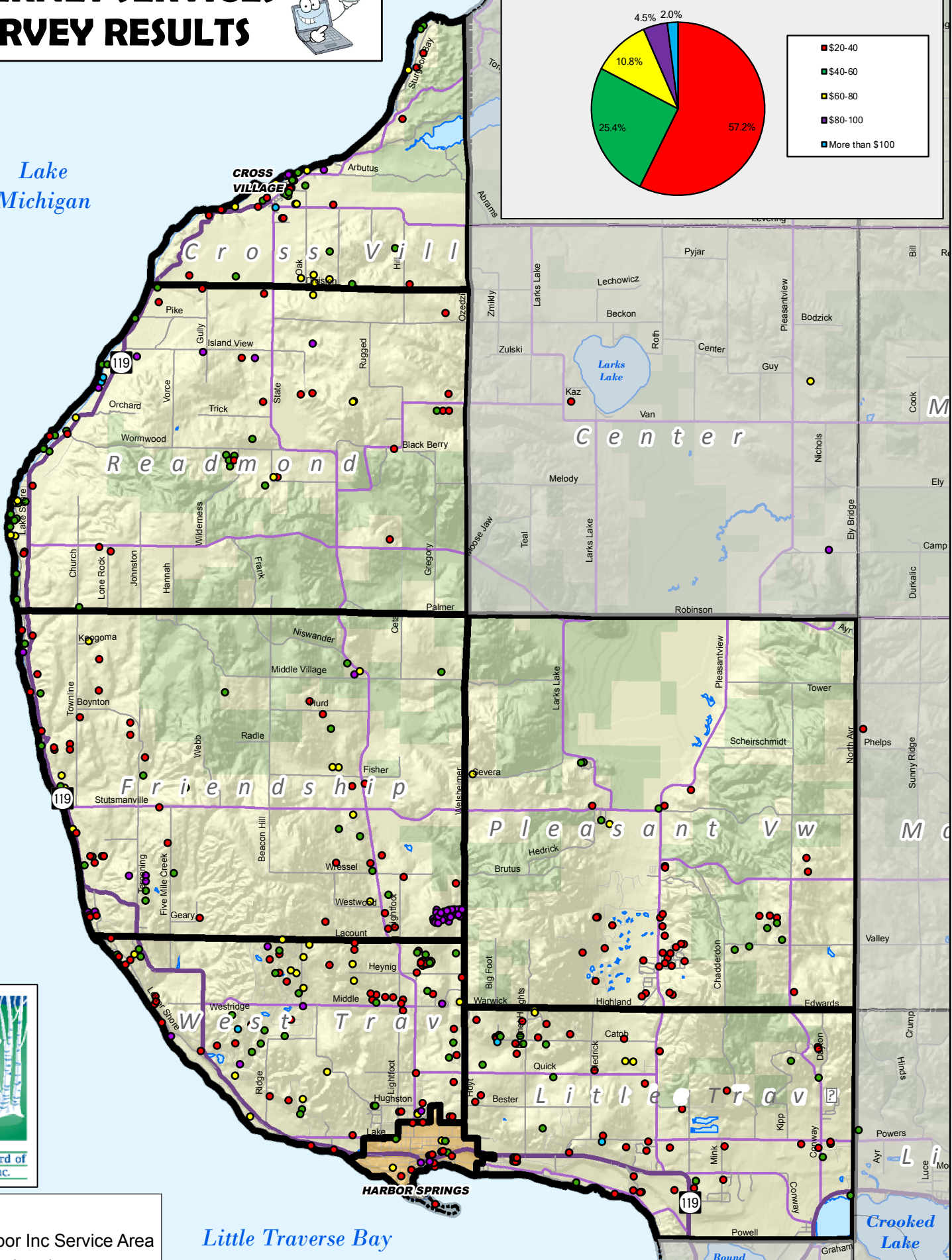
INTERNET SERVICES SURVEY RESULTS



QUESTION #7
How much per month would you be willing to pay for a higher speed Internet connection?



Lake Michigan



Legend
 Harbor Inc Service Area
 State Land

Little Traverse Bay

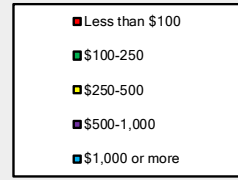
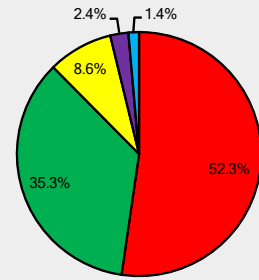


INTERNET SERVICES SURVEY RESULTS

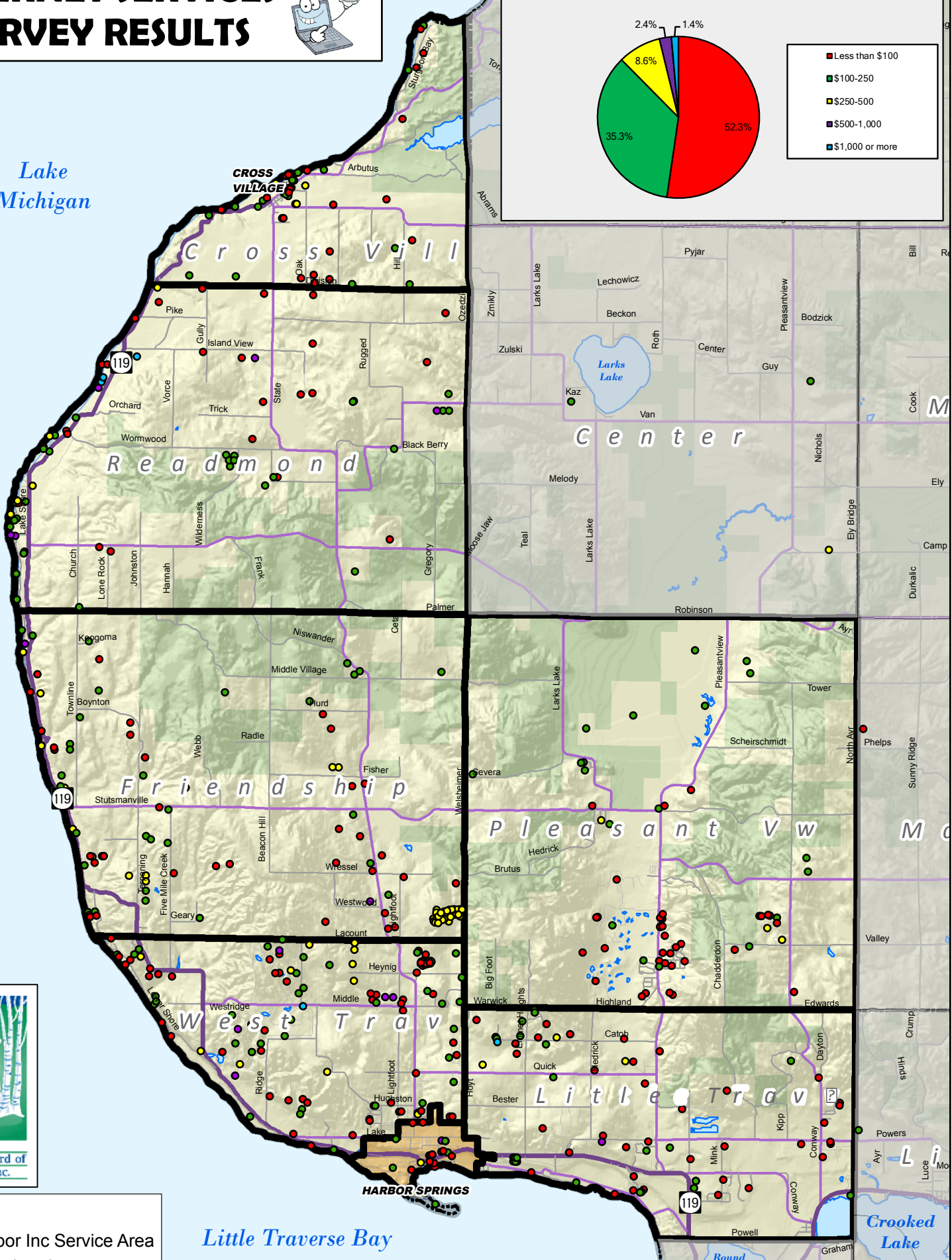


QUESTION #8

If installation of high-speed Internet service requires an initial (one-time) equipment/installation charge, how much would you be willing to pay?



Lake Michigan



Legend

- Harbor Inc Service Area
- State Land

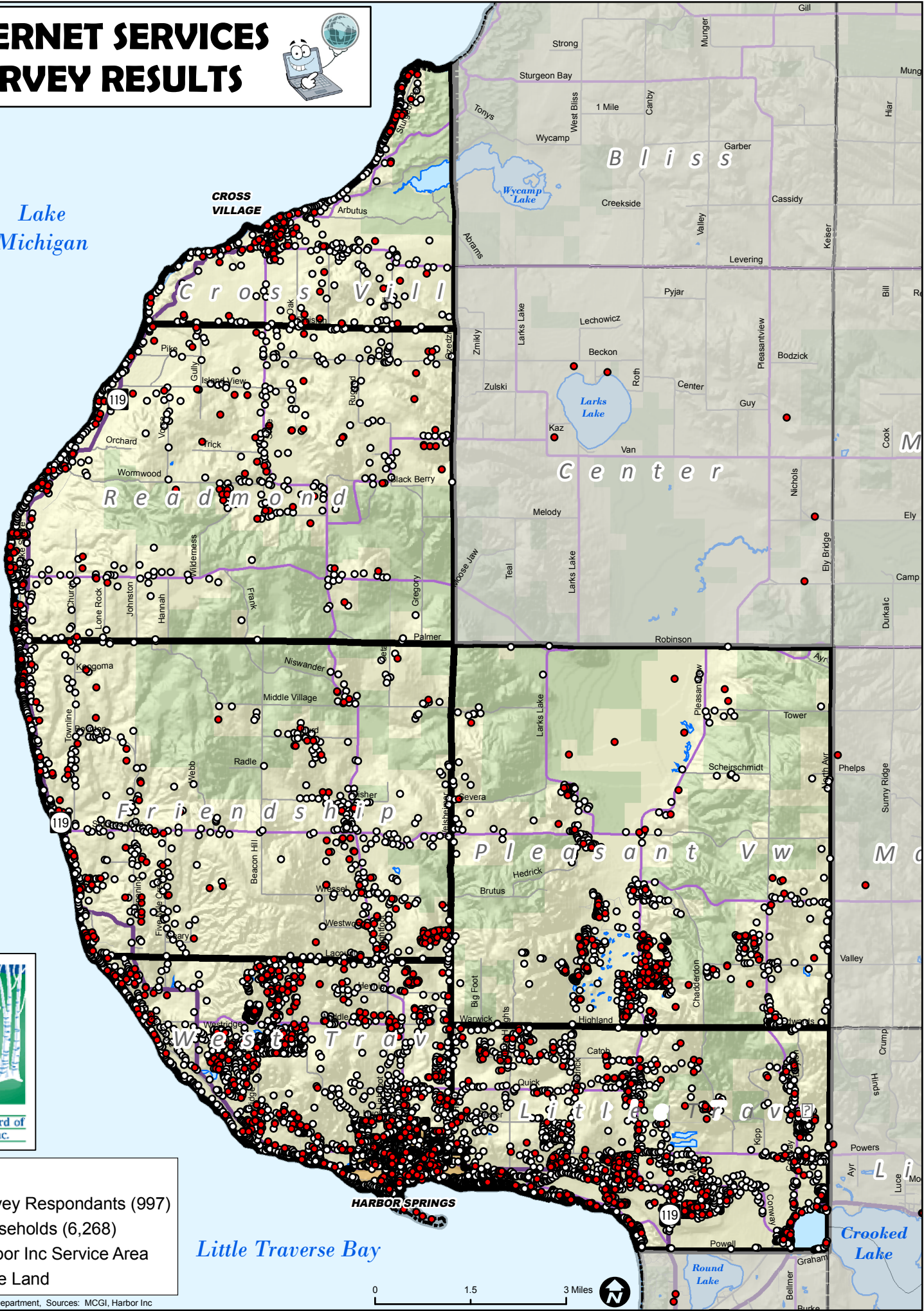
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS



Lake Michigan



- Legend**
- Survey Respondants (997)
 - Households (6,268)
 - ⬛ Harbor Inc Service Area
 - ⊕ State Land

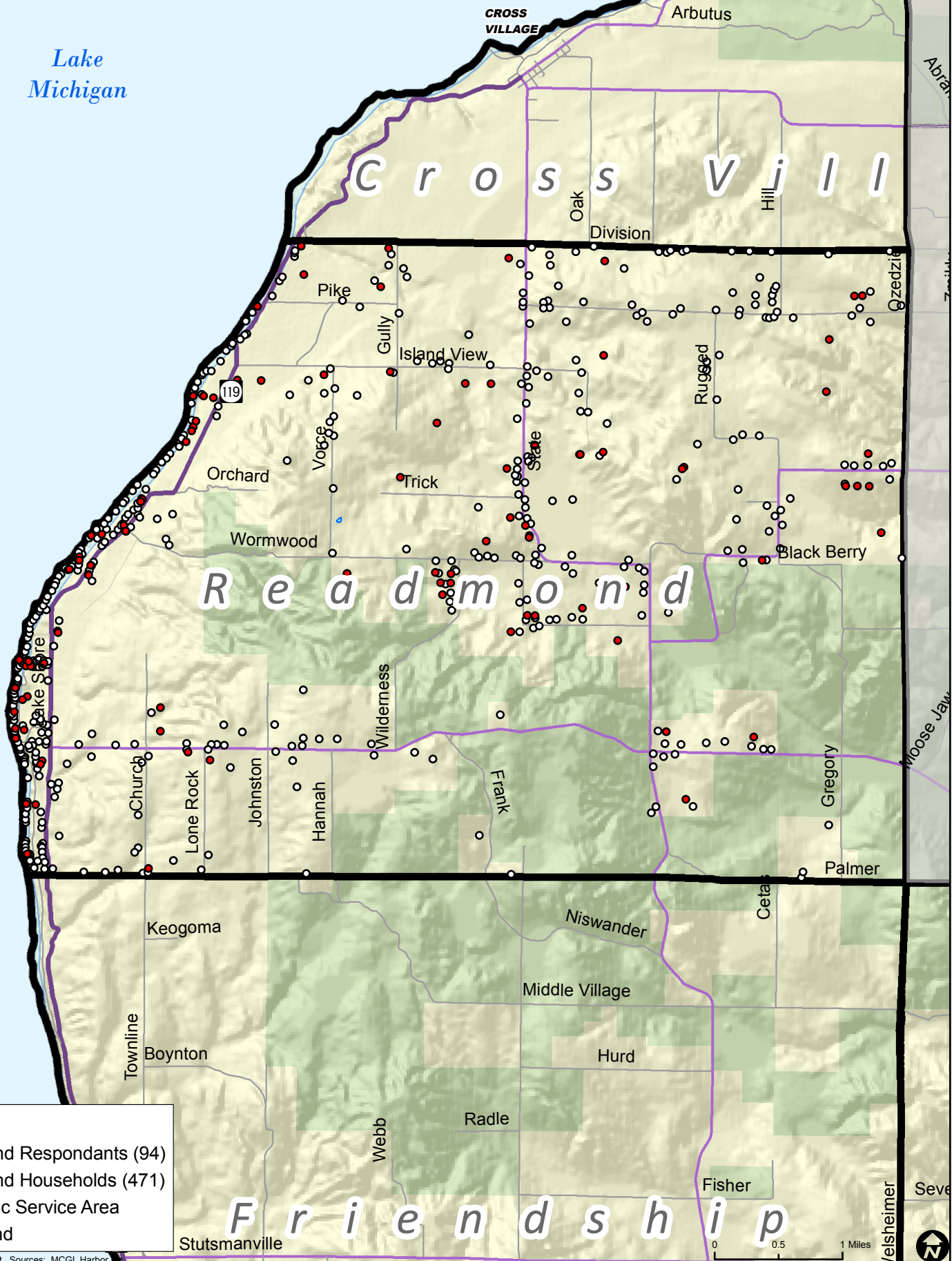
Little Traverse Bay



INTERNET SERVICES SURVEY RESULTS



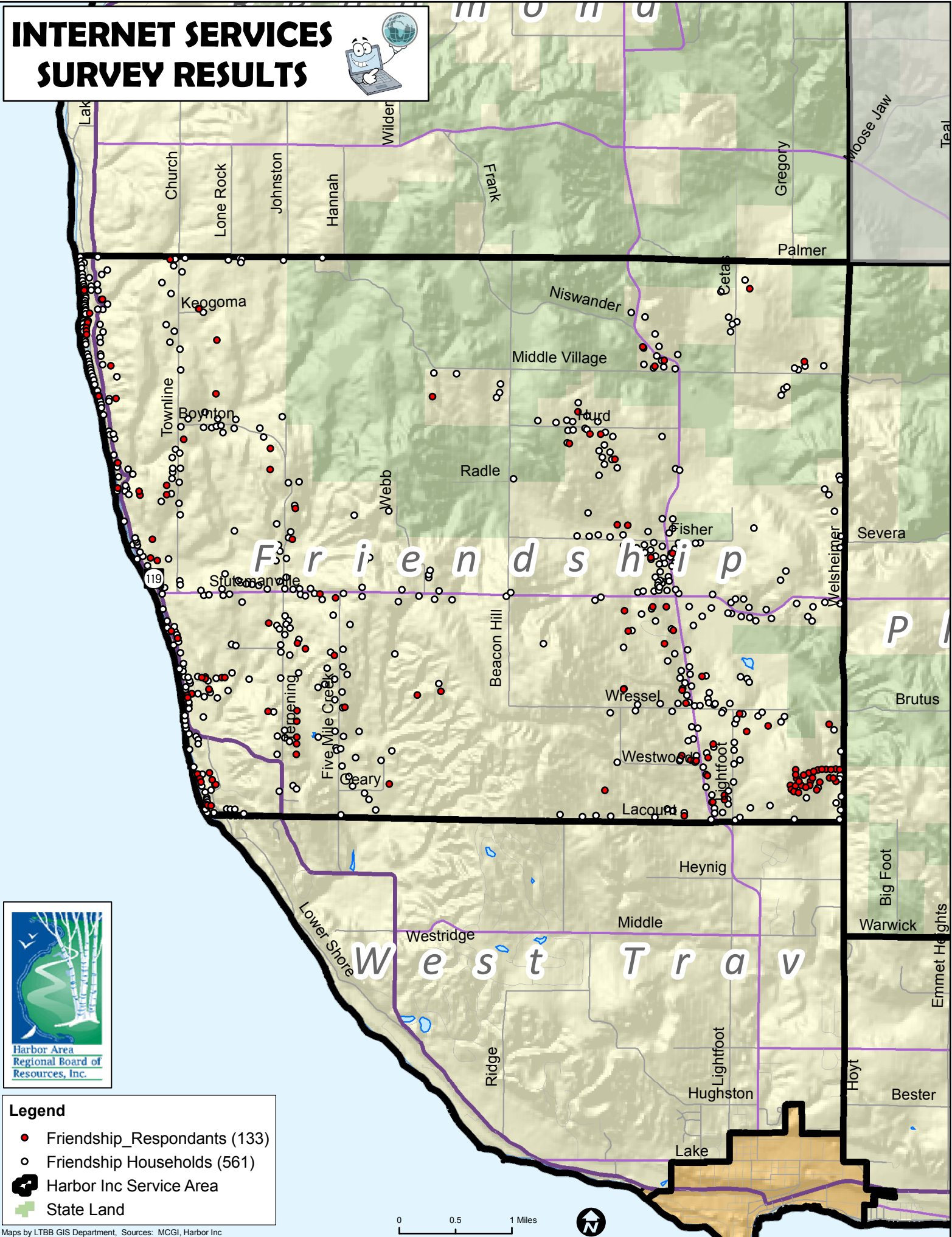
Lake Michigan



- Legend**
- Readmond Respondants (94)
 - Readmond Households (471)
 - ⊕ Harbor Inc Service Area
 - ⊕ State Land

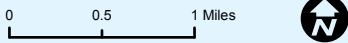


INTERNET SERVICES SURVEY RESULTS



Legend

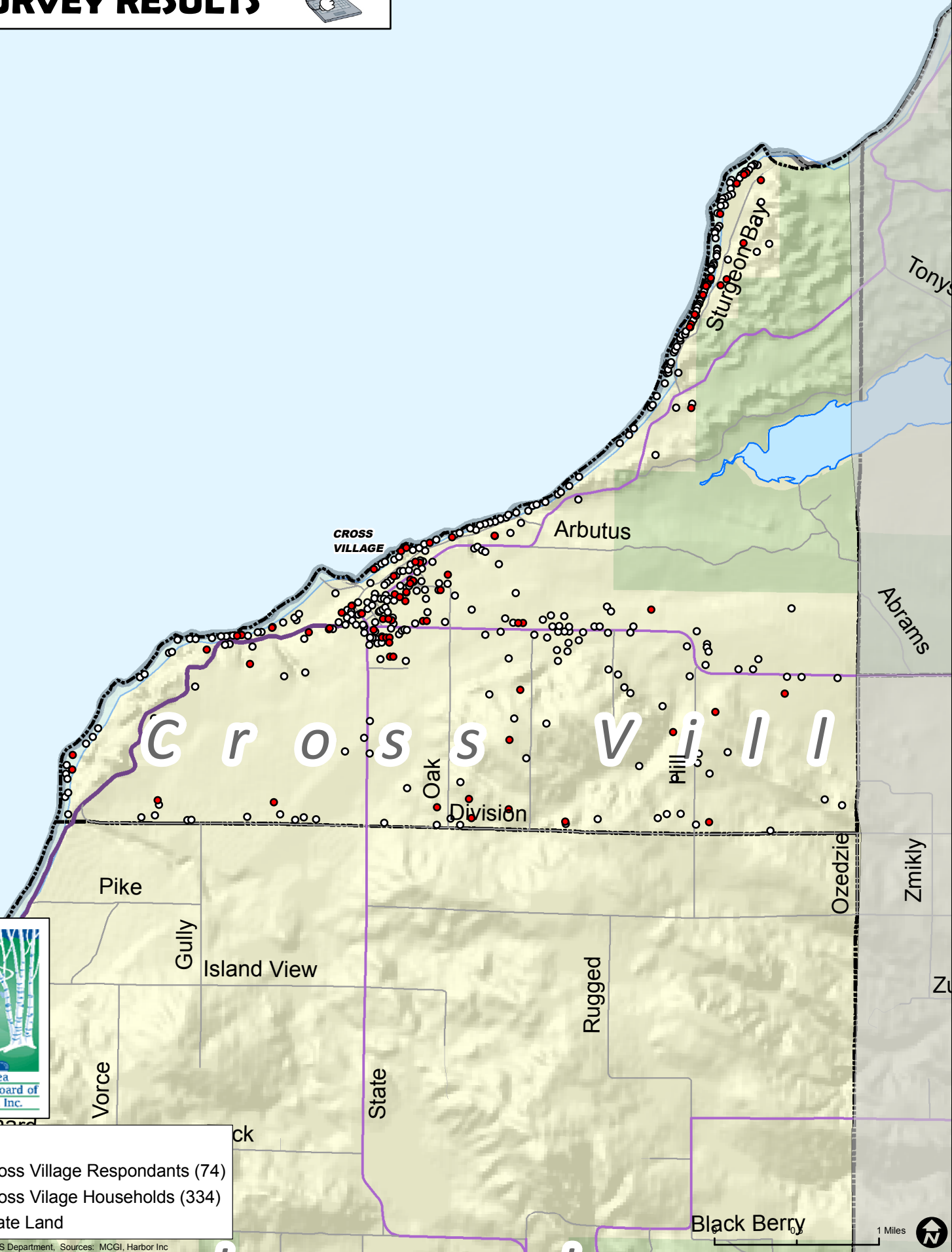
- Friendship_Respondants (133)
- Friendship Households (561)
- ⬛ Harbor Inc Service Area
- ⬜ State Land



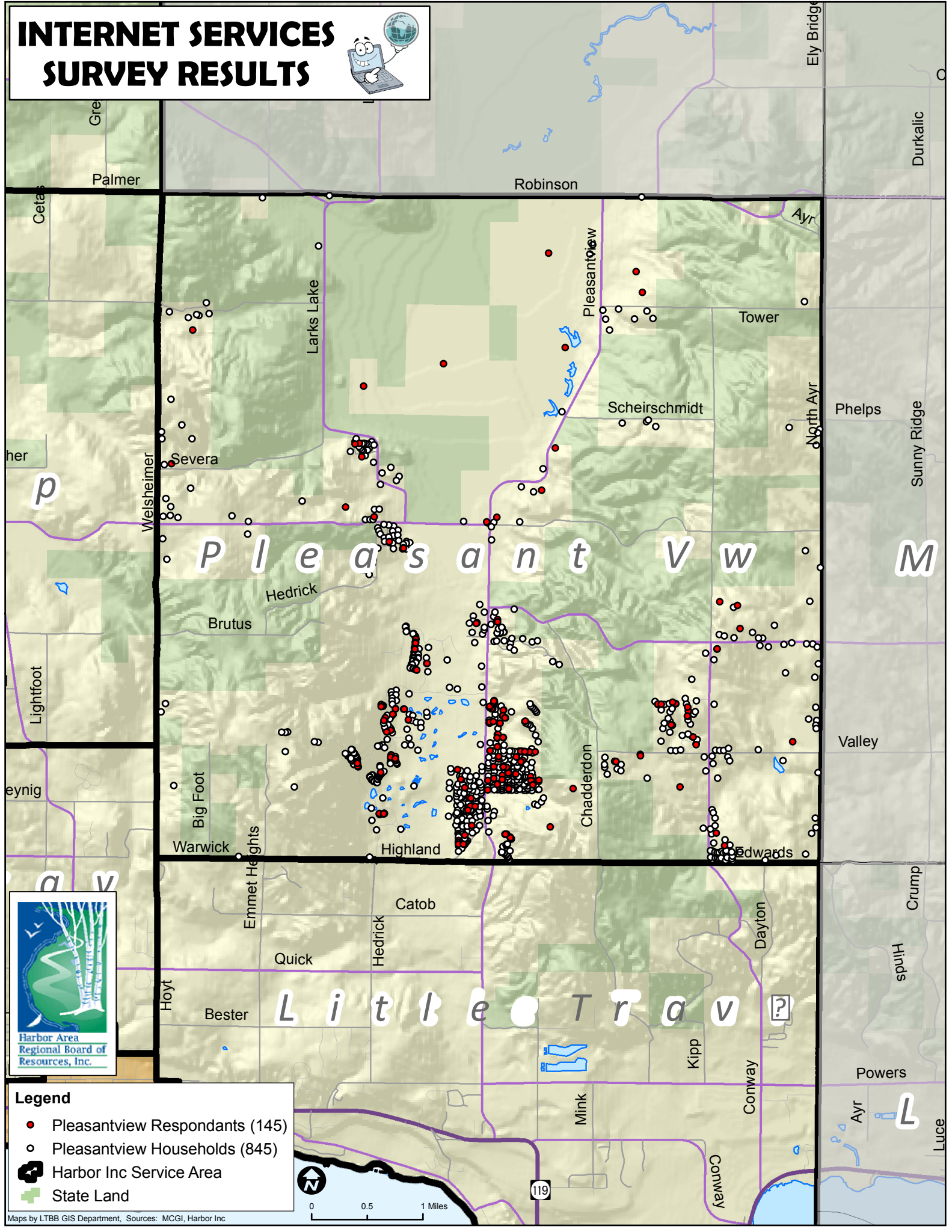
INTERNET SERVICES SURVEY RESULTS



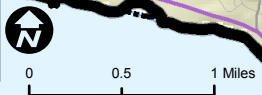
- Legend**
- Cross Village Respondants (74)
 - Cross Village Households (334)
 - State Land



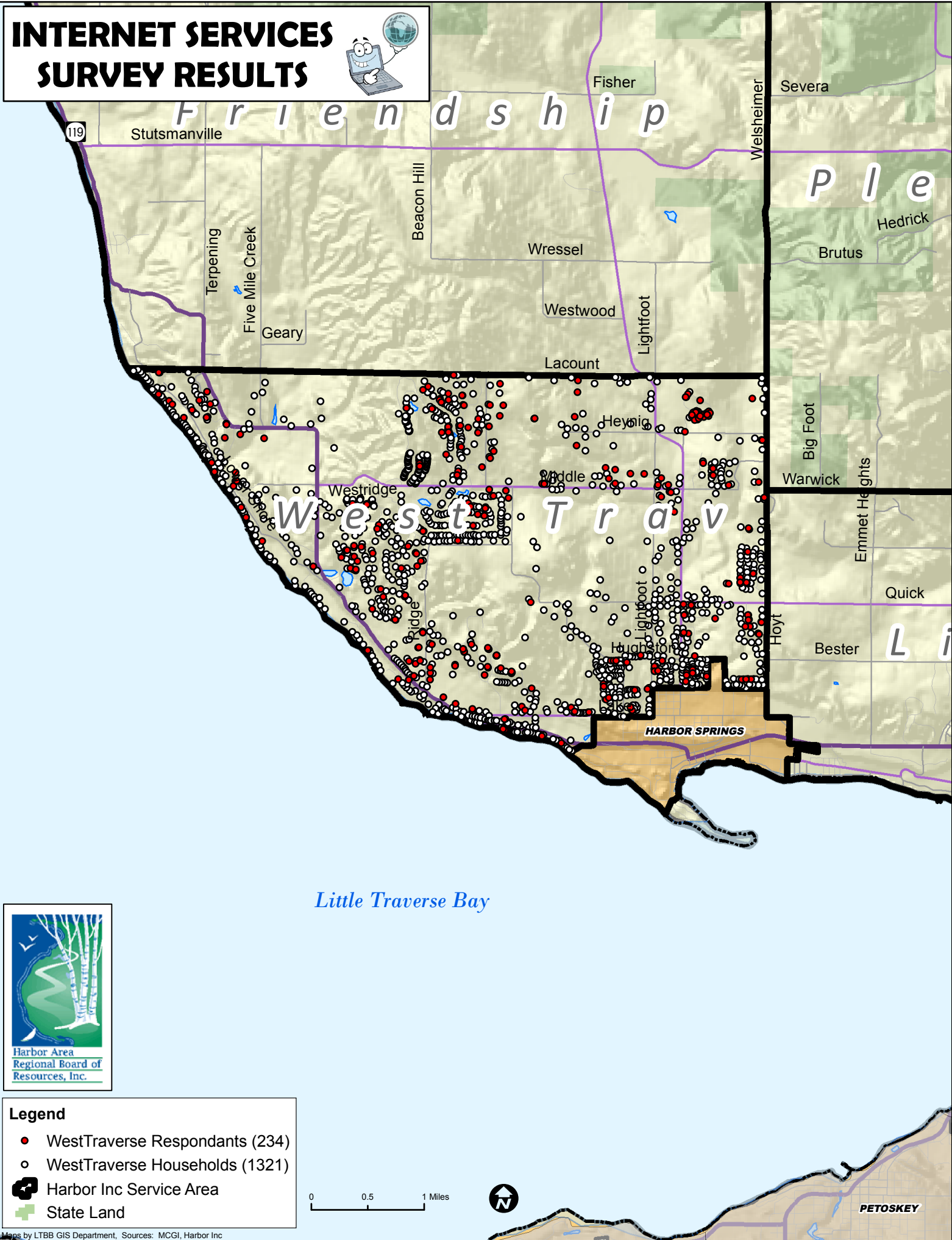
INTERNET SERVICES SURVEY RESULTS



- Legend**
- Pleasantview Respondants (145)
 - Pleasantview Households (845)
 - ⊗ Harbor Inc Service Area
 - ⊕ State Land



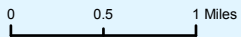
INTERNET SERVICES SURVEY RESULTS



Legend

- WestTraverse Respondants (234)
- WestTraverse Households (1321)
- Harbor Inc Service Area
- State Land

Little Traverse Bay



PETOSKEY