

July 2, 2021

Mayor William "Dub" Pearman
City of Senoia
80 Main Street
Senoia, GA 30276

Re: Engagement Proposal

Dear Dub:

It was a pleasure meeting with you yesterday and having the opportunity to discuss the efforts you are undertaking to develop a comprehensive plan for the City of Senoia. On behalf of The Shpigler Group, I want to thank you for the opportunity to present this proposal to evaluate the issues associated with optimizing the water system, determining the viability of various broadband options, and developing an overarching "smart city" strategy. As we discussed, The Shpigler Group has worked with a wide variety of municipalities on a number of community development issues, and we welcome the opportunity to support the City of Senoia going forward.

The Shpigler Group has a great deal of experience in the area of community planning and operations, including a great deal of work in community improvement planning, new technology application, and system analysis. Furthermore, The Shpigler Group has extensive experience in advanced technology infrastructure and working with municipalities to develop optimal deployment strategies. In fact, we have worked with over 200 utilities and communities over the past twenty years.

As such, our collective experience will be utilized in developing an appropriate strategic and operational plan for your use. We have divided our proposal into five sections:

- Our Understanding of the Situation
- Proposed Approach
- Partial Client List
- Our Experience
- Timing and Costs

Mayor William "Dub" Pearman - City of Senoia

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We look forward to working closely with you on this critical set of tasks – tasks that will position the City of Senoia for both near and long term success.

Very truly yours,

THE SHPIGLER GROUP

By: 

David Shpigler
President
Its duly authorized officer

OUR UNDERSTANDING OF THE SITUATION

There has been a considerable amount of activity among many cities considering the viability of implementing a “smart city”. According to one definition,

“A smart city is an urban area that uses different types of electronic Internet of Things (IoT) sensors to collect data and then use insights gained from that data to manage assets, resources and services efficiently. This includes data collected from citizens, devices, and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste management, crime detection, information systems, schools, libraries, hospitals, and other community services.”¹

Each smart city application offers the potential for municipalities to engage in activities that deliver efficiency gains and/or enhanced community services. Below we consider some common smart city use cases:

Program	Description
Digital Patrol	Enables law enforcement to improve officer productivity, reduce response times, and adjust resources based on crime pattern analysis
Enhanced GIS Solutions	Layers show property ownership; household occupancy; property values/tax assessments; demography; employment; building data
Environmental Monitoring	Solutions that utilize geo-referenced information about the influence of pollution and micro-climatic conditions on the quality of life
Optical Sensors	Systems to support pavement management, incidents of theft, civic disturbance and unauthorized access, and other non-security items
Parking Management	Electronic parking space sensors provide drivers a view of available spaces via digital sensors and apps
Smart Home Devices	Devices that can be used with home automation and are responsible for controlling a home's heating and/or air conditioning
Smart Mobility	Support smart transportation (EVs, electric bikes, pedestrian services) through a collector system
Smart Street Lights	Smart lighting helps cities save energy, lower costs, reduce maintenance while better serving citizens and reducing energy use and CO2 emissions
Traffic Management	Traffic system tracking to supply citizens with real-time travel updates via digital signs and on their mobile devices
Utility Metering	Using system to support advanced metering infrastructure and support the delivery of customer interface
Waste Management	Potential application to support city-specific programs involving third party applications to create additional efficiency and visibility

Every community is different, and there are no universal answers as to which use cases should be pursued. For each one, a given community must consider how the smart city application

¹ McLaren, Duncan; Agyeman, Julian (2015). Sharing Cities: A Case for Truly Smart and Sustainable Cities. MIT Press.

would impact residents, businesses, and the municipality itself in order to quantify the value proposition of each.

How can we improve the lives of those who live and work in Senoia and how can the city best support that effort? The development of a smart city approach is one that promises to drive real economic development for the City of Senoia, given its unique set of characteristics. More and more communities are seeking opportunities to leverage the benefits associated with technology development to explore the potential of smart city programs.

Not all of the potential use cases are appropriate for Senoia, but some may offer significant positive value. The goal is to identify the appropriate path for Senoia and establish a strategy that can be pursued in the months and years ahead. Prior to further exploration of the optimal path, there are a number of key issues that need to be addressed:

- Will a smart city program in Senoia be cost justified?
- What use cases would offer value in Senoia? What applications would be of value to local residents and businesses?
- As part of an overarching municipal strategy, what options are available to Senoia with respect to broadband deployment?
- How can the water and wastewater system best utilize “smart water” technologies to improve service delivery?
- What would the economics of a comprehensive strategy involve? What would the funding requirements be?

From our experience, we know that a detailed business and operational analysis evaluating the true costs and benefits of any proposed approach is called for prior to developing any kind of meaningful strategy. As a result, The Shpigler Group has been asked to develop research and analysis that will help in developing a robust metering and smart city plan and business case for the City of Senoia. Below I have listed the approach we propose in delivering this output.

PROPOSED APPROACH

We are prepared to support City of Senoia in each of the key activity areas outlined above (and others as they arise). In particular, our scope of work for this assignment will fall into five key areas:

Phase 1 – Smart City Roadmap

David Shpigler will lead a one-day “strategic visioning” workshop which will help Senoia understand the available programs, technologies, and requirements to execute an optimally designed smart city program. Typical topics covered within the workshop include:

- The Art of The Possible: Use Cases (or Services)
- Technologies, Top Vendors & State of the Market
- Potential Use Cases
- Long-Term Vision for the City
- Review of the Desired Requirements and Goals

Phase 2 – Smart Water Roadmap

Smart water involves building the utility of the 21st century. It involves “smart” systems to measure consumption at different times of the day, new communications networks to send data to and from utilities, and new database systems to manage and use the valuable new data which advanced systems generate. It may also involve new “smart” systems that can respond to signals automatically to turn themselves on or off, up or down. These initiatives have become reality due to the advancements in communications technologies, coupled with the reduction in cost of communication components. Adherence to widely adopted industry standards for communication interfaces creates the possibility of an open architecture. Specifically, the inclusion of Ethernet interfaces in devices deployed across the utility network can facilitate diverse, redundant access to utility infrastructure devices.

The combination of redundant communications paths and advanced analytics creates a system which overcomes the inherent weaknesses of the “hub-and-spoke” utility system architecture. A robust communication system, coupled with centralized management systems and correctly applied business intelligence, creates an environment where automation programs can be developed and implemented, supporting a variety of distribution functions. Over the next few years, it is feasible for utilities to develop and implement systems to automate and/or greatly improve common utility operations functions to enhance service and reduce operating costs. Our overall scope of work in this phase will include:

- Leverage current mission, vision and key areas of focus related to the water and wastewater system
- Gather data on existing water and wastewater operations
- Assess the capabilities and key drivers that Senoia will encounter in its movement toward system automation
- Identify the specific pain points within the City of Senoia and evaluate the costs and potential solution options

Phase 3 – Broadband Roadmap

For many years, the dream of building high-speed broadband networks that encompass last mile connectivity seemed always to be in far off in the distance. With advanced network infrastructure capabilities now in place, today more and more communities are looking at ways to support the development of advanced communication networks. Some of the recent industry developments include:

- 5G network deployment continues to grow, driving the need for additional fiber-based backhaul
- Software-defined networking and network functions virtualization (SDN/NFV) have pushed the need for deeper access networks
- Higher bit rates exist for passive optical networking systems
- The drive toward high speed networks, including XGS-PON and NG-PON2 has raised the stakes of networking


Part of the reason so many communities are exploring the proposition of building and/or sponsoring the development of advanced communication networks lies in the potential to spur economic development. For example, the existence of fiber to a home has been shown to add value. According to one study, access to fiber may increase a home’s value by up to 3.1 percent – equivalent to adding a fireplace, half of a bathroom or a quarter of a swimming pool to the home. In addition, studies have demonstrated that higher per capita GDP exist in communities where Gigabit Internet is available.

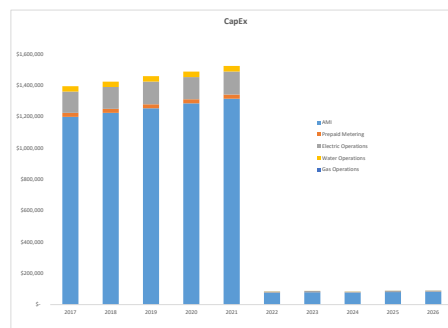
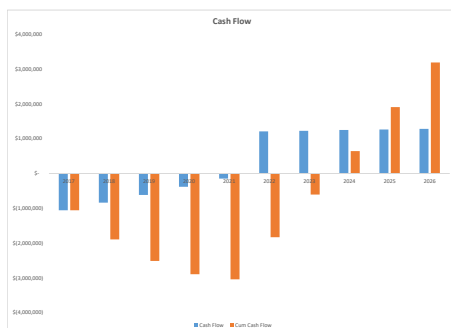
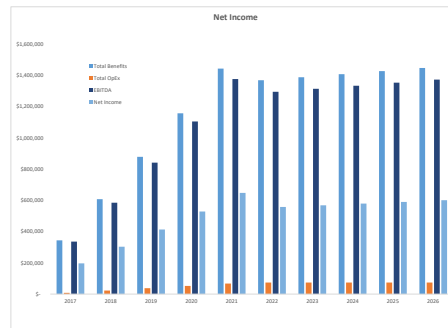
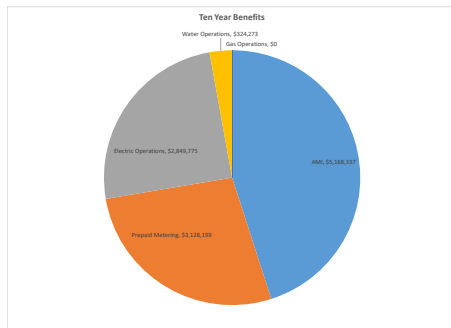
The Shpigler Group will work with Senoia to evaluate the potential opportunity given Senoia’s unique geographic footprint and operating characteristics. The Shpigler Group will initiate the engagement by looking at a number of key elements of the broadband strategy as it applies to Senoia, including:

- Review of the desired goals that would come from network deployment
- Assess differing network operating structures, including landlord, developer, and service provider strategies
- Review potential service options and identify key sources of value proposition

Phase 4 – Roadmap, Business Case, and Business Model Development

We are strong advocates of developing financial modeling tools that allow for the complete financial analysis of the strategies being evaluated rather than simply operating at the "50,000 foot level" of strategy design. As such, we will develop a customized financial model that will allow us to illustrate the characteristics of the approach being considered. Below is an illustration of some related work we have delivered for a similar project:

System Automation Business Model										
Prepared for:					Prepared by:					
										
Business Case Results (\$MM)										
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Benefits										
AMI	\$ 0.2	\$ 0.3	\$ 0.5	\$ 0.6	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9	\$ 0.9	\$ 0.9
Distribution Automation	\$ 0.1	\$ 0.3	\$ 0.5	\$ 0.6	\$ 0.8	\$ 0.9	\$ 0.9	\$ 0.9	\$ 0.9	\$ 0.9
Total Benefits	\$ 0.3	\$ 0.6	\$ 0.9	\$ 1.2	\$ 1.6	\$ 1.8	\$ 1.8	\$ 1.8	\$ 1.8	\$ 1.9
OpEx										
AMI	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
Distribution Automation	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
Support Staff	\$ 0.2	\$ 0.2	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3
Total OpEx	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4
EBITDA	\$ (0.1)	\$ 0.2	\$ 0.5	\$ 0.9	\$ 1.2	\$ 1.4	\$ 1.4	\$ 1.4	\$ 1.4	\$ 1.4
Depreciation	\$ 0.3	\$ 0.4	\$ 0.5	\$ 0.6	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.8	\$ 0.8	\$ 0.8
Net Income	\$ (0.4)	\$ (0.2)	\$ 0.0	\$ 0.2	\$ 0.4	\$ 0.6	\$ 0.6	\$ 0.6	\$ 0.6	\$ 0.6
CapEx										
AMI	\$ 1.6	\$ 1.0	\$ 1.1	\$ 1.2	\$ 1.2	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.2
Distribution Automation	\$ 1.0	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0
Total CapEx	\$ 2.6	\$ 1.2	\$ 1.2	\$ 1.3	\$ 1.3	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2
Cash Flow	\$ (2.7)	\$ (0.9)	\$ (0.7)	\$ (0.4)	\$ (0.1)	\$ 1.2	\$ 1.2	\$ 1.2	\$ 1.2	\$ 1.2
Cum Cash Flow	\$ (2.7)	\$ (3.6)	\$ (4.3)	\$ (4.7)	\$ (4.9)	\$ (3.7)	\$ (2.4)	\$ (1.2)	\$ 0.0	\$ 1.3
NPV	\$ 2.4									
IRR	15.0%									
Peak Funding	\$ 4.9									





(all figures \$000)

		Cash Flow Breakeven	Net Income Breakeven
Year 1	Gap	\$76	\$547
	Added Sales Needed	\$181	\$1,305
	Potential Additional Revenue Needed	5.6%	40.0%
Year with Largest Gap	Gap	\$147 (Year 3)	\$570 (Year 3)
	Added Sales Needed	\$351	\$1,360
	Potential Additional Revenue Needed	10.8%	41.7%

Our overall scope of work in this phase will include:

- Gather data to define the business requirements for the implementation of a potential system deployment for the targeted programs
- Choose use cases and timelines
- Identify forecasted capital expenses
- Evaluate economic values that reflect technical considerations
- Define assumptions for putting together the financial projection
- Apply previous experience, research and industry benchmarks to determine the financial and operational model that will support the financial analysis

Phase 5 – Funding & Execution Plan

Given the uncertainty that may exist surrounding the successful implementation of the targeted program, we can safely state that some risk may exist. In order to (a) understand the risks at hand, (b) the relative level of importance and impact of each, and (c) the mitigation strategies, The Shpigler Group will deliver a report to City of Senoia detailing all of the issues related to these factors in three key areas:

- Technology Risk – the risk that technology will fail to deliver the desired results
- Market Risk – the risks associated with the community not engaging with or utilizing systems as projected
- Execution Risk – the risk that operational efforts to deliver the vision fail to achieve targeted results

Furthermore, in order to ensure successful implementation of the outlined strategy, we are prepared to support City of Senoia in translating the strategy to application through the following activities:

- We will utilize the results of the business model to identify the capital and operational funding needs and prepare a funding plan. Included in this element will be an assessment of the optimal funding sources.
- We will identify the capabilities needed to execute the strategies outlined. Case studies of other applications of similar executions of strategy will be identified and illustrated as needed.
- We will match the requirements of the business case to existing priorities, constraints, and competitive advantages and disadvantages in order to develop a complete set of recommendations for action that will create direct value.
- We will work with City of Senoia staff to ensure a smooth transition for any work output created, including, but not limited to, training on use of any models created, explanation of documents delivered, and clarification of any outputs and/or sensitivity studies used as part of the analysis.
- The Shpigler Group will provide other areas of support for execution of the strategy, as needed.

PARTIAL CLIENT LIST

The Shpigler Group was founded in 2001, and in the past 20 years we have worked with over 200 clients. Below is a sampling of some of our recent municipal clients:

- Bartow County, GA
- Borough of Kutztown, PA
- City of Alameda, CA
- City of Anaheim, CA
- City of Athens, TN
- City of Burbank, CA
- City of Centralia, WA
- City of Clyde, OH
- City of Colorado Springs, CO
- City of Columbus, OH
- City of Gillette, WY
- City of Glendale, CA
- City of Jacksonville, FL
- City of Lake Worth, FL
- City of Lewes, DE
- City of Madison, SD
- City of Manassas, VA
- City of Milford, DE
- City of Moreno Valley, CA
- City of Newport News, VA
- City of Newark, DE
- City of Pasadena, CA
- City of Rio Rancho, NM
- City of Roseville, CA
- City of Salem, VA
- City of Seaford, DE
- City of Tallahassee, FL
- City of Thief River Falls, MN
- City of Troy, AL
- City of Wadsworth, OH
- Habersham County, GA
- Municipal Services Commission of the City of New Castle, DE
- Plaquemines Parish, LA
- St. Bernard Parish, LA
- Town of Clayton, DE
- Town of Eastover, SC
- Town of Leighton, AL
- Town of Middletown, DE
- Town of Smyrna, DE

OUR EXPERIENCE

The Shpigler Group supports municipalities through the delivery of strategic management consulting services. We support our clients in identifying opportunities to create value in a constantly changing world. Some examples of the types of engagements we work on include:

- Developing strategic assessments for clients considering how to modify their operations in a new “smart city” world
- Implementing go-to-market strategies for new programs
- Performing audits and benchmark studies to support performance enhancement
- Developing comprehensive and fact-based business plans
- Developing complete network designs for a variety of technology approaches and performing economic analysis of chosen models
- Calculating economic development and environmental opportunities through the development of smart systems
- Preparing applications for federal and state grant programs
- Developing strategic and operating financial models
- Developing detailed operating plans and supporting project management efforts

As specialists working with utilities to develop strategies and business plans, we plan to leverage our experience from past work and analysis to support the City of Senoia’s needs during the course of this project. A sample of some of our recent project work is listed below:

- Developing system assessment for rural water utility. Conducted analysis of water distribution system and identified use cases that could add value for operations. Developed business model to identify the forecasted benefits, operating requirements, and capital expenses for each use case to identify the viability of each one. Developed recommendations to support development of technical requirements of targeted systems.
- Developing a smart water strategy for a small municipal water system. Developed detailed business model to identify the use cases that offered value for community and detailed forecasted system savings, operating requirements, and capital costs. Developed overarching strategy to assist with implementation plans.
- Developing smart city plan for investor owned utility. Evaluated 14 distinct programs, including initiatives within grid services, communication network programs, and third-party attachment services. Developed financial model to assess value of program for city-wide demo and ten-year contract and developed pricing for services delivered via the grid.
- Conducting technical evaluation of communication systems for municipality interested in performing technical trials of differing broadband systems. Performed analysis of

distribution network and existing fiber routes to determine viability of each identified vendor system. Provided detailed technical data and system specifications for different chosen vendor systems.

- Preparing system automation feasibility study for municipal four-service utility (electric, gas, water, wastewater). Evaluated economic and operational impacts of a wide variety of programs, including advanced metering, prepaid metering, connect/disconnect, fault detection, voltage management, phase & load balancing, feeder gateway temperature monitoring, smart pumping, and leak detection. Conducted iterative analysis to identify optimal business case with over 25% IRR.
- Conducting research on the trends for deployment of Distributed Antenna Systems on utility poles. Evaluated the operational practices and challenges associated with permitting and deployment of DAS units. Conducted detailed primary and secondary research to identify some of the historical trends among existing DAS deployments. Conducted analysis to profile the potential long term impact to the electric utility.
- Conducting assessment of competing SCADA systems for municipality. Evaluated cost proposals of competing SCADA systems and calculated payback of each. Considered differences in resource requirements and system efficiency to develop plan that led to reduction in payback from 3.0 years to 1.8 years.
- Developing analysis of broadband system on behalf of Public Utility District. Conducted detailed financial analysis to evaluate viability of differing network architectures. Highlighted suitability of competing vendor systems based on system characteristics. Provided overview of customized operating requirements for network design, implementation, and full system deployment.
- Managing procurement process for county-wide water system seeking to deploy smart water system. Developed technical requirements for five specific use cases – meter data management, leak detection, optimized pumping, automated water quality management, and asset management. Developed RFP and managed entire procurement process, including coordinating RFP communications, proposal evaluation, vendor negotiation, and deployment planning.
- Developing business plan for telecommunications provider planning on launching statewide broadband access deployment. Analyzed market potential associated with five target markets and provided deployment strategy for each. Provided background information in support of planned partnership with infrastructure developer.
- Developing smart city implementation plan to support city-utility partnership model. Sponsored workshop to identify potential programs and develop priorities. Developed detailed roadmap, business case, and operating model to guide development of Smart City effort. Wrote formal implementation plan document to achieve approval from state regulators.
- Developing business case analysis and technical evaluation for cable operator interested in pursuing additional services on existing network. Conducted market study to

determine the likely penetration rate and competitive response involved in delivering digital cable platform and VoIP. Analyzed technical aspects associated with network migration.

- Developing detailed business feasibility study and qualitative assessment of network expansion of cable provider into telephony market. Conducted demographic analysis of service territory to identify likely service penetration level. Conducted network build analysis focused on identifying network expansion requirements. Developed proprietary financial model to evaluate financing requirements and prospects for system payback. Conducted assessment of strategic and tactical requirements in support of network expansion.
- Conducting research campaign on municipal utility deployments of telephony services. Conducted research effort that identified the market penetration rates of a wide variety of telephony offerings and identified key operating characteristics for analysis. Conducted regression analysis to develop predictive tool for projecting market take rates in other markets given a number of select system and market characteristics.
- Conducting analysis of smart city revenue opportunity for investor owned utility. Developed analysis for various smart city programs, including considerations for utilization of utility-owned and city-owned infrastructure. Developed complete market analysis covering service territory to evaluate the viability of deploying services in a mixed regulated/unregulated market pursuit across three states.
- Developing system requirements of smart grid/smart water system for municipal utility. Profiled technical requirements for a range of use cases, including AMI, meter data management, connect/disconnect, prepaid metering, conservation voltage, demand management, smart pumping, and leak detection. Developed detailed assessment of use cases and developed standards for key performance indicators, system requirements, operational impacts, pilot deployment plan, and migration plan.
- Conducting procurement process for smart city initiative. Issued RFP for smart lighting program, covering LED lighting units, optical controls, communication system, and management platform. Supported all elements of procurement process, including RFP development, legal review, RFP process management, vendor negotiations, and program design. Subsequently initiated RFI process for additional Smart City programs to supplement lighting program.
- Conducting research on the trends for deployment of Distributed Antenna Systems on utility poles. Evaluated the operational practices and challenges associated with permitting and deployment of DAS units. Conducted detailed primary and secondary research to identify some of the historical trends among existing DAS deployments. Conducted analysis to profile the potential long term impact to the electric utility.
- Conducting optimization study on behalf of rural broadband provider to identify how to enhance profitability. Developed detailed business model to assess the state of current operations and identify sources of enhanced profitability. Conducted detailed analysis

of competitive dynamic, market demand, and operational issues. Developed detailed plan to increase earnings by over \$3 million, including plans to change customer pricing, extend market outreach, add services, and pursue opportunities in dark fiber sales.

- Writing Request for Proposals for community broadband demonstration project. Developed RFP for year-long pre-commercial pilot focused on system integrators and service providers. Developed scoring template based on key criteria to guide decision process. Acted as facilitator of decision process for chosen system provider.
- Performing Monte Carlo simulation on business plan for proposed broadband deployment. Calculated potential range of valuation, rates of return, and funding requirements based on market indices. Developed "worst-case scenario" in support of go/no-go market deployment decision.
- Developed "dashboard" metrics platform for community to allow for automated process of complying with grant reporting requirements. Developed custom platform that tracked all of the relevant deployment and impact metrics for external reporting requirements. Established system of internal deployment evaluation during the project period.
- Developing a feasibility study on behalf of a Southeastern community seeking to implement broadband access network. Conducted research on county-wide availability of communications infrastructure and calculated potential demand for broadband services. Conducted financial analysis to determine cost for alternative network architectures as well as value of economic development characteristics associated with network deployment. Performed service offering overview to determine viability and associated benefits of a variety of broadband-enabled applications.
- Conducting study on distributed antenna systems on behalf of Town seeking to limit the proliferation of cell towers. Validated feasibility of alternate system design involving smart antennas working in concert with existing base stations as a response to application submitted by cellular carrier seeking to deploy single-use tower in residential neighborhood. Evaluated technical and economic merits of approach and provided legal, technical, and economic basis for providing counterproposal for network approach.
- Delivering briefing to city leaders on opportunities for smart city deployment. Developed briefing materials and advised utility management and city Board and staff on key issues involved in technology. Profiled industry trends, regulatory issues, technology capabilities, vendor overviews, and business case issues.
- Developing feasibility study on behalf of Midwestern municipality seeking to build access network in support of SCADA system and wholesale community broadband access network. Developed build plan for hybrid network to connect distribution substations and deliver access for open access carrier network. Calculated financial profile of business operation and identified optimal technology platforms. Profiled operational requirements and laid foundation for delivery of network deployment.

- Developing engineering design of commercial broadband system for Midwestern municipality. Prepared entire network design for system covering 3,000 homes and business locations. Arranged and managed all network and system integration plans, including deployment. Developed fiber splicing and termination design.
- Writing Request for Proposals for municipality seeking to enter into franchise relationship with communications provider. Outlined key technical and commercial agreement terms consistent with state laws and existing cable franchise agreement. Supported procurement process by performing project management function during solicitation period.
- Developing comprehensive plan for city-wide communications system deployment. Trained crew for fiber cable management and equipment mounting outside (pole mount units, manage fiber). Provided RF training to field crews for proper placement of radios and antennas in large-scale wireless networks. Established circuit layout record database for accounting of splicing and fiber strand, fiber distribution panel, and opto-electronics facilities.
- Analyzing optimal backbone network approach in support of communications network deployment. Conducted engineering review of proposed telecommunications network. Developed cost model to calculate cost structure for different technology approaches. Prepared hybrid network design that reduced overall capital requirements by over 25%.
- Developing pricing strategy for metro fiber provider. Conducted market research to identify prevailing prices in select Tier 1 metro markets and identified key cost drivers. Conducted regression analysis to identify links between select market conditions and metro fiber pricing. Developed automated pricing model that allowed sales staff to immediately calculate appropriate price levels for dark fiber quotes.
- Developing fiber pricing study for municipality entering into metro fiber market. Collected price data for dark and lit fiber on competing fiber routes and calculated likely market demand for bandwidth. Conducted regression analysis to analyze the true drivers of price differentiation on fiber routes. Conducted game theory analysis to develop optimal pricing strategy.
- Conducting assessment of impact of small cell deployment in Canadian market. Evaluating economics of utilizing transmission towers and distribution poles to provide for small cell attachments. Delivered information relative to attachment rates, operational issues, safety, power usage, and cell spacing to enable the development of a long-term strategic plan. Developed business model to assess financial impact of deployment options.
- Delivering organizational workshop to guide strategic "visioning" to municipal utility. Identified use cases appropriate to the community in the field of Smart City, Smart Grid, and Smart Water programs. Developed framework for proposed utility of the future.
- Implementing grid modernization program on behalf of investor owned electric utility. Developed requirements for implementation, including development of system level

architecture, key performance indicators, use cases, operational impacts, and migration plan. Developed technical requirements and transitioned them into a fully formed vendor Request for Proposals.

- Developing assessment of AMI system for municipal electric and water distribution system. Developed comprehensive business case for a number of AMI-enabled use cases to identify the optimal network approach. Developed migration strategy to incorporate elements of the IT/OT infrastructure. Identified risk factors and developed comprehensive set of operating recommendations. Developed plan for communications network to support community's needs.


TIMING AND COSTS

Based on the work outlined, our assessment is that the work associated with the study will require the dedicated effort of the team for a period of 5 weeks. We are prepared to complete all of the requirements as described above for a fixed professional fee of \$5,000. Given that we are local, no expenses for travel will be charged.

If the foregoing fairly states our understanding, please indicate your agreement by causing your duly authorized officer to sign where indicated below.

Very truly yours,

SHPIGLER CONSULTING

By:  _____

David Shpigler
President
Its duly authorized officer

Address of Notices: Shpigler Consulting, Inc.
181 14th Street
Suite 425
Atlanta, GA 30309
Phone: 404-600-5480

ACCEPTED AND AGREED TO:
City of Senoia

By: _____

Address of Notices: _____

Attn: _____

Dated: _____