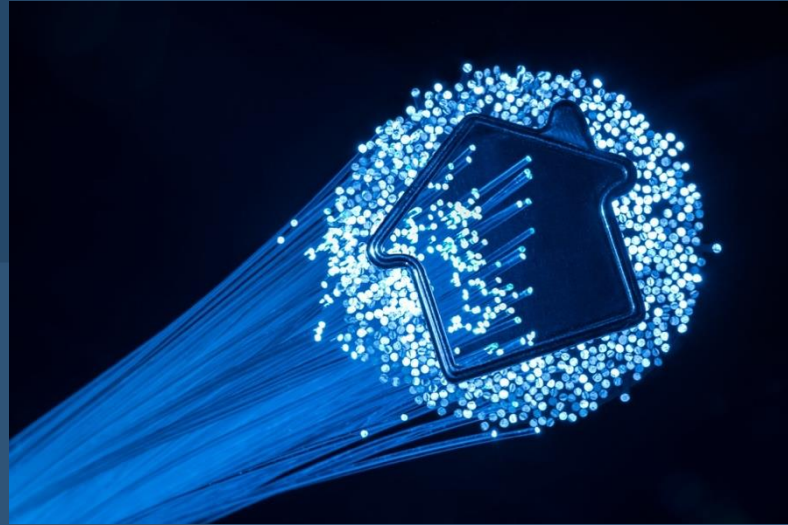


LAS VIRGENES/MALIBU COUNCIL OF GOVERNMENTS



Digital Infrastructure Design

Prepared for:
Terry Dipple
Executive Director
Las Virgenes/Malibu Council of
Governments
terry@lvmcog.org
818-968-9088

Prepared by:
Jory Wolf
Magellan Broadband
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818-312-7768
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Letter of Transmittal

August 26, 2022

Terry Dipple
Executive Director
Las Virgenes/Malibu Council of Governments

Dear Terry,

Magellan Advisors is pleased to submit this proposal to assist the Las Virgenes/Malibu Council of Governments (LVMCOG) in finalizing the design and implementation plan for its Digital Infrastructure Project.

Based on your feedback and direction, we have prepared a proposal targeted specifically for your needs and timeline, with an initial four-month engagement that will put LVMCOG in a position to have and use full design engineering plans to solicit construction bids to build a fiber optic network to interconnect all of the member city halls.

Magellan provides professional consulting services to local governments that want to develop effective broadband and Smart City strategies that are unique to their communities and are based on real-world and demonstrable success. Our team of advisors has worked with agencies throughout California and around the US to help them develop and execute broadband strategies for their communities. We understand the challenges and opportunities local governments face in gaining a competitive edge for economic development and bridging the digital divide. Magellan has worked with several communities like LVMCOG to create actionable strategies that leverage existing infrastructure, develop strategic partnerships, create successful broadband policies and identify smart investments to enhance services and operations of government, businesses, education and healthcare institutions, including:

- County of Marin: Digital Marin
- County of Napa: Broadband Strategic Planning
- County of Sonoma: Broadband Feasibility
- County of Ventura: Broadband Master Planning
- County of Fresno: Broadband Master Plan
- City of Fremont: Broadband Master Planning
- City of South San Francisco: Broadband & Wireless Master Planning
- City of Concord: Broadband Master Planning
- City of San Leandro: Broadband Master Planning

As every community is unique, our goal is to deliver individually tailored strategies and guidance

to you. We strongly believe our experience makes us well suited to work extensively with your staff and departments as well as stakeholders in your communities to understand how LVMCOG can best use its unique capabilities and strengths to enhance the availability of broadband throughout its communities. Magellan Advisors prides itself on being more than just consultants; our team is comprised of practitioners of innovative broadband strategies deployed by local governments in cities across the nation.

If you have any questions or we can be of assistance in any way, please feel free to contact me with any questions or comments. You can reach me directly at 818.312.7768 or jwolf@magellan-advisors.com.

Sincerely,



Jory Wolf
VP of Digital Innovation, Magellan Advisors

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Magellan Overview

Magellan Broadband serves local governments nationally with offices in Texas, Colorado, Florida, California and Missouri. Our Colorado headquarters are located at 999 18th Street, Suite 3000 Denver, CO 80202. Magellan's web address is www.magellanbroadband.com. Magellan Advisors, LLC was founded in January of 2004 and has been in operation as a Limited Liability Company since inception. Magellan's office number is 888-960-5299. Magellan's Federal Employee Identification number is 65-1218484. The contact for this contract is Vice President Jory Wolf. His email is jwolf@magellanbroadband.com and his phone number is 818-312-7768.

Magellan is the leading turnkey broadband development firm for municipalities and utilities. We specialize in planning, designing and building fiber to the home networks for communities that need faster, more reliable high-speed internet. With over 18 years in business and over 400 municipal clients, Magellan is the most experienced firm for munis that want to enhance economic development, education, healthcare and the quality of life of their communities through world-class broadband.

Our staff understands the goals of local governments that recognize broadband as a policy issue. In our feasibility studies, we help educate, inform and direct municipalities to the most feasible options for solving local broadband issues. We work with internal and external stakeholders to build a profile of your community to determine the current state of broadband and identify key issues. Based on real-world solutions, we help you determine the best opportunities to close gaps and position your community for the future. We believe that every community is unique and customized broadband strategies are essential in every project we undertake. In every case, we have helped municipalities find and implement the right solutions to enhance local broadband.

We are the only firm that creates custom tailored broadband networks to achieve municipal objectives. Our networks deliver the fastest internet services at the lowest cost, while giving municipalities a platform to deploy smart city innovations that help them manage their communities. We've led the planning, funding, construction and management of over 50 fiber broadband networks passing over 1 million households and connecting more than 1,000 schools, hospitals, government offices and community organizations and totaling \$1 billion in investments. Magellan has helped more communities successfully plan, implement and manage broadband networks than any other firm in the market.

Magellan 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 Magellan 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.

MUNICIPALITIES

The fastest, most innovative fiber and broadband networks, purpose-built for your community's unique needs.

[Get in touch](#)

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 to the home solutions enable our clients to serve their citizens most pressing broadband needs in the digital age.









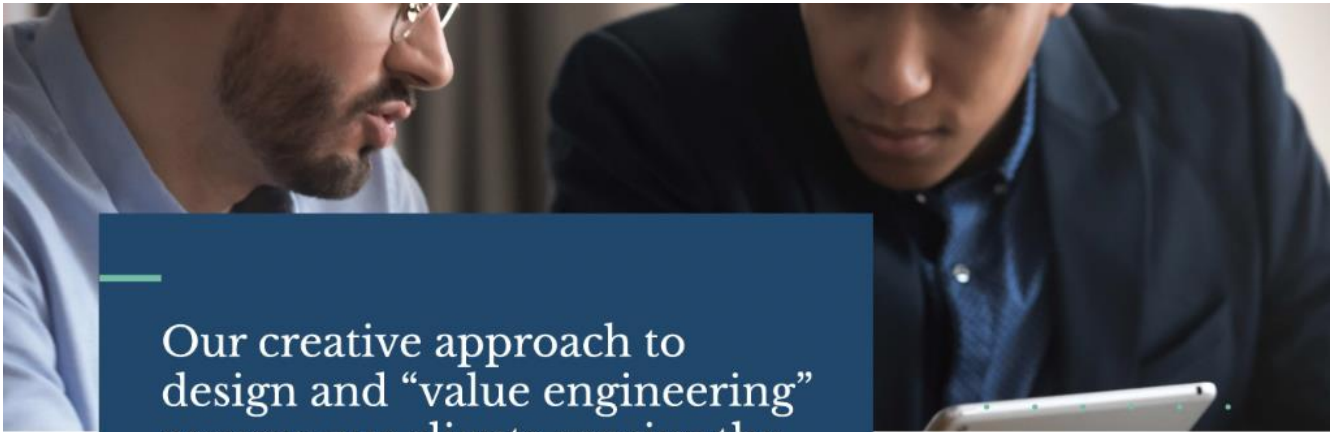
We work for municipalities, utilities, co-ops and regional governments but serve any organization that is building fiber and broadband infrastructure.

Magellan is trusted by over 400 municipalities and utilities to plan, engineer and build their broadband & smart city networks

<p>400 MUNIS, UTILITIES & CO-OPS</p>	<p>50 FIBER & WIRELESS NETWORKS</p>	<p>900 THOUSAND HOMES WITH FIBER</p>	<p>750 MILLION IN NEW INVESTMENTS</p>
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Community Focused Fiber & Broadband Solutions

 <p>Broadband Planning</p> <p>Feasibility studies, fiber master plans and business plans that give you real-world guidance and results you can count on when deploying fiber and broadband.</p> <p>→</p>	 <p>Grants & Funding</p> <p>Funding strategy, grant writing and compliance for all major federal and state fiber and broadband grant programs.</p> <p>→</p>	 <p>Design Engineering</p> <p>Cutting edge fiber and broadband engineering to connect more sites, more devices and more customers at the speed of light.</p> <p>→</p>
 <p>Turnkey Implementation</p> <p>A single, trusted partner to manage your entire network implementation, with over 50 fiber and broadband deployed networks across the US.</p> <p>→</p>	 <p>Launch & Startup Support</p> <p>From network integration, to billing, to customer service to tech support, we provide you with the most experienced resources to manage your fiber and broadband networks.</p> <p>→</p>	 <p>Retail ISP Services</p> <p>LightSpeed, powered by Magellan Advisors serves your community with fast, reliable and affordable internet services, built on a culture of delivering superior service.</p> <p>→</p>



Our creative approach to design and “value engineering” assures our clients receive the best possible outcome.



FIBER TO THE HOME - FIBER BACKBONES - METRO & LONG HAUL

Fiber & Broadband Design Solutions



Aerial

Thousands of miles of aerial fiber installed for over a million homes. Our experience includes ADSS, strand and lash, make-ready and pole preparation in diverse environments.



Underground

We manage the entire design, engineering and permitting process for direct bury and conduit installations to minimize cost and accelerate construction.



GPON & Active Ethernet

FTTX architecture and design based on end-user customers' need for speed, reliability and redundancy.



Data Center, Central Office & Shelters

Inside plant design covering layouts, infrastructure, racking, power, cooling, fiber termination and equipment.



Network Architecture

Turnkey layer 2 and 3 design, including IP, MPLS, Carrier Ethernet, DNS and DHCP.



Construction Packages

Complete packages for competitive bidding that result in the lowest cost and best value.



Construction Management

We manage the entire construction project from start to finish, ensuring that the network is built to client specifications.



Project Management

We manage large and complex construction projects, letting our clients focus on their most valuable asset – their customers.



Related Experience and References

FIBER & WIRELESS NETWORK DESIGN: NAVAJO NATION



CONTACT

Pearl Lee
 Program Manager
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 E: pearllee@navajo-nsn.gov

Start and End Date:
 2019 - present

"This is an incredible opportunity for the Navajo Nation. For the first time, all three branches of the Navajo government have collaborated to develop a comprehensive plan that makes affordable, high speed connectivity a reality for all Navajo communities and anchor institutions."

-Norbert Nez, IT Manager, Division of Community Development

CHALLENGE:

Navajo leaders understand the financial and social consequences of having little to no broadband service across the reservation. The quality of life for Navajo families, K-12 students and elders deteriorated significantly due to Covid-19. To address this ongoing economic burden, the current Navajo leadership supported the creation of a Navajo interagency task force that focused on identifying existing broadband assets and developed strategies for increasing infrastructure deployment. The Nation engaged Magellan in early 2020 to develop a broadband plan that would provide coverage across 26,000 square miles in four states: Arizona, New Mexico, Utah, and Colorado. Magellan also conducted a Nation-wide infrastructure inventory and issued a guidance framework to help improve coverage using fixed and mobile platforms including the utilization of different licensed and unlicensed spectrum assets including 2.5Ghz, 3.5Ghz, 5.9Ghz and 700Mhz.

MAGELLAN'S SOLUTION

Navajo leadership turned to Magellan to develop a cost-effective fiber and wireless solution. Magellan's team developed a preliminary design and cost analysis of a proposed Navajo Network that provides fiber as middle-mile backbone throughout the Nation and a wireless solution to deliver last-mile service. Magellan maintains a dedicated team of broadband engineers and planners that developed a network design that included a wireless overlay for all 26,000 square miles of the reservation. By utilizing a hybrid fiber and wireless model, the design included coverage to 100% of homes and anchor institutions.

OUR CLIENT'S SUCCESS

The Navajo Nation President Nez presented testimony that was drafted by Magellan to the U.S. House Energy and Commerce Committee articulating the need for additional funds to support investment in broadband infrastructure. Magellan continues to support the Nation on all aspects of its broadband funding, engineering and network design needs as well as its policy goals to increase the adoption and expansion of distance learning, telehealth, public safety, digital literacy, and other critical use cases.

FIBER DESIGN & CONSTRUCTION REFERENCE: CITY OF RANCHO CUCAMONGA, CA



CONTACT

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 Utility Division Manager
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"Today this infrastructure plays a crucial role in Rancho Cucamonga, not only in economic development, but will be pivotal in the long-term sustainability and future planning of the City. Rancho Fiber has arrived." -Fred Lyn, Utilities Division Manager

CHALLENGE

City leadership recognizes that fiber-optic infrastructure is an important part of the Rancho Cucamonga community. They understand that in today's world, connectivity affects every aspect of the community - whether in municipal operations, public safety, education, healthcare, quality of life, entertainment and commerce. To realize leadership's vision, the City needed a partner that could develop and manage the expansion of fiber-based broadband across the City in a measured approach that achieved the City's financial constraints while expanding access in year-by-year deployments across the City.

MAGELLAN'S SOLUTION

In 2016, Magellan worked with the City to develop a fiber master plan and engineering assessment that laid out a multi-year plan for new aerial and underground fiber deployment throughout the City, totaling \$12 million over 6 years. Since adopting the master plan in 2017, Magellan has designed and built the first three phases of the fiber to the premises network. In this work, we have provided full engineering, fielding, utility assessments, pole and make ready planning, construction prints and bid packages. We also manage construction as an owner's representative for the City in the fiber build, ensuring that the construction contractor meets our engineering specifications developed for the City, with tight quality control and within the budget.

OUR CLIENT'S SUCCESS

Today, the City has connected neighborhoods and business corridors, enabling gigabit broadband services to residents and businesses across the City. Residential customers receive gigabit service for \$69.99 per month, giving them nearly 5 times the bandwidth for a lower cost than is available in the market today. Businesses have competitively priced internet on City fiber that has replaced slow and unreliable DSL, and cable internet services.

FIBER DESIGN & CONSTRUCTION REFERENCE: CITY OF HILLSBORO, OR



CONTACT

Greg Mont
Information Services Director
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"The partnership between the City and HSD is all about what's best for our community. We have a long history of working together to best serve our students and families, and this is another opportunity for us to do the right thing and make our schools and our community stronger."

-Mike Scott, Hillsboro Schools District Superintendent

CHALLENGE

The City of Hillsboro and Hillsboro School District envisioned a joint partnership for a community owned fiber network to support schools' connectivity needs and enable a platform for world-class broadband. In 2017, the City and School district signed an agreement to co-build the network. The next step was to identify a partner that understood municipal fiber projects and could manage the complex engineering process at hand, creating two networks from one.

MAGELLAN'S SOLUTION

The City of Hillsboro hired Magellan in 2017 to develop a citywide fiber backbone and fiber to the home broadband network. Magellan approached the design by working with School District staff to determine their most important needs – high bandwidth, reliability and redundancy across all schools. Through the planning process, Magellan designed a highly redundant, multi-ring fiber backbone to connect 34 schools with dark fiber.

Concurrently, Magellan engineered an optimal fiber to the home architecture using the backbone network as a launchpad for broadband. Our design furnished the City with a blueprint for broadband across 44,000 homes and businesses. We provided detailed fielding, utility assessment, permitting, make-ready, prints, costing and as-builts for each phase of construction. The design delivers 1 and 10 gigabit capabilities natively in the network. To enable seamless deployment of the network, the City also selected Magellan to manage construction, given our deep experience constructing municipal fiber and our collaborative approach with the City's internal departments.

OUR CLIENT'S SUCCESS

Today, 34 schools are connected to the network, providing nearly unlimited bandwidth to support their current and future needs, while reducing its operating budgets by \$200,000 annually. The fiber backbone and the first phase of fiber to the home construction have been completed to enable the City to launch its gigabit internet services to the first homes in Hillsboro.

Broadband Feasibility Study – City of Waterloo, Iowa



CONTACT

Andy Van Fleet
Waterloo Communications
Board Chairman
P: 319-291-4323
E: andy@vlgux.com

CHALLENGE

The City of Waterloo, Iowa selected Magellan Advisors in 2019 as its partner in the development of a Broadband Study and Action Plan that will identify needs and opportunities for future broadband expansion and growth. Magellan assisted the City of Waterloo in preparing for the internet of things by integrating fiber-to-the-home broadband and smart city technologies into the City's Broadband Study and Action Plan, a long-term plan, which will ensure that Waterloo is prepared to take advantage of all future wired and wireless applications which may benefit the community.

MAGELLAN'S SOLUTION

Magellan Advisors engaged the City of Waterloo leadership and studied the state of broadband throughout the community, while gathering and presenting information to assist City leadership in making informed decisions as it relates to deploying broadband citywide. The Magellan team developed supporting financial models and presented multiple options to the City for its consideration. Our team developed an implementation strategy and action plan for Waterloo, allowing the City to immediately begin making improvements to the community's broadband services. This plan will enable the City of Waterloo to also support retaining and attracting new businesses, improving residential and business broadband services all while making Waterloo a high-tech competitive community. The project's final report will serve as an implementation roadmap to ensure the broadband needs of Waterloo are served today, and well into the future.

OUR CLIENT'S SUCCESS

In April 2021 the City of Waterloo extended Magellan's contract to begin Design, Engineering and Permitting activities for a 120-mile fiber-optic backbone identified in the Action Plan. This backbone will connect hundreds of City and Utility sites and will provide the necessary capacity to support a Fiber-to-the-Home deployment. Magellan Advisors engaged the City of Waterloo in 2020 to study the state of broadband throughout the community to gather and present information to assist City leadership in making informed decisions as it relates to deploying broadband citywide. The Magellan team developed supporting financial models presented multiple options to the City. Our team developed an implementation strategy and action plan for Waterloo, allowing the City to immediately begin making improvements to the community's broadband services. This plan will enable the City of Waterloo to also support retaining and attracting new businesses, improving residential and business broadband services all while making Waterloo a high-tech competitive community. The project's final report has been delivered and the City is moving forward with funding.

FIBER DESIGN ENGINEERING REFERENCE: CITY OF GLENDALE, CA



CONTACT

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Deputy General Manager
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"Today this infrastructure plays a crucial role in Rancho Cucamonga, not only in economic development, but will be pivotal in the long-term sustainability and future planning of the City. Rancho Fiber has arrived."

-Fred Lyn, Utilities Division Manager

CHALLENGE

Glendale Water & Power currently owns and operates approximately 98 miles of dark fiber network within Glendale's city limits. The majority of connections are for municipal communication systems with limited commercial access. To meet increasing demand for fiber in the City, City Council authorized the development of a Fiber Optic Business Plan. This plan is currently under implementation to provide improved commercial network infrastructure and necessary business organization required to expand the City's operation as a provider.

MAGELLAN'S SOLUTION

In 2018, Magellan Advisors has been the City's partner for implementation of its fiber strategy, including design for electronics and connectivity, development of the construction documents and strategy for deployment of an expanded fiber backbone to bring connectivity to Glendale's electric substations and other field equipment to serve the utility. Magellan's strategy was to leverage the fiber backbone expansion for as many purposes as possible across the City, utility and broadband use cases. Magellan laid out fiber backbone routes to reach all electric substations, creating a new ring of connectivity to improve reliability in the electric plant. The design was dimensioned to support high-capacity broadband services as part of Glendale's strategic plan to deploy the network.

OUR CLIENT'S SUCCESS

Today, the City has connected neighborhoods and business corridors, enabling gigabit broadband services to residents and businesses across the City. Residential customers receive gigabit service for \$69.99 per month, giving them nearly 5 times the bandwidth for a lower cost than is available in the market today. Businesses have competitively priced internet on City fiber that has replaced slow and unreliable DSL and cable internet services.

FIBER OPTIC NETWORK EXPANSION REFERENCE: CITY OF PALO ALTO, CA



CONTACT

Todd Henderson

IT Manager

P: 650.329.2342

E: Todd.Henderson@CityofPaloAlto.org

MAGELLAN'S SOLUTION

Magellan was selected by the City of Palo Alto to assist the City and its electric utility with development of a high-level design for an expanded backbone network to connect City facilities for the enhancement of automated meter reading (AMI), Public Works, and Public Safety functions. The project also includes a high-level design and business case assessment for a fiber-to-the-home network that leverages existing infrastructure and expands the City's existing commercial fiber offerings to residents.

OUR CLIENT'S SUCCESS

Our team of engineers and consultants worked to assess the current residential broadband market in Palo Alto to determine appropriate rate structures and focus areas, made recommendations about policy to enhance broadband, and interviewed City departments to determine use cases for the backbone network, leading to the development of a resilient fiber ring that will support the City's internal functions for years to come, as well as a FTTH design to support residential broadband needs. The designs also included an analysis of the business case for extending fiber and conduit infrastructure, a detailed bill of materials, and phased implementation plan for deployment. In the second phase of the project, our team will continue our work with Palo Alto by assisting with outreach to the community and investigating partnership options.

Project Team

JORY WOLF

VP of Digital Innovation: Project Executive

Jory joined Magellan after 22 years as CIO of the City of Santa Monica, CA where he launched Santa Monica City Wi-Fi, which provides free internet services to the public through a network of 32 hot zones and wireless coverage in most major commercial and transit corridors throughout the city. He created Santa Monica City Net, a 100-gigabit broadband initiative to support an environment for local businesses to compete in the global economy with cutting edge network solutions. Jory has over 35 years of experience in Information Technology, including broadband, FTTH and Smart City initiatives. Jory and his teams have received over 50 awards for information technology projects during his career and in 2012 he received the CIO Lifetime Achievement Award from the Los Angeles Business Journal. Since joining Magellan Broadband in July 2016, Jory has led teams that have worked on 60+ government projects in broadband master planning, feasibility studies, wireless strategic planning, 5G small cell policies, dig once policies and smart city.

WILL MORAT

Senior Broadband Consultant: Project Manager

Will has 15 years of experience leading complex projects in government, communications, and economic development. He has led public fiber optic network projects from the nascent stages all the way through launch. His focus is on leveraging public assets with private investment to realize community benefit: closing the Digital Divide, improving public services through technology, and enhancing the quality of life and economic environment. Will brings a background in public policy, local government administration, and cross-departmental experience in project management that complements the critical role of broadband in community growth and development.

AL KAMUDA

Design Team Lead

Al Kamuda is a seasoned telecommunications and GIS professional with over 20 years' experience in telecommunications engineering, mapping, design and outside plant construction. Prior to joining Magellan, 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.

COLE HENKLE

Director – Broadband Design

Cole 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 Hillsboro, OR, Chesapeake, VA, Portsmouth, VA, Boulder, CO, and Ann Arbor, MI. Mr. Henkle led the City of Hillsboro design engineering project, with 100 miles of fiber backbone and 5,000 homes designed and built to date.

SHAWN MORRIS

Broadband Designer

Shawn Morris has more than seven years of experience designing, and coordinating fiber projects and has additional experience in the architecture design industry. Most recently, Shawn has contributed towards multiple municipality based FTTH and Infrastructural Network projects. Shawn excels at identifying potential problems early in projects and uses his problem-solving skills to plan and develop processes and procedures to navigate each unique challenge. His excellent customer service is consistently recognized by our clients and Shawn always ensures that quality deliverables are provided. Shawn holds a Master of Architecture from Kansas State University. Shawn is experienced with the following software: Microsoft Office, Autocad, ArcGIS, 3-GIS, SketchUp, Adobe InDesign, G Suite, and Lucidchart.

Scope of Work

TASK 1: DESIGN ENGINEERING

1.A: Conceptual Design

Magellan will create a High-Level Design (30%) that can subsequently be completed and finalized in Task 1. As we develop the High-Level Design, we will work with the LVMCOG team to determine the best running lines, infrastructure and locations where fiber should be constructed.

Magellan will have their design process begin in which fiber alignments, placements, structures, cable sizes and splice points are identified in the network. Magellan will work with the LVMCOG to analyze any existing fiber backbone routes and determine the best construction strategy and methods. Minor changes in the backbone routes may be preferred to avoid congestion or those planned for replacement in the next few years.

Also, Magellan will look at opportunities to optimize the backbone for future city services and broadband applications that may give the cities advantages for expanding the network in the future but come with little if any additional cost today. The High-Level Design will include geo-located data layers for the following:

- Review of construction standards, policies and practices
- Placement of new backbone cable
- Right of way analysis
- Sites to connect on the backbone
- Laterals to each site
- Interconnection with core data centers/utility sites

The 30% High-Level Design will focus on 4 key components that will accurately inform and guide the final design engineering:

Backhaul/Redundant Connections – Connecting any City's local, publicly-owned fiber network to other public and/or private regional middle-mile and long-haul transport circuits to procure diverse, redundant pathways to colocation and data facilities that ensure connection to the Internet. A resilient regional network will require at least two independent fiber paths to ensure that service is not interrupted due to technical issues, construction, accidental cable cuts, natural disasters/fire, or other unforeseen events.

Core Fiber Backbone - Connecting city halls to one another across the region and building a high-capacity fiber backbone that connects to the greater internet points of presence, colocation centers and central offices. The core fiber backbone will consist of high-count fiber using redundant rings and/or mesh architectures to support a highly resilient backbone. It will include all outside plant fiber assets, hut locations, facility locations and core network elements to light the network.

Fiber Laterals to Key Organizations – We will connect key community anchor organizations to the fiber backbone, providing multi-gigabit connectivity to government offices, public safety facilities, and other key facilities. It will include all outside plant fiber assets and network elements to connect facilities to the network.

As Magellan completes the High-Level Design, we will conduct a formal review with maps illustrating all components of the backbone build. We will present the 30% design, alignments, sites, laterals and connections to give the LVMCOG staff a first look at the preliminary design, provide feedback and give Magellan a chance to make any adjustments to running lines and other outside plant aspects of the network before moving into detailed engineering.

1.B: Low Level Design (60%)

Once consensus on the high-level design has been received, Magellan will begin the onsite fielding process, in which the internal field team will conduct detailed walkouts of all routes and fiber lines. Our fielding process identifies features and attributes, constructability, hazards, and survey of existing infrastructure. We utilize Trimble GPS units for all fielding and iPad data collection to record features and upload them in real time to our design engineers in the back office. This gives us the ability to expedite the design process in concert with our onsite field team. The fielding team will also provide make-ready analysis for the fiber overbuild. Magellan will look at the opportunities to over lash to existing cable vs new attachments for backbone fiber installation.

After all field data has been collected, Magellan will begin the detailed engineering design from the survey data and make adjustments to running lines. This is known as the Low-Level Design and is the 60% milestone. Magellan utilizes a route optimization process to determine the best paths for fiber backbone routes, avoiding any potential constructability issues encountered during the fielding process. This process allows us to optimize the final routes for you and value engineer the network to keep costs down. Our low-level design process will also create all fiber cable sizes, splicing diagrams, port assignments, terminations and final site connections for the new backbone. Furthermore, it will provide preliminary bills of materials and cost estimates for the new network.

Magellan will review the Low-Level Design (60%) with the City and will provide the first set of construction prints with detailed placement and routing, integration with existing fiber and conduit, preliminary fiber splice plans, cabinet layouts, pedestals and other low-level outside plant infrastructure documentation. Magellan will provide a detailed review of the plant with the LVMCOG, pointing out how the design has changed from the 30% Conceptual Design. In this review, Magellan will provide GIS data and plots to the LVMCOG in advance of the meetings, so you have ample time to review. Accompanying this data will also be the preliminary cost estimates, bills of materials and bid package documents for construction. This 60% review will give The LVMCOG a chance to provide feedback to Magellan at a more detailed level and better understand the costs of plant construction, to determine if any changes should be made to reduce budgets, speed the deployment or adjust the fiber routes.

1.C: Final Design (90%)

Once all updates are invoked Magellan will complete the 90% milestone known as the Final Design. This design process will incorporate any changes from the 60% Low Level Design into the final design. We will finalize all routing, alignments, separations, structure sizing and placement, cabinet placement, splice plans and other components of the design. This process will also identify all permits required, costs and timeframes to acquire the permits. Magellan will have a final review with the LVMCOG to review all of the scope and address any questions or concerns.

The Final Design and Bid Package will provide the LVMCOG with the following:

- All construction documents
- City procurement requirements
- Construction standards
- Construction plans
- Sequencing and schedules
- Bills of Materials using unit costs and pay items for the release and RFP or invitation to bid.

Magellan will provide final QA/QC on all documents and conduct a formal review of the final deliverables with the LVMCOG to determine if any changes need to be made before going to bid. Magellan will develop the final bid package for construction and provide the LVMCOG with all content to support a competitive construction procurement. Magellan will provide design specifications, prints, pay items, units, and final documents, incorporating in the LVMCOG's existing procurement documents to create a final construction package for release to the market. Magellan is happy to manage the pre-bid meeting, answer questions, post addenda, evaluate bidders and make recommendations to the LVMCOG on the final award.

1.D: Bill of Materials

Magellan will create a final high-level design and cost estimates for the fiber network which itemizes all labor, materials and equipment costs. We will provide a comprehensive bill of materials with unit rates for construction, based on local labor costs that are commensurate with the current market. This bill of materials will supply each per unit cost for outside plant construction, splicing, termination, testing, wireless siting, construction, installation and activation.

Task 1 Deliverable: *Magellan will provide geodata files, maps and accompanying files for a 30% High Level Design, 60% Low Level Design, a 90% Final Design, a Bill of Materials, and Bid Package.*

Timetable

- ◆ Ongoing Task
- Final Deliverable



	Month 1	Month 2	Month 3
Task 1: Design Engineering	◆	◆	□

Pricing

The total cost to LVMCOG is \$299,122. and includes all work to be completed by Magellan as stated in this proposal. Magellan will bill the LVMCOG in three (3) equal monthly payments of \$99,707.33. Magellan will bill on the first day of the month for the current month’s services. Unless otherwise noted below, travel and incidental expenses are not anticipated for this project as all work will be performed remotely. Invoices are payable on net 30 terms from the date of invoice. Pricing for Task 1: Design Engineering are estimated costs and may be adjusted based on the data collected and knowledge gained regarding more accurate construction footages while working on the project.

Description	Cost
Task 1: Design Engineering	\$299,122
Total for Services	\$299,122