

## Partnership Brings E-Connectivity to Southwest Nebraska



Nebraska truck and silos. Photo credit Mary Ridder.

A public-private partnership between public power districts, telecommunications providers, wireless internet service providers, and Paige Wireless may make southwest Nebraska and eventually the rest of the state a leader in the use of sensors and other connected devices for agriculture and the power industry. The partnership also aims to improve broadband availability in the area.

### Identify Mutual Benefits to Public and Private Partners

The partnership started with a discussion between NPPD and Paige Wireless on the benefits of Paige Wireless's low bandwidth wireless network using the LoRaWAN® protocol. According to Julie Bushell, president of Paige Wireless, LoRaWAN is beneficial in rural areas where cellular connectivity is scarce and where lowcost remote telemetry is needed.

"The benefits of LoRaWAN are very, very low subscription rates and an incredibly long battery life on sensors," said Bushell. "The sensors we deploy average between a 5- and 10-year battery life depending on the application. Typically, for a cellular data plan that is about \$30 a month. LoRaWAN is about \$2 a month. The goal of LoRaWAN is to realize the true potential of everything connected, so the sensors are very cost effective as well."

NPPD realized the benefits of LoRaWAN for both agriculture and for the power industry.

"The LoRaWAN low-speed sensor network is potentially a huge value for a utility," said Dave Webb, the director of technology integration at NPPD.

The Electric Power Research Institute (EPRI) has a whole set of advanced sensors for utility transmission operation and substations. The institute is converting all of its sensors to LoRaWAN. Nebraska will be a primary test site for the use of these sensors, explained Webb.

Some of the agricultural data collected on the network such as soil moisture probe and weather data data is also helpful for load management for utilities.

## Southwest

### Nebraska

**Model:** Aggregating demand and streamlining permitting and processes for colocation of facilities

**Champions & Key Supporters:** NPPD, Paige-Wireless, rural public power districts, wireless internet service providers and telecommunications providers

**Funding:** No additional public funding required

### Key Takeaways

Identify mutual benefits to public and private partners

Facilitate discussions with customers and providers

Facilitate identification of assets, colocation of facilities

Aggregate broadband requirements and engage in strategic sourcing

Interview Date: May 2020

**LoRaWAN** stands for Long Range Wide Area Network and is a low power networking protocol designed to connect battery-operated sensors and other devices to the internet. It is being used for a number of applications including monitoring soil moisture and ground water levels and collecting weather station data. The number of applications is expected to grow as network availability grows. Paige Wireless anticipates covering all of Nebraska with its LoRaWAN network by the summer of 2020.

### Facilitate Discussions with Customers and Providers

NPPD invited telecommunications providers and rural public power districts to meet with Paige Wireless to better understand the initiative and the benefits of LoRaWAN.

“And then the relationship grew into essentially helping us deploy our network, and I would say that most of that help has been through facilitation,” said Bushell.

### Streamline Identification of Assets, Colocation of Facilities

NPPD helped Paige Wireless identify the locations of their towers and power poles that could be potentially leveraged.

“We have communications towers and structures that we let any communications company attach to through a standard process, but we are hoping we can streamline that process and make sure that they have knowledge of where our towers are,” said Webb.

### Aggregate Broadband Requirements and Facilitate Partner RDOF Efforts

The need for better broadband for backhaul and high bandwidth agricultural applications also emerged from the discussions among Paige Wireless, public power districts and telecommunications providers.

A pilot in southwest Nebraska was initiated in late 2019 to identify and aggregate the need for backhaul services for Paige Wireless and wireless internet service providers as well as the backhaul and overall e-Connectivity needs of McCook, Southwest, Twin Valleys, and Dawson Public Power Districts. However, as more information became available about the Rural Digital Opportunity Fund (RDOF), it made sense to consider a larger, potentially statewide effort. To that end Pat Pope, NPPD’s former CEO, invited Public Power Districts from all over the state to participate in a network design and RDOF enabling effort with the National Rural Tele-

communications Cooperative. The NRTC, made up of rural electric and telecom COOPs nationwide, specializes in designing a network and plan that optimizes the use of electric infrastructure to satisfy both the e-Connectivity needs of the utility and in our case, enable better business cases and RDOF bids for any private telecom partners who are involved. Pope stated, “We hope this effort can be coordinated with other statewide efforts. When the FCC looks at Nebraska’s effort we want them to say ‘WOW! This is how to get it done!’ If we work together, Nebraska could be the blueprint for the nation for rural e-connectivity deployment.”

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### Pilot Will Demonstrate Precision Ag Technologies

The pilot in southwest Nebraska will also serve as a demonstration project for precision ag technologies.

“We want to bring in some very interesting technologies that will require real-time data transfer, and also autonomous vehicle pilots on tractors and planters in the pilot area, so that we can really show what this awesome connectivity can do for the rural communities and the precision ag that surrounds them,” said Bushell.



Ranch view. Photo credit Mary Ridder.