

# Memorandum

To: Eric Peterson, Town Manager  
From: Chris Johnston, IT Manager  
Date: April 1, 2026  
Subject: Fiber Loop Project – Update and Next Steps



## Context

Fiber connectivity has been a consideration for the town since at least 2017. Previous memos on the town fiber loop project (see attached) emphasized that the purpose of the fiber loop, and more generally fiber connectivity, was to support the need for a reliable and fast internet connection for applications, web access, records, and services. In 2026, this need is even more evident, as the capabilities and requirements of online services and our reliance on them have continued to expand.

At staff's recommendation, the Town of Hillsborough has planned, budgeted, and put aside funds for the design, construction, implementation, and maintenance of a private town-owned fiber loop. The intention was for the infrastructure to be wholly owned and operated by the town for security, reliability, and independence.

The original plan envisioned sharing costs with our partners at Orange County, who were also planning the creation of their own fiber loop. Due to changes at the county level, that partnership did not continue. Orange County has proceeded on its own with designing a plan involving running wires along existing power and telephone poles rather than trenching and laying underground fiber due to issues with cost and complexity of drilling through the rock found throughout our area. They are currently wrapping up trimming trees near the proposed first run and will start construction soon.

## Where We Are Now

In the intervening decade, the town has continued to rely on DSL internet connectivity at our seven main locations: Town Hall, Town Hall Annex, Police Department and Annex, Water Treatment Plant, Wastewater Treatment Plant, Adron Thompson, and the Highway 86 Facility.

This connection is asynchronous, which means download and upload speeds are different. Users at each of the sites have access to internet with download speeds that go "up to" 300Mbps but upload speeds as low as 10Mbps. For large file uploads such as videos or investigations data, this means that file uploads can take hours and must be run overnight. In practice, download speeds are also rarely as fast as advertised, often closer to 50-100Mbps.

These two factors directly affect the productivity of employees at all our sites and across departments. This is especially egregious as users at home can enjoy speeds twice or three times as fast as those they get at town facilities.

In addition to download and upload speeds, reliability has also been an issue. In the five months that I have been with the town, we have had three major outages that have affected services, including one that affected the Water Treatment Plant.

## Our Options

While some aspects of the situation have changed significantly since this discussion began ten years ago, we still have a few options to address this issue.

### 1. Building a Town-Owned Fiber Loop

This option involves the design, construction, and implementation of a town-owned private fiber loop. Previous staff in this role have worked hard to explore this option both with private partners (MCNC) and state partners (NCDIT). Loop designs have been created and planned out, with a phased approach being the preferred option to connect key facilities in a staggered manner to control costs (see most recent attached fiber loop plan from NCDIT).

Building a town-owned fiber loop would provide many benefits to the Town of Hillsborough. It would provide speed, connectivity, and reliability. It could also provide increased security and dependability, depending on how it was designed and operated. This would be a long-term investment and could potentially provide longstanding benefits to the town.

However, this option has several challenges, both generally and more specifically to our town. These include:

- a. **Costs** – The 2019 memo (see attached) estimated connecting all buildings in town at a cost of \$2.7M. Since then the costs to design, bid out, construct, and maintain the fiber loop over the life of the project have only increased. The financial investment for a project of this scale is significant and would require more funds than the \$500,000 currently set aside. For reference, Orange County is currently running aerial fiber over 3 miles to its buildings in downtown, a project that is budgeted to be \$500,000 on its own. Due to high costs, the project was envisioned to be broken into phases (see most recent fiber loop plan from NCDIT) to lessen the upfront financial burden. Phase one would connect downtown locations (Red loop - Town Hall, Town Annex, PD, Gold Park) and then other phases could be completed as funds became available. Additionally, some of the costs had been planned to be shared with Orange County, but with our projects diverging, those savings may not be realized.
- b. **Geographic Considerations** – Hillsborough's unique geography and geology, along with our facilities being spread out across town, present problems for construction. Crossing rivers and railroad tracks both present challenges that would slow implementation and increase costs. Mitigating these challenges by limiting our interactions with these features would either increase costs through inefficient routing or reduce redundancy by creating single points of failure.
- c. **Construction Time** – Projects of this scale require extensive permitting, coordination, and staged construction. For context, Orange County's project has been ongoing for years, and they are only now in the implementation phase. The timeline for a project like this would easily be in the 3–5-year range before any increased connection performance could be realized. Additionally, due to the phased deployment approach used to mitigate costs, our satellite offices (Water Treatment Plant, Wastewater Treatment Plant, Hwy 86 Facility) would be even further out from bringing a fiber connection online.
- d. **Employee Capacity** – We have a limited number of staff who would need to take on an increased workload that would involve design, permitting, planning, and implementation as well as post implementation locates, maintenance, upgrades, and field work.

## 2. Leasing Fiber Service

Alternatively, the town could lease existing fiber service from telecom providers in our area. There has been a rapid increase in the number of fiber providers available in the last few years, increasing competition and lowering costs.

I have reached out to multiple vendors regarding providing fiber for our seven main locations. Two enterprise-grade providers, Spectrum and Brightspeed, have provided the best connection quotes. Other newer providers such as Google and Lumos do not currently have fiber at all seven of our main locations, which would make them less desirable providers.

The benefits of leasing services rather than constructing our own network include:

- a. **Costs** – Currently the town is paying about \$26,500 annually to Spectrum for DSL internet. Brightspeed has quoted \$66,000 annually for fiber internet, with no upfront or one-time conversion costs. This is an increase of \$39,500 annually, which is less than the \$50,000 we are currently setting aside for the fiber construction project. Though this would increase our costs for internet service by 150%, this change is considerably less expensive than the option of building and maintaining our own fiber network, while still providing the same benefits to town employees. If we no longer built our own fiber network, we would have roughly \$500,000 of accrued funds to use on other needs or to return to savings.
- b. **Service-Level Agreements** – With private fiber we would be responsible for overseeing uptime and fixing any problems with our fiber loop. If a backhoe took out a fiber line, we would be the ones to have to quickly deploy resources to repair it, requiring extra employee time and training. Service-level agreements for both Spectrum and Brightspeed are above 99.999% uptime, with Spectrum claiming to provide 100% uptime.
- c. **Capital Expenses vs. Operating Expenses** – Both Spectrum and Brightspeed will need to build out fiber to reach some of our outlying town buildings, such as those at Dimmocks Mill Road. To offset the cost of construction, we would enter into a five-year lease agreement. This would provide budgeting consistency during the duration of the lease. With Brightspeed, the buildout costs for the sites that are currently not serviced would be paid off in year 4 of 5 and could be lowered in subsequent years.
- d. **Reduced Liability and Risk** – One of the largest issues with building our own fiber network is dealing with Hillsborough’s unique geographic and geologic considerations. With leased fiber, we would not need to work through getting over the river, encroaching on the railroad right of way, or crossing over highways and thoroughfares. The internet service provider would be responsible for maintaining insurance for the fiber lines, in addition to managing and maintaining their service-level agreements.
- e. **Quicker Time to Connect** – If we lease service from a provider, our employees will begin experiencing the productivity and other benefits of fast and functioning fiber sooner than the years it would take to construct our fiber loop. The estimate from Brightspeed was activation at 90 days.
- f. **Upgrades** – A service provider would oversee upgrading their infrastructure as new technologies became available, providing faster speeds and additional benefits.
- g. **Flexibility** – The town currently leases multiple buildings and units, including at Cornerstone. If we needed to add additional fiber through a lease, we would reach out

and have that fiber brought online. If we wanted to bring our own fiber to those buildings, we would need to start the construction process over again.

**3. Do Nothing**

We also have the option to do nothing. We currently have functioning internet at all our sites. Users can complete their work, albeit with limitations, and this option would not incur additional costs outside of regular annual increases.

**Recommendation**

Based on the above considerations, my recommendation is that we move forward with leasing fiber services. The work completed by previous staff members to develop the option of building a town-owned fiber loop was important and contributed to our current understanding of the situation. Since then, additional fiber vendors have joined the local market and costs have decreased. By not owning the fiber ourselves, we would give up control over security and other aspects, however users would get faster internet in a few months rather than years from now. We would also not be responsible for repairs, locate requests, and other maintenance and upgrade items that an internet service provider has the bandwidth and experience to handle.

Cc: Jen Della Valle, Administrative Services Director  
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