



# Fiber Optic Valuation

## The need for conformity

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The discovery of fiber optics in 1970 revolutionized the telecommunications industry by the speed of light. However, since the industry failed to make comparable sales and rental data available for fiber optic lines, we have been left to use alternative approaches of value. The process of estimating its fair market value has been challenging, at best. As a result, the price that fiber optic companies pay for utilizing rights of way remains inconsistent.

As real estate professionals, we need clarity and availability of market data for transactions of real property for fiber optic lines. Otherwise, the marketplace will continue accepting a wide variety of methodologies and approaches of value. In this article, we will describe the techniques, approaches of

value, and a sample survey of rents and fees that are often charged for the real property encumbered by fiber optics.

### EVOLUTION OF FIBER OPTIC

In 1970, a team of researchers with Corning Glass introduced fiber optic wire or “optical wave guided fibers” capable of carrying 65,000 times more information than copper wire, through which information carried by a pattern of light waves could be decoded at a destination even 1,000 miles away. In 1977, the first optical phone communication system was installed for a distance of approximately 1.5 miles under downtown Chicago, and each optical fiber carried the equivalent of 672 voice channels. Today, more than 80% of the world’s long-distance traffic is secured over optical fiber cables.

For some time, it was difficult to get fiber optic service without a long wait or agreeing to long-term commitments. But things turned around during the telecom bubble in 2001, when it became apparent that the fiber optic infrastructure was overbuilt. In fact, it was reported that 90% of all the fiber installed in the U.S. was still dark. Since internet and wireless demand has grown significantly since 2008, the current recession has had very little effect on the market for fiber.

### BENEFITS OF FIBER OPTICS

Fiber optics are actually lines of thin glass that can send digital information by transmitting light signals. Thousands of these optical fibers are arranged in bundles and optical cables, protected by an outer covering, called the jacket. Optical fibers can be single-mode fibers that transmit infrared laser light, or multi-mode fibers that transmit infrared light from light-emitting diodes (LEDs).

For comparison, optical fibers have the diameter of a human hair. Each fiber optic line is comprised of three parts. The core is a thin glass center of the fiber where the light travels. The outer optical material surrounding the core is the cladding, which reflects the light back into the core. The plastic coating that protects the fiber from damage and moisture is called the buffer coating.

The benefits of fiber optics are numerous. While most DSL and broad-band cable networks are made up of metal wiring, mostly copper, fiber optics are superior in most technical categories. One is a lower cost, as the same length of optical fiber can be made for much less than copper wire. Optical fibers are thinner and lighter than copper wire and offer a better capacity. Less power is required. In fact, no power is needed to propel the signal in an optical fiber once it has been sent. And because optical fibers have lower signal degradation than copper wire, they offer a better signal.

The rule of thumb in burying fiber lines is three to four feet deep and typically encumbers an area non-exclusively between three to ten feet wide. In addition, protective cable materials are designed for approximately a 40-year lifetime, and the glass fiber inside the cable is good for a millennia, as long as the coatings and plastics used in the cable remain intact. The biggest cause of failure is damage from backhoes or digging up buried underground cables.

The downside, according to experts, is that the installation cost to place fiber optic conduits underground is twice as much as the cost to hang fiber optic cable from the poles. However, more conduits can be placed underground for little additional cost per conduit, and several times more fiber can be installed simultaneously underground than on poles.

### VALUATION OF FIBER OPTIC RIGHTS

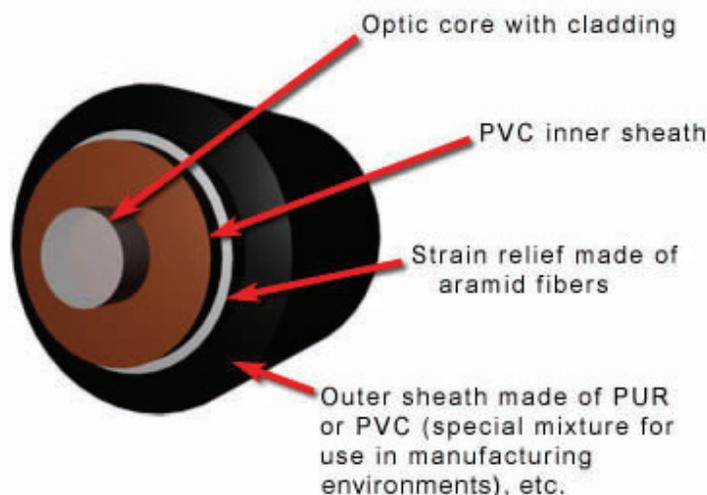
Telecommunication utility corridor rights, including fiber optic rights, are rights in real estate. They are not ownership rights in the business or enterprise. As a result, they should be valued based upon their contribution to the land.

According to a California/Arizona study, the telecommunication corridor right of way market is immature and characterized by divergent methodologies and valuation results. There are a host of reasons for these inconsistencies. One is that there is enormous confidentiality in the agreements and a lack of free-flow market information. Telecommunication companies may rely on inexperienced appraisers who set value rather than take the time to determine what it should be. And if appraisers rely on only one method to solve the appraisal problem or only use a local market for their data, this can lead to a wide variance in the results.

Because fiber optic companies lack the power of eminent domain and would be unable to create a corridor initially, it is imperative that they use existing transportation corridors. In the 1970s, Southern Pacific Railroad was a pioneer in bringing about one of the first fiber optic lines on their property, although laws at the time allowed only a single user and would not allow switches for multiple uses. In the early 1980s, Southern Pacific Railroad changed the name of its fiber optic division to Sprint, the acronym for Southern Pacific Railroad Intelligent Network of Telecommunications. A few years later, GTE acquired Sprint and renamed it GTE-Sprint. Subsequently, the telecommunication industry was deregulated, and the use of fiber optic lines flourished.

### LOCAL GOVERNMENT AND FIBER OPTIC RIGHTS

Local governments are owners of vast amounts of real estate corridors that are highly suitable for multiple uses, including fiber optics. They have a duty not to give away public property for private use without just compensation. In fact, doing so would be a violation of law, which would constitute a gift of public funds. In the same way, the local governments charge rent when private companies use public buildings to make a profit, and the federal government auctions public airways, or requires just compensation for placing communication towers located



on federal lands. Likewise, local governments require reasonable compensation for use of their right of ways.

The Telecommunications Act of 1996 appeared to have limited some governmental agencies' ability to maximize the value of their own right of way properties within public transportation corridors. According to a California Supreme Court ruling (*Williams v. City of Riverside*, 2004), municipalities and local governmental agencies may not charge more than nominal amounts for administrative fees to allow telephone companies or fiber optic companies access into their public rights of way, except when their title to the right of way is clear.

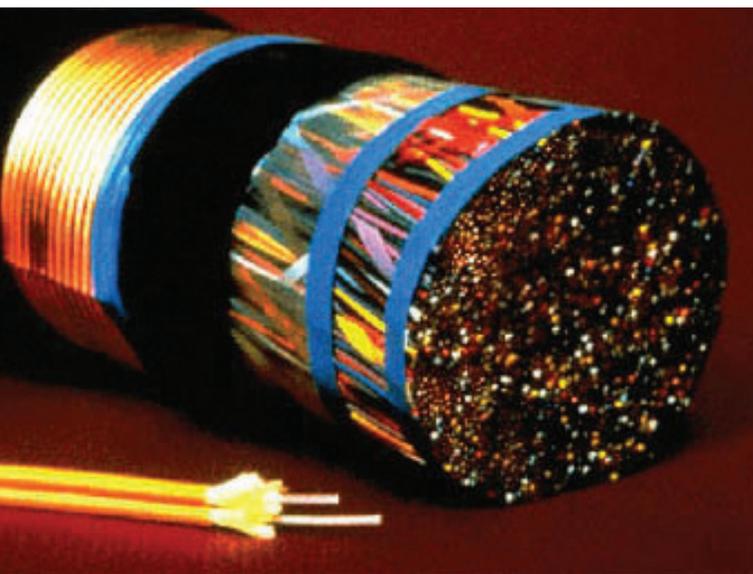
### METHODOLOGIES OF VALUE

The following methodologies are used in appraising the real property when encumbered by fiber optic lines in existing transportation corridors for both transverse and longitudinal takings. The approaches to value are similar to appraising any other transportation corridor, with some variations.

### SURVEY METHOD

The Survey Method includes discussions with right of way owners who have allowed leases or easements for fiber optic lines on their corridors. In addition, further discussions are obtained from users who have fiber optic lines throughout various transportation corridors. These may include those in the private and public sectors.

As you can see by the sample survey, there is a significant range for the purchase of easements and for lease rates of transverse crossings and longitudinal rights of fiber optic lines throughout



For comparison, the optical fiber cable in front has the equivalent information-carrying capacity of the copper cable shown behind.

the country. Based on our survey for acquiring real property for fiber optic lines, we found that the range of values are unacceptably large.

For an easement, the transverse crossing overhead ranges from \$900 to \$2,500, or ATF, while the subsurface is \$1,000 to \$2,500 or ATF. The longitudinal rights range from \$3/lf to \$7.25/lf, or ATF. Annualized leases for a transverse crossing is \$1.75/lf to \$2,722, or ATF. Longitudinal rights are \$0.95/lf to \$5.49/lf, or ATF.

A nominal lease fee may be anywhere from \$850 to \$2,500, while a dark fiber can average \$200 a month for each mile. The encumbered width for a fiber optic line typically ranges from three to ten feet and encumbers the fee simple interest of the transportation corridor by 25% to 50%. Land rates used for leases range from 10% to 12%.

For the most part, the San Diego Gas & Electric Company is a user of transportation corridors only. As such, they do not lease rights of way or provide easements for fiber optic lines. Rather, they secure primarily easements for their gas pipelines and secure easements for their electrical transmission lines at a minimum of \$2,500 for each easement.

According to State of California Executive Order S-23-06, the State of California no longer charges for installing fiber optic lines in their rights of way. This is an attempt to increase state use of broadband networks and advanced communication services that are anticipated to enhance the telemedicine for healthcare, distance learning for education, and better coordination in areas of public safety. However, nominal rates are charged based on administrative fees of \$82 per hour at approximately 30 hours per transaction, equaling a fee of \$2,460 per transaction.

Southern California Edison does not allow the use of longitudinal rights, and the minimal amount of consideration is \$1,000 for administrative expenses per transaction.

### ACROSS-THE-FENCE (ATF)

ATF assumes that the value of the corridor is similar to the value of the adjacent properties. It is based on the Concept of Alternative Use as assignable land segments within the overall corridor. ATF is the Sales Comparison Approach modified to the degree that the shape, size, topography and access of the right of way are disregarded. In fact, many transportation corridor owners use the ATF methodology when appraising real property taken for fiber optic use, both for longitudinal and transverse crossings.

In one case, the California Appeals Court ruled that said trial should have considered the ATF approach, and it was sent back

## Survey of Market Data of Fiber Optic Lines

Location	Easement	Lease (Annualized)
<b>Port of Long Beach</b>	Transverse Crossing- NA Longitudinal Rights – NA	Transverse Crossing - ATF for 3' wide non-exclusive easement with a 50% discount for encumbered vertical rights and applying a 10% land rate Longitudinal Rights - Same as above Minimum \$1,000 fee per year Initial processing fee for project review-\$2,500
<b>Boston MTA</b>	Transverse Crossing Overhead - \$900 Transverse Crossing Subsurface - \$1,200 Longitudinal Rights - \$7.25/lf	Transverse Crossing – NA Longitudinal Rights – NA
<b>Railroad Company</b>	Transverse Crossing – ATF (minimum 10' wide non-exclusive easement) Longitudinal Rights – ATF (minimum 10' wide non-exclusive easement)	Transverse Crossing – ATF (Same as easement and with a 12% land rate) Longitudinal Rights – ATF (same as easement with 12% land rate) Minimum \$2,000 nominal fee for administrative expenses
<b>San Diego Gas &amp; Electric</b>	Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing – NA Longitudinal Rights – NA
<b>Southern Pennsylvania Transportation Authority</b>	Transverse Crossing – NA Longitudinal Rights - \$4.80/lf for 100-200 ft \$3/lf for 201 ft +	Transverse Crossing – 0 to 72-strand capacity: \$2,100 - \$2,722/annually (\$29.17/strand) 73+ Strands capacity - \$37.80/strand/annually Longitudinal Rights – NA
<b>Washington Mutual Area Transit Authority City of Phoenix</b>	Transverse Crossing – NA Longitudinal Rights – NA Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing – NA Longitudinal Rights – 144-strand fiber optic cable (formula) – approximately \$1,305,018/year/mile for 45 miles, or \$5.49/lf Transverse Crossing – NA Longitudinal Rights - \$0.95/lf/year
<b>City of Burbank</b>	Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing – NA Longitudinal Rights - \$10,200 to \$16,200 Minimum charge- One mile; One time connection fees: \$550 to \$1,925 Dark fiber - \$200/fiber/mile/mo.
<b>City of Portland</b>	Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing – NA Longitudinal Rights - \$3.50 to \$4/lf plus annual CPI adjustment
<b>Contra Cost County</b>	Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing - \$1.75/lf Longitudinal Rights - \$1.75/lf
<b>State of California</b>	Transverse Crossing – NA Longitudinal Rights – NA	Transverse Crossing – NA Longitudinal Rights – NA
<b>Southern California Edison</b>	Transverse Crossing – ATF after adjusting 25% to 50% for vertical rights Longitudinal Rights – NA	Transverse Crossing – ATF after discounting 25% to 50% for allocation of vertical rights Longitudinal Rights – NA

to the lower court to retry the case. Other important decisions affecting the valuation of fiber optics in transportation corridors include a case involving a Southern Pacific Transportation Company corridor, which entitled them only nominal damages as a result of that diminished value of a transverse crossing.

One of the most basic principles of eminent domain law that pertains to the appraisal of transportation corridors is that the search for fair market value depends on what the property owner has lost as opposed to what the taking agency has gained or avoided.

### ACROSS THE BOARD OR REGION

Another popular approach in the valuation of real property of fiber optic lines is referred to as “Across the Board” or “Across the Region,” a methodology created in the early days of the industry’s growth.

Several opportunities arose for various railroads and other right of way companies where fiber optics had a window of opportunity to beat out the competition and secure laying thousands of miles of fiber optics in agreements that needed to close in a very short period of time. In such cases, for example, negotiators for Southern Pacific Transportation Company still needed some idea as to the value of real estate these fiber optic lines were encumbering along their corridors, although there was not enough time to do a complete appraisal on the proposed fiber optic line. At that time, management would call on the appraisal department to arrive at rough ATF values from records in the files for assistance. Over the years, Southern Pacific Transportation Company arrived at Across the Board values for fiber optic lines, equaling \$10,000 an acre for a rural area and \$25,000 an acre for urban areas. In fact, Southern Pacific Transportation Company continued using these Across the Board numbers for nearly two decades (1980’s-1990’s), and

they proved to be very reliable and comparable to ATF values on long fiber optic lines.

Another acceptable unit of comparison for the Across the Board approach is price per mile. But in so doing, the appraiser needs to consider the encumbered width and other conditions of the agreement. The width of the fiber optic corridors would range from three to ten feet and include non-exclusive agreements.

## MARKET APPROACH

The final approach in appraising the fair market value of real property for fiber optic lines is the Market Approach. This requires obtaining comparable leases or easements of fiber optic lines. These comparables are adjusted for necessary market adjustments, including terms and conditions of the agreement, changing market conditions, location differences, and for differences of physical characteristics between the comparable and the subject property.

The Market Approach is often recognized as the most reliable method for appraising real property for fiber optic lines. However, there are pros and cons. The pro for using the Market Approach is that a corridor is a specific use that is almost never related to uses of adjacent properties. The cons are threefold. One is that part of the business component of the enterprise is included in the Market Value Approach. Another is that the Market Approach does not fully consider economic differences for location adjustments. Also, it takes into account project influence, which cannot be considered in eminent domain appraisals.

In 1983, there was an appellate case in Texas where the railroad protested the school district's valuation methodology for assessing the value of railroad easements solely upon the comparable sales approach. The court went on to observe that the Market Approach was of little value when there are no comparables.

## CONCLUSION

There are reasons why different methodologies are used in appraising the real property of fiber optics. The rapidly growing telecommunications industry continues to be hampered by the blockage of free flowing information due to confidential agreements. Without a standard appraisal methodology, it's no surprise to see such a wide range of fees charged across different markets.

Until there is some level of uniformity in the units and elements of comparison used in appraising real property for fiber optic lines, their fair market values will fall short of its very definition. Instead, values will be based on uninformed negotiations and misrepresentation of its fair market value. As real estate professionals, it is incumbent upon us to consider the best available data. However, until market data becomes more widely available for transactions of real property for fiber optic lines, the marketplace will continue accepting a host of methodologies and approaches of value.

## References

The Birth of Fiber Optics, [www.inventors.about.com](http://www.inventors.about.com).

How Fiber Optics work," Craig Freudenrich, Ph.D., [www.communication.howstuffworks.com](http://www.communication.howstuffworks.com)

Fiber Optics Finally Recovering from the Last Recession, Fiber Optic Association Newsletter, [www.vfoa.org](http://www.vfoa.org), October 2010.

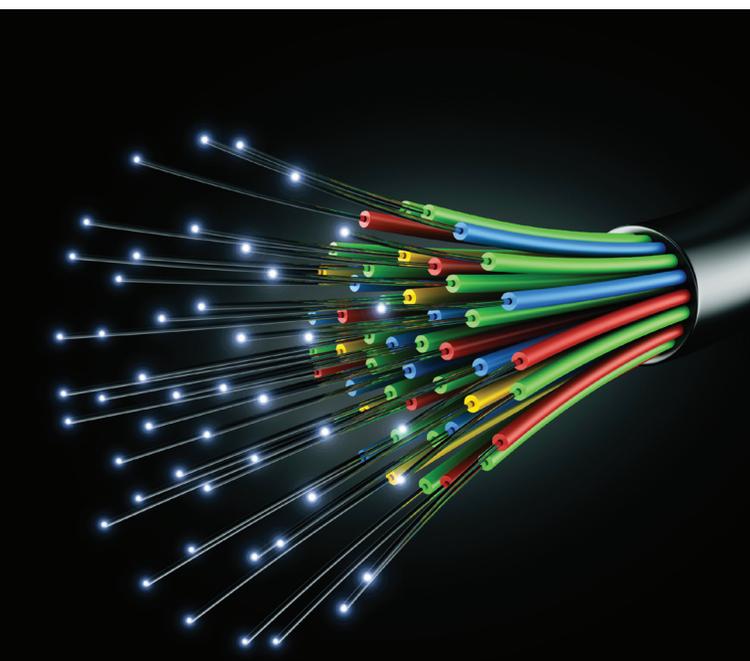
Charles Bucaria, Sr., MAI, and Robert Kuhs, Esq., "Fiber Optic Communication Corridor Right-of-Way Valuation Methodology," Right of Way Magazine, November/December 2002.

Barry A. Diskin and Liz Citron, "A Corridor Within a Corridor – a Case Study for Fiber Optics Corridor Valuation," Journal of Property Valuation and Taxation, Fall 2002.

SPTCo. vs. Santa Fe Pacific Pipelines, (1999) 74 Cal App 4th 1232.

People ex rel. Dept. of Transportation vs. SPTCo (1978) 84 Cal App. 3d 315. People vs. SPTCo, Supra, 84 Cal App. 3d 315, 324.; and United States vs. Virginia E. & P. Company (1961), 365 US 624, 633.

Missouri Pacific Railroad Company vs. Midland Independent School District, 647 S.W. 2d 62 (Tex) App-El Paso 1983.



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