

Fiber Asset Ownership

Fiber Optic Overview

Platte River has a regional fiber optic network that stretches from Fort Collins to Longmont and from Estes Park to Loveland. Fiber optic cables ring each of the four cities and can be used to provide telecommunications connectivity. The ring configuration creates a diverse and redundant communications path. Long haul fiber optic cables interconnect the local fiber optic loops to allow communication between the local loops. Two long hauls also provide redundant and diverse pathways between the local loops in Fort Collins, Longmont, and Loveland.

Estes Park currently has a single fiber optic connection back to the fiber system. Platte River's electric operations use microwave transmission as the redundant connection to Estes Park. There are no backups for the other services that Estes Park relies on such as telephones, 911, or the internet. A project is underway to construct a second long haul between Estes Park and Loveland. This new fiber optic cable will provide a diverse and redundant high speed pathway to Estes Park.

The following diagram provides a high level representation of the fiber system. Below each cable designation are two numbers. The first number represents the quantity of fiber optic strands that are dedicated to Platte River's electric operations. The second number represents the extra capacity that was installed to support city operations and telecommunications development.

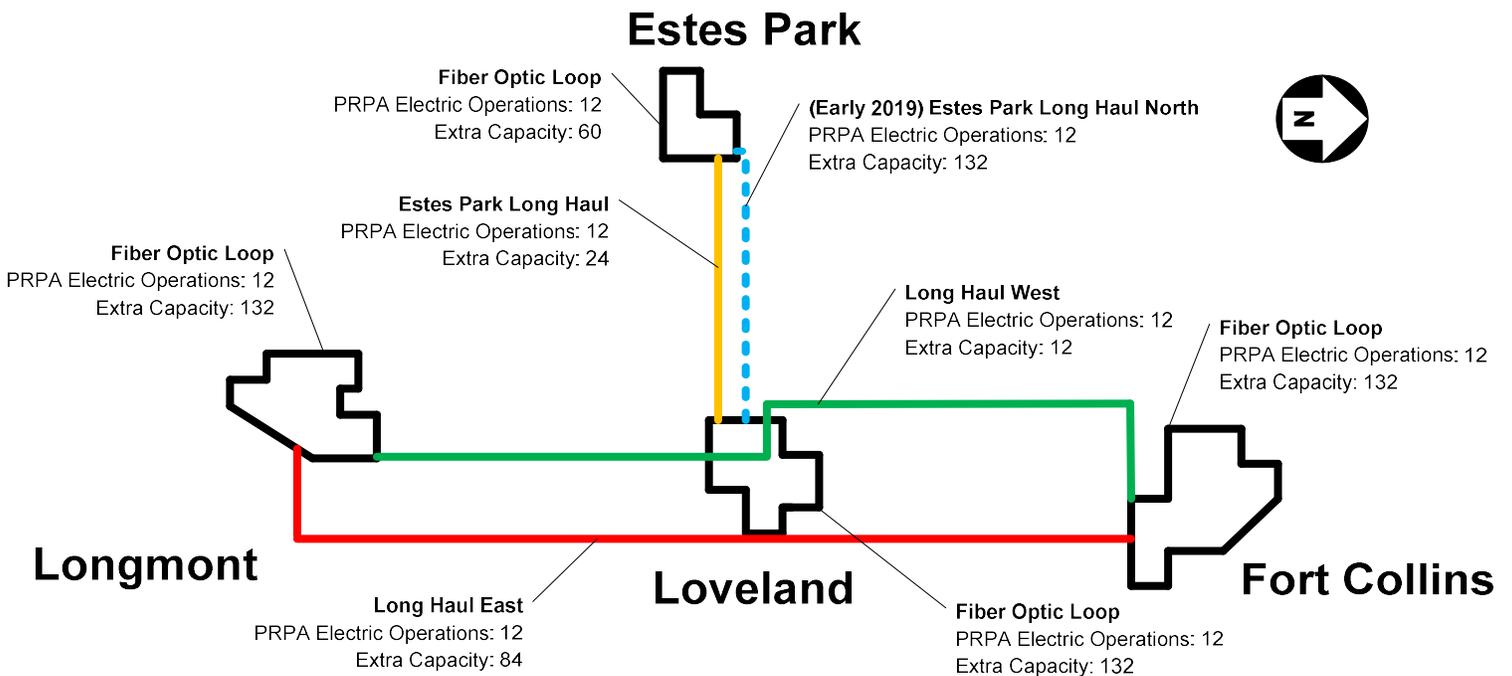


Figure 1

Brief History of Fiber Development

Prior to 1998, Platte River used radios, power line carrier, and leased phone lines to operate the bulk electric system. Most companies at the time used T1's running at speeds of 1.44 Mbps and the average individual accessed the internet through a modem. In the late 1990's, Platte River constructed an extensive fiber optic network. The primary purpose of the fiber network was to modernize the communications support for electric operations. Platte River only needed 12 fiber strands for internal communications but the incremental cost of adding additional fiber capacity was minimal. The Board, therefore, decided to add the excess capacity, anticipating that the excess would be useful to the member municipalities in the future.

The initial intent of the Board is demonstrated in Resolution 21-97. The resolution appropriated funds necessary for the construction of fiber loops in Fort Collins, Longmont, Loveland, and the long hauls. The resolution references a memo dated April 15 that discusses the fiber project. The memo states:

- "This seems like a unique opportunity to leverage a Platte River-only project into a broader activity that will help the four cities with their telecommunications needs and plans."
- "Platte River's role would be to build/fund the fiber optic cable loops around each of the four cities, reserve a small number of fibers for electric system communications, and turn the balance of the fiber over to the respective cities to manage for their use in city operations or telecommunication development."

During the year following the April, 1997 adoption of Resolution 21-97 the concept of transferring the excess fiber to the member municipalities changed.

Longmont had intended to provide communication services to its residents, and had begun installing fiber optic cable before Platte River started construction on their loops. Platte River eventually purchased the portion of the ring that Longmont had installed and incorporated it into the larger project. When the extra capacity became available, Longmont willingly took ownership.¹ Fort Collins and Loveland believed that a joint regional approach to telecommunications would be best and, therefore, asked Platte River to take the lead in establishing joint communication services. Eventually, Estes Park, Fort Collins, and Loveland settled on having Platte River continue to own the local loops and lease dark fiber on their behalf.

During its meeting in October, 1998, the Board adopted resolution 17-98 which authorized the General Manager to negotiate dark fiber leases. Platte River embarked on an effort to lease dark fiber on the fiber optic loops in Fort Collins, Loveland, and eventually Estes Park. Pursuant to this direction, Platte River entered a 20 year franchise agreement with Fort Collins. No similar agreements were entered with the other three municipalities but, for dark fiber leasing

¹ It should be noted that Resolution 9-98 only authorized the General Manager to "transfer ownership of 132 fibers in the Longmont fiber optic loop". This was in line with the 1997 resolution which directed that only "the balance of the fiber" would be turned over. The Division Manager of Power System Operations made sure that the entire fiber optic loop (the cable) was not transferred to Longmont. Resolution 9-98 has been misunderstood as saying that Platte River gave Longmont title to the cable but that is not the case. The distinction between "cable" and "fiber" becomes important in the context of control splicing activities.

activity, Platte River used the Fort Collins franchise as a model for lease payments to Loveland and Estes Park. Concurrently, Longmont began to plan for the creation of a local broadband utility.

In 2005, the Colorado General Assembly enacted Senate Bill 152 which placed significant restrictions on the offering and/or facilitation of telecommunications services by local government. The definition of “local government” includes “political subdivision[s] of this state.”² All four of the member municipalities have voted to exclude themselves from the restrictions of SB 152.

Fiber Asset Accounting Treatment

As a result of Resolution 9-98, the transfer of title to Longmont’s 132 fiber strands was recorded as a contribution of assets to Longmont and was reflected as a reduction of equity. The value of the 132 fiber strands was calculated based on the total cost to install Longmont’s fiber cable multiplied by the ratio of fibers (132/144). Similarly, the fiber optic loops in Estes Park, Fort Collins, and Loveland were treated as a contribution of assets to each municipality. However, the transaction was recorded on an annual basis over a twenty-year period, since title had not been transferred and Platte River retained ownership of the municipalities’ extra capacity. Furthermore, this avoided cost sharing of these assets amongst all of the municipalities. This accounting treatment is in opposition to the treatment of other typical Platte River assets, for example transmission lines or substations, in which costs are allocated through rates and collected in line with municipal ownership share of Platte River.

Alternatively, Platte River could have assumed that the majority of the installation costs were needed to support Platte River’s electric operations requirements, regardless of the number of fiber strands, thus keeping the majority of the cost shared and recorded as Platte River’s asset.

Operational Concerns

The fiber optic system plays an essential role in the reliable operation of Platte River’s transmission system. Power System Operations uses a SCADA system to monitor and control the transmission system. The SCADA system utilizes the fiber optic system to communicate with RTUs located in substations throughout the four municipalities. Protective relaying, which will trip a circuit breaker and de-energize a line to both protect the transmission line from damage and ensure a level of safety, depends on the fiber optic loops to provide communication connectivity to neighboring substations.

Fiber optic rings are designed to withstand a single cut without affecting the dependant communications. A cut in two or more locations on the ring will result in a loss of high speed relaying as well as a loss of control and situational awareness, resulting in an increased risk to both the transmission system and system reliability.

² In September, 2015, the Board convened an Executive Session to discuss legal issues associated with the fiber system.

Fiber optic system outages can happen for many reasons but can be grouped into two main categories: controllable and uncontrollable outages. Uncontrollable outages include instances where the fiber optic cable is damaged as a result of natural disasters, weather, or excavation damage to cable. In these instances, the only option is to react to the event.

Broadly, controllable outages can be either intentional or unintentional and are the result of planned activities on the fiber optic system. It is crucial that a single entity take a holistic system-wide view, when managing physical work being performed on the fiber optic system, to prevent or minimize controllable outages. System-wide management activities may include:

- Coordinating when fiber work is performed to ensure that two or more activities are not performed simultaneously and open the fiber ring in multiple places.
- Coordinating fiber work with Power System Operations, Substation Engineering, and Platte River Telecommunications in order to ensure that no other conditions are present which could be compounded by a fiber outage.
- Setting system-wide fiber optic standards for equipment, splicing, and the condition of hand holes and splice cases.
- Communicating with electric operations so that they know when work is being performed on the fiber system.
- Ensuring that common standards are implemented across the entire fiber system by having a single entity perform physical fiber work on the fiber optic loop cables.

Platte River is in the best position to provide system-wide fiber optic loop management. As long as the operation and protection of the transmission system depends on the fiber system, the transmission and fiber system should be managed together.

Fiber Asset Ownership Proposed

A number of factors have recently merged making it imperative that we discuss what type of framework Platte River and the municipalities might want to employ for the future of the fiber network. For example, each of the municipalities have voted to exempt themselves for the restrictions of S.B. 152 and three of the municipalities are engaged in internal studies of providing broadband services. Longmont already provides broadband services. Technological advances have been made that may allow the municipalities to use the existing fiber more efficiently through consolidated efforts.

There may be multiple means to proceed to systematically address the future of the fiber network, but the focus of this whitepaper is on the ownership of the fiber asset. A structured approach is needed to clarify the interactions and responsibilities for the fiber asset to provide a balance between electric operations, communication services and S.B. 152 restrictions.

Previous Board Resolutions use the terms “fiber optic loop” and “extra capacity” or “balance of fiber” when discussing the fiber optic system. For the purpose of this discussion, it is useful to define these terms. The “*fiber optic loop*” refers to the base cable and the fiber strands that Platte River needs for electric operations. Initially, a Platte River-only project was planned to install the fiber optic loop base cable. The required capacity for the fiber optic loop’s base cable was determined to be 12 strands of fiber.

The “*extra capacity*” or “*balance of fiber*” refers to the fiber optic strands contained within the fiber optic loop base cable that are in excess of the 12 strands required for electric operations. For example, in Fort Collins, Longmont, and Loveland, the extra capacity is 132 fibers out of the total 144 strands of fiber optic loop cable.

The term “long haul” refers to the fiber optic cables that interconnect the fiber optic loops located within each municipality.

Platte River currently owns:

- The fiber optic loop base cables in Estes Park, Fort Collins, Loveland, and Longmont;
- The extra capacity fibers in Estes Park, Fort Collins, and Loveland; and
- The long haul cables.

Longmont owns 132 fiber strands of extra capacity in the Longmont fiber optic loop.

Platte River is proposing that the municipalities will take title to their extra capacity in the fiber system, while Platte River will retain ownership of twelve fibers and the fiber optic loop base cables. This arrangement has the following advantages: 1) Due to their exemption from the S.B. 152 restrictions, the municipalities will have more flexibility in the types of services that they can provide and the classes of customers able to receive those services. 2) In order to limit the types of controllable outages discussed above, Platte River will oversee the entire fiber optic system and coordinate fiber work with electric operations activities.

Transferring ownership of the extra capacity in the long haul cables presents unique issues. While a fiber optic loop resides within the boundary of a single municipality, a long haul cable extends between multiple municipalities. It seems impractical and inefficient to try to subdivide a long haul cable. If the Board and the municipalities wish to pursue the proposed ownership it may make sense for the municipalities to explore opportunities for joint ownership of the long-haul assets.

Platte River believes that it would be beneficial for the municipalities to designate a single entity that could take title and make decisions pertaining to the jointly owned long haul extra capacity. Platte River would continue to maintain the long haul base cables and the new long haul entity would become the single point of contact for long haul decisions and activities such as:

- Holding title to the fiber strands
- Approving fiber allocation
- Assigning cost allocation
- Distributing revenue

There may be multiple potential options for designating a single entity to hold title to the long haul extra capacity, but these options are best explored by the municipalities and their legal staffs.

Next Steps

The next step involves a more interactive presentation at the October Board meeting after the Board has had time to digest this proposal. During the coming months the Board can provide feedback on the proposed fiber asset ownership, which involves transferring title to much of the

fiber assets to the municipalities with Platte River remaining active as a manager of the assets to ensure the continued integrity of the fiber.

The determination of cost allocation for fiber expenditures is currently being reviewed and may result in a different allocation than what was previously used, depending on Board preference. As mentioned earlier, previous original construction costs were treated as a reduction to equity that was based on an allocation of the installed fiber costs. However, incremental cost or retaining the fiber system as a Platte River asset may be more applicable today.

Platte River has been asked to investigate methods to more efficiently utilize our fiber optic system. The current process of leasing dark fiber results in an inefficient use of the fiber, since each lease consumes a minimum of two fibers from the pool. Assuming that each customer only leases one pair, the extra capacity can only accommodate 66 customers. In actuality, this number is much lower because the municipalities use many fibers for their internal operations and customers lease multiple pairs.

Platte River is working on an RFP which will investigate available technologies to lease circuits instead of dark fiber. The RFP can become the basis of a future business plan. The RFP will investigate:

- Business models
- Emerging technology
- Markets and take rates
- Cost accounting
- Capital costs
- O&M costs
- Staffing requirements