

WORKING WITH LANDOWNERS

Rights-of-Way for Power Lines and Access Roads



Tri-State Generation and Transmission Association (Tri-State) owns (wholly or jointly) or has maintenance responsibilities for more than 5,200 miles of transmission line across Colorado, Nebraska, New Mexico and Wyoming. Line crews and substation technicians work to ensure power delivery is safe and reliable.

As a not-for-profit power supplier, Tri-State continues to invest in transmission infrastructure to ensure dependable power delivery to its 44 member cooperatives throughout its four-state service territory. The West's vast power supply network is currently strained and improvements and expansion to the system are essential to enhancing regional power reliability.

Tri-State uses a comprehensive and methodical process to determine the location for new transmission facilities, which involves an interactive process that includes gathering comments and concerns from property owners during a public participation phase.

Not only does Tri-State work with individual landowners along transmission line routes, but for most projects the association also must receive easements from cities and counties, rights-of-way grants from state and tribal entities, and permits and/or easements from federal land agencies.

Right-of-way and easement are interchangeable terms.

Establishing Rights-of-Way

Once a route is selected and the necessary land use permits have been obtained, Tri-State works directly with affected landowners to acquire the necessary power line and access easements for projects.

- Tri-State typically contracts with qualified land management and acquisition consultants to obtain the easements.
- Tri-State also obtains access easements for construction and long-term maintenance of transmission lines.
- Tri-State acquires temporary access or survey permission from landowners to perform various survey activities and possible geotechnical investigations on their property.
- Engineering, environmental and land surveying studies are conducted to complete a detailed assessment of a line's alignment.
- Should a property be subject to a conservation easement, approved uses of a conservation easement typically include power lines and other public utilities.
- Landowners are justly compensated by Tri-State for the granted easement.

Tri-State's objective is to work closely with the landowners to negotiate easement terms. When negotiations are unsuccessful, as an electric utility, Tri-State may have to exercise its eminent domain authority. Fortunately, these are rare cases.

The goal for all projects is to identify a transmission line route that balances the need for reliable electric service with environmental concerns, public acceptance, engineering needs, economics, and legal and regulatory requirements.

The Nuts and Bolts

The width of a transmission line easement is determined based on the voltage of the line, height of structures, spacing between structures, design requirements and safety considerations. Easements are determined by applying engineering specifications to meet the design and safety requirements of the National Electric Safety Code (NESC) and the Rural Utility Service (RUS).

- A right-of-way for both the long-term operation of the power line and short-term construction phase are typically required for new lines. It also addresses access to the line during the facility's operational life.
- Transmission structure types vary from wood or steel. Shapes include H-frames, mono-pole or multi-pole and lattice structures. Different line voltages and terrain characteristics require different types of structures. Sometimes different types of structures are used throughout the length of the line.
 - » Depending on terrain, the structures will be placed about 600 to 1,000 feet apart. Span lengths are maximized where possible.
 - » Structure heights are determined by the type used. Typically, structure types range from 70 to 150 feet tall.
 - » Shorter structures result in more structures per mile.
- In accordance to NESC and the RUS, the conductors (or wires) are never to be less than 27 feet above the ground when the lines reach maximum operational temperatures. Ground clearance will be increased as appropriate to allow for the elevation of the line, snow levels and due to engineering considerations.
- The width of an easement is intended to contain the potential sway of the conductors.
- Tri-State's system consists primarily of 115-kilovolt and 230-kilovolt lines. Easement widths are:
 - » 115-kV: typically 75 - 100 feet
 - » 230-kV: typically 150 feet
- Sometimes two circuits (six wires) are strung on the same structure, which is known as a double-circuit line. An "under build" is when a lower voltage line, usually of distribution voltage, is strung on the same structure as a high-voltage line. The under build is installed below the higher voltage circuit and may have a different configuration.
- Specific details are always provided to landowners once design details are finalized.

Easements and Agriculture

Center Pivots—Tri-State will avoid irrigation equipment to the extent possible. Each individual situation will be worked out with the landowner.

Planting and Harvesting—Tri-State will work with individual landowners to avoid construction during the planting and harvesting seasons. If damage to crops cannot be avoided, compensation for crop loss will be offered.

Livestock—Segments of fences may be removed during line construction, but Tri-State will construct temporary fences and work with landowners to minimize impacts to livestock and their safety.

Undergrounding High-Voltage Power Lines

High-voltage overhead transmission lines are a reliable, low-cost, easily maintained and established method to transport bulk electricity across long distances. Tri-State's line crews have a topnotch performance and safety record for repairing and maintaining its extensive overhead infrastructure.

An underground line is expected to be four to 14 times the cost of an overhead line due to time, materials, process and the use of specialized labor. The environmental impacts of construction also are greater for an underground transmission line than for a comparable overhead line. If a landowner wishes to bury a line, the requesting party must agree to pay for the difference in cost between construction of an overhead line and an underground line.

Electric and Magnetic Fields

Because the use of electric power is so widespread, people are constantly exposed to electric and magnetic fields (EMF). They are invisible lines of force associated with the production, transmission and use of electric power such as those associated with high-voltage transmission lines, secondary power lines, and home wiring and lighting. EMF is highest closest to electrical equipment or devices and fall rapidly with distance.

Many studies of EMF have been conducted but none have identified a mechanism where EMF can cause disease. Considerable research has been devoted to this subject over the past 30 years. More information, questions and answers can be found on the Web site for The National Institute of Environmental Health Sciences:

<http://www.niehs.nih.gov/health/topics/agents/emf/>



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