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The Network of Possibilities

SERVICE PROPOSAL:

Broadband Feasibility Study

PREPARED FOR:

City of Harvard, IL



February 21, 2024

City Administrator – Broadband

RE: Broadband Feasibility Study

City Administrator - Broadband:

Essentia appreciates the opportunity to develop a Broadband Feasibility Study for City of Harvard, IL. With a rich history of collaboration with various government levels and the private sector, we are well-prepared to integrate our work into City of Harvard's strategic broadband initiatives. Our extensive expertise spans comprehensive consulting, design, and deployment of telecommunications infrastructure, informed by our team of seasoned professionals.

We are committed to enhancing the country's information infrastructure and are well-versed in navigating the intricacies of federal funding and stakeholder expectations.

For further inquiries, Adolfo Torres, our Vice President of Telecom Consulting, is available for contact to ensure that our proposal meets City of Harvard's requirements and to facilitate ongoing dialogue.
Sincerely,

Adolfo Torres

Adolfo Torres
Vice President, Telecom Consulting
304-541-3373 | adolfo.torres@essentia-inc.com



City of Harvard

Broadband Feasibility Study

Company:

Essentia-Inc.
10130 Mallard Creek Road
Suite 300
Charlotte, NC 28262

Contact:

Adolfo Torres
Vice President, Telecom Consulting
304-541-3373
adolfo.torres@essentia-inc.com



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Proposal & Methodology

Statement of Understanding & Approach

Essentia will launch the Broadband Feasibility Study project with a meticulously organized project initiation kick-off meeting with the City of Harvard representatives. This formative session is a cornerstone of our collaborative approach, designed to establish a solid professional rapport between Essentia's team and City stakeholders. Our agenda for this foundational meeting is to align on the project's vision, set clear objectives, and solidify the partnership necessary for the project's success. Our methodology for these initial discussions is comprehensive, encompassing high-level project planning and a thorough evaluation of the resources and documentation at hand. Therefore, it ensures that the project work plan is tailored precisely to the City's needs of identifying unserved/underserved households and that all parties understand the tasks ahead. This strategic planning session will delve into discussions of the City of Harvard's current broadband initiatives, encapsulating local and regional aspirations and evaluating the achievements to date.

Essentially, Essentia intends to build upon and amplify the existing broadband infrastructure groundwork in the City of Harvard. Our mission is to refine and enhance these efforts, crystallizing a broadband strategy that propels the City's endeavors forward. Our objective is clear: to deliver a Broadband Feasibility Study that aligns with and accelerates the City of Harvard's mission to broaden and enrich broadband service accessibility for its citizens.

Demand for Broadband Service

We propose a detailed and methodical approach to estimate the demand for broadband services in the City of Harvard, IL. Our strategy encompasses evaluating the current broadband landscape, assessing user satisfaction, and forecasting the market for additional, enhanced services.

Our assessment begins with a thorough analysis of existing broadband speeds and latency. This involves collaboration with incumbent providers for data collection, augmented by on-site testing across diverse locales within Harvard to gauge actual service performance. This data will be benchmarked against national and industry standards to provide a contextual performance overview.

To gauge customer satisfaction, we will employ surveys and interviews targeting both residential and business sectors to extract qualitative and quantitative insights into the community's perception of current services. This feedback will inform our understanding of market needs and service shortfalls.

Our approach includes a market analysis to identify competitive gaps and opportunities, followed by demand forecasting using statistical models to estimate the demand for new broadband services. This analysis will focus on key service enhancements like cost reduction, reliability improvement, speed upgrades, and customer service improvements. We will segment this demand estimation between residential and business customers to tailor our approach to the specific needs of each group.

Additionally, we plan to integrate demographic and economic analyses to refine our demand projections, considering factors like population density, income levels, and business types prevalent in

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Harvard: The potential financial impact of enhanced broadband services, including business growth and job creation, will also be evaluated.

Our methodology will leverage advanced tools such as Geographic Information Systems (GIS) for infrastructure mapping and Big Data analytics for trend analysis, ensuring a comprehensive and accurate demand estimation. We aim to provide a nuanced understanding of the market potential and service gaps by comparing Harvard's broadband metrics with similar cities.

Education/Community Engagement Plan

Essentia proposes a comprehensive education and community engagement plan to illustrate the multifaceted benefits of enhanced broadband services. This plan will be meticulously crafted to inform and engage residents and businesses and highlight broadband's pivotal role in healthcare, education, economic development, public safety, and government services.

Our approach integrates the development of engaging and informative materials designed to be versatile for use in City Council meetings and public information sessions. These materials will include presentations, infographics, fact sheets, and case studies demonstrating broadband's positive impact on various sectors. For instance, we will showcase how telemedicine advancements can improve healthcare access, detail online educational enhancements, and illustrate broadband's role in driving economic growth and innovation.

To effectively communicate these benefits, our strategy emphasizes the versatility of digital and traditional engagement methods. We will disseminate information through social media platforms and the City's website, using a mix of posts, videos, and interactive webinars to foster community interest and participation. These digital efforts will complement in-person meetings, ensuring broad outreach and accessibility.

Our community engagement approach will be interactive and inclusive. We will encourage feedback and questions from the community to better tailor the broadband implementation strategy to local needs. We will organize workshops and Q&A sessions virtually and in person to facilitate direct dialogue and build community consensus on broadband initiatives.

Regarding implementation support, Essentia will assist the City of Harvard in executing the education/community engagement plan, which includes facilitating sessions at City Hall, conducting public information events, and coordinating ongoing communication efforts to keep the community informed and involved throughout the broadband development process.

Engineering Design Options

Essentia is poised to develop a pre-engineering broadband infrastructure network design, focusing on passive optical network (PON) and active ethernet network solutions. This high-level design aims to provide a clear overview of the capital cost implications for constructing the proposed broadband network, setting a solid foundation for future detailed engineering studies.

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Our pre-engineering design will comprehensively analyze Harvard's current infrastructure, demographic distribution, and topographical layout to determine the most effective and economical deployment strategy for PON and active ethernet networks. The PON design will focus on scalability and cost-efficiency, which are ideal for widespread coverage and accommodating future growth. Conversely, the active ethernet design will cater to areas requiring high bandwidth and low latency, offering dedicated fiber connections to each endpoint.

For the capital cost estimation, we will factor in various elements such as fiber optic cable routing, network equipment, installation labor, and project management expenses. We will leverage our industry experience and existing data from similar projects to provide an accurate high-level cost projection. While this initial phase does not delve into the minutiae of a detailed engineering design, transitioning from this high-level design to a comprehensive engineering study would involve additional in-depth analysis, including specific site surveys, detailed route planning, and precise infrastructure mapping. This transition could increase the project cost by approximately 15-20%, depending on the complexity and specific requirements discovered during the detailed design phase.

To address the integration of wireless technology, our network design will incorporate the strategic placement of small cell sites to support 4G LTE and 5G. These small cells will seamlessly integrate into the fiber network, ensuring robust backhaul capacity and facilitating high-speed, low-latency wireless communication across Harvard. This approach will enable the City to leverage the existing and new broadband infrastructure for enhanced mobile connectivity, catering to increasing data demands and supporting innovative applications and services enabled by 5G technology.

Broadband Model Options

Essentia will propose several broadband model options, each accompanied by a detailed control and financial risk analysis, sustainability evaluation, and a comprehensive five-year pro forma analysis.

Municipal Broadband Network:

Control: This model offers the highest level of control, as the City would own and operate the network and make all strategic and operational decisions.

Financial Risk: Initial capital investment is substantial, but long-term financial risk can be mitigated through strategic planning and phased implementation.

Sustainability: Designed to support emerging technologies, ensuring long-term relevance and adaptability.

The pro forma analysis will include costs related to operations, marketing, customer service, billing, infrastructure maintenance, electronic refreshes, and debt service against projected revenues based on service take rate and pricing.

Regional Partnership Model:

Control: Shared control with partner communities, necessitating cooperative decision-making processes.

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Financial Risk: Spreading the investment and operational costs across participating municipalities reduces individual financial exposure while leveraging larger-scale efficiencies.

Sustainability: Enhanced through shared resources and increased service area, facilitating the integration of new technologies.

The pro forma analysis for this model will similarly cover all operational and maintenance costs, debt service, and revenue projections tailored to the dynamics of a regional system.

Franchising Model:

Control: The City would license operations to a private entity, retaining some regulatory oversight but with limited operational control.

Financial Risk: Lower than owning and operating the network, as the franchisee assumes most capital and operational expenses.

Sustainability: Depends on the franchisee's commitment to upgrading and supporting new technologies. The pro forma analysis will reflect the franchising fees, regulatory compliance costs, and projected revenue from the franchise agreement.

Cooperative (Co-op) Model:

Control: Operated by a co-op formed by the City and its residents or businesses, offering moderate control with community-focused decision-making.

Financial Risk: Distribution among co-op members offers a balanced financial risk profile.

Sustainability: Driven by the co-op's ability to adapt and invest in technology upgrades.

The pro forma analysis for the co-op model will include member dues, operational and maintenance costs, and revenue projections based on membership fees and service charges.

For each model, the five-year pro forma analysis will be provided in Microsoft Excel format, allowing for adjustments in assumptions related to take-rate estimates, pricing, and operational and maintenance costs.

For models where Harvard owns and operates the network, additional plans will be provided, including:

- A Marketing Plan outlining strategies to promote the broadband service and achieve the desired take-rate.
- An Operations Plan detailing network management, customer service, and billing processes.
- A Maintenance Plan focusing on infrastructure upkeep and technology updates.
- A Municipal Governance Plan establishes municipal oversight and regulatory compliance framework.
- An Implementation Plan delineating the phased rollout of the broadband network, resource allocation, and timeline.

Capital Funding Options

Essentia will identify several potential capital funding options to support the development of the City's broadband infrastructure. Our comprehensive analysis considers various sources, including federal and state funding programs, innovative financing models, and local funding mechanisms.

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Federal and State Government Grants or Low-Interest Loans: Federal and state programs offer grants and low-interest loans for broadband infrastructure development, particularly in underserved or rural areas. These programs are designed to promote digital equity and expand internet access. We will explore programs like the Broadband Technology Opportunities Program (BTOP), the Connect America Fund, and state-specific initiatives aligning with Harvard's infrastructure goals and eligibility criteria. These grants and loans are often competitive and require detailed application processes, including comprehensive feasibility studies and project plans.

Public-Private Partnerships (PPP): A PPP model can attract private investment into the broadband project, leveraging the strengths of both public and private sectors. In this model, the City of Harvard could partner with a private broadband provider to share the broadband deployment's costs, risks, and rewards. This approach can accelerate project timelines, bring in technical expertise, and potentially reduce the financial burden on the City. Structuring a PPP deal would involve negotiations to define the investment, operational responsibilities, and revenue-sharing arrangements between the City and the private partner.

Municipal Bond Options: Harvard can consider issuing municipal bonds to raise capital for the broadband project. These bonds can be general obligation bonds, backed by the full faith and credit of the City, or revenue bonds, which are repaid from the income generated by the broadband services. Municipal bonds are a traditional method for funding large infrastructure projects and can offer lower interest rates and tax-exempt benefits for investors.

Tax Options: Implementing specific tax initiatives, such as special assessments or increment financing districts, can generate funds dedicated to the broadband project. These taxes would be applied strategically to areas benefiting from the broadband infrastructure, ensuring that the funding mechanism aligns with the project's beneficiaries. Careful consideration of the tax impact on residents and businesses is essential to balancing funding needs with community support and economic sustainability.

Final Deliverable, Recommendations, & Next Steps

Essentia's final deliverable for the City of Harvard Broadband Feasibility Study will be a comprehensive Broadband Strategic Plan, meticulously consolidating all project phases. The plan will outline a clear community assessment. It will include strategic recommendations based on a thorough analysis of broadband access, network financing models, deployment options, and potential improvements. A careful review of federal, state, and private funding sources for network deployment will also be provided. The deliverable will feature a presentation to City leadership, encapsulating the entire project's findings and a conclusive section on recommendations and next steps tailored to meet the City's broadband objectives. Essentia's guidance will be informed by a deep understanding of infrastructure challenges, funding mechanisms, and strategic planning, ensuring actionable insights for the City of Harvard's broadband future.



Independent Qualifications

Organization & Staffing

Essentia will articulate a systematic approach to organizational and staffing requirements, ensuring a seamless execution of the project. This will include:

- Regular, scheduled communications to synchronize with client expectations and project objectives.
- Initial and ongoing meetings to outline project goals, quality control measures, and to define roles and responsibilities.
- Continuous engagement with stakeholders through customized questionnaires, targeting key community sectors for input on broadband priorities.
- Strategic collaboration with local industry experts to advise on regulatory improvements, leveraging public assets, and fostering private investment in broadband.
- Proactive consultation on current and future broadband service needs, addressing the requirements of schools and other community anchor institutions, particularly focusing on cost-effective solutions.
- A unified strategy to integrate various funding opportunities, enhancing the efficiency of broadband initiatives.
- Expert telecom consultancy to navigate the rapidly evolving broadband industry, including updates on policy changes, funding opportunities, and technological advancements.

Essentia's comprehensive plan will leverage our vast experience to guide City of Harvard towards an inclusive and forward-thinking broadband strategy.

Company Information

At Essentia, we've assembled a team of trusted experts who design and build turnkey outdoor & indoor networks with unrivaled quality and record-setting cycle times. We know true breakthrough innovations are the ones that target real customer pain points, inefficiencies, and error-prone processes. That's why we're delivering tech-enabled infrastructure services including drone data capture, engineering automations, and machine learning – powered by our proprietary eSpeed Technology Platform. Founded in 2003 and based in Charlotte, N.C., Essentia has planted roots across the country while supporting Government Entities, Telecom Carriers, Cable MSOs, on-the-move Enterprises, and Critical Infrastructure / Utilities. Essentia is a Certified Great Place to Work® and an Inc. 5000 honoree.

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With over 20 years of industry leadership, we specialize in the design, build, and maintenance of both fiber and wireless networks. Our end-to-end capabilities ensure projects are guided from inception through to operation, culminating in sustainable network assets. Essentia's collaborative approach is designed to align with our clients' visions, offering full-scale solutions, including land acquisition, engineering, and construction oversight. Recognized for our excellence in network development and strategic consulting, our team is committed to advancing the telecommunications infrastructure, ensuring each client's objectives are realized. Our extensive experience in administering grant programs complements our consulting acumen, providing a holistic solution to broadband infrastructure challenges. With a strong financial foundation and a proven track record, Essentia stands ready to deliver a strategy that meets regulatory standards and aligns with City of Harvard's digital equity and inclusion goals.

Experience, Qualifications, References

Experience

Data Collection

Essentia has a solid track record of large-scale, precise data collection critical for broadband infrastructure projects. Our recent undertakings include:

- **Aerial Data Collection:**
 - Successfully captured data on 60,000 poles for WOW (since 2022), 11,000 poles for OMNI (since 2023), and 10,000 poles for Glide (2024), utilizing advanced digital tools like IKE or Katapult. This process involves collecting 20-30 critical data points per pole to create accurate digital replicas with scalable imagery.
 - For a prior firm, orchestrated aerial data collection across 20 FTTH markets, covering approximately 150,000 poles (2020-2022).
- **Underground Data Collection:**
 - Conducted extensive underground data collection totaling 700,000 feet for OMNI (2023), 3 million feet for WOW (2022-2023), and 8 million feet for Glide (2023-2024).
 - Undertook underground data collection for 20 FTTH markets, aggregating around 5 million feet (2020-2022).

Approach to Data Collection

- **Underground Field Data Collection:**
 - Our in-field technicians perform thorough site visits, assessing proposed routes with the support of field collection applications. These visits are inclusive of all associated travel expenses and utilize digital tools to verify the constructability of High-Level Design (HLD) plans in real-time, as well as to confirm the viability of key infrastructure components like cabinet locations and handholes. Our deliverables include a revised and accurate address list and GIS depictions

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post-walkdown. Notably, our scope excludes topographic surveys and right-of-way research for backyard easement.

- **Aerial Field Collection:**

- Essentia's field teams gather comprehensive pole data necessary for Make Ready Engineering and Pole Loading Analysis. We meticulously document pole ownership, physical characteristics, and attachment heights, among other details, supported by extensive photographic evidence. While certain data like primary power midspan measurements are assumed from utility design specs, our fieldwork includes critical assessments of pole congestion and tree trimming needs. We provide organized data accessible upon request and engage in limited attempts to access restricted areas, with provisions for change orders if required.

Essentia employs a rigorous 'boots on the ground' approach to verify on-site conditions, complemented by sophisticated software solutions for aerial work. Our underground activities encompass constructability reviews, measurements, and verifications to ensure seamless transitions from underground to aerial infrastructure. Essentia's comprehensive deliverables empower clients with actionable insights and detailed visual representations of existing and proposed broadband networks.

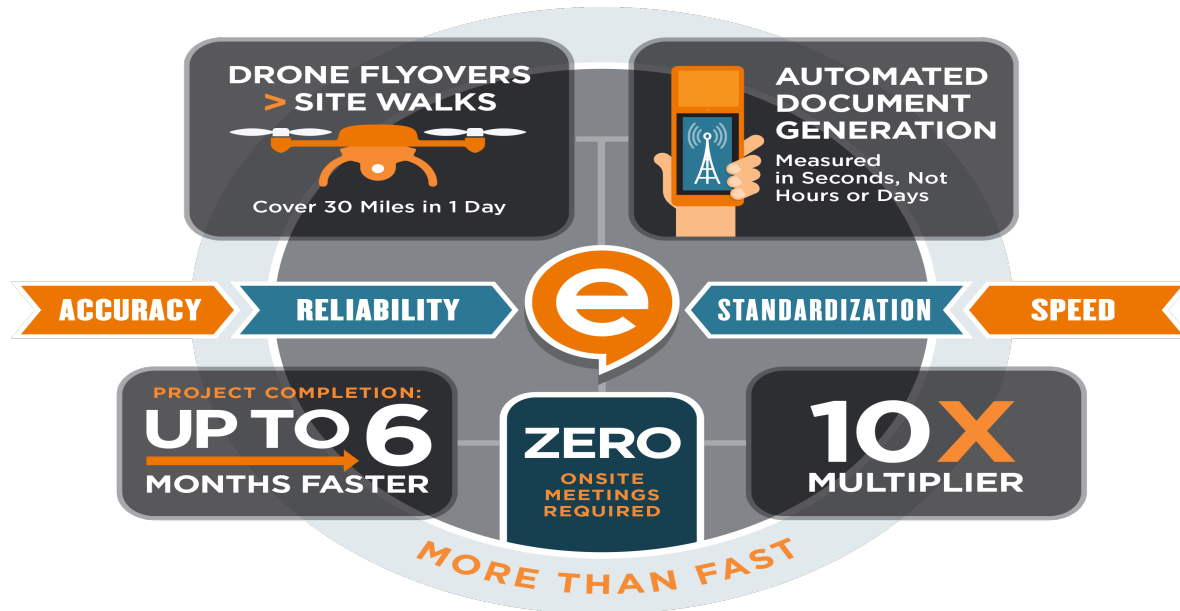
OUR TECHNOLOGY PLATFORM IS NEXT-LEVEL

We define our eSpeed Technology Platform as a set of different technologies — hardware, software, and tools — all wrapped around efficient processes with proprietary programming and workflows. Our clients define it as a game-changer that accelerates data collection, performs powerful integrations, provides an intuitive database (the only one you need), and automates deliverables.

Not only is eSpeed proven to save 6+ months on network infrastructure deployments, but it also helps you achieve the following:

- Faster to deployment
- Faster capitalization of assets
- Increased return on capital

eSpeed Features & Benefits

*Market Analysis*

With over two decades of experience, Essentia brings unparalleled expertise to the table, particularly in the realm of analyzing data sets and methodologies crucial for identifying unserved and underserved areas, especially in rural landscapes. Our proficiency extends to various geographic regions across the United States. Notably, our work with Glide Fiber involved in-depth market analyses spanning diverse geographies to evaluate both the feasibility of infrastructure development and its commercial viability. Our approach encompasses a multifaceted examination, including pipeline assessments, macro demographic analyses, competitive landscape evaluations, and thorough scrutiny of community attributes. This comprehensive methodology ensures that our insights are meticulously tailored to the unique needs and challenges of each locality, empowering our clients to make informed decisions regarding fiber optic network planning and deployment strategies.

Stakeholder Engagement

Essentia details a comprehensive approach to stakeholder engagement for expansion of fiber optic networks. It emphasizes targeted communication strategies across different phases of projects, from initial introductions and discovery meetings with City officials to permit submissions, construction kick-offs, and resident meet-and-greet events. Engagement tactics include in-person and virtual meetings, email communications, social media outreach, and ceremonial events to foster collaboration and transparency with local government bodies, residents, and media. By prioritizing clear and frequent communication, the plan seeks to streamline permitting processes, align on construction schedules, and address community inquiries and concerns effectively, showcasing Essentia's deep expertise in managing complex stakeholder relationships in fiber optic network planning and implementation.

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Market Aggregation

With an extensive track record spanning two decades, Essentia boasts a wealth of experience in deploying a diverse array of sales and marketing strategies tailored to assess demand for broadband products across a spectrum of environments, encompassing both urban and rural landscapes. Our strategic approach combines a blend of online and offline tactics meticulously designed to garner insights into market demand. From conducting surveys to organizing community outreach initiatives and engaging in door-to-door engagement efforts, Essentia employs a multifaceted methodology to comprehensively evaluate broadband demand. By leveraging these strategies, we can effectively gauge the needs and preferences of communities, thereby enabling our clients to develop tailored solutions that meet the unique requirements of each locality. Our proven expertise in sales and marketing strategies underscores our commitment to facilitating the successful planning and deployment of fiber optic networks, ensuring widespread access to high-speed broadband connectivity for all stakeholders.

Marketing

Drawing upon decades of industry experience, Essentia possesses a comprehensive understanding and proficiency in all facets of marketing, spanning from contemporary social media strategies to conventional media channels. Our expertise extends beyond traditional marketing approaches, encompassing a nuanced understanding of non-traditional techniques tailored to diverse community landscapes. From leveraging the power of social media platforms to implementing targeted advertising campaigns, we are adept at crafting engaging content that resonates with our audience. Furthermore, our proficiency in non-traditional marketing methodologies, including door-to-door direct engagement, event tactics, and community organizing, underscores our commitment to fostering meaningful connections with communities. By employing a holistic approach that combines both conventional and innovative marketing strategies, Essentia ensures that our clients receive comprehensive support in reaching their target audience and achieving their broadband deployment objectives.

Engineering Assessment

As an expert with 20 years of experience we can provide a detailed summary focusing on the engineering assessment aspect of fiber optic network planning. Our approach at Essentia integrates meticulous attention to every stage of the process, ensuring the optimization of construction and network design. This spans across key areas such as Fiber Network Design, Field Engineering, Permitting & Licensing, and Local Government Engagement. We employ proprietary programming and workflows to encapsulate hardware, software, and tools into efficient processes. Our expertise ensures that from the macro to micro level, every phase is addressed with precision, aligning with Generation West Virginia's requirements for a robust and future-proof fiber optic network. Our commitment to stakeholder engagement, especially with local government bodies, further streamlines the project, ensuring that all permits and licenses are obtained in a timely manner and that the network design is optimized for the local terrain and community needs.

Digital Equity and Inclusion Analysis

Essentia, with its wealth of experience and expertise, is well-positioned to address the needs outlined in the RFP. With a track record of success in developing and implementing digital equity and inclusion strategies, Essentia has navigated the complexities of both urban and rural environments. Our team, led by Mary Ellen, is adept at leveraging federal, state, and local engagement methodologies to ensure thorough coverage and compliance with regulatory requirements. Our approach to digital equity centers

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on a three-pronged strategy, focusing on access, devices, and digital skill-building. By prioritizing infrastructure development and affordability measures, Essentia aims to overcome barriers to broadband access, thereby promoting inclusivity and connectivity for all community members. Additionally, our emphasis on providing devices and fostering digital literacy underscores our commitment to empowering individuals with the tools and knowledge necessary to fully utilize broadband resources. Through collaborative partnerships and tailored solutions, Essentia is dedicated to bridging the digital divide and fostering a more connected and equitable society.

Grant Development

Essentia boasts a proven track record of success in securing substantial grant funding for broadband infrastructure projects, exemplified by our leadership in securing over \$100 million in grant awards from federal and state sources during our tenure. This achievement underscores our expertise and effectiveness in navigating the complex landscape of grant applications and funding opportunities. Our strategic approach, coupled with meticulous project management, has enabled us to drive impactful broadband initiatives in states such as Vermont, New Hampshire, and Maine. Some notable examples of our successful grant-funded projects include [insert specific project examples here]. Through our experience and proficiency in grant acquisition, Essentia is well-equipped to assist Generation West Virginia in identifying and securing the necessary funding to support the development of its fiber optic network infrastructure, ensuring enhanced connectivity and digital opportunities for the community.

Strategic Planning

Essentia's extensive experience in strategic planning spans across diverse sectors, encompassing both public and private entities, ranging from the United States Army to industry giants like Google. With a nuanced understanding of the intricacies of strategic planning, Essentia has successfully guided clients through complex challenges and opportunities. Our expertise extends to various facets of strategic planning, including go-to-market strategies, public relations, marketing initiatives, community engagement efforts, and business development tactics. By leveraging our functional expertise and strategic acumen, Essentia is poised to provide invaluable insights and guidance to Generation West Virginia in navigating the intricacies of fiber optic network planning. Our tailored approach ensures alignment with Generation West Virginia's objectives while fostering sustainable growth and development in the broadband landscape.

References

<p><u>WOW!</u> Keith Kirby VP, Construction – System Expansion keith.kirby@essentia-inc.com 586-453-3501 Turnkey FTTH Projects in Multiple Florida Counties Ongoing \$40 Million</p>	<p><u>Verizon</u> Marvin Fisher Engineer IV marvin.fisher@verizon.com 904-687-6051 Fiber One Build in Jacksonville, FL 2018-2022 \$15 Million</p>
<p><u>Crown Castle</u> Jason Smith Construction Manager jason.m.smith@crowncastle.com 305-815-3296 FTTC Projects Nationwide 2014-2019 \$15 Million</p>	<p><u>Ericsson</u> Steven Strickland Director – Partnerships & Channel steven.strickland@ericsson.com 404-769-7575 Fiber Engineering & Construction Projects Nationwide 2004-Current \$30 Million</p>

Descriptions of Past Completed Projects

State of New Hampshire

Statewide Broadband Build for Unserved and Underserved Communities, RFP DBEA 2023-06

On behalf of 36 communities across New Hampshire, Led a team that received \$40 Million of state grant funds to serve over 24,000 unserved/ underserved locations and 57,000 total locations with fiber-to-the-home broadband services. The team developed the approach to organize support in each community, identify grant-eligible locations, lobby state officials, develop the construction schedule and method, and develop the successful grant application. The team and communities were granted the award in February of 2023.

State of Vermont, Southern Vermont Communications Union Generation West Virginia

On behalf of 14 communities across the southern region of Vermont, led a team at that received a grant of \$9Million in state funds as part of a public private partnership to build 251 miles and serve 6,412 addresses with fiber-to-the-home services. The team first won a competitive RFP to be selected by the Southern Vermont Communications Union (CUD) to be their ISP of choice. Working with the CUD, Developed the grant proposal selected for funding by the Vermont Community Broadband Board. In support of this effort, Mary Ellen developed the public relations and communication strategy that led to the grant’s award. This grant award made this region of Vermont, formerly one of the most underserved in the nation, receive the coveted status of universal service. The grant was awarded in.

Google Fiber Digital Inclusion Investments

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Developed the go-to-market strategy for fiber-to-the-home services in the area. As part of this strategy, led efforts for investment in digital inclusion activities including sponsorship of Digital Inclusion Fellowships at area non-profits, the deployment of a community connections program (free of charge for local anchor institutions), and product investments for affordable services for residents in public housing properties in Charlotte.

Cable MSO Greenfield Project

Essentia's proficiency in managing large-scale Greenfield projects for major cable operators is unparalleled. Our comprehensive plan involved deploying a suite of turnkey solutions, including advanced field services leveraging eSpeed technology for data collection, detailed base mapping, precise pole annotation across jurisdictional boundaries, and meticulous permitting for both aerial and underground infrastructure. Utilizing GIS and CAD for intricate fiber design, our approach ensures flexibility to adapt to real-time changes. Our successful included completion of a significant milestone, passing 100,000 homes, underscoring our ability to support projects of substantial scale and complexity.

Amtrak

Essentia underscored our extensive experience in deploying intricate IT infrastructures across a multitude of challenging environments, including some of the nation's most active transportation hubs. Our deployment covered 750 distinct locations, each presenting its own set of unique challenges—from railyards and maintenance yards to utility tunnels, active railway systems, and historically significant buildings. This vast endeavor required a sophisticated orchestration of human resources, streamlined processes, and advanced systems, all tailored to operate effectively within these complex and dynamic settings.

Omni Fiber

Essentia, exemplifies our proficiency in fiber optic network planning. In a turnkey project for aggressive FTTH (Fiber to the Home) builds in Western PA, we were tasked to cover 87,000 household premises. The scope encompassed high-level design, aerial field survey of over 10,000 poles, and construction among other aspects. Our approach included a revamped high-level-design process, engaging with municipalities to speed up permitting, and leveraging established subcontractor networks to scale effectively. This resulted in our ability to meet forecast discussions for 2024, with additional construction and engineering work on the horizon, underlining our capacity to deliver expansive fiber optic network solutions efficiently and reliably.

Financial Plan

Essentia proposes a fixed fee pricing structure for this engagement with a monthly invoice schedule. Below, please find our rates for this engagement, as well as an estimates table supporting our proposed budget.

Requirement #	Estimated Hours	Cost
1. Demand for Broadband Service	80	\$ 13,600
2. Education/Community Engagement Plan	60	\$ 10,200
3. Engineering Design Options	100	\$ 17,000
4. Broadband Model Option (s) Recommendations	100	\$ 17,000
5. Capital Funding Options	40	\$ 6,800
6. Respondant Qualifications		
Total Cost	380	\$ 64,600

Expenses

For the duration of the project, Essentia shall be reimbursed for all reasonable, necessary, and pre-approved travel expenses incurred by its employees and consultants in the performance of services under this agreement. Reimbursable travel expenses include but are not limited to transportation costs (e.g., airfare, train tickets, car rentals, mileage for the use of personal vehicles as per the current IRS standard mileage rate), lodging, meals (up to a per diem based on the GSA rates for the specific project area), and incidental expenses.

Project Schedule

Week	Month 1				Month 2				Month 3			
	1	2	3	4	5	6	7	8	9	10	11	12
Task												
Demand for Broadband Services												
Education/Community Engagement Plan												
Engineering Design Options												
Broadband Model Option (s) Recommendations												
Capital Funding Options												

Disclosure

To the best of Essentia-Inc’s knowledge, we are not involved in any current litigation or the subject to arbitration.

Essentia: Pioneering Digital Transformation for Thriving Communities

In the modern landscape, the value of a community is increasingly defined by digital capabilities rather than just traditional resources. Where once the availability of developable land, power, water, and transportation formed the backbone of community viability, today the keystones are bits and bytes, code and data, networks, and smart systems. Digital technology is not just an adjunct but the central axis around which traditional resources are optimized and utilized. The broadband revolution has catalyzed unprecedented possibilities across various sectors including business, healthcare, education, governance, public safety, and more, all hinging on the pivotal axis of affordable and pervasive connectivity.

With the onset of the COVID-19 pandemic, the importance of broadband has been magnified, underscored by legislative initiatives aimed at expanding and enhancing connectivity across the nation.

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This period has marked the zenith of broadband's significance as a conduit for community resilience and continuity.

At Essentia, our trajectory through the broadband industry has allowed us to witness, first-hand, the escalation of connectivity from a luxury to a necessity. Our consultants, boasting two decades of industry expertise, have been at the forefront, advising public entities at all levels on the development and implementation of cutting-edge broadband solutions. Our team is not only well-versed in the latest technological advancements but also adept at navigating the intricate web of financing and deployment strategies that bring these technologies to life in communities.

For City of Harvard, Essentia proposes a strategic, analytical approach to broadband planning. We aim to delineate the multifaceted impact of broadband, illuminating its value to governance, community services, public safety, digital inclusivity, and economic fortification. Our analysis will transcend the general advocacy for high-speed connectivity, delving into the needs and ambitions of City of Harvard, crystallized through initial consultations and a thorough review of ongoing initiatives. It is our commitment to tailor our discourse and recommendations to resonate with the unique priorities and challenges identified by the City, ensuring that our strategic input translates into tangible enhancements in the lives of its residents.

Project Team

As a Certified Great Place to Work, we've built a culture that's the foundation for a top-flight recruitment brand, allowing us to hire the best of the best talent from verticals including Consulting, Critical Infrastructures, Telecom, Cable, and other verticals.



Adolfo Torres
Vice President, Telecom Consulting
304-541-3373

Adolfo has consistently exhibited excellence in navigating industry challenges, building collaborative relationships, and driving successful outcomes. Prior to joining Essentia, Adolfo was Director of the Telecom Consulting PMO at Tilson Technology Management. There, he was responsible for multiple broadband consulting engagements building up to a successful national footprint. Consulting projects included the administration of ARPA and BEAD funding for West Virginia, Puerto Rico, and other states; as well as operational support for the California Middle-Mile Broadband Initiative. Prior to working at Tilson, Adolfo was a Director of Operations for KGPCo overseeing national efforts and responsibility for Google Fiber maintenance, MDU network construction, and utility locates in Arkansas. Adolfo is a seasoned, telecom executive with a multidisciplinary focus ranging in call center management, NOC, technical service management, outside plant construction management, and facility assignment center management at Verizon and Frontier.

Proprietary and Confidential



Anthony Bachmeier
Director of Engineering
701-630-8416

Anthony has nearly 13 years of experience in the telecommunications Industry. He has worked as a Project Engineer, Project Manager, Business Development, Principal Engineer, and Director of Engineering. He has a broad range of technical knowledge in engineering for both Inside Plant and Outside Plant builds. He has served in various projects including construction staking and inspection, grant writing, OSP design and permitting, fiber testing, central office power and grounding, network transport, soft switch implementation, voice, wireless design and implementation, data networks, and Internet Protocol.



Kevin Brecht
Corporate Counsel
330-590-3970

Kevin Brecht, Corporate Counsel and Director of Real Estate at Essentia since 2018, is a seasoned legal professional with a law license obtained in 2010 and extensive courtroom and mediation experience. In his role, Kevin has successfully managed over 20,000 pole attachment approvals and 5,000 permits, including fiber optics and small cell deployments. His regulatory expertise spans FCC regulations, pole attachment agreements, and licensure matters, complemented by a deep understanding of state and local laws. Kevin's proficiency in real estate law is demonstrated through his handling of over 200 Title Opinions, negotiation of mineral leases and easements, and management of various real estate transactions. Furthermore, his active involvement in government relations, including the drafting of small cell ordinances and advocacy before officials, showcases his commitment. Kevin's comprehensive knowledge of telecommunications laws and regulations, encompassing key legislations and FCC rulings, positions him as a vital asset in navigating the legal and regulatory complexities of the industry.



Mary Ellen Player
Chief Revenue Officer
617-256-6377

Mary Ellen has over 15 years in the technology and telecommunications industries. She currently serves as the Chief Revenue Officer for Glide Fiber, responsible for the go-to-market strategy, marketing, sales, customer support, and government relations. Prior to joining Glide, she was the Vice President of Market Management and Expansion at Consolidated Communications, a 127-year-old local exchange carrier serving 22 states nationally. At Consolidated, she was responsible for the sales strategy/execution and Public-Private Partnerships/Grants for the Fidium fiber-to-the-home division of the company. Before joining Consolidated, Mary Ellen had a 13-year career at Google, most recently serving as the first General Manager of Google Fiber in Charlotte, North Carolina. She was responsible for launching and managing all aspects of Google's business in Charlotte from construction to sales to digital inclusion and community impact. She holds a BA from Harvard University and an MBA from the Stanford Graduate School of Business.

OUR WORK SPEAKS FOR ITSELF. SO DO THESE ACCOLADES...



“The company has excelled at building the trust, speed, and expertise for being the go-to-entity for full-fledged fiber installations.” – *Telecom Tech Outlook*

“Best vendor on the planet!” – *Director, Fortune 500 Defense Contractor*



Adolfo Torres

Hurricane, WV 25526 • 304-541-3373

Flaco62160@hotmail.com • linkedin.com/in/AdolfoTorres

Skills

- **Communication** – Helping understand roles, goals, and achievements.
- **Relationship Building** – Building productive relationships and collaborating with varied stakeholders.
- **Problem Solving** – Quickly resolve conflicts and achieve actionable results.
- **Organization** – Prioritizing tasks, developing new ideas, and ensuring adherence to deadlines.

Experience

2024-Current

Vice President, Telecom Consulting

- Lead Telecom Consulting Organization
- Business Development owner for Telecom Consulting

2022-2024

Director, Telecom Consulting PMO, Tilson Technology Management

- Grew Telecom Consulting practice from \$8 million a year to \$28 million a year in revenue.
- Consistently achieve 60%+ gross margin
- Increased the size of the Telecom Consulting team to 70 Consultants.
- Responsible for 132 projects in a national footprint.

2022-2022

Manager, Telecom Consulting PMO, Tilson Technology Management

- Manage Team of Broadband Consulting Project Managers.
- Constant interaction and collaboration with the Tilson executive team.
- Oversight on multiple projects in a national footprint.
- Responsible for process development.

2021-2022

Senior Project Manager, Broadband Consulting, Tilson Technology Management

- Manage all levels of Broadband Consulting projects.
- Work in the telecommunications industry on complex projects for public sector clients.

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- Controlling project tasks, project plans, schedules, financial performance, and subcontractors.
- Oversee client communications and reporting requirements.
- Develop project management processes and procedures.
- Engage in the bid and request for proposal evaluation and response process.

2017-2021

Director, Demand Services – KGPCo

- National customer POC for Google Fiber all customer demand-driven services.
- Grew Google Fiber, Nashville, accounts from \$600,000 annually to \$5.5 million annually in 3 years.
- Identify customer improvement opportunities to advance operational success.
- Launched \$6 million+ utility locate operation, from the ground up, incorporating the entire state of Arkansas, and regularly met with local customers and utilities.
- Single point of contact for demand-driven services requests for proposals and customer sales bids.
- Representative of KGPCo at customer sales and service meetings.
- Customer liaison for any customer and billing issues.
- Owner of customer relationship for \$7 million Verizon Fiber project in Cincinnati and Columbus, OH.

2014-2017

Senior Manager – Frontier Communications

- Lead a team of 114 Assignment Administrators and 7 Management personnel in 3 different locations.
- Implemented high speed internet self-install dispatch save process that yielded \$25,600 savings in March 2016 and is projected to save \$332,000 annually.
- Planner for Mid-Atlantic Leadership Council annual meeting.
- Established a Microsoft SharePoint site for the WV Plant Service Center used to warehouse and catalog process, results and initiatives.
- Represent Frontier in bargaining negotiations with Communication Workers of America Local 2276.
- Collaborated with WV Operations team in Attorney General Settlement list scrub that generated 1460 HIS speed upgrades, thereby, capturing at least \$14,600 of lost revenue.

2010-2014

Construction Supervisor – Frontier Communications

- Supervise 27 union Cable Splicing Technicians and Outside Plant Technicians in two different locations.
- Contributed to state-leading 2037 high-speed internet sales resulting in \$488,888 in annualized revenue.
- Managed \$8,000,000 capital construction budget for new state-of-the-art telecommunications infrastructure.
- Interviewed and hired 9 employees.
- Created goals and objectives for employees as well as year-end performance appraisals measuring results.
- Performed monthly safety meetings and quality reviews to ensure compliance with regulations.
- Partnered with Sales Engineer to develop customized solutions for customers.
- Facilitated employee meetings geared to communicate corporate vision and direction.

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- Established Construction organization in Ohio and increased capitalization to 73%.
- Identified as an exceptional performer within the management team of West Virginia and Ohio.

2007-2010

Technical Service Manager – Government and Education – Verizon

- Technical Service Manager for the State of West Virginia, WVU, Marshall University, and other high-profile state and local government and education accounts with an annual revenue of \$34.7 million.
- Oversaw customer resolution process.
- Lobbied as a customer advocate in relation to the performance of Verizon products and services.
- Produced standard network performance reports with added services to customer accounts.
- Delivered root-cause analysis reports to customers, as needed, geared to adding services.
- Develop and manage Service Improvement Plans.
- Performed network analysis and diversity reviews to sell value-added services.

Education

University of Charleston -Master of Business Administration

Virginia Wesleyan College- Bachelor of Arts, Liberal Arts Management Program

Language

Fluent in English and Spanish.

Mary Ellen R. Player

www.linkedin.com/in/merped (617) 256-6377

merpie@gmail.com Experience

Glide Fiber

Chief Revenue Officer Lake City, SC

- Responsible for the Marketing, Sales, Revenue Operations, Customer Experience, and Government Relations **Consolidated Communications**

Vice President Market Management and Expansion (2021-2023) Boston, MA

- Responsible for the strategy and execution of residential and small business field sales, customer retention, and satisfaction across a 22-state territory
- Developed and implemented the go-to-market strategy for the launch of Fidium Fiber across >600,000 passings, ultimately winning “Best of” honors in multiple geographies.
- Built a 100+ person national field sales team across 6 regions in 18 months, including door-to-door sales (direct and in-direct) and multi-family sales.
- Developed and implemented public private partnerships strategy, leading team to > \$60 Million in broadband grant funding awards across 3 states in 16 months with a pipeline of over \$100 Million poised for award in 2023.
- Built the multi-family line of business from build process and engineering through end user sales, tripling sales every quarter since launch (4 consecutive quarters)
- Developed and implemented pre-sales strategy (sales starts at construction), quadrupling pre-sales performance since brand launch.
- Developed and implemented community engagement strategy for all residential sales teams.
- Represent Consolidated on a variety of topics including build strategy, sales execution, and municipal partnerships to public officials, media, and industry organizations.

Google, Inc (2008- 2021) Google Fiber Charlotte, General Manager (Google Fiber) [2014-May 2021] Charlotte, NC

- Developed go-to-market strategy and managed P&L for the build, launch, expansion, and sales of Google’s fiber-to- the-home network in Charlotte.
- Responsible and accountable for annual customer acquisition targets and revenue growth across all product categories (residential and small business) and sales channels (door to door, multi-family, inventory acquisition, retail) achieving 16 consecutive quarters meeting/exceeding goals.
- Built and managed top performing sales teams in multiple categories (top national D2D team of 2019, top national multi-family sales team 2019-2021)
- Led negotiations and relationships with senior elected officials (state and municipality), local government staff, real estate development executives, and key community partners.
- Negotiated agreements with real estate and land developers for use of fiber assets in local projects, growing portfolio.

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- Led internal cross functional work across Construction, Operations, Product, Customer Service, Marketing, Sales, Business Development, Public Policy, Communications, Finance, and Legal
- Hired and developed Charlotte Fiber team (from 0 to 35), ultimately responsible for office culture, team building and day-to-day operations.
- Awarded inaugural Fiber Excellence Award (1 of 5 in company) for business excellence and team leadership (2016)

Special Assistant to CFO (Google/Motorola) [2012-2014] Sunnyvale, CA

- Global ecommerce finance lead responsible for budget planning, forecasting, strategy and operational activities including launch of ecommerce capabilities in 5 global markets, reporting directly to CFO
- Managed \$10M internal enterprise telecom program including fostering relationships with major telecom providers (Verizon, AT&T, Sprint, and T-Mobile)

Senior Account Planner, Financial Services Ad Sales (Google) [2008-2010] New York, NY

- Created sales positioning materials for all Google Advertising properties (Search, Display, YouTube, Google TV, Radio) for 17 different client accounts.
- Recipient of Google Fellowship, 100K Tuition Scholarship to attend Stanford GSB

Booz Allen Hamilton [2004-2008]

Mclean, VA

Consultant, Senior Consultant, Associate

- Managed project and staff for a \$3.3 million strategic planning and communications engagement with the Office of the Assistant Secretary of the Army for Acquisitions, Logistics and Technology
- Sold \$3 million client engagement to establish the first office of the Army Chief Marketing Officer
- Developed and implemented Congressional outreach event for 15 different organizations across the Army, bringing together over 100 soldiers, contractors and senior government officials.
- Developed organizational redesign strategy for U.S. Army Recruiting, Marketing and Advertising organization • Assisted in redesign of Army branding campaign (Army Strong)

Community and Board Service

South Carolina Rural Innovation Network

2018- Present

Founding Board Member

- Organization dedicated to revitalizing rural South Carolina via technology infrastructure & digital workforce training

Palmetto Girls State

Senior Counselor, Musical Director, Diversity Council Founder 1999-Present

- Senior Staff at summer leadership development program for outstanding young women in South Carolina

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Education

Stanford Graduate School of Business (2012)

Stanford, CA

Master of Business Administration

- Arbuckle Leadership Fellow, Google Fellowship, Women in Management (President)

Harvard University (2004)

Cambridge, MA

Bachelor of Arts, magna cum laude, Social Studies

Harvard Kennedy School (2019)

Cambridge, MA

Infrastructure in a Market Economy Certification

Personal

Classically trained singer with night club predilections. Raised in a 6,000-person tobacco town in rural South Carolina. Award-winning public speaker and ballroom dancer. Passionate about civil rights, broadband policy, technology/entrepreneurship, and public education. Enjoy hosting dinner parties, Clemson football, dancing, tennis, golf and all things South Carolina.

KEVIN BRECHT

Wadsworth, OH 44281 • (330)515-5555 • kevinbrecht@gmail.com

www.linkedin.com/in/KevinCharlesBrecht

- I am a Licensed attorney with significant Corporate Counsel experience including transactional experience in Real Estate, Oil & Gas, Construction, Telecommunications, SAAS, Regulatory, and Municipal Law. I also have significant experience managing both projects and people.
- Memberships: Ohio State Bar Association, Akron/Canton REIA, Phi Delta Theta, City of Norton Architectural Review Board Member. Previous member of AAPL.

PROFESSIONAL EXPERIENCE

CORPORATE COUNSEL / Essentia, Inc.

2018 - Present

- I am responsible for all day-to-day legal work for Essentia. My duties include complex contract management, drafting, negotiation and review, leasing, easements, rights-of-way, risk mitigation, trademarks, government relations, HR, client, customer, and vendor onboarding, advising on federal, state, and local law, and working with corporations, municipalities, and other government entities on large scale infrastructure projects.
- I have significant experience working with and managing Outside Counsel.
- As part of my duties, I previously oversaw our real estate division which is responsible for permitting, easements, leasing, environmental, regulatory, pole attachment agreements, utility coordination, and site acquisition. I have worked with numerous utility companies ranging from Duke, First Energy and AEP to small Co-Ops and Municipal Power companies.
- I am responsible for the creation and maintenance of all contracts, forms, HR documentation, employee documentation and all other standard forms necessary for day-to-day operations.

ATTORNEY / Kevin C. Brecht, Attorney at Law LLC

2010 - Present

- My practice areas include; oil & gas, real estate, telecommunications, public utilities, regulatory, municipal, and right-of-way law. I have extensive experience in: negotiating leases, easements and right-of-way agreements; researching mineral and land ownership; producing mineral title opinions; performing curative title work; negotiating, drafting, and reviewing complex contracts; interpreting state laws and local ordinances; reviewing maps; plotting deed calls to determine property boundaries; utilizing GIS mapping services; and navigating online databases. I have courtroom experience in the areas of civil, criminal, juvenile and family law.
- From 2011-2016, I also worked as an independent contractor with Orange Energy, Western Land Services and Kastner Land Services to perform leasing, right-of-way, curative, and title

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opinion work for numerous companies including Chesapeake, BP, ARU, Enervest, Anschutz, COSOL, and Murray.

- I am not actively practicing but maintain this as an active business.

GOVERNMENT RELATIONS MANAGER / Mobilitie 2016 – 2018

- My responsibilities with Mobilitie were substantially working with state and local jurisdictions to build out 4G, 5G, and Macro networks. I attended literally hundreds of zoning hearings, building and permitting meetings, City Council meetings, County Commissioner meetings, and various other hearings. I also worked with numerous townships, cities, counties and states to develop new laws, ordinances and aesthetic standards to govern wireless telecommunication infrastructure. I gained extensive experience in Municipal law, and Zoning law. I also served as Project Manager overseeing a team for permitting and leasing for smalls cells and macro towers on public and private property.

EDUCATION

**JURIS DOCTOR / Cleveland State University - Cleveland, OH
Graduation Year 2009**

- Real Estate Focus, Urban Development Legal Clinic

**B.S POLITICAL SCIENCE/ CRIMINAL JUSTICE / University of Akron –
Akron, OH Graduation Year 2006**

- Dual major with 3 minors
- Magna Cum Laude
- Phi Delta Theta



Anthony Bachmeier

137 Redbud Dr.

Bachmeier@gmail.com

Clayton, NC 27520

701-630-8416

Electrical Engineer – Specializes in Outside Plant (OSP) Telecommunications

Professional Summary

I have nearly 13 years of experience in the Telecommunications Industry. I have worked as a Project Engineer, Project Manager, Business Development, Principal Engineer, and Director of Engineering. Currently, I am the Director of Engineering for Essentia, Inc overseeing the Outside Plant department. I have a broad range of technical knowledge in engineering for both Inside Plant and Outside Plant builds. I have served in various projects including construction staking and inspection, grant writing, OSP design and permitting, fiber testing, central office power and grounding, network transport, soft switch implementation, voice, wireless design and implementation, data networks, and Internet Protocol.

Areas of Expertise

DESIGN SOFTWARE

- AutoCAD
- 3GIS
- ESRI Suite (ArcMap, ArcGIS, ArcGIS Pro, AGOL)
- ARAMIS-DT

OSP FIBER DESIGN

- FTTH Design – Passive Splitters and Home Run
- FlexNap design
- Central office infrastructure and equipment specifications
- Access equipment specifications
- GPON, NG-PON2, G.Fast and Active Ethernet design and specifications
- Fiber testing and troubleshooting fiber issues.
- Fiber routing and remote site design

CENTRAL OFFICE POWER

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- Design of redundant DC power systems
- Analysis of existing systems for present and future power needs
- Battery backup and recharge times
- Generator backup power

CENTRAL OFFICE GROUNDING

- Detailed grounding audits using RUS and NEC guidelines for central office locations.
- Recommendations for grounding deficiencies
- Central office ground field design and testing

TRANSPORT SYSTEMS

- Design and specifications of Ethernet, IP, and OTN based architectures.
- CWDM and DWDM design and specifications

SOFT SWITCH

- Specifications and vendor selection based on current and future client needs.
- Translations, implementation, and cutover assistance

WIRELESS DESIGN

- Knowledge in both public and private networks
- Licensed and unlicensed spectrum
- Assistance with FCC regulations and requirements for spectrum and tower additions or changes
- Knowledge of Small Cell technology and implementation
- Small Cell design and pole specifications

Networking and Internet Protocol

- Knowledge in many IP and networking technologies
- Cisco Certified Network Associate

RUS Grant/LOAN DESIGN AND CONTRACTS

- Coordination and assembly of RUS required, and Engineering recommended documents for RUS Grant/loan applications
- Knowledge of RUS contracts and procedures from budget line-item closeout

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Work Experience

Essentia Inc Remote – Raleigh, NC December 2022 - Present

Director of Engineering

As Director of Engineering with Essentia, I work with clients and staff to ensure a quality project is delivered on time and maintains project margins throughout the life of the project. I work with staff to set up processes to efficiently complete and deliver a project from start to finish. I work with clients to meet their needs while simultaneously moving the project forward. I manage complex projects with specific timelines and goals.

I also take on the duties of as a Client Manager, Project Engineer, and Project Manager while maintaining my duties as Director of Engineering. I am the main go to for design, engineering, drafting, fielding, permitting, construction, and training. I design and quality check work to ensure staff are trained and the proper processes are in place.

I supervise and lead engineers, designers, fielders, and technicians to plan and develop OSP projects as I oversee production and quality control. I direct and coordinate production, operations, and quality assurance. I oversee and implement the research and development of new products and procedures. I hire, train, and mentor other professionals and supporting staff. I plan yearly forecasts for the company based on existing work, potential incoming work, and any internal needs.

- Full ownership of Client relationships, Client Management and all aspects of Engineering and design by major Client or by Types of projects.
- Reports to VP and included as senior leadership within the organization.
- Responsible for procedures and policies within the client group or program.
- Responsible for resource planning within the Program, including hiring, staffing allocations and performance improvement plan implementation.
- Manages all financial metrics within the Program including Invoicing, revenue recognition, Accounts payable, Accounts Receivable, forecasting and carryover.
- Measure team members performance
- Understand and communicate expectations for production rates for various types of work.
- Possess the ability to identify opportunities to increase revenue.
- Develop, or assist in the development of Project Proposals / RFP responses.
- Understand individual project scopes and deliverable commitments.
- Maintain a thorough understanding of Contract Terms
- Develop and implement processes to improve/optimize production rates.
- Understand project contract structure and areas of risk
- Develop mitigation measures for areas of risk.

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- Monitor that all work is performed under contract and work with Project Managers to review and approve work performed out of standard contract sequence.
- Work with Project Managers to lower expenses on projects trending over budget.
- Maintain and nurture Client relationships.
- Establish positive relations within the project team(s) and with supporting groups within the company.
- Monitor and forecast staffing levels.
- Assist their reporting Managers by bringing attention to issues or potential issues.
- Identify inconsistencies across individual project design deliverables and target standardization of deliverables.
- Identify constructability issues and provide guidance on the resolution of these issues.
- Identify public right-of-way, private property, and easements.
- Thorough understanding of client standards and guidelines
- Thorough understanding of national standards and guidelines
- Understand public right-of-way, existing underground, and overhead facilities, and how they interact with each other.
- Identify inconsistencies between documentation and existing surveyed or observed conditions and provide guidance on the resolution of these inconsistencies.
- Identify technical inconsistencies on design documents.
- Supervise a team of Engineers, Designers, Drafters, and Fielders.
- Responsible for financial tracking of projects and provide training to project managers to track project financials.
- Responsible for invoicing of all projects across the department in coordination with the finance team.
- Responsible for revenue forecasting and revenue recognition models.
- Responsible for tracking Accounts payable and carryover.

KLJ Engineering Remote – Raleigh, NC June 2021 – November 2022

Project Manager - Project Delivery ENR

As a Project Manager with KLJ, I worked with clients and staff to ensure a quality project is delivered on time and on budget. I worked with staff to set up processes to efficiently complete and deliver a project from start to end. I worked with clients to meet their needs. I completed proposals, set budgets, set up timeframes, and work with finance to complete invoicing. I managed complex projects with specific timelines. I prepared cost analysis, project management plans, and forecasting staff needs and milestones for new projects.

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I also worked as a Project Engineer while also Project Managing I provided support for network design, engineering, fielding, and permitting. I QC'd design and work with staff to ensure they are trained, and processes are in place.

I helped the sales team with business development. I assisted in initial conversations with perspective clients to discuss their needs and help shape a business plan. I would come up with a scope of services, discuss the perspective project with all department managers involved in the scope, and put together pricing. I worked with the sales team to put together the proposal and present it to the client. Once the project was awarded, I worked as the project manager to ensure a quality project is delivered on time and on budget.

Project Manager and Engineer Grant and Loan Applications - Multiple Clients

As a Project Manager and Engineer with KLJ, I have assisted multiple clients with different grant and loan applications including the USDA (RUS), NTIA, and local government grants. I have successfully assisted clientele in receiving grant/loan awards in North Dakota, South Dakota, and Montana. I currently have multiple Reconnect USDA (RUS) grant applications submitted and waiting award notification in the states of North Dakota and Oregon.

Throughout the application process, I would figure out which area is applicable to the grant/loan, who has insufficient broadband access in those areas, work with the client to determine if and where a CO, hut, or cabinet is necessary, and design the routes. I would put together schedules and pricing for the engineering, materials, and construction for the life of the project. I would work with the client to determine the best choice technology (ISP and OSP) to use and which vendors to go with. I would also oversee the environmental and cultural portions of the application when the application requires it.

Project Manager and Engineer Beacon Broadband – Oregon Software – ArcMap, AutoCAD, Google Earth, Katapult, O-Calc Pro

Much of Oregon's rural population is underserved due to the terrain and cost of constructing fiber in the mountains and wooded areas. I assisted Beacon Broadband in submitting a USDA Reconnect application for a grant to assist with the costs of providing fiber to the home in western Oregon. There were 7 different serving areas consisting of approximately 1,150 miles of fiber routing. The main routing option is to use existing power poles so as to avoid placing new fiber through rocky terrain. I assisted Beacon with pole collection, pole loading analysis and make readies, permitting, environmental, cultural, fiber engineering, and construction services such as fielding, staking, and observation.

Telamon CLS 319 Chapanoke Road, Suite 118, Raleigh, NC 27603 May 2020 – June 2021

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OSP Principal Engineer and Department Manager

Software – ARAMIS-DT, AutoCad, ArgGIS Online, Google Earth, IKE, O-Calc, SiteTracker, Salesforce

As the OSP Principal Engineer and Department Manager, I helped Telamon to build OSP services from the ground up. I supervised and lead engineers, designers, and technicians to plan and develop OSP projects as I oversaw production and quality control. I directed and coordinated production, operations, and quality assurance. I oversaw and implemented the research and development of new products and procedures to bring consistency to the work. I hired, trained, and mentored other professionals and supporting staff. I laid out project specifications, prepared budgets, bids, and contracts.

I've won multiple bids with AT&T and Verizon. I interviewed and built up a team of 35 dedicated designers, drafter, and field staff based in the US and in India. When I left Telamon, were on pace to break 2 million in revenue for the OSP department alone.

I worked on multiple projects from cradle to grave doing AT&T F1 and F2 projects as well as Verizon maintenance projects. We utilized ARAMIS-DT and I set up new processes to help suit AT&T's needs. I managed staff, on boarded, and trained.

I set up bid sheets and forecasting in SiteTracker. I utilized Salesforce to track bid opportunities. I work closely with the general manager and VP of Engineering to set goals and processes to achieve them.

KLJ Engineering 5110 E 57th St, Sioux Falls, SD 57108 April 2011 – May 2020

Project Engineer

Verizon – One Fiber – Alabama, Nebraska, and Wisconsin

Software – 3GIS and ArcMap

This project's purpose was to bring fiber from pre-determined hubs to towers, small cells, and businesses spread out in metro areas. I led a team of up to 6 people to do the design and splicing schematics while also working with the contractors to meet their needs during construction. I was responsible for delegating work, Quality Assurance/Quality Control, troubleshooting, as-builts, and coordinating between all the different teams on the project. I was responsible for deadlines and forecasting budgets for my team. The project included high-level design all the way down to the low-level detailed ODN design used to bring drops into the buildings, assign fiber counts, and design inside plant equipment. It consisted of almost 700 miles with a mix of aerial and underground through rural and urban terrain. I worked very closely with Verizon to ensure all needs were being met. The project utilized 3GIS and ArcMap software.

Project Engineer

Verizon Small Cells – Dakota Carrier Network – North Dakota and Minnesota

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Software – ArcMap and AutoCAD

This project's purpose was to place Small Cell technologies in cities in North Dakota and Minnesota that need to offload capacity from their Macro Cell Towers. Verizon was experiencing congestion on their network in certain high population areas and required a solution that didn't include building more Macro Cell Towers. The Small Cell design allowed for radios and antennas to be mounted to existing or upgraded streetlights in high populous areas. This allows the smaller radios and antennas to pick up the traffic and offload the users which frees up the larger tower to pick up the remaining consumers. I aided the client in completing the regulatory negotiations with the cities and the final agreement contracts with the cities. I designed the pole specifications, outside plant design for fiber and power, environmental studies, right-of-way, permitting, surveying, and construction observation. I also worked with vendors to ensure the proper equipment was being purchased at the right time and at a reasonable price.

Project Engineer

Juniper IP Network Setup – Dickey Rural Networks – North Dakota

Software – Metaswitch

Dickey Rural Networks was upgrading their existing transport technologies to a newer IP based transport using Juniper Routers. This consisted of placing 26 new Juniper routers in their central offices throughout their exchanges. I was tasked with doing power and grounding audits on each of the COs to determine if there was adequate power, backup power, and grounding to handle the addition of the new equipment. I mapped out where the new Juniper and power equipment should go and worked with vendors to price out and install the needed equipment. After the necessary equipment was installed, I assisted the client with implementing and turning up the Juniper routers to set up their network and meet all the failsafe requirements essential for a Telecommunications Company.

Project Engineer/Manager

Switch Consolidation – Moore and Liberty Griggs County Telephone Company – North Dakota

Software – Metaswitch

Moore and Liberty Griggs County Telephone Company requested assistance in consolidating their existing number of switches down to a single switch. The client had a total of 4 Metaswitches spread out over multiple cities in North Dakota. They wanted to reduce it to a single switch in their main CO to help reduce the cost of maintenance associated with the additional switches. I assisted in establishing new trunking to terminate all traffic to the one switch, performed the necessary translations to allow all subscribers to be hosted on the single switch, helped make all the appropriate changes to the access equipment, moved line locations from the 4 Metaswitches to the new ATCA hardware, and performed Metaswitch conversions on approximately 3,000 subscribers from all exchanges. I provided all the necessary testing and checking forms to the client prior and during the cutovers. I also aided on all cutovers the night of each cut.

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Project Engineer

Enderlin, Sheldon, Finley, Cooperstown, Binford, McHenry Fiber to the Home (FTTH) – Moore and Liberty Griggs County – North Dakota

Software – AutoCAD and Google Earth

Moore and Liberty’s existing copper plant had outlived its usable life and was not able to provide the data speeds necessary to be considered high speed internet. A home run fiber optic systems design allowed for GPON access equipment to be utilized with a clear and easy path to NG-PON2 or Active Ethernet as customers require faster and more dedicated Gigabit data speeds. The project included FTTH design and construction, transport node upgrades, central office infrastructure and fiber termination, core router replacement with configurations, voice switch replacements with configurations, premise inside wiring, access equipment including ONTs with configurations and fiber optic acceptance testing.

Project Engineer

Wireless Network and Generator back up power – Morton County – North Dakota

Software – AutoCAD

Morton County was looking to expand their wireless emergency network by placing new antennas on an existing tower. Morton County wanted a turnkey solution. I provided this by helping to choose the tower location, the contractor, the CO hut to house the equipment, and the generator for backup power. I negotiated with the tower owner to get the antenna mounting height, hut placement, and generator placement solidified. I then designed the network and footprint within the tower’s compound and worked with the contractor to get the hut, power, generator, antennas, and misc. equipment installed and working at the site.

Project Engineer/Manager

Kindred Town and Rural Fiber to the Home (FTTH) – Moore and Liberty Griggs County – North Dakota

Software – AutoCAD and Google Earth

The project’s purpose was to complete a FTTH build to expand the client’s fiber footprint into a new territory as well as expand the client’s existing transport network. A home run fiber optic system was designed in Kindred Town and Rural that would allow for GPON access equipment to be utilized with the possibility of an easy upgrade to NG-PON2 or Active Ethernet as required in the future. I did the full design, permitting, and construction management. I assisted in working with RUS to shift loan funding to incorporate the additional transport fiber construction that would allow them to expand their transport network and be less reliant on leasing competitor’s fiber to complete their transport ring redundancy. I led discussions with

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the client and vendors to determine what the best route would be for both expanding and upgrading MLGC's existing transport network to gain extra speed and capacity.

Project Engineer

Wireless Network Design – Dakota Midstream – North Dakota

Software – AutoCAD and Google Earth

Dakota Midstream wanted to set up a way to remotely monitor all their oil well sites without having to have a person on site. Due to the location of the oil wells, fiber optic cable was not an option. Point to point wireless links were established using the unlicensed spectrum. I determined where the best placement for the wireless equipment should be, designed the plan sheets, and coordinated with the contractor to get the equipment installed. Due to the intricate quality of the project, additional fail-safes had to be put in place. I spec'd out routers with 4G LTE capabilities so that if anything happened to the point-to-point wireless link then the 4G LTE would kick in and Dakota Midstream would not lose remote monitoring. After the necessary equipment was installed, I assisted the client with implementing the necessary IP protocols on the routers to set up their network and meet all the failsafe requirements as set by a SCADA project.

Project Engineer

Business Development

Software – Salesforce

I have aided KLJ in gaining exposure outside of their traditional footprint and brought in new clientele. I have done technical presentations at multiple different conferences across the nation. I have aided clients in doing Rural Utility Service loans and grants, FCC grants, and NTCA grants. I have successfully brought in work from new clientele both through the local telcos themselves and through good relations with contractors. I am experienced in doing bids and contracts in multiple states. I have successfully won work in North Dakota, South Dakota, Iowa, Kansas, Oklahoma, Arkansas, Illinois, Texas, Alabama, Wyoming, Montana, Michigan, Oregon, Nevada, Kentucky, Pennsylvania, South Carolina, Georgia, Colorado, Florida, and Missouri.

Education

BS Electrical Engineering – North Dakota State University – 2009

Designations

Engineer in Training (EIT)

Certifications

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CCNA – Routing and Switching (expired)

Calix Ethernet Access Network Specialist (expired)

Genband C1511 Certification (expired)

Ongoing Education

Professional Engineer Examination

Network Certifications

Project Management Training – PMP Certification

Graduate School - MBA