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A collage of images related to technology and energy, including a hand holding a tablet with a bar chart, a hand plugging a blue charging cable into a station, a person in a hard hat working on a large pipe, a person in a hard hat pointing at a tablet in front of a control room, a robotic arm, and a field of solar panels.

Broadband Feasibility Study Request for Proposal (RFP) Response

Attention:

Lou Leone

City Administrator - Broadband Feasibility Study RFP

City of Harvard

April 5, 2024

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April 5, 2024

City Administrator – Broadband Feasibility Study RFP
City of Harvard, Illinois
201 West Diggins Street
Harvard, IL 60033

Regarding: Broadband Feasibility Study - RFP

Dear City Administrator:

On behalf of EN Engineering, LLC we would like to thank you for the opportunity to develop a proposal for a Broadband Feasibility Study for the City of Harvard, Illinois (“the City”).

EN Engineering (EN) is a leading national engineering services firm providing comprehensive design, engineering, and consulting services to gas and electric utilities, local governments including cities, counties and tribes, as well as other energy and industrial end-markets. With over 3,000 professionals in 36 offices nationwide, EN offers customers an unparalleled spectrum of services with expertise in electric power transmission, substation, distribution, and fossil / renewable power generation, as well as a vast array of telecommunications services.

We look forward to putting our people and our processes to work for you, to complete services on a consistent and timely basis. We thank you for your consideration. Please do not hesitate to contact your project executive Marcellus Nixon at mnixon@entrustsol.com.

Sincerely,



Jesse Rodriguez
Executive Vice President
Commercial Operations



ABOUT US

What We Do and Who We Serve

For 20 years, businesses, people, and communities have entrusted the employees of EN Engineering Services with their most valuable assets, infrastructure, and the projects that improve them. We have embraced growing markets such as renewables, power engineering services, EV infrastructure, data analytics, and geospatial with cutting edge engineering, consulting, and automation services. We offer valuable solutions to challenges faced by our clients, restore and expand infrastructures, enhance and streamline systems, and identify and record key assets for clients, including gas and electric utilities, telecommunication service providers, pipeline operators, and industrial companies. As one of the fastest-growing engineering firms in the country, we have grown from a single Midwest office to a national network of locations, which has only strengthened our commitment to serving with *excellence... from start to finish.*



Business Mission

EN EN Engineering Services is committed to **growth** by providing innovative solutions to our clients with a focus on **long-term relationships**, while consistently maintaining the highest level of quality, safety, integrity, and ethics.



People Mission

Our success is achieved through continuously cultivating a culture that values the contributions of our diverse and **talented team** members. We seek out and encourage colleagues who are passionate, curious, and client focused. We maintain an environment of mutual respect and commitment to professional development and advancement.



Community Mission

We are committed to the safety and sustainability of the communities, team members, and stakeholders that we serve. We are a strong catalyst for positive change in the communities where we partner with our clients. We achieve this through charitable **giving**, partnering with **community development** organizations, and creating local **job growth**.



WHY CHOOSE EN ENGINEERING SERVICES

Who We Are and How We Can Help



Safety

Relentless commitment to safety for our employees, our vendors, our clients, and our communities



Quality

Strict quality control procedures; proven methodologies; impeccable resources; continuous communication with client and project team members



Expertise

Strong focus on the energy industry; nationally recognized subject matter experts; highly experienced, industry-trained core staff



Value

Complete projects on-time and on-budget with low risk to client



Location

Network of 35 offices close to key energy sectors and critical industry hubs



Diversity

EN Engineering Services utilizes diversity contractors and has implemented a comprehensive Disadvantaged Business Enterprise (DBE) initiative across our services that complies with the needs of our clients

*Large enough to **serve you nationally**, small enough to **serve you** with our senior staff and **industry-leading experts**.*

PROJECT SAFETY

Promoting a Culture of *Safety First*

At EN Engineering, our goal is to reduce health, safety, and environmental risks. We promote safe and environmentally responsible work practices and are committed to maintaining the highest level of safety standards.

EN recognizes the priority that the City places on safety and the importance of complying with health, safety, and environmental policies and procedures to ensure a successful relationship for both the City and EN.

We have set our **safety objective at zero** for vehicle accidents, property damage, lost time, and medical aid injuries by EN and its subcontractors. A team approach, focusing on a cooperative effort between EN and its subcontractors and clients is essential in order to meet this objective. All team members must exercise every effort to eliminate personal injury, equipment loss, or damage to facilities and are required to participate in our safety program. EN has had zero OSHA safety violations since the inception of the company.

A pre-job meeting shall be held before commencing any new project to establish the safety program and objectives. EN employees, subcontractors, and client representatives shall attend the meeting. On an as needed basis, EN shall conduct a Tailgate safety meeting with each crew to review the client safe work permits and health and safety issues associated with the day's work, or in some cases, prior to a specific high-risk task.

If required, we will train and qualify one of EN's employees to train other EN employees on the City's safety standards. EN will ensure that all employees will be trained prior to any site visits on the City's facilities.

EN employees working on the City's projects will be placed into our Department of Transportation drug testing pool. We maintain a comprehensive insurance package and health & safety program.



VENDOR QUALIFICATIONS

EN provides fiber engineering, consulting and network implementation to municipalities and utilities whose goal is to improve broadband in their communities. Over 400 municipalities, utilities and cooperatives have used EN to develop their fiber and broadband networks. Our mission is to connect every community, one at a time, to the digital economy so that no one is left behind. Our work ensures that communities can access every opportunity the internet has to offer so they can thrive in the connected world.

Our turnkey broadband solutions allow our clients to maintain a single partner that fulfills every aspect of planning and deploying broadband networks, with seasoned experts guiding their deployments every step of the way. Our success is based on our clients' success and our fiber solutions enable our clients to serve their citizens' most pressing broadband needs in the digital age.

Our mission is to provide a single-source solution to innovative cities that believe in broadband's ability to transform communities. Our staff comes from other cities that have implemented broadband. They carry the most experience industry-wide in planning community needs assessments, engineering, construction management, inspections, sales, marketing and operations. EN provides a full spectrum of services to our municipal clients because we know that they need guidance on all stages of broadband planning and development, as well as guidance on how to fund, deploy, launch, operate, and provide the best levels of services to their citizens and businesses.

Over our 20 years in business, we've worked with over 400 municipalities, with over 1 million miles of municipal fiber designed and over 75 municipal fiber networks built and active today. This experience has shaped the way we serve our clients' needs. It's led us to develop a consultative and collaborative approach, ensuring that your community is engaged, and their needs are well-defined. We work hard to develop innovative solutions to deploy broadband networks because we know the political, financial, regulatory, and operational challenges that cities face in implementing these projects.



PROJECT APPROACH

Proposed Scope of Work

The City of Harvard, Illinois has determined that broadband is no longer a ‘nice to have’, but critical civic infrastructure mandatory for community vibrancy. EN shares this view and takes a multi-decade approach to your digital infrastructure requirements and potential investments. We take an independent advisor approach and will analyze the City’s current environment in detail. We will then analyze select business/operating models against this reality and present a thorough and unbiased analysis with recommendations and implementation roadmaps.

To this end, we are proposing the following approach to ensure project success.

TASK 1: DEMAND FOR BROADBAND SERVICE

Market Analysis

EN will analyze the local digital infrastructure in the City of Harvard. EN defines Local Digital Infrastructure (LDI) as including three components:

Ubiquitous multi-gigabit services to all reasonable location, by at least one provider, preferable more

Full 5G coverage by the three national providers

Redundant high-speed connections to the ‘edge’ of the Internet and the cloud

EN will perform market analysis detailing broadband coverage, capacities, and pricing plans for internet service providers in the city. We will review the competitive environment in the city on a neighborhood-by-neighborhood basis. Emphasis will be on facilities-based providers, or those that own and operate their own network infrastructure including fiber optics and wireless radios.

We will document all publicly-owned and privately-owned networks in the city and extrapolate likely local upgrade strategies based on our extensive knowledge of private ISPs, roadmaps of broadband technologies, and fiscal realities. The analysis will include:

- Document areas that are well served by competing providers and areas that are under- and un-served
- Document existing fiber networks within the city, including ownership and availability for use by other network providers
- Document 5G fixed and mobile coverage



- Provide an overview of current broadband providers' services, pricing strategies and coverage areas
- To the best extent possible, determine and analyze the investment and deployment plans of incumbent providers

This analysis will document fiber-optic long-haul and metro networks, facilities, data centers, and related infrastructure in the city. These artifacts will determine the options for middle-mile connectivity to the major inter-exchange points (IXPs) to enable direct internet edge connectivity.

Stakeholder Outreach

EN proposes conducting a series of focus groups (Virtual and/or locally) with key stakeholder representatives to determine what high-speed internet means to them, their connectivity needs, and how high-speed internet development might enable them to be more effective and successful. The goal is to understand long-term requirements as well as current issues. Generally, these focus groups are structured around organizations in particular sectors, with common goals or issues, and shared interests. Stakeholder inputs also help to identify under-served areas, communities, and populations along with prospective tactics for closing high-speed internet gaps.

Public Agencies

Public agencies are important barometers of high-speed internet deployment and use, and they often function as “anchor tenants” for infrastructure deployment. EN typically structures focus groups for these stakeholders around functional areas, engaging representatives from various jurisdictions. Functional areas include:

- Administration, including public officials and information technology
- Community development: Permitting, planning, zoning, etc.
- Economic development, including entrepreneurial support and targeted industries
- Emergency services and first responders: Sheriff, Police, Fire, EMS, 9-1-1, etc.
- Roads, traffic, transit, and transportation
- Utilities
- Parks & Recreation

Community Anchors

Every community has a unique set of private and public organizations that determine quality of life and provide essential services. They typically have diverse requirements and can provide key insights into community structure and other stakeholders. They include:

- Arts, culture, leisure pastimes, parks, recreation, and sports
- Education: Colleges, libraries, school systems, universities, etc.
- Health and wellness: Clinics, hospitals, specialists, etc.
- Social services and support, generally focused on at-risk populations or particular topics



Major and Targeted Industries

Major and targeted industries bring capital investment into communities and create jobs to produce goods and services that are generally sold outside the area. They manage or own major office and production facilities, supply chains, and wide-area networks to interconnect them. Often local representatives are branch managers or, as targeted industries, local representation is limited. Therefore, it may be necessary to identify directors of higher-level divisions or related organizations and conduct individual interviews to get input for these stakeholders.

Small and Medium Businesses

The bedrock of any local economy are its small and medium-sized businesses. Generally, they are very diverse and dynamic to meet constantly evolving economic needs and opportunities. Of course, this creates a challenge to understand current connectivity and requirements for the future. To address this, EN recommends engaging local business associations such as chambers of commerce, merchant associations, tech associations, etc.

Residents

Most input from residents will be via the community survey discussed below. It may be appropriate to conduct a community workshop or “town hall” meeting to get feedback on results of other components of the study.

Community Internet Survey

EN’s Community Internet Survey is driven by locations—households and organizations. The objective is to understand what services are available and subscribed to at each location studied. EN pioneered this methodology, including built-in speed test, demographic benchmarking, and geographic targeting.

Typically, this is a “convenience” survey that is generally promoted to the public without direct requests to specific prospective respondents. It is up to the client to ensure widespread awareness of the survey by promoting the existence and the importance of the survey. We recommend the client create a promotional plan, with a small budget, to take advantage of all available outreach platforms (e.g., bill inserts, newspaper ads, social media). Promotional plans should include follow up with non-responding areas or populations, and further promote the survey via stakeholders. EN will work with the client to share best practice to ensure success.

The results of the survey will be used to:

- Create a map of broadband speeds and providers as a GIS layer that can be integrated into the City’s mapping system
- Determine actual broadband speeds delivered to residents and businesses in the City



- Determine current attitudes and concerns regarding broadband of the City's residents



TASK 2: EDUCATION/COMMUNITY ENGAGEMENT PLAN

EN understands the importance of educating all community constituencies on the City's initiative to bring broadband services to the City. To facilitate this, EN will develop a Messaging Framework on potential investment within the city, broadband policies, actions, to ensure clear and consistent communications throughout the community. This framework will include:

- Key messaging points to drive the narrative
- Constituent segment specific messaging
- Copy and images suitable for websites, print ads, social media post, etc.
- Educational materials in the desired formats that clearly articulate the importance of broadband and digital infrastructure in the future success of the community

EN will also support a limited number of on-site presentations at community educational events and city leadership meetings.

TASK 3: ENGINEERING DESIGN OPTIONS

EN will assist the City in developing the most appropriate broadband network design based on the City's specific needs.

EN's network design approach will include dividing the City into serving areas called polygons leveraging major thoroughfares as fiber backbone routes. This approach enables access to the residences, businesses, anchor institutions (service end points) in each area.

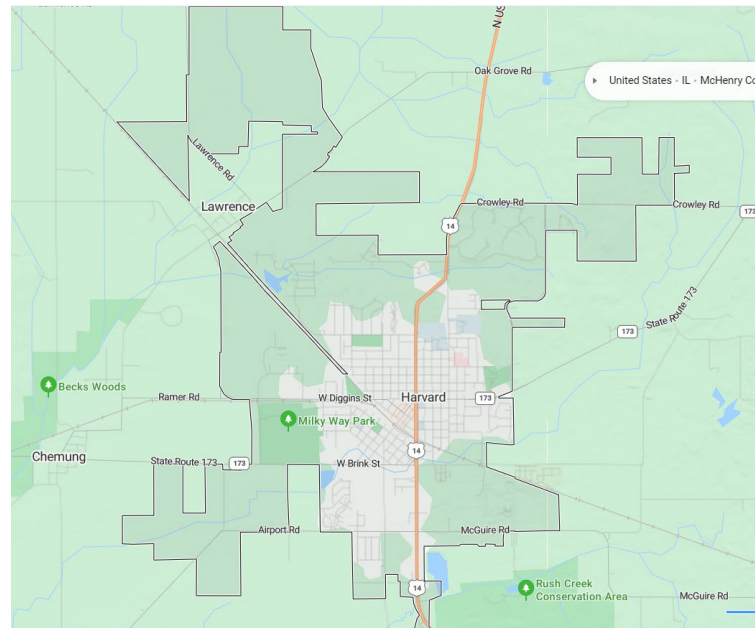


Figure 1 – Map of Harvard, Illinois Major Thoroughfares



EN will work with the City to develop a pre-engineering broadband infrastructure network design to include a pre-engineering deliverable of a high-level design including overall capital cost of construction. As requested, when the time comes, EN will also develop a detailed engineering design, and provide an estimate of what it would cost to go from a high-level engineering design to a detailed engineering study.

EN specializes in designing and determining the capital cost for both passive optical network (PON) and an active ethernet infrastructure. Our recommendation is to begin the implementation with PON at the 10G symmetrical level then deploy active ethernet when there is a small, medium and large commercial driver to do so. With this in mind, we will design the infrastructure with this approach.

EN also specializes in determining and incorporating how the broadband infrastructure network design can be supported and/or complimented by wireless technology such as a small cell technology that will be required to support 4G LTE densification and 5G technology.

We propose utilizing any existing and planned City conduit, fiber, facilities, and other municipal assets as a foundation to develop a fiber-optic network capable of serving the various city needs. We will leverage this foundation to determine how to connect all proposed locations in the best possible topology addressing both short-term capital costs and long-term operating costs.

This task will entail network design elements for last-mile, middle-mile and long-haul connectivity. We will help the City develop a strategy for last-mile connectivity – the connections from conduit and fiber to sites and facilities. We will also help the City develop a strategy for the middle-mile connectivity and interconnection points within the City’s fiber network. We will identify any current or potential data centers or colocation facilities in the City and the surrounding region and will determine if/how the City’s network can interconnect to them. For example, the Equinix telecom/internet hotels in Chicago, as depicted in figure 3, have the densest concentration of major network entities in the world to include Netflix, Amazon, Google, etc. Implementing the depicted connectivity on two separate paths from the City of Harvard to Chicago will provide reliability, availability leading to increased City of Harvard internet subscriber satisfaction.

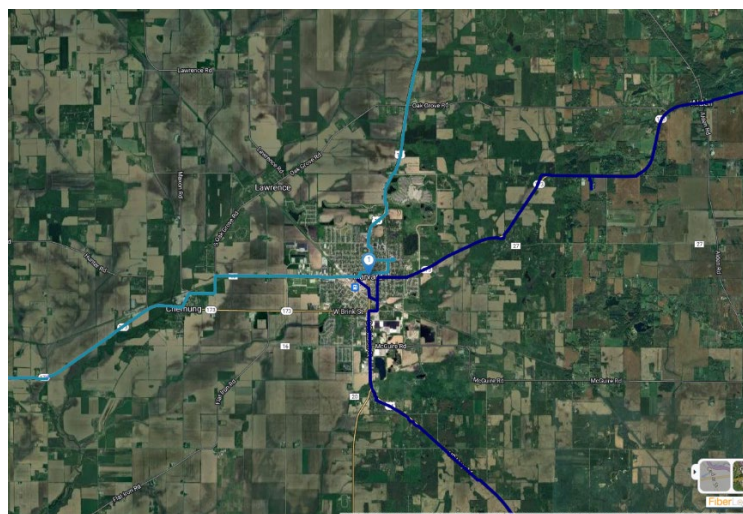


Figure 2 – Map of Harvard, Illinois Major Thoroughfares Telecom Connectivity



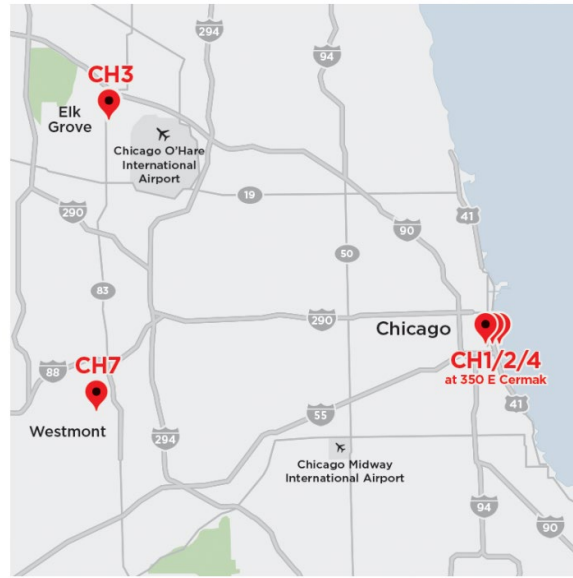


Figure 3 – Chicago major telecom/internet hotels in which Harvard would interconnect



City of Harvard fiber backbone connectivity to major carrier backbones, two separate paths for redundancy

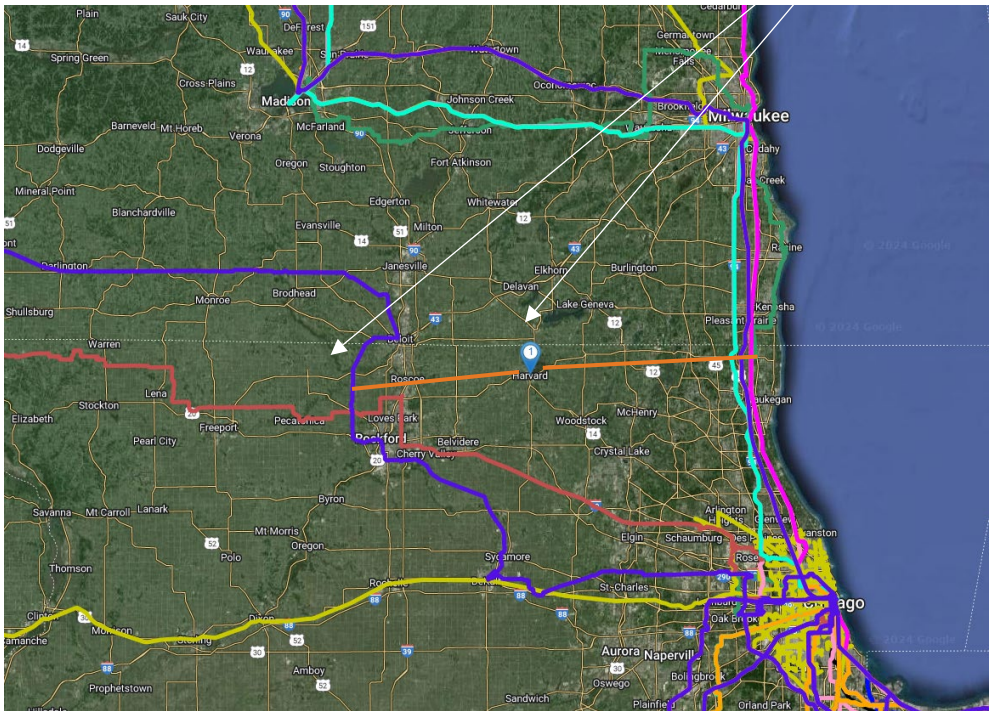


Figure 4 – Depiction of Harvard connecting to major telecommunication provider backbones enabling redundancy, reliability and decreased long-term operating costs

We will also design the network for multi-service capabilities to meet a variety of end user needs and to expand and diversify revenue sources. As the network is designed, we will provide documentation on the allocations of network capacity for different users, across City, utility, community anchor and broadband applications. This capacity plan will ensure that the City creates the necessary fiber allocations for all potential users on the network and maintains enough reserve capacity for other future needs. The capacity plan will give the City a systematic way to assign, identify and manage the fiber network, which, as the



network grows will become a critical process to ensure the City maintains accurate records.

We will also provide general options for development to include phasing, partnerships, targeting, and technologies. The conceptual design will provide cost estimates, expected coverage, and impact, including revenue potential on a per area basis.

TASK 4: BROADBAND MODEL OPTIONS AND RECOMMENDATIONS

EN will incorporate findings from the previous phases of the study to develop business and operating models that fit the framework of financial, operational, and organizational requirements of the City, and will have the greatest chance of success and financially sustainable. We will present these business analyses to the City’s team and provide details of how they meet the City’s goals in the project. Each city is unique, and through our proven process and experience, we will work with the City to find the model that is most feasible and presents the best opportunity for its unique community needs and ambitions.

Selecting the right broadband business model for a local government depends highly on a number of factors that will dictate the most appropriate option for the organization. These include competitive and market factors that define what options fit well within the current environment, organizational and operational capabilities of the local government and financial and risk factors that determine what risks, rewards, and funding commitments an organization is willing to make toward a broadband initiative.

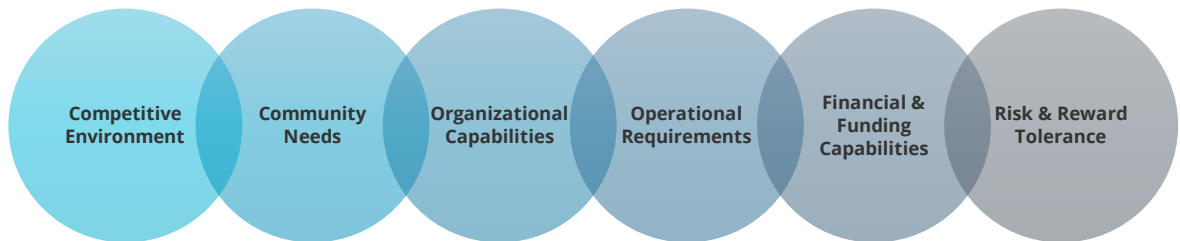


Figure 5 - Inputs to Selecting the Right Broadband Business Model





Figure 6 - Risk/Reward Continuum

The commonly implemented business models fall on a continuum that ranges from low risk, low investment options to higher risk, high investment options. Figure 3 illustrates this continuum. As a local government evaluates the various business model options along the continuum, it will encounter greater degrees of risk and reward; risk, in terms of financial, operational, and regulatory risk; reward, in terms of community benefits, revenue generation, and overall potential for profit. In addition, moving “up” the continuum also implies greater local government participation in the delivery of broadband services. Public policy and infrastructure only options are considered “passive” business models, whereby the government does not operate a broadband network versus Public Services Providers, Open Access Providers, and Retail Provider Options, whereby the government operates a broadband network to varying degrees. Public-private partnerships are not classified as a particular business model but instead fall along the continuum because these partnerships take many forms. Local governments must determine which business models meet their organization’s risk/reward tolerance to achieve the community’s broadband goals.

As requested, EN will include a detailed analysis, with Pro-forma financial results of City as the ISP model and a number of public-private partnership (3P) models. The 3P models will include the passive asset (e.g., Fiber and Conduit) leasing model where the city would lease the entirety of the passive assets to one ISP for a number of years. While a 5-year Pro Forma was requested, we believe a 20-year duration more accurately models the potential broadband business.

Financial Analysis

EN will provide detailed financial models of each relevant operating model. EN’s financial models have been specifically developed for broadband utilities. Our models are widely used tools to model feasibility and financial performance for over 50 municipal broadband providers and have been utilized to plan and manage broadband network investments for over \$500 million in broadband projects nationwide. Using EN’s tools, we suggest using the following process to conduct the business model analysis and make recommendations:



1. Develop the cost model for the network, including one-time and ongoing capital expenditures to build the network
2. Develop the cost model for operations, including operations & maintenance (O&M), network operations, field services, staffing, billing, marketing, and customer service
3. From the market analysis and outreach, determine the customer segmentation and growth on the network, across each type of customer (business, school, hospital, etc.)
4. Determine a proposed competitive rate schedule for potential services, using pricing information from the market analysis and benchmarking information
5. Develop financial statements, pro formas, depreciation schedules, and cash flows
6. Conduct comprehensive financial analysis on the project to determine overall financial sustainability using key metrics such as free cash flow, debt service coverage, operating margin, and net income
7. Use scenario analysis to evaluate different business models and determine which are feasible for the City to consider
8. Recommend the most feasible business model based on overall business and financial sustainability, community benefit, and long-term value to the community

As noted, we would propose developing a 20-year pro forma to analyze the project.

TASK 5: CAPITAL FUNDING OPTIONS

Based on the financial model analysis EN will identify possible funding options. These include:

- State and federal grant programs
- Municipal debt options
- Private equity funding
- Private debt funding
- Inter-governmental agency transfers

EN's Grants Team has significant and deep experience in preparing applications for federal and state grants and funds on behalf of EN clients. The Grants Team supports the due diligence and application remediation efforts to answer grantor agencies to clarify any questions and bring applications into complete conformance with the grant Notice of Funding Opportunities (NOFO) and/or Funding Opportunity Announcements (FOA). EN supports the business review of offered grant documents. Once the client accepts the award, EN offers services to support the grant recipient's compliance obligations imposed by the awarding agency. Initially, EN evaluates the financial and operational systems required to support the performance of the grant program commitments; this includes the



client's financial control systems, the records management, and data retention systems required to manage all required data through the life of the award and post-award audits.

EN also offers ongoing contract administration and grants compliance services, ensuring that the awarded client stays in conformance with all grant obligations that accompany an awardee of any federal grant throughout the life of the award. EN will provide guidance on assuring competitive solicitations by reviewing content prior to issuance. EN can offer additional optional services in evaluating proposal responses, reviewing contracts, and other administrative services if and as agreed. EN's Grants Team also possesses financial expertise to provide support for pro forma forecast, tracking actual and forecast expenditures against budget, and financial analysis.

Our Grants and Consulting Teams work together to ensure we remain up to date on all State and Federal Broadband Initiatives to bring our clients the most informed choices for broadband solutions.

External Financing Options

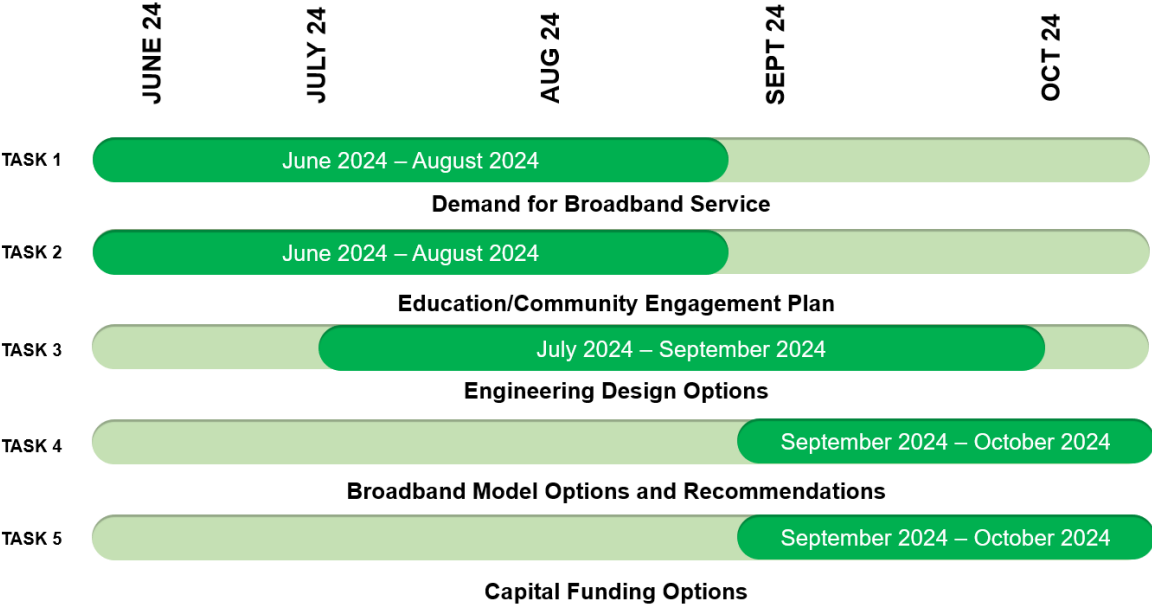
EN will analyze the financial models and determine the applicability and sources for external financing. EN will work with the City to understand the current financial situation and the receptiveness for different types of municipal debt. We will work with the City to determine the structure of potential municipal debt instruments (E.g., G.O. Bonds, Revenue Bonds, etc.). EN will also analyze the private equity and private debt markets as potential sources of funding.

Inter-governmental Agency Transfers

EN will review internal sources of funding. We will work with the city to identify sources and to structure the appropriate financial transfer and payback mechanisms.



PROJECT EXECUTION PLAN



PROJECT COST

The costs outlined below are EN's estimated work effort required to complete the tasks described within this document. Work is intended to be performed on a Fixed Fee basis.

The total proposed cost to the City of Harvard for the Broadband Feasibility Study is \$92,989.

Description	Cost
Task 1: Demand For Broadband Service	\$23,139
Task 2: Education/Community Engagement Plan	\$12,600
Task 3: Engineering/Design Options	\$25,200
Task 4: Broadband Model Options and Recommendations	\$16,800
Task 5: Capital Funding Options	\$7,250
Travel	\$8,000
Total for All Services	\$92,989



Assumptions and Clarifications:

1. EN's proposal is proposal is based on EN's current understanding of the scope of work described in the RFP documents and assumptions stated in this proposal. If the scope differs from what is detailed in the RFP, EN will provide the City with a new price proposal addressing the modified scope of work.
2. EN will bill on the first day of the month for \$18,597.80, five (5) equal monthly payments.
3. Reimbursable expenses incurred in performing the scope of work described in this proposal will be invoiced directly to the City, including, but not limited to, authorized out-of-town travel costs, mileage, postage, courier drawing transmittal costs, and messenger services.
4. The provided pricing is valid for 180 days from submittal.



PROJECT TEAM

We have listed the bios for the Project Team for the City of Harvard. Additional resumes can be provided if needed.

Courtney Violette – Chief Management Officer, Principal – Binding Authority

Courtney has led hundreds of municipal broadband and smart city planning and implementation projects across North America over his 25-year career in the technology and telecommunications sector. He is a Certified Fiber-To-The-Home Professional and holds several technical certifications in broadband, information technology and information security. Prior to joining EN Engineering Services, he spent six years as the CIO for the City of Palm Coast, and before that worked in the private water utility sector. Courtney is a US Army Veteran and holds an MA in Information Technology Management and BS in Computer Science from Webster University.

Marcellus Nixon – Project Manager - VP, Broadband Consulting, and Implementation – Binding Authority

Marcellus has more than 35 years of experience building fiber-optic infrastructure, domestically and internationally, and is a trusted advisor in the high-speed internet space. As Vice President of Consulting, Marcellus initiates consultant engagements and guides clients through the planning phase for their projects, helping them understand how to build for long-term infrastructure sustainability. Before joining EN Engineering Services, he most recently led a successful greenfield high-speed internet project for United Cooperative Services in Burleson, Texas, including design, construction, network deployment and operations, marketing and sales across 14 north central Texas counties. Marcellus is a graduate of the University of Virginia.

Greg Whelan - Senior Broadband Consultant

Greg is a subject matter expert in broadband, fiber, 5G/6G, digital infrastructure, and smart cities. He was a pioneer in broadband and created the first broadband modem chipset in the industry. He was a co-founder and vice president of the Broadband Forum and participated in early international broadband standards organizations. He was part of the team that architecture one of the first open access broadband networks in the USA and was early in connecting private funding and open fiber networks in the USA. Prior to joining Magellan Advisors, he was an independent broadband industry analyst and advisor. Before that he led broadband marketing and products at Cisco Systems, Cascade Communications, Analog Devices, and a number of start-ups in greater Boston.



Mark Lane - Senior Technical Consultant

Mark Lane has over 30 years of experience in enterprise IT, carrier network operations, and technology consulting. While serving as CTO for Bristol Virginia Utilities OptiNet, he helped provide the strategic direction and practical implementation responsible for their fiber-to-the-premise (FTTP) network build-out and broadband service deployment for eight counties in Southwest, VA. His vision and leadership contributed to Bristol, VA being selected as an Intelligent Community Forum Top 7 Intelligent County in 2009. Mark received a bachelor's in computer science from the University of Tennessee.

Al Kamuda - Fiber Design Team Lead

Al Kamuda is a seasoned telecommunications and GIS professional with over 20 years' of experience in telecommunications engineering, mapping, design and outside plant construction. Prior to joining EN Engineering Services, Al was the Senior Design Manager for the Central Florida region at Spectrum (Charter Communications), where he led the planning, project management and implementation of outside plant design for various company growth projects including residential, commercial, cellular backhaul and metro WIFI. His extensive experience with the telecommunications industry, CAD platforms and geospatial expertise along with his strategic forward thinking provides an extremely diverse skill set that allows him the valuable insight needed to understand the client's objectives in all aspects of telecommunications construction and design processes.

Cannaith Thomas - Project Management Analyst

Cannaith is a dynamic professional with a strong background in sales, leadership, and client relationship management in various industries. Most recently as an Account Manager in the property technology and access control arena, Cannaith collaborated with clients to champion smart parking initiatives, which involved navigating regulatory landscapes and leveraging innovative solutions to enhance urban mobility. She brings a unique blend of customer-centric expertise and project management skills to drive success. Cannaith has a BS in Sociology and Anthropology and a Master's in Business Administration with a concentration in Management.



Adrienne Schmidt – Project Management Analyst

Adrienne is an accomplished Analyst known for her expertise in distilling large, intricate datasets into actionable insights. With a keen ability to communicate these findings effectively to both technical and non-technical stakeholders, Adrienne is instrumental in driving business growth. Certified as a Lean Six Sigma Yellow Belt, she excels in streamlining processes and improving efficiency. Adrienne earned her Bachelor of Science in Chemical Engineering with minors in Mathematics and Chemistry from Virginia Tech, providing her with a robust foundation for analytical problem-solving and strategic decision-making.



RECENT EXPERIENCE



CUSTOMER	STATE	TYPE	FEASIBILITY STUDY	FIBER MASTER PLAN	BROAD BRAND BUSINESS PLAN	GRANT DEVELOPMENT	BROAD BRAND POLICY	ENGINEERING DESIGN	PERMITTING	PROCUREMENT	CONSTRUCTION MANAGEMENT	INSPECTIONS & CLOSE-OUT	STARTUP & LAUNCH	OPERATIONS & MANAGEMENT	SALES & MARKETING	BROAD BRAND EXPANSION
			BROADBAND PLANNING				ENGINEERING			TURNKEY IMPLEMENTATION						
City of Chicopee	MA	City	*	*			*	*								
Vermont Electric VELCO	VT	Electric Utility	*	*			*	*								
City of Syracuse	NY	City	*	*			*	*								
City of Rochester	NY	City					*	*								
Niagara County	NY	County	*	*	*	*	*	*	*	*	*	*	*	*	*	*
City of Morrisville	VT	City	*	*			*	*								
City of Jupiter	FL	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Palm Coast	FL	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Hamilton	OH	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Portsmouth	VA	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Rancho Cucamonga	CA	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Clermont	FL	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Hillsboro	OR	City	*	*		*	*	*	*	*	*	*	*	*	*	*
City of Mont Belvieu	TX	City	*	*	*	*	*	*	*	*	*	*	*	*	*	*
City of Tuscaloosa	AL	City	*	*			*	*								
City of Tuscaloosa	AL	City	*	*			*	*								
Navajo Nation	NM	Tribal Organization	*	*		*	*	*								
Rancho Santa Fe	CA	City	*	*			*	*								
City of Huntington Beach	CA	City	*	*			*	*								
City of Manhattan Beach	CA	City	*	*			*	*								
City of Mission Viejo	CA	City	*	*			*	*								
Pima Area Council of Govts	AZ	Regional Organization	*	*	*	*	*	*								
South Bay Council of Govts	CA	Regional Organization	*	*	*	*	*	*	*	*	*	*	*	*	*	*
City of Ventura	CA	City	*	*			*	*								
City of Oxnard	CA	City	*	*			*	*								
City of La Mesa	CA	City	*	*			*	*								
City of Santa Clarita	CA	City	*	*			*	*								
City of Chula Vista	CA	City	*	*			*	*								
City of Hayward	CA	City	*	*			*	*								
City of Concord	CA	City	*	*			*	*								



REFERENCES

1. **Ann Arbor, MI - Ann Arbor – Fiber Master Plan and Design**

Contact: Tom Shewchuk

Phone: 734-794-6551

Email: tshewchuk@a2gov.org

Scope of Work Summary: EN was retained by the City of Ann Arbor in late 2019 to develop a fiber plan and engineering design for Ann Arbor’s Downtown Development District. Ann Arbor’s goals were to densify fiber in the downtown area to support the growth of businesses, attract new high-tech companies and enable other stakeholders to interconnect with one another using a high-speed and highly redundant fiber backbone. EN’s work engaged city departments, utilities, the University of Michigan, economic development organizations and other community organizations to determine fiber needs and develop the backbone based on key locations that needed service. Following the needs assessment, EN is conducting detailed field engineering and design for the fiber backbone, along with developing a final bill of materials, construction prints and bid package for construction of the network.

2. **Hillsborough County, Florida – Broadband Assessment**

Contact: Axel Clauberg

Phone: 813-307-4469

Email: ClaubergA@Hillsboroughcounty.org

Scope of Work Summary: In May 2023, EN finalized a Broadband Assessment for Hillsborough County, FL to help them determine low-cost and effective ways for the County to improve the local broadband environment for the benefit of its communities. The study included an asset assessment, market analysis which included a community survey with 1,491 respondents, and stakeholder outreach. The team identified and mapped/plotted 3 unserved areas/Proposed Funded Service Areas (PFSA). The project team included its proposed technologies and detailed cost estimates per PFSA, along with guidance on federal, state, and local grant opportunities. Collaboration with the County’s project team facilitated the presentation of findings and recommendations to the Local Technology Planning Team (LTPT) and other critical stakeholders.

3. **Sault Ste Marie Tribe of Chippewa Indians in Michigan (Sault Tribe) – Broadband Strategic Plan**

Contact: Larry Jacques

Phone: 906-635-6050

Email: ljacques@saulttribe.net

Scope of Work Summary: In 2021, EN developed a Broadband Strategic Plan for the Sault Tribe to deploy fiber-to-the-home services across their federally recognized tribal lands in the Upper Peninsula of Michigan, which led to a successful USDA RUS ReConnect Grant for \$28+M for their fiber network construction which covered Chippewa and Mackinac Counties, MI. EN raised a total of \$29.6M for the tribe. This project is soon to kick off, with engineering, environmental, construction and other key tasks kicking off in 2024.



APPENDIX A: RESUMES

Courtney Violette, CISSP
Chief Operating Officer (Magellan)

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Resume Highlights

Project Management

Contract Negotiations

Operations Management

Executive Leadership

Years of Experience: 23

Primary Office Location:
Orlando, FL

Education:
Master of Arts, Information
Technology Management -
Webster University
Bachelor of Science, Computer
Science - Webster University

Skills

- Strategic Planning
- Broadband Deployment
- Market Planning
- Funding Strategies & Procurement
- Financial Planning
- Performance Management
- Contract Negotiations
- Operations Planning
- Technical Planning
- Technical Design
- Technical Implementations
- Operations Management



OVERVIEW

Courtney has nearly 23 years in the IT/telecommunications sector and has led hundreds of municipal and utility broadband planning and implementation projects across North America. He is a Certified Fiber-To-The-Home Professional and holds several technical certifications in broadband, information technology and information security.

Prior to joining Magellan, he spent six years as the Chief Information Officer for the City of Palm Coast, Florida. During this time, he planned and built the first true city-owned open-access network in the Southeast. Through his leadership, the network grew to serve government, business, education and healthcare needs across the city, saving these organizations millions of dollars and providing gigabit connectivity to meet the community's needs.

EXPERIENCE

Magellan Advisors LLC Chief Operating Officer/Managing Partner

Courtney has focused his consulting efforts on strategic technology planning, broadband and network deployment, as well as smart city/IoT innovations. He leads teams across the company, performing technical consultations, network and system deployments, and policy/legislative initiatives that further his clients' missions.

Courtney has co-led Magellan's growth over the last 10 years, including the launch of a full Electronic Power Control division responsible for leading design, permitting, construction management and inspections of implementation projects. In addition, he has led customer growth into the Canadian market, broadening Magellan's reach beyond the United States.

City of Palm Coast, Florida Chief Information Officer

The City of Palm Coast located in North Florida serves a population of nearly 80,000. This full-service city is a leader in Florida with investments in technology initiatives in commercialized broadband infrastructure geared toward providing business-class services to regional anchor institutions and the Palm Coast business community.

As Director of Technology and Communications/CIO, Courtney managed a full services department of IT professionals in areas of Network/Telecommunications, Application Development, Geographic Information Systems and Video Broadcasting.

Additionally, he managed the implementation of Palm Coast FiberNET, Florida's first municipally owned "carrier-class" open-access network.

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Certifications

- CISSP – Certified Information Systems Security Professional
- ITIL v3 Foundation
- CCIO – Certified Chief Information Officer
- CCNA – Cisco Certified Network Associate
- MCSE – Microsoft Certified Systems Expert

He created departmental goals and objectives that directly aligned with the organization's vision, values and strategic plans and was responsible for risk management, information security audits, physical security and all federal regulations related to organizational data and infrastructure.

Valencia College **Associate Professor**

Courtney served as a full-time Associate Professor and an Adjunct Professor of the Computer Engineering Technology Department specializing in instruction in areas of Telecommunications, Network Services and Information Security.

Valencia College ranks among the nation's top two-year colleges and is considered a premier learning college that provides opportunities for academic, technical and life-long learning in a collaborative culture dedicated to inquiry, results and excellence.



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Resume Highlights
<i>Developing KPIs</i>
<i>Identifying Risks and Problems</i>
<i>Mentoring</i>
<i>Fiber Infrastructure</i>
<i>BSS</i>
<i>Calix</i>
<i>Juniper</i>
<i>OSS</i>

Years with ENTRUST: 1

Years of Experience: 15

Primary Office Location:
Warrensville, IL

Education:
Executive Master Business
Administration
Virginia Tech University

Bachelor of Interdisciplinary
Studies
University of Virginia



OVERVIEW:

Marcellus has more than 35 years of experience building fiber-optic infrastructure, domestically and internationally, and is a trusted advisor in the high-speed internet space. As Vice President of Consulting, Marcellus initiates consultant engagements and guides clients through the planning phase for their projects, helping them understand how to build for long-term infrastructure sustainability.

EXPERIENCE:

VP of Consulting Entrust Solutions Group

We plan, design, and build fiber networks that empower communities.

- Manages project teams and ensures projects are prepared according to proposals developed for clients
- Manages a portfolio of key customers and works to maximize relationships with every client

VP; Internet Services United Cooperative Services (UCS)

UCS is 8th largest rural electric distribution utility in TX, 33rd in US

- Led \$270M greenfield project to deliver high-speed internet to >70,000

un(der)served across 14-county north central Texas region

- Partnered with CEO and Board of Directors to develop expedited plan to

provide service 75% faster than initial project plan

Senior Director; Network Engineering and Operations Verizon Digital Media Services

VDMS streamlines video content delivery for broadcasters

Anchored network operations towards a DevOps approach to improve infrastructure deployment deficiency by 75%

Head, Internet Architecture Reliance Jio

Jio is the first pure Internet Protocol or IP-based 4G network in India

Developed strategy & implemented Internet network to serve 100M mobile users enabling an innovative technology era in an emerging market

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Resume Highlights

Local Digital Infrastructure

Network Architectures

Broadband/Fiber Economics

Smart Cities, Smart Farms

Years with EN Engineering: 3

Years of Experience: 30

Primary Office Location:

999 18th Street Suite 3000
Denver, CO 80202

Education:

BS-Electrical Engineering Cornell
University Ithaca, NY

MBA – Innovation Management
Northeastern University Boston, MA

Skills

- Broadband Market Analysis
- Financial Modeling
- Smart City Architectures
- Broadband Technical, Business, and Financial Architectures
- End-to-End Broadband Network Architectures, Business Models, and Financial Structures
- Internet Service Providers

OVERVIEW:

Greg is a subject matter expert in broadband, fiber, 5G/6G, digital infrastructure, and smart cities. He was a pioneer in broadband and created the first broadband modem chipset in the industry. He was a co-founder and vice president of the Broadband Forum and participated in early international broadband standards organizations. He was part of the team that architecture one of the first open access broadband networks in the USA and was early in connecting private funding and open fiber networks in the USA. Prior to joining Magellan Advisors, he was an independent broadband industry analyst and advisor. Before that he led broadband marketing and products at Cisco Systems, Cascade Communications, Analog Devices, and a number of start-ups in greater Boston.

RELEVANT EXPERIENCE:

**Magellan Advisors
Sr. Broadband Consultant**

Provided comprehensive broadband, fiber, and smart city consulting services to city governments, public utilities, and private companies across the U.S.A. Provide feasibility studies, market analysis, ISP strategy analysis, network architectures, business models, financial modeling and analysis, conceptual network designs, use case creation & prioritization, ISP public-private partner negotiation (3P), RFP creation/evaluation, etc.

Developed a complete smart city and connectivity plan for a US City with long-term strategies, budgets, and implementation plans. Created open smart city architecture and end-to-end system supporting all use cases (~35). Interviewed city officials, community leaders, local ISPs, and tech ecosystem participants.

**Greywale Advisors
Principal Advisor**

A global thought leader and industry analyst focused on broadband, fiber, and local digital infrastructure. Provided CxO-level insights and strategies to a wide range ecosystem participant including technology vendors, private equity and venture capital investors, investment bankers, infrastructure investors, network service providers, fiber owners, electric utilities, entrepreneurs, and municipal leaders.

**Cisco Systems
Sr. Marketing Manager – Broadband Service Providers**

Subject matter expert in the global telecommunication service provider market. Led Cisco's Global Service Provider (SP) marketing for video, voice, mobile, cloud & connected home. Worked with executives, global ISPs, subject matter experts, senior network architects, and global field teams to develop and launch a long-term ISP end-to-end visionary broadband architecture and tactical evolutionary roadmap.



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Resume Highlights

<i>Network Engineering</i>
<i>Inside Plant Implementation</i>
<i>Operations Implementation</i>
<i>Service Implementation</i>
<i>Project Management</i>

Years of Experience: 38

Primary Office Location:
Bluff City, TN

Education:
B.A. Computer Science
University of Tennessee,
Knoxville

OVERVIEW:

Mark Lane is employed as the Senior Technical Consultant for ENTRUST Solutions' EN Communications group, providing support for both consulting and implementation projects. Mark has nearly 40 years of experience in all aspects of enterprise networks and municipal broadband system operations and management. While serving as CTO for Bristol Virginia Utilities OptiNet, he helped provide the strategic direction and practical implementation responsible for their fiber-to-the-premise (FTTP) network build-out and broadband service deployment for eight counties in Southwest, VA. His vision and leadership contributed to Bristol VA being selected as an Intelligent Community Forum Top 7 Intelligent City in 2009.

RELEVANT EXPERIENCE:

**August 2016 – present ENTRUST Solutions (formerly Magellan Advisors)
Senior Technical Consultant**

Provide technology solution development, recommendations, deployment planning, and project management for municipal and utility broadband clients. Magellan's turn-key division provides implementation services for clients moving from a broadband feasibility study to a full network deployment. Responsibilities include network design, RFP management, network installation, data center standups, operational deployments, and a broad spectrum of engagement activities.

**February 2009 – March 2016 BVU OptiNet, Bristol VA
Chief Technology Officer**

Involved in all aspects of OptiNet growth, budget, technology direction, product development, and strategic planning.

**April 2002 – January 2009 BVU OptiNet, Bristol VA
Manager of Network Engineering**

Responsible for OptiNet network implementation, service delivery, and operational management.

**1994 – present 3rd Wave Technologies Bristol, TN
Owner and Principal Consultant**

Provide technology solution development, deployment planning, and project management for clients. Regional ISP providing dialup and dedicated Internet access, website development and hosting, and co-location services to a customer base of 3000+ subscribers. Sold ISP in October 1999 to Planet Systems, Inc.

**1999 - 2000 Wellmont Health System Kingsport, TN
Co-director of Information Services**

Responsible for co-directorship of Information Services department, including a staff of 43 and an annual operating budget of \$5 million.

**1986 - 1999 Bristol Regional Medical Center Bristol, TN
Network and Telecommunications Manager**

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Responsible for a staff of 15 managing the voice, data, and video network operations and security for five regional hospitals and 50+ remote health care facilities. The network supported over 2500 workstations, servers, and clinical/financial application hosts, 4300 PBX extensions, and 4 video conferencing centers. Led networking and services team involved in planning and execution of entire information services move to new hospital facility in 1994, and merger with Holston Valley Hospital into Wellmont Health System in 1996.

AWARDS AND PRESS RECOGNITION

Best Networked Hospitals Award – 1995 Healthcare Technology

Imaging Innovator Award – 1996 Healthcare Informatics

100 "Most Wired" Hospitals – 1997 Healthcare Technology

Panelist at IEC Supercomm June 2005

Presenter for Fiber Broadband Association (previously FTTH Council) on various topics related to fiber-based broadband service.

RELEVANT PROJECTS:

Chesapeake VA:

- Development of Master Fiber Plan and ensuing implementation of Chesapeake Connects network for replacement of incumbent service providers and economic development.
- Provided technical interviews, design, and content for the city's Master Fiber Plan in 2019.
- Participated in stakeholder meetings with city departments, agencies, and anchor institutions.
- Created feasibility budget for service provider network.
- Managed procurement and implementation of inside plant, prefab data center, and implementation services.
- Managed procurement and implementation of LPWAN pilot in support of smart city strategy development.
- This project is currently under construction and anticipated to be completed in 2025.

Waterloo IA:

- Implementation of Waterloo Fiber, a competitive municipal fiber-to-the-user network supporting residential and commercial data, voice, and video services.
- Managed procurement and implementation of inside plant, prefab data center, and implementation services.
- Negotiated bills of material and vendor contracts.
- Assisted with operational stand-up including early proof-of-concept pilot, service provider interconnections, service/content acquisition, general manager interviews, back-office/billing systems, product creation/testing, and workflow development.

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Professional Organizations & Affiliations:

Professional Registrations:

RELEVANT PROJECTS: (cont'd)

Dayton TX:

- Implementation of DayNet, a competitive municipal fiber-to-the-user network supporting residential and commercial data services.
- Managed procurement and implementation of inside plant, prefab data center, and implementation services.
- Negotiated bills of material and vendor contracts.
- Assisted with operational stand-up including early proof-of-concept pilot, service provider interconnections, service/content acquisition, general manager interviews, back-office/billing systems, product creation/testing, and workflow development.

Matawa First Nations Management, Ontario Canada:

- Implementation of RapidLynx, a tribal-owned long-haul and fiber-to-the-user network supporting residential and commercial data services for 9 First Nations.
- Managed implementation of 900Km long-haul optical network and IP edge collocation at 151 Front Street in the TorIX.
- Managed procurement and implementation of inside plant, prefab shelters, and implementation services.
- Managed procurement of experienced operating partner for implementation and operation of network.
- Negotiated bills of material and vendor contracts.
- Assisted with operational stand-up including service provider interconnections, service/content acquisition, general manager interviews, back-office/billing systems, product creation/testing, and workflow development.

[Intelligent Communities Think Tank Releases White Paper on Top 7 Cities \(govtech.com\)](https://www.govtech.com)

[Bristol, Virginia - Intelligent Community Forum](#)

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Resume Highlights

<i>Engineering Design</i>
<i>Project Management</i>
<i>GIS</i>
<i>Operations Management</i>
<i>QA/QC</i>

Years with EN Engineering: 6

Years of Experience: 21

Primary Office Location:
999 18th Street Suite 3000
Denver, CO 80202

Education:
Associate of Science (AS),
Electronics CPI, East Hartford, CT

Skills:

- ESRI ArcGIS Server
- ESRI ArcGIS Pro / Desktop
- ESRI Web Development
- ESRI Web Services
- ESRI SDE Management
- QGIS
- Bentley Communications
- Bentley Comm Oracle Spatial
- OSP Insight
- 3-GIS
- GE Small World
- OSP Design / Costing
- Quantitative Analysis
- Management & Leadership
- Team Development



OVERVIEW:

AI Kamuda is a seasoned telecommunications and GIS professional with over 20 years' experience in telecommunications engineering, mapping, design and outside plant construction. Prior to EN Engineering, AI was the Senior Design Manager for the Central Florida region at Spectrum (Charter Communications), where he led the planning, project management and implementation of outside plant design for various company growth projects including residential, commercial, cellular backhaul and metro WIFI. His extensive experience with the telecommunications industry, CAD platforms and geospatial expertise along with his strategic forward thinking provides an extremely diverse skill set that allows him the valuable insight needed to understand the client's objectives in all aspects of telecommunications construction and design processes.

AI has a decade of experience managing large broadband designs. He manages the full life cycle of engineering projects from inception to completion, managing all permitting activities and personnel in local and remote locations. He has direct experience working with major carriers, municipalities and regional governments on regional fiber and broadband deployments across the US, some of which include Google Fiber, Verizon and the Cities of Boulder, CO, Chesapeake, VA, Portsmouth, VA, and Ann Arbor, MI.

RELEVANT EXPERIENCE:

**Magellan Advisors
Design Team Lead**

Magellan Advisors is a full-service consulting and technology services firm, specializing in telecommunications, broadband and smart city planning deployment and management for public and private sector organizations.

**Spectrum /Bright House Networks
Senior Manager HFC Design and Drafting**

Provided engineering support and direction for new or existing technologies and on-going operational initiatives to Regional, Network Operations and other cross functional leadership regarding technical operations. Development and implementation of outside plant infrastructure and design specifications for various company strategic growth projects including fiber to the premise (FTTH, FTTX), Public Wi-Fi, Node segmentation, mid-band return spectrum and cellular backhaul.

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Resume Highlights

Client Relationship Management

Vendor Management

Training and Development

Regulatory Compliance

Years with EN Engineering: <1
New Hire

Years of Experience: 7

Primary Office Location:
Remote

Education:
BS Sociology & Anthropology
Lincoln University
Lincoln University, PA

Skills

- Network building/development
- Project management
- Liaising and communications
- Outreach and education
- Data collection and analysis
- Leadership
- Microsoft Suite
- Adobe Suite
- Social media: Instagram, LinkedIn, Facebook

OVERVIEW:

Cannaith joined the Entrust team in December 2023, after 4 years with Kastle Systems, a property technology company in Northern Virginia. At Kastle, Cannaith served as an Account Manager for KastlePark, a Smart Parking initiative aimed toward parking solutions for the city of Arlington. As the primary contact for clients, Cannaith coordinated project timelines, budgets, and resources to ensure optimal project delivery. Cannaith played a pivotal role in spearheading efforts to optimize parking efficiency for the new Amazon headquarters and businesses in the surrounding areas. With a strategic mindset and a hands-on approach, Cannaith has excelled in navigating multifaceted projects, fostering stakeholder collaboration, and delivering innovative solutions that exceed client expectation.

RELEVANT EXPERIENCE:

Account Manager, Kastle Systems

Account Manager responsible for orchestrating successful launch of new SaaS product, resulting in 50% increase in customer adoption within six months, leading to a \$400,000 increase in annual recurring revenue for the company. Structured product demos and trainings for customers, teaching more than 200 end-users how to self-serve which resulted in a reduction of 90 to 25 requests per day. Led cross-departmental development teams to deliver three monthly product enhancements aligned with client needs.



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Resume Highlights

Data Analytics

Lean Six Sigma Yellow Belt

Engineering

QA/QC

Years with EN Engineering: <1
New Hire

Years of Experience: 7

Primary Office Location:
Remote

Education:
B. S. in Chemical Engineering
Virginia Tech
Blacksburg, VA

Skills:

- Data Analytics
- Project Management
- Lean Process Improvement
- Algorithm Design
- Business Continuity
- Microsoft Suite
- Social Media Analytics
- Search Engine Optimization



OVERVIEW:

Adrienne earned her BS in Chemical Engineering with minors in Mathematics and Chemistry from Virginia Tech. She joined Entrust Solutions Group after two years as a risk and compliance analyst for Serco, a government contractor, where she served as the subject matter expert in business continuity, ensuring that secure measures were in place to guarantee uninterrupted services for 200+ government projects. In her role at Serco, she became certified as a Lean Six Sigma Yellow Belt, demonstrating her passion for streamlining processes and improving efficiency. Her technical background provides her with a strong foundation for analytical problem-solving and strategic decision-making. Coupled with her passion for leveraging technology to bridge digital divides and empower communities through enhanced connectivity and access to information, she prioritizes the robustness and efficiency of broadband infrastructure, ensuring reliable services for all communities.

RELEVANT EXPERIENCE:

Risk & Compliance Analyst, Serco

Analyst working alongside the chief executive management team of the \$2.1 billion North American division of Serco Group (United Kingdom parent firm) to develop and maintain 20+ corporate and 200+ contract business continuity and emergency plans. Analyzed changing federal and state regulations and translated regulatory requirement into quality system, ensuring procedures were current and regulatory requirements were met. Contributed to drafting procedural documents and compiling a comprehensive quality manual to support the company's ISO 9001:2015 certification process. Visualized and presented subject matter expertise on analysis of business continuity to chief level executive management team via PowerPoint.

Chemical Engineering Project Intern, BAE Systems - Radford Army Ammunition Plant

Chemical Engineering Project Intern reporting to Project Engineer at the Radford Army Ammunition Plant contracted by the government contractor, BAE Systems to develop a user-friendly model and algorithm for production floor workers to easily change incoming nitrocellulose production process streams (a process to produce helicopter propellant) to maintain a steady, constant operation with an optimal incoming stream composition to reduce wasted costs.

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