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December 17, 2014

VIA ELECTRONIC SUBMISSION

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Notice of Ex Parte Presentation of Panhandle Telephone Cooperative, Inc.
Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform – Mobility Fund
WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, WT Docket No. 10-208

Dear Ms. Dortch:

On December 15, 2014, Shawn Hanson, CEO of Panhandle Telephone Cooperative, Inc. ("PTCI"); Mark Sharkey, Project Engineer at PTCI; and Robert Silverman of Bennet & Bennet, PLLC, counsel for PTCI, spoke by telephone with Louis Peraertz, Legal Advisor to Commissioner Mignon Clyburn regarding the above-referenced proceedings. Pursuant to Section 1.1206, this letter is being filed electronically with the Federal Communications Commission ("Commission").

PTCI is a rural telephone cooperative that has been serving the Oklahoma Panhandle area (OK RSA #1 - Cimarron, Texas & Beaver Counties) for 60 years. PTCI provides, through its subsidiaries, mobile wireless services as well as telephone, high speed Internet, and video services. Using a variety of data, PTCI illustrated how the Oklahoma Panhandle is a major road and rail transportation corridor and an important industry corridor for energy (oil & gas, wind), food (pork production) and agriculture, and detailed how PTCI's mobile wireless service is heavily relied upon by these industries as well as those who live, work in, and travel to the Oklahoma Panhandle area.

In the meetings, PTCI discussed the importance of ongoing high cost universal service support through Mobility Fund Phase II support for its provision of mobile wireless service

throughout the Oklahoma Panhandle area, especially to ensure continued voice and 911 emergency call capability. PTCI has reasonably expected that its high cost service areas would be eligible for ongoing Mobility Fund Phase II support. In particular, PTCI addressed the Commission's area eligibility proposal "to focus competitive bidding for Mobility Fund Phase II support on extending mobile 4G LTE to the remaining U.S. population that will not have it available from either Verizon or AT&T…"[1] and the Commission's request for input regarding the eligibility of "areas where a portion of a network overlaps in part with an area that has LTE coverage provided by AT&T and/or Verizon…"[2] In OK RSA #1, the competitive landscape for mobile wireless services consists of Verizon's CDMA LTE network and PTCI's GSM-based UMTS LTE network.[3]

In its discussions PTCI noted that, despite the growing use of 4G LTE networks for data services, the current incompatibility between CDMA and GSM networks due to band class differences and carriers' continuing need to rely on 3G or even 2G networks for voice/text services (such that GSM-based smartphones cannot be used to make voice calls on a CDMA carrier's network and vice versa) will persist in the foreseeable future[4] and during the anticipated term of Mobility Fund Phase II. PTCI indicated that, accordingly, the presence of *either* Verizon's CDMA-based network *or* AT&T's GSM-based network is not a sufficient benchmark for universal 4G LTE mobile wireless service in an area and should not exclude an area for Mobility Fund Phase II support. In the Oklahoma Panhandle, a supported carrier is the only mobile wireless provider serving GSM customers throughout the *entire* area (including customers roaming on AT&T or T-Mobile) because such customers are unable to connect to Verizon's CDMA 4G LTE network. Rather, a more appropriate criterion for ineligibility would be the presence of both Verizon's and AT&T's 4G LTE networks in an area. For areas where a

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[1] *Connect America Fund*, WC Docket No. 10-90, *A National Broadband Plan for Our Future*, GN Docket No. 09-51, *Universal Service Reform–Mobility Fund*, WT Docket No. 10-208, *ETC Annual Reports and Certifications*, WC Docket No. 14-58, *Establishing Just and Reasonable Rates for Local Exchange Carriers*, WC Docket No. 07-135, *Developing an Unified Intercarrier Compensation Regime*, CC Docket No. 01-92, Report and Order, Declaratory Ruling, Order, Memorandum Opinion and Order, Seventh Order on Reconsideration, and Further Notice of Proposed Rulemaking, FCC 14-54, ¶241 (rel. June 10, 2014).
[2] *Id.* at ¶242.
[3] PTCI explained that legacy GSM 2G-only networks in OK RSA #1 either already have been decommissioned or are expected to be decommissioned in the near future. PTCI also indicated that neither AT&T nor T-Mobile has deployed a competing network in OK RSA #1.
[4] *See, e.g.*, Fitchard, Kevin ,"Verizon starts killing off 3G networks to make room for LTE," Gigaom (December 3, 2014), *available at* https://gigaom.com/2014/12/03/verizon-starts-killing-off-3g-networks-to-make-room-for-lte/ (visited December 5, 2014) ("About 80 percent of Verizon's mobile data traffic now rides over LTE, *but some 40 million (41 percent) of the total devices on Verizon's networks only have 2G and 3G radios. That means for the foreseeable future, Verizon will have to keep a modicum of EV-DO capacity online at every cell site to support those devices… As for 2G, it will be around even longer than 3G since it's still Verizon's primary voice network*, but eventually Verizon will begin the bulk of its voice traffic onto its new voice-over-LTE service") (emphasis added).

portion of a network overlaps in part with an area that has LTE coverage provided by one of AT&T or Verizon, the entire area should remain eligible for Mobility Fund Phase II support.

Finally, PTCI was invited by Mr. Peraertz to provide additional information to the Mobility Fund Phase II record regarding the issue of budget size and how carriers such as PTCI rely on continuing high cost support to keep their networks running.

If there are any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,

/s/ Robert A. Silverman
Robert A. Silverman

Attachments

cc (via email): Louis Peraertz
Rebekah Goodheart

Panhandle Telephone Cooperative, Inc. (PTCI)

Mobility Fund Phase 2
WC Docket Nos. 10-90, 10-208 *et al.*

Ex Parte

December 3-4, 2014

Eligibility

- Getting area eligibility right is crucial for PTCI and similar carriers that serve expansive rural areas
- For purposes of eligibility, FCC must account for technology compatibility issues; GSM & CDMA are not interoperable
- Area eligibility/non-eligibility should be determined on presence of *both* Verizon (VZW) and AT&T 4G LTE services; the presence of just one of AT&T or VZW should not preclude MFP2 area eligibility
- Current MFP2 proposal could lead to exclusion of PTCI's GSM coverage area because of VZW's *incompatible* CDMA presence

Interoperability

- 4G/LTE not interoperable due to different band classes
- Voice/Text not interoperable due to 3G default requirement
  - CDMA & GSM networks are not interoperable for Emergency/911 calls

PTCI Introduction

Panhandle Telephone Cooperative, Inc. (PTCI)

- Serving Oklahoma Panhandle area for 60 years
  - Cimarron, Texas & Beaver Counties
- Telephone, High Speed Internet, Video, Cellular

Oklahoma Panhandle

- Major transportation corridor
  - Roads & Rails
- Major industry corridor for energy and agriculture
  - Oil & Gas
  - Agriculture & Pivot Irrigation
  - Hog Farms
  - Wind Farms

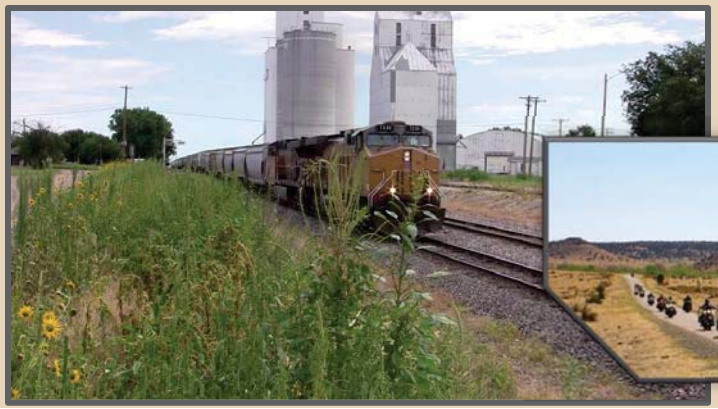
PTCI's Territory

Highways: 3/412, 287/385, 56, 64, 54, 136, 83, 270

Larger Cities/Towns: Beaver, Boise City, Goodwell, Guymon, Hardesty, Hooker, Keyes, Turpin, Tyrone

Roads and Rails

Major transportation corridor; roads used by residents, trucks, industry workers; also important rail system through Panhandle

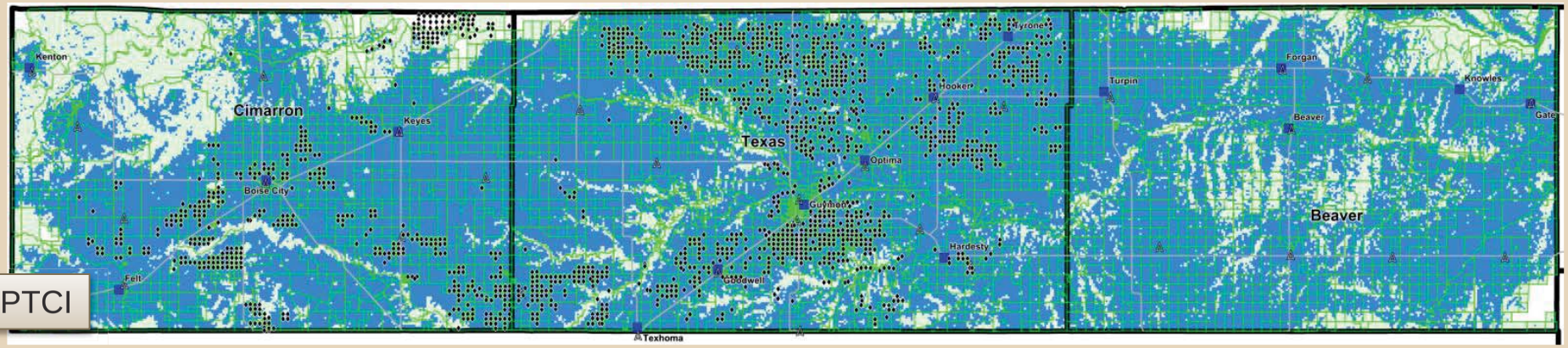


Center Pivot Irrigation (CPI)

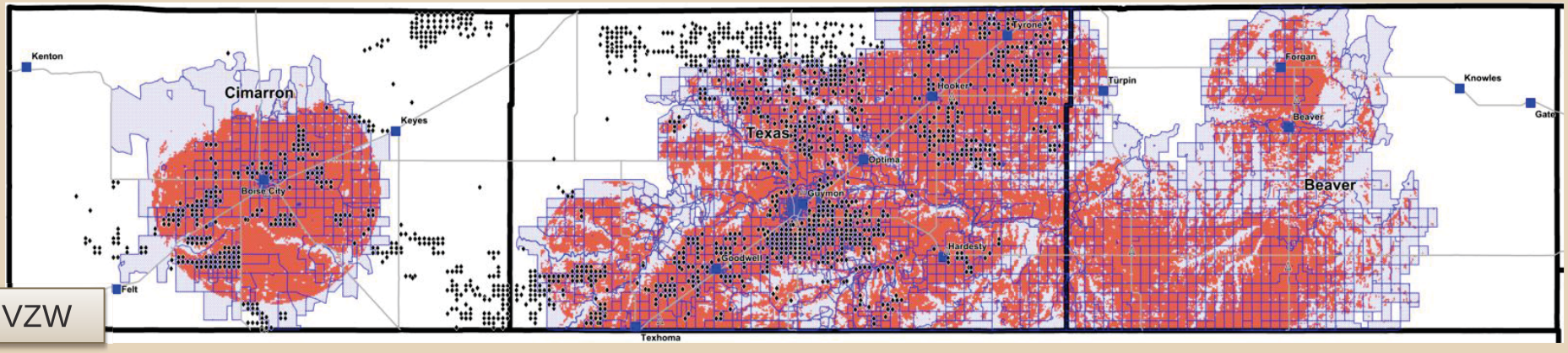
CPI relies on cellular for improved efficiency: track progress, shutdown or start pumps, link with weather, mobile apps to help farmer, send alert messages (stuck, power failure)

Industrial Agriculture employs 2,500 in the Panhandle

Center Pivot Irrigation



PTCI

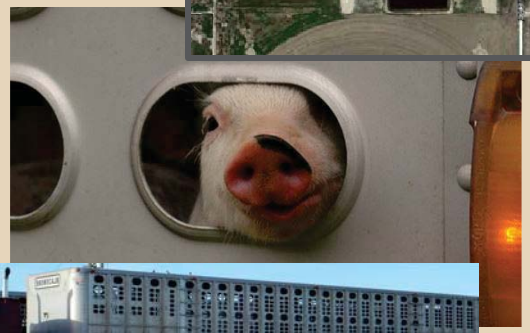


VZW

Hog Farms

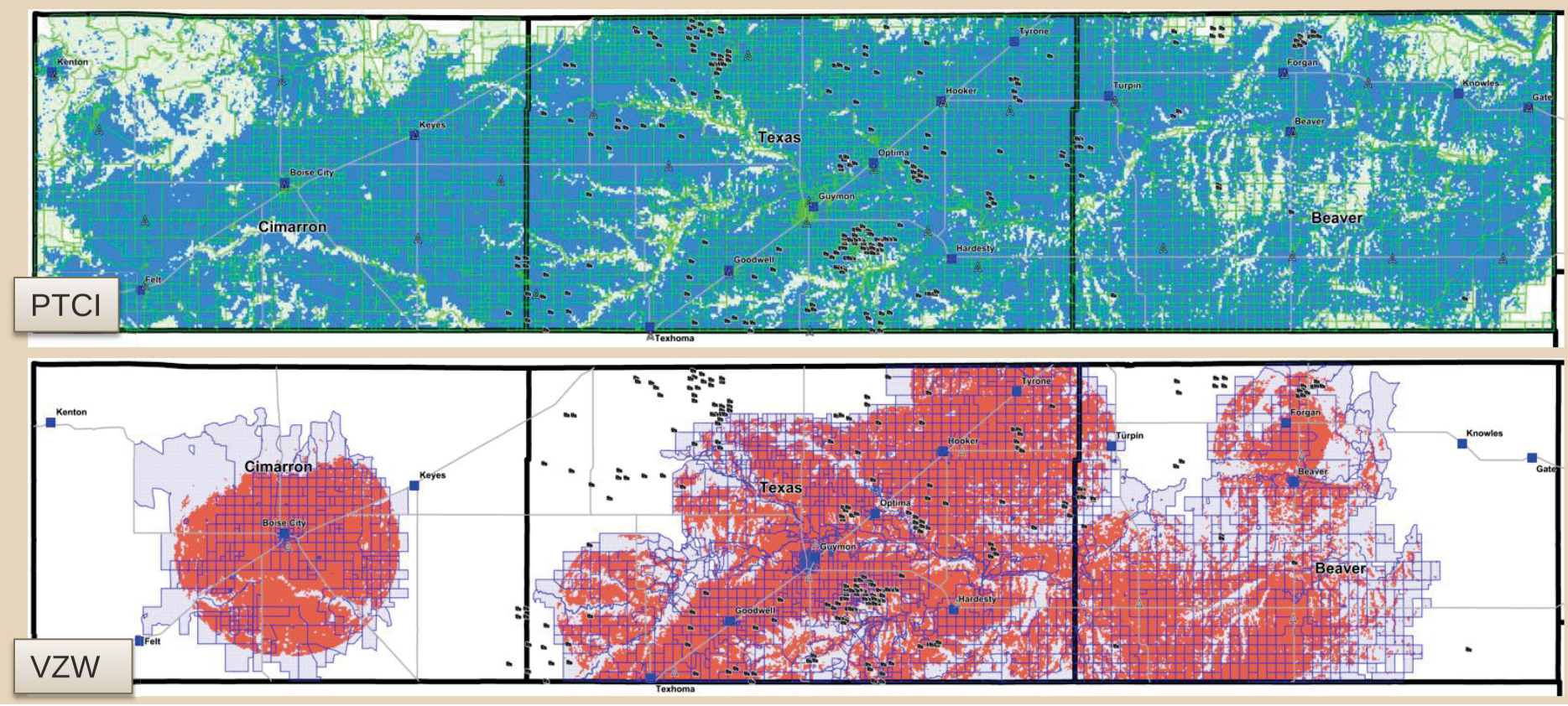
Hog industry relies heavily on transportation industry – feed (raw components to mill & final product to barns), live haul transfers (barn to barn & barn to plant), final product transfer to end users

Wireless is important for worker connectivity (barns, trucks, mill, plant); M2M for remote monitoring of temperature and humidity, water pressure, power, feed/water levels



Local hog industry directly employs over 550 workers with many more employed as contract labor in various capacities

Hog Farms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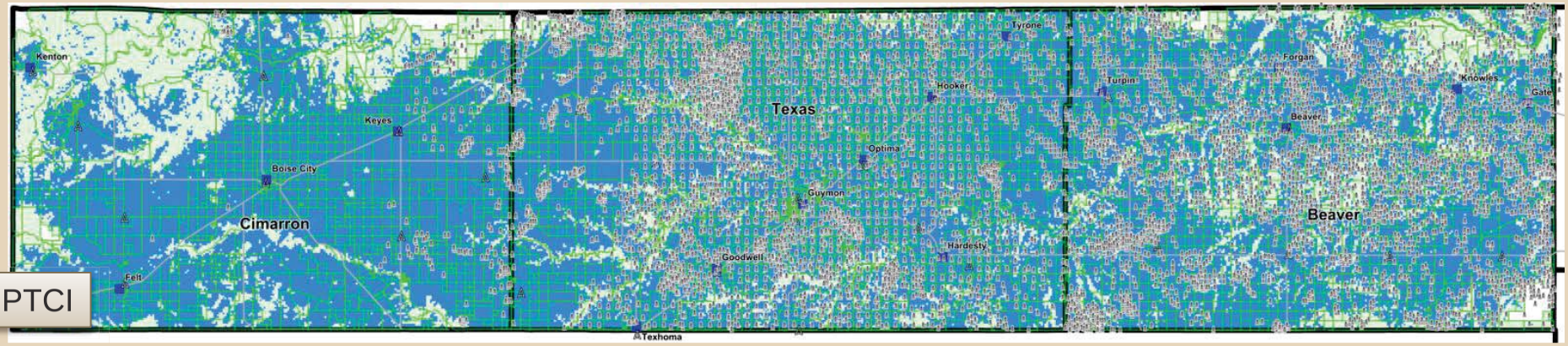
Tyrone
Hooker
Optima
Guymon
Goodwell
Hardesty
Texhoma
Turpin
Forgan
Beaver
Knowles
Gate
VZW

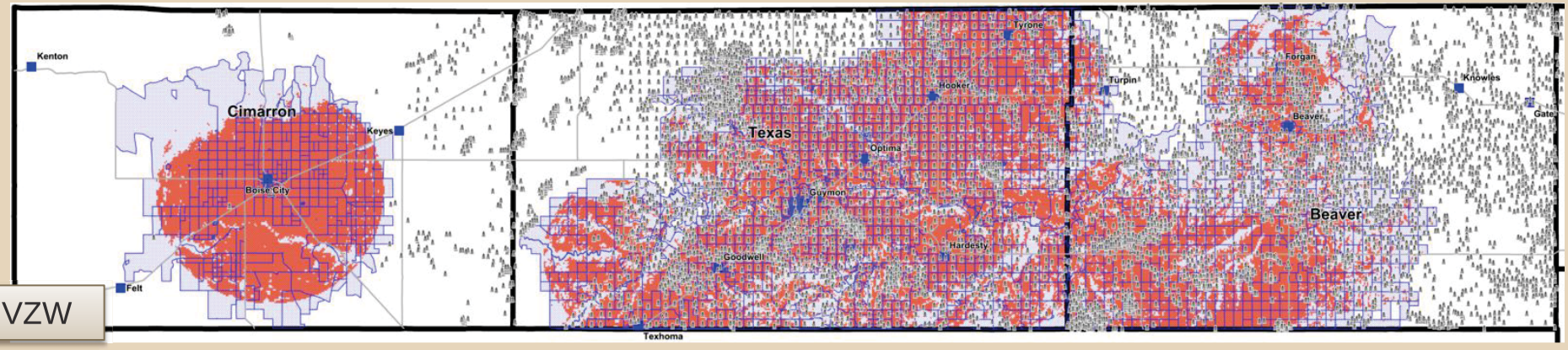
Wells – Oil & Gas Industry

Wireless Technology used for remote monitoring & control (turning pump on/off; tank levels); communications & diagnostics; workforce connectivity (scheduling load transfers); surveillance

Currently 750 oil/gas related employees in the Panhandle

Wells – Oil & Gas Industry





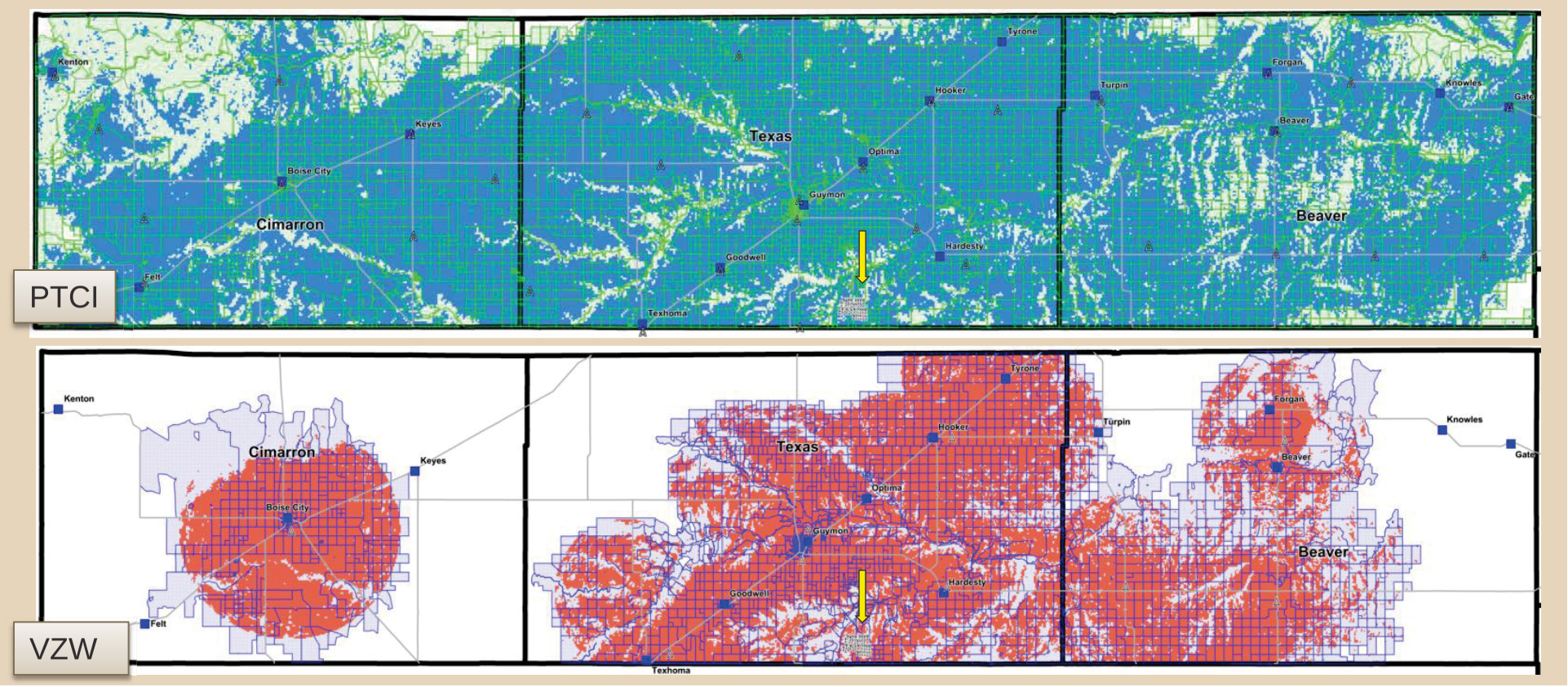
Wind Farms

Growing Industry; at least 2 new transmission lines in Panhandle

Cellular/Wireless Important for workforce connectivity; M2M for remote monitoring; repair/service; redirect to best capture wind energy; emergency shut-down (wind speeds too high)

Currently 150 workers/families brought to the area for wind industry; Future potential for over 3,000 non-resident wind farm construction jobs & 30-50 permanent wind farm technicians

Wind Farms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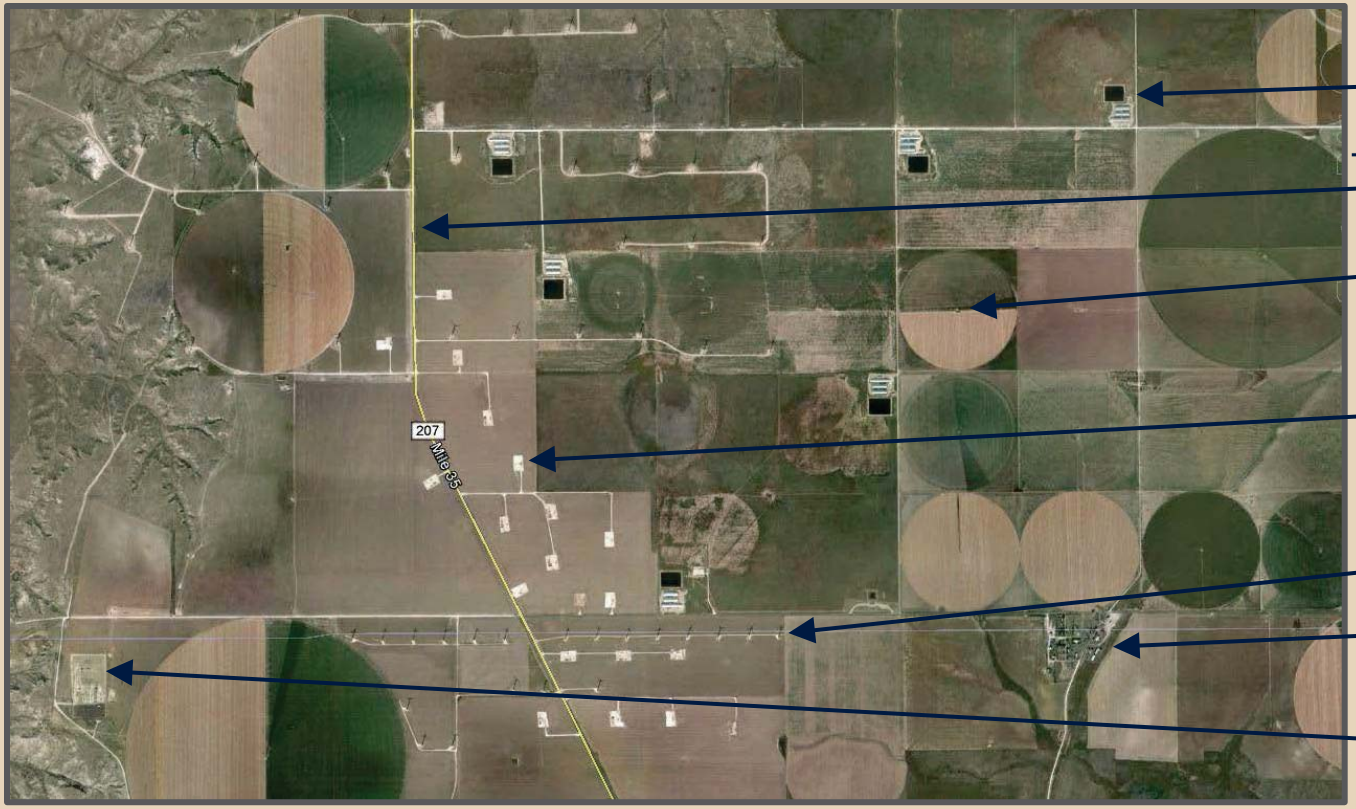
Snap Shot of the Panhandle (approx 18.5 mi²)



Hog Farm

Transportation Corridor

Center Pivot

Oil Well

Wind Farm

Customer Premise

Electric Sub-station

Competitive Landscape in OK RSA #1

- 2G Networks shutting down gradually; ongoing need to serve 2G customers during transition without sudden cutoff of service
- No motivation for major nationwide carriers to launch/expand service into OK RSA #1 due to low population density per square mile and high cost of buildout
- VZW = 9 cell sites – 4G CDMA/LTE
- PTCI = 34 cell sites + COW (cell on wheels) – 4G UMTS/LTE
  - 3G deployment began in 2008 – plan to decommission in 2015
  - Interoperability issues will not immediately disappear after PTCI's planned 3G decommission

Competitive mobile network landscape in OK RSA #1 expected to remain unchanged into 2015 and beyond

4G LTE Compatibility

- 4G LTE networks are being built upon networks that are still subject to GSM & CDMA incompatibilities and 3G fallback requirements to support voice, text and E-911
- 3G networks need time to be phased out *without abandoning customers* after 4G interoperability is achieved
- Until 4G LTE has become truly universal and has shed interoperability issues, *it is not sufficient to sustain universal service*
- *Until VoLTE (Voice over LTE) has become the voice standard, fully interoperable and fully deployed throughout the nation the 2 cellular technologies will remain incompatible*

Technical Comments from the Industry

Gigaom (November 2014):
"A lot of carriers are already offering HD voice, but it's surprisingly difficult to actually make a high-definition call. Not only do both you and the person you're calling need to own HD-capable VoLTE handsets…, you need to be connected to an HD-enabled cell site. And in nearly all cases today, you also have to be on the same carrier.

Verizon, for instance, launched VoLTE in September with a FaceTime-like video chat capability that will work between any of its VoLTE handsets. That's great if everyone you know happens to be a Verizon customer and has a new VoLTE-capable handset, but until we get interoperability those services will be trapped with their carrier's individual networks.

You can think of VoLTE as SMS at the beginning of the millennium. All 2G phones had the ability to send and receive text messages, but because every carrier was using its own proprietary technology, there was no guarantee that any message sent to another carrier's network would ever be received (imagine if Gmail users could only send email to other Gmail users). When the U.S. mobile industry finally got its act together and standardized SMS, we finally saw the explosion in text messaging already witnessed in other parts of the world."
https://gigaom.com/2014/11/03/can-you-hear-me-now-verizon-att-to-make-voice-over-lte-interoperable-in-2015/

Technical Comments from the Industry

CNET (April 2014):
"Figuring out which hardware works on which network is tricky, even for experts such as myself and CNET Reviews Senior Editor Brian Bennett… **The Bottom Line:** Unfortunately, there aren't any devices today that work perfectly on every carrier. But a basic rule of thumb is that unlocked GSM phones, such as the Google Nexus devices, and phones designed for AT&T and T-Mobile will work reasonably well on most GSM networks… And remember that these GSM-based smartphones won't work at all on a CDMA carrier's network. "
http://www.cnet.com/news/will-a-verizon-moto-x-really-work-on-at-t-and-t-mobile/

PC Magazine (December 2013):
"The CDMA vs. GSM gap will close eventually as everyone moves to 4G LTE, but that doesn't mean everyone's phones will be compatible. LTE … is the new globally accepted 4G wireless standard. All of the U.S. carriers are turning it on. The problem is, they're turning it on in different frequency bands, with different 3G backup systems, and even, in the case of the new Sprint Spark network, using an LTE variant (TD-LTE) that doesn't work with any other U.S. carrier's phones. Furthermore, it's not like the 2G and 3G networks are going away any time soon."
http://www.pcmag.com/article2/0,2817,2407897,00.asp

Extreme Tech (April 2012):
"It looks like the CDMA… and the GSM family variants of HD voice are not interoperable for the foreseeable future, so GSM calls to CDMA phones and vice versa will drop down to narrowband codecs that the current interoperability systems support."
http://www.extremetech.com/electronics/125235-what-is-hd-voice

Comments of MFP2 Record

- Any one citizen currently has access to only 50 percent of the total network deployed nationwide (assuming GSM/CDMA are split evenly). So unless a rural consumer can afford to carry two phones, she will drive around rural America with service in some areas, but not others, while urban counterparts will enjoy networks that provide coverage throughout a community and surrounding areas. *Comments of C Spire at 9.*

- If either AT&T (which uses a GSM platform) or Verizon (which uses a CDMA platform), but not both, are present, the consumer will be relegated to inferior coverage because GSM and CDMA technologies are not compatible – that is to say, a customer of one of these "Big 2 carriers" may not be able to roam on the towers of the other. The Commission should ensure that all consumers, regardless of their choice of technologies, have as expansive coverage as possible. *Reply Comments of Copper Valley Wireless, LLC* at 3.

- It is well documented that VoLTE has 'stumbled out of the gate.' Indeed, the two largest carriers in the nation have both had to push back their announced VoLTE target dates. *Comments of the Blooston Rural Carriers* at 3.

PTCI & USF

- PTCI relies on high-cost universal service to support and upgrade its network
  - PTCI's network is 4x the size of VZW in OK RSA #1
  - Costly to support a 4G Network
    - Electricity, Maintenance, Licensing Fees, Work Force, Back Haul, Lighting, Roaming, Tower & Spectrum compliance, etc.
- PTCI reasonably expected MFP2 funding eligibility to provide continued service to all of its customers and to roaming GSM customers
- Without continued universal support it will become increasingly difficult to keep network in high-cost areas

Letters from the Panhandle

Dr. Bryant, President of Oklahoma Panhandle State University (OPSU); Letter dated November 17, 2014:
"PTCI's deployment of the 4G UMTS LTE network in July, 2014 ensured that new and returning students with GSM based devices would have progressive … service on campus and throughout the Oklahoma Panhandle. Reliable cellular service is essential for college students. … OPSU strongly requests that the FCC recognize the importance of support for 4G UMTS LTE cellular service in the Oklahoma Panhandle. Absent PTCI's supported network, students with GSM based carriers and devices would have poor service and/or no service."

Jack L. Perkins, CEO of Tri-County Electric Cooperative, Inc. (TCEC); Letter dated November 20, 2014:
"Our employees routinely rely on PTCI's cellular network when performing maintenance in all remote areas of the Oklahoma Panhandle. At times, PTCI's cellular network has been our sole source of communication with line crews performing dangerous field work due our radio system limitations. The only other cellular network available in our area is provided by Verizon and it does not reach many of the remote areas we work in on a regular basis.

Following a severe storm on June 30, 2014, TCEC had to replace nearly 600 damaged utility poles. Many of these were in remote areas. Utility crews from eight cooperatives located in Oklahoma, Kansas and Texas came to our assistance in the restoration effort as 9,000 electric accounts were initially without service. Crews arriving with AT&T or T-Mobile cellular service had little to no service in the Oklahoma Panhandle because PTCI's UMTS LTE network had not yet been activated and AT&T and T-Mobile do not have cellular networks here and because AT&T/T-Mobile service is not inter-operable with Verizon's CDMA platform."

Contact Information

Shawn Hanson, CEO
shawn.hanson@ptci.net
580-468-2180

Mark Sharkey, Project Engineer
mark.sharkey@ptci.net
580-468-2100

www.ptci.net

PREDCI

November 21, 2014

PTCI
Attn: Shawn Hanson
PO Box 1188
Guymon, OK 73942

Dear Mr. Hanson,

Cellular networks are vital to keeping the Oklahoma panhandle and surrounding regions on a level playing field for economic development.

As the Executive Director of the Panhandle Regional Economic Development Coalition, Inc. I can tell you that having a strong cellular network is without a doubt one of the most critical requirements a site selector or developer is looking for when locating a new project.

Our current economic base is made up primarily of agriculture, gas/oil and recently wind energy. All of these industries require a large portion of their workforce to serve in the very remote, rural areas of the Panhandle at various sites: hog farms, feedlots, feed mills, grain elevators, gas/oil wells, gas plants, substations, wind farms, etc. We currently have an estimated 2,500 Industrial Agriculture employees working in the remote areas of the Panhandle, 750 gas/oil related employees, and 150 wind energy employees. This does not include employees working in cities across the region or the non-resident workforce coming into the region.

The Panhandle region is expected to grow exponentially over the next 10 years with electric transmission construction, wind energy development, value added agriculture, bio energy and gas/oil. Next month APEX Clean Energy will break ground on their 300 MW wind farm in a remote area of Beaver County. They will have approximately 300 non-resident workers constructing the wind farm. Tradewind Energy will break ground on their 250 MW wind farm in a remote area of Texas County and will have approximately 250 non-resident construction workers. These will bring an additional 30-50 permanent technician jobs working out in the remote rural panhandle areas.

Clean Line Energy will be constructing the 3500MW HVDC Plains & Eastern Clean Line transmission line to carry clean energy from the Panhandle region to the east coast grid system. They will break ground in early 2016. It will take two-three years to construct and will have over 1,000 non-resident workers on the project. Another estimated 1,500 non-resident construction workers will erect 3500MW of wind turbines across the region to serve that transmission line.

711 E. Highway 3 • Guymon, Oklahoma 73942
Office: (580) 338-8500 • **e-mail**: executivedirector@predci.com • **web site**: www.predci.com

Access to consistent cellular service provided by PTCI is not only critical to the efficiency of day to day operations, but it is vital for health and safety of a workforce working in such remote rural areas. The majority of the region is extremely rural with no service by the major cellular providers like Verizon, AT&T, T-Mobile or Sprint; these industries rely heavily on PTCI's extensive cellular network.

Prior to July of 2014, it was difficult to market our region to businesses that were AT&T or T-Mobile customers. Non-resident construction crews and workers were complaining that most of the time they had little to no service while in the region...they were concerned about operations in an area where they couldn't compete or communicate effectively.

We commend PTCI's efforts to bring 4G UMTS LTE network to the region, allowing all our non-resident workforce, visitors and business prospects that are AT&T and T-Mobile customers to enjoy excellent services while in the Panhandle.

Please let us know how we can support PTCI's efforts in the FCC Mobility Fund Phase 2 regulation proceeding. FUSF funding is vital for PTCI to provide critical service for workforce and non-resident workforce in our remote rural areas of the Panhandle region.

Sincerely,

Vicki Ayres-Portman

Vicki Ayres-Portman
Executive Director

711 E. Highway 3 • Guymon, Oklahoma 73942
Office: (580) 338-8500 • **e-mail**: executivedirector@predci.com • **web site**: www.predci.com

November 20, 2014

PTCI
Attn: Shawn Hanson
PO Box 1188
Guymon, OK 73942

Dear Mr. Hanson:

I understand that the FCC is considering a revision to current FUSF support regulations in Mobility Fund Phase 2 proceedings that may impact PTCI. PTCI's cellular service is critical to TCEC's operations in the remote areas of our electric service territory.

Headquartered in Hooker, TCEC is a not-for-profit electric distribution cooperative and is the sole electricity provider for the Oklahoma Panhandle. We serve nearly 23,000 consumers and maintain nearly 5,500 miles of transmission and distribution electric lines.

Our employees routinely rely on PTCI's cellular network when performing maintenance in all remote areas of the Oklahoma Panhandle. At times, PTCI's cellular network has been our sole source of communication with line crews performing dangerous field work due our radio system limitations. The only other cellular network available in our area is provided by Verizon and it does not reach many of the remote areas we work in on a regular basis.

Following a severe storm on June 30, 2014, TCEC had to replace nearly 600 damaged utility poles. Many of these were in remote areas. Utility crews from eight cooperatives located in Oklahoma, Kansas and Texas came to our assistance in the restoration effort as 9,000 electric accounts were initially without service. Crews arriving with AT&T or T-Mobile cellular service had little to no service in the Oklahoma Panhandle because PTCI's UMTS LTE network had not yet been activated and AT&T and T-Mobile do not have cellular networks here and because AT&T/T-Mobile service is not inter-operable with Verizon's CDMA platform.

PTCI's UMTS LTE network is now providing an essential telecommunication service that ensures that residents, visitors, and travelers with GSM based devices have progressive voice and data services and access to emergency services throughout the Oklahoma Panhandle.

Sincerely,

Jack L. Perkins
Chief Executive Officer

302 East Glaydas Street | P.O. Box 880 | Hooker, Oklahoma 73945-0880 | P 580.652.2418 | 800.522.3315 | F 580.652.3151 | www.tcec.coop

Established 1909

Office of the President

November 17, 2014

Mr. Shawn Hanson
Chief Executive Officer
Panhandle Telephone Cooperative, Inc.
PO Box 1188
Guymon, OK 73942

Dear Mr. Hanson,

As president of Oklahoma Panhandle State University (OPSU), I want to be on record strongly supporting PTCI's cellular network and service to OPSU and the Oklahoma Panhandle and surrounding communities. I am opposed to any Federal Communications Commission (FCC) revisions to current regulations that would reduce financial support to the PTCI cellular network and service.

The following points summarize OPSU's position in the Oklahoma Panhandle and our relationship to PTCI:

- OPSU is the only university serving the Oklahoma Panhandle. OPSU is a baccalaureate degree granting institution. General governance of the institution is in the hands of the Board of Regents for the Oklahoma Agricultural and Mechanical Colleges. Academic programs and financial support are authorized and coordinated through the Oklahoma State Regents for Higher Education.

- OPSU has a faculty and staff of 198 serving 1300 students from a campus located in Goodwell, Oklahoma.

- OPSU students come from all over the United States, but predominantly from Oklahoma, Texas, New Mexico, Colorado, and Kansas. Fifty percent of OPSU's students come from outside of Oklahoma.

- Prior to PTCI's deployment of a 4G UMTS LTE cellular network, students arriving on campus with GSM based devices from AT&T or T-Mobile would have poor 2G service or no service.

- PTCI's deployment of the 4G UMTS LTE network in July, 2014 ensured that new and returning students with GSM based devices would have progressive mobile voice and data service on campus and throughout the Oklahoma Panhandle. Reliable cellular service is essential for college students.

- OPSU understands that the FCC is working to determine Universal Service Fund (USF) support for rural areas in a Mobility Fund Phase 2 Proceeding. OPSU strongly requests that the FCC recognize the importance of support for 4G UMTS LTE cellular service in

P.O. Box 430 Goodwell, Oklahoma 73939 Telephone 580-349-1302 Fax 580-349-1307

the Oklahoma Panhandle. Absent PTCI's supported network, students with GSM based carriers and devices would have poor service and/or no service.

Please keep me informed of any proposed revisions to current Federal Universal Service Fund support regulations, and let me know how OPSU may continue to support PTCI.

Sincerely,

David A. Bryant
President

Comments on the record have recognized the incompatibility of present-day air interfaces and that the rollout of interoperable VoLTE devices has been slow-going.

The Commission's optimistic assessment of the mobile broadband marketplace also fails to account for the fact that, even when 4G LTE networks are deployed, any individual consumer only has access to a single GSM-based or CDMA-based network. The Mobility Fund will not be successful if the Commission cuts its budget and Phase II support only delivers a patchwork of incompatible technologies throughout rural America.[1]

* * *

Even in a 4G LTE world, any single consumer only has access to a GSM- or CDMA-based network because the consumer's handset is not capable of accessing service provided on an incompatible network platform. Beyond making a 911 call, consumers are locked out of any area with incompatible network coverage.[2]

* * *

[A]reas that have some coverage should not be eliminated from receiving investment support, because, as stated above, without further investment citizens in these areas will be relegated to an inferior experience due to the fact that devices work on a CDMA- or GSM-based network, but not both.[3]

* * *

Availability of LTE is critical in the transition to a single supported mobile broadband network: where the market will not support LTE absent high cost funds, loss of support for a CDMA/EVDO or GSM/UMTS provider could actually lead to shutting down one of the two families of air interfaces, reducing coverage for at least one set of wireless consumers.[4]

* * *

Any one citizen currently has access to only 50 percent of the total network deployed nationwide (assuming GSM/CDMA are split evenly). So unless a rural consumer can afford to carry two phones, she will drive around rural America with service in some areas, but not others, while urban counterparts will enjoy networks that provide coverage throughout a community and surrounding areas.[5]

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[1] *Comments of the Rural Wireless Carriers* at v.
[2] *Id.* at 17.
[3] *Id.* at 37.
[4] *Comments of General Communication, Inc.* at 8.
[5] *Comments of Cellular South Licenses, LLC d/b/a C Spire* at 9.

If either AT&T (which uses a GSM platform) or Verizon (which uses a CDMA platform), but not both, are present, the consumer will be relegated to inferior coverage because GSM and CDMA technologies are not compatible – that is to say, a customer of one of these "Big 2 carriers" may not be able to roam on the towers of the other. The Commission should ensure that all consumers, regardless of their choice of technologies, have as expansive coverage as possible.[6]

* * *

In mandating that Phase II winners deploy 4G LTE, and provide voice as well as data service (by virtue of the requirement that Phase II recipients obtain ETC status), the Commission should build in protections to make sure that smaller carriers are not harmed by the somewhat uncertain status of Voice over LTE (VoLTE) technology. It is well documented that VoLTE has 'stumbled out of the gate.' Indeed, the two largest carriers in the nation have both had to push back their announced VoLTE target dates. Therefore, small and rural carriers should be given a flexible schedule to comply with the Mobility Fund Phase II voice service obligations, until a reasonable amount of time after VoLTE-enabled handsets and network capability are readily available from multiple vendors at reasonable cost.[7]

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[6] *Reply Comments of Copper Valley Wireless, LLC* at 3.
[7] *Comments of the Blooston Rural Carriers* at 3.

Carriers have different ways to spell 'LTE'

Rob Pegoraro, Special for USA TODAY 8 a.m. EDT July 7, 2013

Question: Can I use a Sprint LTE phone on Verizon's network or any other carriers?

Answer. No, but Sprint is hardly alone in its exclusivity. And the Sprint rep who told this reader otherwise in a tech-support chat isn't alone in his confusion.

First, LTE — short for "Long Term Evolution" — isn't a single standard. It's a sort of language that phones and networks can speak on many different sets of frequencies, just like such earlier, slower standards as GSM ("Global System for Mobile communications," used by AT&T and T-Mobile) and CDMA ("Code Division Multiple Access" operated by Sprint and Verizon Wireless).

To compound the confusion, manufacturers and carriers can describe these spectrum slots in different ways, when they document them at all: by frequency ("1900 MHz"), by technical jargon ("PCS") or numerically ("band 2").

The last is clearest, since many LTE bands overlap each other's frequencies. So here goes: In the United States, AT&T uses bands 4 and 17, Sprint employs band 25, T-Mobile runs on band 4, and Verizon is on band 13.

That doesn't make LTE roaming impossible across the board, since many phones support multiple LTE bands. Samsung has a six-band version of its Galaxy S 4 that is, alas, not available in the U.S., while an unlocked GSM iPhone 5 supports four bands and the CDMA version has the hardware for five.

But carriers also have to find it worth their while to sign roaming agreements first, and that's a steeper barrier. AT&T and T-Mobile may have an LTE band in common, but they don't share each other's frequencies. Verizon's only roaming deals are with small carriers in 14 states that allow it to fill in rural coverage. And Sprint doesn't roam on anybody else's LTE.

For now, the practical effects of each carrier's LTE service remaining an island unto itself are pretty limited. Voice calls continue to be confined to 2G service (the regional carrier MetroPCS, recently acquired by T-Mobile, is a rare exception in offering voice over LTE on some phones, albeit at a cost in battery life) unless you use a separate Internet-calling app. It's more important that 2G and 3G roaming deals exist between compatible carriers — AT&T and T-Mobile, Verizon and Sprint — to provide minimum service to your phone.

And even if all the carriers in the U.S. supported the same LTE bands, you still couldn't take a phone sold by one carrier and use it on another as long as that first company locked the phone or the second carrier refused to accept phones it didn't sell itself. Sadly, both conditions persist, notwithstanding promising legislation that would legalize phone unlocking.

Finally, potential LTE roaming also doesn't affect international use nearly as much as the basic split between GSM and CDMA. The former works around the world--Verizon and Sprint iPhones allow global use only because they include GSM circuitry — while the latter is confined to a far smaller set of countries.

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Can I use my Verizon/Sprint phone on another network?

Summary: *You've bought your phone and you probably think that entitles you to do whatever you like with it. Well, if you bought it through Verizon or Sprint that isn't exactly the case.*

By Joseph Hanlon | 27 August 2014 (Original 25 June 2014)

Follow @whistleout

After decades of the big 4 networks dominating our choice for wireless services, we are now seeing the beginnings of a mini-revolution. Though exact figures are difficult to find, it's believed that 10-percent of the wireless subscribers in the US are using an MVNO.

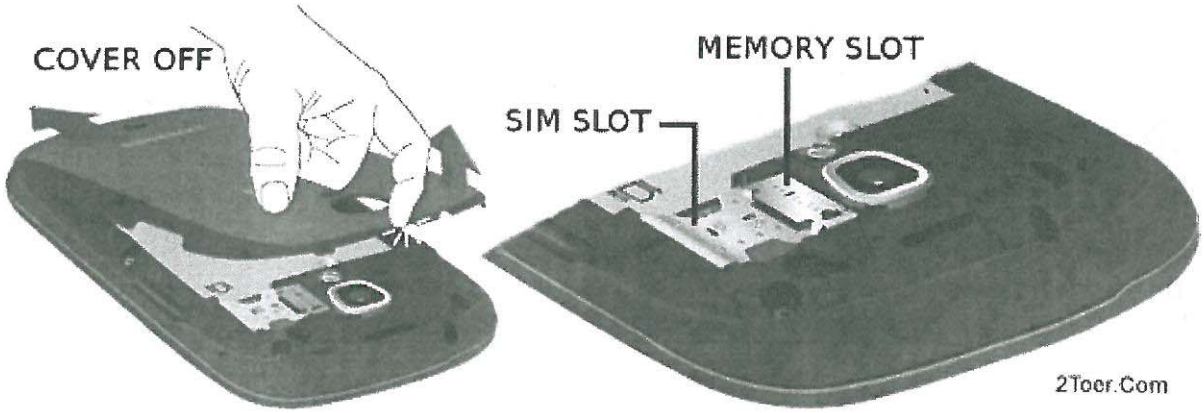
As more and more people choose a cheaper MVNO option, one question will be asked time and again: will my X phone work on Y network?

In this article we'll try to offer some answers for people who have bought their phone through Verizon or Sprint.

A SIM or no SIM?

Wondering about whether you can take your phone to another network is almost a uniquely North American experience. In most other parts of the world, phones work on common radio frequencies and are easily ported from one network to another.

In the US, there are two legacy wireless technologies — CDMA and GSM — and they are completely incompatible with the other. The majority of the Verizon and Sprint networks use CDMA technology, while AT&T and T-Mobile use GSM.



Apart from a wide range of technical differences, there is one key difference in the phones you buy for these different networks. GSM phones use a removable SIM card to identify the handset on the network, while CDMA phones have this information embedded in the phone.

In short, if you have a Verizon or Sprint phone that does not have a SIM-card slot, then you can't take it to AT&T or T-Mobile (or any of the dozens of MVNOs that resell GSM services exclusively). You'll need to buy a new phone.

And because the handset's identification code is built-into the phone, taking it Verizon or Sprint to the other is not an option either — despite both companies using similar CDMA technology. You would need the destination carrier to install software on the phone and to be provisioned with a new customer identification number (or ESNS) and the telcos are not in the habit of handing those out — not when they can sell you a new phone instead.

But wait, I have a SIM card slot!

This is where things get interesting. If you have a new LTE-capable phone (Verizon calls these Global Ready phones), then you have a SIM-card slot. All LTE networks in the US use GSM

technology, so newer Sprint/Verizon phones need to support both CDMA and GSM.

This said, your phone still may not work on any or every GSM network around town. It still needs to be compatible with the specific radio frequencies that your new network uses.

Verizon's own 'Device Unlocking Policy' states that it doesn't lock any of its newer phones, but if you require an unlock code it should be either '000000' or '123456'.

Sprint's unlock policy is far less friendly. You need to meet a number of requirements, including having paid off your contract, and then you need to contact Sprint for a special code.

The catch is (and you knew there would be one) that if you do put in another GSM SIM card you may be restricted to 2G and 3G services only — 4G LTE is still locked down on many devices.

Newer Verizon devices should technically be compatible with AT&T and T-Mobile's LTE services, but it depends on the phone and whether it has built-in support for the bands of LTE that GSM carriers use. The same goes for some Sprint devices (although AT&T is still maintaining that no Sprint phones are compatible with its network).

To sum it up, while you may be able to take your old Sprint or Verizon phone to a different network, it's not guaranteed that the device will be able to access all of that network's features. It really depends on the phone model and which carriers you're taking it from and to - so you may need to check with your intended provider before making a move.