COLORADO

Department of Regulatory Agencies

Colorado Office of Policy, Research & Regulatory Reform

2024 Sunrise Review

Fiber Optic Technicians

December 31, 2024

COLORADO
Department of Regulatory Agencies
Executive Director's Office

December 31, 2024

Members of the Colorado General Assembly
c/o the Office of Legislative Legal Services
State Capitol Building
Denver, Colorado 80203

Dear Members of the General Assembly:

The General Assembly established the sunrise review process in 1985 as a way to determine whether regulation of a certain profession or occupation is necessary before enacting laws for such regulation and to determine the least restrictive regulatory alternative consistent with the public interest. Pursuant to section 24-34-104.1, Colorado Revised Statutes (C.R.S.), the Colorado Office of Policy, Research and Regulatory Reform (COPRRR) at the Department of Regulatory Agencies (DORA) undertakes a robust review process culminating in the release of multiple reports each year on June 30 and December 31.

A national leader in regulatory reform, COPRRR takes the vision of their office, DORA and more broadly of our state government seriously. Specifically, COPRRR contributes to the strong economic landscape in Colorado by ensuring that we have thoughtful, efficient and inclusive regulations that reduce barriers to entry into various professions and that open doors of opportunity for all Coloradans.

As part of this year's review, COPRRR has completed its evaluation of the sunrise application for the regulation of fiber optic technicians and is pleased to submit this written report.

The report discusses the question of whether there is a need for regulation in order to protect the public from harm, whether regulation would serve to mitigate the harm and whether the public can be adequately protected by other means in a more cost-effective manner.

To learn more about the sunrise review process, among COPRRR's other functions, visit coprrr.colorado.gov.

Sincerely,

Patty Salazar
Executive Director

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Background

Sunrise Process

Colorado law, section 24-34-104.1, Colorado Revised Statutes (C.R.S.), requires that individuals or groups proposing legislation to regulate any occupation or profession first submit information to the Department of Regulatory Agencies (DORA) for the purposes of a sunrise review.

The intent of the law is to impose regulation on occupations and professions only when it is necessary to protect the public health, safety or welfare. DORA's Colorado Office of Policy, Research and Regulatory Reform (COPRRR) must prepare a report evaluating the justification for regulation based upon the criteria contained in the sunrise statute:[1]

> (I) Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety, or welfare of the public;
>
> (I.5) Whether the practitioners of the profession or occupation exercise independent judgment, and whether the public can reasonably be expected to benefit from the direct regulation of the profession or occupation if a practitioner's judgment or practice is limited or subject to the judgment or supervision of others;
>
> (II) Whether the public needs, and can be reasonably expected to benefit from, an assurance of initial and continuing professional or occupational competence;
>
> (III) Whether the public can be adequately protected by other means in a more cost-effective manner; and
>
> (IV) Whether the imposition of any disqualifications on applicants for licensure, certification, relicensure, or recertification based on criminal history serves public safety or commercial or consumer protection interests.

Any professional or occupational group or organization, any individual, or any other interested party may submit an application for the regulation of an unregulated occupation or profession. Applications must include a description of the proposed regulation and justification for such regulation.

[1] § 24-34-104.1(4)(b), C.R.S.

Methodology

During the sunrise review, COPRRR staff performed a literature search, contacted and interviewed the sunrise applicant, contacted regulators in Colorado, reviewed laws in other states and interviewed stakeholders and other subject-matter experts. To determine the number and types of complaints filed against fiber optic technicians, COPRRR staff also contacted regulatory agencies in other states.

Profile of the Profession

Fiber optic technology allows data, sound and images to be transmitted as rays of light through thin, flexible glass or plastic fibers. Fiber optic technology has mostly replaced copper wire,[2] and it is commonly used to deliver telephone, television and high-speed internet services.[3]

A fiber optic technician is a type of telecommunications technician that specializes in installing, repairing and maintaining fiber optic lines. They must be proficient in the use of specialized tools to test, repair, splice and terminate fiber optic cables.[4]

A fiber optic technician, sometimes referred to as a fiber optic splicer or lineman, typically works outside rather than in offices or residential buildings. They work on the main lines of a fiber optic network: splicing new lines onto the network, installing lines on poles or in manholes and repairing lines.[5]

Fiber optic technicians are often trained on the job, but some employers look for candidates with a certificate through a private trade association or an associate degree. Training lasts several years and includes both formal instruction and supervision by an experienced technician. Equipment manufacturers, schools, unions and private trade associations offer fiber optic training.[6]

Building Industry Consulting Service International (BICSI) is a private trade association that offers certification in information and communication technology. BICSI offers education, training, conferences, technical manuals and several different certifications for installing cable,[7] such as:[8]

- Installer 1 — an entry-level certificate that demonstrates knowledge and skills required to install information and communication systems;
- Installer 2, Optical Fiber — a certificate that demonstrates expertise in optical fiber networks; and
- Technician — a certificate that demonstrates competence to install and perform diagnostic testing on highly technical information and communication systems.

[2] Encyclopaedia Britannica. *Fiber Optics.* Retrieved September 26, 2024, from www.britannica.com/science/fiber-optics
[3] ZipRecruiter. *Fiber Optic Technician: What Is It? and How to Become One?* Retrieved November 13, 2024, from www.ziprecruiter.com/career/Fiber-Optics-Technician/What-Is-How-to-Become
[4] Bureau of Labor Statistics. *Occupational Outlook Handbook: Telecommunications Technicians.* Retrieved November 13, 2024, from www.bls.gov/ooh/installation-maintenance-and-repair/telecommunications-equipment-installers-and-repairers-except-line-installers.htm
[5] ZipRecruiter. *Fiber Optic Technician: What Is It? and How to Become One?* Retrieved November 13, 2024, from www.ziprecruiter.com/career/Fiber-Optics-Technician/What-Is-How-to-Become
[6] Bureau of Labor Statistics. *Occupational Outlook Handbook: Telecommunications Technicians.* Retrieved November 13, 2024, from www.bls.gov/ooh/installation-maintenance-and-repair/telecommunications-equipment-installers-and-repairers-except-line-installers.htm
[7] BICSI. *Who We Are*. Retrieved December 5, 2024, from www.bicsi.org/about-us/about-bicsi/who-we-are
[8] BICSI. *BICSI ICT Cabling Installation Certifications.* Retrieved December 5, 2024, from www.bicsi.org/education-certification/certification/cabling-installation

Installer 1 Certificate

The Installer 1 Certificate is a credential that demonstrates the holder has entry-level knowledge and skills to work with modern information and communication technology systems. To obtain this certificate, BICSI recommends that candidates complete the Installer 1 Training Course and spend 50 hours studying the *Information Technology Systems Installation Methods Manual*. The final step to obtain the Installer 1 Certificate is passage of the Installer 1 Examination.[9]

The Installer 1 Examination covers nine skills related to installing cable:[10]

- Conducting field planning, implementation and design (13 percent);
- Establishing pathways and space (31 percent);
- Pulling copper and fiber cable (21 percent);
- Terminating copper and fiber cable (15 percent);
- Testing copper and fiber cable (6 percent);
- Troubleshooting (6 percent);
- Performing retrofits (3 percent);
- Applying either concepts of integration or converge to scope of work, or both (3 percent); and
- Understanding codes and standards (2 percent).

The Installer 1 Examination is a two-part examination that includes a practical portion and a written portion. The practical portion of the examination covers six tasks. Each task must be performed to industry standards within a 20-minute period. If a candidate fails one task, they have an opportunity to attempt the task again on the same day for no additional cost. However, if a candidate fails two or more tasks, they must retake the practical portion of the examination on another day.[11]

Once a candidate has successfully completed the practical portion of the examination, they may take the written portion of the examination, which is a two-hour computer-based examination that includes 75 multiple-choice questions.[12]

The examination fee for the Installer 1 Examination is $400 for nonmembers and $335 for BICSI members.[13] The Installer 1 is an entry-level certificate, which is valid for three years and is not renewable.[14]

[9] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 7.
[10] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), pp. 8-9.
[11] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 10.
[12] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 10.
[13] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 24.
[14] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 29.

Installer 2 – Optical Fiber Certificate

The Installer 2, Optical Fiber Certificate (Installer 2 Certificate) is a credential that demonstrates the holder has the skills necessary to install, repair and maintain structured cabling systems and network components.[15] To obtain the Installer 2 Certificate, a candidate must first follow one of three routes:[16]

- Option 1: Hold an Installer 1 Certificate and complete six months of experience in structured cabling systems through a trade school, an apprenticeship or on the job.

- Option 2: Complete one year of experience in structured cabling systems through a trade school, an apprenticeship or on the job and successfully complete optical fiber structured cabling systems training through BICSI.

- Option 3: Complete two years of experience in structured cabling systems through a trade school, an apprenticeship or on the job and complete 35 hours of continuing education in optical fiber structured cabling systems.

The final step to obtain the Installer 2 Certificate is passage of the Installer 2 Examination.[17]

The Installer 2 Examination covers 10 skills related to installing structured cabling systems and network components:[18]

- Conducting field planning, implementation and design (15 percent);
- Establishing pathways and space (28 percent);
- Pulling fiber cable (14 percent);
- Terminating fiber cable (14 percent);
- Performing splicing (5 percent);
- Testing fiber cable (6 percent);
- Troubleshooting (6 percent);
- Performing retrofits (4 percent);
- Applying either concepts of integration or converge to scope of work, or both (5 percent); and
- Understanding codes and standards (3 percent).

The Installer 2 Examination is a two-part examination that includes a practical portion and a written portion. The practical portion of the examination covers six tasks. Each task must be performed to industry standards within a 20-minute period.[19]

[15] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 15.
[16] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 15.
[17] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 15.
[18] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), pp. 16-17.
[19] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 18.

Once a candidate has successfully completed the practical portion of the examination, they may take the written portion of the examination, which is a two-hour computer-based examination that includes 100 multiple-choice questions.[20]

The examination fee for the Installer 2 Examination is $400 for nonmembers and $335 for BICSI members.[21]

The Installer 2 certificate must be renewed every three years. To renew, certificate holders must complete either 15 credits of continuing education or pass the Installer 2 Examination again.[22] The renewal fee is $130 for BICSI members and $185 for nonmembers.[23]

Technician Certificate

The Technician Certificate is a credential that demonstrates the holder is a specialist with the skills necessary to install, maintain and repair highly technical systems and perform diagnostic testing on structured cabling systems and network components.[24] To obtain the Technician Certificate, a candidate must first follow one of four routes:[25]

- Option 1: Complete one year of experience in structured cabling systems through a trade school, an apprenticeship or on the job and successfully complete copper and optical fiber structured cabling systems training through BICSI.

- Option 2: Complete two years of experience in structured cabling systems through a trade school, an apprenticeship or on the job and successfully complete structured cabling systems training through BICSI.

- Option 3: Complete three years of experience in structured cabling systems through a trade school, an apprenticeship or on the job and complete 35 hours of continuing education in copper and optical fiber structured cabling systems.

- Option 4: Hold an Installer 2 Certificate.

The final step to obtain the Technician Certificate is passage of the Technician Examination.[26]

[20] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 18.
[21] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 24.
[22] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 23.
[23] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 29.
[24] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 19.
[25] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 19.
[26] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 19.

The Technician Examination covers 10 skills related to installing structured cabling systems and network components:[27]

- Conducting field planning, implementation and design (20 percent);
- Establishing pathways and space (20 percent);
- Pulling fiber cable (12 percent);
- Terminating fiber cable (12 percent);
- Performing splicing (6 percent);
- Testing fiber cable (7 percent);
- Troubleshooting (7 percent);
- Performing retrofits (5 percent);
- Applying either concepts of integration or converge to scope of work, or both (7 percent); and
- Understanding codes and standards (4 percent).

The Technician Examination is a two-part examination that includes a practical portion and a written portion. The practical portion of the examination covers 12 tasks. Each task must be performed to industry standards within a 20-minute period.[28]

Once a candidate has successfully completed the practical portion of the examination, they may take the written portion of the examination, which is a two-hour computer-based examination that includes 100 multiple-choice questions.[29]

The examination fee for the Technician Examination is $400 for nonmembers and $335 for BICSI members.[30]

The Technician certificate must be renewed every three years. To renew, certificate holders must complete either 18 credits of continuing education or pass the Technician Examination again.[31] The renewal fee is $130 for BICSI members and $185 nonmembers.[32]

Employers may also require a driver's license and first aid or cardiopulmonary resuscitation certification as a condition of employment.[33]

[27] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), pp. 20-22.
[28] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 22.
[29] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 22.
[30] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 24.
[31] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 23.
[32] *ICT Cabling Installation Certification Handbook*, Building Industry Consulting Service International (2024), p. 29.
[33] Bureau of Labor Statistics. *Occupational Outlook Handbook: Telecommunications Technicians.* Retrieved November 13, 2024, from www.bls.gov/ooh/installation-maintenance-and-repair/telecommunications-equipment-installers-and-repairers-except-line-installers.htm

In May 2023, technicians who install and repair telecommunications lines, such as fiber optic technicians, earned a median annual wage of $64,640. From 2023 to 2033, job growth is expected to decline three percent for telecommunications technicians since fiber optic cables require less frequent maintenance and repairs than previous generations of telecommunications lines and new fiber optic installations will have been completed.[34]

It is unknown how many fiber optic technicians are currently working in Colorado. The sunrise applicant, a nonprofit organization that advocates for regulation, standardization and education of fiber optic technicians, estimates that approximately 2,000 qualified fiber optic technicians and an additional unknown number of day laborers and workers from out of state are currently working to install fiber optic networks in Colorado.

Recently, the sunrise applicant has observed an increase in fiber optic technicians in Colorado due to state and federal initiatives to expand high-speed internet access to all residents.

In 2023, Colorado was awarded $826.5 million through the federal Broadband Equity, Access and Deployment Program for the purpose of expanding high-speed internet throughout the state. The Colorado Broadband Office, in the Governor's Office of Information Technology, is the state agency charged with the distribution of these and other funds to internet providers, middle-mile builders and municipalities.[35]

As of June 30, 2024, approximately 94.4 percent of Colorado locations had access to high-speed internet.[36]

[34] Bureau of Labor Statistics. *Occupational Outlook Handbook: Telecommunications Technicians.* Retrieved November 13, 2024, from www.bls.gov/ooh/installation-maintenance-and-repair/telecommunications-equipment-installers-and-repairers-except-line-installers.htm

[35] Tamara Chuang, "What's Working: New broadband laws to help Colorado streamline distribution of $800+ million," *The Colorado Sun,* July 1, 2024.

[36] Colorado Broadband Office. *Colorado Broadband Office Mapping Hub.* Retrieved December 16, 2024, from broadbandhub.colorado.gov

Proposal for Regulation

The Fiber Optic Network (Applicant), a nonprofit organization that advocates for regulation, standardization and education of fiber optic technicians, submitted a sunrise application to the Colorado Office of Policy, Research and Regulatory Reform in the Department of Regulatory Agencies for review consistent with section 24-34-104.1, Colorado Revised Statutes (C.R.S.).

The Applicant proposes that the State of Colorado regulate fiber optic technicians, and it identifies licensure as the appropriate level of regulation.

According to the Applicant, the public's ability to access fiber optic networks is critical and protecting them should be a priority. Fiber optic networks will continue to impact the lives of Coloradans and how the state does business in the future since many modern services, such as smart cities, toll roads and driverless cars, rely on fiber optic networks. Coloradans also rely on fiber optic networks for entertainment, shopping, networking, education and employment.

The Applicant states that fiber optic technicians work in a variety of settings, including underground telecommunications facilities, vaults, manholes, handholes, highway off ramps and traffic cabinets on city streets, railroad tracks, mines, wind turbines and utility lines. They must be able to climb or access cables on telephone poles and wireless towers.

In order to be licensed as a fiber optic technician, the Applicant proposes that candidates:

- Complete three to five years of apprenticeship training or experience, and
- Pass an examination in fiber optic networks.

The Applicant also proposes that candidates for a fiber optic technician license submit to a criminal history record check and that anyone with a criminal history be prohibited from working as a fiber optic technician.

According to the Applicant, requiring a license would prevent unqualified individuals from working as fiber optic technicians. Additionally, if they were required to be licensed and a problem occurred, an investigation could be conducted and, if warranted, the regulator could take action against the licensee.

With regulation, the Applicant also seeks to establish, modernize and enforce industry standards.

The Applicant would also require any fiber optic network installations built for a government entity, such as a municipality, to be inspected by a state or local inspector.

Further, the Applicant proposes that law enforcement be granted the authority to stop anyone who is working as a fiber optic technician to check that they are properly licensed. It also seeks to require the name of the company employing or contracting with fiber optic technicians to be clearly branded on vehicles that are used in the installation, repair or maintenance of fiber optic networks.

While the application states that continuing education should be required, the Applicant did not complete an application for mandatory continuing education as required by section 24-34-901, C.R.S.

Summary of Current Regulation

Federal Laws and Regulations

While at the federal level, the telecommunications industry underwent significant deregulation in the 1990s,[37] the Federal Communications Commission (FCC) continues to regulate interstate telecommunications providers, such as: internet service providers, wireless providers and radio and television broadcasters. Generally, states have the authority to regulate cable companies and intrastate wired communication providers.[38]

At this time, no federal laws or regulations require fiber optic technicians to obtain a state license, certification or registration.

The Colorado Regulatory Environment

The Colorado Public Utilities Commission oversees some aspects of telecommunications services, such as 911 calls, the high-cost support mechanism, relay services and a few other programs;[39] however, for the most part, the General Assembly has deregulated telecommunications providers, including intrastate wired communication providers, as public utilities in Colorado.[40]

According to the Fiber Optic Network (Applicant), fiber optic technicians are often compared to or categorized as electricians.

In some states, fiber optic technicians are, in fact, regulated as electricians by the state electrical board. The Colorado Electrical Board, in the Division of Professions and Occupations in the Department of Regulatory Agencies (DORA), enforces the state electrical statutes, and it regulates electricians, apprentices and electrical contractors.

However, in Colorado, fiber optic technicians and contractors are specifically exempt from regulation under the state electrical statutes.[41]

[37] Federal Communications Commission. *Telecommunications Act of 1996*. Retrieved November 27, 2024, from www.fcc.gov/general/telecommunications-act-1996
[38] Library of Congress Research Guides. *Telecommunications Industry: A Research Guide*. Retrieved November 27, 2024, from guides.loc.gov/telecommunications-industry/laws-regulations
[39] Colorado Department of Regulatory Agencies. *About Telecommunications*. Retrieved December 23, 2024, from puc.colorado.gov/abouttelecom
[40] Alex Schatz, et al., (2014) "Telecommunications Modernization," *Colorado Legislative Council Staff: Issue Brief* 14 (06), p. 1.
[41] § 12-115-116(15)(c)(II), C.R.S.

Regulation in Other States

The sunrise application asserts that no states require fiber optic technicians to be registered, certified or licensed; however, it identified a few states that require fiber optic contractors to be licensed. While a fiber optic contractor may be an individual, they are often specialized construction companies that hire crews of fiber optic technicians and other specialists to complete fiber optic projects.

To verify the information provided in the application, the Colorado Office of Policy, Research and Regulatory Reform (COPRRR) staff surveyed states contiguous with Colorado. Finding that no contiguous states regulate fiber optic technicians or contractors, COPRRR staff also conducted a Google search to identify other states that regulate fiber optic technicians and contractors.

Table 1 illustrates whether a fiber optic technician or contractor must be licensed, certified or registered in selected states.

Table 1
Regulation in Other States

State	Technician License Required	Contractor License Required
Arizona	No	No
Connecticut	Yes	Yes
Georgia	No	Yes
Kansas	No	No
Minnesota	No	No
Nebraska	No	No
Nevada	No	Yes
New Jersey	No	No
New Mexico	No	No
Oregon	Yes	Yes
Rhode Island	Yes	Yes
South Dakota	No	No
Utah	No	No
Wyoming	No	No

Nine of the 14 states that COPRRR surveyed do not regulate fiber optic technicians or fiber optic contractors, and two of the states surveyed regulate fiber optic contractors but not fiber optic technicians. Only three of the 14 states surveyed regulate fiber optic technicians.

Connecticut, Oregon and Rhode Island regulate both the technicians and the contractors who install fiber optics. Georgia and Nevada, on the other hand, do not regulate fiber optic technicians directly, but they do require the contractors who provide low-voltage services, including telecommunications installations, to be licensed.

At one time, New Mexico regulated fiber optic technicians, but it has since deregulated this and other construction-related occupations.

COPRRR staff requested licensing, complaint and disciplinary data for the three states that require fiber optic technicians to be licensed.

Rhode Island reported that they have roughly 1,000 licensed "telecommunications technicians" and 400 licensed "telecommunications contractors." Public utility employees, however, are exempt from the licensure requirement.

In Rhode Island, licensed telecommunications technicians may be certified in four different categories: data, telephony, video or sound. Most telecommunications technicians in Rhode Island apply for certification in data, which allows them to install and service all types of data-related equipment and cabling systems, including fiber optics.

Rhode Island has regulated telecommunications technicians and contractors for 25 years. The regulatory program was established following the receipt of numerous consumer complaints. Today, staff in the regulatory agency report that licensed individuals act and perform responsibly, and they receive few consumer complaints and uncover few violations.

As of this writing, Connecticut and Oregon have not responded to COPRRR's requests for information.

Analysis and Recommendations

Public Harm

Sunrise criterion I asks:

> Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety, or welfare of the public.

The Fiber Optic Network (Applicant) alleged the following types of general harm from the unregulated practice of installing, maintaining and repairing fiber optic networks.

Physical Damage to Fiber Optic Infrastructure

- Intentional damage to network
- Unintentional damage to network from inexperienced fiber optic technicians
- Network failures from poor installation
- Weakened national security from day laborers accessing fiber optic networks

Physical and Emotional Harm

- Injury to fiber optic technicians who do not take appropriate precautions
- Injury to motorists and pedestrians in the public right of way due to a failure to provide safety training
- Harm to the public when 911 is unavailable during an emergency due to a network failure
- Harm to frontline workers and first responders when unable to access communications due to an outage

Financial Harm to Government

- Increased costs from poor workmanship
- Delays in installing a network because of inadequate training
- Increased costs to taxpayers from improperly installed networks and systems
- Increased costs to repair damaged cables due to incompetence or negligence
- Increased costs from lack of secure data transfers and the associated loss of exposed data

Financial Harm to Businesses

- Lost revenue from internet and telephone outages
- Lost revenue from outages impacting the financial sector
- Financial exposure to businesses and associated losses from exposed data breaches

Financial Harm to Citizens

- Increased costs to taxpayers from poorly installed networks and systems
- Inability for the public to access telephone or internet services during outages
- Increased costs to the public when networks need to be rebuilt

In order to determine whether the regulation of fiber optic technicians is necessary, the Colorado Office of Policy, Research and Regulatory Reform (COPRRR) staff requested that the Applicant provide specific examples of harm, which are highlighted below. COPRRR's analysis is provided following each case description.

While additional cases were included in the sunrise application, only those cases that took place in Colorado and involved fiber optic networks are described and included in the analysis below.

Cases of Harm

Case 1

In 2024, two individuals purposefully severed 10 fiber optic cables in Colorado Springs, which caused a widespread phone and internet outage, leaving 40,000 customers without services for 12 hours. The estimated cost of the repair was approximately $250,000.[42]

Analysis

Clearly, consumers were harmed when they lost services for several hours and the telecommunications provider was harmed when it sustained damage totaling $250,000. However, according to news reports, the suspects who damaged the fiber optic cables were stealing scrap metal in the alley where the fiber optic cables were located. There is no evidence that these individuals were or had been employed as fiber optic technicians or were connected to any fiber optic technicians. Therefore, it is unlikely that regulating fiber optic technicians would prevent cases like this.

[42] Brett Yager, "Suspects of damaging fiber-optic cables identified," *Fox21,* February 2, 2023.

Case 2

In 2023, an inexperienced fiber optic technician working for a telecommunications provider knocked out fiber optic service in a 15-story building in Denver when they cut the wrong cable. The connections were lost for 10 hours, and 75 percent of the businesses in the building were impacted. At the time, other fiber optic technicians and a supervisor were at the location.

Analysis

The businesses in the building were harmed when they lost their internet and possibly telephone connections and their ability to do business following an error caused by a fiber optic technician. Experienced fiber optic technicians rarely splice the wrong cable, but errors sometimes happen even with experienced fiber optic technicians. In this case, the fiber optic technician was a new hire, and the supervisor told the fiber optic technician which cable to cut. Either the supervisor or the fiber optic technician should have tested the cable to ensure that it was not live prior to cutting it.

Case 3

A lack of due diligence on the part of a general contractor caused a temporary outage in Northern Colorado when they cut the wrong cable at a large data center north of Denver.

Analysis

In this case, the data center was impacted by the loss of a cable that needed to be repaired. As previously stated, experienced fiber optic technicians rarely splice the wrong cable, but errors sometimes happen even with experienced fiber optic technicians. In this case, the supervisor told the fiber optic technician to cut the cable, and they failed to test the cable to ensure that it was not live. However, the harm to the data center and its customers in this case was minimal since large data centers like this one have redundancy built into their networks, and data can be rerouted through other cables.

Case 4

In 2022, a gas leak caused an explosion that destroyed a home and killed a resident in Gypsum, Colorado. The gas leak occurred when fiber optic cable was being installed underground for a large telecommunications provider.

Analysis

This case involved a large telecommunications provider that contracted with a construction company, which specializes in wired and wireless communications, to connect the town of Gypsum to high-speed internet. In this case, the construction company contacted 811 to have any utility lines marked. However, while the construction company was boring a tunnel to thread a fiber optic line underground, a gas line was compromised, resulting in an explosion that killed one resident. An accident investigation was conducted by local, state and federal authorities: the Eagle County Sheriff's Office, the Colorado Division of Fire Prevention and Control and the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives. Installing fiber optic cable and boring tunnels underground to lay fiber optic cable are two different skill sets. In this case, the damage was not caused by a fiber optic technician.

Case 5 — Westminster

In 2024, three photographs were taken on Church Ranch Boulevard and 104th in Westminster. An unmarked splicing truck and trailer with North Carolina license plates set up at an electrical underground enclosure. The truck was parked on a sidewalk, and it was blocking access to pedestrians, cyclists and people in wheelchairs and other adaptive devices. While a few traffic cones were placed around the vehicle, they did not meet basic expectations for general traffic control.

Analysis

In this case, the fiber optic technicians blocked a public sidewalk which may have inconvenienced or endangered the public. Additionally, traffic cones were not placed at an appropriate distance from the site where the work was being performed, which could result in an accident and possibly damage the fiber optic network. However, no actual harm from this case was reported.

Case 6 — Denver

In 2020, a photograph was taken of an independent contractor who was working for a subcontractor without proper equipment. The image does not demonstrate any evidence of traffic control or personal protective equipment. The fiber optic technician was also not properly entering the manhole, which is a confined space and may be dangerous. In addition, the cables from the truck are strewn across the ground, providing a tripping hazard for pedestrians and risking damage to the cable and the network. Poor practices like this can greatly impact the serviceability and integrity of the cable.

Analysis

In this case, a fiber optic technician is looking into a manhole. As described in the previous paragraph, the individual does not appear to be using appropriate safety precautions, and the cables are spread across the grass close to a sidewalk. While these practices are likely problematic, no actual harm from these issues was reported.

The Applicant also submitted several other pictures, which were taken in Colorado between 2012 and 2024, that demonstrate instances of poor workmanship involving fiber optic cable in Colorado.

- One picture shows a manhole in which fiber optic cables were not labeled, restrained or cared for, and the cables needed to be identified and restrained. The potential harm could be data loss, poor bandwidth and injury to other utility workers entering the manhole. While this picture demonstrates poor workmanship that needed to be redone, no other harm was alleged.

- Four pictures show trays of fibers that are not properly routed or contained, which could potentially cause network outages and impact emergency calls. While these trays demonstrate poor workmanship that needed to be redone, no other harm was alleged.

In the above cases, it is unknown whether the fiber optic technicians involved were working alone or on a crew of several fiber optic technicians and whether they were supervised.

Additionally, COPRRR staff reached out to the Colorado Electrical Board for any non-jurisdictional complaints related to fiber optic technicians or contractors that staff may have received. However, staff could not recall any complaints being filed against fiber optic technicians or contractors.

COPRRR staff also reached out to the Colorado Public Utilities Commission (PUC). Anecdotally, staff in the PUC reported receiving two or three calls from residents complaining about the quality of fiber optic work being performed in the last year. For example, one resident complained that the fiber optic line was not buried deeply enough in their yard, so the homeowner cut into the line when they were gardening. It is unknown whether the complaints were related to an individual fiber optic contractor, or a fiber optic technician or crew employed by a contractor. It is also possible that the trench where the fiber optic cable was buried may have been dug by a construction worker who is not a fiber optic technician. According to PUC staff, the agency rarely receives complaints about fiber optic installations, and two or three complaints in a year is unusual.

Additionally, PUC staff reported cases of gas pipelines and other utilities being damaged in connection to fiber optic projects throughout Colorado. However, construction workers who are not fiber optic technicians are often involved in boring tunnels for fiber optic projects, and no evidence was provided that tied these cases to fiber optic technicians.

COPRRR staff also reached out to the Colorado Broadband Office, which distributes funds to connect unserved or underserved areas of the state to high-speed internet. When grant funds are distributed for these projects, the Colorado Broadband Office sets construction milestones and its staff monitors the work onsite. When staff uncover instances in which these fiber optic installations are not properly done, staff requires the installations to be brought into compliance.

The Colorado Broadband Office reported that it does not receive many complaints against fiber optic technicians. While it receives reports of problems with fiber optic installations, the issues are not related to individual fiber optic technicians.

Finally, COPRRR reached out to three other states that regulate fiber optic technicians. As of this writing, only one response was received, and no cases of harm were provided.

In summary, few cases of harm related to the practice of fiber optic technicians were uncovered during the sunrise review.

Independent Judgment

Sunrise criterion I.5 asks:

> Whether the practitioners of the profession or occupation exercise independent judgment, and whether the public can reasonably be expected to benefit from the direct regulation of the profession or occupation if a practitioner's judgment or practice is limited or subject to the judgment or supervision of others.

Fiber optic technicians often work with a crew of two or more fiber optic technicians. They may be supervised by an experienced fiber optic technician or another professional, or they may work independently.

If a fiber optic technician is working independently, then they must exercise independent judgment. However, fiber optic technicians are typically receiving supervision and direction from other fiber optic technicians and professionals.

Need for Regulation

Sunrise criterion II asks:

> Whether the public needs, and can be reasonably expected to benefit from, an assurance of initial and continuing professional or occupational competence.

Some of the cases of harm provided in the sunrise application are concerning. In particular, one case involved the destruction of a home and the death of a resident in Gypsum. However, the damage that occurred was not caused by fiber optic technicians.

Several other cases demonstrated evidence of poor workmanship that needed to be corrected, but no other harm was alleged. Otherwise, only two cases that could be directly tied to the actions of individual fiber optic technicians provide clear evidence of harm to the public. In each case, a supervisor provided instruction to the fiber optic technician that caused the damage.

As there is little evidence of actual harm, it is unreasonable to require an assurance of initial and continuing professional or occupational competence for the entire profession.

Alternatives to Regulation

Sunrise criterion III asks:

> Whether the public can be adequately protected by other means in a more cost-effective manner.

The Applicant is seeking to require fiber optic technicians to be licensed by the state, which is the most restrictive form of regulation. Since there is little evidence of harm that can be directly tied to an individual fiber optic technician, an intrusive and costly regulatory program is unwarranted.

While formal education beyond high school is not typically a job requirement for fiber optic technicians, some employers require an associate degree in a related field and other employers require certification through a private trade association.

Typically, private certification represents a high level of occupational competence, beyond what is necessary for public protection. Unlike private certification, the purpose of state regulation is to ensure practitioners have the minimum standards necessary to protect the public health, safety and welfare.

An associate degree and private certification are credentials that offer employers some assurance of occupational competence. As academic programs and private certifications are available, an employer has a choice to hire a fiber optic technician without a degree or certification, or not.

An academic degree and private certification provide a market advantage to those who have them. Anyone who does not have an academic degree or private certification must compete with those who do, and when it is important to employers, applicants without these credentials are at a competitive disadvantage.

Since fiber optic technicians are usually trained on the job, employers could also rely on the expertise of an experienced fiber optic technician or a job training program in their company to provide the necessary knowledge and experience. Also, they could rely on experienced fiber optic technicians to supervise and inspect the work of an individual employee.

Individual residents are not likely hiring fiber optic technicians directly, and the telecommunications providers and the companies that are hiring fiber optic technicians should have the ability to vet and train these practitioners.

While little evidence of harm that can be directly tied to individual fiber optic technicians in Colorado was provided during the sunrise review, there are some alternatives in place that can provide an assurance of occupational competence.

Collateral Consequences

Sunrise criterion IV asks:

> Whether the imposition of any disqualifications on applicants for licensure, certification, relicensure, or recertification based on criminal history serves public safety or commercial or consumer protection interests.

The sunrise application proposes that candidates for a fiber optic technician license undergo a criminal history background check and that anyone with a criminal history be prohibited from obtaining a license.

However, only one case of harm related to criminal activity in Colorado was included in the sunrise application, and this case did not involve fiber optic technicians. Therefore, the evidence does not support disqualifying an individual from working as a fiber optic technician on the basis of having a criminal record.

Conclusion

The sunrise application does not provide sufficient evidence to support an expensive, highly restrictive and intrusive regulatory program.

Moreover, as fiber optic technicians are hired by telecommunications companies, construction companies and general contractors and are typically trained on the job, it seems unreasonable to place the regulatory burden on the shoulders of the individual fiber optic technicians. The telecommunications providers and the contractors who employ fiber optic technicians have an interest in ensuring that the individuals performing this work are competent.

That said, the surge in fiber optic installations being performed in an effort to connect the last remaining areas of the state to high-speed internet may have strained the existing workforce and provided opportunities for some unscrupulous contractors. However, COPRRR did not uncover any evidence that these problems are systemic.

Additionally, during the sunrise review, concerns were raised about fiber optic projects in which existing utilities, including gas pipelines, have been damaged. However, much of this harm appears to have involved construction workers who were operating heavy machinery and not fiber optic technicians.

In conclusion, the purpose of state regulation is to ensure that practitioners have the minimum qualifications necessary to protect the health, safety and welfare of the public. With little evidence of harm from individual fiber optic technicians, there is no justification under the sunrise criteria for the state to create a new regulatory program for this occupation.

Recommendation — Do not regulate fiber optic technicians.