

# Smooth and Complete Fiber Optic Design

Truckee Donner Public Utility District (PUD) avoided the high cost of poor fiber-optic design by building a single-mode fiber-optic system to improve both data reliability and security for existing infrastructure. The system will also help operators prepare for smart grid and new SCADA technology.

## What did they do?

Truckee Donner PUD operators moved smoothly through the design and planning stages. They used the utility's existing ArcGIS® platform from Esri and the Fiber Manager solution from Esri partner Telvent® to perform location analytics that would determine all the materials needed for its project—from cable footage to the number of splices required for each specific splice box. When utility operators accepted contractor bids for the project, they already had a well-organized plan, complete with a clear understanding of the required materials and cost.

## Do I need this?

An intuitive, visual interface solution, based on ArcGIS technology from Esri®, helps utilities design everything from the actual path of the fiber optics to the assets the fibers will be tied to, like overhead pole lines, underground communication lines, or live electrical conduits. Additionally, the seamless, map-based data format enables operators to determine the best transition points, splice locations, cable sizing, and circuit paths.

## Case Study

### Organization

Truckee Donner Public Utility District (PUD)

### Location

Truckee, California

### Industry

Electric and Water Utility

"We planned a 400,000-foot land fiber network to interconnect our data center with five electrical substations and 42 water stations. From the beginning, we were able to present the contractor with a well-organized plan, complete with map layouts and splice diagrams."

**Ian Fitzgerald**  
IT/GIS Operations Manager  
Truckee Donner PUD

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Need more details?

During the design phase of the fiber network, Truckee Donner PUD operators had to be 100 percent sure that any layout would accommodate existing and future data requirements and system specifications. In the build phase, the district needed documentation that could accurately direct the contractor to construct, splice, and label cable for the system. To address quality control, the district required absolute knowledge of decibel loss for every fiber, cable, and circuit to ensure that construction was completed to contract specifications.

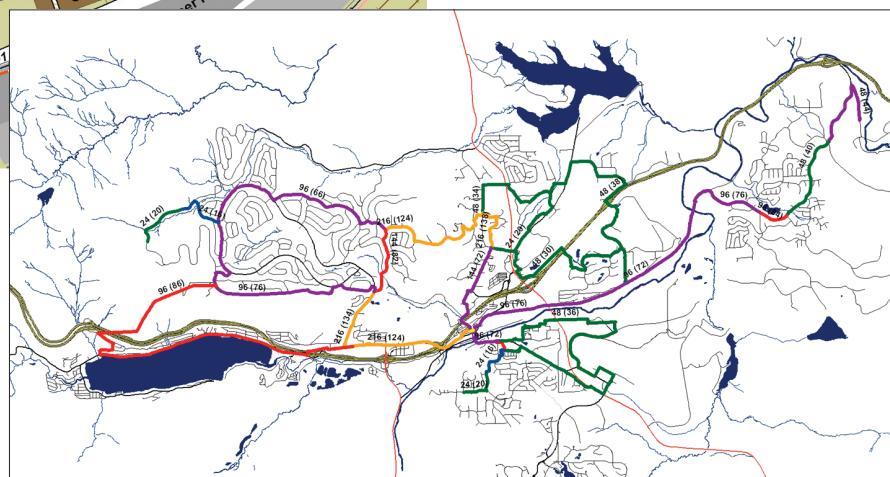
"Fiber optics is one of the most difficult utility networks to design, manage, and quality control," said Ian Fitzgerald, Truckee Donner PUD IT/GIS operations manager. "The ArcGIS software-based solution gave us the information we needed to normalize and standardize the number of cables we keep in stock and purchase the right equipment. Streamlining our inventory needs significantly keeps our stocking costs down and helps ensure we are using the right cables not just for right now, but for our future growth."

The ArcGIS software-based solution provided additional benefits to the staff at Truckee Donner PUD:

- An interactive map helped planners establish correct sizing and monitor the fiber availability of every cable throughout the entire system. Real-time data allowed the utility to identify the locations of any cables of incorrect size and to readjust the sizing before it became a costly mistake.
- Capacity analysis enabled operators to plan ahead to ensure that the utility will not run out of fiber as the city and infrastructure continue to grow. Planning will save both time and money, since replacing fibers after implementation is nearly impossible and extremely expensive.
- Advanced modeling and reporting capabilities provided the contractor with critical information that helped all teams work as efficiently as possible. PUD's splicing contractor commented that in her 20 years in the industry, she had never seen a more organized, prepared, and accurate project.



A map provides detailed design of Truckee Donner's fiber network serving a residential area of downtown Truckee.



ArcGIS enables Truckee Donner staff to visualize fiber paths based on the number of available strands.

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