MACON COUNTY BOARD
FINANCE COMMITTEE MEETING

MACON COUNTY OFFICE BUILDING
COUNTY BOARD ROOM #514
121 S. MAIN STREET DECATUR, IL 62523
January 3, 2022 5:15 P.M.

MEMBERS PRESENT
Kevin Greenfield, Chair
Greg Mattingley
Ryan Kreke
Jim Gresham
Marcy Rood
Linda Little, Vice Chair

MEMBERS ABSENT
Helena Buckner

COUNTY PERSONNEL PRESENT
Rocki Wilkerson, Workforce Investments
Bruce Bird, Highway Engineer
Debra Kraft, Board member
John Jackson, Treasurer
Carol Reed, Auditor's Office
Kim Fowler, SofA
Jessie Smalley, HR

Jeannie Durham, County Board Office

CALL TO ORDER
The meeting was called to order by Chairman Greenfield at the Macon County Office Building.

APPROVAL OF THE MINUTES FROM PRIOR MEETING
Mr. Gresham made a motion to approve minutes of the 11/29/2021 Finance Committee meeting, seconded by Mr. Kreke & the motion carried 6-0

CLAIMS
Ms. Little made a motion to approve the claims, seconded by Mr. Mattingley, and the motion carried 6-0.

REPORTS
Audit Sub Committee - *No Report*

Auditor – *No report*

Board of Review –
Ms. Fowler reported that they have a total of 357 appeals filed for 2021. There is only about 55 of those left to review. That is a pretty good start on those.

Final notices have gone out for everything that has been reviewed up through now. The hearings will start on January 5. That usually takes a couple to three weeks by the time they are scheduled and then they do have an opportunity to reschedule one time.

Typically, there is about 500 – 600 appeals. So, the numbers are down quite a bit this year which is good. Last year there were 563 appeals filed.

Supervisor of Assessments –
Ms. Fowler reported that they had the Township Organizational meeting. That was in December. That is required before the new year starts every year. The same format that was used in the prior year was used again this year. That was a call in conference. Ms. Fowler said she had emailed the packets and mailed a hard copy of it as well. That gives the Township Assessors the instructions for reviewing and completing the assessment work for the next assessment year. The meeting was closed with an opportunity for questions.

The quads for this year are Hickory Point, Friends Creek, Whitmore Township and Oakley Township.

GIS –
Ms. Fowler reported that they are currently working on the 2022 map edits. So, that work can continue for the new parcels that are created.

Chairman Greenfield asked if someone new had been hired for GIS. Ms. Fowler said no, the mapping person is the same one that they have had, Jacob. Mr. Greenfield asked if he was working out ok. Ms. Fowler confirmed that he is.

Treasurer –
Mr. Jackson announced that there was not a need for the *Macon County Board Resolution to Execute Deed to Convey Property in which Taxes were Delinquent* this month and so it is being pulled from the agenda.

Macon County Board Resolution Authorizing Plan to Execute Fiber Optic Project within Macon County with Shelby Electric as Provider and Finley Engineering as Support that Falls under the American Rescue Plan Act Guidance

Mr. Jackson reported that he has shared the packet from Shelby Electric and the team is present. The resolution is on tonight's agenda. Josh Shallenberger from Shelby Electric and Sean Middleton who is with the engineering firm. He asked them to come up to answer any questions. He said he also had their presentation pulled up.

Mr. Shallenberger thanked the committee members for having him back. He reminded them that he had been at the meeting at the end of August. He said he had left the room then after being asked the question about the proposal for potential partnership with Shelby Electric Cooperative to provide fiber to the home in the Macon County area that is served by Shelby Electric, if it is viable and the County has to make a contribution, then what is that contribution. That was the note that it was left on. Mr. Shallenberger said he had said it would require them to do some homework. He said they reached out with someone they have partnered with over the years, Finley Engineering. He introduced Sean Middleton saying he is a professional engineer with Finley. He said he has known Sean for many years. He has actually rural electric cooperative background as well. He was resident engineer at Illinois Electric Cooperative in Winchester where they were far ahead of their time in deploying communications alongside their electric plant. So, he knows it well and made the transition to the professional engineering company years back. Mr. Shallenberger said that, with that relationship, they do a lot of their

utility engineering. This is a subset of what they do at Finley, the communications engineering too. He said he was glad that Sean was able to join him.

He said they had prepared a presentation, just to help structure the conversation, but they encourage a dialog with any questions because they know this is a big decision for the County and the Finance Committee in particular tonight. It is meant to provide some structure. In addition, Mr. Jackson had enclosed the full proposal in the packet. It has the whole meat of the matter on how they would deploy the fiber to the home network. But, what he tried to do, he had a meeting with some of the County officials on December 9 and tried to put in a very succinct, one point at a time format so it could easily be stepped through without reading the whole proposal. The first 8 points really do a good job of summarizing the proposal in its entirety. He repeated his appreciation for being able to come back and said that they would go ahead and tick through the presentation.

(The presentation is attached to these minutes. The minutes will only reflect questions asked & resulting discussion that took place.)

Ms. Rood said that she was under the impression that there is fiber optic to Richland and asked if that could be explained. It was explained that there is and they are going to, in fact, utilize the what is there. They are proposing to serve Richland. That is a network pop, a point of presence, for the Illinois Century Network. He said they are just saying they would have a presence going to Richland that you could then expand beyond that. But no, Shelby Cooperative would not be serving Richland. They do have fiber at Richland Community College. That is where Illinois Central Network would be able to write it back to the Data Hotel in Chicago. Mr. Mattingley asked if that would be like a trunk line. Mr. Shallenberger confirmed that it would be.

Mr. Mattingley asked about the effect of ice storms on the lines. Mr. Middleton said it is interesting. On a fiber optic construction, obviously if you bury it, it is very reinforced. But, these things have Kevlar coating with reinforcing members. And this is a funny side note – we have had an instance where a pole got broken from whatever event and the fiber sometimes is more tinsel strength than the copper conductors that up there in place. So, if you put that fiber in, it actually puts in a very strong reinforcing medium to the existing thing and it is way lighter. Fiber optic is all glass. We are talking about Kevlar coatings and things. You have a metal messenger that would be lash to and the rest of it is . . . Again, when you say a fiber's strand is 144 cables, it is ½ inch wide or something like that. 144 cables can support more than Macon County would need. That is one of the things. They are engineered for that. In our area, knowing we live in the Midwest, there's Grade B Heavy National Electric Safety Code in there engineered to take so much wind and ice and all those kinds of things.

Ms. Rood asked if the labor would be union labor. Mr. Middleton asked for clarification as to whether she was referring to construction or something else. Ms. Rood said construction. Mr. Shallenberger explained that there are grant programs out there that require union labor. He said the contractor he has lined up would not be a union shop. He said they could do prevailing wage if that was required by the County. Ms. Rood said it is probably required by the Feds. Mr. Shallenbarger said he did not know of any prevailing wage requirements for this. Ms. Rood

said at least, it is in the Infrastructure part. Mr. Shallenbarger clarified that that was just signed in January.

Ms. Little commented that there are 743 homes / businesses in Macon County that would benefit from this and asked what percentage of total homes / businesses in Macon County this 743 would be. Mr. Jackson said there is roughly 52,000-53-000 tax parcels. Ms. Little asked if only people using Shelby Electric would be eligible for this. Mr. Shallenbarger said for the initial, what is being proposed tonight, the direct connection. He said they see it as an opportunity to expand. Talking about the new Infrastructure dollars. He said he sees this as a great way to demonstrate that Macon County has made the commitment to invest in broadband on their own through discretionary means and then you could go to USDA, the NTIA funding that is coming out in the near term and say, look, we've already done 1/3 of the county in the rural areas. We could really use some help in getting the rest of the county done. He said he would hope that they could leverage that. He asked Mr. Middleton to weigh in as well because he knows that he has gone looking for other opportunities when it comes to funding. Typically, it takes you demonstrating that you already have a winning solution, sometimes to get people to buy in. That just demonstrates your commitment, but then also maybe assures them of success for the project. That plays well for everybody that you know that that project is ultimately going to be successful. Mr. Jackson asked if they are saying that there could be more funding based on if the County had a project in play. Mr. Shallenbarger said there is more funding available. But he thinks this serves as a lever / fulcrum to gain access to that funding that otherwise you may have been passed over just because you have not demonstrated any initiative. He said he would talk a little more about that when they get into the financials and what they've been doing in the past in trying to get FCC money, past USDA money.

Chairman Greenfield asked what they are looking at as far as cost. Mr. Shallenbarger said they are almost there. Mr. Jackson asked if they could get there right now. Mr. Greenfield said he has not understood a thing they've said so far, so he'd like to know the cost.

Mr. Shallenbarger said this is the answer. He should have started with this slide, but this is the answer to what he left the last meeting on. He explained that they have been exploring ways, as mentioned earlier, since 2019, to develop a true fiber to home network for the members of Shelby Electric. Number one, because they could not serve all members with fixed wireless because they did not have access to line of sight and number two, because of the capacity of the radios just does not allow for the throughput which is what Mr. Middleton alluded to. He said they are always building to what is needed now and that just outstrips that capacity pretty shortly. So, working closely with Finley and an organization called TCA out of Colorado doing marketing analysis which is all in the proposal. We do not need to get into the details, but this is what drops out with the cost and the individual line items. That $8.7 million and what they are proposing at Shelby Electric is to split that equally at a 50% . For Shelby Electric to construct, own, operate, maintain and service that network for 20 years plus includes two equipment change outs at year 7 and year 14 to ensure that the network continues to perform. Once that fiber optic plant is in place, the actual strand, then it is just supporting it with new equipment from the back end to make sure it keeps up with the demands of the bandwidth in the future. Mr. Shallenbarger said it is important for him to give the committee members the idea that they are not just wildcatters here looking for their first foray into this. He said they have

looked at a couple of different programs and tried to partner with a middle mile provider a couple of years ago and get access to USDA reconnect funding in one of their initial programs. He said that unfortunately, that is kind of on them. That was an initial exploration of a for profit entity trying to partner with a member owned entity and there are different objectives there. He said they did not feel like the final proposal was going to work out so they walked away from it. The second thing, two years ago, they went to the FCC, the Federal Communications Commission, at a Rural Digital Opportunities Fund Auction. It is a reverse auction of the universal service fund which is tax that has been collected from rural telephone users over many, many years. There is a lot of money sitting in this. It was determined that just a very inefficient process existed to get that money deployed to develop a broadband solution for the rural members which is really what was needed out in the rural areas. The FCC came up with a way to reverse auction. What will you bid in to develop and operate a broadband network in the census block groups. Mr. Shallenbarger said they had bid on all of the census block groups, not only in the Shelby territory, but it would have been outside the fringes where it made sense. Unfortunately they bid at the gigbit tier and had every intention of deploying a fiber to the home network just like what is being proposed tonight. When you get into those types of situations, and the rules allow for bad actors, which they did in this case, fixed wireless providers of which we are one and know the capabilities were allowed to bid at the gigabit symmetrical tier. They are not capable. That's how politics sometimes work. He said he is just being straight. They were allowed to bid in. They did and took a large portion of most of the area Mr. Shallenbarger said they are looking at. A company out of Texas got that. Pennies on the dollar, very low consequences for not deploying. So, he said he did not think there would be any significant punitive damages placed on them for not deploying the network. He said he doubts that you will ever see anything as a result of that auction. Again, it was pennies on the dollar. Mr. Shallenbarger said they had bid aggressively for that money. So, they have tried this a couple of different ways and feel like this is a really good chance for the representatives of the constituents of Macon County to have discretionary authority over how this money is spent without the politics becoming intertwined and that is why he said they are strongly encouraging a strong look and think about this. The intention, when developing this proposal, was not to come in and give the County something they could live with. It was to give both the County and Shelby Electric something to live with. It really was meant to sharpen that pencil and they have gone back and forth a couple of times. They have a really good handle on costs so they reduced some items where they just thought that budget could be reduced and they could get a lower share for each party. He said they felt that a 50/50 cost ratio, whereas you see a lot of 80/20 with 20% by the provider. It just makes for an alignment of the members of the cooperative and the constituents of Macon County. The point is is that if someone were standing next to Mr. Shallenbarger tonight that had a proposal, he said he would feel pretty good coming in thinking that if you guys are interested in getting fiber to the home to these locations, you are going to go with Shelby Electric Cooperative. That is how good Mr. Shallenbarger said he feels about the numbers.

Ms. Little asked, if the board were to approve, is this a not to exceed proposal or here is what we think. Mr. Shallenbarger said this is a not to exceed amount and he has authority from the Shelby Electric Board to proceed. So, it is not an Oh, by the way. He said they are ready to go. They have the materials and contractors lined up. He said they could start tomorrow as far as he was concerned within the engineering determining the make ready. A big piece of this is the

make ready for the pole infrastructure. Even though there is an existing pole plant, it will require a significant amount of change out because there is not the height required to meet the National Electric Code Standards for some of the plant. You will see some of that involved in here and that is one of the ancillary benefits of the cooperative as well. Just being very forthright.

Mr. Jackson asked, for future opportunity, could somebody put up a 5G network on Shelby Electric's system. Mr. Shallenbarger said, like Mr. Middleton had said, a 5G network requires fiber and they certainly could utilize that as a middle mile provider. Mr. Jackson asked if it would have capacity to support that network. Mr. Middleton said yes, and many times beyond. Mr. Shallenbarger added that when you get into a 5G network, the tower density has to be pretty dense. That is what is required just to get the speeds that you are going to realize. That is also why it is primarily deployed in an urban area. But, going to that point of ok, you've got a fiber plant that is out there to support other things. When you get into precision farming, then you can be very strategic in how you deploy a wireless node to support precision farming operations. That might be an example where the fiber network traditionally as we think of it would have not have had that opportunity.

Ms. Rood said the Infrastructure Investment and Jobs Act and said the goal of that is related to that 5G network. She said she thought she might feel a little better if she knew a little more about what funding opportunities would be coming down the road with that. Mr. Shallenbarger said that there will be, distributed through NTIA but coming through the States and he said he assumes that the Illinois Office of Broadband will, in all likelihood, administer that program. Mr. Shallenbarger said he is on the Illinois Broadband Advisory Council. He said the way he sees it is that this initial build is what leverages that additional funding to the rest of the County. He said he has seen it time and time again, where there is demonstrated investment, it begets additional investment from the Feds or the State just because they truly know that you are invested in it already and you are determined to make that a success. It does not hinge on them making it a success and their money. You've already make that investment on your own. Mr. Middleton added that it is kind of like a catalyst. The joke is if you build it they will come, but truly others do follow those capital investments when they know you have the pathway to be able to make that go. You're an easy Segway to continue that investment.

Chairman Greenfield asked, in their footprint, if they had south of Mt. Zion, actually in the Village limits now, Silverleaf and those areas. Mr. Shellenbarger said they do serve into the Silverleaf Estates. He said they have just an underground plant there. Mr. Greenfield said the Village of Mt Zion is getting ready to run fiber optic out there and they are going to pay for it. He asked if that is figured in this cost. Mr. Shallenbarger explained that this includes every Shelby Electric location, so, yes, it would be included. Nothing was excluded just because there was a proposal to run anything anywhere.

Ms. Rood said she understands enough about the entire county and its needs, but she was under the impression that the northeast part of the County is in more dire need of this than the southern part. So, that is one thing she said she was struggling with. She asked if the northeast needed fiber to the tower as a first step to make it more accessible to individual households versus what is being proposed here, fiber to the house. Mr. Shallenbarger said he draws

heavily on his experience, both from what they had as the best information to pull together a proposal for the County and one that they knew would fly and make sense. When it comes to fiber to the tower, you still are limited to that base station radio located at the tower as to how much capacity through that you can put through that base station radio. Backhaul has to be there to support the continued growth. You can do that microwave or once you do it fiber, then you kind of open up the pipe. It's called last mile from the tower to that end user, but it has to keep pace with technological needs as well. It is a two part process. You have to back haul support and then you do that last mile someway, whether it is wireless, fiber or something else. Any support you can create in any part of that infrastructure helps. One step further, when you get into fixed wireless product or even just a mobile wireless product, you are limited by the capacity of that pay station. There are economic issues that you have to overcome because you're going out point to multi-point and you might have $5,000 to $6,000 in that base station and you can only support so many base stations on one power. Otherwise, you run into interference issues. There is a limited ability, even though you have that fiber connection going to that base station to really support the needs for that last mile. You will see a lot of fixed wireless providers especially when it comes to subsidy and that that are trying to block out on the mapping what they can get access to. On a dedicated connection, Mr. Shallenbarger said he can get 100 by 20 with that base station, but it is going to, for him to recover his cost on a single location, it is going to far exceed what that household can afford. That is what they tried to put into this project too, it is not only access, but it is affordability.

Mr. Greenfield asked, if this was in place now, what would a household pay? Mr. Shallenbarger said for a 100 mg by 100 mg, that is 100 mg down and 100 mg pushing up, symmetrical service, it is proposed at $69.99. For those low income that would qualify through the FCC's emergency benefit program which Shelby Electric subscribes to and have available to the membership, it is a $50 subsidy off of that per month. But, that changes to the emergency connectivity fund in March and it reduces that benefit to a $30 a month subsidy. So, effectively, you are looking at $40 per month for 100 by 100 connection if you are a low income subscriber.

Ms. Rood asked if they direct outreach to help educate those that might need extra support. Mr. Shallennbarger said they do on their website, Facebook, through the app on your phone that is used on the billing side but can be used for messaging as well and in their magazine. Those are the most effective ways that they can do this.

Mr. Jackson said that there is one other piece on this and he had sent a separate email on it a month or so ago. That is all forwarded out over the project timeline. This is not an initial investment at all upfront. Mr. Greenfield asked if that was included in this. Mr. Jackson said he did not believe it was, but it is on the resolution.

Mr. Greenfield commented that he thinks this is a great idea, but he questioned how it gets done for one part of the county and not the rest of the county. Mr. Jackson explained that that is the caveat, at least in his mind, you start the progression to get there until you can expand to all of them because you don't have that now. Mr. Greenfield asked then, what is the cost to do the whole county. Mr. Jackson said that as we move along, that is what Mr. Shallenbarger was saying, he could liaison with the other co-ops. They have interest. Mr. Greenfield said that is

one of the answers we don't know yet. Mr. Jackson said that based on the footprint, talking about the northeast needing the most, the . . . Mr. Greenfield said, anybody in the rural area that doesn't have . . . Mr. Jackson said correct. Mr. Greenfield said he guessed he must have misunderstood Mr. Jackson when they had talked about this because he thought he's said that it would pretty much supply the whole county. Mr. Jackson said that that is what Mr. Shallenbarger was talking about when he said you hook on, you go to Richland and that gives you the touchpoints with the other coops that you can cover those areas. Mr. Greenfield said it gets you to them, but it doesn't get you to the house. Mr. Jackson explained that Mr. Shallenbarger is saying that he could liaison with those co-ops and take it to the house. They have interest, the same as they do as a co-op, but they are not in that game now. Mr. Greenfield said, ok, if our cost is $4.3 million and that is how many properties? Mr. Jackson said that is all of the southern, so how many would you have? There wouldn't be much out northwest and Cerro Gordo north, there's not a lot. What is the population now? 105,000 total? With the majority in town. It can't be much higher than what we've got for the whole southern half. Mr. Greenfield said he did not think the cost is going so much to the house, its getting to the house. Mr. Shallenbarger said that, on average, what the study provided and keep in mind is that when Finley engineered this, it is an architecture that supports a redundant network. So, you could do a radio fee and maybe do it a little cheaper, but you don't get that benefit of reliability. But, on average, just looking at the cost per – it's in the slide $11,676 – so if you knew the rural residents, he thought that gets you pretty close considering that the density is similar throughout. So, we're at about 3 ½ members per mile in this particular area. Again, you can do the math, that would give you a close approximation. He said in his time and working and trying to secure grant funding, he can't tell you how much that means to folks that are administering those programs is that they have a success story and that they have someone that is willing to put skin in the game. He said that is where he would just caution them when it comes to trying to be dependent. If this is what your goal is. You have to determine that for yourself, but he said he thinks this is a great first step if you want to see rural deployment throughout the whole county.

Ms. Little asked, if this goes through and everybody, magically, on the south side of Macon County has it and you say it will run out to Richland and people could tap in or whatever and other co-ops would be interested and blah, blah, blah. So, when the other co-ops come to us here at the county and say, hey, they've done all this work and we want a piece of it too, would you expect that we would be shelling out another $11,000 per parcel to do this or is the hard stuff done and the other co-ops would have a much easier time? Mr. Shallenbarger said he thinks it makes it easier. Ms. Little said she does not have a problem starting with one part of the county, but . . . Mr. Shallenbarger said but you want to see the whole thing done. Ms. Little agreed, saying eventually, but we can't cough up another $4.3 million because we need the northwest side done. Mr. Shallenbarger explained that how he sees this, and he does not want to be misunderstood because he does not want it to be interpreted that he is speaking for other staff from other cooperatives, because he has relationships and he knows there is interest. So, it may very well be Shelby working with those other cooperatives to get access to their pole infrastructure as opposed to them doing it themselves. They may not have an appetite to be in rural broadband, but they certainly all recognize the need for economic development purposes, for just satisfaction with their members to have a fiber to home solution or a very robust broadband solution. So, when you go to the State and say, ok, you're going to have a 50/50

program available through the state funding. We are interested in partnering with the State. Shelby Electric is. We're willing to put the 50% up that is required to gain access to your grant funding mechanism and you put 50% up. Macon County has already demonstrated that they've put skin in the game on the southern part. That was to get us started. That is how Mr. Shallenbarger said he ultimately sees that playing out. There is going to be . . . The NTIA is where the majority of the funding is coming from through that infrastructure package. But, he said he thinks it will be, in all likelihood, written and administered by the Illinois Law Office of Broadband. Ms. Little said, then, basically, yes, we can count on $11,000 per parcel unless there is a 50/50 state grant of some sort that comes along. Mr. Shallenbarger said yes. Ms. Little said she realizes that most of the parcels are in the area that they are currently addressing. It is more sparsely populated in the other direction.

Mr. Middleton added, from a perspective from Finley, actually, he said he does a lot of different roles within Finley, but one of the roles is when he is working projects like this, not just from the design element, but it depends on the entity he is working with. Sometimes he works with a co-op directly and they do design and build, project management, all kinds of things. But, they also do a lot of feasibility studies where they are trying to help entities figure out if they should do it in the first place. So, guess what, he said they can work right with the provider like a utility. They work with telecommunications providers. But, guess what has become the new hot button in the last multiple years and it is partially driven by this grant fund? He said he, actually, in his personal repertoire is working with city and county governments personally. He said he actually has one in Illinois that he is doing that very thing. They are trying to determine what they do, how they start and where they go from there. They are actually spending money directly with Finley to have them lay out, from the county level and not partnering with an ISP and they are going to determine, they're actually going to go after ISPs from a county perspective. So, this is not unique. That potential that this exists. This is done for municipal entities and others that are like, how do we get this started; how do we get the engine running, so to speak. There is a playbook for this that would help you in that endeavor. Kind of like what you are saying, once you kind of define the roadmap, so to speak, then it is amazing how the ISPs kind of show up out of the woodwork. Once they see there is going to be a potential for them to partner and build on someone else being the precursor. It is amazing how many of these, with the catalyst of all the funding that is sitting out there, it is just adding more impotence to the whole discussion. He said he just wanted to offer that, that that is happening right now.

Mr. Shallenbarger said he wanted to be clear that the reason he is there at the meeting is because to make the business case, it require a subsidy. He said he thinks this is just a unique opportunity with the ARPA funding to get the County started. That is the proposal.

Chairman Greenfield thanked them and said he'd like to hear the board members' thoughts on this.

Mr. Gresham said this is basically 25% of the ARPA funds the County is expecting. Broadband is definitely within the parameters of what we are encouraged to spend the money on. One question, has the group that Chairman Greenfield appointed to look into how to spend this money come up with any recommendations?

Chairman Greenfield explained that the group has kind of fizzled out. So, they thought it would just be better off for everybody to bring their requests to the Finance Committee. He said he doesn't know enough about broadband and things like that to make a $4 million decision without more information and more dialogue on it.

Ms. Rood added that they are waiting for the Administrator to be hired. Mr. Greenfield agreed that the group had talked about waiting for the new County Administrator to be hired and then let them investigate it and report back to the board what they found out. He said it was his understanding that that was one of the federal government's big things. They were going to expand broadband to the rural areas. Ms. Rood said it is. Mr. Greenfield continued saying he didn't think that bill has passed yet. Ms. Rood said it is in the Infrastructure Investment and Jobs Act. So, in that bill, there is lots of money for broadband. She said she just doesn't know enough of the particulars about this and that is why she was asking those questions. But, it probably is a 50/50 match because that is typically what the feds use. Mr. Greenfield said he would think there has to be some grants available. Ms. Rood agreed saying, yes, it would be grant based. Mr. Greenfield said that hopefully, the County Administrator will either be familiar with writing a grant or put us in the right direction where we can start that ball rolling as well. He said that in taking with Mr. Bird, County Engineer at the Highway Department, the rules have been changed on the COVID money. Now, he said he didn't know how much could be used for infrastructure. At the time when that bucket list was set up, that was not an option. He said he also did not know if it would be an option to save a little bit of that money too or if it all still has to be spent. He said he does know, that with Reas Bridge, they just keep changing the bar on that all the time. We've got to go to letting on that bridge. We could take some of that COVID money. If we get funding somewhere else, we could replenish the COVID money. He said he thinks we will be able to do that. At least, Ann Schneider and some of the other people think so. We are going to need $6 million of the COVID money for that. Mr. Mattingley said that with $6 million for that and a little over $4 million for broadband, if they did that, that would be half of the $20 million. Ms. Rood asked Ms. Reed how much is left. Ms. Reed said that basically, only $750,000 spent on premium pay has been spent. It is under $1 million at this point. There have been some other small ones, but nothing that takes us over $1 million spent. Mr. Greenfield said, let's just say we've got $9 million left. Six and four, and we're all confident we're going to get that other $10 million, but until you've got the check in hand, you'd better not be spending it because it's been known to go south too. Mr. Gresham said the likelihood that we will get it is pretty good, and looking at what we have in hand, we're talking payments over 2 years. He said he thought they just need to say whether they want to spend half of the $20 million on broadband infrastructure and the bridge. He said he did not know how the board would want to proceed with that. He said he did not know the answer to that. Chairman Greenfield agreed that he did not know either. As Ms. Little brought up, we do have the rest of the county to think about. Ms. Little commented that that is the most populous area of the county. So, it makes sense to start there. Chairman Greenfield said he does know that the Village of Mt. Zion is taking some of their COVID money, about $250,000 to $300,000, and they are going, but they've annexed some of that property in too. So, like south of the high school down and around and some of the new subdivisions down there. They are going to pay to run that.

Mr. Jackson asked if they are Shelby Electric. Mr. Greenfield said they are Shelby Electric customers. Mr. Jackson asked if they'd (Village of Mt. Zion) be willing to put their money in towards us. He said he bet they would. Mr. Greenfield said probably, but he hasn't talked with them about it because this is kind out of his realm of things.

Ms. Little said her only hesitancy is the amount. It is probably a legitimate amount, and feels that getting the high speed internet to the rural areas is very important, but . . .

Mr. Greenfield asked Mr. Jackson, down by where you live, is there any internet at all? Mr. Jackson said he has Shelby on direct line of sight from a tower. It is marginal at best. He said he does not even have city water.

Mr. Greenfield said that in the Oakley area, they don't have hardly anything at all.

Ms. Rood said she just didn't know if they should be spending the money on fiber to the tower versus this. Mr. Jackson said one good thing on this project, and they hit on that. Once you start in the project, you are on the top of the list for any funding coming your way. Both Finley and Shelby would be those grant writers. They would be that liaison. They are on the board. The others that Mr. Jackson said he has talked to, Cornbelt FS, they have interest. They don't have the pockets. When you say, why are we starting here, its because nobody else is willing to step up and put up four to five million of their money to get it to this point.

Chairman Greenfield said he would like to see two things; 1) how they came to the $8 million and 2) some kind of a customer agreement about the monthly charge to the customers. He said he did not want to see it double in year two. We have got to have that. He said he is assuming that after we pay for it, we have no more skin in the game. Mr. Jackson said no, we will have oversight of the project management until we sign off at completion of the project from the close of it with the remaining 15%. So, we do have skin in the game all the way. Ms. Little clarified that that would be for 2 years. Mr. Jackson agreed. Mr. Greenfield said he is talking about once it is all done, we are not part of the ownership of it and are no part of it. Mr. Jackson said that is correct, but you would not want that, the liability on that anyway. That is not our bag of tricks. He said that the email he had sent to everybody on the Finance Committee a month ago has the details Mr. Greenfield is looking for.

Chairman Greenfield said he did not know about the rest of the committee but he is not ready to make that $4 million decision right now. But, if someone wants to make a motion –

Ms. Little said she also is not ready to commit to the $4 million even though she thinks it is a wonderful program and would like to see it started in the rural areas, but –

Chairman Greenfield said he thinks they need to get a five person group that is educated and familiar with this, maybe Mr. Jackson, Mr. Tanner, not sure who else. Ms. Rood said Mr. Miller from the Sheriff's Department. He seems really knowledgeable. She said she thinks we need some IT people on it. Mr. Gresham suggested that Ms. Rood has been involved in this stuff too. Ms. Rood said she is not really educated on it. Mr. Greenfield said he did not care who, but he knows it is not him. Mr. Gresham agreed that it is not him either. Mr. Jackson said

you will find out, when you pull those people in, because he, Ms. Reed and Mr. Tanner have talked with them and at the end of the day you are still looking for the same thing because you've got such a small gross number of people on it at the current time. It won't change. You're providing fiber service to a limited thing right now. The network is small because there is nothing new on it. You have the opportunity to bring things new on it, future state. Right now, you just filled it out. You have nothing. Everybody has been waiting for years to say - Like you said, five years ago they had a letting for the service. Someone in Texas took the money and ran, didn't provide the service. It has just been a slush fund of give me the money. Nobody has ever stepped off to make the infrastructure. He asked Mr. Bird if that was a fair statement. Mr. Bird said he guessed so. Ms. Little said she feels it is a good investment. She just thinks that is a huge chunk of change. Mr. Greenfield asked if the reason they don't bury it is because it is cheaper to go pole to pole? Mr. Jackson explained that it is $100,000 a mile to bury it and it is already buried from Chicago to Richland. Buffett tied into it at his place, and that is the end. You can take a letting on this and you may not be able to get anybody else to bid, but you might. Ms. Little said she is not arguing that the cost they say it is is not legitimate, she said her hesitation is that she is not ready to hand them half of the ARP money. That is $5,200 per household that we would be investing in not everybody. She said she gets it, if you get the southside done, the smaller co-ops may jump on and say yes, they want a piece of it and it will expand. She said she does not think it is realistic to think you could do the whole county at the same time, but that is just an awful big chunk of change. Mr. Jackson said that honestly, the infrastructure is not set up to cover the people in town either. There are a lot of underground that already have good internet providers. Ms. Little said she is not interested in getting people in town. She is interested in getting good internet to the rural communities. Mr. Jackson said exactly.

Chairman Greenfield said the in town people have the opportunity to get it now anyway. Ms. Kraft commented that that is not the county's responsibility. Mr. Jackson confirmed, but said when you're talking about the numbers, the numbers are in Decatur. Your numbers are not going to change much when you go to the west or northeast. Ms. Little agreed but said they're asking us to spend $5,200 per house right now. She said she would be interested in knowing what percentage of that population that 743 is. She said she thinks it is a pretty significant percentage. Mr. Jackson said it is, because it runs from the far boundaries of the west to the east and from Decatur down. Ms. Little said she would be interested in knowing what percentage that is.

Mr. Greenfield said he would contact Julie Miller from Mt. Zion and see exactly what they were going to run south of Mt. Zion. He said he thinks they were going down Trauber Road, Kraft Road, and make a loop type thing. Mr. Jackson asked if they were burying fiber. Mr. Greenfield said he thought so, but wasn't sure. Ms. Rood asked about the other, smaller towns. Mr. Jackson said they are on Shelby too, but - Ms. Kraft said part of it, but part is Ameren. It is split out around Elwin and up in there, but they all have their recovery money and they're investing, the ones she said she has talked to.

Mr. Greenfield asked, if they are Ameren customers, they wouldn't get supplied? Ms. Kraft said that is how she understands it. Ms. Little agreed saying, this is only for Shelby Electric customers. Mr. Jackson said that in future state, they would expand. Ms. Kraft said that the

way she understands from Mr. Tanner, once they get that main line, they can branch out to the other. She said she agrees with his perspective that if we do this, our chances of getting more money are better. Mr. Greenfield and Ms. Little both said they agree with that as well. Ms. Kraft said you have to bit the bullet or not at some point.

It was discussed that since no vote has been taken, there is nothing to table. Mr. Greenfield said he would check with Mt. Zion and see what their plan is. He asked if Macon has anything. Ms. Kraft said that Macon has funds and she has reached out to all of them because she was told the Act is going to lay fiber optic, and then she's been told that they are not, but supposedly Boody has a contract with AXE for fiber optic. Mr. Jackson agreed, saying but it is just a tower and they're assuming they're going to have fiber optic speed on that. Ms. Kraft said they are planning to use some of their funds on that. She said she has reached out to Elwin too. Mr. Greenfield asked about Blue Mound and Macon and what are they doing? Are they waiting for us to run this branch line or something. Ms. Kraft said she did not think so, not at all. Mr. Jackson said everybody is just out there on their own. Mr. Greenfield asked if they are taking care of their villages or their rural areas too. Ms. Kraft said probably just the village. The unincorporated areas . . . It was agreed that it would be worth reaching out to them to find out. Mr. Jackson said the Townships did not get ARP money. It was mentioned that it was not ARP money, but they did get some money. Mr. Greenfield said that maybe if everyone kicked in something . . . Ms. Little stated that it would be worth reaching out to the Villages that would be encompassed in this rather than everybody inventing their own wheel. Ms. Rood said yes, the group had wanted to do a plan, but then decided to just wait on the new Administrator.

Mr. Greenfield said he thinks waiting for the new Administrator would be good. He asked Ms. Wilkerson about interviews that are coming up. These are second interviews for people. He repeated that he would Mt. Zion and see how much money they are going to spend and where they are going to spend it. Mr. Jackson said they will be on the hook for that forever unless they're just doing it for a grant fund for whoever it is. Mr. Greenfield asked if they would then collect the revenue off of it. Mr. Jackson said no. From his understanding that will be with the provider.

CITIZEN'S REMARKS - ***None***

OLD BUSINESS – ***None***

NEW BUSINESS –
Transportation
Macon County Board Resolution Approving a Survey Agreement with Hanson Professional Services, Inc.

Mr. Bird explained that the parcel that they had bought from ILLICO needs to be split out into what needs to be kept for right of way and what is not going to be used. That will be split into three parcels and are going to go ahead as part of this and add the part that has to be sliced off the Huddle House lot and they're going to do all of this at the same time. This is the first step for us to sell parcels / buy parcels for the right of way setup.

Mr. Kreke made a motion to forward the resolution on to the full board with recommendation to approve, seconded by Mr. Gresham and the motion carried 6-0

Macon County Board Resolution Approving a Funding Agreement for the CH 38 Washington Street Bridge

Mr. Kreke made a motion to forward the resolution on to the full board with recommendation to approve, seconded by Ms. Little and the motion carried 6-0

Macon County Board Resolution Approving a Funding Agreement for the Reas Bridge Road Project

Mr. Kreke made a motion to forward the resolution on to the full board with recommendation to approve, seconded by Ms. Little and the motion carried 6-0

Macon County Board Resolution Approving and Appropriating Additional Funds for the Turpin Road CIR Project

Mr. Kreke made a motion to forward the resolution on to the full board with recommendation to approve, seconded by Ms. Little and the motion carried 6-0

Chairman Greenfield asked, going back to Reas Bridge, and wanted to know about what the funding agreement is. Mr. Bird explained that there is a large number of federal funds involved. It goes all the way back to the $178,320 that is still left over from the original earmark from 1998. He said they are going through spending out a bunch of that. The other federal funds, there are two major bridge grant monies we got at $4 million apiece and if you jump over to the state funds, it shows the money originally given to us by Gov Quinn. That is the remaining amount left out of those. Basically, all of the leftovers are being scraped together from all the past sources plus some grant money thrown in to get everything added up. The ARPA money, since that is being given to Highway, it is considered local money, not federal funds. The County Bridge part is our actual money. So, out of all the original money that came from Macon County taxpayers is $200,000 for a $20 million project. He said the hope is to get started in March.

Chairman Greenfield asked how much they are short right now. Mr. Bird said the ARPA funds are making up the difference. That is the $6,279,935. That is an estimate. The estimate was just redone with current prices as of a month ago. The total construction was just shy of $19 million. Mr. Greenfield asked what the cost had originally started at. Mr. Bird said it was about $15 million. In the last 3 to 4 years, it has gone up about $3 to $4 million with the rate increase and amount of construction.

Ms. Little asked if it would be completely shut down. Mr. Bird said for a short period of time. There is about a 5 week period on the east end in order to get grading in. From the Sangamon Road intersection on the east side of the bridge, from there west, it is going to be open all the time. But, from Sangamon Road to the east end of the project which is about 600 to 700 feet, there is going to be about a 5 week window there where it will have to be closed where it will

have to be graded. It is written in that they have to have it open for the next Farm Progress Show because this is a two year project. Whoever bids that, there will be no uncertain terms on that.

Chairman Greenfield asked Ms. Reed if a resolution was needed to spend that $6.3 million. Ms. Reed said yes, it has not yet been appropriated. There is a plan, but no appropriation or resolution putting it into the budget. The question to the committee is, are you ok with that because without that $6.3 million, we cannot go to letting. Ms. Little said she definitely supports. Mr. Gresham asked about the previous mention of the possibility of some money being made available that would come back to us to offset some of this. Mr. Bird said there was an earmark that was supposedly set up. All the earmarks were peeled off when they did the infrastructure bill and put them all in the Build Back Better Bill. If we would happen to get that, it could be substituted in on the funding agreement. You could put in an amended funding agreement at any time during the project. The nice thing about that is because that federal funding typically is on the state side and when you have a funding agreement, they don't like to change that because that is their side having to budget it. Since we already have the money in the bank, so to speak, it is considered local funds. If we end up with another source of local funds before we are spending that money, they will allow us to change it. It is no problem. From their standpoint, you are just getting it out of a different bucket and we don't care.

Ms. Little asked if we need a resolution to come out of this committee to go to the board to - Chairman Greenfield said it will have to go on the agenda and they could vote on it at the next board meeting next Thursday. The board rules will have to be suspended to do that. He said that is probably something that will need to be done to get this going. Ms. Reed said she would get the resolution put together. There was not an infrastructure bucket at the time the plan was put together because at that time, it could not be used for infrastructure. Ms. Reed explained that everything that has been spent so far has been by resolution.

Courts
Macon County Board Resolution Approving Appropriation of Funds for Equipment Purchases for the Law Library FY22

Ms. Little made a motion to forward the resolution on to the full board with recommendation to approve, seconded by Mr. Mattingley and the motion carried 6-0

NEXT MEETING - 1/31/2022

ADJOURNMENT
Motion to adjourn was made by Ms. Little, seconded by Mr. Kreke, and Chairman Greenfield adjourned the meeting at 6:45 p.m.

Minutes submitted by Jeannie Durham, County Board Office

Shelby Electric Cooperative

Your Touchstone Energy® Cooperative

Macon County, IL

Rural Fiber Optic Network Design Project

DUE DATE/TIME:

December 3, 2021

Josh Shallenberger
CEO / General Manager
Shelby Electric Cooperative
1355 State Hwy 128
Shelbyville, IL 62565

RESPONSE FROM:

Finley Engineering Co., Inc.
104 E. 11th Street – PO Box 148
Lamar, Missouri 64759
(417) 682-5531

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Table of Contents

Executive Summary

Broadband has fast become to the residents and businesses of Macon County in 2021 what electricity was to those living in the early 1900's. While separated by almost 100 years of time, the improvements in productivity and quality of life which resulted from the introduction of new and improved technology has resulted in profound improvements to "everyday life".

While we know the importance of access to broadband to operate in today's society, the critical importance of high speed and reliable broadband network has been magnified in the past 2 years as everyday school and work life, healthcare and commerce has seen success or difficulty hinge on access to broadband.

We live in an interesting intersection of understanding what "internet speed" is adequate for the needs of both rural and urban communities around the United States; if we consider that only 2 years ago anyone with less than 25/3Mb was considered "underserved" for the purposes of the FCC Rural Digital Opportunity Fund (RDOF) auction. A short 2 years later in 2021 we have seen that nearly all federal funding mechanisms have some consideration for areas without access to 100/20Mb broadband and infrastructure investment targets for networks that can provide simultaneous 100/20Mb minimum speed levels to all customers with a very real desire for investments that can provide a minimum of 100/100Mb symmetrical broadband.

State of Broadband in Macon County

All locations in the United States are experiencing the same increases in demand for broadband. In places like rural Macon County, that need for broadband is very real. Some folks do not have reliable access to a broadband connection while others have access to options for broadband service that may not meet their current or future needs. When you look at the available data and consider observations from people in Macon County, we find that the southern region contains areas with the lowest broadband usage and speeds.

FCC 477 Broadband Data

Provider reported speeds to the Federal Communications Commission (FCC) show that wireline connections capable of speeds greater than 100/20Mb are only near Decatur and in the towns of Blue Mound and Macon.

Microsoft Internet Usage Report

Less than 50% of locations in southern Macon County zip codes use the internet at speeds above 25/3Mb.

Ookla Speedtest

Data from Ookla shows that nearly all speed tests in Macon County outside the cities of Blue Mound and Macon are below 25/3Mb broadband connections.

NTIA Broadband Indicators Map (NBAM)

Information from the NTIA shows in southern Macon County 15% of homes do not have a computer, 20% of homes have no broadband internet access and speeds of less than 25/3Mb

broadband; these metrics are most prevalent in the very southwest and southcentral parts of Macon County.
Our further review finds that small communities such as Blue Mound, Macon and some areas adjacent to Decatur may have access to broadband providers which can provide up to gigabit download speeds (while providing significantly less upload, i.e., non-symmetrical) over a wired connection but may only have one option for a sustainable broadband connection.

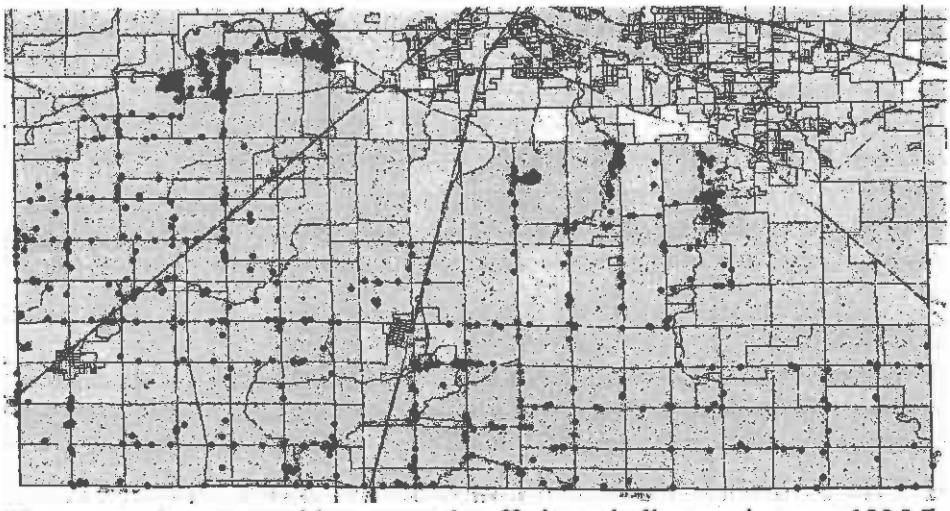
Macon County Market Survey

According to an extensive market assessment that included research of national survey data, statistical data, mapping overlays, competitive network data, and 'secret-shop' conversations with CSR's employed at each competitor, wireless and satellite providers make up most of the competitive footprint in southern Macon County.

To quickly summarize our overall view of broadband in southern Macon County please find attached a straightforward map and short description of what we believe to be the true broadband landscape.

Green areas in the map view below may have access to 25/3Mb or less fixed terrestrial service available based on our analysis of the providers in the market. We know that all the fixed wireless is Line of Sight and wireline is ADSL at best. So we are saying they have access to a wireline or fixed wireless service of 25/3Mb or less.

Blue areas are probable to have access to wireline broadband speeds greater than 100/20Mb. These areas are the only areas with access to a wireline broadband connection and excludes fixed wireless as a viable delivery platform for 100/20Mb.



There are only two providers currently offering wireline service over 100 Mbps / 20 Mbps, A.C.T.S. and Sparklight, to some of the Shelby Electric member locations included within the network design. A.C.T.S.' wireline footprint is currently minimal, with a fiber connection offered to only 5% of the proposed network. However, when submitting the Shelby locations to Sparklight (and Comcast/Xfinity through their partnership and/or shared network), these providers claim to offer 1 Gig / 50 Mbps to 56% of the proposed network. We find that based on

our experience the ability of Sparklight or Comcast to actually provide service to these locations is much lower than 56%, it is quite common for customers to find out that even though the provider website broadly states they can get service, it is actually not available.

With the information found within the marketing assessment regarding competitive availability and pricing, a 50% penetration may be attainable over five years at the following price points:
-100 Mbps / 100 Mbps for $69.99
-500 Mbps / 500 Mbps for $79.99
-1 Gig / 1 Gig for $99.99

Technology Review

All fiber broadband networks have been in full operation since the early 2000's; and these networks are still performing flawlessly while offering full gigabit broadband to customers. The proposed all-fiber network across the Shelby Electric footprint offers robust Gigabit symmetrical broadband services to all the Shelby Electric Cooperative members within Macon County. It provides the infrastructure for enhanced electric grid operations, a fiber backbone network which can be leveraged for future technology and the ability for Shelby Electric to expand an all-fiber network throughout Macon County through future funding applications.

The fiber network is a Passive Optical Network (PON) which means that the network uses an optical splitter to minimize the number of fibers and electronic equipment locations in the network while still enabling gigabit services for customers. The PON network is by far the most widely deployed network in the United States and allows for the deployment of mature 2.5 GPON optical equipment and the opportunity to deploy 10Gb PON immediately or seamlessly in a network expansion as demand for broadband dictates. The network design also has additional fibers included for connection of Shelby Electric grid, future broadband connections, and additional growth of network services. The proposed Macon County fiber network utilizes GPON network architecture and equipment.

The fiber network will be installed on existing Shelby Electric pole lines, with only minimal buried fiber required to make a new internet backbone connection. Aerial installation leverages the existing investment of Shelby Electric Cooperative members and allows for a much quicker deployment timeline compared to what is typically required in an all-buried network.

The installation of aerial fiber is something quite commonplace in the United States; in fact, Finley has engineered rural electric FTTH projects in Missouri and Arkansas with over 1,300 miles of aerial fiber that have been in place for nearly 5 years with no issues for maintenance or reliability. Finley continues to work with rural electric utilities to implement FTTH networks over the utilities existing pole line with an active project in Arkansas, and active projects in New Mexico and Colorado representing an additional 1,300 miles where aerial fiber is installed in very difficult terrain and the fiber must survive difficult weather conditions.

Shelby Electric Cooperative intends to utilize existing pole infrastructure where available. The existing easements Shelby EC has for electric purposes do not necessarily support a fiber communications network such as the one being proposed within the framework of this

document; accordingly, this proposal is contingent on Shelby EC's ability to obtain all necessary easements. For purposes of this proposal, we assume that most landowners will consider this an improvement to the value of their property and will agree to incorporate fiber communication systems into their existing easements free of charge. Shelby EC intends to utilize its best efforts to acquire this landowner approval where needed and as cost effectively as possible. In those situations where landowners require compensation for the additional easement rights, Shelby EC will communicate with the County and will seek an agreement from the County whereby the payment is split equally between Shelby EC and Macon County. However, in the event landowner opposition makes easement acquisition more complicated or costly than anticipated, Shelby EC reserves all rights to withdraw this proposal without further obligation or liability to Macon County.

With the unprecedented demand for broadband network construction, material availability and timelines are extended at this time. Fortunately, Shelby Electric is already working with contractors and vendors to build fiber backbone networks for electric substation communications and expect any material lead times to be negligible. Material acquisition for a Macon County project could begin immediately with a project award, network construction to be finished within one year of project start, and initial customer connections to begin 6 months from project start.

Financial Requirements

The smart investments being made today are those in broadband infrastructure which have long asset lives, are scalable for future broadband capacity requirements and are multi-use. FTTH has been a technology used to provide broadband services directly to residential and business locations for more than 20 years. An investment in fiber has an expected lifespan of 30 years or more and is long term the de facto smart decision as a broadband investment in Macon County. An investment in fiber-based broadband is not just a long-term investment in infrastructure; it is a generational investment in education, healthcare, workforce development, job creation/retention and other community improvements none of us may not know about simply because they have not been developed.

The costs of deployment for an FTTH network in the rural area of Macon County that Shelby Electric serves is quite high, with a **total cost to build of $8,675,324**. This rural area has a density of customers of less than 4 per mile, and the proposed Shelby fiber network does not come close to being a profitable endeavor without some infusion of grant funds to support the initial investment. For the Shelby network, a **grant of 50% of the total initial cost of construction** is required to make a break-even business case at a 50% take rate. While this may seem extraordinary, these costs and grant requirement are in line with analysis we have done for other providers with a similar density of customers and investments we see being made by similar providers, especially electric cooperatives.

Macon County Broadband Solution

As a response to the now universally understood need for broadband, significant amounts of federal funds have been designated to invest in high capacity, robust and forward-looking broadband networks particularly in areas that are considered unserved or underserved.

Macon County is the recipient of one set of funds, American Rescue Plan Act (ARPA) funds, some of which Macon County can use for expansion of broadband. The U.S. Treasury has a very straightforward approach for the use of ARPA funds for broadband; fund networks which can provide robust broadband speeds, fund scalable networks so the investment can be leveraged for future good and target initial investments to the areas of most need.

U.S. Treasury also included guidance for ARPA funds that acknowledges that investment in broadband should not be made for the goal of profit but to be for the benefit of the communities where the investment is made; the U.S. Treasury includes a preference for investments made by communities, not-for-profits, and other cooperative entities.

Understanding that initial access to robust broadband solutions is a primary need in rural Macon County, affordability of the robust broadband solution is equally important. The proposed pricing for Shelby Electric FTTH broadband service offers premium broadband service at a cost-effective price point, which is something desperately needed in rural southern Macon County.

The price point for a 100Mb connection is $69.99/month and a Gigabit is slightly higher at $99.99/month. Shelby Electric is already a participant in the Emergency Broadband Benefit (EBB) program; the EBB provides qualifying households up to a $50 credit per month (transitioning to a $30/month discount in March 2022) to help pay for broadband service. This discount coupled with affordable pricing offered by Shelby provides a forward-looking solution for access to quality broadband service while delivering world class broadband service at a very competitive price to all consumers.

Shelby Electric Cooperative is a member-owned electric distribution cooperative and through an operating division, PWR-net, has been a provider of fixed wireless internet services in a large portion of Macon County for over a decade. The internet offerings of PWR-net filled a much-needed gap of internet service options in Macon County where the incumbent providers had not made the necessary investments to provide internet service. This area of Macon County is also the area of the county with the lowest overall average internet speeds and the largest percentage of the population without internet access.

Shelby Electric Cooperative is requesting funding from the Coronavirus State and Local Fiscal Recovery Fund allocated under the American Rescue Plan Act to make a larger broadband commitment in Macon County by investing in an all-fiber broadband network, beginning where a rapid implementation of broadband can be accomplished by utilizing the existing Shelby Electric pole line. Staffing and scalable information systems used for mapping, billing and work processes are already in place for a seamless transition to a fiber-based broadband system. The medium of data packet exchange will merely be changed from RF (radio frequency) transmission to that utilizing the transport medium that has proven to be the most robust, reliable, and future proof available to date – a fiber optic network.
We propose a 1-year last-mile fiber-to-the-home (FTTH) broadband infrastructure project which will provide fast, reliable, and affordable broadband service with speeds of at least 100 Mbps symmetrical up to 1G symmetrical to 678 households in southern Macon County. We estimate that a majority of these households lack access to speeds of at least 100/20 Mbps through a wired connection.

Wireline broadband speeds of 100M or higher will allow for multiple users within the same location to simultaneously utilize the connection for advanced multi-media transmission, which is critical for online education, remote work, and access to advanced rural telehealth services. The proposed project will address this critical need for broadband service and ensure that these households have access to sufficient speed to directly enable work, education, and health monitoring opportunities during the pandemic and beyond.

Shelby Electric Cooperative, or a wholly owned subsidiary thereof, will own, operate and receive all revenue, from all sources utilizing the fiber. In exchange, Shelby will ensure successful completion of the project, operate and support the network, provide for future equipment upgrades, in addition to contributing 50% of the total up front cap ex cost to put the FTTH network in place. This network, as proposed, provides for internet access only. Phone service access, if required by the county, would be an addition to the proposal.

Shelby Electric Cooperative was established by farmers who wanted to bring electricity to rural and underserved areas in Illinois. The cooperative currently serves all or parts of Christian, Cumberland, Effingham, Fayette, Macon, Montgomery, Moultrie, Sangamon, and Shelby Counties. When it was first established, Shelby Electric Cooperative brought power to 481 member-owners and today, the cooperative serves over 10,000 member accounts over 2,200 miles of energized lines. In 2008, Shelby Electric Cooperative launched PWR-net, an always-on, line-of-sight, wireless broadband solution with speeds comparable to Digital Subscriber Line (DSL), to provide fast, reliable, and affordable broadband service to members in underserved areas. Today, PWR-net covers the entire Shelby Electric Cooperative service area and has expanded its services to additional locations.

Shelby Electric is committed to being more than an electric service provider in Macon County. Its operations abide by the Seven Cooperative principles. Cooperative Principle Seven is Concern for Community, and the decision to make the investment in a FTTH broadband network and seek funding assistance from Macon County accomplishes the tenants of the principle. Cooperative Principle 7 states that cooperatives work for the sustainable development of their communities. The rural areas of Macon County need access to robust, reliable broadband. Shelby Electric, working cooperatively with Macon County meets the goals of Shelby Electric Cooperative Principles, enhances Macon County, and allows for highly effective use of the Macon County ARPA funds.

Shelby Electric is actively involved in community civic and economic improvement initiatives by partnering with other like-minded entities such as CoBank in the Sharing Success Program and other economic development initiatives. Shelby actively supports the youth of Macon County through academic scholarships and activities such as the Rural Electric Youth Tour, which sends youth to Washington D.C. to see some of our great nation's history and get a firsthand view of our federal government. Shelby also actively participates in the United States Department of Agriculture Rural Economic Development Loan and Grant Program (REDLG), leveraging zero percent loans from the REDLG program to foster economic and workforce development for the benefit of the local communities.

Market Assessment Report

Competitive, Demographic, Pricing, and Penetration Analysis

Project Goal:

This research is designed to assist in the decision-making process and the building of a businesscase for the construction of a fiber-to-the-home project as defined by Finley Engineering's network design within Shelby Electric's existing electric distribution service area footprint. This informationcan be included in a proposal to apply for ARPA funds as applicable.

Introduction

In the fall of 2021, on behalf of Shelby Electric Cooperative and Finley Engineering, TCA conducted a market assessment which analyzed demographic information, existing PWR-Net market penetration, existing speed availability, and competitive information to determine opportunity, speed/pricing recommendations, and estimate penetration projections for financial feasibility and marketing scalability, all as it pertains to the plausibility of a fiber-to-the-home broadband network build within current Shelby Electric and PWR-Net footprint, and to construct an ARPA funding proposal for the project.

Bio

Since 1982, TCA has served as consultants to independent telecommunication companies on a full range of management, financial, and regulatory matters. TCA provides assistance through nine service areas - Financial, Competitive Services & Marketing, Regulatory, Strategic Planning, Advocacy, Network Services, Performance Management, HR Solutions and Mergers and Acquisitions.

The goals of this research were to:

- Determine and secret shop existing internet providers by area to gauge market opportunity
- Assess current internet availability and competitive pricing information
- Develop recommendations for speed tiers with corresponding pricing that are competitive enough to maximize market opportunity and gain penetration, as well as exceed monthly operational and wholesale costs to allow for monthly profit margin; price point recommendations were then used in the project's financial projections
- Use competitive and market research to determine penetration/take-rate projections over three years upon build out
- Obtain demographic information to build an ARPA proposal for county and to use for future marketing purposes as applicable

The information provided in this report is an overview of findings based on the market and competitive analyses, demographic information, speed tier and pricing recommendations, existing

market penetration, and penetration/take-rate projections. Recommendations are based on research findings and are designed to serve as a starting point to assess overall project feasibility.

The information provided within this report is intended as a guideline for making a business case for an extensive fiber broadband build and for the application for ARPA funds.

Competitive and demographic information is current as of 11/15/2021, the mapping systems used in this research were the NTIA broadband map, FCC 477, ReConnect Round 3 eligibility mapping, and other internal mapping resources – all current as of December 2020 or later.

The information provided in this report does not include surveys, survey results, or speed tests submitted by actual users as that was not included in the scope of this project.

Methodology:

Research was conducted using national, state, and local statistical data sources that draw from census and survey data, mapping services, and FCC provided data. Competitive data was also collected through address scrubbing and secret shopping to further estimate speed availability and pricing available throughout the study area, as well as service details.

Observations and Recommendations

Market Opportunity:

Wireless and satellite providers make up most of the competitive footprint within the proposed project network: Rise Broadband, Rocket Comm, A.C.T.S, Viasat, and HughesNet. Consolidated Communications is an ADSL provider and Sparklight is a cable internet provider. A.C.T.S. has deployed fiber to a small percentage of the homes-passed included in the network design.

There are only two providers currently offering wireline service up to 100 Mbps / 20 Mbps within the proposed project footprint. These providers are A.C.T.S. and Sparklight. Sparklight currently offers their wireline (cable) internet connection of up to 1 Gig / 50 Mbps to 381 of the 658 active homes-passed within the proposed network.

Comcast/Xfinity also reports wireline availability up to 1 Gig / 50 Mbps within the project footprint on the FCC's 477 data. However, when Comcast/Xfinity was researched and secret shopped, their website and Customer Service Representatives redirected the inquiry to Sparklight each time. In TCA's opinion. this indicates a partnership, ownership agreement, and/or shared network between Comcast/Xfinity and Sparklight within the project footprint. The detail behind this relationship remains unknown at this time.

Based on information collected regarding the availability of Sparklight and A.C.T.S wireline connections, between 39% and 44% of the homes passed as represented in the network design do not have access to 100/20 Mbps or higher through a wired connection. Wireline broadband speeds of 100/20 Mbps or higher will allow these residences access to high-speed internet for multiple

users within the same location to simultaneously utilize the connection for advanced multi-media transmission, which is critical for online education, remote work, and access to advanced tele-health services.

Though Sparklight offers up to 1 Gigabit download, they do not currently present the availability of a symmetrical data package. Their highest upload speed as presented to the public is a maximum of 50 mbps due to the technical capability of their current cable network, whereas fiber-to-the-home can offer symmetrical packages of 1 Gig / 1 Gig and beyond.

A.C.T.S. and Consolidated Communications have indicated future fiber builds within this footprint. This is public information through their websites, marketing materials such as mailers, and/or was communicated by their sales staff over the phone while secret shop research was being conducted.

However, most homes-passed do not currently have access to fiber broadband, despite fiber technology being hailed nationally as the most scalable, cost-effective, and sustainable broadband technology on the market.

* All satellite providers and satellite availability have been omitted from the charts below for clarity.

City/Town// Township	Homes Passed	Rise Broadband	Rocket Comm	A.C.T.S.	Sparklight (Cable One)	Consolidated Communications
Blue Mound, IL	126	25 Mbps / 4 Mbps	X	up to 100 Mbps / 20 Mbps (wireless)	1 Gig / 50 Mbps	40 Mbps / 10 Mbps
Boody, IL	2	X	X	X	X	X
Dalton City, IL	44	25 Mbps / 4 Mbps	X	up to 100 Mbps / 20 Mbps (wireless)	1 Gig / 50 Mbps	X
Decatur, IL	239	50 Mbps / 5 Mbps	X	up to 100 Mbps / 20 Mbps (wireless)	X	X
Macon, IL	177	25 Mbps / 4 Mbps	X	1 Gig / 1 Gig (fiber)	1 Gig / 50 Mbps	X
Mount Zion, IL	30	25 Mbps / 4 Mbps	X	X	1 Gig / 50 Mbps	X
Mowequa, IL	36	25 Mbps / 4 Mbps	X	1 Gig / 1 Gig (fiber)	1 Gig / 50 Mbps	X
Other Rural Macon County	24	Varies by location	Varies by Location	Varies by Location	Varies by Location	Varies by Location

The following information was attained through scrubbing and testing homes-passed addresses through competitive service online availability systems and public databases, as well as secret shopping via phone calls to competitive sales teams to assess the most accurate availability. Of all 678 addresses tested, the following percentages were calculated as the existing availability with

Rise Broadband (wireless), Rocket Comm (wireless), A.C.T.S. (wireless/fiber), Sparklight (cable), and Consolidated Communications (ADSL).

Speed Availability	Homes-Passed with Access to 25/3 Mbps	Homes-Passed withAccess to Wireline 100/20 Mbps	Homes-Passed withAccess to Wireline 100/20 Mbps (excluding A.C.T.S)
Percentage	97%	61%	56%

Critical to note is that this research is based on what has been presented to the public by these specific service providers through their own data reporting, advertising, website information, and as data presented in real time by the service providers' customer service representatives. Field testing is recommended to further confirm, or dispute results based on these service providers' technology and equipment present within the market and its corresponding reach and overall capabilities.

Market Penetration within PWR-Net Wireless Footprint:

To further gauge projected take-rate, the current PWR-Net penetration was assessed to assume that existing PWR-Net customers would convert to new, more cost-effective, higher-speed fiber service. Twelve existing customers could not be sorted by township but were considered to calculate the total PWR-Net customer penetration of homes-passed upon completion of fiber project. Of the 743 homes- passed provided by the engineering cost estimates and mapping, 678 of those homes-passed are active homes with active electric meters. It was determined that the remaining homes-passed included on the network design are structures such as barns, agricultural structures, or any other non-occupied structures determined by lack of active water meters and electric utility accounts provided by Shelby Electric.

City/Town//Township	Total Homes Passed	PWR-Net	Existing Penetration
Blue Mound, IL	126	5	4%
Boody, IL	2	0	0%
Dalton City, IL	44	11	25%
Decatur, IL	239	6	3%
Macon, IL	177	17	10%
Mount Zion, IL	30	0	0%
Mowequa, IL	36	2	6%
Other Rural Macon County	24	3	13%

If we assume a 100% conversion rate of PWR-Net customers within the prospective fiber footprint, Shelby Electric will enter the market upon the completion of the build with an 8% penetration, based on 678 active homes-passed.

With this assumption, and based on competitive and market information, a realistic estimate of total penetration/take-rate over 3 years is approximately 35%-50% of homes-passed.

* A 50% projection assumes the implementation of a highly aggressive marketing budget and it's corresponding strategic planning throughout and after project completion.

Competitive Speed Packages and Pricing:

For recommending speed packages and the corresponding pricing, competitive offerings were assessed to ensure that recommendations would not just make sense from a financial (costs & profit margin), demographic affordability, and market opportunity perspective, but would also make sense from a competitive standpoint. The following was considered to project speed tiers and pricing that lends to maximize take-rate and overall market penetration.

The following pricing is what is currently offered within the project footprint:

Internet (all speeds download 'up to')	Rise Broadband (Wireless)	Realtel Comm (Wireless)		A.C.T.S (Wireless and Fiber)		Sparklight	Consolidated Communications (ADSL)
		Wireless	Fiber	Wireless	Fiber		
1 Mbps/ 256 Kbps							
4 Mbps / 1 Mbps							
6 Mbps / 512 Kbps							$ 23.95
8 Mbps / 2 Mbps		$ 49.00					
10 Mbps / 2 Mbps				$ 20.00			$ 28.95
12 Mbps							
12 Mbps							
12 Mbps							
15 Mbps / 2 Mbps							
18 Mbps / 3 Mbps		$ 69.00					
20 Mbps							$ 33.95
25 Mbps	$ 50.00						
25 Mbps / 3 Mbps							
25 Mbps / 3 Mbps							
25 Mbps / 3 Mbps							
25 Mbps / 3 Mbps							
25 Mbps / 5 Mbps			$ 56.00				
35 Mbps / 3 Mbps		$ 99.00					
50 Mbps / 3 Mbps	$ 60.00	$ 129.00		$ 50.00	$ 20.00		$ 58.95
100 Mbps				$ 60.00		$ 35.00	$ 68.95
100 Mbps / 25 Mbps			$ 59.00				
200 Mbps				$ 125.00		$ 65.00	
250 Mbps / 50 Mbps			$ 79.00		$ 50.00		
300 Mbps						$ 80.00	
500 Mbps					$ 80.00		
1 Gbps / 50 Mbps						$ 125.00	
Up to 1 Gbps / 100 Mbps			$ 99.00		$ 125.00		

Demographic Information:

The markets within the fiber project footprint were assessed for social vulnerability and internet service affordability based on median age, annual household income and median home values. This information was not just gathered to formulate speed packages and pricing recommendations, but for future marketing campaigns as well.

The following is what was assessed within the project footprint:

City/Town//Township	Median Age	Median HH Income	Median Property Value	Socially Vulnerable?
Blue Mound, IL	36.1	$ 43,667.00	$ 86,500.00	No
Boody, IL	36.1	$ 43,667.00	$ 86,500.00	No
Dalton City, IL	36.5	$ 62,292.00	$ 93,500.00	No
Decatur, IL	40.2	$ 42,701.00	$ 83,000.00	No
Macon, IL	44.5	$ 67,188.00	$ 97,000.00	No
Mount Zion, IL	39.1	$ 85,765.00	$ 152,000.00	No
Mowequa, IL	46.6	$ 60,357.00	$ 89,600.00	No

Speed Package and Pricing Information:

Taking into consideration competitive offerings, market opportunity, market affordability, and on- going operational cost estimates, the following speed packages and pricing is recommended:

Speed	Price
100 Mbps / 100 Mbps	$69.99
500 Mbps / 500 Mbps	$79.99
1 Gig / 1 Gig	$99.99

Conclusion

Based on this research it must be determined through the financial feasibility and ARPA funding eligibility factors if a case can be made to apply for ARPA funds to complete a fiber-to-the-home network within Shelby Electric's existing footprint as outlined on the network design.

The following is recommended as next steps once the project moves forward into construction:

- Determine Shelby Electric's USP (Unique Selling Proposition) regarding the marketing of fiber internet and how both the USP and the benefits of fiber will serve as a competitive edge based on providing the most value to the customer
- Focus on building brand awareness, digital presence, and online reputation around the fiber internet product
- Start an aggressive marketing campaign (using a variety of media best suited to the market) and electric bill inserts to promote upcoming fiber build and the benefits of moving service to Shelby Electric/PWR-Net.

Engineering Report

Evaluating the Network Options

In our evaluation of the Shelby Electric service area in Macon County, we considered the application of an all-fiber broadband network. In evaluating this approach, we considered the following criteria that are necessary elements of a broadband solution:

- Bandwidth capacity.
- Availability of funding source for the construction of a broadband network.
- Cost of the network.
- Expected life cycle of the technology.

Network Design

The engineering study looks at building fiber to pass every home and business in Macon County that is served by Shelby Electric Cooperative. Fiber broadband networks have been around as an end user delivery platform since the late 1990's. The Fiber-to-the-Premise (FTTP) technology that is currently in the marketplace has been around for over 15 years and the technology is now mature and widely used around the world.

The design of fiber networks and the associated electronics are fairly straightforward, but every network differs in the details of how the network will be deployed, the method of construction, geography, topography, the number of customers and the long-term goals of the fiber provider. Below is a description of the major component of a FTTH network and a discussion of the factors which influenced our design decisions for the network.

There are two primary types of fiber electronics used in FTTH networks – passive and active. Finley chose a passive network for several reasons, and a detailed comparison of the two technologies is included below.

All the network architecture, the design elements, and the electronic equipment used in this design have standards based and used by multiple broadband operators across the United States.

The Shelby network is designed as an all-Internet Protocol (IP) network; meaning that all traffic and connections are IP based. The FTTH network is broken into two distinct types of connectivity:

- Fiber network *(Physical network of connectivity from central office to customers)*
- IP network *(IP packets with internet information on optical signals)*

The easiest way to understand the distinction is that the fiber strands (the physical network) carry IP packets which communicate to and from the Internet.

Overall Design Criteria

In the Shelby Electric service area in Macon County, the existing wireline providers utilize all buried copper and fiber construction in addition to their aerial coaxial cable assets. It is advantageous to consider the existing electric utility poles for FTTP network deployment since Shelby already maintains these assets for electric service. We also note that new buried fiber construction may face significant head winds due to differing opinions on the existence of public right-of-way along county roads.

The basis for any FTTH network design relies mostly on the network topology, fiber cable fill percentage, and the number of potential broadband customers – these factors largely determine the size of fiber required, the requirements to terminate the fiber in cabinets or frames, and the type of buildings or cabinets required for the FTTH optical equipment.

In the Shelby design, Finley worked with Shelby GIS data to understand the mix of residential, business, future growth, expansion opportunities and designed the network accordingly.

In the telecom industry the number of potential customers is referred to as passing. Using the Shelby GIS records, we selected all meter locations for the FTTP fiber requirements; we know this includes some locations which are barns, shops, etc. but we include those to account for the potential for future growth of related broadband services.

We also considered the amount of capacity on the network needed for future growth. While we understand that many rural areas are contracting in population, we know from years of building fiber networks that it is prudent to plan for increased fiber utilization over time. In fact, a guiding principle for ARPA funds is a scalable network for future growth and ARPA directly encourages the investment in fiber networks where feasible. In the network design we applied a 1.5 fiber factor, meaning that for the number of meters being served on any given tap we multiplied that number by 1.5 to determine the fiber cable size required, typically rounding up to the next industry standard fiber size. We carried this factor throughout the network from the core hub to the customer locations. The network design also includes additional fiber on routes which might be attractive for dedicated connection for future expansion of the Shelby network to other parts of Macon County.

Fiber Network Design

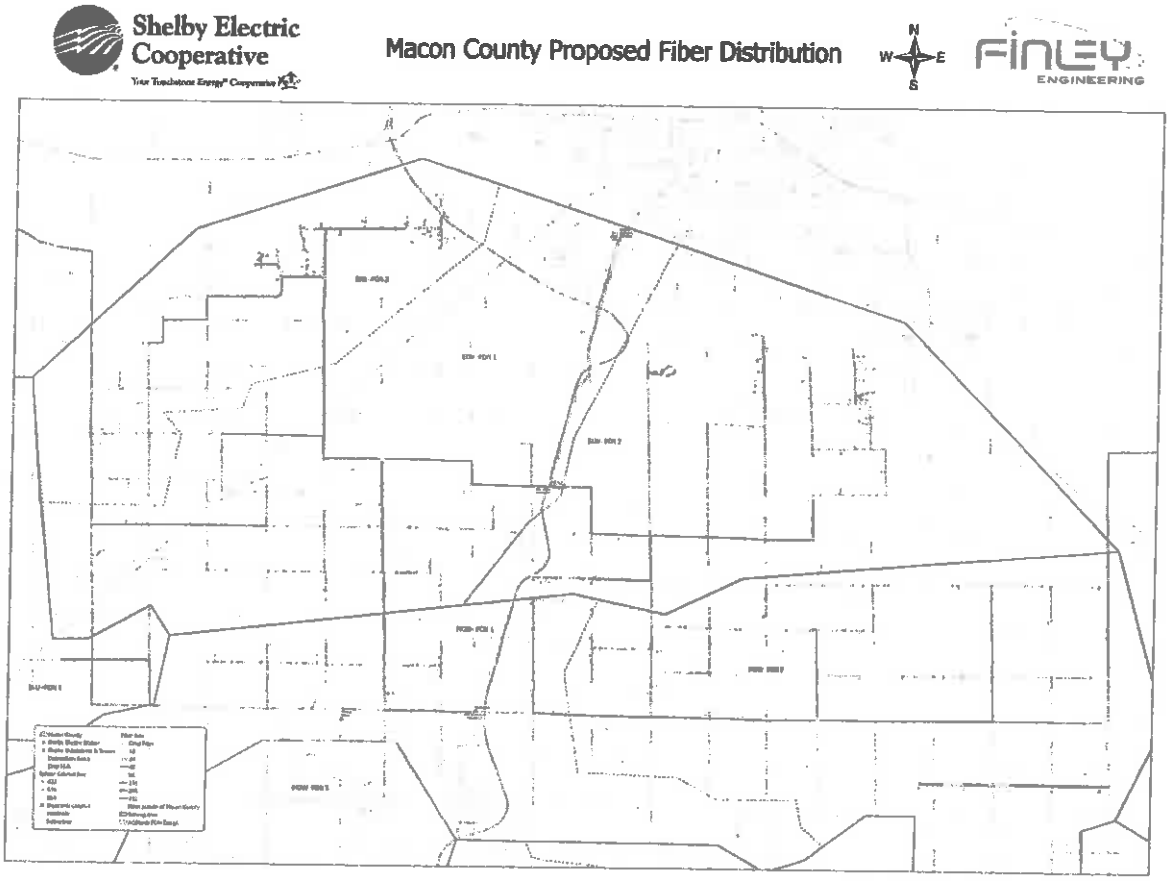
There are two components of the fiber network design:

Backbone Fiber. Our preliminary network design includes (4) locations that will house electronics and (6) passive optical cabinets to support the distribution fiber network.

As part of an overall larger fiber strategy for Shelby Electric, we have engineered a ring within the network and created other transport/sub rings which consist of a minimum of 12 fibers that are connected to fiber equipment sites, are dedicated for this purpose, and are not used to serve customers. The ring configuration provides for redundant fiber paths between all locations. This

means that most of the node locations have a fiber connection to two adjacent nodes in the ring; so if connectivity is lost in one connection, all traffic routes over the other connection in the ring network, ensuring that each node stays connected.

Due to the linear nature of some of the end customers at the ends of the Shelby network, two equipment nodes are unprotected at this time. Future network expansion could allow for these sites to become part of a fiber ring.



Last Mile Fiber Network. The last mile fiber network extends from each of the (6) hub locations to reach customer locations. The total fiber network, including the backbone fiber, covers 199 miles of fiber network construction.

Finley utilized standard fiber cable sizes for the Shelby fiber network design; the fiber cable sizes used were 12, 24, 48, 72, 96, 144, and 288 fibers in a bundle. We always try to design using standard fiber sizes since such fiber is more readily available from contractor and vendors for additional network construction and repair. Also, standard sized fiber is generally priced more competitively.

Our design tries to determine the right sized fiber cable for each route. One of the most significant costs of deploying fiber is the cost of labor needed to splice fibers together, so our goal is to not

include unneeded fiber pairs, that limit by the needed number of splices. Every splice in a network also adds a small amount of signal loss, so the ideal network is one that includes the least number of splices.

Aerial Fiber Basics. There are several factors that can determine the cost of aerial cable. We've estimated these various factors in making construction cost estimates. The primary factors that affect aerial construction costs include:

- The location of the new fiber on existing poles. The current Shelby facilities include just the electric conductors and neutral wire.

- If the new fiber is to be placed closer than 40 inches from the neutral wire the installation would have to be done using contractors who are qualified to work in the energized supply space. This adds to the installation cost since qualified installers with that skill generally are paid higher salaries than other installers. If the fiber is to be placed lower in the communications space the primary issue is whether there is enough room to add the fiber and still provide enough space between the existing cables on the poles. The NESC electrical code requires specific clearances between different kinds of cables on poles, and any new construction is expected to meet these codes. It's also sometimes necessary to place a new pole if rearranging the current wires still won't meet NESC code.

- The Finley network design assumes a strand and lash installation, which means an all-dielectric cable is lashed to a steel messenger for the FTTP network. This cable can be placed in as close as 18" inches to the electrical neutral or other energized parts of the electric distribution system as long as installation and maintenance is done by personnel qualified to work near energized lines. This cable placement is acceptable in industry practices and meets typical construction standards and the requirements of the NESC code. Shelby Electric and its contractors are qualified to construct and maintain the installed fiber network.

Make-Ready. The most important aspect of utilizing existing pole infrastructure for communication equipment attachment is something that the industry calls make-ready. There are national electric codes that define the spacing between the wires of different utilities. In rural areas, poles may already be carrying electric wires and telephone wires. There also could be existing fiber on some roads that is used for some purpose other than serving households and businesses.

The national electric codes include two important requirements that can affect the cost of getting onto poles. There must be sufficient space between the different providers on a pole. For example, a new fiber must be at least 18 inches above the cable below it (be that a telephone cable or wires from a cable TV company). There are also minimum clearance rules for the lowest that any cable can be above ground for the safety of those beneath the pole. These rules are in place to provide safety for technicians that work on cables, especially during and after storm damage and to keep from unnecessarily obstructing traffic and work flows located at ground level.

When there is not sufficient room for a new wire, then an industry practice called make-ready is invoked. Make-ready is the process of moving the existing wires on poles, as needed, to make room for a new wire. The make-ready can be somewhat simple, such as moving an existing wire

by a few inches, or it can be major, such as having to move all of the wires on a pole or possibly even replacing the pole with a taller one.

Optical Electronics Design

The predominant technology solution for FTTH networks deployed today is a gigabit passive optical network (GPON). These networks are capable of delivering 2.5 Gigabits of downstream bandwidth to a cluster of customers. Newer PON technologies such as XGS-PON and NGPON2 that can deliver 10 gigabits of downstream bandwidth to customers are rapidly becoming much more prevalent as prices for equipment and optics continue to come down. We will discuss later in the report why we did not choose these technologies. We have designed the network to allow for expansion to faster technologies if needed at some time in the future.

One consideration when designing PON networks is the optical distance from an OLT port to the customer ONT, the design of the 2.5 GPON network for the Shelby service area includes a 35km design limit and was selected based on vendor optic availability. We designed the hut locations to account for this optical budget limitation.

The basic design characteristic of a PON network is that multiple customers in a neighborhood can share the same fiber. This is accomplished by use of splitters located throughout the network that are used to split one fiber from the central office or one of the huts to serve up to 32 customer locations. The primary advantage of this fiber sharing is that far fewer pairs of fiber must be deployed in the customer network.

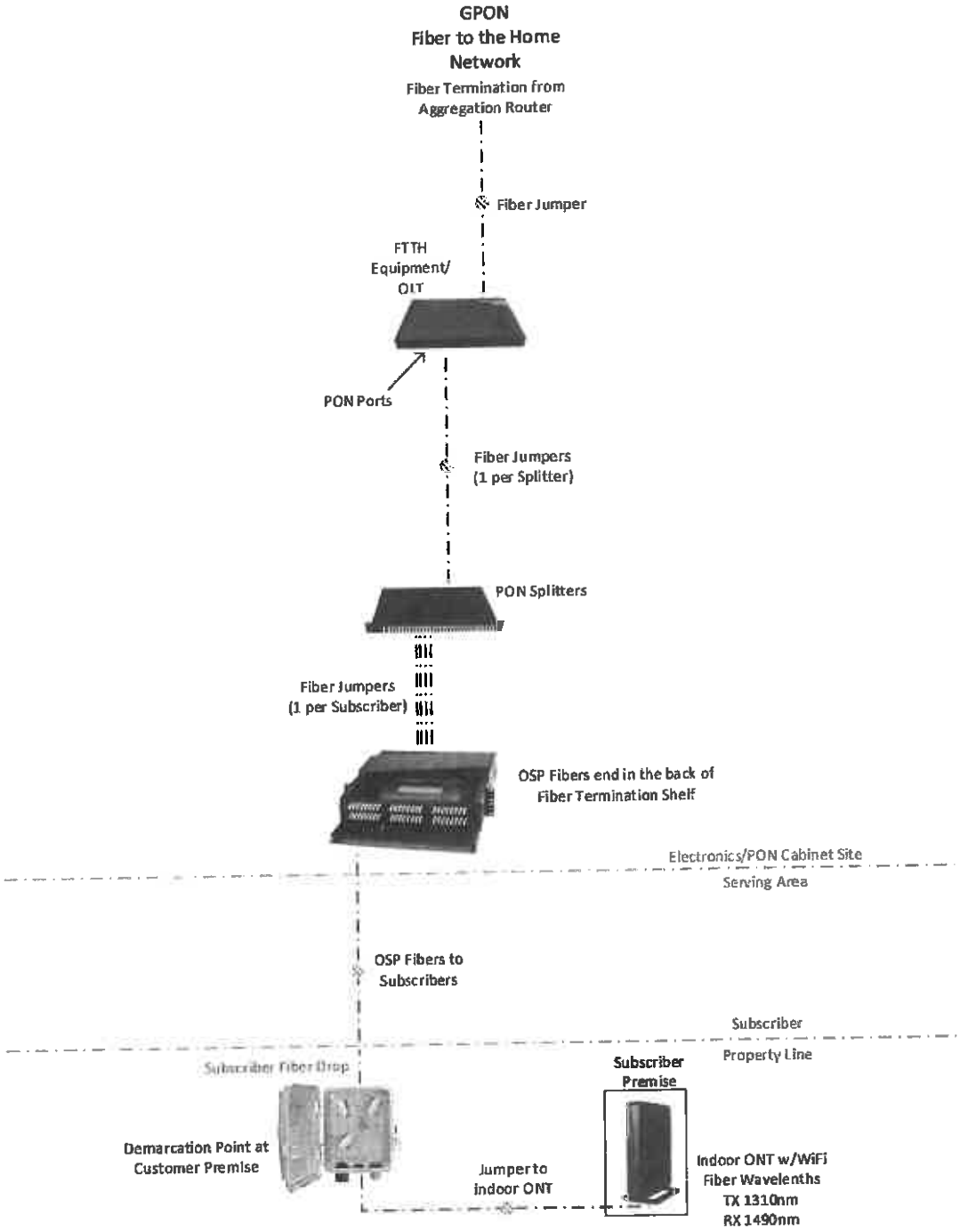
Our design provides the ability to serve 100% of Shelby Electric customer locations and is capable of providing more than 1/1Gigabit sustained broadband to all customer locations at the same time. The design is also scalable so that future customers could easily be incorporated into the network.

Future expansion of the network could utilize several technologies such as coarse wave division multiplexing (CWDM) or dense wave division multiplexing (DWDM) to increase bandwidth without having to remove and replace equipment in the network.

Each network node is also capable of offering metro ethernet services. Think of metro ethernet service as the IP equivalent of traditional T1 type services offered by legacy telecom carriers. There are likely to be businesses or large data users around the network that will want metro ethernet connectivity.

Local Network Configuration

The following diagram shows the configuration of the network starting with one of the hub sites and ending at each member premises.



Connection to the Internet

Currently PWR-net maintains point to point wireless connections for backhaul of the fixed wireless network internet traffic. The proposed fiber network in Macon County proposes a new buried fiber backbone extension to the City of Decatur and IL Century Network (ICN) fiber meet point near the Macon County Law Enforcement Training Center on the south side of Decatur. Shelby has an existing 500 Mbps broadband backbone connection and another 5Gb backbone connection to the existing fixed wireless network. Increasing the capability of the existing 500Mb connection to 5Gb will enhance resiliency and redundancy of the broadband connections for PWR-net customers, the enhancement of the backbone connection will also allow for enough capacity in the existing network prior to addition of the fiber network customers.

Central Office & IP Core Network

PWR-net maintains an existing broadband core routing network; minor additions or changes are required to the existing core network to support the expansion of a fiber network in Macon County.

Optical Line Terminal (OLT)

The electronics used to light the fiber to customers is called an optical line terminal (OLT). This is the top piece of electronics shown on the diagram. Our design places one OLT in the central office and one in each remote hut. OLTs must be powered, and so each hut location will contain equipment needed to provide power, including batteries and other back-up power to keep the network functioning in case of a power outage.

An OLT functions using circuit cards which can each service between 128 to 256 subscribers. Multiple cards can be installed in each OLT chassis and multiple chassis can be installed in each remote hub site if ever needed, meaning that it's easy to scale the network to accommodate significant future growth.

There are multiple vendors that provide an all-inclusive PON solution combining the cabinet and FTTH equipment solution. All vendors meet industry standards and all of them are priced similarly.

PON Splitters

The next component on the network diagram is a PON splitter. This is a device that can "split" one fiber in order to connect up to 32 customers. On the diagram you can see that there is only one fiber between the OLT and the GPON splitter. This is the place in the network where significant fiber can be saved since one fiber coming into the splitter can serve up to 32 customers. The splitters do not require power, which is why they are referred to as passive. The splitters can be located anywhere in the network where fiber splits are needed to reach customers. Generally, some of the splitters are located in the central office core or at the various network nodes, but many are located in small neighborhood cabinets located closer to customers.

PON Cabinet

Associated with a splitter cabinet is a PON cabinet. The purpose of these devices is to neatly arrange and manage the fibers coming into or out of the splitters to make it easy to identify which fiber serves which customer. The primary purpose of the PON cabinet is to accumulate customer connections at strategic points with the design goal that no fiber in the network needs to be larger than 288 fibers. The PON cabinets designed for the Shelby network are of varying sizes that depend on the customers served from a given hut location.

Below is a picture showing the insides of a typical PON cabinet site. This site includes both a PON cabinet and a splitter cabinet.

Fiber Drops

The local distribution fibers are built to emanate from PON cabinet sites to reach to every customer location. The fiber design assumes a fiber built to reach each location in the Shelby service area, even if they don't initially choose to purchase.

To connect a customer to the fiber network a fiber drop is built from the street to connect to the outside of a customer premise building. The customer drop is a two-fiber cable which is fusion spliced to a single fiber of the main line cable. These splices are housed in a splice case that is sized for each location depending upon the number of homes or businesses that can be served. Splice cases are installed everywhere in the network to provide future access for connecting customers – even in locations where there are homes or businesses that might not initially take service.

At the Customer Location

The piece of customer electronics used to serve customers is referred to in the industry as an ONT (Optical Network Terminal). This is an electronic device that contains a laser, and which connects back to the OLT in the huts or the central office. The ONT receives optical light signals from the fiber network and converts the signal to traditional Ethernet on the customer side of the device.

Originally the ONTs were only placed on the outside of buildings in a small enclosure and powered by tapping into the electricity after the power meter. But today there is also an ONT that can be placed indoors and that is powered by plugging it into an outlet, much like the cable modems used by cable companies. The cost of the two kinds of units are nearly identical and so the study doesn't choose between the two types of units.

Some companies still put the ONT on the outside of the home to give their technicians 24/7 access to the units. Other providers are electing internal units since they are protected from the weather. The industry is split on this choice, but it appears that internal units are becoming the most predominant choice for new construction. One of the major contributing factors that favors indoor ONTs is that ISPs are tying the ONTs to indoor WiFi routers to provide seamless wireless connectivity within the home.

ONTs are available in multiple sizes that can be categorized into units designed to serve homes and small business and units designed to serve large businesses. The study assumes that the smaller unit will be used for most customers, including most small businesses. These units provide one to four Ethernet streams, which is sufficient for most customers.

Regardless of the type of ONT (indoor or outdoor), it will be necessary to drill through the side of the home to bring wiring. ISPs have widely differing ideas on the best way to do this – but most ISPs look for the installation method that requires the least amount of work inside of the customer premise.

Financial Forecast

Shelby Electric Cooperative has been providing broadband services since 2008 and is fully prepared to provide sustainable broadband service using fiber to the proposed areas of Macon County. The initial investment cost to build a FTTH network across the Shelby Electric footprint in Macon County is $8,675,324. Based on the attached proforma showing forecasted net income, balance sheet and cash flow from 2022 through 2041, Shelby Electric Cooperative demonstrates financial sustainability of the proposed project from the commencement of the construction to completion and beyond.

Shelby Electric has identified 743 locations within the proposed funded service area, which upon completion of the proposed project, will have Gigabit fiber broadband available upon request. Utilizing market survey data, Shelby Electric projects at least 5% of these locations will take the proposed broadband service packages in 2022, which is the initial year of construction completion. Shelby Electric projects 20% of locations will take the proposed broadband service in 2023, the year of the construction completion. Shelby Electric projects 30% of locations will take the proposed broadband service by 2023, and a 50% of locations will take broadband service by 2027. Although Shelby Electric Cooperative will have the capability to serve all 743 available locations, we are conservatively estimating 372 subscribers will take the fiber broadband service within the proposed funded service area.

Based on Market analysis, Shelby Electric plans to offer three different speed offerings: 100Mbps at $69.99, 500Mps at $79.99 and 1Gigabit at $99.99. Shelby Electric estimates approximately 60% of residential subscribers will select the lowest priced 100M offering, 20% will select the 500M offering, and 20% will select the highest speed offering of 1 Gigabit. The chart below shows the projected subscriber breakout:

Offering:	Rate	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
100Mbps	$69.99	23	89	133	179	201	224	224	224	224	224
500Mbps	$79.99	7	30	45	59	67	74	74	74	74	74
1 Gigabit	$99.99	7	30	45	59	67	74	74	74	74	74
Total		**37**	**149**	**223**	**297**	**334**	**372**	**372**	**372**	**372**	**372**
Estimated Take Rate		5%	20%	30%	40%	45%	50%	50%	50%	50%	50%

Given these customer projections, Shelby Electric is projecting broadband revenues to grow from nearly $87K in 2023 to over $351K by 2027. To offset estimated inflationary increases in the cost of Shelby's business operations, we assume that the monthly pricing of these packages will need to be increased $5 every three years starting in 2026.

Shelby Electric estimates the following Capital Expenditures will be necessary to provide robust broadband to the proposed service area:

Capital Expennditures for Fiber Project	**$8,675,324**	
In Kind Portion	$4,337,662	50%
Grant Amount	$4,337,662	50%

Description		Amount
Mainline Cost (W/O Make Ready)	$	4,759,619.00
Drop Cost	$	462,378.80
Fill In holes south of the City	$	40,000.00
Make Ready	$	1,694,425.00
2.5% Contingency - Mainline & Make Ready Cost	$	161,351.00
2.5% Contingency - Drop Cost	$	11,559.00
Totals	$	7,129,332.80
OSP Engineering	$	1,104,478.92
Electronics Node	$	60,000.00
Electronics Cost/Customer	$	372,855.00
Electronics Engineering	$	8,657.10
Total Project Cost	$	8,675,323.82
Total Project Cost per Location passed	$	11,676.08
Estimated Amount Funded by the County	$	4,337,661.91
Net Amount Funded by Shelby Electric	$	4,337,661.91

Additionally, Shelby Electric anticipates that all COE electronics will need to be replaced approximately every seven years. We estimate the electronic replace cost will be approximately $530k in 2029 and $635k in 2036.

Shelby Electric estimates the following operating expenses will be necessary to provide robust broadband to the proposed service area:

- Backhaul Expense: Shelby Electric anticipates an annual cost of $10 per customer will be required to provide sufficient backhaul capacity to the proposed funded service. For 2022, $5k of backhaul expenses were estimated to be necessary to ramp up backhaul. By 2023, we estimate that the annual expense will by approximated $37k.
- Poles Expense: Shelby Electric will utilize their own poles for the fiber facility, therefore there is no cost necessary for pole use.
- Additional Labor Cost: Shelby Electric anticipates that one additional Tech may be required to assist with broadband installations and ongoing maintenance. The labor

related costs have not been included in this analysis since the primarily job functions of employee will be related to the utility company.

- Marketing & Advertising: Shelby Electric is anticipating a marketing budget of $10K annually for the first two years, 5k for year three, $2500 for the remaining years will be necessary to achieve the proposed subscriber projection goals.
- Customer Service: Shelby Electric estimates $2 per month per customer for incremental customer services related expenses. These expenses include helpdesk, billing and collection services, etc.
- Corporate Expense: Shelby Electric plans to utilize existing staff for corporate related functions for the proposed funded service area, including management and accounting time. Estimated $1.63 per month per customer. This cost per customer is based on historic costs incurred by PWR-Net.
- Expense increase assumption: Shelby Electric anticipates that labor related expenses will increase annually by 2% to adjust with inflation.
- Interest Expense: Shelby Electric anticipates that of the $4,337,662 of in-kind contribution related to the initial capital expenditures of the project, half will be from financing and half will be from cash. Shelby estimates that the loan will be at a 20-year fixed rate of 3.5%
- Property Tax: Shelby Electric estimates property tax of approximately 2% of assets ($9K annually) for the proposed construction costs, beginning in 2022 and occurring annually throughout the forecast period.
- Income Tax: As a non-taxable cooperative, Shelby Electric assumes no income taxes will be associated with this project.

Based on the projected revenues and expenses, Shelby Electric forecasts achieving positive annual cash flow by 2023. As an Electric Cooperative, Shelby is committed to serving the cooperative community; therefore, Shelby Electric Cooperative does not require a short timeline for payback or a large rate of return to provide fiber broadband service within the cooperative area. Shelby is estimating a positive net income by 2026, and that approximately 85% of their matching $4.33M investment will be recovered within the 20-year forecast period. Without the ARPA grant funding contributed by Macon County, there would not be a viable business case for providing affordable and robust fiber broadband in the proposed area.

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

Income Statement

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LINE	DESCRIPTION		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Years 1-10
			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	TOTAL
A	B	C	D	E	F	F	G	H	I	J	K	L	M
1	**Revenues:**												
2	Customer Revenue		$2,886	$87,037	$174,074	$243,329	$314,200	$351,546	$370,467	$392,787	$392,787	$392,787	$2,721,900
3	Other Revenue		$157	$4,743	$9,486	$13,260	$16,091	$18,003	$18,972	$18,972	$18,972	$18,972	$137,628
4	Federal Funding		0	0	0	0	0	0	0	0	0	0	0
5	Other Support		0	0	0	0	0	0	0	0	0	0	0
6	**Total Operating Revenues**		$3,043	$91,780	$183,560	$256,589	$330,291	$369,549	$389,439	$411,759	$411,759	$411,759	$2,859,528
7				2916%	100%	40%	29%	12%	5%	6%	0%	0%	
8	**Operating Expenses:**												
9													
10	Cost of Goods Sold		$5,000	$37,860	$37,860	$37,860	$37,860	$42,360	$44,640	$44,640	$44,640	$44,640	377,360
11	Plant Expense		$482	$11,878	$18,126	$24,606	$28,193	$31,982	$32,564	$33,145	$33,727	$34,308	249,013
12	Depreciation		$0	$238,959	$238,959	$238,959	$238,959	$238,959	$238,959	$251,100	$285,317	$285,317	2,255,487
13	Amortization		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	0
14	Marketing and Customer Service		$10,074	$11,824	$7,783	$6,278	$6,829	$7,410	$7,500	$7,589	$7,678	$7,768	80,732
15	Corporate Operations		$60	$1,485	$2,266	$3,075	$3,524	$3,997	$4,070	$4,143	$4,215	$4,288	31,123
16	Operating Taxes		$8,675	$8,675	$8,675	$8,675	$8,675	$8,675	$8,675	$9,293	$9,293	$9,293	88,608
17	Other Expenses		$29	$697	$1,044	$1,390	$1,563	$1,741	$1,741	$1,741	$1,741	$1,741	13,426
18	**Total Operating Expenses**		$24,320	$311,378	$314,713	$320,843	$325,603	$335,125	$338,148	$351,651	$386,612	$387,356	$3,095,749
19													
20	Interest Expense		74,694	71,982	69,174	66,265	63,254	60,135	56,905	53,561	50,097	46,511	612,577
21													
22	**Total Expenses before Taxes**		$99,014	$383,360	$383,886	$387,108	$388,856	$395,260	$395,054	$405,212	$436,709	$433,866	$3,708,326
23													
24	**Net Income (Loss) before Taxes**		($95,971)	($291,580)	($200,326)	($130,519)	($58,566)	($25,711)	($5,614)	$6,547	($24,950)	($22,107)	($848,798)
25													
26	**Income Taxes**		0	0	0	0	0	0	0	0	0	0	0
27													
28	**Net Income (Loss)**		($95,971)	($291,580)	($200,326)	($130,519)	($58,566)	($25,711)	($5,614)	$6,547	($24,950)	($22,107)	($848,798)
	EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization)		($12,602)	$28,036	$116,481	$183,369	$251,322	$281,058	$298,925	$320,502	$319,758	$319,015	$2,107,874

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

CONTINUED

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Income Statement

LINE	DESCRIPTION		Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Years 11-20	20-Year T
			2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	TOTAL	TOTAL
A	B	C	N	O	P	Q	R	S	T	U	V	W	X	Y
1	**Revenues:**													
2	Customer Revenue		$415,107	$415,107	$415,107	$437,427	$437,427	$437,427	$459,747	$459,747	$459,747	$459,747	$4,396,594	$7,118,494
3	Other Revenue		$18,972	$18,972	$18,972	$18,972	$18,972	$18,972	$18,972	$18,972	$18,972	$18,972	$189,720	$327,348
4	Federal Funding		0	0	0	0	0	0	0	0	0	0	$0	$0
5	Other Support		0	0	0	0	0	0	0	0	0	0	0	$0
6	**Total Operating Revenues**		$434,079	$434,079	$434,079	$456,399	$456,399	$456,399	$478,719	$478,719	$478,719	$478,719	$4,586,314	$7,445,842
7			-8%	0%	0%	5%	0%	0%	5%	0%	0%	0%		
8	**Operating Expenses:**													
9														
10	Cost of Goods Sold		$44,640	$44,640	$44,640	$44,640	$44,640	$44,640	$44,640	$44,640	$44,640	$44,640	446,400	823,760
11	Plant Expense		$34,890	$35,471	$36,053	$36,634	$37,216	$37,797	$38,379	$38,960	$39,542	$40,123	375,066	624,078
12	Depreciation		$285,317	$285,317	$285,317	$285,317	$243,595	$301,212	$301,212	$301,212	$301,212	$301,212	2,890,924	5,146,411
13	Amortization		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	0	0
14	Marketing and Customer Service		$7,857	$7,946	$8,035	$8,125	$8,214	$8,303	$8,392	$8,482	$8,571	$8,660	82,586	163,318
15	Corporate Operations		$4,361	$4,433	$4,506	$4,579	$4,651	$4,724	$4,797	$4,869	$4,942	$5,015	46,878	78,001
16	Operating Taxes		$9,293	$9,293	$9,293	$9,505	$9,505	$9,505	$9,505	$9,505	$9,505	$9,505	94,418	183,025
17	Other Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	0	13,426
18	**Total Operating Expenses**		$386,358	$387,102	$387,845	$388,801	$347,821	$406,182	$406,925	$407,669	$408,412	$409,156	$3,936,271	$7,032,019
19														
20	Interest Expense		42,796	38,950	34,967	30,842	26,571	22,147	17,566	12,823	7,910	2,823	237,395	431,994
21														
22	**Total Expenses before Taxes**		$429,155	$426,052	$422,812	$419,643	$374,392	$428,329	$424,492	$420,491	$416,322	$411,979	$4,173,666	$7,464,013
23														
24	**Net Income (Loss) before Taxes**		$4,925	$8,028	$11,267	$36,757	$82,008	$28,070	$54,228	$58,228	$62,397	$66,741	$412,648	($18,172)
25														
26	Income Taxes		0	0	0	0	0	0	0	0	0	0	0	0
27														
28	**Net Income (Loss)**		$4,925	$8,028	$11,267	$36,757	$82,008	$28,070	$54,228	$58,228	$62,397	$66,741	$412,648	($18,172)
	EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization)		$342,331	$341,589	$340,845	$362,422	$361,678	$360,935	$382,511	$381,768	$381,024	$380,281	$3,635,385	$5,743,259

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

Balance Sheet

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LINE	DESCRIPTION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
A	B	C	D	E	F	G	H	I	J	K	L
1	**Current Assets**										
2	Cash	$0	$0	$0	$23,765	$116,471	$238,914	$378,223	$8,677	$168,201	$326,983
3	Accounts Receivable	-	-	-	-	-	-	-	-	-	-
4		$0	$0	$0	$23,765	$116,471	$238,914	$378,223	$8,677	$168,201	$326,983
5	**Fixed Assets**										
6	Goodwill	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Plant in Service	$4,337,662	$4,337,662	$4,337,662	$4,337,662	$4,337,662	$4,337,662	$4,337,662	$4,646,720	$4,646,720	$4,646,720
8	Accum Depreciation	-	(238,959)	(477,917)	(716,876)	(955,835)	(1,194,794)	(1,433,752)	(1,464,096)	(1,749,414)	(2,034,731)
9		$4,337,662	$4,098,703	$3,859,745	$3,620,786	$3,381,827	$3,142,868	$2,903,910	$3,182,624	$2,897,306	$2,611,989
10											
11	**Total Assets**	$4,337,662	$4,098,703	$3,859,745	$3,644,550	$3,498,298	$3,381,782	$3,282,133	$3,191,301	$3,065,508	$2,938,972
12											
13	**Liabilities**										
14	Accounts Payable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
15	Long Term Debt	2,092,585	2,013,626	1,931,860	1,847,185	1,759,498	1,668,693	1,574,658	1,477,279	1,376,436	1,272,006
16		$2,092,585	$2,013,626	$1,931,860	$1,847,185	$1,759,498	$1,668,693	$1,574,658	$1,477,279	$1,376,436	$1,272,006
17											
18	**Stockholders Equity**										
19	Equity Contribution	$2,341,049	$2,472,628	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763
20	Retained Earnings	(95,971)	(387,551)	(587,878)	(718,397)	(776,963)	(802,674)	(808,288)	(801,741)	(826,691)	(848,798)
21		$2,245,078	$2,085,077	$1,927,885	$1,797,366	$1,738,800	$1,713,089	$1,707,475	$1,714,022	$1,689,072	$1,666,965
22											
23	**Total Liabilities &**										
24	**Stockholders Equity**	$4,337,662	$4,098,703	$3,859,745	$3,644,550	$3,498,298	$3,381,782	$3,282,133	$3,191,301	$3,065,508	$2,938,972

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

CONTINUED

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Balance Sheet

LINE	DESCRIPTION	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
A	B	M	N	O	P	Q	R	S	T	U	V
1	**Current Assets**										
2	Cash	$505,235	$682,606	$859,093	$1,056,798	$617,830	$813,738	$1,031,060	$1,247,470	$1,462,962	$1,830,914
3	Accounts Receivable	-	-	-	-	-	-	-	-	-	-
4		$505,235	$682,606	$859,093	$1,056,798	$617,830	$813,738	$1,031,060	$1,247,470	$1,462,962	$1,830,914
5	**Fixed Assets**										
6	Goodwill	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Plant in Service	$4,646,720	$4,646,720	$4,646,720	$4,646,720	$4,752,683	$4,752,683	$4,752,683	$4,752,683	$4,752,683	$4,752,683
8	Accum Depreciation	(2,320,049)	(2,605,366)	(2,890,684)	(3,176,001)	(2,889,781)	(3,190,993)	(3,492,205)	(3,793,417)	(4,094,629)	(4,395,841)
9		$2,326,672	$2,041,354	$1,756,037	$1,470,719	$1,862,902	$1,561,690	$1,260,478	$959,266	$658,054	$356,842
10											
11	**Total Assets**	$2,831,906	$2,723,960	$2,615,130	$2,527,517	$2,480,732	$2,375,428	$2,291,538	$2,206,736	$2,121,016	$2,187,757
12											
13	**Liabilities**										
14	Accounts Payable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
15	Long Term Debt	1,163,863	1,051,873	935,899	815,801	691,432	562,639	429,265	291,147	148,117	-
16		$1,163,863	$1,051,873	$935,899	$815,801	$691,432	$562,639	$429,265	$291,147	$148,117	$0
17											
18	**Stockholders Equity**										
19	Equity Contribution	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763	$2,515,763
20	Retained Earnings	(1,697,395)	(1,692,671)	(1,684,643)	(1,673,376)	(1,636,619)	(1,554,611)	(1,526,541)	(1,472,313)	(1,414,085)	(1,351,688)
21		$818,167	$823,092	$831,120	$842,387	$879,144	$961,152	$989,222	$1,043,450	$1,101,678	$1,164,075
22											
23	**Total Liabilities &**										
24	**Stockholders Equity**	$1,982,030	$1,874,965	$1,767,019	$1,658,188	$1,570,575	$1,523,790	$1,418,487	$1,334,597	$1,249,795	$1,164,875

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

Cash Flow

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LINE	DESCRIPTION	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total Years 1-10
A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Cash Flow from Operations**											
2	Net Income	($95,971)	($291,580)	($200,326)	($130,519)	($58,566)	($25,711)	($5,614)	$6,547	($24,950)	($22,107)	($848,798)
3	Depreciation	-	238,959	238,959	236,959	238,959	238,959	238,959	251,100	285,317	285,317	$2,255,487
4	Amortization	-	-	-	-	-	-	-	-	-	-	$0
5	Increase in Accounts Receivable	-	-	-	-	-	-	-	-	-	-	$0
6	Increase in Accounts Payable	-	-	-	-	-	-	-	-	-	-	$0
7		($95,971)	($52,621)	$38,632	$108,439	$180,393	$213,248	$233,344	$257,647	$260,367	$263,211	$1,406,690
8												
9	**Investing - Uses**											
10	Equipment purchases	($4,337,662)	$0	$0	$0	$0	$0	$0	($529,815)	$0	$0	($4,867,476)
11												
12												
13	**Financing - Sources**											
14	Equity Contributions	$2,341,049	$131,579	$43,134	$0	$0	$0	$0	$0	$0	$0	$2,515,763
15	Debt Financing - Operations	-	-	-	-	-	-	-	-	-	-	$0
16	Debt Financing - Facilities	2,168,831	-	-	-	-	-	-	-	-	-	$2,168,831
17	Debt Repayment	(76,246)	(78,958)	(81,767)	(84,675)	(87,686)	(90,805)	(94,035)	(97,379)	(100,843)	(104,430)	($896,824)
18		$4,433,633	$52,621	($38,632)	($84,675)	($87,686)	($90,805)	($94,035)	($97,379)	($100,843)	($104,430)	$3,787,769
19												
20	**Increase (Decrease) in Cash**	$0	($0)	($0)	$23,765	$92,707	$122,442	$139,310	($369,546)	$159,525	$158,781	$326,983
21												
22	Cash, Beginning of Period	$0	$0	$0	$0	$23,765	$116,471	$238,914	$378,223	$8,677	$168,201	
23	Cash, End of Period (cummulative)	$0	$0	$0	$23,765	$116,471	$238,914	$378,223	$8,677	$168,201	$326,983	

Shelby Electric Cooperative
Macon County Fiber Project
20-Year Financial Analysis

CONTINUED

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Cash Flow

LINE	DESCRIPTION	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	Total Years 11-20	Total Years 1-20
A	B	N	O	P	Q	R	S	T	U	V	W	X	Y
1	**Cash Flow from Operations**												
2	Net Income	$4,925	$8,028	$11,267	$36,757	$82,008	$28,070	$54,228	$58,228	$62,397	$66,741	$412,648	($436,150)
3	Depreciation	285,317	285,317	285,317	285,317	243,595	301,212	301,212	301,212	301,212	301,212	$2,890,924	$5,146,411
4	Amortization	-	-	-	-	-	-	-	-	-	-	$0	$0
5	Increase in Accounts Receivable	-	-	-	-	-	-	-	-	-	-	$0	$0
6	Increase in Accounts Payable	-	-	-	-	-	-	-	-	-	-	$0	$0
7		$290,242	$293,345	$296,585	$322,074	$325,602	$329,282	$355,440	$359,440	$363,609	$367,953	$3,303,572	$4,710,262
8													
9	**Investing - Uses**												
10	Equipment purchases	$0	$0	$0	$0	($635,777)	$0	$0	$0	$0	$0	($635,777)	($5,503,254)
11													
12													
13	**Financing - Sources**												
14	Equity Contributions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,515,763
15	Debt Financing - Operations	-	-	-	-	-	-	-	-	-	-	$0	$0
16	Debt Financing - Facilities	-	-	-	-	-	-	-	-	-	-	$0	$2,168,831
17	Debt Repayment	(111,990)	(115,973)	(120,098)	(124,370)	(128,793)	(133,374)	(138,118)	(143,030)	(148,117)	-	($1,163,863)	($2,060,687)
18		($111,990)	($115,973)	($120,098)	($124,370)	($128,793)	($133,374)	($138,118)	($143,030)	($148,117)	$0	($1,163,863)	$2,623,906
19													
20	**Increase (Decrease) in Cash**	$178,252	$177,372	$176,487	$197,705	($438,968)	$195,908	$217,322	$216,410	$215,492	$367,953	$1,503,932	$1,830,914
21													
22	Cash, Beginning of Period	$326,983	$505,235	$682,606	$859,093	$1,056,798	$617,830	$813,738	$1,031,060	$1,247,470	$1,462,962		
23	Cash, End of Period (cummulative)	$505,235	$682,606	$859,093	$1,056,798	$617,830	$813,738	$1,031,060	$1,247,470	$1,462,962	$1,830,914		

Conclusion

Shelby Electric Cooperative has been improving the quality of life for the rural residents of Macon County and beyond for over 80 years. During that time, it has sought to provide reliable electricity distribution while continuing to innovate through reinvestment and smart grid adaptation. With the advent of the PWR-net wireless Internet offering, Shelby Electric holds true to that initial mantra to improve the quality of life for rural residents. Fast forward and today you can see the exact same playbook being enacted while utilizing the decades of experience available to them to bring gigabit symmetrical fiber optic Internet service. Rural communities need a champion like Shelby Electric Cooperative to drive innovation for Macon County. The enhanced internet service being proposed by Shelby Electric will enable a robust work-from-home demographic while boosting population retention and economic development.

Experience and Bios

Shelby Electric Cooperative Bio

Shelby Electric Cooperative is a member-owned electric distribution cooperative serving all or parts of Christian, Cumberland, Effingham, Fayette, Macon, Montgomery, Moultrie, Sangamon and Shelby Counties. Established by farmers who wanted to bring electricity to the rural and underserved areas, Shelby Electric Cooperative brought power to 481 member-owners. On January 1, 1939, 169 miles of line was energized. Today, the cooperative serves over 10,000 member accounts across 2,200 miles of energized lines.

PWR-net Bio

Shelby Electric Cooperative launched PWR-net in 2008. The goal, was to bring a fast, reliable, and affordable Internet solution to members who were unserved by a reliable Internet service. PWR-net is an always-on, line-of-sight, wireless broadband solution with speeds comparable to DSL. PWR-net's cloud covers the entire Shelby Electric service area and has expanded to become available in additional locations.

TCA Experience and Scope of Services

New opportunities for Federal and State Funding are available to fund the expansion of fiber broadbandinto areas lacking sufficient access to wireline broadband, resulting from the Covid-19 pandemic. For nearly 40 years, TCA has provided business consulting services to rural communications companies across the country. We serve rural cooperatives in Kansas, Colorado, Missouri, Wisconsin, Iowa, Nebraska, Tennessee, Virginia, and Alaska. We have worked directly with individual companies as well as both state and tribal governments for the submission of broadband grant applications. TCA has helped our clients secure over $144.5M of Federal and State broadband grant funding over the past decade.

Broadband grant funding will provide your organization with the necessary financial resources to expandaffordable broadband within your rural community. TCA is excited to partner with Shelby Electric Cooperative to provide the following grant feasibility services to help expand your rural broadband network:

- Assist with identifying your organization's target expansion areas for business planning purposes.
- Confirm the current broadband availability of the proposed area and eligibility for grant funding,with the assistance of Finley Engineering.
- Research and complete market assessment, to include demographic and statistical analysis for data input necessary to populate TCA's financial model for both current and forward-looking subscriber projections.
- Prepare 20 Year financial forecast (pro-forma) for business planning purposes, based on the following information provided by your organization and/or other consultants (engineering firm, auditor, etc.):
    - Broadband Investment Plans
    - Historical and projected financial and subscriber data
    - Retail pricing structure
    - Other relevant info as necessary to develop forecasted income and cash flow to meetany broadband obligations
- Prepare grant narratives, including:
    - Description of Community Challenges and Needs the Proposed Project would address
    - Report of Findings – Market Assessment
    - Description of Project Budget and Financial Sustainability

TCA Bios

Kristi Ingrum – Financial Team Director

Having served rural broadband providers since 2006, Kristi specializes in helping companies pursue federal and state grant applications and also analyze business financial projections. In 2016 she became a Shareholder at TCA. Kristi has a Bachelor's degree in Economics with Departmental Honors from Texas Christian University and an MBA in Finance from the University of Colorado. Kristi and her husband Jason have three children, Caleb, Caitlyn, and Corinne, who are actively involved in competitive sports. As a family, they enjoy traveling and spending time with their family and friends.

Kate Young – Marketing Strategist

Kate joined TCA in 2018 with 12 years' experience in marketing and a focus on inbound, omnichannel, and strategic marketing methodologies. She earned a Bachelor's degree in Media Management in 2010 and a Master's degree in Marketing, with an emphasis in Marketing and Sales Integration, Public Relations, and Web Development in 2015. Kate has a creative and outside-the-box approach to marketing that's based on company-wide buy-in to not just understand processes, but the "why" behind what the company does.

Jason Palmer – Senior Financial Consultant

Jason Palmer joined TCA in 2020 after approximately 22 years of experience in the rural telecommunications industry. Jason has specialized in cost analysis, regulatory compliance, and financialforecasting for rural LECs. Jason has a bachelor's of science degree in Accounting from Oklahoma City University, an MBA from Northeastern State University, and passed the CPA exam in 2000. While originally from Tulsa, Oklahoma, he recently moved to Colorado Springs with his wife, Haima, and his teenage son, Ethan. In his free time, he enjoys traveling, cooking, hiking with his family, and exploring various new hobbies (3d printing, collecting rare Lego sets, flying drones, book folding, etc.)

Finley Engineering History and Experience

Finley Engineering Company, Inc. (Finley), offers professional engineering, surveying, mapping, environmental, right-of-way, and project management services in the fields of telecommunications, electric power transmission and distribution, cable television, fiber optics, and related industries. Both the management and professional staff of Finley have extensive experience with service to municipals, cooperatives, public and private companies of all sizes, as well as other types of governmental agencies.

Finley has about 200 employees, 14 licensed professional engineers (licensed in 44 states), 2 licensed surveyors, and was established in 1953 in Lamar, Missouri. In addition to this office, Finley has permanent offices located in Altoona, WI (established in 1960); Bismarck, ND (established in 1966); Slayton, MN (established in 1971); Des Moines, IA (establish in 1994); Minneapolis, MN (established in 2002); Lexington, KY (acquired in 2007); Springfield, IL (acquired in 2010); and Kansas City, MO (established in 2013).

A few of the many services offered by Finley include engineering, studies, inventory assessments, technical evaluations, planning, design, site acquisitions, permitting, CAD/mapping, construction management/inspections, staking, surveying, project management, multi-year work plans and budgets, assistance with loan and grant applications, and many others.

Our domestic and international experience has impacted many hundreds of thousands of subscribers and involved over 1,000,000 miles of copper, coaxial, and fiber optic telecommunications cable, and a variety of network and switching installations. This represents a significant presence in the entire telecommunications and broadband industries. Finley has completed multiple FTTx (Fiber-To-The-x) projects covering nearly 34,000 miles and 158,000 customer locations as well as over 7,000 miles of intercity fiber projects, and various types of metropolitan projects in Phoenix, Pittsburgh, Seattle, Houston, Kansas City, Detroit, Buffalo, Portland, Minneapolis, St. Paul, and others.

Our 'Promise', as mentioned on our website, focuses on 'Integrity into Everything'. We know that Finley customers may be heading into uncharted waters with their new projects, and that they are counting on us to live those values stated above. Finley employees strive to serve our customers just as much during the project, at the end of the project, and after the project, as they do to get the project awarded up front.

Finley Engineering Bios

Sean Middleton, P.E. – Director, Strategy and Operations

With a background in the development of broadband networks and over 24 years of utility experience, Sean can assist in helping clients stay up to date on legislative funding, provide project management support and techniques, for wireless/FTTP and consult on smart grid initiatives. Sean is a member of the IEEE including the Power, Communication, and Photonic Societies and the National Society of Professional Engineers (NSPE). Middleton previously sat on the Cyber Security Member Advisory Group for the Cooperative Research Network (CRN/ NRECA) and serves on the State Board of Professional Engineers for the IL Department of Financial and Professional Regulation.

Sean is a BSEEE graduate of Bradley University, Peoria, IL and earned his MBA from the University of Illinois at Springfield. He is also a licensed professional engineer in 14 states.

Dean Mischke, P.E. – Vice President

Mr. Mischke has been with Finley Engineering since 1990 and is responsible for all operations of the Wisconsin business unit, overseeing and managing the engineering of advanced communications networks, including P.E. approved plans. He provides much expertise in both outside plant engineering as well as inside equipment and IP networks.

Dean is a BSEEE graduate of California State University, Sacramento, and earned his Professional Engineer License in 1994, maintaining active licenses in ten states where he provides consulting and engineering services. He is the Vice President and Manager of Finley's Wisconsin office and has been active in designing communication networks since his first project at Finley. Dean is also a frequent speaker at conferences throughout the U.S. and is a recognized thought leader as per his award through OSP magazine.

Andy Heins – Director, Strategy and Operations

Andy Heins serves as Director – Strategy and Operations, for Finley Engineering. Mr. Heins leads strategic discussions and planning with clients across multiple markets and initiatives, from broadband planning, feasibility and implementation to energy integration and planning. Mr. Heins is a veteran of the telecommunications industry and began his career at Finley in early 2009. Prior to joining Finley, Heins was the General Manager of Alma Communications Company in Missouri. While with Alma, Heins assumed various management and operations roles, and in 2006 deployed the first 100% Fiber-to-the-Home (FTTH) network in the State of Missouri.

Finley Engineering Services

Broadband & Telecom System Engineering

- Engineering Services
- Technical Evaluations
- Feasibility Studies
- Project Management
- Planning, Design Cost Estimates and Economic Selection Studies
- Specifications and Contracts for Central Office and Carrier Equipment
- Outside Plant Engineering
- Outside Plant Specifications and Contracts
- Construction Management and Inspection
- Acceptance Tests and Work Order Inspection
- Appraisals, Inventories, Traffic Studies, CPR Records, & Manual & Computerized Records

Environmental Services

- Feasibility Studies
- Agency and Public Scoping
- Route Analysis and Selection
- Environmental Assessments
- Environmental Impact Studies
- BLM and USFS Permit Applications
- USCOE Section 10 Permits
- USCOE Section 404 Permits
- Resource Analysis
- Wetland Studies & Delineations
- Threatened & Endangered Species
- Biological Clearances
- Cultural Resource Inventories
- Permitting and Licensing
- Construction Compliance

Surveying and Mapping

- GPS Control Surveys
- Route Location and Profile Surveys
- Cadastral Retracement & Property Surveys
- Topographic Surveys
- CAD Mapping
- Construction Surveys and Staking
- River Crossing & Hydrographic Surveys
- ALTA Surveys
- Aerial Photography and Digital Orthophotography
- GIS Data Collection
- ROW Acquisition Maps and Legal Descriptions

Wireless Broadband

- Engineering Services
- Technical Evaluations
- Feasibility Studies
- Project Management
- Site Evaluation and Selection
- Zoning Planning and Permitting
- Lease Reviews and Site Acquisition
- Site Design

- Construction Management and Inspection

Right-of-Way (ROW) Services

- Title Research and Analysis
- Document Preparation
- ROW Negotiations & Acquisition
- Highway and Street Occupancy Permitting
- Conditional Use & Building Permits
- Zoning Changes and Permits
- Construction Liaison
- Damage Claims and Settlements
- Condemnation

CATV Engineering

- Engineering Services
- Technical Evaluations
- Feasibility Studies
- Project Management
- Planning and Cost Estimates
- Make-Ready Estimates
- Outside Plant and Field Engineering
- Plans, Specifications, and Material Lists
- Headend Towers and Antennae Programming
- Construction Management and Inspection

IP Services

- Network design consulting services
- Network & Project Management
- Network Troubleshooting
- Critical Network Infrastructure Security
- Enterprise Services

Electrical Power Engineering Services

- Rates and Cost of Service
- Outside Plant Engineering
- System Protection Engineering
- Long Range Planning
- ROW Clearing Coordination
- Feasibility Studies and Reports
- Construction Plans and Specifications
- Transmission Line Design
- Distribution Line Design
- Project Management