



BROADBANDUSA

Next Generation Technology Deployment

BroadbandUSA Practical Broadband Conversations

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Conference Line: 800-593-7190 Passcode: 984-4951#

May 17, 2017

Today's Presenters

Moderator

- Laura Spining, Director of Products, BroadbandUSA, NTIA, US Department of Commerce, Lspining@ntia.doc.gov

Presenters

- Vernon Brown, Vice President, Marketing & Community Relations, SDN Communications, Vernon.Brown@sdncommunications.com
- Jackie McCarthy, Assistant Vice President-Regulatory Affairs, CTIA, JMcCarthy@ctia.org
- David Young, Fiber Infrastructure and Right of Way Manager, City of Lincoln, NE, DYoung@lincoln.ne.gov

The National Telecommunications and Information Administration (NTIA) advises on telecom policy issues

- NTIA is the Executive Branch agency in the U.S. Department of Commerce that is responsible for advising the President on domestic telecommunications and information policy issues.
- NTIA's programs and policies focus largely on:
 - expanding broadband access and adoption;
 - expanding the use of spectrum by all users, and
 - ensuring that the Internet remains an engine for continued innovation and economic growth.



NTIA's BroadbandUSA program educates communities, facilitates relationships and provides helpful resources

- **Arm stakeholders & community leaders with information** to make the right decisions
- **Convene & facilitate the right conversations** with the right people to increase project success
- **Develop guidance for communities** as they pursue solutions to broadband challenges





Enjoy the UPTIME. | sdncommunications.com

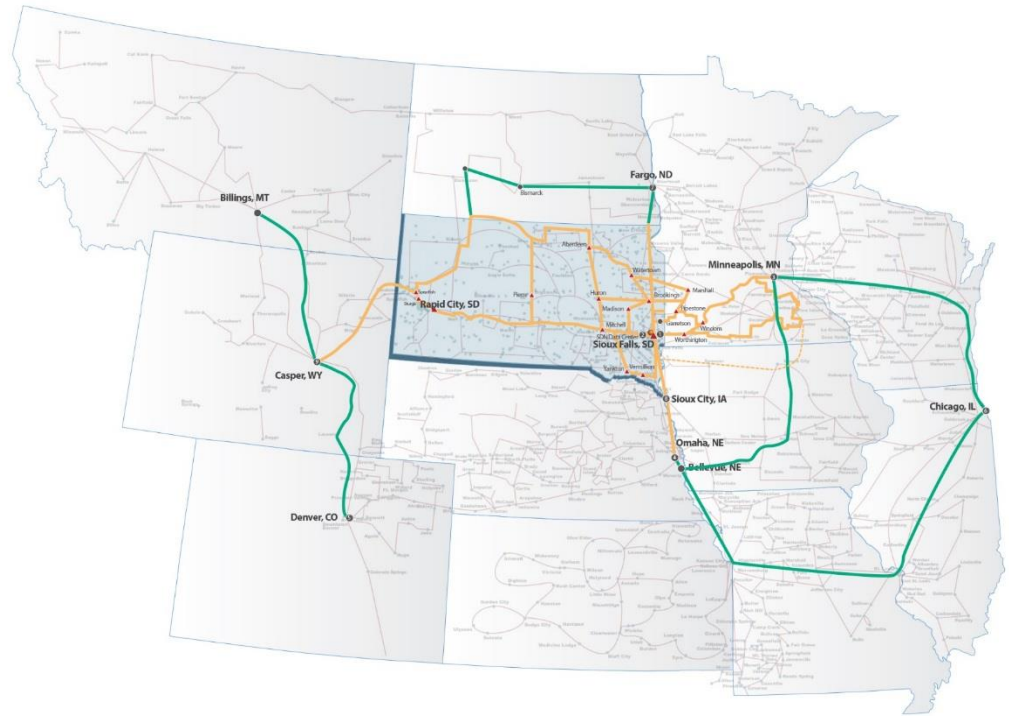
**SDN offers Internet, connectivity and managed services over its 30,000 miles of fiber optics.
The network touches 300+ South Dakota communities, plus connects to other regional and national networks.**

SDN Communications

- 160 employees
- Established in 1989
- Based in Sioux Falls, SD
- Over 30,000 miles of fiber

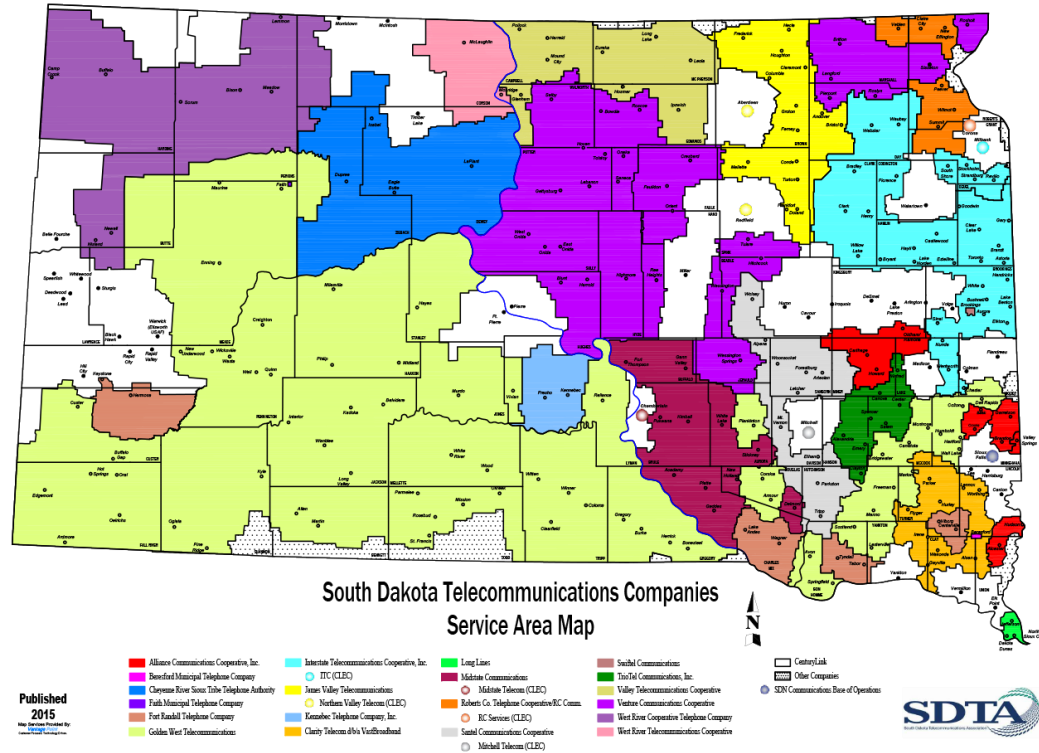
What we do

- Connect businesses
- Haul information
- Managed cybersecurity
- Help SD Telecom companies



SDN Communications

- 17 member companies
- Covering 80% of South Dakota



Published
2015



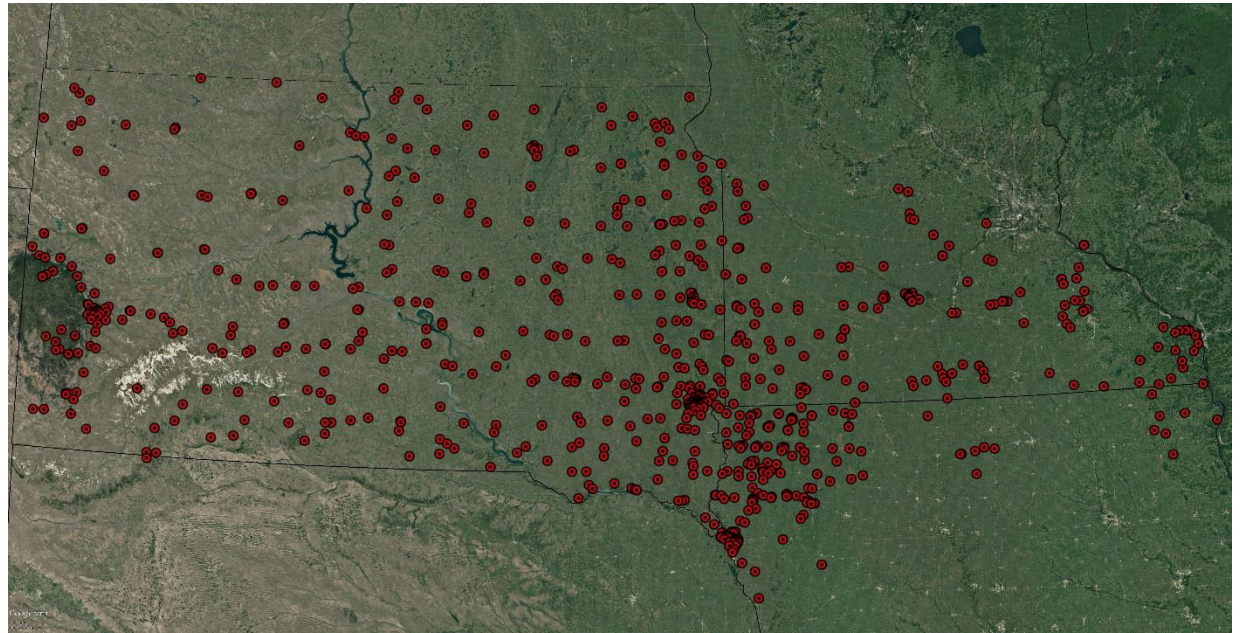
Who we serve



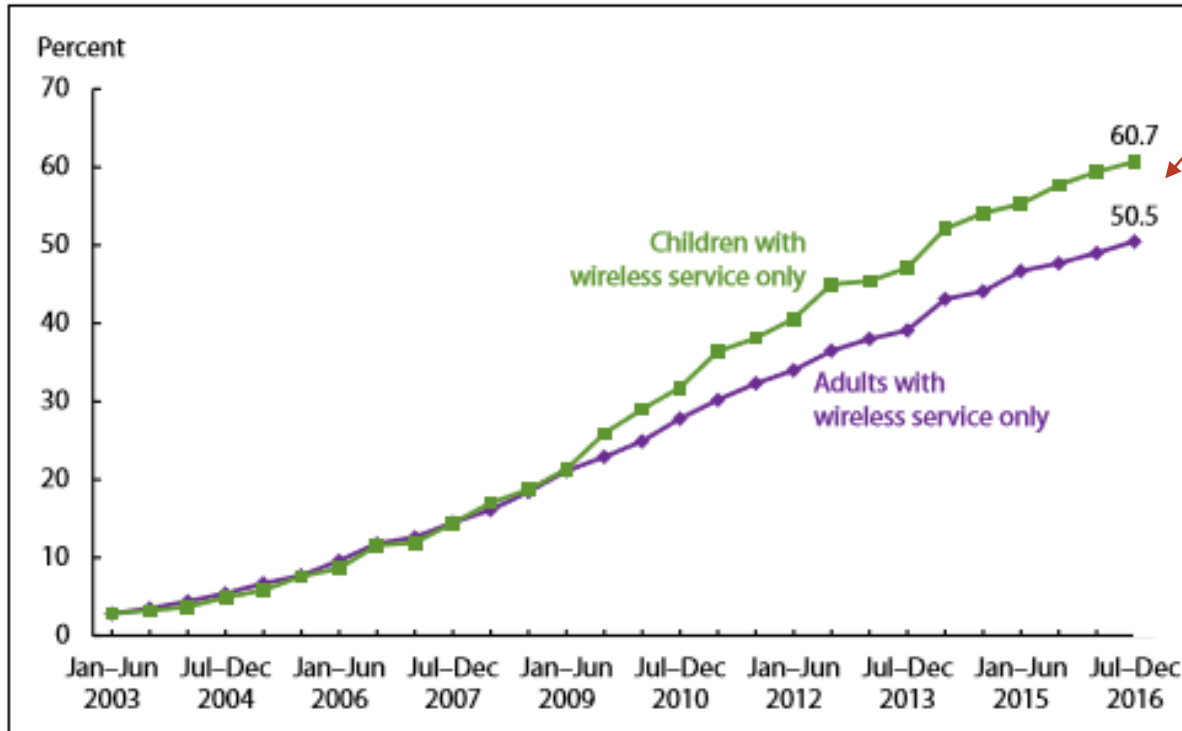
Towers Served by SDN Fiber

566 tower sites

- South Dakota
- Minnesota
- Iowa
- Nebraska



Cord cutting



More than half of U.S. homes don't have a landline and rely on cellphones.

NOTE: Adults are aged 18 and over; children are under age 18.
DATA SOURCE: NCHS, National Health Interview Survey.

THE BIG PIPE

FOR S.D. BUSINESSES, 5G MEANS PROMISE, PREPARATION PAGE 6

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Outsourcing HR can help small businesses focus on main mission.



9 BREAD & CIRCUS
High school friends return to Sioux Falls to open sandwich shop.



14 INVESTING
Active vs. passive: What's the best method of investing?

ONLINE
Find the late news, trends all day at SiouxFallsJournal.com following @

<http://www.argusleader.com/story/news/business-journal/2017/05/09/sd-businesses-5g-means-promise-preparation/100615630/>

PAGE 6: COVER STORY

For S.D. businesses, 5G means promise, preparation

JEREMY J FUGLEBERG
jfugleber@argusleader.com

When Scott Sandal is talking to potential clients, he seems to always get the same question about the speed and bandwidth of the internet he relies upon for his business.

"They're like, 'In South Dakota?'" he said.

Sandal is Sunbird Software's director of service and support. From Sioux Falls, Sandal runs a team monitoring the power needs of data centers all over the globe.

It's a job that requires a lot of bandwidth. But in Sioux Falls, Sandal's got it. Same in Lennox, where he lives, connected online via a fiber optic line.

The quality internet connection helps Sandal recruit South Dakotans who might otherwise look for information technology jobs elsewhere but are surprised to find good, heavy bandwidth jobs here.

"Just the idea of being able to work from home to support this global customer base," Sandal said.

The future of broadband in South Dakota is increasingly the future of business here, and the challenges are many, especially in a largely rural state.

While South Dakota is relatively well-equipped with broadband internet access and fiber optic line, the next step is close on the horizon.

Wireless providers are working now to build out dense-network, small-footprint cell technology that will prove crucial for what's next: fifth-generation mobile data, or 5G. South Dakota's senior U.S. senator, John Thune, is spearheading federal legislation to speed up 5G deployment before 2020.

Business' hunger for bandwidth is growing. Remote IT assistance, data backup and cloud storage are no longer new, and their growing importance for firms large and small has expanded business demand for bandwidth.

High-speed mobile data is the future for many business sectors, including agriculture, telemedicine, virtual reality, internet-connected appliances and driver-free vehicles.

Mobile data is increasingly how we live. Increasingly, it's how business gets done.



Jeff Jones, with ECL, a contractor for Midco, blows in fiber optic lines April 20 at the corner of 57th Street and Sycamore Avenue in Sioux Falls.

"The devices have changed, the bandwidth has changed, and how we use it in our lives have changed," said Mark Shlanta, CEO of Sioux Falls-based SDN Communications.

S.D.'s surprising fiber network
South Dakota isn't entirely connected by fiber optic cable that allows for speedier broadband, but it is surprisingly good at a problem in many parts of the United States: the rural-urban digital divide.

This could prove a crucial key to unlocking the future of 5G wireless data access.

Cities, with their concentration of customers, are natural targets for communications companies in terms of the biggest and best broadband access, and any maps of broadband access will show South Dakota's cities are well served by one or more broadband providers with strong

speeds.
"So how about the rural areas? Broadband is, for the most part, carried by wires. And just as with electrification and paved roads, rural, less-populated parts of the country are sometimes last in line to connect to the rest of the world.
But not in South Dakota. There might even be room to brag a little bit.

"In other states, and you might hear a little bit of that in the national discourse, there's a 'rural digital divide,'" said Shlanta, whose SDN Communications was founded by independent telephone companies in the state that interconnected their networks in 1989. "I would argue (in South Dakota) it might be the inverse. That parts of our more urban communities may be lagging than some of the rural deployments."

About 80 percent of South Dakota's ge-

ography is served by independent telecommunications providers, many of whom have strong fiber networks in place even in rural areas and smaller cities. In a quick survey, SDN's Yerson Boyen heard from 10 member companies. Six are 100 percent fiber networks, and another four were at 50 percent or better.

The advantages for business in the state are clear. Like Sandal in Lennox, being able to do business from outside the state's largest cities pays dividends.

"It's advantageous for business to establish businesses anywhere in the state," said Denny Law, CEO and general manager of Golden West Telecommunications in Wall, which serves customers across western South Dakota and parts of the eastern side of the state. "Certainly

See 5G, Page 7

5G

Continued from Page 6

the populated areas are good," he said. "But the possibility of a four- to six-person shop in Phillip or Springfield or Dell Rapids is a potential game changer for them, I think."

If South Dakota is to fully harness the future roll-out of 5G wireless data, with its dense network and blazing speed, it will require a strong backbone in both urban and rural areas.

"For 5G to be successful, it will require a pretty phenomenal network to transport all of that data," Law said. "And I think that's the role a company like Golden West plays in that, to help facilitate 5G."

And, a little legislative help.

The 5G future requires work

John Thune took his 5G sales pitch to Dakota State University last month, and he didn't pull any punches.

"We're very interested in getting to 5G first," he said. "We're competing with the Europeans, with the Asians, everybody wants to get to fifth-generation technology when it comes to mobile first, and we have to win that race."

South Dakota's senior U.S. senator is the chair of the powerful Commerce, Science and Transportation Committee, with oversight of the national telecommunications laws and regulations. In March, Thune introduced the MOBILE NOW Act, a bill to open up spectrum to telecommunications companies and smooth the path for 5G technology, and moved it through his committee to the Senate floor. The generally accepted target date for 5G is 2020. Thune wants to beat it.

In an April 24 interview, Thune said he had talked to the Trump administration only informally about his bill. But he said the bill should get bipartisan support and gain Trump's support as legislation that could add jobs and boost economy productivity.

"If they're looking for victories, legislative accomplishments they can point to that are transformative for our economy and have bipartisan support, this is something that can accomplish that," he said.

While the legislation awaits congressional approval and a Trump signature, others are fighting smaller, more local battles.

"I use the word 'densification,'" said SDN's Shlanta. "Wireless carriers, 20-25 years ago, were trying to establish coverage so people could complete phone calls."

Today their bigger needs aren't coverage, they're capacity, and the way to ac-



SDN COMMUNICATIONS/SUBMITTED
A "small cell" cell tower atop a light pole stands as an example of technology being rolled out by Verizon Wireless and others, seeking to add capacity to the mobile data network and prepare for the next generation of high-speed mobile broadband.

complish that is greater densification of the networks.

Verizon Wireless is working to build out what are known as small cells, mounting essentially mini cell units atop kiosks and light and power poles. The denser network adds capacity to Verizon's 4G LTE service and is a key stepping stone for 5G, which will require a fiber-connected, small-cell backbone.

Thune's legislation, in part, is meant to address permitting concerns for small cells, that often face the same permitting hurdles as their much, much larger cell tower predecessors.

"Every South Dakota city is different, and many local codes treat small cells the same as a larger traditional cell site," said Meagan Dorsch, a Verizon spokeswoman. "This result can be lengthy and costly permitting that discourages new investment."

"Providing a streamlined process that treats small cells as a permitted use and allowing the attachment of small cells to existing structures in the public right of way will allow companies to build the next generation of 4G LTE for its customers."

While 5G may be the future, and South Dakota's networks are better positioned than some states to handle it, Law at Golden West struck a cautionary note. Look for the roll-out to follow the more traditional path from urban to rural, he said.

"It's going to be an interesting urban application, but it's going to take awhile before neighborhoods have it, and before small communities have it and certainly before rural areas have it," he said. "But I also think it will be cool when it gets here."

In terms of 5G and South Dakota business, "cool" means game-changing.

Time Spent on Smartphones

How we use our smartphones

ACTIVITY BY AVERAGE TIME PER DAY

45 million Americans use mobile phones as their primary Internet access device.

Smartphone penetration is 79%, but exceeds 90% for Americans ages 18 to 34.

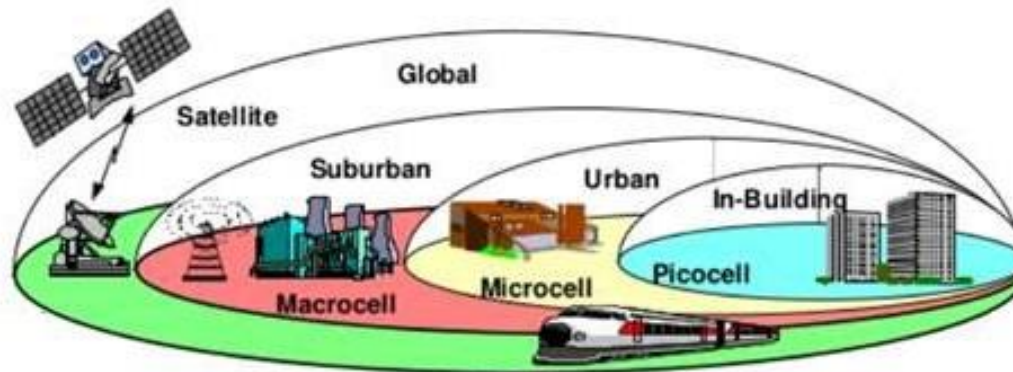


Small Cell Technology

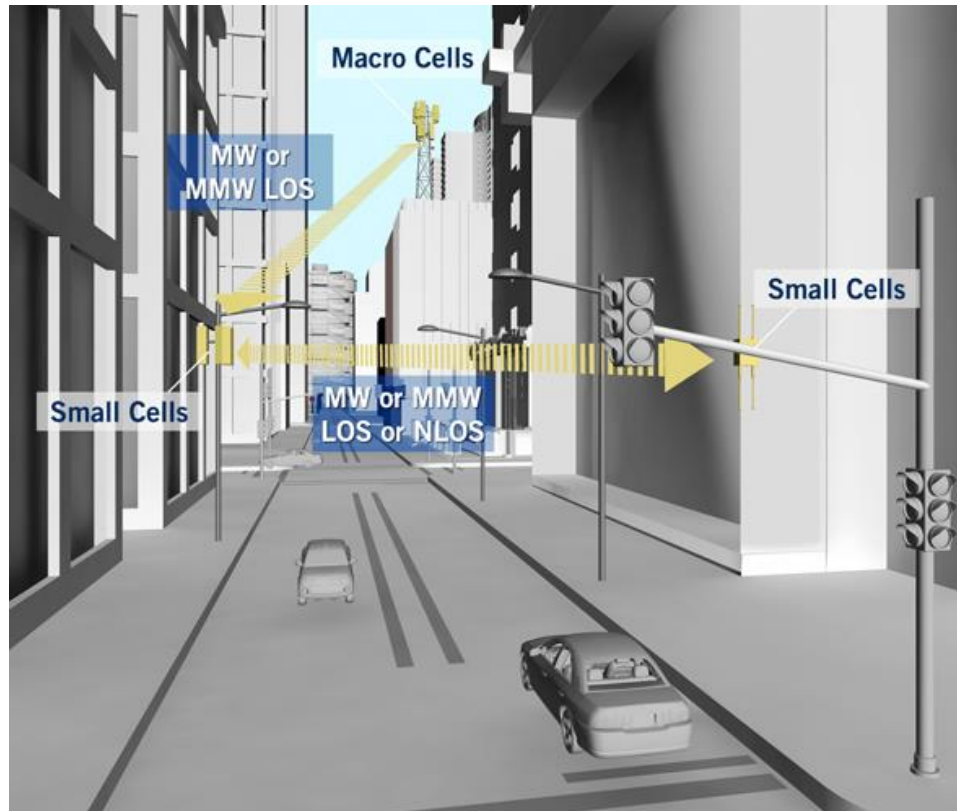
Citizen Benefits

1. Improved public safety
 - Text notifications to 911 – photos/video
 - Extend coverage to hard-to-reach areas
 - Internet of Things – medical device example
2. Fulfilling consumer demand & expectations
 - Consumers value their wireless devices
 - They take their devices wherever they go
3. Improved speed, reliability, and coverage

Layers of Cell Technology



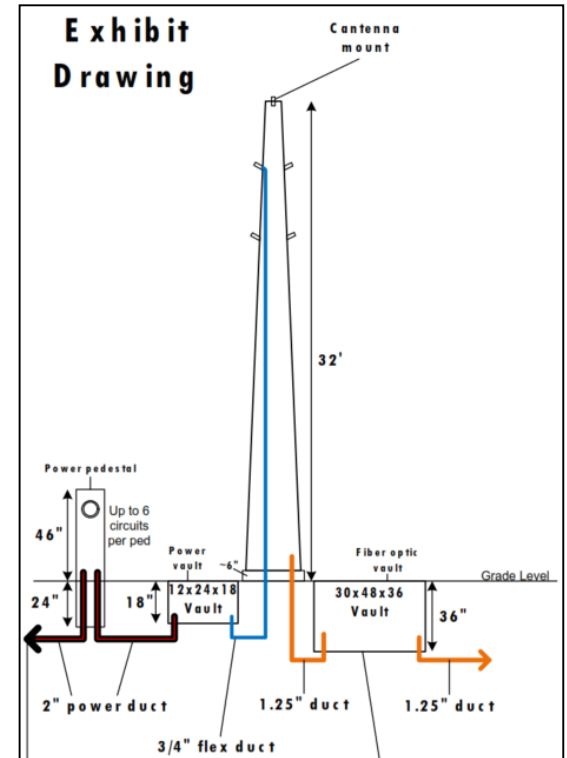
Short Range Mobile Cell Sites



Small Cell Concept

SDN's proposed poles

- Mono pole, metal construction
- 32 feet tall



Small Cell Concept



Small Cell Concept



SDN's proposed poles

- Support two providers

Small Cells Deployed

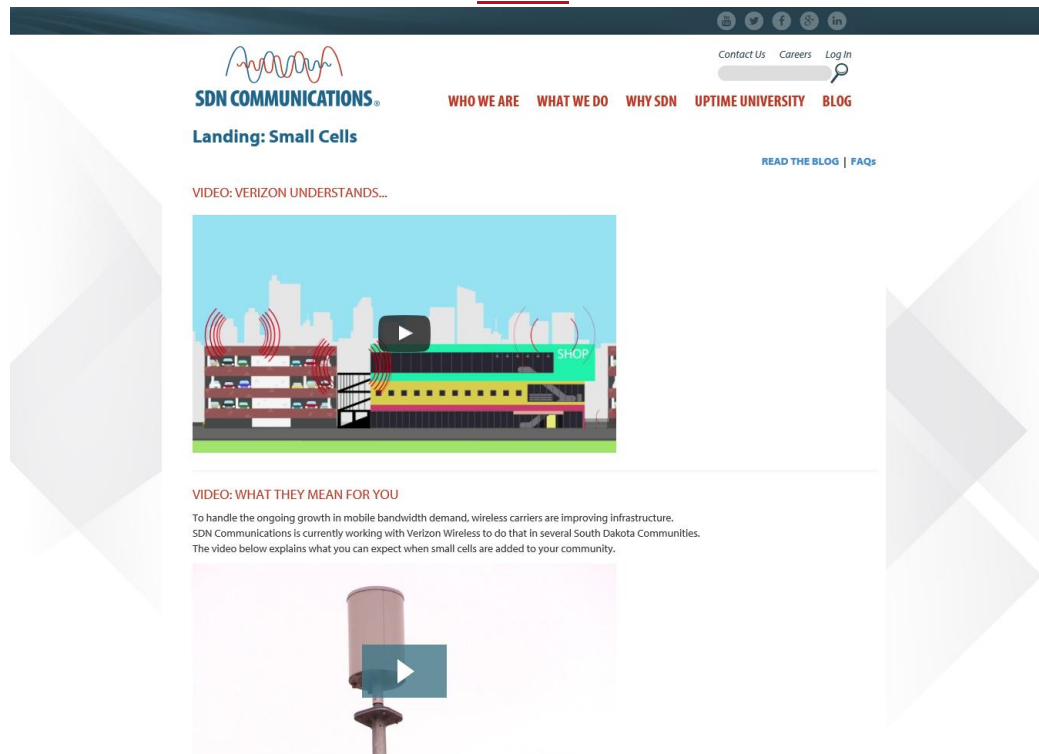


Small Cells Deployed



Outreach: Landing Page

<https://sdncommunications.com/landing/small-cells/>





Enjoy the UPTIME. | sdncommunications.com

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The network touches 300+ South Dakota communities, plus connects to other regional and national networks.**

Wireless Infrastructure & the Internet of Things

NTIA Broadband USA
May 17, 2017

ctia Everything™
Wireless



CTIA Represents the U.S. Wireless Industry

Our Members Include:

- Wireless carriers
- Device manufacturers
- Suppliers
- App companies



Wireless is Everywhere

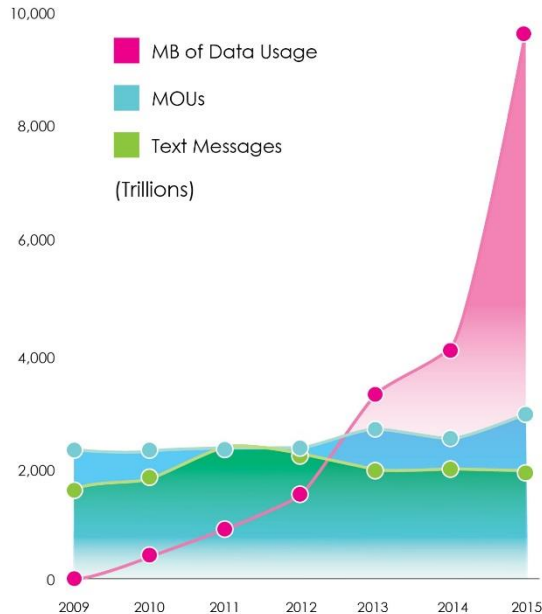
TODAY, NEARLY EVERY AMERICAN HAS HIGH-SPEED MOBILE BROADBAND



- There are **396 million** wireless connections in the U.S. — more than our population
- **99.7%** of Americans have access to 4G LTE networks

Americans Love Wireless

MORE EVERY YEAR



3 out of 4

Americans believe mobile is more important to their lives than it was 5 years ago.



Americans used

35x MORE

mobile data in 2015 than they did in 2010.

5G is the Answer to Our Growing Data Needs

4G MADE OUR NETWORKS FASTER AND OUR LIVES EASIER;
5G WILL BE A MASSIVE LEAP IN SPEED AND CAPACITY.



5G Benefits

SMART COMMUNITIES

Communities will use wireless technology and the Internet of Things to create impactful solutions for their citizens.



INFRASTRUCTURE. Remote monitoring of roads, bridges, buildings, parks and venues to reduce waste and address problems/outages.



PUBLIC TRANSPORTATION. Monitoring and management across public transport modes reduces delays.



CITIZEN CONVENIENCE. Real-time traffic information with data from traffic lights and parking facilities.



HEALTH/SAFETY. 5G can save lives. A 60 second improvement in first responder response time translates to an 8% reduction in mortality.

5G Benefits

CONNECTED CARS

Automobiles will use sensors and collision avoidance capabilities to alert the drivers to stay in lanes and to contact emergency services in the event of an accident.



VEHICLE-TO-VEHICLE (V2V). These safety applications have the potential to prevent or reduce the severity of up to 80% of non-alcohol related crashes.



CONNECTED TRANSPORTATION INFRASTRUCTURE. Will alleviate congestion and reduce travel times. (Examples: traffic signals and interchanges)



Ride-sharing and automation will recover 100 billion hours of productive work that is otherwise used for commuting or driving.



Deloitte

JANUARY 2017

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Wireless

Key Steps for Policymakers

Meet consumer demand, maintain investment, create jobs, and seize 5G leadership by:

- Modernize **infrastructure** siting processes.
- Make licensed **spectrum** available for 5G deployment.
- Adopt **regulatory policies** that promote growth.



Small Cells

WHAT'S NEXT

- ● **NEW OPPORTUNITIES.** Network can now be extended on common structures like street lights and utility poles.

- ● ● **~300K.** Number of pizza-box sized small cells needed in next 3-4 years that can be placed on existing structures like streetlights and utility poles.



Small Cells

THE CHALLENGES

- **ACCESS.** Utility Accommodation Plans do not contemplate wireless antenna on non-towers.
- **DELAY.** 2+ year process to site a single small cell.
- **COST.** Fees that do not correspond to small cell footprint.

TwinCities.com
PIONEER PRESS

**Supply and demand: City asks
T-Mobile for \$7,500 after Verizon paid \$600**

by Frederick Melo
February 2017

“T-Mobile is looking to install 40 pole-top antennas in St. Paul, but the city’s consultants are quoting prices that are more than 10 times higher than what Verizon agreed to three years ago.”

ctia Everything™
Wireless

New Networks, New Rules

Cities, States, FCC, and Congress Play a Key Role

- **GREATER ACCESS.** Improved access to municipal facilities and rights of way
- **REDUCED COSTS.** Reasonable and non-discriminatory fees for new 5G deployments
- **MODERNIZED PROCEDURES.** Improved timelines and more guidance from FCC, FHWA, and state DOTs

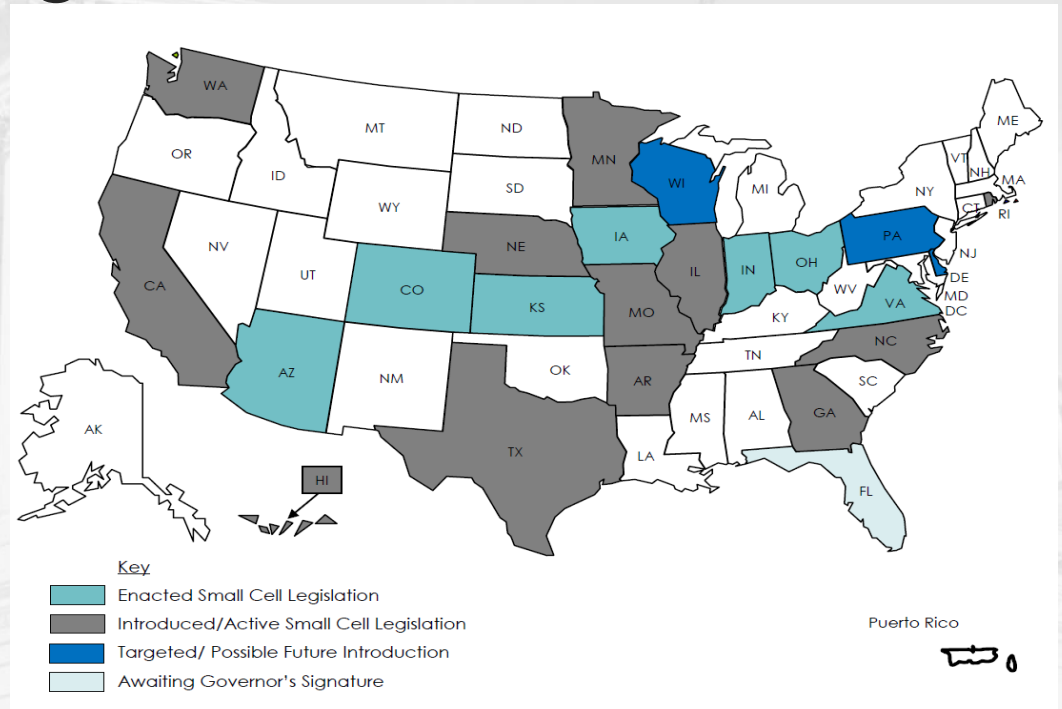
“
Cities and towns which are first to facilitate the wireless infrastructure evolution will see the greatest benefit.”

Accenture Strategy
JANUARY 2017

ctia Everything™
Wireless

Wireless Siting Legislation


- Fair and reasonable **access** to vertical infrastructure
- **Cost-based** fees providing recovery for all municipal costs associated with application
- Predictable **process** through a permitted use for all small cells



Help the Wireless Industry Invest in America

WE NEED A NATIONAL SPECTRUM PIPELINE.

- Prioritize licensed exclusive-use spectrum.
- Identify key government bands for reallocation.
- Allocate a mix of low-, mid-, and high-band spectrum.



Jackie McCarthy
Assistant Vice President,
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Wireless

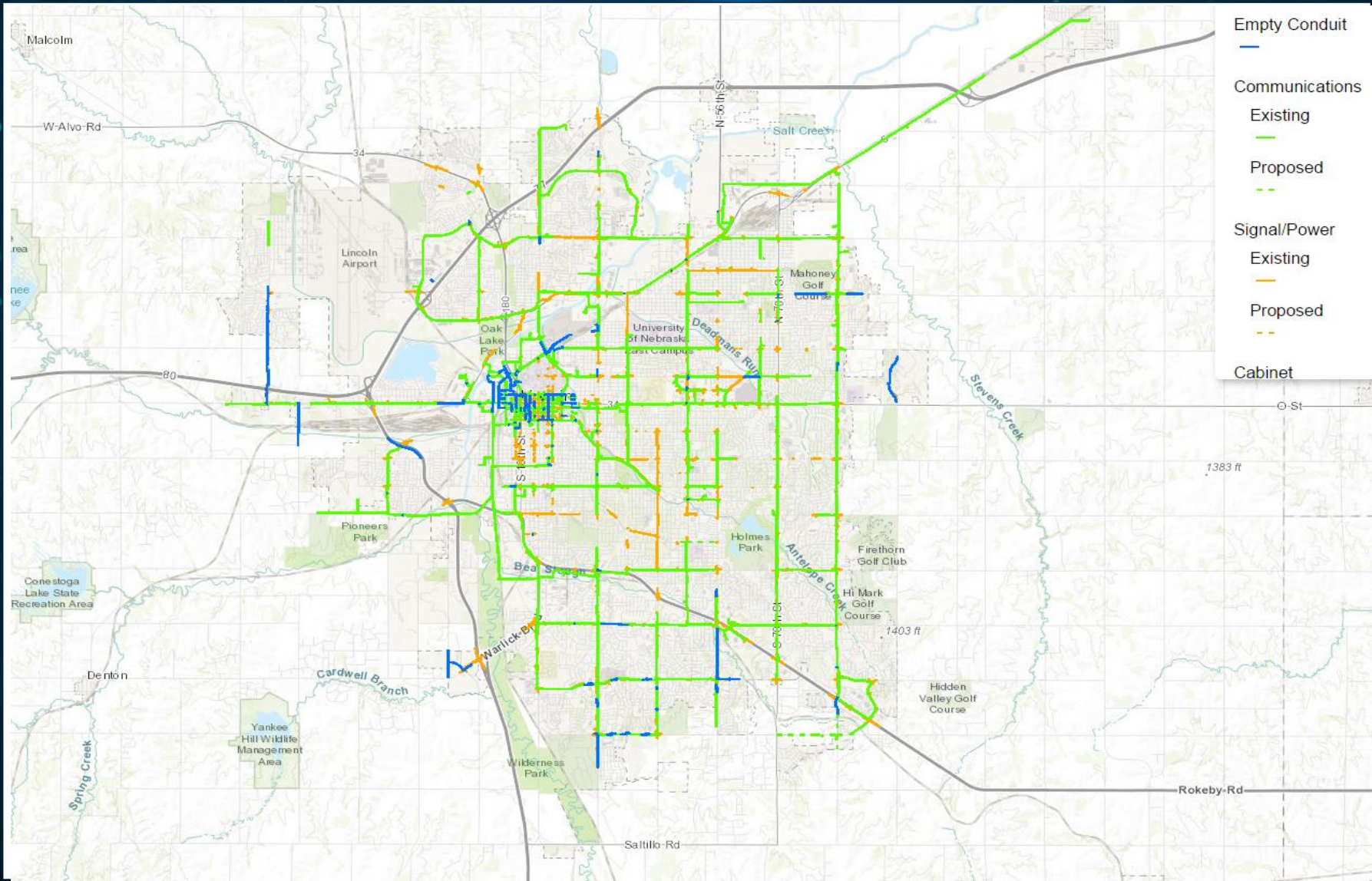
LEARN MORE AT CTIA.ORG



Lincoln TECHNOLOGY IMPROVEMENT System

Lincoln
Small Cell

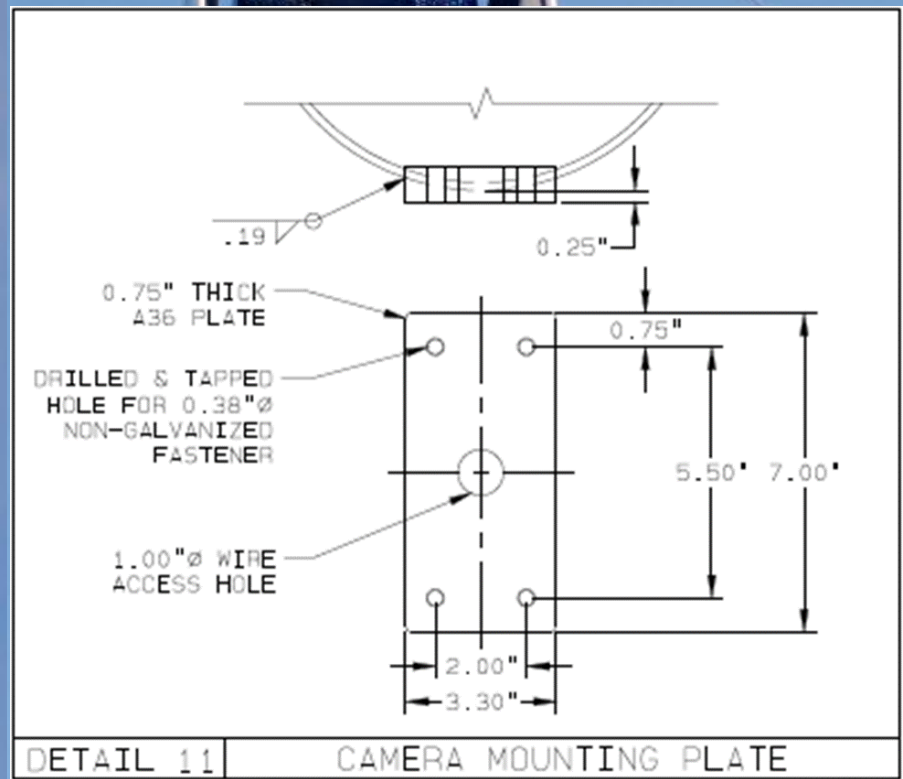


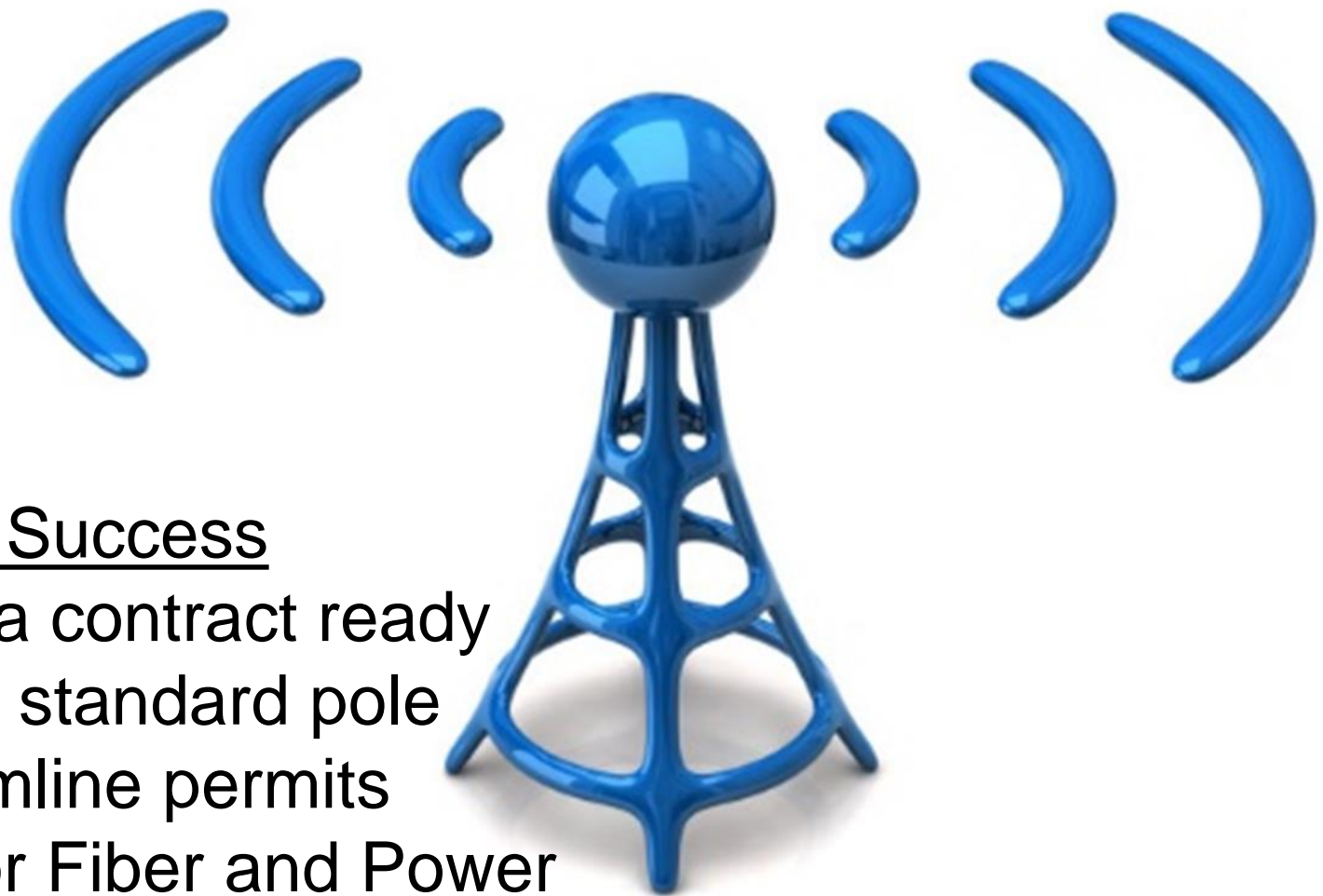






Public Port





Tips for Success

- Have a contract ready
- Pick a standard pole
- Streamline permits
- Ask for Fiber and Power



Lincoln TECHNOLOGY IMPROVEMENT System

Lincoln
Small Cell

Questions and Comments

- Please type your questions in the chat or Q&A box.
- Slides and Transcript will be posted on the BroadbandUSA website within 7 days after the webinar.

<http://www2.ntia.doc.gov/>

BroadbandUSA

Thank you for attending.

Tune in for the next Practical Conversations Webinars:

May 18, 2017 at 2pm ET

Infrastructure Week: NLC, NACo, NTIA Webinar on Smart Communities

Register for the webinar here:

<https://attendee.gotowebinar.com/register/8150431589189300227>

June 21st, 2017 at 2pm ET

Broadband Business Models

Registration is required for this webinar: [http://www2.ntia.doc.gov/](http://www2.ntia.doc.gov) under *Events*



Additional Resources



BroadbandUSA is available to help communities with their broadband efforts

BBUSA Resources:

- [Public-Private Partnerships Guide](#)
- [Community Broadband Roadmap Toolkit](#)
- [Introduction to Stakeholder Outreach](#)
- [Using Partnerships to Power Smart Cities](#)

For General Information:



202-482-2048



broadbandusa@ntia.doc.gov



<http://www.ntia.doc.gov/broadbandusa>

To Request Technical Assistance:



Submit Intake Form