

BRINGING HIGH SPEED BROADBAND TO ALBURGH VT



11/10/2019

Matrix Design Group Proposal to Alburgh, VT

Matrix Design Group's proposal to design, build, maintain and operate
a FTTH network at our expense in Alburgh, VT.



November 10, 2020

Town of Alburgh
1 North Main Street
Alburgh, VT 05440
Attention: Select Board

Dear Select Board Members,

Matrix Design Group is pleased to provide this proposal to Design, Build and Operate a GPON FTTH network for the Town of Alburgh at our expense.

Matrix Design Group and our sister company Millennium Communications Group were founded over 25-years ago. Both companies are privately held with the same principal owners. Matrix can handle the engineering requirements of any fiber project, including the planning, permitting, design, and project management of the installation of our proposed fiber network on budget and ahead of schedule.

Millennium Communications Group handles the installation and electronics for fiber and technology projects. Combined our two companies can handle the "design" (Matrix) and "build" (Millennium) of any fiber project or as we like to say the ability to take any fiber project "from Concept to Completion."

During the past 25-years we've done projects such as building the fiber network for Rutgers University, data centers for ADP, network operations centers for Homeland Security and recently two multi-million dollar Smart Grids for Public Service of New Jersey. We have designed and built 10 FTTH Networks for rural New England towns (9 in Vermont and the Town of Leverett in MA) and are in the process of building 6 more (4 in Vermont for Burlington Telecom and the Towns of Petersham and Shrewsbury in MA). Our top billing customers include AT&T, Level 3 (now part of CenturyLink/Lumen), and Verizon which also happen to be the three largest Internet providers in the US and they choose to do business with us.

Matrix Design Group designed, built and managed the first nine towns built for EC Fiber in Vermont. We put in place the billing systems and customer service and tech support policies and protocols. After three years of operation we handed over control of the network to a new company, Valley Net, formed for this specific purpose by the EC Fiber cooperative of towns.

Under the Matrix Plan the Town of Alburgh would be responsible for paying for the utility make-ready costs, a place to house and power the network electronics, and traffic safety details during make-ready. That's pretty much it. Matrix would design, build and operate

the GPON FTTH network at our expense. Matrix would also give the Town the option to purchase the network after 3-years.

Due to the nature of the work and for simplification's sake - this proposal is being submitted on behalf of Matrix Design Group. However, included in this submission is also information on Millennium Communications Group so that the Select Board can better understand the depth of our combined resources and experience.

Matrix Design Group looks forward to working with the Town of Alburgh to help create a FTTH network that would include the following:

- Matrix Design Group and sister company Millennium Communications would Design, Build and Operate a GPON FTTH network for the Town of Alburgh at our expense
- **The Matrix Plan would require no State funds going directly to Matrix. All State or Federal grants would be going to cover the requirements of the Town of Alburgh.**
- The Town of Alburgh would have the option to purchase the completed network for **\$3,562,666** after 3-years of operation (**buy-out price based upon 76.5 miles of network build passing 1,440 buildings**). The Town of Alburgh would also have the option to purchase after 20-years for just \$10.
- Town would be responsible for make-ready costs, traffic control details during make-ready and place to house and power network electronics plus miscellaneous legal and other costs
- On an on-going basis the Town would be responsible for maintaining the pole attachment surety bond, the yearly utility pole rental fees and power to the network electronics (all of which to be paid for via a fee added to subscriber's monthly bill)
- **Matrix would offer residents a Standard High Speed Internet Service (up to 100 Mbps symmetrical) for \$95 / month and an Enhanced High Speed Internet Service (up to 200 Mbps symmetrical) for \$155 / month**
- The Town of Alburgh would have control over the Standard Internet Tier pricing. The rate of \$95 per month would be locked in for 2-years. Thereafter Matrix would only be able to raise the rates by that's year's CPI (Consumer Price Index) without approval from the Town
- Matrix would offer residents a VoIP line for an additional \$20 / month
- An 802.11 AC WiFi router will be optional for a charge of \$5 / month
- Subscriber would pay a \$400 installation fee (split into two payments) and have a 24-month commitment. If the subscriber also wanted a VoIP line then the installation fee would be \$500 (since we would also be installing a battery back-up unit)

This proposal is designed to minimize or eliminate any tax impact on the citizens of Alburgh.

Due to our experience Matrix Design Group is uniquely qualified to provide this scope of work for the Town. No firm better understands the unique problems facing a rural New



England town trying to build a FTTH network. We have gained this real-world experience and understanding from 25-years of building thousands of miles of fiber networks.

We are currently building a FTTH network in Petersham, MA which has been designed by Matrix and which will be built and operated by Matrix under almost the same terms as our offer to the Town of Alburgh. We highly recommend contacting Petersham to see how they regard their partnership with Matrix Design Group and the benefits it is bringing to their community:

Chip Bull
Chair Petersham Broadband MLP
(978) 724-3339 Home
(978) 413-8089 Cell
chipbull@gmail.com

Matrix Design Group hopes to put our experience to work for the Town of Alburgh.

Thank you for the opportunity to submit this proposal for consideration.

Sincerely,

Chris Lynch
Director, Business Development



Alburgh Executive Summary

- **Matrix Design Group would design, build, maintain and operate a standards based FTTH network in Alburgh at our expense. The estimated value of Matrix's investment in this project would be over \$2.73 million.**
- **The Town of Alburgh would be responsible mainly for securing the right of way for our fiber on the utility poles and providing a place to house and power the network electronics. The Town would own clear title to all of the items which the Town would be financing.**
- **The proposal is based upon 76.5 miles of fiber network build passing 1,440 buildings.**
- **Matrix is proposing this solution with the idea we would be passing all homes in Alburgh whether the homeowner is taking service or not. However, where we build fiber is dependent upon the Town providing the right of way. Certain areas of Alburgh may be excluded at the Town's discretion based upon estimated cost of "make-ready."**
- **It is estimated that Alburgh's responsibilities under this plan could cost as low as \$49,000 with the remaining financed via a VEDA loan which could be paid for via a \$10.50 monthly charge added to subscriber's bills.**
- **Any State or Federal funds or grants would go directly to Alburgh to minimize the economic cost and taxpayer impact of this business model.**
- **This proposal is specifically designed to minimize or eliminate any tax impact on the citizens of Alburgh.**
- **Matrix would require at least 460 subscribers signing up during the pre-subscription period before beginning construction of the GPON FTTH network (roughly a take-rate of 32%)**
- **The Town would have the option to purchase the fiber network after three years of operation. That purchase price would come down by a set amount each year for 17-years until after year 20 it would be just \$10.**

- **Matrix would offer residents Standard High Speed Internet Service (up to 100 Mbps symmetrical) for \$95 / month and Enhanced High Speed Internet Service (up to 200 Mbps symmetrical) for \$155 / month**
- **There are no “data caps”**
- **The Town of Alburgh would have control over the Standard Internet Tier pricing. The rate of \$95 per month would be locked in for 2-years. Thereafter Matrix would only be able to raise the rates by that year’s CPI (Consumer Price Index) without approval from the Town**
- **Matrix guarantees that our Standard Internet tier will meet or exceed the FCC’s definition of broadband (currently 25 Mbps down and 3 Mbps up) for the life of the agreement.**
- **Matrix fully supports Net Neutrality and will not sell subscribers private data to any third party. Nor will we favor one web site over another.**
- **A VoIP (Voice over Internet Protocol) telephone line can be added for just \$20**
- **Based upon past experience of building 10 rural New England Towns – Matrix estimates the time to build the GPON FTTH network for Alburgh to be between 18-24 months. Because Matrix would be owning and operating the network we would be able to “light up” subscribers as we build. That means subscribers in Town could start seeing broadband service in as little as 10 months.**

Town of Alburgh Proposal

Matrix Design Group is pleased to provide this proposal to the Town of Alburgh. This proposal is for Matrix to Design, Build and Operate a GPON FTTH (fiber to the home) Network at our own expense. The plan is designed to minimize or eliminate any tax impact to the residents of Alburgh.

The Town would be responsible for all aspects of the utility pole owners "Make-ready" process including but not limited to pole data survey, utility company pole applications and surety bonds, joint walk-out with utility companies, actual utility company make-ready work, and police details during make-ready. The Town would also be responsible for a place to house and power the network electronics.

The proposal is based upon Matrix building 76.5 miles of fiber network passing 1,440 buildings.

The estimated total overall cost to the Town of Alburgh for utility company make-ready work based upon an estimated 1,709 poles would be **\$769,050**.

The Town would also be responsible for providing a secure area with clean power to house the network electronics. Matrix will assist the Town with specifications for any bids needed to insure a suitable space. The estimated cost to provide a suitable space for the network electronics is **\$100,000**. The costs could be much less if an area in an existing municipal building is utilized for this purpose.

Once again Matrix Design Group would Design, Build and Operate a GPON FTTH Network at OUR OWN EXPENSE. This would include the traffic control details needed during construction.

The cost estimate breakdown for the Town of Alburgh's expenses for this project would be as follows;

- **\$769,050** for utility company pole attachment and make-ready process
- **\$100,000** for place to house and power network electronics

Estimated total of \$869,050

Information on how the Town of Alburgh could pay for this is included in the next section.

Based upon past experience of building 10 rural New England Towns – Matrix estimates the time to build the GPON FTTH network for Alburgh to be between 18-24 months. Because Matrix would be owning and operating the network we would be able to "light up" subscribers as we build. That means subscribers in Town could start seeing broadband service in as little as 10 months.

The fees for a Standard Aerial Fiber installation of FTTH service to Subscribers during a three (3) month pre-subscription period established by Matrix and agreed to by the Town shall be **\$400**. The fee could be broken into two payments of **\$200** each. The first could be due while the make-ready work is being done and be fully refundable. The second payment of **\$200** would be due just prior to construction and could be financed over a period of a year by Matrix with payments added to the subscriber's monthly bill. The fee includes a standard fiber drop to home and standard ONT installation. Subscribers signing up during the pre-subscription period shall commit to a 24-month minimum term of service.

If a subscriber wanted a VoIP line the installation fee would be **\$500**. The extra \$100 would go towards the installation of a battery back-up unit rated for 8 hours of battery so that a dial tone would be present even if power is lost.

Matrix would require at least **460 subscribers** signing up during the pre-subscription period before beginning construction of the GPON FTTH network. **That's a take-rate of about 32% of the buildings in Alburgh.**

It is expected that the Matrix plan will serve between 96% to 100% of the residents of Alburgh.

Subscribers requesting service after the three (3) month pre-subscription period **or who do not wish to commit to a 24-month minimum term of service** shall pay a **\$1500** fee for a Standard Fiber Installation (includes fiber Drop to home, ONT and installation).

The Town would have the option to purchase the completed network for an agreed upon amount after the third year of operation. Based on the estimated 76.5 miles of network and 1,440 buildings - the buy-out amount should be approximately **\$3,562,666**. After that third anniversary the purchase price would then decrease by **\$209,568** each year thereafter. After 20-years the buy-out amount would be **\$10**.

If the Town does not exercise the option to purchase after 20-years then the assets of the network would revert permanently to Matrix Design Group. The Town of Alburgh is under no obligation to exercise this option to purchase.

The Matrix Plan has been reviewed by Goulet, Salvidio & Associates, P.C. Certified Public Accountants (perhaps the leading CPA firm for Municipal Lighting Plants in Massachusetts). They conclude that the Matrix Plan under accepted accounting standards would be accounted as a Capital Lease (see attached letter in next section).

As far as the subscribers - there are two (2) residential service tiers:

Standard Internet: Up to 100 Mbps Internet connection for \$95/month.

Enhanced Internet: Up to 200 Mbps Internet connection for \$155/month.



Matrix Design Group would be able to offer custom services ranging from 100 Mbps Symmetrical to 10 Gbps Symmetrical to subscribers wishing such **dedicated bandwidth** offerings.

Matrix Design Group will also offer a Disadvantaged Student tier of 25 Mbps for \$45 per month for any family with a student who is income eligible under the National School Lunch Program.

Matrix Design Group will lock in all rates for a period of two years. Thereafter, Matrix will agree to limit any future price increases to the Standard Internet Tier to that year's CPI (Consumer Price Index) increase set by the US Department of Labor and Statistics. Any price increase above the CPI for the Standard Internet Tier would have to be approved by the Town of Alburgh.

Internet and VoIP: A VoIP line will allow for unlimited local and long distance calling (all United States and Canada). The VoIP service will come with standard features including but not limited to Caller ID, Call Waiting, 3-Way Calling, etc. Cost to add a VoIP line would be \$20/month. A second VoIP line may be ordered for an additional \$20/month.

Subscribers at time of installation may opt for a Calix GigaCenter 844E 802.11 AC WiFi Router for an additional equipment charge of \$5/month.

Pricing does not include any applicable taxes or Municipal fee. The Municipal fee would be used to pay for the yearly pole rentals, surety bonds and miscellaneous Municipal expenses. The Municipal fee would be set by the Town.

The pricing also does not include any loan repayment fee that might be added to subscriber's bills.

General Subscriber Terms and Conditions: The following are partial general Terms and Conditions of Use for Residential Broadband Service:

- Two year agreement required if customer signs up during three-month pre-subscription period.
- An adult 18 years of age or older must be present during the installation of services.
- Price applies to base monthly rate only; excludes optional services and installation charges.
- Customer will be responsible for the installation of necessary conduit if none is available.
- Payments 30 days past due will result in termination of service. A reconnection fee of \$20.00 will be charged for any service disconnected due to non-payment.
- Pets must be restrained or otherwise kept away from the installer(s) until work is complete.
- Electronic equipment is and shall remain property of Matrix.



- Failure to allow for equipment removal upon termination of services, or damaged equipment, shall result in a \$500.00 fee.
- Internet service and fees will be billed on a monthly basis.
- Except for the ONT, battery back-up unit (if applicable) and service drop, the Customer is responsible, at its expense, for the installation, maintenance and repair of all equipment and wiring on the Customer's premises to the point of connection, as specified by Matrix.

Miscellaneous:

The Matrix proposal is based upon using existing utility pole routes. No underground served areas are included in the plan. If new utility poles were installed those poles would be paid for by and remain the property of the Town. Any work done on underground facilities by Matrix would be done at a mutually agreed cost.

House drops would be 300' from the road either aerially or via useable customer owned conduit. Drops longer than 300' may have additional charges.

All physical assets of the GPON FTTH network would be placed into a new LLC to facilitate transfer of ownership if the Town decides to exercise their option to purchase the network.

How Alburgh Could Finance Their Part

The estimated total overall cost to the Town of Alburgh for utility company make-ready work based upon an estimated 1,709 poles would be **\$769,050**. (Please note that this figure also includes both the Pole Data Survey and Route Strand Mapping work.)

The Town would also be responsible for providing a secure area with clean power to house the network electronics. Matrix will assist the Town with specifications for any bids needed to insure a suitable space. The estimated cost to provide a suitable space for the network electronics is **\$100,000**. The costs could be much less if an area in an existing municipal building is utilized for this purpose.

Once again Matrix Design Group would Design, Build and Operate a GPON FTTH Network at OUR OWN EXPENSE. This would include the traffic control details needed during construction.

The cost estimate breakdown for the Town of Alburgh's expenses for this project would be as follows;

- **\$769,050** for utility company pole attachment and make-ready process
- **\$100,000** for place to house and power network electronics

Estimated total of \$869,050

The first step would be to do a route Strand Map.

Matrix would create Route Strand Map on behalf of the Town to help insure pole attachment applications are created in most efficient manner. **Rate \$.08 per foot**. This cost is included in the make-ready estimate above.

Matrix would then handle the utility pole and preparing and shepherding the pole attachment applications at a rate of **\$3 per pole**. Matrix would require doing this work to reduce or eliminate any potential delays. It is estimated that the Town has 1,709 utility poles. Please note that this does not include the costs of the utility pole attachment applications fees. The application preparation and application fees are included in the total make-ready estimate above.

It is not Matrix Design Group's place to suggest the best way to finance the Town's responsibilities but merely hope to advice on the paths that may exist.

Please note that the total overall cost for this projected fiber build would be over \$3.6 million with Matrix Design Group being responsible for roughly 70% of that total. That 70% could be utilized to satisfy any State or Federal "matching funds" requirements. Such as for Vermont's Connectivity Initiative.

Let's say (conservatively) that Alburgh along with Matrix applies for a grant through Vermont's Connectivity Initiative and received **\$100,000** (again speculation but it is feasible and the reason these funds were put in place). That would further reduce the Town's responsibility to **\$769,050**. However, with the uncertainty surrounding State budgets due to COVID-19 it may be wisest not to count on these funds.

It may be possible to fund the majority of that amount through the VEDA Broadband Expansion Program. Our understanding is the Town would have to put up 10% which would be **\$86,900** which would leave the amount to be financed through VEDA at **\$782,150**. Matrix understands that the funds recently spent on the Utility Pole Survey and Feasibility Study could be credited against the Town's 10% which would reduce the amount Alburgh would have to put up to about **\$49,302**.

The Town could request that Matrix Design Group add an additional "VEDA Repayment" charge of \$10.50 to each subscriber's monthly bill. Under such an arrangement financing the \$782,150 at a 7% interest rate for 10-years would require about 864 subscribers out of 1,440 (a 60% take-rate) to satisfy the loan repayment.

Municipal Leases may also be options. Please find attached some information on MLC, a local Vermont vendor based in Grand Isle. Under a Municipal Lease the upfront, out of pocket expense to the Town and the amount added to the subscriber's monthly bill may be much less. Lease rates for Alburgh have been requested.

**GOULET, SALVIDIO
& ASSOCIATES, P.C.**

CERTIFIED PUBLIC ACCOUNTANTS

January 2, 2018

Mr. Chip Bull, Chairman
Petersham Broadband MLP
2 South Main St
PO Box 486
Petersham, MA 01366

As requested we have reviewed the Matrix Design Group Contact.

It is our position that this contract represents a purchase of equipment that under the current accounting standards should be accounted for as a Capital Lease (ASU 842-10).

Specifics are as follows:

If the lease meets one or more of the following criteria it is accounted for as capital lease

1. Lease term is 75% or more of the estimated economic life of the underlying asset
2. Present value of the lease payments equals or exceeds 90% or more of the fair value of the underlying assets
3. Transfer of ownership to the lessee
4. Lease contains a bargain purchase option

Although the lease Accounting standards are changing effective for 2018 those changes are making it much harder to record leases as operating leases and are advocating for all leases to be recorded as Capital leases, therefore we don't anticipate the new rules to effect Petersham Broadband MLP.

Regards,



Tracy Vaughan, CPA

324 Grove Street Worcester, MA 01605 • 54 East Main Street Webster, MA 01570

Tel: 508.757.5957 • Fax: 1.508.422.0883 • Email: admin@gsamycpa.com • Web: www.gsamycpa.com



Municipal Leasing Consultants
 7 Old Town Lane
 Grand Isle, VT 05458
 (802) 372-8435
 Fax (802) 372-4775
www.PowerOfLeasing.com

Municipal Lease vs. Bond Issues

	Municipal Lease	Bond Issue
Voter Approval	Voter approval not needed. <ul style="list-style-type: none"> Funding comes from annual operating budget Non-appropriation clause provides cancellation provision if future funds are not available 	Need voter approval. <ul style="list-style-type: none"> Risk loss of referendum Cost of election and advertising Cost of delay, inflation
Issuance Cost	A lease APR compares favorably with Bond issues when issuance costs and staff time are taken into consideration.	Issuance cost will be high and measurably affects true borrowing rates. Issuance cost is 1-2% and includes fees for items such as: <ul style="list-style-type: none"> Bond counsel Underwriter Rating Agency Printing costs Reserve fund of Bond financing
Term	Proves effective for terms 20 years and under less than \$30 million .	Appropriate for large issues and for long terms to lock in low rates.



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	Municipal Lease	Bond Issue
Documentation	Less documentation is simpler and the process moves faster . Staff time and soft costs are minimized. There is a single investor.	Bond issuance process is slow , consumes staff time and incurs hidden expenses and overhead costs . There are multiple investors.
Fees	No additional fees or reporting requirements. No Reserve Fund.	Costs continue after bonds are sold: <ul style="list-style-type: none">• Trustee fees• Compliance reports• Footnote disclosure and added audit fees• Periodic rating agency reviews and fees
Covenants	Leases renew on a year-to-year basis and are dependent on annual operation budget for funding thus are not considered debt. Keeps future bond alternatives open.	Restricts future bond issues because of covenant constraints.
Buy-Out	Early buyout options are available on any payment date.	Generally will have call provisions with prepayment penalties after a period of time.

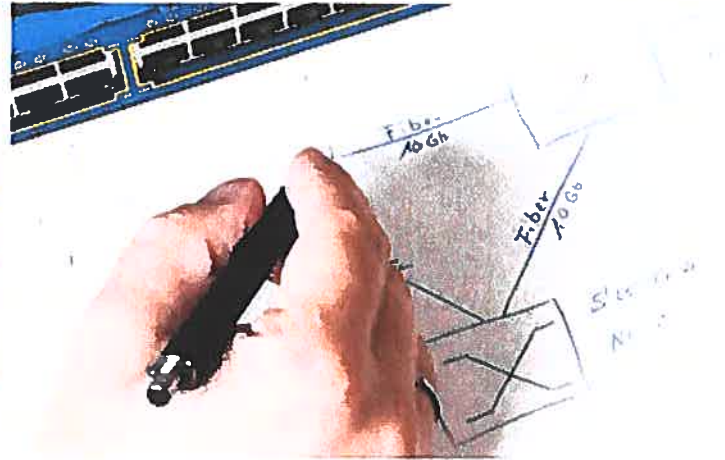


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	Municipal Lease	Bond Issue
Dollar Amount	Finance only what is needed. 100% financing.	Bond issues may not exactly match capital needs. Excess bond proceeds may end up in general fund and earn less than the borrowing rate or general funds will be used to make up balance of cash needed.
Termination	Provides ability to terminate without penalty if funding is not available.	Commits the government entity to fixed payments regardless of local economy cycles.
Useful Life	Matches expected useful life of leased property to the term of lease.	Bond term may exceed life of equipment.
Payments	Flexible payments structured to start when project accepted/installed. Designed to meet your needs (monthly, quarterly, semi-annually or annually).	Typically semi-annual only payments start prior to project acceptance.
Rates	Fixed rates quoted prior to funding, typically held for 30 days. Rate lock option available.	Exact rates unknown prior to funding.



From Concept To Completion



Serving all landscapes across the country, we specialize in fiber optic network deployments, civil engineering, and complete broadband solutions. Our mission is to enable communities, cooperatives, municipalities, and utilities the ability to provide best-in-class broadband communications networks. From feasibility studies, budgeting, underground conduit and aerial cabling, to bridge crossings and outside plant construction, Matrix will provide everything from concept to completion.

Our Experience

As a full service civil engineering and telecommunications design firm, we will perform a variety of public and private sector projects ranging from complete communications networks to storm water management strategies. Whether it's planning the migration of a legacy copper plant, designing a new Fiber To The Premises (FTTP) network, or providing turnkey outside plant managed services, Matrix provides value and savings by being the only go to source for all your project needs.

Our Staff

Our professional staff strives to understand the complexities of each project in order to develop an efficient and effective engineering solution. Our success is built on providing a transparent project environment where clients and their partners are actively involved in the process. We offer unmatched professionalism through a stringent quality control program. Matrix is dedicated to delivering the best services that meet our customers' needs.

Our Promise

We are dedicated to providing next generation technology to all of our industries. We strive to deliver an infrastructure capable of handling the fastest broadband so that our clients can reap the benefits of having the most reliable network. By having Matrix design and engineer a communications system capable of handling big data, our clients get a fast, reliable network infrastructure capable of growing with their business operation.

In addition, we will provide civil engineering services that help our clients solve their toughest challenges. From storm water and environmental services to transportation and traffic engineering and planning, we strive to serve our markets with the utmost quality to deliver the most robust project solutions.





Client: ECFiber

Project: East Central Vermont Community Fiber-Optic Network

Location: Vermont

Background

Having been continually overlooked in their quest for adequate broadband service by the incumbent service providers, 23 towns in east central Vermont banded together in 2008 to explore building a community owned fiber optic network. As the traditional carriers did not find it cost effective or profitable enough to provide high speed bandwidth in their towns, this group of communities decided to take control of the situation. Their cause has resonated throughout rural communities all over the country.

East central Vermont is made up of some of the most rural communities in the United States. These communities recognize that reliable broadband is more than just a matter of profitability; in some cases it's about the very survival of their communities and the rural way of life. The collection of towns formed an organization, known as ECFiber, and through grass roots action in their respective communities, they sought out and received overwhelming community support to build and run their own Fiber To The Home Network (FTTH). When they needed the expertise to help them carry out the plan, they found it in Matrix Design Group.

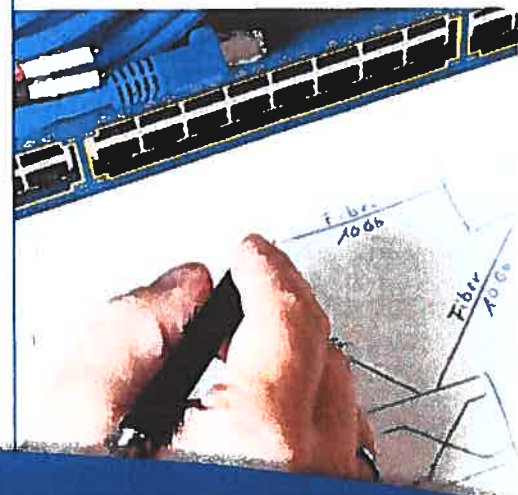
Solution

Matrix Design Group began working with the ECFiber Governing Board, helping to identify the right network design to suit the needs of the community today and tomorrow. Matrix designed a robust network that would connect all 23 towns and all of the homes and businesses within the towns to the outside world. Additionally, Matrix provided capital budgeting oversight for the network plan, including preparation of the financial documents necessary to go to the public markets and managerial support at multiple meetings, both internally and externally.

When the public bond market collapsed, Matrix, without missing a step, redesigned the network to match the much more limited resources available to the project; resources that relied on local grass roots funding by the very people that would use the network. Matrix used its years of experience in designing, building, and operating complex fiber based networks to totally redesign the network to suit the very limited budgets. Although just as viable as the original design, the new design captured the essence of what Matrix is all about; designing and building to meet our client needs, within their budget. This new network, which is operational today, combines innovative thinking, solid engineering and cost effective construction techniques, to deliver world class FTTH service to rural communities in Vermont.

"Matrix has provided an invaluable service to the citizens of East Central Vermont. Our ambitious plan to take control of our future broadband needs was met by a company that stepped right up and made themselves an integral part of our team. We're grateful for their guidance and contribution to our project. Without their truly innovative design, we may not be where we are today, delivering real broadband to areas of our State that may have never gotten it otherwise"

Loredo Sola,
Chairman, ECFiber





Client: Vermont Telecommunications Authority (VTA)

Project: "Middle-Mile" Fiber Optic Broadband Network

Location: Vermont

Background

The VTA, an independent agency of the State of Vermont, was created in 2007 for the purpose of expanding access to broadband and mobile telecommunication services for Vermont residents. As a small, rural state with rugged terrain, Vermont has difficulty attracting broadband Internet providers, who are often unable to build profitable business models for serving the state. The VTA's goal was the development of a 773 "middle-mile" fiber-optic network in Southern, Central, and Northeastern Vermont. The project would connect over 340 community anchor institutions in the project area, encompassing seven of Vermont's fourteen counties.

In 2011, the National Telecommunications and Information Administration (NTIA) awarded VTA with a \$33.4 million dollar grant from the Broadband Technology Opportunities Program. This accomplishment allowed VTA to start soliciting Engineering and Design firms to design open fiber optic networks that would provide data transport services up to 1 Gbps to community anchor institutions, government agencies, and "last-mile" providers throughout the project area.

Solution

Matrix Design Group was selected as an engineering and design consultant to design 27.4 miles of fiber optic infrastructure from Hardwick to Irasburg. In addition to the design of the fiber optic network, Matrix provided additional support services including verification of pole line and underground routes, GIS data collection of pole stock and potential customer sites, preparation of make-ready applications, make-ready joint walk services, utility ride-out with all pole attachments, verification of utility make-ready estimates, material selection and budgeting, construction specifications for a draft RFQ, and optical fiber loss budget calculations.

With the help of Matrix, the VTA was able to offer wholesale data transport services to providers such as Internet Service Providers (ISP's), telecommunications organizations and cellular companies. Matrix designed a network that provides 1 Gbps connections, allowing increased build-outs to additional community anchor institutions such as K-12 schools, libraries, colleges, state government offices, and public safety communications networks throughout the state of Vermont.

Results

The network now brings upgraded broadband and cellular service to areas of the state.

This "middle-mile" network gives educational institutions increased opportunities through media-rich on-line learning.

Brings improved patient care through the support of Electronic Health Records, including transfers of large medical imaging files.

Supports an increase in web-based interactions from state residents to state agencies and reduces state costs of travel and data center space through video conferencing and data center consolidation.

Gives the public access to super high-speed broadband service at public libraries and educational institutions.





Client: Rutgers, The State University of New Jersey

Project: Rutgers University RUNet 2000 Telecommunications OSP Design

Location: Throughout New Jersey

Background

The State University of New Jersey, welcomes over 50,000 students every year. It is one of the nation's leading universities with 7 campuses located in New Brunswick, Piscataway, Newark and Camden, New Jersey. In order to maintain their leading university status, they needed to create a comprehensive and advanced data, video, and voice communications infrastructure that would meet the challenges facing Rutgers in the Information Age.

Rutgers recognized the need to improve its communication infrastructure and network capabilities. Soon after, the university published a Strategic Plan entitled, A Vision For Excellence, which clearly specified that in order to achieve the goals stated within the document, a robust, reliable network infrastructure was deemed necessary. From this idea, RUNet 2000 was born.

Solution

To help move Rutgers towards their goals, Matrix Design Group, provided an engineering and design solution coupled with project management and construction services for the implementation of the Rutgers RUNet 2000 project, the largest project of its kind at an American university, to meet the communications needs of the university well into the next century.

The design included 100 miles of on-campus duct bank and overhead fiber optic backbone systems across six (6) main campuses. The backbone completion phase included 340,000 feet of underground conduits, 150 manholes, and 50 aerial poles. In addition to all Rutgers' residence halls, the RUNet system was connected to all campus academic buildings, libraries, sports arenas, campus centers, student centers and recreation centers.

Utilizing advanced Global Positioning System (GPS) technology, Matrix prepared as-built mapping of the entire system. More than 750 buildings were located with associated database information embedded in the subsequent graphic elements. Detailed data dictionaries were designed based on client requirements to ensure continuity, system performance and functionality. All final mapping is geo-referenced into the appropriate coordinate system to create a university wide telecommunications GIS layer. Subsequent projects included connecting fiber optic cabling to the universities alternative energy windmills, electrical transmission points, and additional new construction buildings.

Matrix has helped Rutgers provide technology-based innovation in research and instructional programs, administrative procedures, and information systems through a robust, reliable network infrastructure capable of handling the needs of their faculty, staff and students.

Project Goals

Provide technology-based innovation in research and instructional programs, administrative procedures, and information systems

Build a robust, reliable network infrastructure capable of supporting client/server administrative systems

Assist in positioning Rutgers in the top quartile of research universities

Upgrade network to permit high-speed data transport, interactive video transmitting, and improved voice applications

Link Rutgers academic and residential buildings through an integrated data, voice and video network





Client: Level (3) Communications

Project: Newtown, PA to Newark, NJ

Location: Newtown, Pennsylvania to Newark, New Jersey

Project Description

This two year, 56-mile project from Newtown, PA to Newark, NJ crossed 14 bridges (including the Delaware, Raritan, Rahway, and Elizabeth Rivers), required review and permitting from 15 townships, 4 counties, and 2 states, crossed 14 railroads (including Conrail, NJ Transit, and Amtrak), and necessitated the review of 9 environmental and historic state agencies. The bulk of the permitting was completed within the first four months of the project. The final routing alignment utilized the NJ State Route 1 corridor to achieve its goal of linking the Washington D.C. backbone with the Connecticut backbone. Matrix Design Group was responsible for project management and administration, utility data collection and verification, conceptual/preliminary/and final running line design, directional drill design, ROW permitting, environmental investigation and permitting, bridge attachment design and permitting, rail crossing design and permitting, and the development of construction and final bid documents.

About Matrix Design Group

Serving all landscapes across the country, we specialize in fiber optic network deployments and complete broadband solutions. Our goal is to enable communities, cooperatives, municipalities, and utilities the ability to provide best-in-class broadband communications networks. From feasibility studies, budgeting and underground conduit and aerial cabling, to bridge crossings and outside plant construction, we provide everything from concept to completion.

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