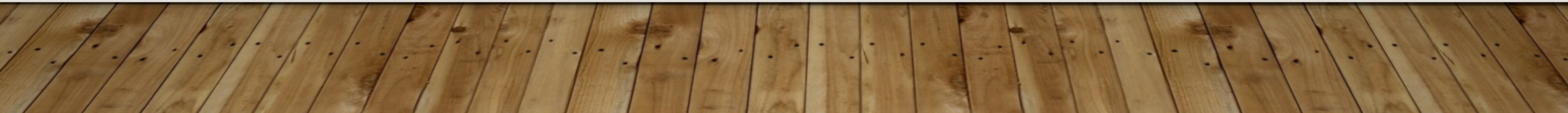


INFRASTRUCTURE SUPPORTING PRECISION/ SMART FARMING

MAKING THE CASE FOR FIBER TO THE FARM

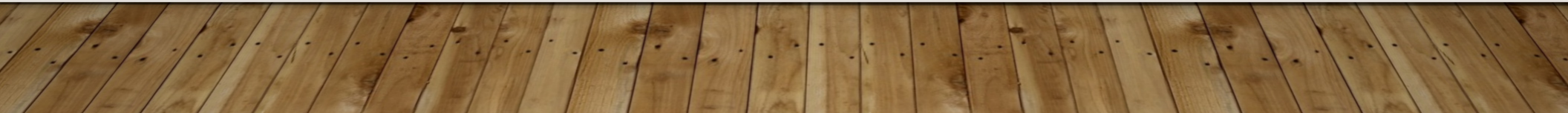
MOUNTAIN CONNECT CONFERENCE

JUNE 6, 2016



PUTTING FIBER IN THE PROPER CONTEXT

- It's all about the bandwidth!
- Ultra high speed connections will transform the way we live, learn, work and play.
- Symmetrical connections are more important than you think.
- The lower the latency the better. Fiber enables real time collaboration.
- Fiber optics has changed communications at nearly every macro level.
- FTTH and farm networks will change communications at the micro level.

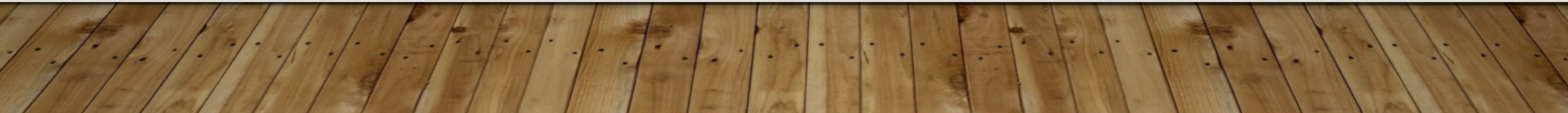


PRESENTATION AGENDA

- Fiber is futureproof. What does that mean?
- Symmetrical nature of fiber adds value
- A brief history of the RS Fiber Cooperative
- Unique Public Private Partnership
- Why a cooperative model works for rural fiber networks?
- Why do farms need gigabit enabled networks?
- Now that you have fiber, what are you going to do with it?

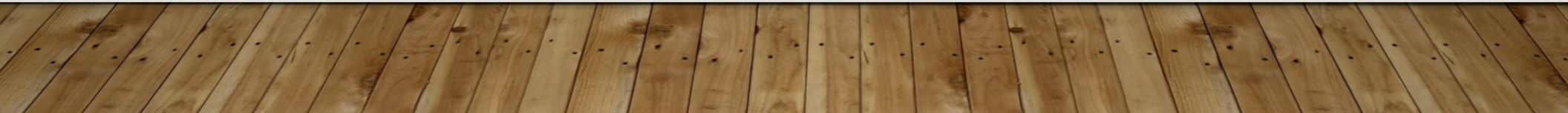
FIBER IS FUTUREPROOF. WHAT DOES THAT MEAN?

- It means the useful life of a fiber network will outlast the financing method used to fund it.
 - Investments in rural fiber networks only work if they are long term investments
 - The real payback isn't monetary, it's what the network will do for your communities, schools, hospitals, businesses and organizations.
 - The biggest cost to construct a FTTH network is the cost of the fiber and labor to construct.
 - The fiber cable in the ground or on the poles will last for decades.
 - Two electronic upgrades have been built into the RS Fiber business plan.



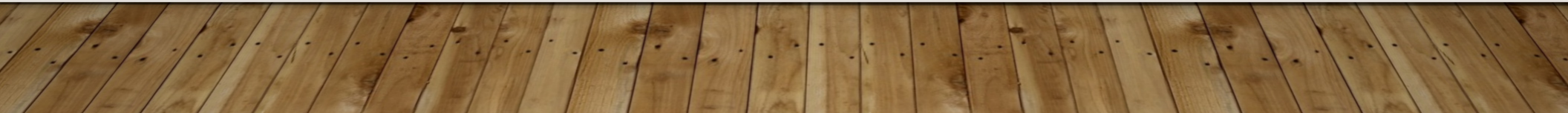
FIBER IS FUTUREPROOF. WHAT DOES THAT MEAN?

- Fiber has the potential to deliver nearly unlimited bandwidth
 - One strand of fiber can deliver 9.6 terabits of bandwidth
 - If 20 megabits of bandwidth is represented by a twenty inch water pipe, 9.6 terabits of bandwidth would be represented by a water pipe nearly 80,000 feet in diameter.
 - Next generation lasers will almost certainly increase that capacity.
 - Fiber has the capacity to deliver needed bandwidth for decades to come.



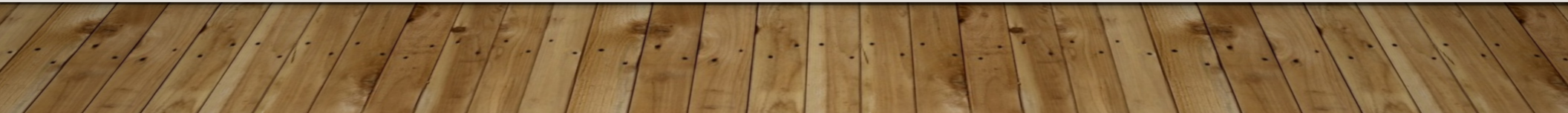
SYMMETRICAL NATURE OF FIBER ADDS VALUE

- Upload speeds are as important as download speeds.
- Symmetrical connections allow real time communication.
- Learning, by nature, is asymmetrical but innovation comes from symmetrical, real time collaboration.
- Skype and other Internet based video communication applications are greatly improved with symmetrical connections.
- Delivery of health care services enhanced by symmetrical connections.



BRIEF HISTORY OF THE RS FIBER COOPERATIVE

- Started in 2010 when 12 cities and two counties formed a Joint Powers Agency to build a 700 square mile fiber to the home and farm network.
- Survey showed support and feasibility study showed viability.
- **Hiawatha Broadband Communications agreed to manage the network.**
- More than 100 public meetings, scores of private meetings, pledge card drive and mailing of 14,000 copies of FTTH Council FTTH Primer.
- In 2012 the bond market balked at a \$70 million revenue bond and decision was made to switch to a private cooperative model with “down payment” from towns and townships in the project area.



BRIEF HISTORY OF THE RS FIBER COOPERATIVE

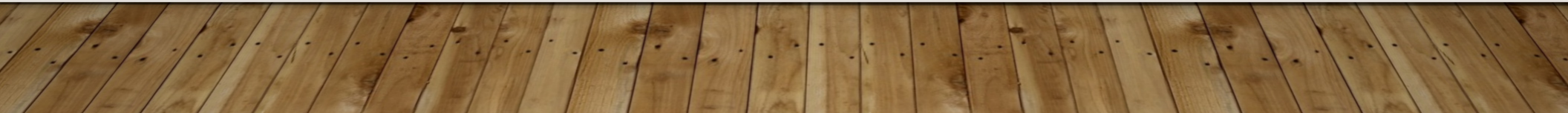
- Restructured project has a total price tag of approximately \$55 million.
- In Phase One, 10 cities will get triple play FTTH and 85% of farms will get 25/25 meg wireless Internet and phone service by the end of 2016.
- Phase Two begins in 2018 when townships sell G.O. Tax Abatement bond, loan proceeds to cooperative and work begins extending the fiber network to the farms.
- Project will be fully completed in 2021.

UNIQUE PUBLIC PRIVATE PARTNERSHIP

- In 2014 the Joint Powers Agency was expanded to include 10 cities and 17 townships.
- In June of 2015 towns sold an \$8 million G.O. Tax Abatement Bond and loaned proceeds to the cooperative as an economic development loan. Cooperative makes the bond payments. The subordinated loan helped the cooperative attract additional funding for \$15 million Phase One.
 - USDA REDLG and REED grants/loans from area electric cooperative
 - Local bank consortium, new market tax credits, equity drive
 - OCC ruling allows local banks to make equity investment in fiber projects.
- G.O. bond 25-years at 4.5%. Higher interest rate because bonds not tax exempt.
- Cities/townships have no equity stake in cooperative, no representative on the cooperative board of directors and no say in the day to day operations of the network.

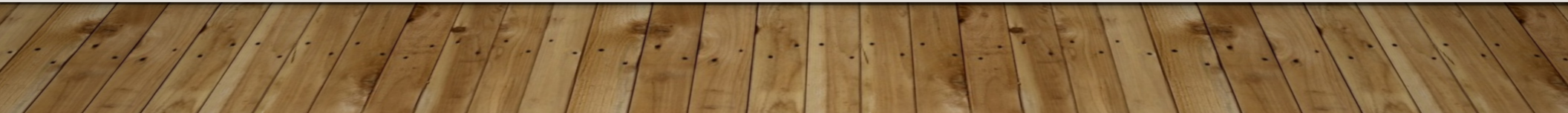
WHY A COOPERATIVE , MODEL WORKS FOR RURAL FIBER NETWORKS?

- Rural fiber network investments are difficult to make because of the high cost of connecting rural homes and farms.
 - \$2,500 average cost per pass in town and \$10,000 average cost per pass in rural area.
- With cooperatives, it's about maximizing benefit to patrons, not profits.
- Large ILEC shareholder owned providers unable to make investment in because their business models need 3-5 year payback with 15-20% ROI.
- 10,000 sq. mile fiber to the home and farm network in North Dakota where multiple cooperatives have connected their networks.
- Paul Bunyan Cooperative in Northern Minnesota is building fiber to the home, farm and cabin.



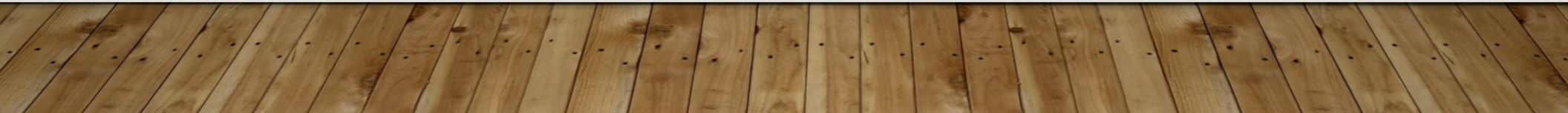
WHY DO FARMS NEED GIGABIT ENABLED NETWORKS?

- Download is consumption and upload in production.
- Ag producers are high tech operations that need fast Internet connections.
- Digital photos of fields, crop prescriptions need to be sent in timely manner
- Rural households are no different than city households.
 - Kids with homework, spouses that telework, far flung family members to Skype, video viewing habits are going skinny . . . Netflix, Hulu, Amazon, etc.
- One network replaces 18 incumbent networks
 - RS fiber network will replace 18 disparate copper networks with one fiber network connecting everyone to the Internet and each other via the INTRANET.



NOW THAT WE HAVE FIBER, WHAT ARE WE GOING TO DO WITH IT?

- We plan to change the way we live, learn, work and play by leveraging the Intranet.
- University of Minnesota Extension / RS Fiber Collaboration
 - Three year collaboration that will place a full time STEM coordinator in project area to:
 - Enhance existing and create new STEM curriculum for local public, private and charter schools.
 - Develop Innovation Center and Maker Space in two locations to provide hands on and online learning opportunities for coding, robotics, drones, videography, microscopy, 3-D printing, digital inclusion, job training, etc.
 - Create first of its kind in the nation broadcast journalism center to give 4-H and FFA students opportunities to write, direct and produce original ag related content for the RS Fiber/Extension Innovation Channel on the RS Fiber network.



NOW THAT WE HAVE FIBER, WHAT ARE WE GOING TO DO WITH IT?

- US Ignite membership will spur economic development by helping us develop software applications for gigabit enabled fiber networks in the areas of:
 - Education
 - Health Care
 - Ag Production
 - Senior Citizens
- US Ignite will make their existing online STEM curriculum available through Extension Collaboration
- Plan to apply for US Ignite Smart Gigabit City grant/designation in 2017

IN THE END, IT'S ALL ABOUT RISK

- We were completely upfront with the risk factor in more than 100 public meetings and scores of private meetings.
- G.O. bonds are tax obligated .. the risk is real, but smaller than you think when placed in the proper context..
 - The risk of doing nothing and continuing to “go nowhere fast.”
 - If project fails catastrophically, property taxes increase \$10-\$15 a month, but cost of telecom services has already dropped \$40-\$50 a month.
- The RS Fiber network will give communities and people the opportunity to have the technology tools to positively affect their futures.

THANK YOU!

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