

Fiber Optic Project Primer

Tribal Broadband Bootcamp



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Last updated 16 May 2022



Fiber Optic Advantages

- The right fiber optic cable has essentially unlimited speed
 - Wireless is limited in speed based on the equipment selected
- You can plan phased rollout for future installations
 - Fiber as far as you can afford, wireless for middle or last mile
- You should be installing fiber optic cabling as far into your planned network as possible
 - All the way to the home and business if you can afford it
 - To wireless towers or key buildings (tribal clinics, headquarters, etc) if you can't afford fiber to the premises



Taking on a Fiber Optic Installation

- Installation of a fiber optic network is an infrastructure project that requires professional design and installation
 - Much like roads or water supply systems
 - Not like constructing a single building
- Unless you have a lot of experience operating a telecommunications system, you will rely on the expertise of your design team, installation contractors, and possibly maintenance contractors



Phases of a Fiber Optic Installation

- Planning
 - Assessing the need of the communities to be served
 - Might need help of a professional designer to provide information about cost estimates and strategy options to serve the intended communities
- Design
 - Will typically require a professional designer
- Installation
 - Will almost always require a professional installer
- Operation
 - Depending on tribal capabilities, might need an outside firm to help



Planning Phase

- This phase will develop the needs documentation that drives the remainder of the phases.
- It will involve community engagement to assess needs
 - Does the community only want Internet access? Or include voice/cellular service as well? How about traditional cable TV like service?
- You will probably need a project manager as early as this process to help guide it and move to a conclusion
- Is there an opportunity for workforce development?



Planning Phase (continued)

- Does the tribe want to start operating a communications network?
 - This will require trained staff with sophisticated equipment
- Where will funding come to build the network?
- Is there a sustainable financial model for operation of the network?
- Will a 4G/LTE network serve the needs of the community?
 - Did your tribe apply for and get a license for the 2.5Ghz EBS spectrum during the Summer 2020 open period?



Design Phase

- Will most likely require a professional design/engineering firm
- This phase will require the tribe to have a project manager overseeing the work (possibly a project management team)
- This phase will look at many issues
 - Rights of way and permitting
 - Fiber optic cable plant design
 - Towers (if providing last or middle mile wireless)
 - Equipment selection
- Output will be bid documents for various components of the completed system



Installation Phase

- There may be a number of installing contractors
 - Fiber optic cable installers/splicers
 - Tower construction
 - Equipment installers
- This phase will be overseen by the design contractor as well as the tribal project manager or project management team



Installation Phase (continued)

- Procurement(s)/Bid Process(es)
- Construction
 - Depending on bid packages, multiple construction projects may be in process at one time (towers, fiber, testbed equipment configuration)
 - Cable installation
 - Fiber optic splicing
 - Testing
 - Documentation
 - Acceptance



System Operation

- Business office
- Equipment installation/replacement/configuration
- Fiber optic repairs
- System locates (one call locate service)



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Resources

- Lots of resources
 - The Fiber Optic Association (<https://thefoa.org>)
 - Very dated and clunky website
 - Lots of good information about fiber optic cable, installation techniques, etc.
 - Not a lot of good information about the equipment to light the fiber optic cable to serve the community
 - Passive Optical Network Primer
 - <https://community.fs.com/blog/passive-optical-network-tutorial.html>
 - <https://www.mdpi.com/2079-9292/9/7/1081/pdf>



Questions/Discussion?



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