

**Before the  
National Telecommunications Information Administration  
Washington, D.C. 20230**

Request for Information	)	Solicitation Number:
LTE Network Build and Operate Partners	)	SA1301-12-RP-0016-b
	)	

**JOINT COMMENTS OF NTCA–THE RURAL BROADBAND ASSOCIATION,  
THE INDATELGROUP™, AND THE NATIONAL RURAL ELECTRIC  
COOPERATIVE ASSOCIATION**

August 30, 2013

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**II. INTRODUCTION AND SUMMARY**

The INDATELGROUP™ (“INDATEL”),<sup>1</sup> the National Rural Electric Cooperative Association (“NRECA”),<sup>2</sup> and NTCA–The Rural Broadband Association (“NTCA”),<sup>3</sup> (collectively the “Associations”) hereby submit these comments in the above captioned proceeding.<sup>4</sup> The Associations represent small critical infrastructure and service providers that use valuable wired and wireless networks, and other technical and operational assets, to serve the most sparsely populated and remotely located areas of our country.

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<sup>1</sup> INDATEL is a telecommunications trade association comprised of 28 statewide fiber network operators (“members”) that are majority owned by rural independent telecommunications providers in 25 primarily rural states. INDATEL member networks are serving some of the most rural areas in the U.S. while being well anchored in 50 of the top 100 Metropolitan Service Areas (“MSAs”) The INDATEL “Network of Networks” is over 70,000 route miles of middle-mile fiber optic network and 850 points of presence (POPs).

<sup>2</sup> NRECA is the national service organization for more than 900 not-for-profit rural electric utilities that provide electric energy to approximately 42 million people in 47 states, comprising 12% of U.S. electric customers, covering 75% of the U.S. landmass. Kilowatt-hour sales by rural electric cooperatives account for approximately 11% of all electric energy sold in the United States. In addition to providing electricity, NRECA members have a strong commitment to social and economic development in the communities they serve.

<sup>3</sup> NTCA represents nearly 900 rural rate-of-return regulated telecommunications providers. All of NTCA’s members are full service rural local exchange carriers (“RLECs”) and broadband providers, and many of its members provide wireless, cable, satellite, and long distance and other competitive services to their communities. Each member is a “rural telephone company” as defined in the Communications Act of 1934, as amended.

<sup>4</sup> See *Request for Information LTE Network Build and Operate Partners, Solicitation No. SA1301-12-RP-0016-b. (rel. July 10, 2013).* (“RFI”).

Rural critical infrastructure, transport, and service providers have an established history of support for and partnership with public safety. The Associations' members have successfully partnered with state and local entities for public safety communications deployments. Further, rural infrastructure and service providers' obligations to serve already are imbued with the responsibility for public safety. For example, electric cooperatives are the entities charged by law with keeping the lights on, and Rural Incumbent Local Exchange Carriers ("ILECs") have a legal responsibility to keep the most rural parts of America connected. After major disasters, the Association's members work alongside public safety to restore critical infrastructure services.

Rural critical infrastructure, transport, and service providers have demonstrated substantial interest in partnering with FirstNet, including by submitting detailed information concerning their service territories and existing assets in Appendix B and Appendix C of this filing; however, the appendices include representative data only, and should not be misconstrued as the sum total of interest in the FirstNet project from the rural sector. The Associations' members stand ready to expand their existing partnerships with public safety, providing the network and operational resources to support the development of the FirstNet Public Safety Broadband Network ("PSBN").

Rural providers have a vast array of existing infrastructure assets that should be leveraged by FirstNet for the efficient construction of the public safety network in rural areas, including statewide fiber transport connectivity in 25 primarily rural states; extensive copper and fiber infrastructure, including last-mile networks suitable for the speeds that will be required by FirstNet's network; utility poles; wireless networks and towers; rights-of-way; and local operational and technical resources. Rural telcos and electricians also hold licensed spectrum and established customer bases, ensuring that these companies are well positioned to sell a

commercial wireless service and thereby enter into a Mobile Virtual Network Operator (“MVNO”) or network-sharing partnership agreement with FirstNet that is financially beneficially for the public safety community. Rural critical infrastructure, transport, and service providers continually re-invest in their networks, and can upgrade their infrastructure more cost effectively and efficiently than a new entrant into the service area.

Put quite simply, FirstNet’s dollars cannot go far enough and achieve its intended purpose without leveraging these kinds of existing network assets in the nation’s most high-cost areas. Moreover, rural infrastructure and service providers are community-based and their overarching mission is to serve the needs of their local residents. As such, many rural infrastructure providers have established long-standing relationships with local tribal leaders that might be of great interest to FirstNet. FirstNet should not waste scarce resources overbuilding existing rural networks that have sufficient capacity to handle public safety traffic.

For their part, large mobile network operators (“MNOs”) cannot offer a cost-effective or efficient solution in rural areas. In areas where they do operate, the “national” MNOs often do not own their vertical assets; instead these assets are owned by companies that specialize in the construction and operation of these assets who lease the infrastructure to the MNOs. In rural areas, the MNO backhaul facilities and wired infrastructure often are supplied by rural providers.

Likewise, satellite service is less-than-optimal and should only be used as a last resort—if at all, especially for public safety matters—in areas where traditional terrestrial service is unavailable or too expensive to construct despite existing resources. Although the major satellite providers offer broadband and other communications services, their service is limited at best in the most rural portions of the nation. Further, there are indications already that new orders for satellite service in certain areas are being limited due to capacity concerns.

Instead, to maximize reach, leverage expertise, and improve the economies of network deployment, FirstNet should ensure that it seeks out, on a case-by-case basis, the best partners and resources in each area. FirstNet should ensure that in any given area where it decides to enter into a network partnership agreement, it selects the best service provider, with the most reliable network, the highest quality of service, the most advanced network technology, and localized experience and pre-existing relationships with public safety entities.

In the Request for Information (“RFI”), FirstNet defines its launch coverage as a minimum of 99% of the population of every State and Territory, and 70% of the landmass of the conterminous States.<sup>5</sup> This breadth of coverage can only be achieved by partnering with rural critical infrastructure, transport, and service providers to utilize their existing assets and infrastructure.

FirstNet should create multiple network partnership models to entice varied rural providers to enter into partnership agreements. Stated differently, FirstNet should refrain from choosing a “one-size-fits-all” model that suits the interest of the large MNOs, and instead leave the door open to all network partnership arrangements and creative solutions to meet local coverage and public safety needs. Rural critical infrastructure, transport, and service providers have varied business plans, and likely will be interested in partnering with FirstNet in several different ways. For instance, rural critical infrastructure, transport, and service providers may offer FirstNet the use of their existing wired and/or wireless assets in exchange for monetary compensation. Additionally, rural providers may be interested in using FirstNet’s 700 MHz spectrum, albeit on a secondary basis, to meet local needs. Another alternative partnership model would entitle FirstNet to utilize existing commercial assets and infrastructure in exchange for the

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<sup>5</sup> RFI at 14.

rural provider to access FirstNet's network on an MVNO-like basis, with access to FirstNet's spectrum, roaming capabilities, network equipment, and customer handsets developed for this spectrum band.

FirstNet should revise its rural coverage standards so that its standards do not undermine its ability to develop productive and successful network partnerships with rural providers that enable the public safety spectrum to be used, on a secondary basis, for commercial service. Further, to provide the foundation for numerous, diverse network partnerships and seamless communications between first responders in different areas, FirstNet should advocate for interoperability in the entire 700 MHz spectrum band.

Rural critical infrastructure, transport, and service providers support FirstNet's efforts to deploy service quickly over existing commercial networks, via MVNO agreements, as a stopgap measure until the PSBN is active. In rural areas, if an existing rural wireless provider is available, FirstNet should negotiate an MVNO arrangement for first responder traffic to ride on top of the commercial network until the FirstNet PSBN is available. FirstNet also should ensure that its MVNO arrangements with large, "nationwide" wireless providers do not result in discriminatory practices against rural providers that weaken FirstNet's network coverage or seamless interoperability across underlying networks.

Rural critical infrastructure, transport, and service providers have the ability to deliver high-quality wireless services and the underlying wired and wireless networks that enable such services, and they stand ready to satisfy any standard that FirstNet may set in the delivery of public safety communications, including hardening their networks to accommodate FirstNet's requirements.

## **II. RURAL TELCOMMUNICATIONS AND ELECTRICITY PROVIDERS ARE COMMITTED TO SUPPORTING PUBLIC SAFETY NEEDS**

Rural infrastructure, transport, and service providers have been and remain committed to supporting the evolving needs of public safety. The rural Associations' members have an established history of working collaboratively with the public safety community and an interest in expanding these partnerships to assist FirstNet's efforts.

### **A. FirstNet Has a Legal Obligation to Ensure that Rural Areas of the Country Are Not Left Behind**

Rural consumers have significant emergency and public safety needs just as their urban counterparts do, even as rural areas may face different challenges in the event of emergencies. Rural areas are often the sites of devastating forest fires, floods, and tornadoes, while the presence of military facilities in rural areas raises distinct public safety challenges as well. Oftentimes, rural citizens reside many, many miles from the closest first responder, firehouse, police station, or health care institution. A next-generation broadband-capable network can help to overcome the unique challenges presented by this remoteness, enabling first responders to communicate with one another and with their headquarters' locations. Just as in urban areas, rural first responders need to access criminal databases, transmit a patient's medical data, and send information back to headquarters concerning the specifics of an incident scene. However, today, public safety officials in rural communities experience the same communication challenges as their urban counterparts, struggling to converse with other first responder entities and exchange data in real-time.

To overcome these challenges, Congress enacted the Middle Class Tax Relief and Job Creation Act of 2012 (the "Act"),<sup>6</sup> which paved the way for the country's first interoperable,

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<sup>6</sup> Middle Class Tax Relief and Job Creation Act of 2012, [Public Law 112-96](#), 126 Stat. 156, Sections 6206(b)(3), (b)(1)(c) (2012) (Act).

nationwide PSBN. FirstNet is required by law to have sufficient representation from rural interests.<sup>7</sup> Further, the Act requires FirstNet, in carrying out its duties, to devise “deployment phases with substantial rural coverage milestones” that are “consistent with the license granted by the Commission.”<sup>8</sup> Clearly, the spirit of the legislation was to ensure that rural areas of the country gain access to the new public safety network, and are not left behind their urban counterparts without access to this vital communications and public safety resource.

**B. Rural Infrastructure and Service Providers Have an Established History and Positive Track Record of Support for Public Safety**

Rural critical infrastructure, transport, and service providers have an established history of support for and partnership with public safety. For instance, oftentimes employees of the rural providers also serve their communities as first responders, volunteering with the local fire, emergency medical services, or police departments. In Appendices A and C, many NTCA members have highlighted their employees’ dual roles as first responders, including Mid-Rivers Communications in Circle, Mt., and The Peetz Cooperative Telephone Co. in Peetz, Co., where 66% of the telco’s employees serve as volunteer firefighters.

Beyond these individual contributions and ties, the Associations’ members have successfully partnered with state and local entities for public safety communications deployments. For example, Holy Cross Electric Association, a rural electric cooperative providing end users with electricity and natural gas in three Colorado counties, shares public safety frequencies in the 700 MHz and 800 MHz bands with Colorado’s statewide digital trunked radio system.<sup>9</sup> In Ohio, 11 of the 25 electric distribution cooperatives in the state currently share

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<sup>7</sup> *Id.*, Section 6204(b)(2)(A)(iii).

<sup>8</sup> *Id.*, Section 6206(b)(3).

<sup>9</sup> The REC filed a waiver with the FCC on May 15, 2008, requesting to share the spectrum. See: Request for Waiver of Section 90.179 of the Federal Communication Commission’s Rules by Holy Cross Energy and the State of Colorado (filed May 15, 2008).

in the Ohio Multi-Agency Radio Communication system, an 800 MHz trunked voice and data system.<sup>10</sup> The system provides statewide interoperability to more than 700 local state and federal public safety agency users through the state. Similar sharing arrangements are in place in Douglas County, Oregon, and the state of Illinois.<sup>11</sup>

Likewise, rural telecommunications providers have demonstrated their commitment to meeting local public safety agencies' needs. For instance, Big Bend Telephone Co. ("BBT") headquartered in Alpine, Texas, plays a strategic role in assisting federal, state, and local agencies in securing the United States/Mexico border. Within BBT's service territory, there are two border patrol station headquarters, three border patrol checkpoints, two ports of entry, the U.S. Air Force Tethered Aerostat Radar System Balloon, and numerous other border security institutions. The extreme terrain and large amount of border that has to be covered poses unique challenges to all public safety entities. This means that broadband technology is an especially crucial element to meet the area's homeland security needs. Because of BBT's next-generation fiber optic broadband network, a variety of applications can be facilitated such as surveillance cameras, thermal-imaging devices, X-ray units at checkpoints, and partially buried ground sensors. This helps agencies cut down on the number of "boots on the ground" personnel while still providing coverage and oversight along the extensive southern border.

Headquartered in Rainsville, Ala., Farmers Telecommunications Cooperative, Inc. ("FTC"), maintains an exceptionally close working relationship with all resident public safety organizations. FTC is officially the designated alternate site for the DeKalb County Alabama Emergency Management Agency, and the telco maintains a "semi-hot standby" readiness. As such, FTC can provision emergency communications services within 30-60 minutes of an

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<sup>10</sup> Reply Comments of the NRECA in FCC WT Docket No. 06-150, PS Docket No. 06-229, WP Docket No. 07-100 (filed May 10, 2011) at 7.

activation request. Although FTC has an established history of partnering with local public safety agencies, the service provider cemented its first responder status just a few years ago when it hosted an incident command center for almost an entire month in response to a natural disaster.

In other parts of the country, Panhandle Telephone Cooperative, Inc., located in Guymon, Okla., and Enhanced Telecommunications Corp., located in Sunman, Ind., are providing 3G and 4G wireless services to public safety officials. These are only a few examples of the creative partnerships taking place between rural telecommunications providers and their local public safety agencies. For more on how rural telcos are responding to local public safety needs, see the case studies in Appendix A on page 30.

Similarly, Iowa Network Services, the statewide, independent fiber network in Iowa and an INDATEL member, has participated in the State of Iowa's Communications Task Force, created in 2004, to develop a strategy of communications interoperability between first responders across the state. Of special note is the fact that INDATEL members currently serve 185 public safety answering points ("PSAPs") with fiber and have the ability to serve 645 PSAPs that are in close proximity to member's fiber facilities. The INDATEL members also have a long history of providing high-quality TDM and Ethernet circuit backhaul services to wireless carriers. Collectively, the INDATEL members will be serving over 4,000 cell sites with fiber by year-end 2013. This represents a 34% growth in the number of fiber-served cell sites in the last year. These are only a few of the many examples of thriving partnerships between rural infrastructure providers and public safety officials. As community-based organizations, rural infrastructure, transport and service providers were created to meet the critical infrastructure

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<sup>11</sup> *Id.* at 8-9.

needs of their local residents, and they continue to operate their businesses today with this one guiding mission, thereby making rural service providers logical partners for the FirstNet project.

**C. Rural Infrastructure Providers' Obligations to Serve Are Imbued with the Responsibility for Public Safety**

Rural infrastructure and service providers' obligations to serve already are imbued with the responsibility for public safety. In times of disaster recovery, rural infrastructure and service providers can and do assist public safety efforts to restore order, and there would be some synergies to having parties on the same communications network. Electric cooperatives have a legal "obligation to serve" the end-users within their service territories on just and reasonable terms and without discriminating. Simply stated, electric cooperatives are the entities responsible for "keeping the lights on." They already respond in emergencies, coordinating their activities with police, fire, ambulance, and other public safety entities at the scene. Given the inherent dangers of electricity, all electric utilities have a duty to protect the general public from hazards associated with its generation and delivery.

Similarly, most rural ILECs serve as the carriers of last resort ("COLR") for their communities. Under many state laws and federal policies, they must provide service to any customer who requests it, must meet specific quality standards of service, must offer subscribers the ability to contact emergency services, and must maintain emergency service continuity plans. Many rural telecommunications providers also serve as incident command centers, as detailed in Appendix A. Simply stated, small telecom providers are the entities charged by law with keeping the most rural parts of America connected. Further, when the PSBN is subject to critical outages via man-made or natural disasters, rural telecom providers will provide the local operational and technical support to ensure the FirstNet network is repaired and restored to service as soon as possible. Indeed, as the parties "closest to the ground" in rural and remote

areas, small telecom and electric providers are perhaps the best equipped to deploy quickly and respond effectively in cases of troubles and outages—an essential asset for the PSBN.

Rural critical infrastructure, transport, and service providers are eager to ensure that the effort to construct a nationwide, interoperable PSBN in rural areas is as efficient and effective as possible, leveraging the best possible aspects of a public-private partnership between public safety representatives and those who have experience in operating rural critical infrastructure.

**D. Rural Infrastructure Providers Have Demonstrated Substantial Interest in Partnering with FirstNet to Deploy the PSBN**

Rural infrastructure providers remain very interested in partnering with FirstNet to ensure that rural areas of the country gain access to the PSBN. Indeed, 168 NTCA members completed NTCA's call to action, describing their local service territories, copper and fiber assets, wireless infrastructure, middle-mile connectivity options, and other network and operational assets. Detailed individual responses can be found in Appendix C, on page 56. In addition, INDATEL members likewise completed a request for information, including information such as the miles of fiber deployed, number of cell sites served, and the number of PSAPs served and able to be served via fiber facilities. This quantitative data, and additional information about INDATEL and its members, can be found in Appendix B, on page 53. Finally, several individual NRECA member rural electric cooperatives are responding directly to the RFI with detailed information about their systems and capabilities. We encourage FirstNet to thoroughly examine this information, and to share it with the state points of contact for this project who might likewise be interested in solutions to rural coverage for the PSBN. Our respective members look forward to sharing more detail at the federal level and in individual state initiatives in regard to how they can be of service to FirstNet. Rural critical infrastructure, transport, and service providers stand

ready to expand their existing partnerships with public safety, providing the network and operational resources to support the development of the FirstNet PSBN.

### **III. RURAL PROVIDERS HAVE A VAST ARRAY OF EXISTING INFRASTRUCTURE ASSETS THAT SHOULD BE LEVERAGED BY FIRSTNET FOR THE EFFICIENT CONSTRUCTION OF THE PUBLIC SAFETY NETWORK IN RURAL AREAS**

Rural infrastructure, transport, and service providers are uniquely positioned, with a wealth of knowledge concerning local coverage needs, operational expertise, and physical presence in hard-to-reach rural areas, and existing wireline and wireless assets that can be leveraged for the efficient construction of the FirstNet PSBN.

#### **F. Overbuilding Existing Networks is Wasteful and Unnecessary**

FirstNet should not waste scarce resources and public funds to overbuild an existing rural network that already has sufficient capacity and robust redundancies to handle public safety traffic. In sparsely populated, high-cost rural areas, overbuilding areas sufficiently served by rural providers is wasteful and unnecessary, and would quickly deplete the entire \$7 billion network construction budget allocated to FirstNet. It would also put existing networks at financial risk, jeopardizing consumer access to affordable mobile broadband in rural areas.

In some areas, existing networks may not be adequate for FirstNet's requirements. However, FirstNet should not fall into a trap of reviewing current network infrastructure and assuming that if an asset is not available today that this means it needs to build it on its own. It would still be more cost effective and efficient for FirstNet to partner with rural providers to share the cost for upgrades and leverage existing assets where in place rather than construct new infrastructure from scratch and consequently overbuild existing networks. Rural critical infrastructure, transport, and service providers are willing and able to invest in their networks,

and, in fact, they have an established and lengthy history of advancing their networks, services, and products as technology has progressed and end user demands have changed.

In the past, despite the existence of rural assets, some local governments have established dedicated broadband networks, typically for use by education and health care institutions. While such “private” networks do not serve the population ubiquitously, as the rural carriers do, they still “compete” by locking up some of the largest consumers of bandwidth—community anchor institutions—in the area and thus create competitive pressures in many areas that cannot sustain multiple providers. It is unclear whether these entities, who are not “in the business” of operating advanced networks in the first instance, are adequately equipped to provide their “internal” networks to outside parties like first responders who need mission-critical and reliable access. FirstNet should therefore take into account whether partnering with local governments in high-cost, low-density rural areas would ensure sufficient and reliable assets for use by FirstNet and first responders, and whether doing so might also put the existing commercial network at risk, thereby threatening the ability of rural customers to access high-quality affordable broadband service.

Likewise, FirstNet should refrain from selling commercial services to end users, including residential customers and anchor institutions, and last-mile connectivity and middle-mile capacity. Particularly in sparsely-populated areas rural areas, “cherry-picking” the most attractive, high-volume, lucrative customers consequently leaves the most costly-to-serve remnants of the serving area to the COLR, and thus *increases* the existing service provider’s reliance upon (and demand for) High-Cost Universal Service Fund support. If a number of revenue-generating anchor institutions are suddenly and artificially extracted from the customer base in the broader community, this likely will place unbearable pressure on the existing

commercial service provider. Instead, consistent with good public policy, public safety should seek to utilize the existing assets and infrastructure of rural providers wherever possible.

## **B. Rural Providers Have a Vast Array of Existing Infrastructure Assets**

Rural utility and transport providers have valuable assets in rural areas that should be of particular interest to the FirstNet and its mission, including transport connections, copper and fiber infrastructure, utility poles, wireless networks and towers, right-of-ways, and other operational and technical resources. Given limited financial resources and a vast country to cover, FirstNet—and the American public—would be best served by leveraging the expertise and presence of existing service providers with deep experience and deployed network assets in hard-to-serve areas, in lieu of seeking to create all aspects of an interoperable network from whole cloth.

NTCA’s nearly 900 members operate wireline networks in 45 states. On average, NTCA member companies’ customer density is approximately 7 customers per square mile. By contrast, larger telecommunications companies, on average, serve 130 customers per square mile. As a result, NTCA’s members serve the most rural and sparsely populated areas of the country with advanced telecommunications services.

One hundred percent of respondents to the *NTCA 2012 Broadband/Internet Availability Survey Report*<sup>12</sup> offer broadband<sup>13</sup> to some part of their customer base. Respondents use a variety of technologies, including 88% who offer broadband via copper, 74% who offer fiber to the home (“FTTH”), 48% fiber to the node (“FTTN”), 16% cable modem service, 15% licensed wireless, and 14% unlicensed wireless service. Seventy-four percent of 2012 survey respondents

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<sup>12</sup> To access the *NTCA 2011 Broadband/Internet Availability Survey Report*, visit <http://www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2012ntcabroadbandsurveyreport.pdf>.

<sup>13</sup> Broadband was defined as throughput of at least 768 Kbps in one direction.

provide broadband via both digital copper loops and fiber broadband service. Seven out of 10 customers of survey respondents can now receive broadband service of up to 6 Mbps. Further, 40% of respondents' customers can receive service of greater than 10 Mbps. Existing copper and fiber optics infrastructure will be particularly useful for backhaul and middle-mile transport of traffic within the FirstNet network.

Further, many respondents have plans to upgrade their access network with fiber infrastructure. Fifty-three percent of those respondents with a fiber deployment strategy plan to offer FTTN to more than 75% of their customers by year-end 2015, while 61% plan to offer FTTH to at least 50% of their customers over the same timeframe.

In addition to their last-mile networks, in 25 primarily rural states these same telecommunications cooperatives and small companies have formed statewide fiber network companies, interconnecting their local wireline and wireless networks throughout the region. These statewide fiber networks (INDATEL members) continue to add middle-mile and last mile fiber facilities. The INDATEL "Network of Networks" is forecasted to grow by 10% in total route miles of fiber during 2013 and is 95% interconnected with broadband transport facilities.<sup>14</sup> Electric utilities also have undertaken fiber deployments, generally within their electric distribution service areas, to support utility grid communications and other applications.

Rural telecommunications providers also have invested considerable resources in and have considerable experience with wireless technology and operations, including providing high-speed connectivity to existing tower sites. According to the *NTCA 2012 Wireless Survey*

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<sup>14</sup> For more information concerning the statewide telecommunications networks, visit the *INDATELGROUP'S* website: <http://www.indatelgroup.org>.

*Report*<sup>15</sup>, 46% of survey respondents indicated that 100% of their existing wireless sites deployed are currently IP backhaul ready.

To ensure the most efficient and effective deployment possible, FirstNet can and should leverage the experience of rural providers and the extensive network of rural mobile service providers' wireless towers—and, in the case of electric utilities, transmission poles and towers—for future cell sites. According to the NTCA Wireless Survey Report, the average total cumulative investment by respondents in wireless facilities, excluding spectrum, was \$11.7 million per company, ranging from a high of \$119 million to a low of \$25,000. Approximately 62% of respondents assert that they offer wireless services to their customers. Further, 38% of respondents not currently offering wireless service indicated that they are considering doing so. Sixty-three percent of survey respondents are looking to provide wireless service to both their wireline service area and their neighboring territories.

In a testament to their rural service territories, survey respondents report that they serve an average of 9,969 wireless subscribers, with an average of 38 cell sites. However, a few larger respondents skew these numbers upwards; the median number of wireless subscribers is 1,560 and the median number of cell sites is 9.

According to data collected by NTCA, rural telecommunications providers hold 700 MHz, AWS, and PCS spectrum licenses covering rural areas, which are identical to the spectrum assets the large MNOs are using to deploy LTE. More than 100 rural service providers hold 700 MHz licenses that cover 50 million+ pops, and more than 60 rural service providers hold AWS spectrum licenses that cover 20 million+ pops. However, when asked which Commercial Mobile Radio Services their company has deployed, only 15% of respondents to the NTCA

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<sup>15</sup> To access the *NTCA 2012 Wireless Survey Report*, visit [www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2012ntcawirelessurveyreport.pdf](http://www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2012ntcawirelessurveyreport.pdf).

Wireless Survey indicated LTE service. Seventy seven percent of those who have plans to deploy next-generation services said they would be deploying LTE technology. As such, although most rural service providers have not yet deployed LTE, the vast majority will.

Working together pre-deployment may allow for a more efficient use of capital and network deployment when it comes time to build the FirstNet LTE network, as an existing 2G or 3G Radio Access Network will not need to be retrofitted for LTE technology, but rather deployed for the first time. Retrofitting existing cell sites is typically not the best solution, as it can require costly and time-consuming upgrades to the tower, antenna system, radio base station equipment, and/or backhaul facilities. Through a simultaneous green-field deployment of LTE, both FirstNet and the rural operator can work together to minimize costs by selecting the optimal cell site locations, installing multi-band antenna systems and radio base station equipment, and provisioning sufficient backhaul capacity to support both networks.

NRECA's approximately 900 members own and/or operate approximately 39,000,000 distribution poles and upwards of 800,000 transmission towers throughout their service territories that span 72% of U.S. geography and 47 states. NRECA's members have experience in not only electric facilities, but also in building and operating broadband network as well. Fourteen of the association's members successfully applied for \$280,000,000 of funding under The American Recovery and Reinvestment Act of 2009 to build out telecommunications projects to serve their members. This includes FTTH, middle mile fiber, and microwave wireless projects.

In areas without existing commercial wireless service where it may be necessary for FirstNet to deploy new wireless infrastructure, the rights-of-way and real estate assets of the

electric, telecom, and transport providers (*e.g.*, more than 35 million distribution facilities, substation locations, and remote terminals, *etc.*) should be applied in new site construction.

**C. Rural Providers Have Unparalleled Technical and Operational Experience in Rural and Remote Areas**

In addition to their existing infrastructure, FirstNet should leverage the significant human resources of rural infrastructure, transport, and service providers. Rural providers have experienced technicians in rural America who can cost effectively provide the operational and technical resources needed to deploy a next-generation, interoperable PSBN. Rural critical infrastructure providers are experts in the terrain and geographic challenges within their service territories; they understand where local public safety coverage is needed most, and how to effectively set wireless assets to meet the end users' communications requirements. Further, when the PSBN is subject to critical outages via man-made or natural disasters, given their physical presence in rural areas, these providers are "first responders" themselves—they are better positioned than any other carrier or operator to provide on-the-ground network operational and technical support to ensure the FirstNet network is repaired and restored to service as soon as possible.

Rural infrastructure and service providers are community-based and their overarching mission is to serve the needs of their local residents. As such, many rural infrastructure providers have established long-standing relationships with local communities generally, and tribal leaders more specifically. Indeed, NTCA members include both tribally owned telecommunication companies such as Gila River Telecommunications, Inc., owned by the Gila River Indian Community in Chandler, Ariz., and, as profiled in Appendix A, Fort Mojave Telecommunications Inc., located in Mohave, Valley, Ariz. NTCA's membership also includes companies that are managed by non-natives but serve substantial portions of tribal lands such as

Golden West Telecommunications, a member-owned cooperative headquartered in Wall, S.D., and Midstate Communications located in Kimball, S.D., and also profiled in Appendix A.

NTCA has at least 36 member companies that serve Native Nations.

Of NRECA's members, approximately 125 serve tribal reservations. This number does not include the number of NRECA's members that serve tribal lands, or the members that communicate and coordinate with tribal leadership where their facilities cross tribal lands. Two of NRECA's members are tribal authorities. In short, rural electric cooperatives and telecommunications providers have a long history of working with tribal authorities. These relationships between rural service providers and tribal leaders likely would be of interest to FirstNet as it attempts to educate tribal leaders about its mission and develop connections with the Native Nations to ensure that their first responders can access the PSBN.

**D. Large Mobile Network Operators Cannot Offer a Cost-Effective or Efficient Solution in Rural Areas**

INDATEL, NTCA, and NRECA applaud the efforts of the FirstNet Board of Directors, including the conceptual network architecture presentation by Board member Craig Farrill at the Board's inaugural meeting held on September 25, 2012, and the business plan presentation delivered on August 13, 2013. In its various communiqués and public speeches FirstNet has acknowledged the benefits of creating a diverse nationwide PSBN, with multiple wireless networks and systems—all of which, of course, rely heavily on robust wired networks to provide reliable backhaul connections and move significant amounts of data over great rural distances. Although FirstNet is headed in the right direction, the Board should expand its thinking to leverage the assets of rural critical infrastructure, transport, and service providers.

Although it may be tempting for FirstNet to partner with only one or two of the large MNOs for the PSBN construction, these partnerships would be neither cost effective nor efficient

for rural areas of the country. Despite their extensive networks, large wireless providers generally focus their activities around more populated areas, and have traditionally declined to build out their networks in rural areas. They also lack local presence, meaning that mean time to restore and repair can be more difficult in the remote and rural areas that smaller providers call home. As NTCA has highlighted in past proceedings,<sup>16</sup> when left to their own tactics, large operators typically focus capital investments on urban areas with concentrated population centers, while licensed spectrum in rural areas lies fallow. Historically, “nationwide” wireless providers do not provide service in rural areas, or, if they do, the implementation timeline is significantly longer than that in urban areas.

For example, the top 250 Cellular Market Areas contain approximately 74% of the total U.S. population but encompass just 14% of the total U.S. land area. This is a stark contrast to the 72% of the U.S. landmass served by the rural electric cooperatives, and the 12% of the U.S. population served by those same entities.

Further, 73% of respondents to the *NTCA 2011 Broadband/Internet Availability Survey Report* indicated that their fixed service competitors were only serving the cities and towns in

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<sup>16</sup> As NTCA has noted:

The large carriers argue that if it was economically beneficial for them to deploy services in a particular area, they already have the incentive to do so without regulatory intervention. This large carrier argument is a prime example of the different incentives driving large carriers and small carriers. Large carriers ignore the less dense and less lucrative markets because it is easier to make quick profits in densely populated areas or high usage corridors. Their cost-benefit analysis does not include a look at the needs of a particular community. If they can make enough money by serving an area, or freeing the spectrum, they will do so. If it’s not financially worth their trouble, they will not. Small carriers, in contrast, are situated in the communities they serve. . . A cost-benefit analysis includes a look at the rural community’s needs. What may be considered a longer term and too risky investment to a large carrier, can be a necessary one to a rural carrier. Wireless carriers that are not willing to risk their capital in rural areas should not also be permitted to hold the unused spectrum hostage.

*See* In the Matter of Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services; 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services; Increasing Flexibility To Promote Access to and the Efficient and Intensive Use of Spectrum and the Widespread Deployment of Wireless Services, and To Facilitate Capital Formation (WT Docket No. 02-381, 01-14, 03-202), Comments of the National Telecommunications Cooperative Association, January 14, 2005.

their service areas. To the extent that national providers do operate in rural areas, MNOs tend to focus their coverage around highway systems, ignoring the surrounding residential areas and rural parts of the country (including state highways and local roads over which many first responders must travel to reach emergency sites). This isolated coverage is not conducive to FirstNet's mission or the needs of rural first responders. That means in many rural areas, a smaller rural-focused operator is the best and perhaps only resource with whom FirstNet might roam with or consult on the construction of the PSBN.

In areas where they do operate, the "national" MNOs often do not own their vertical assets; instead these assets are owned by companies that specialize in the construction and operation of these assets who lease the infrastructure to the MNOs. In rural areas, the MNO backhaul facilities and wired infrastructure often are supplied by rural electric, telecommunications, and transport providers.

Large MNOs cannot offer FirstNet a plug-and play solution, as they would need to significantly upgrade their existing Radio Access Equipment to support the Band Class 14 LTE Network for Public Safety. The larger wireless providers also would need to harden their existing cell sites to meet FirstNet's requirements.

In short, FirstNet should ensure that its partnership agreements do not become "lock-ups" with a few large wireless providers that offer little in the way of vertical assets and infrastructure in rural areas. Instead, to maximize reach, leverage expertise, and improve the economies of network deployment, FirstNet should ensure that it seeks out, on a case-by-case basis, the best partners and resources in each area.

**E. Satellite Cannot Offer the Same Quality of Service as Traditional Terrestrial Mobile Solutions**

Satellite Internet access service should only be used as a last resort, where there is truly no other wireless or wireline terrestrial service available to support the PSBN. Although the major satellite providers have deployed next-generation technologies, their service is limited at best in the most rural portions of the nation. Further, although the next-generation of satellites may offer a more compelling product in places where it is available, it is unclear how this service will perform over time and if it will resolve longstanding issues associated with satellite Internet access. For instance, by its very nature, satellite service is subject to weather disturbances and tree cover that interferes with the wireless signal. Over time, the satellites likely will become congested with commercial users vying for bandwidth; indeed, there are indications already that new orders for satellite services in certain areas may be limited due to such concerns. For first responders who expect a reliable PSBN, these limitations should give significant pause. As such, satellite is a less-than-optimal service and should only be used in areas where traditional terrestrial service is not available or is too expensive to construct.

**IV. TO ACHIEVE RURAL COVERAGE, FIRSTNET SHOULD CREATE NETWORK BUILD AND OPERATION PARTNERSHIPS WITH RURAL SERVICE PROVIDERS**

Network partnerships provide the best and most effective way for FirstNet to deploy its capital most efficiently, as the right agreements could save millions—and possibly billions—in construction costs. In support of this goal, the Act directs FirstNet to create “partnerships with existing commercial mobile providers to utilize cost-effective opportunities to speed deployment in rural areas.”<sup>17</sup>

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<sup>17</sup> Act, Section 6206(b)(3).

In the RFI, FirstNet defines its launch coverage as a minimum of 99% of the population of every State and Territory, and 70% of the landmass of the conterminous States.<sup>18</sup> As such, this breadth of coverage can only be achieved by partnering with rural critical infrastructure, transport, and service providers to utilize their existing assets and infrastructure. Rural providers are ideally suited to serve as FirstNet network partners as they offer valuable and unique assets in rural areas, as evidenced above, in areas that typically are not served by their larger competitors with primarily metropolitan footprints. In the short term, rural critical infrastructure, transport, and service providers could significantly assist FirstNet with network planning and construction. Further, over time, these established partnerships could provide FirstNet with a sustainable source of revenue.

**A. FirstNet Should Partner with the Existing Commercial Service Provider that Provides the Best Coverage for the Local Area in Question**

Given FirstNet's limited construction budget and extensive coverage needs, it will need to partner with a variety of operators in order to gain the assets and infrastructure it needs to operate a ubiquitous, nationwide 4G LTE network. A systems integrator likely will assist in this effort, piecing together the assets of large MNOs and smaller rural providers. FirstNet should ensure that any prime contract includes the sub-prime resources of rural infrastructure and network service providers, many of whom are small businesses that often act as significant employers in their rural communities. FirstNet should ensure that in any given area where it decides to enter into a network partnership agreement, it selects the best service provider, with the most reliable network, the highest quality of service, the most advanced network technology, and, perhaps most importantly, the best knowledge of how to serve a vast rural coverage area.

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<sup>18</sup> RFI at 14.

**G. FirstNet Should Create Multiple Network Partnership Models to Entice Varied Rural Providers to Enter into Partnership Agreements**

In its RFI, FirstNet asks for feedback on network partnership models. Rural critical infrastructure, transport, and telecommunications service providers have varied business plans and likely will be interested in partnering with FirstNet in several different ways. For instance, rural critical infrastructure, transport, and service providers may offer FirstNet the use of their existing commercial wired and/or wireless assets in exchange for monetary compensation.

In rural areas, first responders may not need access to the entire 22 MHz of spectrum set aside for their use. As such, rural service providers may be interested in the exchange of existing commercial assets for access to FirstNet's prime, beachfront, 700 MHz spectrum. Under this partnership model, the rural provider would utilize FirstNet's spectrum, on a secondary basis, to fulfill local needs. For instance, rural electric providers could utilize the network to provide for workforce communications, grid operations, and communications with other electric providers when they provide mutual assistance in times of post-disaster restoration. Similarly, in areas where there is no existing rural commercial wireless service provider, rural telecommunications providers would greatly benefit from access to the network, on a secondary basis, in order to provide commercial broadband service to under/unserved rural areas.

Finally, another alternative partnership model would entitle FirstNet to utilize existing commercial assets and infrastructure in exchange for the rural network provider to access FirstNet's network capacity on an MVNO-like basis. The rural provider would be able to offer compelling mobile broadband service in its local area, with the added bonus of access to the nationwide FirstNet network for roaming, and network equipment and customer handsets that have been developed for this slice of spectrum.

At a minimum, FirstNet should refrain from choosing one model that suits the requirements of the large mobile network operators, Tier 1 and/or Tier 2 carriers; rather, FirstNet should leave the door open to all kinds of network partnership arrangements and creative solutions that can be tailored to meet local needs and challenges. As noted previously, each of these models taken by itself would likely be of interest to a subset of rural infrastructure, transport, and service providers, and the Associations' members remain open to further discussing the specifics of network partnering models.

Moreover, as national organizations, INDATEL, NRECA, and NTCA could serve as central facilitators and negotiating points of contact between FirstNet and rural critical infrastructure and service providers. The Associations are constantly surveying their members on a variety of issues, creating and managing listservs through which utility providers share data and information on best practices and lessons learned, and mapping the assets of their memberships. This scope and capability could be very helpful to FirstNet in carrying out its mission.

**H. FirstNet Should Revise its Rural Coverage Standards So That its Standards Do Not Undermine its Ability to Develop Productive and Successful Network Partnerships**

In Section IV, 7 of the RFI, FirstNet has defined its network coverage and capacity performance requirements. According to the RFI, “all 2010 Census defined Urban Areas” will require first wall, in-building coverage for hip-mounted Class 3, Category UEs.<sup>19</sup> In regard to “major highway and roads outside 2010 Census defined Urban Areas”, as well as “populated areas outside the 2010 Census defined Urban Areas to meet the population coverage requirement secondary roads,” FirstNet has defined its coverage requirements as Coverage for Class 3,

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<sup>19</sup> See RFI at 17.

utilizing Category 3 vehicle-mounted modems.<sup>20</sup> For all “other areas” FirstNet has listed its coverage requirements as Category Class 1, using Category 3 UE vehicle-mounted modems.<sup>21</sup>

Unfortunately, FirstNet has made a series of engineering assumptions regarding its necessary coverage requirements outside of urban areas. The FirstNet Board has thereby developed guideposts for rural coverage requirements that are inadequate for commercial service. Although this may be sufficient for initial launch coverage for first-responder service via professionally mounted vehicle modems, the network will be too thin to support the common, commercial smartphone, and the consumer’s expectation that it be able to operate without a vehicle-mounted modem. As such, FirstNet is precluding the use of network partnership arrangements that allow for rural providers to access FirstNet’s spectrum and capacity, albeit on a secondary basis, to offer commercial service. Therefore, for many rural infrastructure and service providers, partnering with FirstNet will be far less attractive. FirstNet should revise its coverage requirements to ensure that it does not undermine its ability to develop creative network partnership agreements that enable the spectrum to be used, on a secondary basis, for commercial service.

**I. FirstNet Should Advocate for Interoperability in the Entire 700 MHz Spectrum Band to Provide the Foundation for Numerous, Diverse Network Partnerships,**

It is in the public interest for FirstNet to express specific support for interoperability in the entire 700 MHz spectrum band. For FirstNet, the cost to support multiple spectrum bands is minimal, especially when compared with the larger cost savings it will be able to achieve by partnering with multiple interoperable providers to leverage existing infrastructure and assets and thereby avoiding additional network construction expenses. Mobile device interoperability

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<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

protections across the entire 700 MHz spectrum band would benefit consumers and public safety. Increased device availability, increased mobile provider competition, and additional roaming partnerships between providers would encourage innovation and keep equipment and device prices lower. Public safety users would have the ability to take advantage of handsets and other devices developed for commercial use.

**J. Rural Critical Infrastructure Providers Support FirstNet’s Efforts to Deploy Service to First Responders Quickly via MVNO Arrangements**

Rural critical infrastructure, transport, and service providers support FirstNet’s efforts to deploy service quickly over existing commercial networks, via MVNO agreements, as a stopgap measure until the PSBN is active. In support of this, the Act granted FirstNet the authority to negotiate and enter into roaming agreements, as it deems appropriate, with commercial network providers to allow public safety to gain access to and priority over commercial networks in times of an emergency.<sup>22</sup> As noted above, in any given area where it decides to enter into a network partnership agreement, FirstNet should select the “best” service provider; this holds true for network partnership agreements and MVNO arrangements. Indeed, in rural areas, if an existing rural wireless provider is available, FirstNet should negotiate an MVNO arrangement for first responder traffic to ride on top of the existing commercial network until the FirstNet PSBN is available.

**K. FirstNet Should Ensure that its MVNO Arrangements Do Not Result in Discriminatory Practices Against Rural Providers that Weaken FirstNet’s Network Coverage**

Part of the initial MVNO solution will necessarily be derived from large, Tier 1 wireless providers. However, before FirstNet enters into an MVNO agreement, the Board should be aware that is common for large wireless providers to construct roaming policies that discriminate

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<sup>22</sup> Act, Section 6206,(c)(5).

against small and rural wireless service providers. The large MNOs typically make it difficult for their customers to access other networks when roaming, allowing the customer only to access the lowest common denominator of network service that is available. As such, if a large MNO customer is roaming from its home network, and a small, rural provider is providing the network connectivity, the MNO might only allow the customer to access 2G service, even if 3G or 4G is available. Our nation's first responders need the best coverage available at all times, and standard MVNO arrangements with large, nationwide providers may unfairly restrict the first responder's access to network coverage, and unfairly discriminate against rural providers that have more advanced services already deployed and available for roaming customers. FirstNet should ensure that the MVNO arrangements with large, nationwide providers do not result in discriminatory practices against rural providers that in turn weaken FirstNet's network coverage.

## **V. Conclusion**

Rural infrastructure, transport, and service providers have substantial experience developing creative solutions to meet the communications needs of local public safety agencies. The Associations' members also have demonstrated considerable interest in continuing their public safety partnerships with FirstNet. In order for FirstNet to achieve its stated goals in an expedient and efficient manner, the Board should leverage existing commercial infrastructure to speed network deployment. Rural infrastructure providers are ideally situated to serve as network partners with FirstNet, with a vast array of existing assets including wired infrastructure used for backhaul and transport, and, in many cases, wireless towers and equipment. FirstNet should create multiple partnership models to entice varied rural providers to enter into partnership agreements. FirstNet also should revise its rural coverage standards to allow for the public safety spectrum to be used on a secondary basis for commercial service, thereby leaving

the door open to creative partnerships with rural providers. To speed network deployment, FirstNet should enter into MVNO arrangements to allow first responders to ride on top of existing commercial networks as a stop-gap measure until the PSBN is available. Finally, FirstNet should ensure that its MVNO agreements with large MNOs do not unfairly discriminate against rural providers and thereby weaken FirstNet's network coverage.

Respectfully submitted,

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**Appendix A:**

**Case Studies:**

**Partnerships between Rural  
Telecommunications Service Providers  
& Public Safety Agencies**

## **Case Study: Big Bend Telephone Co. (Alpine, Texas)**

### **Background**

Big Bend Telephone Co. (“BBT”, [www.bigbend.net](http://www.bigbend.net)), headquartered in Alpine, Texas, has been serving rural and remote areas of the state with advanced communications services since the late 1950s. The service provider operates a mesh network to meet the needs of its approximately 20,000 residential households and anchor institutions, utilizing fiber, DSL service via copper wire, and fixed wireless technologies.

The terrain surrounding BBT is rugged and unforgiving, with more than 18,000 square miles of desert and backcountry trails. The area attracts tourists and locals alike for mountain biking, trail hiking, and canoe excursions down the Rio Grande River. Further, of the 984 miles of southern border served by rural telecommunications providers, BBT serves nearly 50%, or 485 border miles—more border miles than the entire state of Arizona. As such, public safety is critically important to Big Bend’s residents and visitors.

Due to the extreme terrain of the area, BBT often will use non-traditional, creative, and hybrid communications solutions to reach its customers. For example, to reach one of its most remote customers, BBT relies on fiber to a central office, unlicensed wireless backhaul to a mountain top site, a second unlicensed hop down to an Ethernet broadband loop carrier, combined with short-loop copper to reach the customer’s premises.

### **Local Public Safety Needs**

Located in Brewster County, the largest county in the state of Texas, BBT plays a strategic role in assisting federal, state, and local agencies in securing the United States/Mexico border. Within BBT’s service territory, there are two border patrol station headquarters, three

border patrol checkpoints, two ports of entry, the U.S. Air Force Tethered Aerostat Radar System Balloon, and numerous other border security institutions.

BBT has been able to future-proof its network by investing in and maintaining a strong core network of fiber optics. This fiber backbone allows the company to meet and sustain the advanced technological demands of border agencies at all levels.

The extreme terrain and large amount of border that has to be covered poses unique challenges to all public safety entities and ensures that broadband technology is an especially crucial element to meet the area's homeland security needs. Because of BBT's next-generation fiber optic broadband network, a variety of applications can be facilitated such as surveillance cameras, thermal-imaging devices, X-ray units at checkpoints, and partially buried ground sensors. This helps agencies cut down on "boots on the ground" personnel while still providing coverage and oversight along the extensive southern border.

Additionally, as stated above, BBT's fiber optic network also sustains the radio networks utilized by its local and county law enforcement agencies (Brewster County Sheriff's department) that are dependent on the landline wired network for communications consolidation. The Brewster County Sheriff's Department has 192 border miles to protect and it serves as a first responder for individuals who are lost or injured on this very remote stretch of border.

BBT has worked closely with all public safety entities in the area, including U.S. Department of Homeland Security officers, the local sheriff's department, and the Texas Department of Public Safety ("DPS"). In fact, BBT recently partnered with the game wardens at the DPS office to provide service to enable them to access the Texas Parks and Wildlife network. Game wardens are state or local officials responsible for enforcing laws pertaining to the hunting, fishing, and trapping of wild animals, and, in some areas, they also have general law

enforcement authority. Access to BBT's broadband service allowed a senior DPS officer to be remotely stationed in Alpine, Texas. Further, BBT has worked specifically with Ronnie Dodson, Brewster County Sherriff, and Bill Brooks, Southwest Border Field Branch Chief, U.S. Customs and Border Protection.

### **Boquillas Crossing and Checkpoints**

Thanks to BBT Broadband service, Boquillas Crossing, a technology-centric immigration station and the only border crossing between Presidio and Del Rio, (approximately 300 miles apart) was able to reopen this year. Prior to this re-opening, the crossing had been a primitive point of access that had been closed for more than 10 years. Federal officials had originally closed the border out of concern that a terrorist could slip across the border unnoticed. Boquillas Crossing is now the only unmanned checkpoint along the entire Southern Border, and only the second of its kind in North America.

For travelers entering the United States, the National Park Service maintains an interagency facility that houses two kiosks with a remote link to Customs & Border Protection officials in other locations. Arriving visitors use these kiosks to transmit travel documents and identification information to U.S. Customs and Border Protection staff who are located in remote offices. Valid border-crossing documents, such a passport or border card, are required. Border agents interview crossers via real-time video, and examine their documents via the remote link thanks to the fiber optic service provided by BBT Broadband.

Additionally, as stated above, the U.S. Department of Homeland Security has increased the amount of proven, effective technology deployed at border crossings and interior checkpoints by including mobile X-Ray units, a license plate reader recognition system utilizing fixed and mobile cameras, and low-energy mobile video surveillance systems (MVSS) deployed

throughout the sector. The MVSS includes a similar package of radar, cameras, and laser-range finders, mounted on short masts atop trucks that are parked for long periods of time on top of hills. This provides the MVSS with coverage of the desert that augments the towers that are spread throughout the territory. Agents rotate in and out of the MVSS, watching their areas, able to beam imagery back to a main station or zoom in on an area that needs closer examination.

As technology advances, BBT expects the U.S. Border Patrol's need for cutting-edge technology to likewise evolve. BBT is committed to collaborating with local public safety officials to meet their ongoing technology and communications needs.

**Resources:**

- What BBT's Network Means to Homeland Security: <http://vimeo.com/63687559>
- Boquillas Crossing Information: <http://www.nationalparkstraveler.com/2013/04/port-boquillas-border-crossing-open-once-again-big-bend-national-park23114>
- [Boquillas Crossing information 2: http://www.texasmonthly.com/story/boquillas-crossing-reopen](http://www.texasmonthly.com/story/boquillas-crossing-reopen)

## Case Study: Enhanced Telecommunications Corp. (Sunman, Ind.)

### Background

In 1933, Robert Miller founded the Sunman Telephone Co. to connect patients to doctors in Sunman and New Alsace, Ind. Throughout its 80-year history, the telco has changed names and expanded its services, but it has not lost its commitment to its customers and community.

Enhanced Telecommunications Corp. (“ETC”, [www.etczone.com](http://www.etczone.com)) is an aggressively innovative telecommunications provider, delivering the total package of communications, information, and entertainment services through technologies, services, and support. ETC now provides many advanced services, including long-distance voice, video, high-speed Internet, cellular, business phone systems, security systems, Web design, and Web hosting. The telco employs nearly 90 people and has offices in Batesville, Brookville, Greensburg, and Sunman, Ind.

ETC’s family of companies provides service to more than 10,000 customers spanning more than 10 counties in Indiana. ETC’s Incumbent Local Exchange Carrier provides service to approximately 250 square miles with density of 14.3 subscribers per square mile; its Competitive Local Exchange Carriers stretches across 44 square miles, with 144 customers per square mile; and its wireless business provides service to 2,066 square miles.

To support these services, ETC has an extensive fiber network with approximately 500 miles of deployed fiber. Multiple dense wavelength division multiplexing fiber rings enable ETC to offer capacity from 10 Mbps to 10 Gbps, and the telco has customers at each of those service levels. ETC also owns 700 MHz lower B-block spectrum which it has used to deploy an LTE wireless network. ETC’s wireless business provides commercial fixed wireless services.

## **Communications Packages for Public Safety**

ETC has collaborated with its local public safety officials to develop unique networks, products, and solutions that meet their communications needs. For instance, in Decatur County, Ind., ETC is leasing dark fiber to the police department, city hall, jail, courthouse, and sheriff's department (as well as other ancillary offices). This has enabled local public safety officials in both the city and county government to leverage ETC's commercial network, which is financially efficient, as opposed to building and maintaining their own private networks.

In regard to the sheriff's department, portions of the network connection are fully redundant. The sheriff's department is located in a unique location that allows for diverse fiber entrance into the building. ETC has provided these two separate connections into the building from separate parts of the ring. Therefore, if one connection breaks, the building will retain a portion of its services through the other fiber connection.

This public-private partnership model has been duplicated by the city of Greensburg, Ind., which uses Internet Protocol-enabled video cameras in many city buildings. ETC provides connectivity between these locations via point-to-point dark fiber connections. Prior to the dark fiber connections, ETC created a special service package of virtual point-to-point (E-LINE/E-LAN) connections between the buildings until the need for dark fiber arose.

## **A Commercial LTE Network and Public Safety**

ETC has deployed a 4G LTE wireless network on 700 MHz B-block spectrum. Although ETC serves a very sparse area, the telco was able to leverage funds from the Broadband Initiatives Program, established in response to the American Recovery and Reinvestment Act of 2009, to serve previously un-served and underserved customer locations in Indiana. For

instance, ETC is now able to provide Internet access to a small city (Osgood, Ind.), including four offices in town via its 4G product. As an added benefit, public safety is interested in the new services that ETC can provide using this next-generation wireless system.

ETC assists the Westport Police Department, providing their officers with 4G wireless Internet access in their squad cars. The community was previously unserved by ETC. It now leases ETC space on its water tank, for a fee, and this enables the telco to provide three police vehicles with mobile connectivity, a public hotspot in the town hall, and coverage to nearly 2,000 nearby residences.

In addition, the Greensburg Police Department is exploring new a partnership opportunity with ETC. The Greensburg Police Department will be testing air cards from ETC that provide officers with an “always-on” connection back to the department’s core network, similar to a virtual private network (“VPN”). This will allow the officers to access all of their systems and databases that, in the past, have been limited to in-person static office visits. For instance, officers will be able to access vehicle information database and run real-time queries. The city and county are currently moving toward a computer-aided dispatch system, and with access to ETC’s 4G VPN-like service, the officers will be able to access this new digital system from their laptops and patrol cars. ETC’s solution also will be more secure as the police officers’ traffic will not travel over the public Internet.

In addition to traditional first responders, other government workers will be able to access this private 4G mobile network. For instance, meter readers will be able to perform their jobs using ETC’s wireless connectivity; their traffic, however, will be segregated from public safety officials. In short, ETC plans to offer additional functionality, without any data caps, at reasonable pricing that meets public safety officials’ needs.

## **Additional Services**

As part of its wireline services, ETC currently provides backhaul connectivity to more than 11 Verizon and AT&T wireless towers. Although this enables commercial wireless service, having adequate cell service can be very important in an emergency, especially in sparse, unpopulated, rural areas where first responders may reside many, many miles away.

ETC also has an established relationship with its local hospitals in Greensburg and Batesville. In Batesville, ETC provides Margaret Mary Community Hospital with Internet and voice services, ensuring that during an emergency, it can access state-of-the-art health services and remote specialists. ETC also provides the hospital with eight dark fibers, four each in fully diverse paths that connect the hospital to its secondary campus. Additionally, ETC has developed “E-Line” services where the telco utilizes its network to backhaul remote offices (in Batesville, and surrounding communities) thereby providing for direct connectivity back to the main hospital campus network. This means that data from these offices does not traverse the public Internet, thus keeping patient information more secure.

ETC remains focused in the coming years on continuing to build its core fiber network, and working with local communities to serve their needs, including through additional public safety partnerships.

## **Case Study: Farmers Telecommunications Cooperative, Inc. (Rainsville, Ala.)**

### **Background**

As Alabama's largest member-owned, operating telephone cooperative, Farmers Telecommunications Cooperative, Inc. ("FTC", <http://farmerstel.com>) was originally incorporated in February 1952. FTC is headquartered in Rainsville, Ala. Responding to the need for reliable communications with their neighbors and the world, a handful of area residents joined together to begin organizing and building FTC. In 1955, FTC secured federal funding to construct 100 miles of telephone lines and to install the necessary switching equipment to connect approximately 1,000 members in a two-county area. By 1960, FTC had grown to more than 2,000 members. FTC was the first carrier in Alabama, independent or otherwise, to deploy digital switching.

From those early days of initial hook-up, FTC now tells a story of steady growth and advancement. Today, FTC serves close to 16,000 subscribers in seven exchanges across DeKalb and Jackson counties, offering traditional wireline voice service, high-speed broadband, digital television, and mobile wireless connectivity. To enable these services, FTC has deployed 980 route miles of fiber optic cable. The telco operates an active Ethernet optical fiber-based platform, and is on track to make optical fiber available to 82% of its customers by the end of 2014. Further, at the close of the 2014 calendar year, approximately 92% of FTC's customers will either have a fiber optic cable available, or be on a copper loop of less than 6 kft from a fiber-fed remote switch. FTC's core network architecture generally consists of 1-10 Gigabit Ethernet transport assets arranged in a geographically diverse redundant ring topology.

## **Emergency Management and Disaster Preparedness**

FTC maintains an exceptionally close working relationship with all resident public safety organizations. FTC is officially the designated alternate site for the DeKalb County Alabama Emergency Management Agency, and the telco maintains a “semi-hot standby” readiness for a full communications platform. As such, FTC can provision emergency communications services within 30-60 minutes of an activation request.

Although FTC has an established history of partnering with local public safety agencies, the telco cemented its first responder status just a few years ago when it hosted an incident command center for almost an entire month in response to natural a disaster. In 2011, a series of tornados wreaked havoc on the East coast, including three tornados that caused extensive damage to FTC’s Northern Alabama service territory. In fact, FTC’s service territory was among the hardest hit in the state. The electric power grid, including the transmission and distribution assets, was severely impacted.

City, county, and state officials attempted to construct an incident command enter within DeKalb county, but their primary facility was without power. FTC quickly made its own headquarters’ auditorium available to be used as an incident command center. The telco itself was without a primary power source, but FTC enacted its disaster recovery plan, turning on auxiliary sources to power its communications switch and the command center. FTC quickly had the command center set up with cutting-edge communications capabilities, including wireline voice services, fiber broadband capacity, and Internet access. FTC also provided food and other services to the command center personnel. In addition, within less than two hours from first notification of need, FTC was able to provision, on an ad-hoc basis, a wired backhaul connection for the Alabama Emergency Management Agency’s mobile wireless deployable

system, which was used by first responders in the area. This was an incredible feat given that the neighboring Tier 1 and Tier 2 wireless providers had provided the federal government with a three-four day wait time as an estimate for provisioning backhaul services. Finally, in addition to its traditional public safety partnerships with local and federal government officials, FTC has worked very closely with the Red Cross on disaster recovery; the telco also hosted the Red Cross for more than one month at its headquarters in response to the 2011 tornados.

## **Case Study: Fort Mojave Telecommunications (Needles, Calif.)**

### **Background**

The Fort Mojave Indian Reservation straddles the east and west banks of the Colorado River near Needles, California. The reservation includes nearly 42,000 acres in the tri-state area of Arizona, California, and Nevada, including 23,669 acres in Mojave County, Arizona; 12,663 acres in California; and 5,582 acres in Clark County, Nevada. The Fort Mojave Tribal headquarters is located in Needles, California.

Fort Mojave Telecommunications Inc. (“FMTI”), located in Needles, Calif., has been in business since 1989, and is owned and operated by the Fort Mojave Indian Tribe. FMTI is an Incumbent Local Exchange Carrier which acts as carrier of last resort, providing traditional voice connectivity in addition to broadband Internet access and cable TV service.

FMTI provides 100 % fiber-to-the-home and fiber-to-the-business in its service territory, stretching 104 miles from Needles, Calif., to Aztec Road in Mohave Valley, Ariz. FMTI’s infrastructure also consists of one 60-foot self-supporting tower, part of the Mesquite Creek Central Office, the highest point in its service territory, along with a proposed 100-foot self-supporting tower in the Arizona Village subdivision later this year. The towers are used for wireless backhaul. FMTI has several redundant middle-mile connections.

The telecommunications provider boasts state-of-the-art equipment and power backup capability to withstand the lengthiest power outage, providing FMTI with a reliable, redundant network that can meet the most demanding data needs.

## **A New Wireless Network for the Tribal Police Department**

In August 2011, the Fort Mojave Department of Emergency Response (“DER”) received a \$1.537 million U.S. Department of Homeland Security grant to upgrade the tribal police radio to a P-25 compliant trunked simulcast radio system. The benefits of a P25-compliant system are much touted and include long-term cost savings for public safety, plus improved communications capabilities to an agency’s users.

Although the tribal government could have selected to construct a private network, thereby overbuilding the existing commercial network, it recognized that a better course of action was to partner with the local telecom service provider for a collaborative deployment of the P25 police wireless system. FMTI has extensive infrastructure, and operational and technical resources, that will be of great assistance in building and maintaining this new wireless network.

The new mobile wireless radio system will rely on FMTI’s fiber optic network; the police department leased a 2 Mbps fiber pipe for backhaul from FMTI. The core radio system also will be installed in the telecommunications provider’s central office location, and FMTI will lease two tower locations to the police department so that it can co-locate its wireless equipment.

Once the radio system is up and running, FMTI will provide ongoing support and maintenance for the system, managing the core equipment and handset inventory, control, and maintenance, and ensuring that the system is secure from natural disasters and cyber attacks. The Fort Mojave tribe is working to expand this network to allow all tribal public safety agencies, including fire, emergency medical services, emergency management, healthcare and public works, to use the new radio system.

## **Case Study: MidState Communications Cooperative (Kimball, S.D.)**

### **Background**

Since 1952, when Midstate Communications (“Midstate”, [www.midstatesd.net](http://www.midstatesd.net)) was incorporated as a telephone membership cooperative, the telco has proudly serviced the communication needs of Central South Dakota with state of the art telecommunications technology and services. Headquartered in Kimball, S.D., Midstate currently services nearly 5,000 access lines and 2,400 broadband customers in 11 communities throughout Central South Dakota, spread over approximately 2,200 square miles.

On October 30, 1952, the Articles of Incorporation for Midstate Telephone Co. were drafted and signed. During the next couple of years, acquisitions were made to include Kimball, White Lake, and Stickney exchanges in 1955; the Gann Valley, Pukwana, and New Holland exchanges in 1956; the Delmont exchange in 1957; the Fort Thompson exchange in 1959; and the Platte and Geddes exchanges in 1998, which form the modern day Midstate Communications Cooperative.

Midstate is continually upgrading its infrastructure to serve its customers with modern communications services, including traditional voice connections, high-speed broadband Internet, cable TV, and a range of computer and network support services. The telco is approximately 85% complete with its fiber-to-the-home build and expects to complete the project in the next four years. Approximately 2,700 route miles of cable is predominantly fiber optics, with 100% of Midstate’s core network and backhaul facilities fed via fiber.

## **Assisting Public Safety Answering Points and Tribal Areas**

Midstate has an established history of collaborating with public safety answering points (“PSAPs”) and first responder agencies. The telco has provided discounted circuits and other infrastructure to meet local public safety officials’ evolving communications needs. Midstate’s employees also serve as first responders, including firefighters and emergency medical technicians.

According to Midstate, PSAPs within South Dakota have been striving for additional standardization. The state has been engaged in centralized planning, with the goal to deploy next-generation 911 (“NG911”) services in the next five to seven years throughout South Dakota’s approximate 30 PSAPs. NG911 will make all PSAPs more effective and efficient, enabling plug-and-play IP solutions such as allowing call takers to route calls to other PSAPs during high-volume traffic. Midstate has assisted local PSAPs for years, working with them to find the highest quality and most affordable options to provide emergency 9-1-1 services.

Midstate now provides connectivity to three PSAPs in rural South Dakota, located within the communities of Mitchell, Lake Andes, and Fort Thompson. The telco was instrumental in helping to consolidate their services. Recently, several of the counties within the Midstate serving area converted their small PSAPs to regional PSAPs capable of providing enhanced 911 (“E911”) services. The PSAPs were able to realize significant efficiencies through this consolidation of their operations, enabling them to pool their resources for staffing, mapping, and migrating to E911, a necessary step on the path to NG911. In addition to the PSAP consolidation efforts by these counties, Midstate has collapsed its internal network to two switches. The telco effectively reduced the number of trunks required to provide access to 9-1-1

emergency services. Midstate now routes 9-1-1 calls originating within its service territory to the three above-mentioned PSAPs locations.

Midstate also has developed a strong working relationship with a local Native American tribe. The telco provides Internet access and traditional voice services to residents of the Crow Creek Sioux Tribe located on the Crow Creek reservation. In regard to public safety, Midstate provides the connection for the PSAP operated by the police department located in Fort Thompson, S.D., a Bureau of Indian Affairs' operation, which provides 9-1-1 services for the entire county. Midstate installed and maintains a standard telephone line key system for the PSAP. This voice connection enabled the call center to develop its own 9-1-1 dispatch services. Although the Crow Creek Sioux Tribe has not been able to afford to move to E911, Midstate's connection allows the PSAP to maintain its independence by answering calls for emergency services from within the surrounding county and then dispatching first-responder personnel.

## **Case Study: Panhandle Telecommunications Cooperative, Inc. (Guymon, Okla.)**

### **Background**

Panhandle Telephone Cooperative, Inc. (“PTCI”, [www.guymonok.org](http://www.guymonok.org)) was incorporated and began providing telephone service to its rural customers in 1954. Its service territory now includes more than 3,700 route miles of copper and 1,700 route miles of fiber facilities, and encompasses the Oklahoma Panhandle (Cimarron county, Texas, and Beaver county, Texas) as well as portions of Harper county, Okla. PTCI serves more than 5,900 square miles, with a density per square mile of 5.2 people. This includes 15 incorporated cities/towns, 12 unincorporated communities and numerous major U.S. highways. PTCI provides traditional landline voice, wireless, TV, high-speed Internet, computer installation/repair, and business systems services. PTCI maintains 10 Gigabit Ethernet transport assets arranged in a geographically diverse redundant ring topology.

In 1989, PTCI acquired Cellular B Block 850 MHz licensed wireless spectrum, and, at that time, became the sole mobile provider in the Oklahoma Panhandle offering 2G services. In 2006, the telco began providing high-speed 3G Internet service to its rural customers utilizing 700 MHz spectrum. In 2012, PTCI upgraded its service and now provides fixed 4G LTE services to its rural citizens, farmers, and ranchers. Today, only 1% of PTCI’s potential subscriber locations are out of range for high-speed Internet services, provided over wireline or wireless infrastructure.

### **Public Safety Partnerships**

PTCI has an excellent working relationship with local public safety officials and agencies. Many first responder agencies including police, fire, the district attorney’s task force,

and emergency management departments utilize PTCI's 3G mobile wireless network for Internet connectivity via air cards/dongles and wireless modems throughout the Oklahoma Panhandle. In addition, the Guymon Police Department is currently testing a next-generation 4G dongle on PTCI's LTE mobile network.

When the need arises, PTCI sets-up ad-hoc communications capabilities at command center locations for local, state, and federal emergency management officials. For instance, last year, there was a head-on train collision between Guymon, Okla., and Goodwill, Okla. PTCI stepped forward to provide all first responders with modems to access the telco's wireless LTE network. This communications connectivity was especially important to provide critical care to those who were injured on site, and to secure the scene due to chemical spills.

In addition, just a few years ago there was a major blizzard in the area. Although many first responders had wireless phones, their handsets relied on GSM connectivity from a Tier 1 wireless provider and did not have any reliable service. PTCI is traditionally a CDMA and EVDO provider, unable to provide roaming connectivity to GSM handsets, and, for its part, the Tier 1 wireless provider had not built out the rural area with service. As such, to meet their immediate communications needs, PTCI provided first responders with the Oklahoma State Emergency Management office with wireless phones to access the telco's wireless network.

Approximately three years ago, when a local school-aged child was kidnapped, PTCI provided communications services to state officials and FBI associates. The emergency responders selected a command center location and PTCI provided fiber optic backhaul to the facility within less than 12 hours, including phone lines for call center operations and high-speed Internet access for use in the investigation. Finally, at a fire mobile command center a few

years ago, PTCI provided the response team with LTE Internet access, including data speeds of at least 10-12 Mbps. The majority of the handsets were provided free of charge.

PTCI continues to look for creative solutions to meet the evolving needs of its city, county, state, and federal first responders.

## **Case Study: Southern Kansas Telephone Company, Inc. (Clearwater, Kan.)**

### **Background**

Southern Kansas Telephone Company, Inc., (“SKT”, [www.SKTMainstreet.com](http://www.SKTMainstreet.com)) was founded in 1940, and has been owned and operated by the Mikesell family from its beginning. The company provides telecommunications products and services to customers in Southeast and South central Kansas. Over the years, the company has evolved from providing telephone service in three communities to now providing a sophisticated blend of telephone, cable, Internet, wireless, and security services across seven counties. Collectively, the SKT family of companies serves more than 12,000 customers from its corporate headquarters in Clearwater, Kan.

SKT operates a mesh network with copper and fiber technology and coaxial plant for cable TV. The telco has the ability to backhaul circuits of various nature via nine fiber optic rings, including one 10 Gigabit ring and six 1 Gigabit rings. In addition to its wireline infrastructure, SKT currently holds licensed AWS spectrum, although it is not currently in use at this time.

### **Complimentary Services**

SKT works very closely with its local government and public safety officials. The telco provides complimentary communications services to more than 100 various city entities, including county sheriff departments, city police departments, county and city emergency medical services, rural water districts, and city and county fire departments. SKT also provides free cable TV service to the seven K-12 schools in its service area. SKT provides all of the entities with a 4.0 Mbps downstream connection free-of-charge; higher connections are available at standard rates. SKT also offers traditional voice services to all of these anchor institutions at

standard regular rates. In 2010, SKT was able to provide savings topping \$60,000 for these vital community hubs. In addition, SKT allows these entities to advertise on the telco's local cable channel free of charge, so that they can make citizens aware of events and non-emergency information. Each ad displays for 15 seconds, with the ads rotating 24 hours a day, seven days a week, 365 days a year.

Similar to other rural telcos, SKT's employees often volunteer as emergency medical technicians ("EMTs") and firefighters within their communities. SKT allows these employees to leave the office during the workday as needed, since there are so few citizens available to provide emergency services in these areas on a voluntary basis. SKT also supports their efforts by providing Firebar service in four small towns throughout its service territory: Clearwater, Elk Falls, Longton, and Viola. The Firebar service simultaneously contacts every volunteer EMT and member of the fire department at the same time, and enables them to communicate with one another and receive important information about an emergency.

To activate the service, an end user can contact the 9-1-1 public safety answering point ("PSAP"), or call the Firebar designated phone number. At this point, the call is routed to a special server that triggers the Firebar service. Each first responder will receive the distress call on his home phone and mobile public safety radio, at the same time. As soon as the first responder answers the call, he is immediately placed into conference with the Firebar call and other first responders. If the citizen-in-need has dialed a PSAP, the call-taker also will be present on the call. However, if the citizen has directly called the FireBar designated number, the citizen will be present on the conference line. SKT's softswitch enables this Firebar service, which is of utmost importance to a small rural community with a volunteer first-responder force.

SKT remains committed to serving the needs of its local public safety officials and agencies, and ensuring that its anchor institutions have access to the tools they need to protect and assist the community at large.

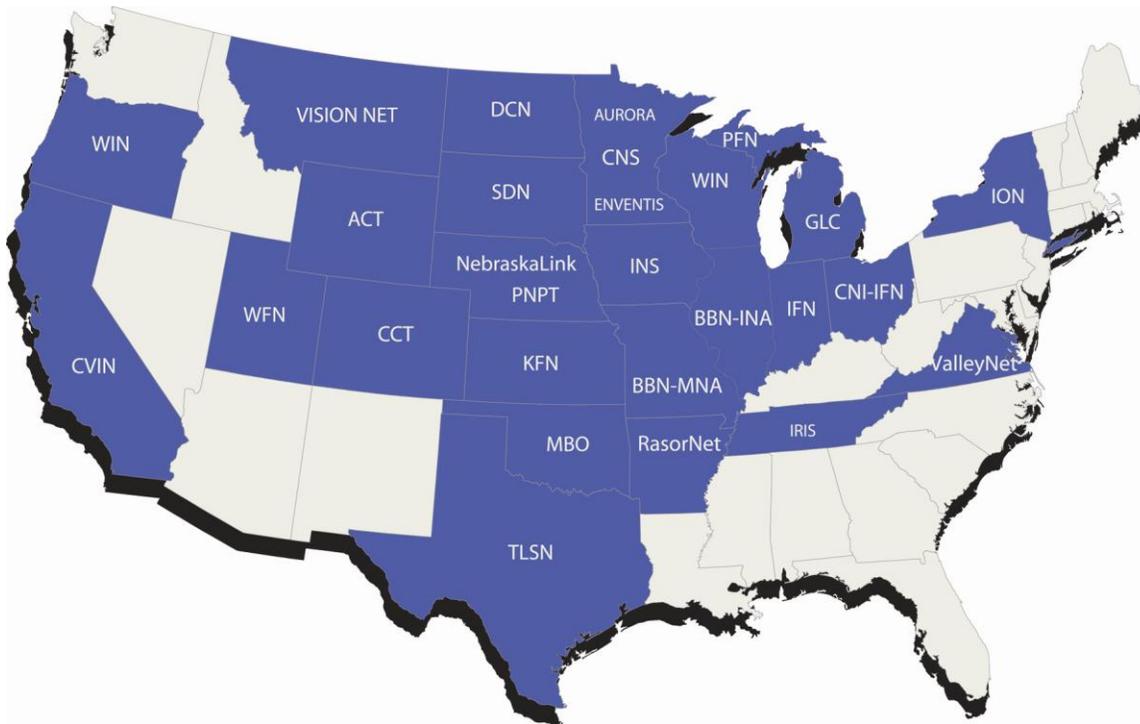
**Appendix B:**

**INDATEL RFI Responses –  
Rolled-Up Information**

The following are key statistics gathered from the INDATEL Membership and rolled-up to the INDATEL level:

<b>1</b>	<b>Current Route Miles of Fiber</b>	<b>66,225</b>
<b>2</b>	<b>YE 2013 Planned Route Miles of Fiber</b>	<b>72,858</b>
<b>3</b>	<b>Current Number of Fiber-served Wireless Cell Sites</b>	<b>3,022</b>
<b>4</b>	<b>YE Forecast Number of Fiber-served Wireless Cell Sites</b>	<b>4,057</b>
<b>6</b>	<b>Current Number of PSAPS served by Fiber</b>	<b>185</b>
<b>7</b>	<b>Potential Number of PSAPS served by Fiber</b>	<b>645</b>
<b>8</b>	<b>Number of Members that are State Government Vendor Approved</b>	<b>20</b>
<b>9</b>	<b>Number of Members that are NTIA BTOP Grant Recipients</b>	<b>8</b>
<b>10</b>	<b>Number of “On-Net” Fiber-served Data Centers</b>	<b>96</b>
<b>11</b>	<b>Number of Members responding directly to FirstNet RFIs</b>	<b>13</b>

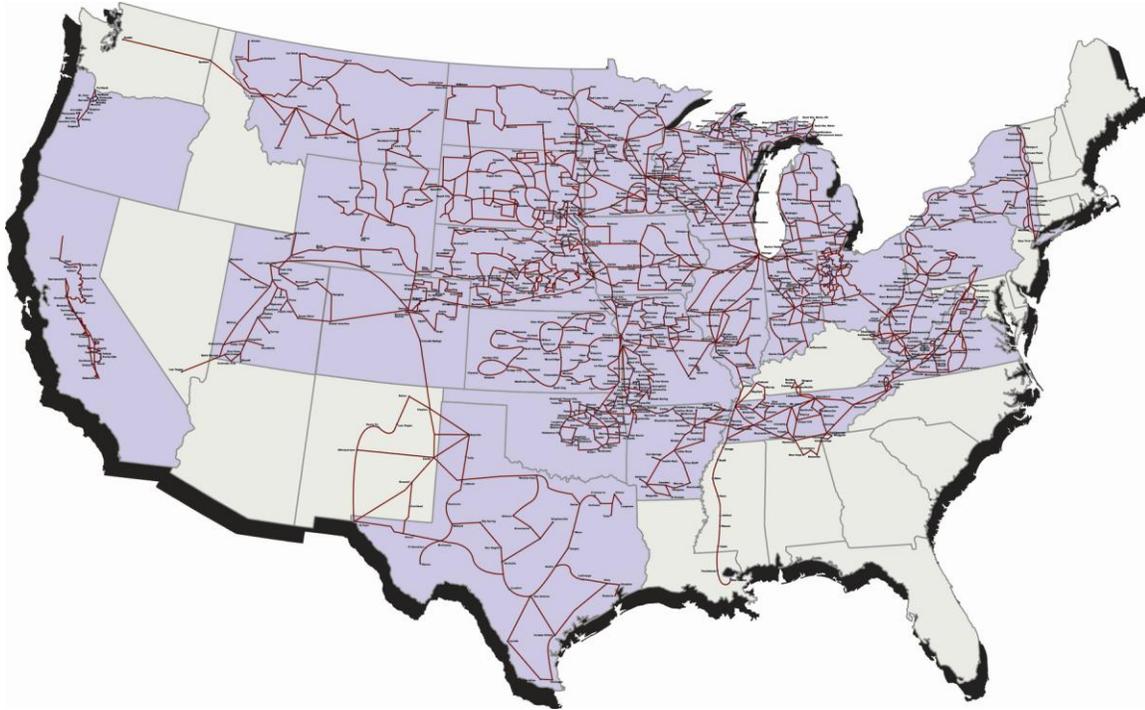
**INDATEL Member Map:**



Go to [www.INDATELgroup.com](http://www.INDATELgroup.com) and click on the Member acronym/name and you will be directed to the Member's website for more information about their network and services.

- 28 Members – Owned by 500 Rural Local Exchange Carriers (“RLECs”)

#### INDATEL “Network of Networks” Map:



- Over 70K route miles of fiber
- 850+ Points of Presence (“POPs”)
- Anchored in 50 of the Top 100 MSAs
- Major Aggregation POP at 350 E. Cermak, Chicago, IL – Tier 1 Carrier Hotel

**Appendix C:**

**NTCA Member Company RFI Responses**

## NTCA Member Company RFI Responses

The following is an alphabetical listing by state of the NTCA member company RFI responses that are included in this Appendix:

### AK

REVL, Inc. dba REVL Communications & Systems  
TelAlaska, Inc.

### AL

Farmers Telecommunications Cooperative, Inc. & Operating Subsidiaries  
Otelco / OTT Communications

### AR

Lavaca Telephone Co. Inc. d.b.a. Pinnacle Communications  
Mountain View Telephone Company  
Ritter Communications  
Walnut Hill  
Yelcot Telephone Company

### AZ

Fort Mojave Telecommunications, Inc.  
Accipiter Communications, Inc. dba Zona Communications

### CA

Sierra Telephone

### CO

Blanca Telephone Company  
Eastern Slope Rural Telephone Association, Inc.  
FastTrack Communications Inc.  
Haxtun  
Jade Communications, LLC  
Nucla-Naturita Telephone Co.  
The PeetzCooperative Telephone Company  
Phillips County Telephone Co., d/b/a PC Telcom  
Rye Telephone Company  
South Park Telephone Company  
Wiggins Telephone Association

FL

Nefcom

GA

Pineland Telephone Coop. Inc.  
Public Service Communications Inc.  
Waverly Hall Telephone

IA

Butler-Bremer Communications  
Cascade Communications Company  
Dumont Telephone Company  
Farmers Mutual Cooperative Telephone Company  
Iowa Network Services, Inc.  
Jefferson Telcom  
Farmers Mutual Telephone Company d.b.a. OmniTel Communications  
Premier Communications  
Preston Telephone Company  
Van Buren Telephone Company, Inc.  
Webster-Calhoun Cooperative Telephone Association

ID

Custer Telephone Cooperative, Inc.  
Farmers Mutual Telephone Company

IL

Home Telephone Co.  
One-Eleven Internet Services (Moultrie Independent Telephone Co.)

IN

Endeavor Communications  
Enhanced Telecommunications Corp.  
Monon Telephone Company, Inc.  
Perry-Spencer Rural Telephone Cooperative, Inc., d.b.a. PSC  
Rochester Telephone Company  
SEI Communications

KS

Blue Valley Telecommunications  
Columbus Telephone Co.  
Craw-Kan Telephone Cooperative Inc.  
Cunningham Telephone Company, Inc. (ILEC) and Cunningham Communications, Inc. (CLEC)

Golden Belt Telephone Assn.  
Home Communications, Inc.  
Mokan Dial, KS  
Mutual Telephone Company  
Nex-Tech  
Peoples Telecommunications, LLC  
Rainbow Telecommunications Association  
S&A Telephone Company, Inc.  
SCTelcom  
Southern Kansas Telephone Company, Inc.  
Twin Valley Communications, Inc.  
United Telephone Association, Inc.

#### KY

Logan Telephone Cooperative, Inc.  
Duo County Telephone Coop.

#### LA

East Ascension Telephone Company, LLC (EATEL)  
LaFourche Telephone Company, LLC  
Northeast Louisiana Telephone Co., Inc. dba NortheastTel

#### MI

Waldron Telephone Company

#### MN

Emily Cooperative Telephone Company  
Halstad Telephone Company  
Rothsay Telephone Co.

#### MO

Choctaw  
Fidelity Communications Inc.  
Kingdom Telecommunications Inc.  
Kingdom Telephone Co.  
Mokan Dial, MO  
Oregon Farmers Mutual Telephone Co. (OFM)  
Rock Port Telephone Company and Subsidiary

MS

Georgetown Telephone Company, Inc.

MT

Mid-Rivers Communications  
Nemont Telephone Cooperatives, Inc. and its subsidiaries  
Range Telephone Cooperative, Inc.  
Triangle Communications

NC

Atlantic Telephone Membership Corporation  
Randolph Telephone Membership Corporation  
Star Telephone Membership Corporation  
Surry Telephone Membership Corp.  
Yadkin Valley TMC and Yadkin Valley Telecom, Inc.

ND

Consolidated Telcom  
DCN, LLC dba Dakota Carrier Network  
Red River Communications  
West River Telecommunications Cooperative (WRT)

NE

Dalton Telephone Company  
Elsie Communications, Inc.  
Glenwood Telephone Membership Corporation  
K&M Telephone Company  
Keystone Arthur Telephone Company  
Nebraska Central Telephone Company  
Northeast Nebraska Telephone Company

NM

Plateau Telecommunications

NV

Lincoln County Telephone Sys, Inc.  
Moapa Valley Telephone

NY

Oneida County Rural Telephone

OH

Arthur Mutual Telephone  
Benton Ridge Telephone Company  
Glandorf Telephone Company, Inc.  
McClure Telephone Company  
Minford Telephone Company  
The Ottoville Mutual Telephone Company

OK

Canadian Valley Telephone  
Central Oklahoma Telephone Co., L.L.C.  
Chickasaw Holding Company (CHC)  
Hinton Telephone Co  
Panhandle Telephone Cooperative, Inc. (PTCI)  
Pioneer Telephone Cooperative, Inc.  
Pottawatomie Telephone Company  
Salina Spavinaw Telephone Co., Inc. (SST)

OR

Clear Creek Communications  
Colton Telephone Company  
Pioneer Telephone Cooperative  
Stayton Cooperative Telephone Company

PA

Pymatuning Communications

SC

Home Telephone ILEC, LLC d/b/a Home Telecom  
Sandhill Telephone Coop.

SD

Brookings Municipal Utilities d/b/a Swiftel Communications  
Golden West Telecommunications Cooperative  
Interstate Telecommunications Cooperative  
James Valley Cooperative Telephone Company

Kennebec Telephone Co., Inc.  
Midstate Communications  
Roberts County Telephone Coop  
TrioTel Communications, Inc.  
Valley Telecommunications Cooperative

TN

North Central Telephone Cooperative, Inc  
Twin Lakes Telephone Coop. Corp

TX

Alenco Communications, Inc.  
Cap Rock Telephone Cooperative, Inc.  
Central Texas Telephone COOP Inc.  
Community Telephone Company  
Electra  
Ganado Telephone Co., Inc.  
La Ward Telephone Exchange, Inc.  
Nortex Communications  
Peoples Telephone Cooperative, Inc.  
Poka Lambro Telephone Cooperative, Inc.  
Tatum Telephone  
Taylor Telephone Cooperative, Inc  
West Texas Rural Telephone Cooperative, Inc., (ILEC) and WT Services, Inc. (CLEC)

UT

All West Communications  
Manti Telephone Company  
South Central Utah Telephone Association, Inc  
STRATA Networks

VA

Pembroke Telephone

WA

Hood Canal Communications  
Toledo Tel

WI

Bloomer Telephone Company  
Chibardun Telephone Cooperative, Inc. dba Mosaic Telecom  
Cochrane Cooperative Telephone Company  
Coon Valley Farmers Telephone Co  
Lakeland Communications  
Manawa Telephone Company  
Price County Telephone Company

WV

Hardy Telecommunications, Inc.

WY

Advanced Communications Technology Inc. (ACT)  
Dubois Telephone Exchange, Inc. (DTE)  
RT Communications, Inc.