

# Fiber-to-the-Home Network



TDS Telecom, a wholly owned subsidiary of Telephone and Data Systems Inc. (NYSE: TDS, TDS.S), provides phone, broadband and digital television services in hundreds of rural, suburban and small metropolitan communities in 30 states nationwide. The company serves both residential and business customers and has nearly 1.2 million access line equivalents in service.

In early 2008, after years of increasing competition across its footprint from cable operators offering low cost bundles combining digital voice and higher speed broadband along with digital television, executives at TDS Telecom embarked on a strategy to systematically upgrade its networks using fiber optics to deliver a “super high speed data” service to leapfrog the competition. As part of the plan, each year budget would be allocated for upgrading networks using Fiber-to-the-Home (FTTH) and Fiber-to-the-Node (FTTN) architectures to enable TDS Telecom to offer customers broadband speeds of 25 Mbps downstream and 1.5 Mbps upstream – significantly faster than their cable competitors.

The upgrades would be prioritized based on which networks were experiencing the fiercest competition and had the density of households to justify the investment in fiber optics, with networks in Tennessee, Minnesota and New Hampshire identified as the initial upgrades for 2008.

### Project Overview

Mike Bewersdorf, Outside Plant Engineer for TDS Telecom, was responsible for the FTTH/FTTN project in the New Hampshire network, which serves a number of communities in the central part of the state. Once given the directive from corporate in March 2008, Bewersdorf and a supporting team worked on an aggressive schedule over the next three months to review the subscriber densities, establish FTTH/FTTN network design options and budgets, secure corporate approval and start material acquisition for the network build.

Given the scope of the project – one of the largest in recent history for TDS Telecom – a major challenge was actually building the network, something that would require a firm with knowledge of fiber optics engineering and both aerial and underground plant construction.

### Choosing nextGen

TDS Telecom issued a request for proposal for the network build and invited a number of firms to bid on it, including nextGen Telecom Services Group. NextGen had an existing relationship with TDS Telecom through a Master Service Agreement (MSA) to provide construction services in their New Hampshire and Vermont network service areas.

After an exhaustive review of the bidders’ overall capabilities, TDS Telecom selected nextGen as its contractor for the FTTH/FTTN network based on its comprehensive portfolio of services, fiber optics experience, project management skills and competitive pricing. In addition, according to Bewersdorf, another key part of the decision was that nextGen’s business philosophy and work ethic had already made a highly favorable impression on TDS Telecom.

“ I’ve never worked with such a professional, knowledgeable and high-functioning operation as nextGen – from the guys literally in the trenches up to the CEO – and it’s their unique approach that avoided delays, controlled costs and finished the project on time. ”

– Mike Bewersdorf  
Outside Plant Engineer  
TDS Telecom

“Under the existing Master Service Agreement, nextGen had already distinguished themselves by stepping up numerous times to go above and beyond what was specifically called out in their contract, particularly in terms of completing projects ahead of schedule. They proved themselves to be a true business partner, something that clearly made them stand out as we evaluated all of our options.”

And it didn't take long for nextGen to go above and beyond again. After reviewing the initial network design and budget, nextGen project manager, Mike Dion, felt that the network could be built for significantly less than TDS Telecom had originally budgeted because there would not be as much underground construction – the costliest part of the build – as was expected.

To prove his point, Dion field engineered the proposed network route and recalculated footages for both aerial and underground construction. This proactive effort confirmed that the underground construction would be half of what was in the plan, immediately taking \$500,000 of cost out of the project and cementing TDS Telecom's view – both locally in New Hampshire and at corporate headquarters in Wisconsin – that nextGen would deliver additional value throughout the project based on their extensive experience and attention to detail on key issues.

### **Building the network**

Between August 2008 and January 2009, nextGen built the FTTH/FTTN network, which included:

- 35,000 individual fiber splices
- 100 miles of aerial construction
- 5 miles of underground construction
- 4100 households passed

The nextGen team was divided into three separate teams – aerial construction, underground construction and fiber splicers – with more than 40 people working on the network at any given time during the peak of the project.

From trenching the ground to lay conduits and pull fiber, overlashing fiber on TDS Telecom's aerial copper facilities and splicing all the fiber 'tails' and service terminals together with complete testing and full documentation, the nextGen team did it all and was flexible and adaptable enough to complete the project on time even though the start of the project was delayed and nextGen had to endure harsh winter weather for a significant portion of the build.

To maximize project management efficiency and communications, each team had a separate supervisor on-site who all reported back to Mike Dion at nextGen's

headquarters. Dion, the field team supervisors and nextGen's executive management team held daily meetings to track the progress of the project and address any issues, providing regular updates to Bewersdorf.

In fact, it was nextGen's internal structure, communications and professionalism that also stood out for Bewersdorf, “There is an industry stereotype about construction services firms and nextGen couldn't be further from it. Many firms eliminate the on-site supervisors or overall project managers to reduce costs, but that only increases poor communications, confusion and likely project delays and cost overruns – especially on large builds like this one.

“I always had a direct contact in the field or at nextGen's office to call and everyone on their team always was completely up to speed on the project's status. They also communicated both the positives and challenges we faced to make sure they could be addressed to keep the project moving forward. I've never worked with such a professional, knowledgeable and high-functioning operation as nextGen – from the guys literally in the trenches up to the CEO – and it's their unique approach that avoided delays, controlled costs and finished the project on time.”

### **Building networks and strong partnerships**

With the network built, Bewersdorf recognized that nextGen had once again delivered as a true business partner - the team worked quickly and efficiently to keep the project on track, communicated constantly and delivered high quality plant construction and fiber splicing. As part of the project, nextGen developed detailed fiber block diagrams that were utilized by the splicers to increase their operational efficiency as well as by TDS Telecom personnel after the network was built to help them immediately identify the proper fiber for individual customers.

With the first customer service on the new FTTH/FTTN network set for April 2009, TDS Telecom is looking forward to competing on a new fiber-based network platform and offering their customers more advanced services and even greater value.

### **About nextGen**

NextGen Telecom Services Group offers communications network infrastructure engineering, construction and fiber optics services to broadband service providers, carriers, electric utilities, system integrators, equipment vendors, municipalities, government agencies, military bases, educational institutions, healthcare providers and enterprises throughout the eastern United States. More information about the company and its services is available at [www.ngengroup.com](http://www.ngengroup.com).