

# BOLD

## BROADBAND OPPORTUNITIES AND LEADERSHIP DEVELOPMENT

K-12 Career Awareness Toolkit



# CREATING A SKILLED WORKFORCE

Increasing demand for broadband alongside historic initiatives to deploy state-of-the-art networks throughout the United States are highlighting the need to ensure a skilled workforce for the communications industry. Expert professionals will be needed to meet an array of demands including network design and engineering; construction; cybersecurity; operations, and repairs; and support for internal operations including marketing and in-house management. These demands will continue even after initial infrastructure deployment is completed as vital communications networks require ongoing maintenance and upgrades to meet evolving growth and market demands.

In response, Smart Rural Community<sup>SM</sup> and the National Rural Education Association (NREA) present BOLD: Broadband Opportunities and Leadership Development. BOLD is a toolkit to guide K-12 schools and rural broadband providers as they work together to cultivate broadband career awareness among high school and younger students. These efforts complement other initiatives of NTCA—The Rural Broadband Association (NTCA) that promote learning and work opportunities for post-secondary learners.

BOLD aims to help locally operated communications providers and educational leadership facilitate skilled labor pipelines by aligning K-12 educational programming to industry needs. This toolkit recognizes that there is no “one-size-fits-all solution.” Accordingly, BOLD draws from the broad perspective of NTCA’s more than 850 members and combines it with the expertise of NREA to offer best practices that individual schools and companies can adapt to their unique community needs.



**NTCA** represents more than 850 independent, family-owned and community-based telecommunications companies providing voice and broadband services in rural areas. NTCA’s members build and deliver connectivity and operate essential services in rural and small-town communities across the United States. For more information, please visit [www.ntca.org](http://www.ntca.org).



**NREA** is the voice of all rural schools and rural communities across the United States. In an increasingly confusing system, NREA helps educators navigate through the noise by finding and helping educators use the resources needed to educate today’s students. For more information, please visit [www.nrea.net](http://www.nrea.net).



**Smart Rural Community** promotes collaboration among locally operated rural broadband providers and other leaders to identify and deploy broadband-enabled solutions to improve agriculture, economic development, education, healthcare, and other vital services in rural spaces. For more information, please visit [www.smartruralcommunity.org](http://www.smartruralcommunity.org).

## About the Author

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# BUILDING A CONNECTED FUTURE

## Who drives these efforts?

The deployment and operation of advanced broadband networks requires specialized skills across several disciplines. Rural broadband leadership, working with local schools, can increase awareness of career opportunities in the industry and ultimately enable the cultivation of a skilled workforce. In contrast, a lack of awareness could result in a future shortage of skilled workers. This would not only affect the communications sector, but also have an impact on the ability of rural communities to engage vital benefits such as telehealth, education, telework, and other broadband-enabled services.

Career awareness will include cultivating not only technical proficiencies but also soft skills such as teamwork and collaboration; communications; and problem solving. Participants in this effort will include educators (state and local, including superintendents and principals); industry (locally operated rural broadband providers, engineers, and construction firms); and national and state telecom trade associations. The importance of these collaborative efforts cannot be underestimated: Schools are the primary point of contact for students and play an integral role in assisting students to identify and assess their skills, talents, and interests, while industry leaders are positioned to understand current and future market demands.

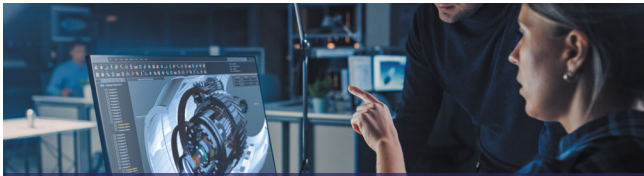
## How can students be introduced to broadband?

Schools and industry can work together to cultivate, relate, and demonstrate. The primary goal is the cultivation of student awareness of careers in the rural broadband industry. Bridging the “relevance gap,” *i.e.*, the potential challenge students might face relating classroom instruction to life experiences, is critical. Studies find that interest in academic material declines when students do not relate what they learn in school to their lives and interests outside of school. Educators and the broadband industry can help students understand careers in broadband—and identify the relevance of related coursework—by illuminating for students the role that broadband and broadband-enabled applications play in their lives, starting with the devices they often hold in their hands or the computers they use at their desk. These include voice and text communications, connected devices (including smart home appliances), entertainment, gaming, agriculture, and streaming services. As educators highlight the connections between learning and life and the various academic offerings that serve as bridges between them, students can be exposed to the broad range of career opportunities that are available in the broadband sector and encouraged to explore how they connect to their individual interests. These can include network deployment

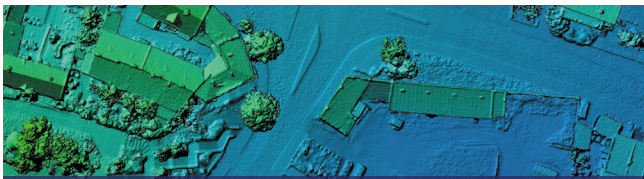


Sources: CISCO, CTA Consumer Electronics Show

## SAMPLE JOBS/CATEGORIES



Construction; operation of hand and power tools including large equipment; project management; computer aided design (CAD).



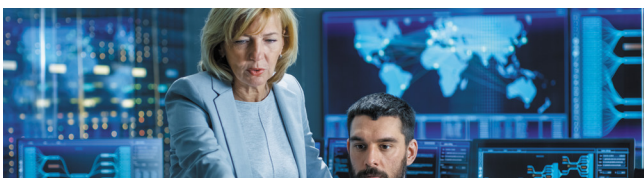
Installation/maintenance installation, service, and repair of communications networks; geographic information systems (GIS); map creation software.



Machinery maintenance and repair of equipment; computer aided manufacturing (CAM); industrial control systems.



Customer service includes front-line customer interactions, problem solving and communications; database entries and management; billing and operations systems.



Cloud support wide area network (WAN) and local area network (LAN) design; cybersecurity; data access management.

Source: Brookings Institute

(engineering, construction), operations (coding, cybersecurity), and management (marketing, customer-facing engagements, leadership). As interests may change across the journey of a student's career, educators can incorporate exposure to the broadband industry through existing programs such as career fairs and counseling as students prepare for graduation. It is worth noting, as well, long-term career potential in the industry by highlighting that many current senior managers and executives in rural broadband companies started at entry-level positions, including such jobs as linemen or maintenance operators.

### When do we begin?

A key question that often arises when schools and industry explore career awareness efforts is, "When should we begin?" While some programs focus on middle school years (grades 6-8), building career awareness can begin as early as elementary school (K-5). The Pennsylvania Department of Education (PDE) identifies grade 3 as a stage when students can be introduced to recognize that individuals have unique interests; to help students identify their interests; to recognize different jobs that exist in their communities; and to understand that jobs and roles can evolve over time. The PDE approach progresses to milestones through middle school and beyond, addressing such topics as the relationships between personal interests and careers, as well as pathways to career training including two-and-four colleges; career and technical training; apprenticeships; and the military. The PDE model culminates with grade 11 instruction in job applications, interviewing skills, and resume writing.

Importantly, these or approaches like these should not intend to constrain a student's future choices, but rather serve as an opportunity to introduce students to various career pathways with the understanding that interests and aptitudes can change over time, and may lead students in different directions. The specific inquiries of students at each age level differ: Younger students



are often interested in the day-to-day activities of the job, while older students are often interested initially in salaries and compensation. High school can be an opportune time to explain the respective roles of wages and benefits, including health insurance and retirement investment plans, in overall compensation. Early high school is also an important time to engage introductory conversations that help students understand the transition to post-secondary options, which may include direct entry to the workforce, two- or four-year colleges (including trade colleges), apprenticeships, or careers with the military that can take advantage of GI Bill or ROTC opportunities.

## WHAT CAREERS ARE AVAILABLE IN THE BROADBAND INDUSTRY?

“Guide to Careers in Rural Telecommunications,” published by the Foundation for Rural Service ([www.frs.org](http://www.frs.org)), offers a comprehensive guide to career pathways. The resource offers an easy-to-follow organizational chart of a typical rural communications company, including executive, technical, customer-facing, and management/administrative roles and describes nearly 30 career paths in rural telecom that contemplate a wide range of disciplines and skills ranging from technical education to management and business training.

The guide offers a “behind the scenes” look at the many careers that power the devices and applications that students (and their parents and teachers) use on a daily basis. From cybersecurity to construction to engineering to customer service, rural telecom offers opportunities that are at once at the edge of technology and at home in rural spaces.

## PROFILE **Norvado** (Cable, WI)

Leaders from a locally operated broadband provider in Wisconsin observed, “Rural high school students in northern Wisconsin think they have two options when they graduate: move away for work or attend college out of town.” To change those perspectives, Norvado hosted fifty students for a Youth Mentorship Event in the telecommunications field. Students, teachers, and area leaders received hands-on, real-world experience of what it takes to connect rural areas to cutting-edge communications technology. They also learned from industry experts what it’s like to drive innovation that builds opportunities in rural spaces.

Students from area high schools toured Norvado’s headquarters, learned about post-secondary education options, and worked through three interactive breakout sessions in Broadband and IT Network Overview, Fiber Optics and the Customer Network, and The Real World of Marketing.



What you see at home dictates what you do. Farmer, banker, doctor, teacher—exposure carries a tremendous impact affecting students’ interest in careers. And broadband is exciting, how it contributes to our social and professional lives, how vital broadband is to economic energy. Imagine a day without broadband—and inspire students to be part of the industry that is a part of their daily lives.



## WORKING TOGETHER

Education and awareness can be pursued in the classroom, career days, and in hands-on internships or similar student work experiences. Rural broadband providers and schools can work together to identify existing resources as well as new curricula that align with the dual goals of building career awareness and introducing students to skills necessary for work in the broadband industry. The growing use of online learning can encourage educators and industry to identify strategies for reaching dispersed students.

Locally operated broadband providers can play an important role in assisting schools to adapt and/or incorporate new educational initiatives. Industry may consider incentives to encourage schools’ participation, including supplies and materials for hands-on training. Industry may also consider offering guest lecturers or instructors for industry-related topics. And, as noted by some providers, “A little swag never hurt” is a simple yet potentially effective consideration for creating attractive first impressions at school or community

## PROGRESSIVE STEPS FOR HIGH SCHOOL STUDENTS

### Aptitude-based Guidance



- ▶ **Identify** students’ talents

### Academic Advisement



- ▶ **Link** students with counselors who can match abilities and interests with career options

### Advising and Recruiting



- ▶ **Connect** students with potential post-secondary employers

### Certification



- ▶ **Earn** high school or post-secondary credits for classroom and/or work experience





**\$60+**  
BILLION

Devoted by recent Federal legislation to expand broadband networks throughout the country

**>8%**



Growth in telecom installer and repairer jobs 2021–2031, per U.S. Bureau of Labor Statistics

career days. Flexibility is important, too, so that students have sufficient opportunity to sample experiences across a range of choices.

Additionally, it is important to find a champion who believes in the mission of educating students and expanding their perspectives of careers that they can achieve in their home communities. The local telecom industry, in regional coordination with state telecom associations, can help identify enthusiastic ambassadors who can convey the value of exploring opportunities “at home.” Local telecom staff and retired telecom leadership can serve as guest lecturers and explain how high-tech jobs can be found “here at home.” Schools and industry can review best-practices of early adopters and work with organizations outside of traditional state and local government offices. Public interest, philanthropic, and economic development organizations can be partners to support local opportunity-building programming.

Local broadband leadership, including state associations, can help form advisory boards to assist schools to identify and create educational and outreach offerings.

## Experiences

Effective student experiences transcend the classroom. Locally operated broadband providers can support flexible, personalized experiences that are delivered within traditional CTE (career and technical education) courses or work/school experience for high-school or early college credit. Post-secondary Prior Learning Assessment (PLA) credits can create degree options for previously underserved populations. Broadband companies can work with schools to host on-campus career days; “job shadowing” opportunities and ride-alongs; internships; and special forums and seminars.

### CORE COMPETENCIES

- Coding
- Computer Science
- Electrical Engineering
- Environmental Studies
- Mechanics
- Robotics
- Technology

### ADMINISTRATION/MARKETING

- Accounting
- Management
- Marketing
- Web Design

### SOFT SKILLS

- Communications
- Collaboration
- Problem Solving
- Public Speaking

## PROFILE

### Opportunities in Esports

Esports is projected to reach more than \$315 million in U.S. market value in 2023. For schools, esports offers an extracurricular activity that cultivates team building, problem solving, and collaboration while building core technology competencies demanded by the expanding rural broadband market. The virtual nature of esports transcends geographic barriers and brings together people from varied backgrounds. The Entertainment Software Association reports a nearly even split between men and women engaging video games (52%/48%), with an average age of 33 years old.

Paul Bunyan Communications (Bemidji, Minn.) collocates TechXpo with its gaming championship to demonstrate how gamers can leverage their technical skills and enthusiasm into successful careers. The company's Gigazone Gaming Championship is a regional tournament that showcases Paul Bunyan's IT and web development teams. NTCA members report successful recruiting for IT and other tech positions from the gaming community.



Photo: Joshua Seidemann

### TOP OF MIND QUESTIONS

The following are representative introductory questions and issues for local educators and leaders to consider:

- Q** When does the school begin teaching students about careers?
- Q** Does the school have a career and technical education (CTE) program?
- Q** Does the school accommodate internship opportunities?
- Q** Does the school have a career fair or career day?
- Q** Can local industry employers speak at school?
- Q** Does the school offer career guidance?
- Q** Does the school offer aptitude and skills testing?
- Q** Does the school coordinate with other regional schools?
- Q** Typically, how many seniors enter the workforce; college; trade colleges; military?





- Q Can industry leaders join or form a curriculum advisory board?
- Q What types of resources would the school need to support CTE programs?
- Q Does the current curriculum offer courses that teach “soft skills”?
- Q Does the school have the resources it needs to help students prepare for careers? How can industry participate and assist?
- Q What type of public or private funding or grant opportunities might be available?



## PROFILE

# National Rural Education Association— Hardeman County Schools (TN)

The National Rural Education Association (NREA) developed Career Advising Specialist micro-credentialing to assist career guidance and identify “living wage” careers that do not require two- or four-year college degrees.

NREA also developed the K-12 Career Development Framework that focuses on grades K-5, 6–8, and 9–12. This approach is based on current research and aligned to Social Emotional Learning (SEL) standards.

NREA worked with the U.S. Department of Agriculture in rural Southwest Tennessee to create a talent pipeline for emerging tech careers. An initial focus on economically-disadvantaged students and minorities can help industry and communities identify local

talent. Hardeman County also developed a Future Ready course that is required for all 9th graders that includes time management, collaboration, creative problem solving, goal setting, digital literacy, self-awareness, and acting honestly as examples of the content.



## PROFILE

### Profile: HTC, Inc. (Horry, SC)

HTC, Inc. was a key organizer of a Pathways2Possibilities, career fair that attracted 2,000 eighth graders from several surrounding communities. The goal of this program was to introduce junior high school students to career paths in various industries. HTC used this event to explain career paths that include business, marketing, finance, IT, and tech engineering. HTC brought a bucket truck and fiber splicing equipment to the event. The expo included other career representatives, including ag, education, energy, health sciences, law and public safety, and transportation.



Photo: HTC, Inc.

There are all types of innovative steps that we can take to bring these opportunities to the kids. For example, a telecom camp where the students get a week's experience in the field and office to see how a telecom system and company work. Or work with local colleges to promote STEM camp with a focus on broadband. And commercial-type videos about the industry could go a long way toward getting good attention at career fairs—a short video with someone on hand to answer questions and explain more about the industry.

We can show students that they don't need to move to San Francisco to work for a tech company—we have one right here.

Photo: CassComm





## ADDITIONAL RESOURCES

*Academic Standards for Career Education and Work*, Pennsylvania Department of Education (<https://www.education.pa.gov/Documents/K-12/Career%20and%20Technical%20Education/CEWStandards/Main/Career%20Education%20and%20Work%20Standards.pdf>).

*Best Practices in Middle School Career and Technical Education Expansion*, Hanover Research (Dec. 2020) (<https://portal.ct.gov/-/media/SDE/CTE/Best-Practices-in-Middle-School-Career-and-Technical-Education-Expansion.pdf>).

*Career Connected Learning*, New York City Public Schools (<https://www.schools.nyc.gov/learning/subjects/career-and-technical-education>).

*Guide to Careers in Rural Telecommunications*, Foundation for Rural Service (2022) (<https://www.ntca.org/sites/default/files/documents/2023-02/2023%20FRS%20Guide-Final-online.pdf>).

*Labor and Workforce Development in the Rural Telecom Sector*, Joshua Seidemann, Smart Rural Community (2022) (<https://www.ntca.org/sites/default/files/documents/2022-04/discussion-guide-for-rural-workforce-development-web.pdf>).

*Rural Broadband and the Next Generation of American Jobs*, Joshua Seidemann, Smart Rural Community (2019) ([https://www.ntca.org/sites/default/files/documents/2021-03/SRC\\_whitepaper\\_the\\_next\\_generation\\_of\\_american\\_jobs.pdf](https://www.ntca.org/sites/default/files/documents/2021-03/SRC_whitepaper_the_next_generation_of_american_jobs.pdf)).

*What We Know and Where to Go: A Systematic Review of the Rural Student College and Career Readiness Literature and Future Directions for the Field*, J. Kessa Roberts and Phillip D. Grant, The Rural Educator, National Rural Education Association (2021) (<https://files.eric.ed.gov/fulltext/EJ1315158.pdf>).

*Work-Based Learning Implementation Guide*, Tennessee Department of Education (2016) ([https://www.tn.gov/content/dam/tn/education/ccte/wbl/wbl\\_implementation\\_guide.pdf](https://www.tn.gov/content/dam/tn/education/ccte/wbl/wbl_implementation_guide.pdf)).





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