

San Juan Basin Energy Connect

Transmission System

Transmission lines carry large amounts of electricity at high voltages across long distances and are considered bulk power delivery systems. Once the electricity has been generated at a power facility, it is carried to a substation by a transmission line and then to residential and business consumers via distribution power lines. Voltages on a transmission line typically range from 115 to 500 kV. Distribution lines carry the energy at lower voltages (12.5 to 34.5 kV) until it reaches a small transformer that converts it to a voltage of 110 and 220 volts, suitable for consumer use.

Voltage	Double-Circuit 230 kV		Single-Circuit 230 kV
	Steel Lattice Structure	Steel Mono-Pole Structure	Wood H-Frame Structure
Typical Right-of-Way Width	150 Feet	150 Feet	150 Feet
Typical Distance Between Structures	800–1,200 Feet	800–1,200 Feet	800–1,100 Feet
Typical Structure Height	100–150 Feet	100–150 Feet	65–100 Feet
Typical Structures per Mile	4–6	4–6	4–7
Ground Clearance (beneath conductor under maximum operating conditions)	28 Feet	28 Feet	28 Feet
Minimum Clearance of Equipment to Energized Conductor	14 Feet	14 Feet	14 Feet

Clearances would be maintained in accordance with the National Electric Safety Code.

Design and Construction

Tri-State is proposing to use a combination of steel lattice structures, steel mono-poles and wood H-frame structures. The choice of structure type would be dependent on location and design conditions (e.g., mountainous vs. flat terrain, double- vs. single-circuit construction). The transmission line would use low-corona hardware to minimize audible noise. Structures typically range between 100 and 150 feet tall. Some structures, particularly those crossing over lower voltage transmission lines, may need to be taller than 150 feet.

Tri-State would hire a contractor to construct the transmission lines. Construction is expected to take approximately 18 to 24 months and would be completed in several phases: access development, staging structures, foundation construction, framing and erecting the structures, stringing conductor and reclamation. Several work phases may be in progress simultaneously at different locations along the route.

Electric Field Information

Linear metallic facilities such as pipelines or fences that are relatively close and parallel the transmission lines for appreciable distances should be periodically grounded. Electric fields at ground level would not exceed the limits of the National Electrical Safety Code. While many activities are compatible with transmission line rights-of-way, precautions must be taken near electrical equipment.

Corona is the electrical breakdown of the air into charged particles near high-voltage conductors. The charged particles can cause audible noise as well as radio and television interference, which is more noticeable in wet conditions. Audible noise levels dissipate as the distance increases from the transmission line.

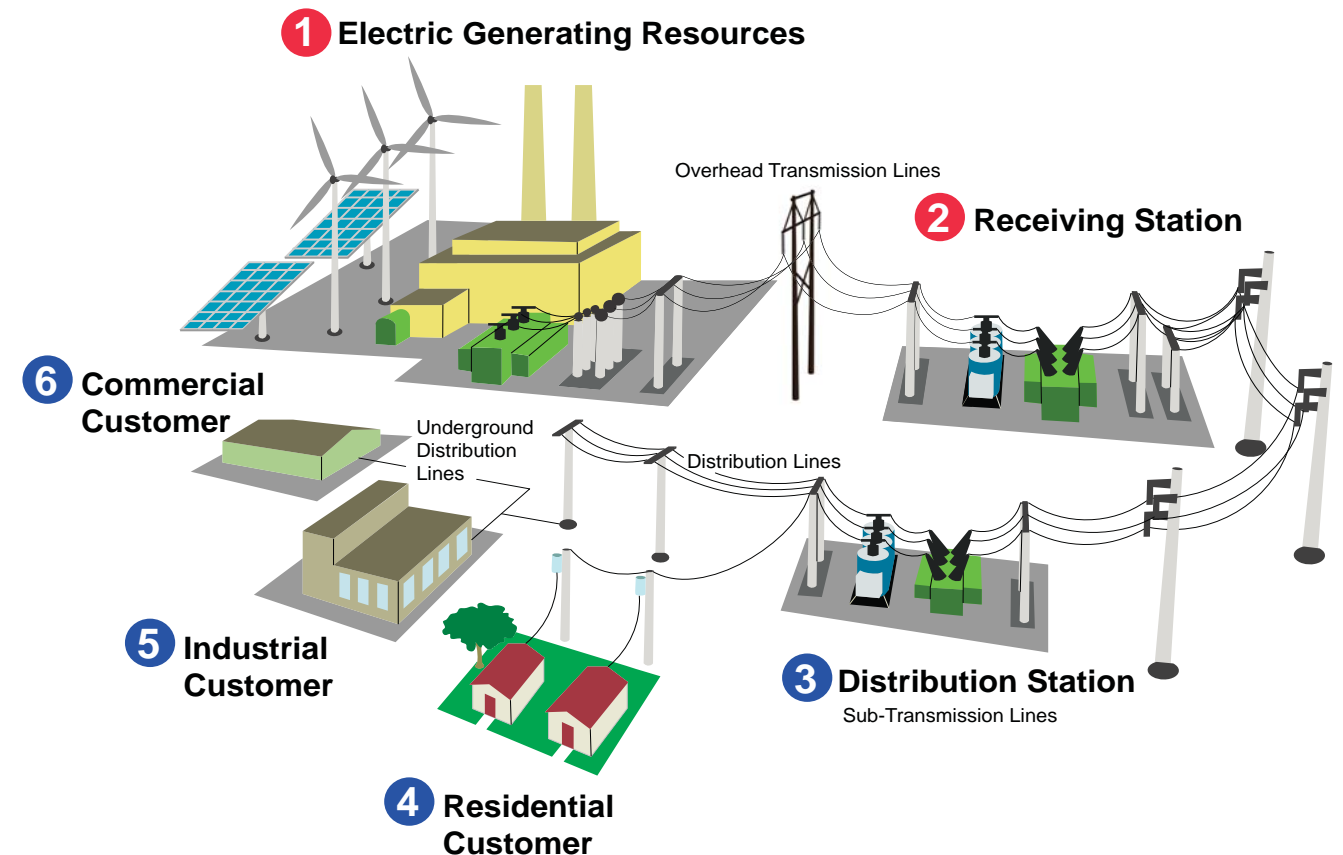
Engineering and Electric Transmission

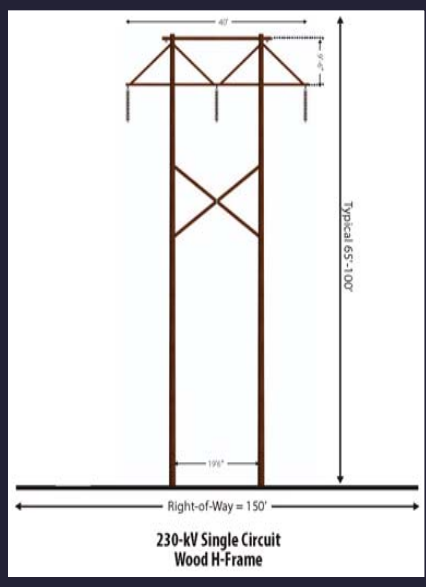
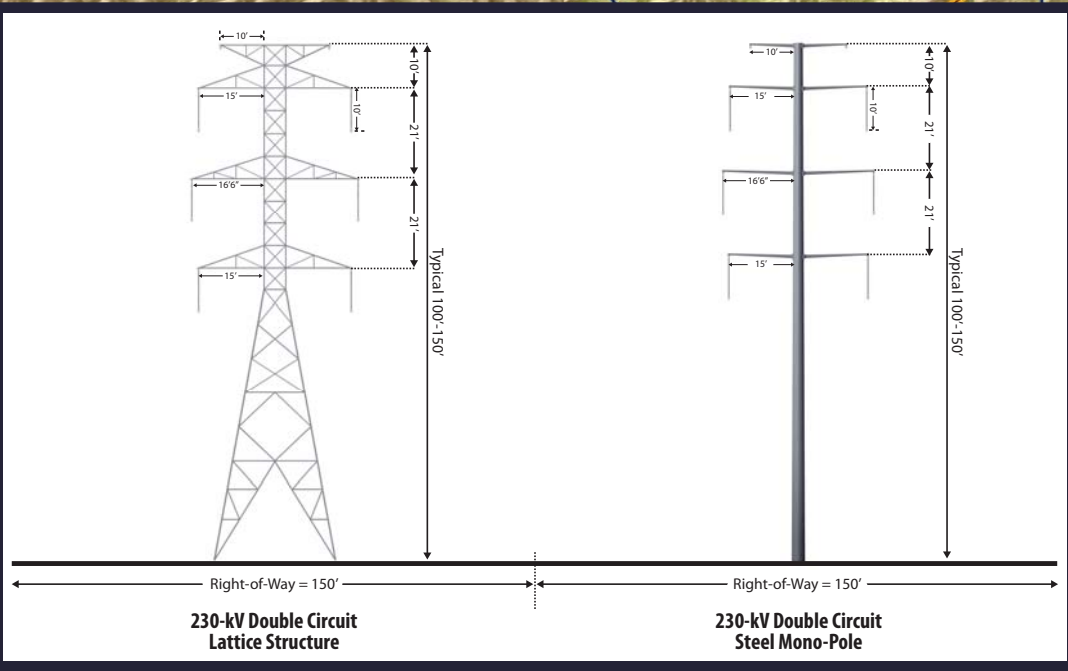
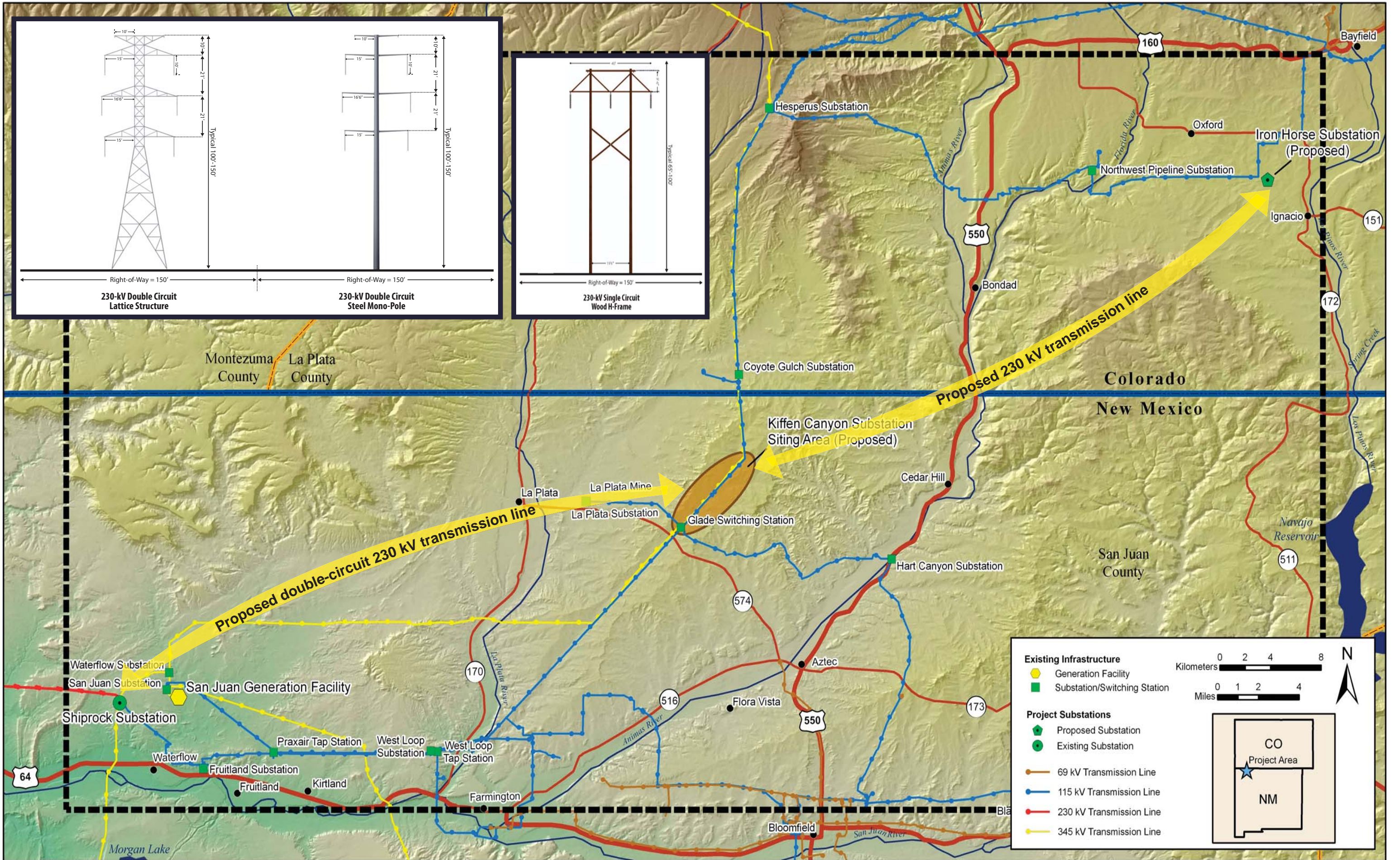
Increasing electric load growth in the San Juan Basin region of Colorado and New Mexico, in residential, commercial and industrial sectors, has put a strain on the existing electrical system.

Tri-State Generation and Transmission Association (Tri-State) is proposing to construct a 230-kilovolt (kV) transmission line from the Farmington area in northwest New Mexico to Ignacio, Colorado. This line and supporting electrical facilities are needed to provide the power delivery infrastructure for the San Juan Basin that will relieve transmission constraints, serve new loads and offer economic development through renewable energy opportunities.

The proposed project would be constructed by Tri-State and includes the following components:

- Approximately 30 miles of new double-circuit 230-kV transmission line from the existing Shiprock Substation to the new Kiffen Canyon Substation near City of Farmington's Glade Switching Station.
- Expansion of the existing Shiprock Substation to accommodate the new 230-kV line termination and installation of additional 345/230-kV transformation equipment.
- The new 230-kV Kiffen Canyon Substation at a location north of the City of Farmington's Glade Switching Station on property that will be acquired by Tri-State.
- Approximately 40 miles of new double- and single-circuit 230-kV transmission line between the proposed Kiffen Canyon Substation and Iron Horse Substation, near Ignacio.
- Expansion of Iron Horse Substation to have termination equipment for the 230-kV line and transformation equipment to step the 230-kV voltage down to 115-kV for interconnection to the area's existing transmission facilities.
- Proposed communication facilities to support operation and maintenance of the transmission lines.





Existing Infrastructure

- Generation Facility
- Substation/Switching Station

Project Substations

- Proposed Substation
- Existing Substation

Transmission Lines

- 69 kV Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- 345 kV Transmission Line

Kilometers 0 2 4 8

Miles 0 1 2 4

CO
Project Area
NM