Agenda
City of Lucas
Technology Committee Meeting
February 11, 2020
7:00 PM
City Hall - 665 Country Club Road – Lucas, Texas

Notice is hereby given that a meeting of the Technology Committee will be held on Tuesday, February 11, 2020 at 7:00 pm at Lucas City Hall, located at 665 Country Club Road, Lucas, Texas 75002-7651 at which time the following agenda will be discussed.

Call to Order

- Roll Call
- Determination of Quorum
- Reminder to turn off or silence cell phones
- Pledge of Allegiance

Regular Agenda

1. Consider approving the minutes of the January 14, 2020 Technology Committee meeting. **(Technology Committee Chairman Paul Rathgeb)**

2. Discuss, evaluate and score all submitted proposals in response to the Request for Proposal (RFP) for Broadband Network Design and Financial Model. **(Assistant to the City Manager Kent Souriyasak)**

3. Consider cancelling the Technology Committee meetings on March 10, 2020 and April 14, 2020. **(Assistant to the City Manager Kent Souriyasak)**

4. Adjournment.

Certification

I do hereby certify that the above notice was posted in accordance with the Texas Open Meetings Act on the bulletin board at Lucas City Hall, 665 Country Club Road, Lucas, TX 75002 and on the City's website at www.lucastexas.us on or before 5:00 p.m. on February 6, 2020.

Kent Souriyasak, Assistant to the City Manager

In compliance with the American with Disabilities Act, the City of Lucas will provide for reasonable accommodations for persons attending public meetings at City Hall. Requests for accommodations or interpretive services should be directed to City Secretary Stacy Henderson at 972-912-1211 or by email at shenderson@lucastexas.us at least 48 hours prior to the meeting.

Item No. 01

City of Lucas
Technology Committee Request
February 11, 2020

Requester: Technology Committee Chairman Paul Rathgeb

Agenda Item Request

Consider approving the minutes of the January 14, 2020 Technology Committee meeting.

Background Information

NA

Attachments/Supporting Documentation

1. Minutes of the January 14, 2020 Technology Committee meeting

Budget/Financial Impact

NA

Recommendation

NA

Motion

I make a motion to approve the minutes of the January 14, 2020 Technology Committee meeting.

City of Lucas

Technology Committee

Regular Meeting
January 14, 2020
7:00 PM
City Hall – 665 Country Club Road – Lucas, Texas

MINUTES

Call to Order

Chairman Rathgeb called the meeting to order at 7:00 pm. It was determined that a quorum was present.

Committee Members Present:
Chairman Paul Rathgeb
Vice Chairman Jamie Gibson
Member Dennis Scully
Member Troy Dechant

City Staff Present:
City Manager Joni Clarke
City Secretary Stacy Henderson
Assistant to the City Manager Kent Souriyasak
Bill Baxter, City IT Consultant

Committee Member Absent:
Member George Brody

City Council Liaison Present:
Councilmember Debbie Fisher

Regular Agenda

1. Citizen Input.

There was no citizen input at this meeting.

2. Consider approving the minutes of the December 10, 2019 Technology Committee meeting.

MOTION: A motion was made by Mr. Scully, seconded by Vice Chairman Gibson to approve the minutes as presented. The motion passed unanimously by a 4 to 0 vote.

3. Provide an update on the status of the Request for Proposal (RFP) for a Broadband Network Design and Financial Model.

Kent Souriyasak, Assistant to the City Manager stated that the RFP was distributed on December 16. Approximately six companies have expressed interest in submitting, and submission deadline was January 24, 2020. Mr. Souriyasak stated that submitted RFPs would be distributed to the Technology Committee on January 27 for review to discuss at the next Technology Committee meeting in February.

Mr. Souriyasak discussed the timeline with the Committee regarding recommendations to the City Council, noting that recommendations would be brought forward to the City Council at their February 20 meeting.

This item was for discussion purposes only, no formal action was taken.

4. Discuss the future of Internet services provided by Frontier Communications.

Kent Souriyasak, Assistant to the City Manager stated that at a previous meeting a citizen came forward with concerns about losing internet service due to their provider, Frontier Communications, filing for bankruptcy. Mr. Souriyasak explained that that he found no information relating to possible bankruptcy consideration by Frontier at this time.

The Committee discussed bankruptcy proceedings noting that most companies would consider some type of reorganization while they were still conducting business and had not heard of any bankruptcy proceedings being filed for this vendor.

This item was for discussion purposes only, no formal action was taken.

5 Adjournment.

MOTION: A motion was made by Mr. Scully, seconded by Vice Chairman Gibson to adjourn the meeting at 7:09 pm. The motion passed unanimously by a 4 to 0 vote.

_____ _____

Paul Rathgeb, Chairman Stacy Henderson, City Secretary

Item No. 02

City of Lucas
Technology Committee Request
February 11, 2020

Requester: Assistant to the City Manager Kent Souriyasak

Agenda Item Request

Discuss, evaluate and score all submitted proposals in response to the Request for Proposal (RFP) for Broadband Network Design and Financial Model.

Background Information

The goal of the RFP is to acquire the services of a consultant to provide a high-level design and financial model for existing and future broadband needs. The broadband study will assess the cost of installation, operation, and maintenance of a broadband network; and the revenues generated from retail services and third-party network access. The deliverables for the study will include a financial model that allows dynamic adjustments in cost and revenue assumptions across a recommended time horizon.

The following vendors have submitted proposals in response to the RFP:

- ACRS
- Foresite Group
- Fujitsu Network Communications
- Lit Communities
- Magellan Advisors
- Mission Broadband
- Vantage Point

The Technology Committee will serve as the evaluation committee to score all submitted proposals at their meeting on February 11. The Committee will receive copies of the RFP, Questions & Answers (Q&A) document, and all submitted proposals. The Committee is expected to score each proposal on how it exceeds, meets or fails to meet the evaluation factors published in the RFP. The evaluation responses must be evaluated independently against the evaluation factors and not compared to any other committee member's evaluation. Each committee member's evaluation and scoring must be based solely on personal review of each proposal.

The Committee will record individual scores for each proposal on the evaluation score sheet provided by City staff. The evaluation score sheet is a standardized form used by all the committee members to record their scores for each of the submitted proposals based on the evaluation factors published in the RFP. After the initial scoring by the Committee, City staff will tabulate the scores in a master score sheet and will rank the proposals from the highest to lowest scoring proposal on a competitive range with a maximum score of 100 points.

Item No. 02

City of Lucas
Technology Committee Request
February 11, 2020

The Committee should read each proposal prior to their meeting on February 11 where the Committee will review, discuss and evaluate each proposal. The recommendations to help with the evaluation process are:

- If a proposer excels in addressing each evaluation factor and exceeds expectations for fulfilling every requirement in the proposal, evaluators may award up to the maximum number of points.
- If a proposer met all the requirements for each evaluation factor and meets overall expectations, one-half of the points may be awarded.
- If a proposer addresses all requirements but fails to achieve a level of accomplishment in describing how it will perform, evaluators may award less than one-half of the points.

It is also recommended that the Committee refer to the published RFP under Section V, Scope of Work to help evaluate how each proposal meets the requirements. Evaluators may also add notes to the comment section of the evaluation score sheet.

The possible points to score the evaluation factors for each proposal are:

Evaluation Factors	**Possible Points**
Responsiveness to the proposal, communicating an understanding of the overall project and services required	20 points
Demonstrated experience developing financial and business models for broadband initiatives	20 points
Direct professional experience with municipalities that offer or are considering broadband services	15 points
Evidence of competent design, work plan, technical engineering capacity, and project management	15 points
Qualifications of assigned staff experienced with similar complex projects	10 points
Timeline for completion	10 points
Cost and clarity of project budget	10 points
Total Possible Points	**100 points**

Item No. 02

City of Lucas
Technology Committee Request
February 11, 2020

The Committee must submit their completed evaluations to City staff following each proposal review. After all evaluations have been submitted, there will be a break session to allow time for City staff to tabulate the scores in the master score sheet. Once the master score sheet has been completed, the Committee will resume the meeting. City staff will provide a copy of the master score sheet to the Committee for review and to verify the accuracy of the scoring. Technology Committee Chairman Paul Rathgeb will review the master score sheet and proceed with announcing the highest ranked proposal.

Attachments/Supporting Documentation

1. Evaluation Score Sheet Template
2. Master Score Sheet Template
3. Request for Proposal (RFP) for Broadband Network Design and Financial Model
4. Questions & Answers (Q&A) in response to the RFP
5. ACRS Proposal
6. Foresite Group Proposal
7. Fujitsu Network Communications Proposal
8. Lit Communities Proposal
9. Magellan Advisors Proposal
10. Mission Broadband Proposal
11. Vantage Point Proposal

Budget/Financial Impact

NA

Recommendation

City staff recommends selecting the highest ranked proposal as a recommendation to the City Council for consideration to acquire the services of a consultant to conduct a broadband network design and financial model.

Motion

I make a motion to approve/deny the proposal submitted by _____ as a recommendation to the City Council for consideration to acquire the services of a consultant to conduct a broadband network design and financial model.

Evaluation Score Sheet Template

Request for Proposal (RFP) for
Broadband Network Design & Financial Model

Evaluator:		**Proposer:**
Evaluation Factor	**Points**	**Comments**
Evaluate each factor based on your review of each submitted proposal.		
1. Responsiveness to the proposal, communicating an understanding of the overall project and services required	**/20**	
2. Demonstrated experience developing financial and business models for broadband initiatives	**/20**	
3. Direct professional experience with municipalities that offer or are considering broadband services	**/15**	
4. Evidence of competent design, work plan, technical engineering capacity, and project management	**/15**	
5. Qualifications of assigned staff experienced with similar complex projects	**/10**	
6. Timeline for completion	**/10**	
7. Cost and clarity of project budget	**/10**	
Total – All Evaluation Points	**/100**	

MASTER SCORE SHEET TEMPLATE

Evaluations for Submitted Proposals

Request for Proposal (RFP) for Broadband Network Design & Financial Model

PROPOSER	EVALUATOR	EVALUATION FACTORS: 1. Responsiveness to the proposal, communicating an understanding of the overall project and services required. (20 points)	2. Demonstrated experience developing financial and business models for broadband initiatives. (20 points)	3. Direct professional experience with municipalities that offer or are considering broadband services. (15 points)	4. Evidence of competent design, work plan, technical engineering capacity, and project management. (15 points)	5. Qualifications of assigned staff experienced with similar complex projects. (10 points)	6. Timeline for completion. (10 points)	7. Cost and clarity of project budget. (10 points)	TOTAL POINTS
ACRS		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Foresite Group		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Fujitsu Network Communications		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Lit Communities		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Magellan Advisors		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Mission Broadband		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**
Vantage Point		0	0	0	0	0	0	0	**0**
	George Brody								**0**
	Troy Dechant								**0**
	Jamie Gibson								**0**
	Paul Rathgeb								**0**
	Dennis Scully								**0**

REQUEST FOR PROPOSAL (RFP)

BROADBAND NETWORK DESIGN
& FINANCIAL MODEL

CITY OF LUCAS
665 Country Club Road
Lucas, Texas 75002

I. INTRODUCTION

The City of Lucas, Texas, is accepting proposals from qualified firms for a Broadband Network Design and Financial Model. The purpose of the study is to provide a high-level design and financial model for existing and future broadband needs. The study will assess 1) the cost of installation, operation, and maintenance of a broadband network; and 2) the revenues generated from retail services and third-party network access. The Work Product Deliverables for the study will include a financial model that allows dynamic adjustments in cost and revenue assumptions across a recommended time horizon.

The anticipated schedule for the RFP process is:

ACTIVITY	PLANNED DATE
RFP Published	December 16, 2019
Q&A	January 8, 2020
Proposals Due	January 24, 2020
Proposal Review	January 25 – February 10, 2020
Proposal Recommendation	February 11, 2020
Proposal Selection	February 20, 2020
Award Notification	February 24, 2020
Kickoff Meeting & Work Session	To Be Determined
Draft Study Report	May 2020
Final Study Report	June 2020

II. BACKGROUND INFORMATION

The City has a 2010 census population of 5,166 and estimated 2018 population of 7,955. The community is growing two percent annually and has added 68 homes to the City and 94 homes to its extraterritorial jurisdiction in 2018. There are currently 2,127 households located within the City. The community has been experiencing the expansion of residential neighborhoods since 1996. The median household income is $151,188 (in 2017 dollars) and the average market value of homes is $624,357 (based on 2019 certified taxable values from the Collin Central Appraisal District). The community is primarily comprised of large residential lots and low-density housing. The City holds minimal commercial activity and continues to remain as a bedroom community within the Dallas metroplex.

In 2018, the City conducted a Technology and Communication Survey which received a total of 400 responses regarding current Internet service and satisfaction levels. In 2019, the City developed an Internet speed test to collect data from residents who reported actual Internet speeds, current providers, types of infrastructure, and address location. There were 503 household responses which makes up approximately 24 percent of total households. The Internet speed test mapped geolocation reports of Internet speeds and service providers on a single map of the City. Based on the reported data, the results showed that over 60 percent of households had a downlink data rate below 25 Mbps and an uplink data rate below 10 Mbps.

The Internet speed test revealed reports of 25 Internet service providers throughout the City. The southern section of the City consists of households with quality broadband service that is mainly provided by Frontier Communications. The northern section of the City consists of underserved areas with multiple providers servicing various households. The infrastructure within these underserved areas range from fiber and copper lines to wireless equipment. There is no clear indication or confirmation from incumbent Internet service providers on where their infrastructure is installed.

Many new and developing subdivisions have installed fiber optic cables; however, this situation leaves older households with inadequate Internet service and the inability to access any nearby broadband infrastructure. The City's Technology Committee has contacted AT&T, Frontier Communications, Suddenlink, Rise Broadband, Grayson Collin Communications, etc., to discuss possible solutions to improve Internet service throughout the City. The consensus amongst incumbent providers regarding improving Internet service throughout the City is that no private sector entity shows any interest in utilizing its own capital to deploy broadband resources to support high speed Internet access due to low density housing.

III. SPECIAL CONSIDERATIONS

The City is considering the possibility of a municipally owned broadband network and offering Internet service as a public utility. Although Fiber to the Premise (FTTP) would be the optimal solution, it is not the City's intent to limit the study to FTTP only. While FTTP is certainly one of the primary options to consider, the consultant should review other commercially available technologies. The consultant should also note the advantages and disadvantages of technologies that offer lower service levels that may become obsolete much earlier than fiber.

Although the study should include information on high speed Internet offerings of incumbent providers and market rate competition, the City is not concerned at this time with creating a residential survey and customer satisfaction with incumbents. The commonly performed customer surveys and related feasibility analysis are not requested at this time.

The consultant must specify in the response to this RFP the technology solutions it intends to recommend to the City and the reasons supporting this recommendation. The City anticipates that funding for a possible broadband network may be funded through municipal bonds in which voters may determine the outcome of funding through a bond election.

IV. SELECTION PROCESS

The selection of the consultant will be accomplished through the following process by the City:

1. City staff and the Technology Committee will review all proposal submittals. Selection may be made strictly from the information provided in the RFP. However, the City reserves the right to conduct interviews with, and request presentations from any, all or some respondents.

2. The Technology Committee will meet in a public forum to discuss and select the proposal for recommendation to the City Council to consider hiring the services of a consultant to conduct a broadband network design and financial model.

3. Selection of the most qualified consultant will be based upon qualifications following the submission requirements.

4. The City Council will consider the Technology Committee's recommendation for the selected proposal and, if approved, City staff will send out the award notification to the selected consultant.

5. Contract negotiations with the consultant that was selected as the most highly qualified to arrive at a mutually acceptable (fair and reasonable) contract price based on the proposal fee submitted as part of the submission requirements. If the City and consultant are unable to reach such an agreement, negotiations will cease, and negotiations will begin with the proposer chosen as the next most qualified provider and so on until an agreement is reached.

V. SCOPE OF WORK

The primary scope of work is a dynamic, adjustable Financial Model that will span a recommended time horizon which will allow the City to consider the financial feasibility of a broadband network. While the City is not directly requesting a detailed plan and design for the installation, operation and maintenance of a broadband network, the consultant is expected to provide supporting evidence for its Financial Model, including all assumptions made and the basis for those assumptions. As such, the consultant should perform sufficient planning and design to support its Financial Model.

A. Guidelines

The following guidelines are provided to the consultant as an example of what the consultant may expect if selected. Additional guidelines may be provided or developed in a kickoff working session after the City selects the prevailing proposer.

- Data gathered through the City's 2018 Technology and Communication Survey and the 2019 Internet Speed Test.

- GIS data from the City relating to existing water and utility right-of-way and easements.

- Broadband network will support access to customers for multiple advanced services providers (e.g. data, telephony, telemetry, etc.).

- Broadband network will support multiple third-party providers for backhaul (e.g. 5G, WISPs, etc.).

- Project is a complete "green field" deployment with no existing equipment, staff, organization, or infrastructure of any kind.

- Other guidelines to be determined with the selected consultant during the kickoff meeting and work session, and as required.

B. Work Product Deliverables

The primary Work Product Deliverable is an adjustable, dynamic Financial Model. However, various basic supporting information and assumptions used to develop this model are expected. The deliverables may include but are not limited to 1) risks and recommendations toward a successful broadband deployment; 2) ongoing broadband operations and maintenance; and 3) miscellaneous details.

C. Adjustable, Dynamic Financial Model

The City does not specify the format of the Financial Model. The proposer can select any format desired which may be an Excel spreadsheet, web-based, or other application. However, the model must be dynamic and easily adjustable by the City to determine various financial scenarios. The consultant will populate the Financial Model with all costs and revenues for all categories and components to provide results and recommendations.

The consultant will provide recommendations to the City that should include full financial feasibility for broadband deployment across a recommended time horizon desired by the City. Additionally, the consultant will work with City to refine the recommendations based upon various scenarios with respect to structuring funding to support a broadband deployment.

As such, the Financial Model must deliver the following:

- Model must allow entry of costs and revenues preferably by month or quarter across a recommended time horizon.

- Costs and revenues need to be groupable by categories to be determined by the City and selected consultant at the Kickoff Meeting and Work Session.

- Model must yield graphs of costs and revenues, separate or together, over time and by category.

- Model must yield summary tables by component or category.

- Model must yield cost and revenue schedules (i.e. amortization tables) across time as desired by the City.

D. Assumptions and Supporting Information

The consultant should provide a list of all assumptions driving the Financial Model that is recommended. These assumptions must be rooted in reality; reflect a realistic timeframe in which a cost or revenue is realized; and all supporting information to justify the assumptions are expected to be included.

The consultant should fully support its recommended Financial Model and be prepared to make dynamic adjustments and adaptations with the City upon delivery of the work product.

A non-exhaustive list of assumptions and supporting information is below:

- Fiber network plan and deployment
- Right-of-way assumptions and estimates
- Real estate assumptions and estimates
- Physical facilities summaries and costs
- Network-related equipment summaries and costs
- Maintenance equipment summaries and costs
- Organization personnel requirements and related cost estimates
- In-source and out-source recommendations and related cost estimates
- Operating income and cash flow
- Projected revenues and benefits
- Expected and minimum take rates
- Operational expenses
- Depreciation schedule
- Construction build-out cost estimates
- Network design (i.e. preferred equipment, technologies, and topology design)
- Product offerings and pricing structure
- Consumer and business retail pricing plans (i.e. installation fee and recurring access charge by tier)
- Market place pricing plans
- Web site design
- Branding, communications and marketing
- Network implementation duration and timing
- All other assumptions and supporting information

E. Risks and Recommendations

The consultant should provide a detailed list of key recommendations with detailed rationale for those recommendations. Similarly, the consultant should provide a list of risks associated with the project with detailed rationale for those risks. Inasmuch as possible, the consultant should quantify the recommendations and risks, including the probability of occurrence.

F. Miscellaneous and Other

The consultant is encouraged to provide as much information as possible, including that not specifically requested in this document, to ensure the City has full knowledge and understanding of the opportunities and risks associated with deploying a broadband network.

G. Funding Identification

Based on the recommendations for broadband deployment options, the consultant will identify and evaluate various resources that can be utilized by the City in the pursuit of a broadband network. These recommendations should consider municipal bonds, initial costs to the City, public-private partnerships, infrastructure investments, and any other municipal options for funding.

VI. SUBMISSION REQUIREMENTS

Interested and qualified firms are invited to submit a proposal that demonstrates their experience in performing projects of this scale and complexity. Qualified firms should submit one (1) electronic copy in PDF format of the completed proposal by 5:00 pm on Friday, January 24, 2020.

Please title your e-mail "[Firm Name] Proposal - Broadband Network Design and Financial Model" and send the proposal to:

Kent Souriyasak
Assistant to the City Manager
City of Lucas
kent@lucastexas.us
(972) 912-1213

All proposals should include documentation that include the following information:

- Profile of the firm's principal and staff to be assigned to this project along with a brief description of experience and expertise offered by each firm member. This should include a designation of the project manager, and the resumes of the project manager, principal and staff having a major role in the project.

- A narrative project approach that conveys an understanding of the project objectives and scope of services, and how the firm will meet expectations for the study.

- A summary demonstrating the firm's qualifications and ability to satisfy areas identified in the section "Scope of Work" and specifically, the firm's ability to provide anticipated professional services as required to successfully complete the Broadband Network Design and Financial Model.

- A proposed cost of services and a timeline for completing the project to identify major deadlines.

- A list of successfully completed projects and current projects under development managed by the firm comparable to this project.

VII. EVALUATION FACTORS

Selection of the most qualified firm will be evaluated on the following criteria:

1. Direct professional experience with municipalities that offer or are considering broadband services;

2. Evidence of competent design, work plan, technical engineering capacity, and project management;

3. Demonstrated experience developing financial and business models for broadband initiatives;

4. Qualifications of assigned staff experienced with similar complex projects;

5. Responsiveness to the proposal, communicating an understanding of the overall project and services required;

6. Timeline for completion; and

7. Cost and clarity of project budget.

VIII. QUESTIONS

Any questions regarding this RFP shall be submitted to Kent Souriyasak, Assistant to the City Manager by e-mail at kent@lucatexas.us or phone at (972) 912-1213.

QUESTIONS AND ANSWERS (Q&A)

The City of Lucas Request for Proposal (RFP)
Broadband Network Design and Financial Model

January 9, 2020

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1. 01/07/2020 – Regarding Section III, Special Considerations: When a response to an RFP is created, we do not have enough information at that point to provide a recommended technology solution for the city. A typical deliverable of our completed study includes an evaluation of potential technology suitable specifically for the area and a recommended technology solution. A detailed recommendation cannot be determined until data is reviewed and analysis is complete. Is that acceptable?

   Answer: We do not expect a detailed response to the RFP. Our primary goals are to get a general idea of what you will propose, and the cost for performing the work in the RFP.

2. 01/07/2020 – Regarding Section V, Under B and C: It describes the deliverable being an adjustable and dynamic financial model. Our financial model includes proprietary calculations and structures that are not typically shared, however the results of the calculations of that model are shared. To clarify, is the model itself (calculations, file, etc) required to be given to the City, or is the result of the model's calculations the deliverable?

   Since we cannot deliver our propriety calculations and tools, if you need to adjust some of the parameters of the model, is it acceptable for us to work with you to receive any requested changes and deliver the new results to you?

   Answer: We understand the proprietary nature of the model, and your desire to keep control of the asset. Our goal is to ensure speedy (instant), dynamic adjustments to the model within to cost quoted for performing the work. We are not interested in a static result that is difficult to adjust, and where additional cost is incurred for requested changes.

3. 01/07/2020 – Is the City anticipating that the vendor will provide the dynamic financial model so that the City can manipulate the data after the project is complete? Does the City want to see the formulas used to generate the spreadsheets?

   Answer: The City would like the model, but it is not required. The formulas aren't necessary, but an explanation of how the numbers are calculated is. We welcome the vendor to provide us with their modeling tool, but this is not required. However, it is required that the vendor be able to support speedy (instant) and dynamic changes to the model according to city input for no additional cost.

4. 01/08/2020 – In “III. Special Considerations”, RFP states that responses should include technology solutions consultant intends to recommend to City and reasons supporting those recommendations. However, “VII. Evaluation Factors” does not include a review or assessment of those technologies.

    a. How will City be using those technology recommendations in evaluation of proposals?

    Answer: Section III, Special Considerations provides further information on what the actual work product should include after the proposal has been selected and a contract has been executed between the City and the selected consultant. The City will not be evaluating technology recommendations as part of the RFP evaluation process. Section III is meant to help prospective consultants understand what the City is looking for in the final report after the consultant has been selected.

    b. Can consultant broaden technology options in final report, as long as analysis in final report includes at least those options offered in proposal?

    Answer: The consultant can certainly broaden the technology options in the final report. The City is not asking for specific technology options in the proposal, but it will be expected in the final report after the consultant has been selected.

5. 01/08/2020 – What is planned timing of delivery of supporting data (survey data, GIS data, etc.) be, measured from executed contract?

    Answer: After a consultant has been selected, the planned timing of the delivery of supporting data will be determined between the City and the consultant during the kick-off meeting and work session. The date for this meeting will be scheduled after a contract has been executed between the City and the consultant.

CITY OF LUCAS
665 Country Club Road
Lucas, Texas 75002

Broadband Network Design & Financial Model

Response to RFP

Submitted by:

ACRS

2601 NW Expressway, Suite 405W
Oklahoma City, OK 73112
(405) 843-9966

CITY OF LUCAS, TX

Broadband Network Design & Financial Model

RFP RESPONSE

Table of Contents

Principle Staff

1.0 Professional Engineering Licenses

ACRS, as an experienced and qualified consulting and engineering firm specializing in the telecommunications industry, has licensed Professional Engineers in multiple states including Texas, allowing us to legally fulfill the scope of services as defined within the City of Lucas, TX RFP.

ACRS will be the principle consultant and execute any contracts with the City of Lucas. ACRS may partner with BLACKHAT Unwired, LLP and RF Design Services, two highly respected firms also working in the telecommunications industry, and utilize their expertise with any potential wireless deployments. While ACRS has the in-house wireless engineers and experience with wireless networks to fulfill the full scope of the Lucas RFP, we also recognize the potential benefit to tap into Blackhat's expertise and their knowledge of the local area in and around Lucas, TX.

Blackhat Unwired provides VoIP solutions and the design, installation, and maintenance of data fiber systems, repair, maintenance, and marketing LTE, WISP, and DAS networks

2.0 Key Personnel

Below is a list of the key personnel who would be assigned to this project. Other staff members will be assigned and ready to assist each of these managers as needed. The table below provides their years of experience and the proposed tasks and involvement with fulfilling the requirements of this RFP.

Personnel	Title	Experience	Proposed RFP Task
James Lightfoot	President/CEO ACRS	29 Years 29 years with ACRS	Professional Engineer in charge of City of Lucas, TX project management, client relations and coordination.
Jerry Bickle	President/CEO BLACKHAT Unwires/RF Design Services	36 Years	RF Design Engineer for any wireless applications or cost estimating.
Steve Davis	Partner BLACKHAT Unwired, LLP	39 Years	Coordination of any wireless application scenarios.
Terry Nelson	ACRS, FTTH High-level design and cost estimating	49 Years 2 years with ACRS	Assist with high-level FTTH designs and cost estimating
Lily Shangreaux	ACRS, Contracts Administrator	34 Years 8 years with ACRS	In charge of all contract administration functions, demographics data and incumbent service provider research.
Brandi Schwerdtfeger	ACRS, GIS/CAD Manager	8 Years 4 years with ACRS	Manage all mapping, drafting and CAD services

Below is a brief summary of the experience of each key manager with detailed resumes elaborating on their experience and qualifications located at the end of this section.

James Lightfoot possesses nearly 30 years of experience in the broadband industry and is a licensed Professional Engineer in the state of Texas and numerous other states. James has been responsible for the feasibility studies, finance acquisitions and detailed engineering and construction management of nearly 100 different broadband networks for large and small operators all over the country. James has managed ACRS projects for smaller operators with less than 100 subscribers to larger operators such as Level 3 and AT&T. These clients included small independently owned telephone companies, WISPs, municipalities, several tribal nations and electric cooperatives.

Jerry Bickle specializes in RF systems design for microwave, satellite, Land Mobile Radio, tropospheric scatter, and Cellular/PCS/LTE and Point to Multipoint. He is proficient with EDX, Wizard, Atoll and PlanetEV propagation tools and assists clients with Distributed Antenna Systems

projects. Jerry has designed PtMP systems for clients in Texas, Arkansas, Kansas, Montana, Maryland and Idaho. Designed hundreds of microwave links and Cellular/PCS GSM, UMTS and LTE sites, and has experience with Satellite, LMR and other types of long-haul communications networks. He also performs FCC filings for licenses, transfers, and many other government filing requirements.

Steve Davis has unique insights into market trends and customer needs resulting in a strong track record of successful project completion and product introduction. His excellent presentation and communications skills have led to superior customer relations coupled with the development of long-lasting executive level relationships. Steve has an exceptionally diverse set of operational experience and a detailed knowledge of technical, engineering, financial and operational constraints providing his with the ability to understand and resolve the most complex operational problems.

Terry Nelson has nearly 50 years of experience in the telecommunications and broadband industry. Terry brings and extensive resume and qualifications to the team related to hundreds of from the initial design of FTTH networks, to const estimating and construction management.

Lily Shangreaux brings 34 years of experience to ACRS with tribal specific companies and for the past 8 years, she has been responsible for assisting ACRS and its clients with the completion of over 50 broadband feasibility studies, federal loan and grant applications and subsequent engineering contracts. Lily holds a bachelor's degree from Princeton University.

Brandi Schwerdtfeger brings a strong skillset to ACRS as the Manager of ACRS' CAD and mapping department with years of experience using AutoCAD, GIS and several other mapping and presentation software programs. Brandi's team assists with presentations and mapping needed for the various feasibility studies and loan and grant applications.

James F. Lightfoot, P.E.

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Oklahoma City, OK 73112
(405) 843-9966 Office (405) 202-3060 Mobile
jamesl@acrsokc.com

Professional Licenses

State of Arizona
Professional Engineering License No. 51862

State of California
Professional Engineering License No. M 35265

State of Colorado
Professional Engineering License No. 44580

Georgia
Professional Engineering License No. PE-35353

State of Montana
Professional Engineering License No. 19652

State of Nevada
Professional Engineering License No. 23584

State of New Mexico
Professional Engineering License No. 19684

State of North Dakota
Professional Engineering License No. PE-7288

State of North Carolina
Professional Engineering License No. 036146

State of Ohio
Professional Engineering License No. 75126

State of Oregon
Professional Engineering License No. 78871

State of Oklahoma
Professional Engineering License No. 21710

State of South Dakota
Professional Engineering License No. 10674

State of Texas
Professional Engineering License No. 98729

State of Utah
Professional Engineering License No.

State of Vermont
Professional Engineering License No. 80364

Commonwealth of Virginia
Professional Engineering License No. 042992

State of Washington
Professional Engineering License No. 46663

State of West Virginia
PE License No. 19811

State of Wisconsin
PE License No. 41273-006

Society Memberships

National Society of Professional Engineers
Membership No. 300001384

Society of Cable Telecommunications Engineers
Membership No. 212835

Work Experience

August 2005- Present	**ACRS 2000 CORP.** President/CEO
April 2000- August 2005	**ACRS 2000 CORP.** Vice President-OSP Secretary- Board of Directors
October 1995- April 2000	**ACRS, Inc.** General Manager-OSP
October 1989- October 1995	**ACRS, Inc.** Engineering CAD Manager

Education

August 2005	**Cellstream, Inc.** The Basics of Multi-Protocol Label Switching, MPLS
February 2005	**CompuMaster** Mastering Microsoft Project
May 2004	**R.O. Associates, LTD.** Comprehensive Grounding and Protection of Communication Sites
May 2002	**Optical Solutions** Fiber-to-the-Home PON Design Certified
August 2001	**Texas A & M University-Engineering Extension Service** Outside Plant Engineering Course
June 1997	**United States Telephone Association** Rights-of-Way & Access to Municipal Facilities
August 1995	**Texas A & M University-Engineering Extension Service** Fiber Optic Engineering Course

December 1994 **Telecommunications Research Associates**
Broadband Technologies: LAN's, ATM and SONET

May 1994 **Bellcore**
Wireless Interconnection

May 1991 **University of Texas at Austin-College of Engineering**
Digital Communications Course

January 1990 **CADTEL Systems, Inc.**
CADTEL Certified in REA AM/FM Computer Aided Drafting

December 1989 **Oklahoma State University**
Bachelor of Science in Mechanical Design Engineering Technology

Qualifications

Engineering, Contract & Construction Management Experience

- President & CEO of a consulting engineering firm responsible for the daily management and operations of the firm including all company personnel, safety, marketing and accounting functions while overseeing all engineering, contract administration and construction management activities

- Over 30 years of experience with RUS, NFPA/NEC, IEEE/NESC compliant engineering designs and installation procedures, contract preparation and vendor coordination for numerous broadband and telephony projects including telephone company outside plant facilities, central office, mobile & fixed wireless, digital loop carrier and SONET transmission equipment, Wi-Fi networks, CATV networks, VoIP implementation, soft switches, distance learning networks and the first fiber-to-the-home network within the state of Oklahoma

- Responsible for overseeing the design and construction of various hybrid fiber-coax, fiber-to-the-home and DSL systems for the transport of telephone, video and high-speed data

- Extensive experience with acceptance testing of the installation and performance of various telecommunications central office, transmission, outside plant, wireless, CATV and FTTH networks

- Supervised the testing of optical and mechanical fiber optic cable properties per ASTM and EIA/TIA specifications within ISO certified laboratories

- Extensive experience with contract administration, permitting and general correspondence with equipment vendors and government agencies

- Responsible for over $100 million in approved grant and loan funds for CLECs, independent telephone companies and Cable companies through the federal government's USDA Department of Interior, Rural Utilities Service (RUS) and acquisition of interim financing through various banking cooperatives

- Experienced with the preparation of business plans, market surveys and subscriber forecasts for established and startup companies

- Close coordination with cost study personnel to ensure engineering design maximizes financial returns through the various cost recovery mechanisms such as the Universal Service Fund (USF) and NECA

- Experienced with interconnections and collocation coordination of ILECs, CLECS and IXCs

- Experienced with network upgrades and coordination with FCC, FAA and other government agencies required to meet E911, CALEA and other federal mandates

- Preparation of environmental reports and coordination with various government agencies including but not limited to the Corp of Engineers, Bureau of Land Management, US Fish and Wildlife Agency, State Fish and Game, State Archaeologists, State Historic Preservation Offices and Bureau of Indian Affairs for obtaining environmental permits and clearances

- Extensive experience with city planning commissions, county road authorities, county assessor's office, state department of transportation officials, federal turnpike and railroad authorities for permitting and right-of-way acquisition necessary for utility installations and the coordination of highway relocation projects

- Aerial pole line analysis, aerial cable design and pole attachment specifications and permitting requirements

- Experienced with site acquisition, permitting, zoning, design and construction of communication towers and coordination required for the co-location of existing towers

- Extensive experience serving as a Resident Engineer and Inspector for RUS and non-RUS funded construction projects overseeing the installation of aerial and buried utility installations

- Managed the Computer Aided Drafting department for all areas of telecommunications engineering incorporating GPS and GIS technologies

Expert Witness Experience

- Technical report writing and expert witness testimony:

  2000, Williams Communications vs. Underground Installation, Inc. and Start Insurance Company, Case No. 98-CV-0027-K (M), United States District Court, Northern District of Oklahoma. Involvement in this case related contracts, bonding and construction issues related to fiber optic facilities.

  2002, Docket Number: 01-CIV-5554, United States District Court, Southern District of New York, Plaintiff(s): Remee Products Corp. Defendants(s): Sho-Me Power electric Cooperative & TM Sales, Inc. Involvement in this case related to the performance and installation of fiber optic cable, manufacturing procedures and specifications and mechanical testing and simulation.

  2007, Medicine Park Telephone Company request for increase in High Cost Fund Settlements, Oklahoma Corporation Commission, Cause No. 200600374. Testimony is this case surrounded state and local regulatory issues, construction, design, contracts and permitting.

  2007, Young vs. Billy Menefee, Billy Menefee Tower Contracting, et al., Circuit Court of Houston County, Alabama, CV-02-115. Involvement in this case was related to the relocation of a communications tower, grounding of the tower site as well as the entire compound and TV station relating to a lightning strike victim.

  2007, State of Oklahoma vs. Michael Erick Stachmus, Pittsburg County Case No. CF-2007-61. This case required investigation of a cellular phone including phone records for pinpointing the location of an individual as well as the operation of the phone and any potential damage or malfunctions of the phone.

  2007, Sylvia Rodriguez et al vs. Cellexion Wireless Services, LLC, District Court of Harris County, Texas, Cause No. 2006-43346. My involvement in this case centered around the investigation of the death of a communications tower climber, tower climbing safety gear and related causes of death.

  2008, Donald Broadnax v. State of Alabama, Middle District of Alabama, review raw telephone switch data and interpret telephone call records for the Federal Defenders.

  2008, State of Missouri vs. Robert Morrow, Cass County Case No. 07CA – CR00290. In this case I provided research of mobile phone records to pinpoint the location of individuals at the time of an alleged crime.

2008, Clarence Brooks, deceased by and through Katerlene Brooks, surviving spouse v. AEP/PSO. This case involved providing an analysis of an aerial power line and its failure during an ice storm leading to the death of an individual.

2009, Becky Clinton vs. Samsung and AT&T Mobility. This case involved analyzing a cellular phone for potential manufacturers or other defects and investigating AT&T's wireless network to determine validity of hearing damage to Ms. Clinton during the use of her mobile phone.

2010, Uplinger/Kessler vs. Six Flags et al. This case involved analysis of engineering design for utility installations, construction methods, local and national codes and liability for the death of construction personnel.

RF DESIGN SERVICES

JERRY BICKLE
PRESIDENT, RF DESIGN SERVICES, LLC

Skills Summary

Specialize in RF systems design for microwave, satellite, Land Mobile Radio, tropospheric scatter, and Cellular/PCS/LTE and Point to Multipoint. Proficient with EDX, Wizard, Atoll and PlanetEV propagation tools. Assist clients with Distributed Antenna Systems projects.

Education

- AS/1998/Information Systems Technology/Community College of the Air Force
- AS/1991/Electronic Systems Technology/Community College of the Air Force
- BS/1993/Colorado Christian University
- MS/1995/Southern Nazarene University

Experience

Designed PtMP systems for clients in Texas, Arkansas, Kansas, Montana, Maryland and Idaho. Designed hundreds of microwave links and Cellular/PCS GSM, UMTS and LTE sites.

Experienced in Satellite, LMR and other types of long-haul communications networks.

Performs FCC filings for licenses, transfers, and many other government filing requirements.

Biography

MSgt. Bickle spent 20 years in the USAF supporting fixed and tactical communications systems. In his early years as a maintenance technician, he installed and maintained a myriad of wireless systems: Air to Ground, Microwave, LMR, Tropopheric Scatter, and HF long haul. The later part of his career as an RF Spectrum Manager he designed and planned wireless systems in tactical training environments as well as real-world missions in South Korea and AWACS worldwide deployments.

After his Honorable Discharge in August, 2000 Mr. Bickle worked for AT&T as a performance and design engineer for 8 years. During that time, he designed hundreds of new cell sites for Oklahoma's cellular network. In 2008 he left AT&T for a position at SAIC (Science Applications International Corporation) where he consulted for large government contracts. In May of 2013 he started his own business, Radio Frequency Design Services, LLC. As president and owner, he provides engineering and technical support for several Independent Local Exchange Carriers (phone companies). He has installed several indoor distributed antenna systems (DAS) at venues such as Chesapeake Energy Arena, Oklahoma University Health Science Center, and the Southwest OSU Event Center. He has also built and consulted with several clients deploying high speed point to multipoint wireless internet systems (WISPs).

Mr. Bickle lives in Edmond, OK with his wife and two children.

RF DESIGN SERVICES

RF DESIGN SERVICES

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
JERRY A. BICKLE	**PRESIDENT/CEO**	35 years	April 1017

15. FIRM NAME AND LOCATION *(City and State)*

RF Design Services, LLC *(Edmond, OK)*

16. EDUCATION *(DEGREE AND SPECIALIZATION)*

- AS/1998/Information Systems Technology/Community College of the Air Force
- AS/1991/Electronic Systems Technology/Community College of the Air Force
- BS/1993/Management of HR/Colorado Christian University
- MS/1995/Management/Southern Nazarene University

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Specialize in RF systems design for microwave, satellite, Land Mobile Radio, tropospheric scatter, and Cellular/PCS/LTE(4g). Proficient with EDX, Wizard, Atoll and PlanetEV propagation tools. Assist clients with Distributed Antenna Systems projects.

19. RELEVANT PROJECTS

a.

(1) RF Design Services, LLC

Oklahoma Dept of Transportation
Oklahoma City, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2015 - 2017	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒Check if project performed with current firm

RF Systems Designer. Professional services for ODOT. Developed comprehensive Master Plan of all ODOT tower sites. Determined FCC frequency assignments for each location, all pertinent tower information such as, accurate latitude/longitude, tower height, antenna height, authorized transmitter power per frequency assignment, and links to the federal databases for Antenna Structure Registrations and FCC frequency assignments. Resolved numerous conflicts with legacy records, no records and what the actual information should be. Consolidated all information in once Master Spreadsheet.

Performed spectrum analysis for ODOT for the Two-way radio site in Harmon, OK. Performed drive testing over 360 degrees to map the broadcast signal levels of this site to determine the antenna pattern. Then using the data collected, created a propagation map to show how each radio that was transmitting on different antennas were all broadcasting in different oblong directions, which showed much of the coverage not overlapping which was causing radio transmissions between mobile users to drop as the transmissions trunked from one radio to the next. This analysis provided ODOT with the information it needed to take action to raise antennas to the tower top instead of side mounting the antennas to the towers which resolved the issue of dropped trunking between mobile units. The side mounted antenna problem was prevalent throughout ODOT's radio network and plans were made to raise antennas at several sites because of these findings.

Developed a grounding guide and grounding plan for ODOT and the El Reno radio site. This extensive and comprehensive plan detailed what needed to be done to fix the grounding problems at El Reno site that had been robbed of its copper several times. In addition, the plan provided a template for improving the site grounds of any site that ODOT needed to test and improve. The plan took the best practices of ATT/Sprint and R56 standards to ensure a methodical approach and consistency with every location to ensure outstanding grounding for the protection of high value microwave and two-way radio equipment, as well as other systems by other government agencies at those locations. ($200,000 annual contract value)

b.

(1) SAIC/RF Design Services, LLC

Kinney County Emergency Services
Kinnery County, Tx

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2017 - Ongoing	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒Check if project performed with current firm

RF Systems Designer. Designed and installed Siren system for Kinney County, Texas. Developed wireless approach to control several sirens in Brackettville, TX. Saved the county over $4300 per month by eliminating a costly T1 cost from AT&T. Provided a new service with state of the art system controls that are managed locally with new equipment panels and that can be activated by smart phone or computer from any location. New system keeps log files and provides an active status and new

features for improved response, features and functionality, all at a fraction of the cost as a service to the county.
($200,000 services contract over 10 years)

c.

(1) SAIC/RF Design Services, LLC

(2) YEAR COMPLETED

Hilliary Communications
Medicine Park, OK

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2017 - Ongoing	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒Check if project performed with current firm

RF Systems Designer. Provided full turn-key site for internet service to Sunset Texas for Hilliary Communications. New four sector site provides over 400Mbps of service per sector of high-speed internet to underserved community. Total site cost with installation on existing tower with new subscriber equipment and home gateway gear was under $40,000. Provided over 1 gigabit of backhaul to the site as well using unlicensed 24Ghz microwave. New revenue stream for Hilliary Communications with short term ROI and new excellent internet services for a small town left behind by the major carriers. Excellent alternative to fiber to the home. ($50,000 contract value)

d.

(1) SAIC/RF Design Services, LLC

(2) YEAR COMPLETED

Oklahoma Western Telephone Company
Clayton, OK

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2017 - Ongoing	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒Check if project performed with current firm

RF Systems Designer. Installed new microwave system in SE Oklahoma in support of OneNet for Nashoba Elementary School. New licensed microwave system used 6' dishes, cross polarization diversity and makes use of the same licensed channel on both diversities for twice the throughput using orthogonal modulation. Overall, the licensed link provides over 730Mbps in both directions to a relay site where an unlicensed radio provides over 300Mbps to the school. The new service provides high-speed internet to the school which had been severely underserved for decades with hardly more than dial-up speeds. Furthermore, the additional throughput to the area was used to support 4G cellular services and improve the DSL service to the Nashoba community. The system cost was approximately $40,000 and provides on-going revenue for the local carrier of $3000 per month with annual increases for the foreseeable future.
Turned up four new E911 trunks and services to Pittsburg County for Oklahoma Western Telephone Company. New services provide location information to within 10-30 meters of a 911 emergency call. Provides safety to the customers of OWTC and its roaming partners.
($85,000 annual contract value)

19. RELEVANT PROJECTS

e.

(1) RF Design Services, LLC

(2) YEAR COMPLETED

Advantage Cellular Systems
Alexandria, TN

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2011 - Ongoing	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒Check if project performed with current firm

RF Systems Designer. Professional services Advantage Cellular Systems dba DTC Wireless. Provide complete RF design for 47 site overlay of GSM, UMTS and LTE. Perform channel planning and mitigate interference for optimum performance. Provide design for microwave backhaul utilizing licensed microwave. Ensure all FCC regulatory issues are completed for all aspects of the network. ($60,000 annual contract value)

f.

(1) SAIC/RF Design Services, LLC

(2) YEAR COMPLETED

Oklahoma University Medical Center.
OKC, OK

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2011 - Ongoing	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒Check if project performed with current firm

RF Systems Designer. Professional services for Oklahoma University Medical Center. Represent OUMC interests as they pursue an In-Building Wireless Distributed Antenna System for several buildings on campus. Working with the cellular carriers to ensure they understand the needs and intentions of OUMC. Working with various vendors interested in providing DAS services to the campus. Ensuring OUMC gets the system they need for the best price. Ensuring the cellular carriers have confidence in the design and installation of the DAS to service their customers without harmful interference to their macro network. DAS System value $1.5MM ($50,000 annual contract value)

g.

(1) SAIC/RF Design Services, LLC

(2) YEAR COMPLETED

	Pioneer Telephone Company **Kingfisher, OK**	PROFESSIONAL SERVICES 2011 - Ongoing	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☒Check if project performed with current firm	
	RF Systems Designer. Professional services for Pioneer Telephone Company. Provided radio frequency spectrum allocations to accommodate the needs of their GSM and CDMA networks. Developed a GSM channel plan that allowed their CDMA network to coexist with their legacy GSM network within the most valuable 850MHz spectrum. This spectrum allocation and channel plan allowed Pioneer Cellular to launch their services in new areas with the most advantageous spectrum which covered farther and penetrated buildings better than 1900MHz spectrum would have. Provided interference resolution to Pioneer's Long Term Evolution 4G network. Resolved long-standing interference by coaching performance technicians actively measuring interference with spectrum analyzers. Building new cell site in Roman Nose State Park. Performing all project management and spectrum planning. Providing consulting services for DAS systems for three event centers. ($65,000 annual consulting contract value)		
h.	(1) SAIC/RF Design Services, LLC	(2) YEAR COMPLETED	
	Cross Wireless **Warner, OK**	PROFESSIONAL SERVICES 2011- Ongoing	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☒Check if project performed with current firm	
	RF Systems Designer. Professional services for Cross Wireless. Engineered 100+ microwave links to support CDMA and LTE (4G) services. Designed site locations for 50+ new LTE sites providing coverage to highways and rural communities in eastern Oklahoma. Ensure all FCC filings, fees and schedules are maintained. Provide propagation maps for Sanborn Mapping and Federal Webpage. ($60,000 annual consulting contract value)		
i.	(1) SAIC/RF Design Services, LLC	(2) YEAR COMPLETED	
	Oklahoma Western Telephone Company **Clayton, OK**	PROFESSIONAL SERVICES 2008 - Ongoing	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☒Check if project performed with current firm	
	RF Systems Designer. Professional services for Oklahoma Western Telephone Company. Provided research and design for new microwave system. Purchased and supervised the installation of this system providing Ethernet and discrete T1 back-haul for OWTC's cellular telephone network. Provide on-going support as their RF Systems Designer and manager resolving issues on a daily basis. Provide optimization of the cellular network. Provide management services for the build-out of their wireless network offering and infrastructure. Upgraded Mobile Telephone Switch from TDM to IP. Eliminated outdated equipment, added functionality and capacity. Designed three unlicensed microwave links, creating a reliable backhaul network supporting four cellular coverage areas. Designed and managed the construction of three new cell sites providing over 200 square miles of coverage. Provide competitive bidding and best prices to the client via SAIC's partnerships with equipment suppliers. Provided E911 Phase 2 location engineering and management for their mobile telephone switch. Gathered bids from contractors, ordered circuits, drove results with switch vendor and E911 vendor to turn up services for Latimer County, OK. Provided project management and RF Engineering support for UMTS overlay of the existing GSM network. Filed all FCC paperwork for multiple contour extensions with adjacent markets and updated the FCC601 ownership filings. ($80,000 annual consulting contract value)		
j.	(1) SAIC *(Oklahoma City, OK)*	(2) YEAR COMPLETED	
	Chesapeake Energy Arena **Oklahoma City, OK**	PROFESSIONAL SERVICES 2008 - 2011	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐Check if project performed with current firm	
	RF Systems Designer. Developed Bid Specification for In-Building Distributed Antenna System. Coordinated with Prime Contractor to bid the system to qualified DAS vendors. Ensured system design met performance criteria. Worked with City to develop permit for use by cellular carriers. Assisted City at various stages to coordinate with cellular carriers on the installation of their equipment. System supports multiple carriers and provides a substantial return on investment to the City of OKC. $150,000 DAS paid for itself within the first 6 months of operation.		
k.	(1) SAIC *(Oklahoma City, OK)*	(2) YEAR COMPLETED	
	Corporate Offices **SandRidge Energy, Oklahoma City, OK**	PROFESSIONAL SERVICES 2008	CONSTRUCTION *(if applicable)* N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐Check if project performed with current firm	

RF Systems Designer. Full planning, design, architecture, interiors, and construction management on the SandRidge tower consisting of approximately 500,000 square feet of office space. Also includes three-dimensional visualization and various building systems upgrades that consist of energy efficient enhancements and sustainable concepts. Mr. Bickle provided consulting advice for the implementation of an in-building cellular base station system. Competing designs from various providers resulted in $400,000 savings to the client.

l.

(1) TITLE AND LOCATION *(City and State)*

Deployment of UMTS High Speed Data and Voice Network
AT&T, Oklahoma City, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2007	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm

Senior RF Engineer. Overlay 140 cell sites with UMTS technology. Led design staff of contractors to produce the best design for Ec/Io, signal strength and optimum coverage using 1900 MHz spectrum over an 850MHz grid. Added new UMTS cabinets, replaced all antennas with dual band antennas, added tower mounted amplifiers. Worked with tower crews and other subcontractors to ensure design standards were followed. Troubleshot multiple installation and interference problems and actively resolved coverage holes and other performance issues. Met all deadlines for completion. Collaborated with Ericsson engineering teams on all phases of design and model tuning.

m.

(1) TITLE AND LOCATION *(City and State)*

Greenfield Build-Out
AT&T, Duncan, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2006-2007	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm

Senior RF Engineer. Built 18 new cell sites utilizing GSM technology at 1900 MHz. Mr. Bickle designed 18 new PCS cell sites. Performed site surveys and worked closely with real estate and construction during the site acquisition process. Made several design adjustments throughout the site acquisition process to site locations and tower configurations based on limitations of zoning or other access issues. Engineered unlicensed microwave link including path profile design, and other equipment specifications with outstanding reliability results. New network provided over 9,000 square miles of additional coverage, opened a new market for sales and eliminated roaming costs of $100,000 per month.

n

AT&T (Oklahoma City)

Blue Network Integration
AT&T Wireless and Cingular Wireless, Duncan, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2006	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm

Senior RF Engineer. Integrate AT&T Wireless and Cingular Wireless networks. Integrated 32 new cell sites and killed 4 non-essential sites in the integration process with minimal customer impact. First market to complete integration. Built scripts for translations integrating new sites. Retuned channel assignments for entire network to optimize performance with additional sites. First in the region to deploy Ad Hoc frequency hopping offering improved voice quality. Engineered unlicensed microwave link to include path profile design, antenna specifications, waveguide type, and transceiver equipment with outstanding reliability results.

o.

(1) AT&T (Oklahoma City)

Deployment of GSM Cellular Network
Cingular Wireless Project Genesis, Over 250-Cells Sites, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2004	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm

RF Engineer. Integrate over 250 cell sites with new base stations, antennas, feed lines, tower mounted amplifiers, base station controllers, and master station controller**.** Mr. Bickle was Lead Design Engineer for Project Genesis in Oklahoma City. Coordinated with Ericsson's Design Engineers in every aspect of the GSM overlay. Worked closely with Bechtel project managers to ensure design was properly implemented. Retuned and consolidated TDMA spectrum and created GSM frequency allocation.

p.

(1) AT&T (Oklahoma City)

Design Build of 28-Greenfield Sites
Salmon PCS, Enid, OK

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2003	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm

RF Engineer. Design 28 new sites for Salmon PCS Networks, a roaming partner with Cingular Wireless. Provide wireless service to 5 counties in northern Oklahoma. Provide contiguous coverage with Cingular's larger network. Mr. Bickle designed Salmon/Cingular's Enid BTA. Optimized coverage for 5

	northern Oklahoma counties with 28 1900 MHz PCS cell sites capturing over 90% of the population with solid handheld coverage.
q.	(1) AT&T (Oklahoma City) **552 Computer Systems Group** **Tinker AFB, OK** (2) YEAR COMPLETED PROFESSIONAL SERVICES: 01/1999 – 01/2000 CONSTRUCTION (if applicable): N/A (3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm **Division Manage/RF Spectrum Manager.** Report to Flight Commander of one of the largest software development groups in the Air Force. Ensure all readiness training for group personnel is scheduled. Maintain over 150 radio frequency assignments used to support the world's preeminent airborne air traffic control radar. Control maintenance activities for two multi-million dollar facilities. Developed and successfully implemented business and strategic plan that positioned the 552 Computer Systems Group at the top of its readiness goals. Coordinated all radio frequency spectrum usage for the Airborne Warning and Control System - Led Tiger Team of stake-holders to author the 552 Air Control Wing regulation detailing processes for the coordination of spectrum resources for air operations throughout the United States. Directed maintenance activities for two multi-million dollar facilities: managed several projects, performed long-range and short-range planning, provided quality assurance, interacted with customers and contractors on a daily basis.
r.	(1) TITLE AND LOCATION *(City and State)* **Wing Initial Communications Package** **552 Computer Systems Group, Tinker AFB, OK** (2) YEAR COMPLETED PROFESSIONAL SERVICES: 10/1997 – 12/ 1998 CONSTRUCTION (if applicable): N/A (3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm **Manager/RF Spectrum Manager.** Manage 12 member team of communications systems technicians to install bare essential communications systems at extreme locations around the world. Developed strategic plan associated with launching the Wing Initial Communications Package as the core element fulfilling the wing's air-to-ground communications needs. Managed in excess of $1 million in assets and $100,000 annual expense budget.
s.	(1) TITLE AND LOCATION *(City and State)* **Plans and Programs Flight - Headquarters 7th Air Force** **Osan Air Base, South Korea** (2) YEAR COMPLETED PROFESSIONAL SERVICES: 1996-1997 CONSTRUCTION (if applicable): N/A (3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm **Area Manager**. Reports to Vice Commander for Communications for the largest contingent of United States forces stationed overseas. Responsible for establishing and executing strategies that allowed all United States and Korean Air Forces to maintain air superiority throughout Southeast Asia. Utilized mission-focused approach to successfully guide leaders from several functional areas to develop the organization's Strategic Plan within 2 months. Designed database to track and assign 150 aircraft radio frequency assignments used in the Republic of South Korea; created an efficient and flexible method to republish country-wide frequency assignments every 30 hours maintaining the secrecy and integrity of command, control and communications.
t.	(1) TITLE AND LOCATION *(City and State)* **Deployment Planning Flight – Headquarters 3rd Combat Communications Group, Tinker AFB, OK** (2) YEAR COMPLETED PROFESSIONAL SERVICES: 1993-1996 CONSTRUCTION (if applicable): N/A (3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☐Check if project performed with current firm **Superintendent Radio Frequency Spectrum Management**. Oversee the RF Spectrum requirements of over 1000 personnel that deploy worldwide to operate and maintain 50 major communication systems valued at over $1,000,000,000. Design RF networks necessary to serve the frequency requirements for deployed USAF wings consisting of 5000 personnel. Mr. Bickle fulfilled the frequency requirements for COMBAT CHALLENGE '94, the largest Command, Control, Communications, and Computer systems competition in history. An interference free environment contributed to the outstanding success of this unique competition. Redesigned and optimized the permanent frequency assets of the 3rd Combat Comm Group providing enhanced flexibility and capabilities to deployed units throughout the state of Oklahoma. Designed microwave, satellite, land mobile, and tropospheric scatter communications links for multiple exercises. Provided path profile engineering and frequency assignments for multiple systems including ground approach radar.
	(1) TITLE AND LOCATION *(City and State)* (2) YEAR COMPLETED

U.	**Plans and Programs Flight – 50th Space Wing** **Falcon AFB, CO**	PROFESSIONAL SERVICES 1989-1993	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐Check if project performed with current firm	
	50th Space Wing Frequency Manager. Analyzes the electromagnetic compatibility impact of and makes frequency assignments for current and planned Air Force Satellite Control Network operations. Mr. Bickle designs and oversees the maintenance of Land Mobile Radio and Cellular Telephone systems. Authored and unabridged listing to depict the location and system parameters of base antenna networks reducing delays for new system engineering at Falcon AFB, CO. Wrote the Spectrum Interference Resolution Program regulatin that ensured the timely and accurate reporting of 12 interference incidents from AFSCN users. Briefed NASA on DoD space operations. Provided statistics and impact to satellite operations with loss of S band frequency spectrum. Resulted in a joint venture with Air Force Space Command and NASA to write a frequency deconfliction and assignment program for the purpose of utilizing the international S band more efficiently.		
V.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	Maintenance Flight Wideband Maintenance Workcenter **2181 Communications Squadron** **Monte Vergine, Italy**	PROFESSIONAL SERVICES 1981-1984 1985-1989	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐Check if project performed with current firm	
	Wideband Communication Equipment Technician/Supervisor. Ensure the efficient operation of tropospheric scatter and line of sight radio systems, analog and digital multiplexers, and signal generation and termination equipment and associated test equipment. Mr. Bickle performed alignments and repair actions to transmitters, exciters, power amplifiers, receivers, conditioning equipment such as the AN/FRC 96/97 heavy troposcatter power amplifiers, heat exchangers, WD 50 dehydrators, AN/FRC 159/162 microwave transceivers, the FCC 32, FCC 21, FCC 97/98 and 46A3 multiplexers, and the FGC 135/136 telegraph terminals. Utilized various test equipment for component level repair including oscilloscopes, spectrum analyzers, voltmeters, etc.		
W.	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	Maintenance Flight SATCOM Maintenance Workcenter **3rd Combat Communications Group** **Tinker AFB, OK**	PROFESSIONAL SERVICES 1984-1985	CONSTRUCTION (if applicable) N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐Check if project performed with current firm	
	Wideband Communication Equipment Technician/Supervisor. Perform site surveys and establish tactical satellite links utilizing mobile satellite system AN/TSC-102. Deployed to multiple locations in support of command post operations establishing secure voice and data transmissions. Performed all maintenance on radio gear, loaded crypto logic devices, installed grounding systems and other tasks for this wholly self contained and self supported communications system.		

Steve Davis
405 627 0040

Expertise:

VoIP, SDWAN, UCASs, CLOUD SERVICES, CYBER SECURITY, BROADBAND, RF RADIO and CELLULAR, OSP/ISP, SAT/COM Networking Turnkey Solutions – Network Deployment Program/Project Management.

Professional Profile

- *Expert in Small cell and DAS, large-scale wireless network deployments and optimization, SAT/COM, OSP Fiber Optic projects for FTTx or fiber and/or Microwave Radio backbone.*
- *Possess a strong technical background with broad knowledge of wireline & wireless communications protocols, networking operation, and system design of advanced technologies for next generation wireless access product evolution and legacy technologies.*
- *This diverse set of operational experiences coupled with detailed knowledge of technical, engineering, financial and operational constraints provide the ability to understand and resolve the most complex operational problems.*
- *Able to work at any level in cross functional teams, improving team building, problem resolution and creating a shared sense of vision and purpose.*
- *Highly respected and regarded as a knowledgeable team player who strives to improve teamwork and communication.*

Responsibilities have included;

- *Managing OSP projects by leading different internal departments, vendor management and main point of contact.*
- *Planning and implementation of OSP projects*
- *Develop project plans, budgets and schedules*
- *Ensure construction vendors are adhering to schedule*
- *Manage relationships with municipalities, utilities, etc.*
- *Review designs and supervise commercial and carrier fiber networks, infrastructure, backbone and lateral builds.*
- *Oversees procurement of equipment and materials related to the assigned projects.*
- *Executes Bid Process, inclusive of budgetary requirements and the tracking*
- *Verify and update project documentation.*
- *Timely tracking of project progress and budget using a tracker.*
- *Timely update of budget requests, purchase orders, project close out and internal service orders.*
- *Must be able to manage multiple RFP and design construction schedules and responses.*
- *Must be able to understand and read construction documents.*
- *Familiar with all facets of OSP management, including quoting, construction and delivery.*

Steve Davis
405 627 0040

Professional Experience

PARTNER / Business DEV **SEP 2018 – Present**
BLACKHAT Unwired, OKC, OK
Providing VoIP, BROADBAND, UCASS, SDWAN, CLOUD Services, Cyber Security, DATA Warehousing.

OWNER / Principal Consultant **MAY 2005 – SEP 2019**
WINS, Inc. Edmond, OK
Provide Wireless RF Engineering and PM Consulting Services via WINS. Sample Projects Below:

- **Small Cell Program Manager** **Oct 2016 – June 2017**
  T-Mobile – Houston, TX

On behalf of T-Mobile lead the turnkey deployment of the Small Cell Program from ring to first call.

- This began with 631 sites being delivered by ZAYO to the addition of 1412 sites to be delivered by Crown Castle and 657 sites to be delivered by Paradigm ICTX in the Houston Market. I lead a team of 6 additional people from PC to Project managers to successfully deliver on a timely basis with quality all of the sites from each vendor into the T-Mobile network

- **TOP GUN Project Manager**
  Sprint - Overland Park, KS **June 2014 – April 2015**

Leading the efforts to implement and manage the National TOP GUN program for Sprint Midwest Region

- **Professional Consulting**
  RuralCom – Canada **July 2013 – March 2014**

Vendor Management consulting for the rural deployment of GILAT SAT/COM connected small cells

- **Senior Project Manager**
  AT&T - Edmond, OK **April 2013 – July 2013**

Lead Technical Project manager for the ATT HQ Program management office RAN

- On behalf of the new ATT PMO RAN organization I was assigned to lead efforts to develop the program management processes, procedures, and practices to support all ATT RAN initiatives.
- I led the development of the requirements for engaging the project management office for the GNG Full post launch optimization and monitoring by the OEM vendor for all LTE market clusters.

- **Senior Project Manager**
  AT&T- Edmond, OK **Sep 2012 – Apr 2013**

Assigned to lead the commercial launch for all ATT LTE markets nationally.

- On behalf of the ATT HQ LTE Realization Team I led the efforts to plan and execute the commercial launch of all new LTE markets for ATT nationally once they have been deemed commercially ready.
- This includes planning and scheduling all internal resources and Ericsson and ALU to conduct the final end to end testing with commercial SIMS as the last requirement for making the markets

- **Principal Consultant**
  AT&T - Edmond, OK **Mar 2012 – Sep 2012**

Led overall program including road show to introduce and demonstrate the AT&T LTE Go No Go Lite System deployment and testing program based on a custom tool development (Hasati Tool)

- Led the effort on behalf of the ATT HQ LTE Realization Team to visit the RAN AVP's and their teams in various regions to present and demonstrate the tool and how it was being used to measure the readiness of the ATT LTE markets prior to commercial launch.
- Acted on behalf of GTL Americas as the primary business development role for the Hasati tool for post launch.
- The tool is widely accepted within AT&T and fulfills all requirements for demonstrating the LTE pre-launch market readiness. Subsequently developed the process for post launch tuning, life cycle monitoring and on-going evaluation.

GTL Americas
Consultant for ATT LTE Go No Go program - Dallas, TX **Sep 2011 – Mar 2012**

Assigned to lead the effort to develop and perfect the National LTE Go-No-Go FULL program.

- Primary Business Development lead for this critical and high visibility nationwide program. Interfaced with ATT for all business and program development activities and drove the program to a successful conclusion.
- Led a multivendor effort on behalf of AT&T to specify, test and develop the measurement equipment and all output reports necessary to determine and establish the require KPI's for all LTE markets.
- Developed all program processes and established best practices policy and documentation
- Acted as central coordinator and resolved conflicting interests between AT&T and vendors to deliver the requirements of this equipment on time and on budget.

Nokia Siemens Networks
Executive Consultant - Dallas, TX **May 2007– Nov 2007**

Supported the head of services as a consultant on a 6 month assignment upon the completion of the Nokia Siemens merger in April of 2007.

- Instrumental in establishing a KPI based methodology for determining the status of all major project milestones and scoring them.
- Subsequently evaluated the Swifttrac product from Job Site Software and successfully introduced that product for project managing the TMO account for NSN.
- Established a successful new partner relationship with Ronin Technology Partners

Ericsson
Engineering Project Manager Dallas, TX **May 2005 – Jan 2007**

Directly responsible for the Core, Transport and RF preliminary design and acceptance by the Cingular market stake holders for the 2006 Ericsson UMTS roll-out.

- Managed the cluster tuning and overall market KPI achievements ultimately attaining GREEN KPI's (Dallas was the 1st GREEN market ready for launch of the 1st fifteen new UMTS market for Cingular in 2006) and market acceptance and handover of the 3G UMTS network launches for Ericsson in Dallas, San Antonio, Austin, Houston, Little Rock and Tulsa.
- Subsequently acted in a business development role establishing additional service offerings from Ericsson, including developing business proposals and presenting to the customer.

EMPLOYMENT HISTORY

Senior Consultant
P3-Group **Aug 2017 –Nov 2017**

Provide Business development and engineering sales support services to the wireless industry on behalf of P3-Group

Steve Davis
405 627 0040

Goodman Networks
Director of Deployment - OKC, OK **Feb 2011 – Sep 2011**

Responsible for P&L of the 2011 $70M budget for AT&T's network construction in the OK/AR market.

- Led the effort to complete over 450 1st carrier UMTS site deployments as well as over 500 UMTS 2nd 3rd and 4th carrier additions and 200 LTE sites in OKC for the AROK market.
- Held the 2nd in command role for the program management responsibilities of the overall program in AROK for GNET.
- On behalf of GNET and the AROK market was the direct customer interface to ATT and also managed the business relationships with all the approved vendors.
- I also had a large staff of direct employees, PM's, CM's, and support staff as well as contract personnel.

TerreStar Networks
Senior Member Technical Team - Dallas, TX **Nov 2007 – Jan 2011**

Lead the effort to deploy the terrestrial component of the hybrid SATCOM network.

- As business conditions dictated the role evolved into the primary field test and acceptance representative for all pre-launch IOT of the SATELLITE payload and subsequent ground systems.
- Launched a new wireless network technology and accomplished several industry firsts establishing the 1st of its kind hybrid all IP SATELLITE/CELLULAR network and handset compatible with AT&T's 2&3G networks called GENUS.
- Supported the development of SLA's and contract negotiations with many vendors.
- Supported handset trials and demonstration of the unique capabilities of the network to public safety and government official at various state and federal levels.

McCaw/AT&T Wireless
Various Roles - OKC, OK **1989-2005**

Progressive advancement from cellular systems specialist as a cell site, central office, and transport technician to RF performance engineer and ultimately the Senior Manager Network performance E2E for OK, AR, East TX, and portions of Louisiana, MO, and KS.

- Over 1000 sites on multiple technologies with 9 engineers in 6 states.
- Managed 6 local and 3 remote engineers and was directly responsible for their development and advancement.
- As a result of the 2004 merger of AT&T Wireless and Cingular, was directly responsible for the divested markets until their eventual disposition in April 2005.

Tulsa Cable Television
Various Roles - Tulsa, OK **1981–1989**

Progressive advancement from field installer and technician to bench tech and cable systems engineer achieving all necessary milestones for advancement including education and experience.

- Managed the deployment of a new SMR network in 1988 to support the company's field force communications requirements.
- Determined the necessary budget performed all product and technology evaluations. Responsible for final selection of the product and technology.
- Responsible for submitting all necessary license requirements including all negotiations and ultimately the successful deployment on time and under budget of a multichannel SMR network.

EDUCATION

Oklahoma Christian University in 1979 – 80
Completed all General Freshman courses

Steve Davis
405 627 0040

Tulsa Junior College in 1981
Completed advanced courses in electronics.

Awards and Recognition

Numerous Industry awards, technical and professional development courses throughout my career.
I was a significant contributor to the Skills Knowledge Transfer and National Engineer development program at AT&T Wireless.

***References from many industry leaders are available upon request.**

TERRY **NELSON**

290 CR 2174, SULPHUR SPRINGS, Texas 75482 | H: 903-335-1475 | tdnelsontdnelson@yahoo.com

SUMMARY

Experienced Outside Plant Engineer proficient in designing copper and fiber optic layouts. Skilled in developing and managing system repairs and updates according to budgets and within deadlines. Ready to offer 49 years' experience in Telcom and take on a challenging new role. Proficient in RUS Knowledgeable telecommunications professional experienced in planning, scheduling and overseeing system changes. Highly organized and resourceful with a quality-focused and hardworking mentality.

SKILLS

- Testing procedures
- Procurement coordination
- Project management
- Mapping understanding
- Fiber ring builds
- Quality controls
- Customer needs assessment
- Excellent problem solving skills

EXPERIENCE

01/2017 to 12/2018 **Outside Plant Engineer**
ACRS Engineering — Oklahoma City, Oklahoma

- Operated within the standards of rights-of-way, private easements and Nye County guidelines.
- Planned enhancements and repairs to current cable layouts.
- Designed and implemented cost-effective fiber and copper layouts to meet new and existing customer needs.
- Collected, organized and modeled field data.
- Developed and managed redlines, control plans and service maps.

01/2016 to 12/2016 **Outside Plant Engineer**
Bechtel Engineering — Raliegh/Durham, NC

- Collected, organized and modeled field data.
- Operated within the standards of rights-of-way, private easements and NC guidelines.

01/2013 to 01/2015 **Staker / Inspector**
Finley Engineering — Lexington, KY
Field Notes and design work on Ftth Project in Auburn,Adairville & Chandler,Ky

- Delivered an exceptional level of service to each customer by listening to concerns and answering questions.

06/2012 to 12/2012 **Elations Staker / Inspector**
Finley Engineering — Lexington, KY
Ftth Project In Glascow, Montana. Delivered completed design for cable Placement.

01/2012 to 12/2012 **Staker / Inspector**
Finley Engineering — Lexington, KY
Ftth Project in Rutland, Vermont staking and inspecting fiber build.

EDUCATION AND TRAINING

1966 **High School Diploma**
Rattan — Rattan, OK

1968 **Southeastern State College** — Durant, OK

1999 **General Telephone Co.** — Various Locations

REFERENCES

Gene Aldridge-Contract Engr. / Project Mgr 903/808-0693
Roger Robinson-Contract Engr. / Project Mgr. 606/371-0114
Mickey Barker-Verizon Mgr. 903/440-4146
Sam Miller-Retired GTE Mgr. 409/996-3086

Lily E. Shangreaux

EDUCATION Princeton University, Princeton, New Jersey
Bachelor of Arts, Psychology, 1982.

EXPERIENCE

ACRS, LLC, Oklahoma City, Oklahoma 2011 to present
Contracts Administrator

- Assist engineers with the preparation of construction contracts and assembly of all plans and specifications, assist with DOT permits and environmental clearances, prepare timelines and related tracking mechanisms, assist with competitive bid process including pre-bid and pre-construction conferences, reconciliation of construction invoices and preparation of contract closeout documents.
- Organization of RUS and other government contract forms, design standards and coordination with engineers
- Research and assist with writing federal grant and loan applications and all subsequent government reporting during construction

Red Earth, Inc, Oklahoma City, Oklahoma 2010 to 2011
Museum Assistant

- Serve as front-line staff for Red Earth Museum and Gift Gallery
- Maintain the permanent collection database
- Work with staff on Gallery shows and exhibits
- Responsible for gallery sales, including invoicing and inventory

BIG Productions, Stillwater, Oklahoma 1993 to present
Owner

- Producer, Researcher, Writer, Production Coordinator
- Develop ideas, budgets and proposals for video projects
- Responsible for continuity and logistical planning when company is shooting
- Manage all aspects of the business office including billing, bookkeeping, and tracking the expenditure of grant/contract funds
- Kept financial records in order and prepared business taxes

Institute of American Indian Arts, Santa Fe, New Mexico 1990 to 1992
Development Associate

- Researched foundation and corporate prospects
- Developed proposals including budgets, tracked and followed up pending proposals.
- Assisted with design of capital campaign, direct mail, and annual fund raising campaign Developed final reports to funding sources
- Coordinated scholarship and student awards funds

Lily E. Shangreaux

Indian Center, Inc., Lincoln, Nebraska **1984 to 1990**
Assistant Director

- Developed new programs and proposals for funding new and existing programs for submission to federal, state, regional and foundation sources
- Collected and analyzed statistical date for proposals, public presentations and other reports Acted as administrative liaison for Board of Directors
- Developed and implemented a public relations plan, including designing brochures, editing agency newsletter, and other PR materials
- Organized special events

SKILLS/OTHER EXPERIENCE

- Seasonal work with H&R Block, 2010 and 2011 tax season: Customer Service Professional.

- US Census Bureau 2010 Census count, Crew Leader. Supervised a crew of 10 to 15 people during field operations.

- Excellent computer skills, including Quickbooks, MS Word, Excel, Peachtree Complete Accounting, PastPerfect (a collection database), Dreamweaver (web design). Some experience with Paint Shop Pro and Fireworks.

- Excellent organizational skills, logistics planning and event planning.

- Knowledge of service and retail accounting practices. Created my own spreadsheets in Excel for double-entry bookkeeping for BIG Productions.

- Excellent customer service skills, scored high on H&R Block Customer Service Professional training and on Census training tests.

- Excellent writing and research skills: grant proposal research and writing, documentary research and scriptwriting, financial and progress report writing.

Brandi Schwerdtfeger

Objective

Find employment appropriate for my training and work experience, with advancement possibilities.

Education

AUTOCAD CERTIFICATE | AUG 2007 TO DEC 2008 | CANADIAN VALLEY TECH. CENTER

Skills & Abilities

OFFICE MACHINES

- Working knowledge of most office printers, plotters, scanners and faxes.

COMPUTER APPLICATIONS

- Working knowledge of Microsoft Outlook, Excel and Word.
- Working knowledge of AutoCAD Map 3D.
- Working knowledge of Google Earth, including making KMZ files, converting to .shp files.

Experience

CAD/GIS MANAGER | ACRS | APRIL 2015 TO PRESENT

- Worked with design team to prepare drawings showing Fiber to the home, included but not limited to roads, power poles, buildings, land features.
- Utilized AutoCAD map tools for base map drawings, showing roads, homes.
- Utilized GIS tools like .shp files in conjunction with AutoCAD.

I & E DRAFTER | ENABLE MIDSTREAM PARTNERS/NER WEST | SEPT 2014 TO FEB 2015

- Worked with design team to update drawings as required.
- Used AutoPlant to make 3D models.
- Used Project Wise database, updating items, migrating projects.
- Used I-Model Composer to make a representation of individual items.

CAD DRAFTER | MIDWEST COOLING TOWERS | FEB 2012 TO JUNE 2014

- Created 3D models, showing the relationship between components.
- Created 2D models, depicting dimensional data for fabrication in shop and erection of components in field. Assuring plans are clear and concise.
- Prepared Bill of Materials for assemblies.
- Modified drawings as needed.

CITY OF LUCAS, TX

Broadband Network Design & Financial Model

RFP RESPONSE

UNDERSTANDING OF PROJECT OBJECTIVES AND SCOPE OF WORK

1.0 Proposal Overview

As mentioned within our Bidder Qualifications Statement, ACRS is an engineering and consulting firm with over 30 years of experience in the field of broadband and telecommunications including the preparation of countless feasibility studies. We believe this experience and expertise gives us a clear understanding of the issues, needs and recommended approach to provide a comprehensive broadband network design and financial model which the City of Lucas can use as a tool to implement their own broadband network.

With our core business being turnkey solutions, the knowledge of the subsequent phases like actual material and construction costs, real world subscriber take-rates and the knowledge of implementing and operating broadband networks, makes for a more realistic feasibility study. Below are several items addressing our understanding of the scope of work.

2.0 High Level Design

ACRS will utilize our licensed Professional Engineers to provide a high-level conceptual design which can be used as a starting point for the subsequent phase of implementing and constructing the broadband network. In the interim, the high-level design will be the basis for all construction cost estimates and the foundation for the financial model.

ACRS will utilize its existing relationships to develop a more efficient plan to utilize existing facilities where it makes sense and construct new facilities as needed and analyze all options for interconnect points, if necessary.

ACRS will utilize its GIS based mapping software, wireless line-of-site and propagation tools and information provided by the City of Lucas to provide multiple design options as one size does not always fit all scenarios. We will consider fiber-to-the-home solutions, the latest in wireless technologies, and potential hybrid solutions utilizing both types of infrastructure.

As mentioned under our qualifications statement, ACRS designed the first fiber-to-the-home (FTTH) system in the state of Oklahoma and two of the state's largest fixed wireless networks. Our experience combined with our extremely

qualified staff, will enable us to develop a broadband design that will ensure reliable service to all end users.

Our designs will provide the City of Lucas with an overview and analysis of the latest FTTH and wireless equipment and standards. We will analyze and offer both GPON, Active and next-gen FTTH technologies to ensure the City of Lucas implements the latest standards.

With the wireless network considerations, ACRS will utilize its experience with the various licensed and unlicensed spectrums available from the FCC. We have the tools and experience to provide line-of-site studies for potential microwave backhaul, propagation studies to analyze possible wireless distribution solutions, and experience in working with the FCC on acquiring FCC licenses.

In addition to considering the construction of new communications towers, we will analyze various existing databases for consideration of tower colocations. We have experience with utilizing the FCC's and other databases and the contacts with the local and national tower companies.

ACRS will also consider permitting considerations such as: environmental, utilizing public and previously disturbed corridors, endangered species, heights of any proposed communications towers and FCC and FAA regulations.

3.0 Cost Estimates

After completion of the high-level design, ACRS will then generate an Engineer's Estimate of the total construction costs for the various buildout scenarios. The costs will incorporate all applicable shipping, taxes and labor to install all electronics.

Engineering costs will be calculated and included as an industry standard percentage of the final project costs. Through our many years of working in this field, we have developed an ability to create relationships with contractors qualified to perform outside plant construction as well as tower erection and other services. Along with this experience comes current and actual labor and material pricing from competitively bid RFPs for the type of construction required for the proposed City of Lucas broadband network. This will allow ACRS to generate a much more accurate financial model and would benefit the City with subsequent phases of the project

Miscellaneous costs like billing systems, management software, network operation center equipment, tools, test equipment and vehicles will all be part of the total cost estimate.

Included as part of the pro forma and financial forecast will be all related operating and reoccurring costs such as salaries, insurance, utilities and pole attachment fees to name a few. These operating costs are elaborated on and further described below under 5.0, Financial Forecast.

4.0 Market Analysis & Subscriber Forecast

For the Market Survey, ACRS will develop a comprehensive list and report of all existing service providers in the area, including all regulated telephone companies, competitive local exchange carriers (CLECs), cable operators and wireless service providers. The report will detail service areas, plans offered with speeds and pricing. This information will be valuable and necessary for generating proposed service plans for the City of Lucas. This Market Analysis will also play a role in the calculation of the City of Lucas's subscriber forecast.

In addition, ACRS will utilize numerous databases such as the National Broadband Map, FCC data bases and other broadband organization lists to assist in identifying all existing providers.

For the subscriber forecast, we will use the results of the Market Survey related to existing service providers considered the City of Lucas's competition. Over the years ACRS has developed a specific formula for forecasting subscriber penetration rates. Our program uses standard penetration rates along with factors to increase or decrease the standard penetration rate based on a variety of factors such as age, family size, income, and commute time to work. All of these statistics, along with the competition, are used to calculate a composite and unique penetration rate for each individual service area.

5.0 Financial Forecast

Similar to the subscriber forecast formula, ACRS has developed a program and financial model to generate a long-term financial forecast or proforma. The program takes into account the other sections of the feasibility study such as the project costs and subscriber forecasts. The program uses the project costs and calculates depreciation based on the company's depreciation rates and amortization.

Based on the subscriber forecast, revenues are calculated for the entire project. Recommended service plans are developed as part of the market survey and ACRS will utilize its knowledge and experience to break the subscriber forecast down into the various takes rates of the various service plans and a subscriber growth over a five-year forecast.

Expenses will be calculated for all possible operating expenses. Based on other service provider's experiences, the number of customer service representatives, technicians and vehicles will grow over time based on the subscriber growth. Numerous other operating expenses will be determined. These will consist of salaries and related benefits and overhead, technical support, billing, tower leases, floor space, vehicle expenses, insurance property tax, service costs for voice and/or video as applicable, bandwidth, pole attachment fees, utilities, office supplies, repairs and maintenance of the network, marketing and professional services.

The end result generates a set of financial statements over a five-year forecast. The report can be used to determine a breakeven analysis and any additional cash support that may be required allowing the City of Lucas leaders to make informed decisions related to the buildout of their own broadband network.

Description of Qualifications

1.0 Company Description

ACRS is a licensed engineering and consulting firm with over 30 years of experience in the field of broadband and telecommunications. ACRS was founded in 1987 as Associated Communications & Research Services, Inc. and converted to an LLC (ACRS, LLC) for tax purposes in January 2011. ACRS specializes in turnkey solutions from the initial feasibility study, to financing, to the final detailed engineering, testing and turn up of new broadband systems.

2.0 Company History

ACRS was established in 1987 by a group of retired Southwestern Bell and AT&T engineers. The company was initially owned by five independent Oklahoma Telephone companies where it provided engineering, financial and regulatory services for the five owner companies as well as marketing the same to other telephone and broadband providers across the country. ACRS is now privately-owned by one of the principle engineers taking a hands-on approach to all projects. ACRS offers engineering services for small rural telephone companies, large carriers like AT&T and Level 3, rural cable TV operators, fixed and mobile wireless providers, municipalities, electric cooperatives and numerous tribal nations.

It is worth noting that ACRS has owned and operated its own broadband company giving us a unique perspective not seen or experienced by most other engineering firms. ACRS at one time, also had an affiliated company which provided broadband network construction services again giving us additional knowledge from a construction perspective.

ACRS has not only worked with and is currently working with numerous municipalities on broadband related projects, but we have assisted with the development of multiple startup companies from the initial efforts similar to the City of Lucas' RFP through the detailed design and construction management.

3.0 Description of Qualifications

ACRS specializes in turnkey solutions from the development of feasibility studies, to financial acquisition of low interest loans and grants, to the detailed engineering and construction management of broadband networks until the final testing and service implementation of the network. ACRS has years of experience in working with contractors to build advanced technology solutions across federal, state, municipal and commercial marketplaces. ACRS has designed turnkey network centric solutions for information transport systems, OSP, ISP, voice, audio/video, data, security, DAS and Small Cell requirements on an enterprise level or as individual services tailored to meet very specific objectives.

ACRS is also well versed in the regulatory aspects of owning and operating a broadband network and has over 30 years of experience in assisting its clients with periodic reporting to Corporation Commissions and the FCC and obtain certifications and licenses such as CCN and ETC. ACRS is also a national leader in the acquisition of federal grants and low interest loans can assist the City of Lucas, TX with the same.

ACRS has experience with many types of systems from FTTH to wireless broadband to hybrid solutions to fit the needs of each unique geographical challenge. ACRS is credited with first FTTH system in the state of Oklahoma and has engineered and helped establish two of the largest fixed wireless broadband networks and is credited with the first full motion distance learning network in the country located in the Oklahoma Panhandle. This breadth of expertise will be extremely valuable throughout the City of Lucas, TX's project with our ability to offer a complete start to finish solution and a scope of services beyond those within the RFQ. A list of services offered by ACRS includes:

- Feasibility Studies
- Market Analyses
- Acquisition of low interest loans and grant financing
- Development of a tribally owned utilities commission
- Acquisition of CCN and ETC under tribal, state or FCC jurisdiction
- FCC 477 and other required reporting
- Engineering services including but not limited to the following functions:
  - Initial design and review of requirements
  - Engineer's estimates
  - CAD mapping with .shp files generated for clients use
  - Permitting & environmental clearances
  - Development of plans and specs & RFP Management
  - Establishing standards as needed
  - Inspection services
  - Cable schematics
  - Customer fiber assignments
  - Fiber splicing and acceptance testing
  - As-builts master redlines & CAD .shp files
  - Interconnections coordination

ACRS has coordinated with several state and local groups charged with connecting communities with broadband, working with all parties to facilitate joint cooperation for the expansion of broadband to underserved areas. ACRS was involved in structuring a cooperative effort between the Oklahoma DOT broadband system on their emergency broadband network and with rural broadband providers and FirstNet, the nation's first responder network authority, to work together to enhance the delivery of service in Oklahoma.

ACRS is a national leader in the acquisition of federal grants and has been very successful in securing grants for clients under the RUS Community Connect Grant Program for many years. In 2011 67% of the Community Connect grants awarded went to clients of ACRS. In 2013 we were again the leader in acquisition with 8 of the 14 grants awarded that year. ACRS has acquired more of these RUS grants than any other engineering firm in the country. We understand the importance of addressing the issues that rural and underserved communities have in the United States and incorporate these into our work with all federal loan and grant applications.

Most recently ACRS completed and submitted multiple applications for clients across the country under the USDA ReConnect Loan & Grant Program including applications in the 100% grant category, the 50/50 Grant/Loan and the 100% Loan categories.

Our work with other clients includes submitting applications under the FCC Connect America Fund (CAF) auction, the Distance Learning and Telemedicine grant program, the USDA Rural Business Opportunity Grant (RBOG), and the American Reinvestment and Recovery Act (ARRA) grant program.

ACRS has also been successful in obtaining approval for lower interest, priority status or extended loan repayment terms under a Substantially Underserved Trust Area (SUTA) request for clients whose project is located on tribal trust land.

ACRS is currently working with the City of West Plains, MO, Houston, MO and Chanute, KS on projects nearly identical to that of the project outlined in this RFP. Our clients stretch from coast to coast including current projects in the state of Texas. Our knowledge of the area and local resources will prove to be an advantage to the City of Lucas, TX.

ACRS CORPORATE OVERVIEW

JAMES LIGHTFOOT, P.E., President

Established in 1987

Headquarters: Oklahoma City, OK

ACRS is a licensed Professional Engineering firm with over 30 years of experience in the design of fiber optic, wireless, switching and transmission broadband facilities of RUS funded projects.

ACRS provides consulting and engineering services for rural ILECs, CLECS, cable companies, WISPs, municipalities, electric cooperatives, Native American Tribes and larger operators like AT&T, Williams Communications and Level 3.

- **ACRS engineered and constructed the first Fiber-to-the-Home network in the state of Oklahoma – completed in 2000, a full 5 years before Verizon began FTTx deployment**

ACRS designed and developed the first full motion distance learning network in the U.S. with Panhandle State University

- **National leader in broadband grants, since 2006, ACRS has acquired more RUS Community Connect Broadband Grants than all other engineering firms combined.**

100% success rate with RUS Infrastructure loans

Excellent reputation and relationship with USDA Rural Utilities Staff general field representatives and the D.C. staff.

ACRS engineered and provided construction management services for two of the largest WISPs in the state of Oklahoma.

- **ACRS has owned and operated its own Broadband Network giving us experience and a unique perspective not found with other engineering & consulting firms**

Turnkey Solutions

- Feasibility Studies
- Engineering Services
- Financial
- Regulatory Services
- Installation & Testing Services

FEASIBILITY STUDIES

- FTTH & Wireless Networks
- Broadband & Municipal & Cooperative Use
- Cost Estimates & CAPEX Requirements
- Market Analysis of Existing Providers
- Subscriber Forecast & Revenue Projections
- Staffing & Expense Analysis
- Financial Pro Forma & Forecast

ENGINEERING

- Fiber-to-the-Home
- Softswitch
- Voice over IP (VoIP)
- Wireless Broadband
- Video
- Distance Learning & Telemedicine

ENGINEERING

- Network Planning and Engineering
  - Outside Plant
    - Design, Staking, CAD Mapping, Permitting, Right-of-way Acquisition, Environmental Clearances, GIS, GPS, Inspection
  - Central Office & Transmission Equipment
    - Design, Installation & Acceptance Testing, Software upgrades & Maintenance

ENGINEERING

- Wireless
  - Network Design, Site Acquisition, Line-of-Site and Propagation Studies, FCC Registrations, ER Clearances, Installation, Acceptance Testing & turn-up & Maintenance
- Any Network Type or Technology
  - Legacy voice, Softswitches, VoIP, IP video, Twisted Pair, Active or PON FTTH, HFC, Wireless
  - DWDM, SONET, TDM, ATM, IP, WiFi, WiMax, QAM

FINANCIAL

- Financing
  - RUS Infrastructure & Broadband Loan Programs
  - Community Connect Program
  - Distance Learning Telemedicine Program
  - Connect America Fund
- Cost Recovery
  - Lifeline and Link-Up
  - USF – Connect America Fund

REGULATORY

- Settlement Support
- Expert Testimony
- Interconnection & Co-location Support
- CLEC & ETC Filings
- FCC Reporting

INSTALLATION & TESTING SERVICES

- Fiber Optic Splicing
- Fiber Optic Testing & Troubleshooting
- Wireless & Transmission Electronics Installation
- Softswitch Acceptance Testing

Contact Information

James Lightfoot, P.E.

ACRS

2601 NW Expressway, Suite 405W

Oklahoma City, OK 73112

(405) 843-9966

JAMESL@ACRSOKC.COM

Cost Proposal

1.0 Cost Proposal Overview

ACRS is pleased to provide this cost proposal in response to the City of Lucas' Broadband RFP.

ACRS hereby offers the City of Lucas a lump sum bid of $18,000.

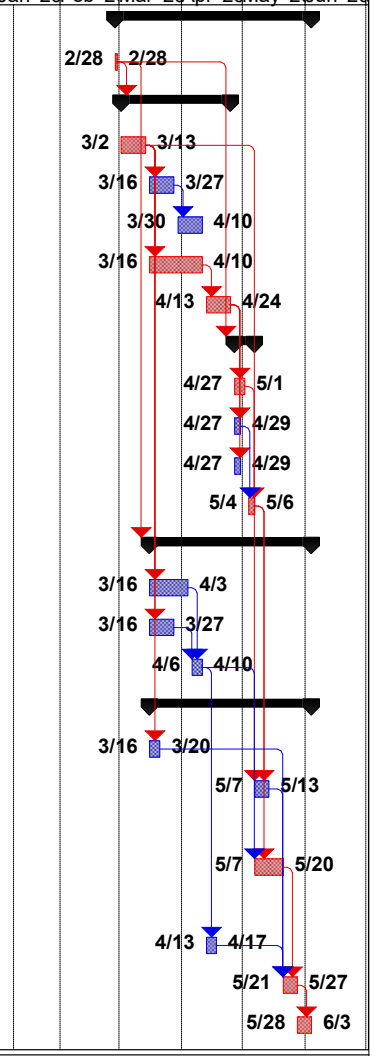
ACRS is receptive to negotiations with the City to determine an acceptable payment plan or monthly progress payments as agreed to by both parties.

This cost proposal covers the complete scope of services and deliverables as defined within the City of Lucas' RFP and is inclusive of all expenses including travel, hotel, reproduction, etc.

Our proposal also assumes an initial data gathering exercise and field trip and meeting with the City as well as a final formal proposal to City Council and modifications of the model as requested by the City.

City of Lucas, TX
Broadband Network Design & Financial Model

ID	Task Name	Duration	Start	Finish	% Complete
1	**City of Lucas, TX**	**69 days**	**Fri 2/28/20**	**Wed 6/3/20**	**0%**
2	**Execution of Contract**	1 day	Fri 2/28/20	Fri 2/28/20	0%
3	**High Level Design**	**40 days**	**Mon 3/2/20**	**Fri 4/24/20**	**0%**
4	Initial Review of Requirements & Data Gathering from the City of Lucas	10 days	Mon 3/2/20	Fri 3/13/20	0%
5	Research of Existing Tower Sites for Potential Wireless Hotspot	10 days	Mon 3/16/20	Fri 3/27/20	0%
6	Run Preleminary Propagation Studies	10 days	Mon 3/30/20	Fri 4/10/20	0%
7	Develop Initial Route Mileage Construction Estimates	20 days	Mon 3/16/20	Fri 4/10/20	0%
8	Finalize High Level Conceptual Design & Review with the City of Lucas	10 days	Mon 4/13/20	Fri 4/24/20	0%
9	**Cost Estimates**	**8 days**	**Mon 4/27/20**	**Wed 5/6/20**	**0%**
10	Assemble Current Material & Labor Pricing	5 days	Mon 4/27/20	Fri 5/1/20	0%
11	Review Requirements for NOC with City officials	3 days	Mon 4/27/20	Wed 4/29/20	0%
12	Calculate Indirect Costs required for the Project	3 days	Mon 4/27/20	Wed 4/29/20	0%
13	Extrapolate total CAPEX Required for Various Design Scenarios	3 days	Mon 5/4/20	Wed 5/6/20	0%
14	**Market Analysis & Subscriber Forecast**	**58 days**	**Mon 3/16/20**	**Wed 6/3/20**	**0%**
15	Research Existing Service Providers Including Service Plans Offered	15 days	Mon 3/16/20	Fri 4/3/20	0%
16	Research Census Demographics	10 days	Mon 3/16/20	Fri 3/27/20	0%
17	Calculate Final Subscriber Forecast Based on Data Gathering Efforts	5 days	Mon 4/6/20	Fri 4/10/20	0%
18	**Financial Forecast**	**58 days**	**Mon 3/16/20**	**Wed 6/3/20**	**0%**
19	Review Depreciation Rates with the City	5 days	Mon 3/16/20	Fri 3/20/20	0%
20	Determine Cost of Financing of the Project & Review Financing Options	5 days	Thu 5/7/20	Wed 5/13/20	0%
21	Draft of & Finalize all Assumptions related to Operating Costs with the City officials	10 days	Thu 5/7/20	Wed 5/20/20	0%
22	Calculate all Projected Revenues & Proposed Service Plans	5 days	Mon 4/13/20	Fri 4/17/20	0%
23	Run Five Year Financial Forecast for Each Design Scenario	5 days	Thu 5/21/20	Wed 5/27/20	0%
24	Presentation of Final Report	5 days	Thu 5/28/20	Wed 6/3/20	0%



Project: City of Lucas Broadband Netw
Date: Thu 1/9/20

Task		Split		Manual Summary Rollup	
Critical Task		External Tasks		Manual Summary	
Milestone		Project Summary		Start-only	
Summary		External Milestone		Finish-only	
Rolled Up Task		Inactive Milestone		External Tasks	
Rolled Up Critical Task		Inactive Summary		External Milestone	
Rolled Up Milestone		Manual Task		Progress	
Rolled Up Progress		Duration-only		Deadline	

List of Completed and Current Projects

1.0 Completed and Current Projects

Below is a list of just a few of our more recent turn-key engineering and design projects. The majority of these and in the subsequent tables are comparable to the size and scope of the City of Lucas, TX RFP.

Client	Project Number	Costs	Timeline
West Plains, MO	MO Non-RUS	TBD	10/2017 to Present
Assistance with the completion and test and turn-up of the initial broadband FTTH pilot project and perform all subsequent engineering design for a complete city-wide FTTH network. Coordination with the city council, cost estimate and timeline and financial projects were also provided to the city. The final cost of the project is still to be determined and falls under our non-disclosure agreement.			
Houston, MO	MO Non-RUS	TBD	12/2019 - Present
ACRS prepared a fiber-to-the-home feasibility study and financial forecast for a city-owned broadband network design similar to the RFP herein. We subsequently awarded the contract and have recently commenced with a post study and detailed engineering and design.			
City of Chanute, KS	KS Non-RUS	$750,000.00	3/2014 to Present
ACRS prepared an Engineering Feasibility Study for the implementation of a new FTTH system which could also be used as part of a new smart grid system for monitoring, meter reading and preventive maintenance of their utility infrastructure. The study included a high-level design, cost estimates, revenue and expense projections with a payback analysis. Subsequent to the study, ACRS designed the first pilot phase of the FTTH system. The design included redundant fiber rings and upgraded electronics used to serve multiple schools and other critical community facilities. More recently the City has retained ACRS to design and provide construction management services of a second phase of the project.			
City of Miami, OK	OK Non-RUS	TBD	4/2013 to 8/2013
Prepared an Engineering Feasibility Study for the implementation of a FTTH broadband network to be used for a smart grid system for monitoring, meter reading and preventive maintenance of their utility infrastructure, and for the offering of broadband services to all businesses and residents. The study included a high-level design, cost estimates, financial forecast and coordination with third party service providers to determine interconnections and who would own and operate the broadband network and service offerings. The final cost of the project is still to be determined and falls under our non-disclosure agreement.			

Client	Project Number	Costs	Timeline
Osage Nation of Oklahoma	OK Non-RUS	$48,000.00	9/2015 to 12/2015
ACRS prepared a broadband feasibility study to determine infrastructure needs and plans to improve safety, health, and economic development opportunities. We helped the Osage Nation and one of their tribally owned companies (Osage Innovative Systems) to obtain grant funding for the initial stages of construction.			
Osage Innovative Solutions	RUS OK1414	$6,000,000.00	3/2017 - Ongoing
ACRS assisted OIS in acquiring federal grants to construct the first two phases of the project as designed for the Osage Nation, which has plans to network Osage Nation headquarters, programs and services in as many of their service areas as possible. The RUS funded service areas included schools, medical first responders and all residential establishments.			
Choctaw Nation of OK	RUS OK1416A	$3,000,000.00	Ongoing
Our services included, as the consulting engineer, a high-level design of fiber backhaul facilities, FTTH distribution facilities and wireless distribution. This was also all part of our preparation of a feasibility study and analysis. The study also included cost estimates, research on third party service providers and partners, subscriber revenue projections, operating cost estimates and a long-term financial forecast and payback analysis. Subsequent to the feasibility study ACRS assisted the Choctaw Nation with acquiring federal grant funding for the initial phase of the project. ACRS is now working with the Choctaw in the preliminary stages of engineering for this project that will cover 10.5 counties in southeastern Oklahoma within the Choctaw Nation serving all residential establishments and critical community facilities, including schools, hospitals and first responders.			
Valliant Telephone Company	RUS OK1412	$3,000,000.00	3/2015 to 6/2017
This project consisted of the preparation of applications for federal grants to construct a broadband telecommunications system inclusive of fiber backhaul and a wireless distribution system for rural residents in Oklahoma, including redundant connections to the local schools and other critical community facilities. These grants were awarded and the network is being constructed using the grant funds. The application required a high-level design of all fiber facilities, cost estimates and a financial forecast. ACRS subsequently provided all detailed engineering and construction management.			

Client	Project Number	Costs	Timeline
Kaw Tribe of Oklahoma	RUS OK1120	$189,500.00	2010 to 2012
Prepared an application for and acquired a federal grant to fund an initial broadband feasibility study. Subsequent to the grant funding, a detailed feasibility study was prepared consisting of components including but not limited to a high-level design, cost estimates, interconnection and potential third-party service provider partners.			
Pine Telephone Company	RUS OK550	$11,163,000.00	3/2017 - Preent
This project consisted of the preparation of an application for and acquired a federal grant for to construct a broadband telecommunications system inclusive of fiber backhaul and FTTH cabling for rural residents in Oklahoma. The grant was awarded and Pine is currently using the funds to construct the network, serving all residential establishments and critical community facilities, including schools, hospitals and first responders. The application required a high-level design of all fiber facilities, cost estimates and a financial forecast.			
Atlas Telephone Company	RUS OK547	$5,064,000.00	2013 - Present
Prepared and acquired a low interest long-term federal broadband loan to fund the entire project. The project was to phase out existing copper facilities and expand the fiber optic plant upgrading the broadband network to accommodate FTTH services. The expansion included upgrades to not only the outside plant fiber facilities but to the central office GPON electronics, central office power system and the fiber backhaul network.			
Valley Communications Association	NV – Non-RUS	TBD	12/2014 - 2018
This project began with a broadband feasibility study for a new startup company. Subsequent to submitting the feasibility study, we assisted Valley with efforts to acquire funding for the project. Upon funding, we have and are currently working with Valley to design the new broadband network consisting of both the fiber backhaul and FTTH distribution facilities to serve all of Pahrump, NV and surrounding communities, including multiple schools, hospitals and other critical community facilities.			
Community Telephone Company	RUS TX576	$26,396,478.00	9/2013 - Present
Prepared and acquired a federal broadband loan to phase out existing copper and expand the fiber optic plant further into Community's exchanges. The expansion will provide the fiber backbone and active FTTH services to offer high-speed internet access consistent with, or exceeding, the National Broadband Plan. ACRS not only provided the initial feasibility study and cost estimates, but successfully acquired low interest long-term federal financing for the project and is subsequently supplying all detailed engineering and construction management services. The design included redundant fiber rings and upgraded electronics used to serve multiple schools under the E-rate program.			

Client	Project Number	Costs	Timeline
City of Butler, MO	MO Non-RUS	TBD	July 2017
Prepare a broadband feasibility study for the implementation of a new start-up company. The project is proposing a FTTH network to serve all businesses and residents of the City of Butler. Our study contains a high-level design of both the fiber backhaul facilities and FTTH distribution facilities. The study also includes cost estimates, research on third party service providers and partners, subscriber revenue projections, operating cost estimates and a long-term financial forecast and payback analysis. The final cost of the project is still to be determined and falls under our non-disclosure agreement.			
Northeast Rural Services	RUS OK1122A	$90,000,000.00	2/2013 to 4/2016
ACRS supplied detailed engineering services for this large GPON FTTH system including all fiber backhaul, central office electronics engineering and construction management for a triple play system which could also be utilized for smart grid applications. The redundant fiber network provided broadband services to the local schools through the E-rate program, and other critical community facilities.			
OG&E	OK Non-RUS	$1,819,761	June 2018
This project is to provide and install 19 miles of new duct bank, maintenance holes, underground fiber optic cable and aerial fiber optic cable including all splicing, termination, and testing from the new operations center to several sites around the OKC metro area.			

Below is an additional list of current and former projects and ACRS clients for which ACRS has supplied detailed engineering and construction management services. Those which were RUS funded contained an initial cost estimate and financial forecast as part of the initial feasibility study and financing efforts.

Client	Project Number	RUS Funded	USDA/RUS Program
Agave, LLC	NM1411	Yes	Community Connect Grant
AtLink Services, LLC	OK021	Yes	Community Connect Grant
Buford Communications	TX1409	Yes	Community Connect Grant
CablePartner.Net	TX1411	Yes	Community Connect Grant
Cherokee Telephone Company	OK549	Yes	Infrastructure Loan

Client	Project Number	RUS Funded	USDA/RUS Program
Choctaw Electric COOP	OK028	Yes	Community Connect Grant
Crystal Broadband Network	IL1105B	Yes	Farm Bill/Broadband Loan Community Connect Grant
Direct Communications-Rockland Tel Co	ID513	Yes	Infrastructure Loan
ERF Wireless	TX012	No	Detailed engineering and professional services Non-RUS funded
Fort Mojave Telecommunications, Inc.	CA545	Yes	Infrastructure Loans
Fort Peck Nation	MT	No	Detailed engineering and professional services Non-RUS funded
Gila River Telecommunications, Inc.	AZ511	Yes	Infrastructure Loans
Hinton Telephone Company	OK538	Yes	Infrastructure Loans
KFW	TX009	No	Detailed engineering and professional services Non-RUS funded
McCloud Telephone	OK	Yes	Infrastructure Loan
Medicine Park Telephone Company	OK562	Yes	Infrastructure Loans Community Connect Grant
Oklahoma Western Telephone Company	OK555	Yes	Engineering under Infrastructure Loan & FCC 901 Auction
Orca Broadband, Inc.	OR1404	Yes	Community Connect Grant
Oso Vista Ranch Project Ramah Navajo Reservation	NM719	Yes	Distance Learning Telemedicine Grant Including RUS SUTA Provisions Approval
PC One	TX007	Yes	Community Connect Grant
Plateau Wireless	NH1401	Yes	Community Connect Grant
R&S Communications	VA1409	Yes	Community Connect Grant
Rhino Communications	OK033	No	Detailed engineering and professional services Non-RUS funded
Rico Telephone Company	CO535B	Yes	Infrastructure Loan
Saginaw Chippewa Tribe	MI	No	Detailed engineering and professional services Non-RUS funded
Sierra Telephone Company	CA515	Yes	Infrastructure Loan

Client	Project Number	RUS Funded	USDA/RUS Program
Southern Plains Cable	OK036	No	Detailed engineering and professional services Non-RUS funded
Techcore (Almega A-loan)	TX1408	Yes	Community Connect Grant
Texhoma Fiber	OK1411	Yes	Community Connect Grant
Turkeyfoot Construction	MO1420	Yes	Community Connect Grant
Vidia Communications	OK1104	Yes	Farm Bill/Broadband Loan Community Connect Grant
Vyve-Allegiance Communications	OK		ARRA Stimulus Loan
Verizon – Oklahoma City Market	PA002	No	Detailed engineering and professional services Non-RUS funded
West Plains, City of	MO080	No	Detailed engineering and professional services Non-RUS funded
White Mountain Cablevision, LLC	NJ1402	Yes	Community Connect Grant
Wichita Online, Inc.	OK1108	Yes	Farm Bill/Broadband Loan Community Connect Grant

CITY OF LUCAS

BROADBAND NETWORK DESIGN AND FINANCIAL MODEL

Foresite Group, LLC
3000 E Cesar Chavez St
Suite 300
Austin, TX 78702
www.foresitegroup.net

FORESITE group

3000 E Cesar Chavez Street, Suite 300
Austin, Texas 78702
o | 770.368.1399
f | 770.368.1944
w | www.foresitegroup.net

January 24, 2020

Kent Souriyasak
Assistant to the City Manager
City of Lucas
kent@lucastexas.us

RE: Broadband Network Design & Financial Model RFP

Mr. Souriyasak,

Foresite Group's Broadband Engineering team and our partner S.L. King & Associates is pleased to submit a proposal to the City of Lucas, TX for a Broadband Network Design and Dynamic Financial Model to help aid in the creation of affordable internet in the region. We applaud your vision for creating a network to provide high speed, reliability, affordability, and customer service excellence, as well as your determination to create your own future! Foresite Group is confident that our comprehensive team, exceptional qualifications, proven approach, and passion for bridging the digital divide is the right fit for this project.

We want to be a part of your community on this journey of creating new lifestyles and collaborations that can only be achieved through exceptional broadband connectivity. We would love to partner with the city in developing one of the most state of the art broadband markets in the US and achieve your goal of reliable, cost-effective, and fast broadband internet service to residents, businesses, and industries in and around Lucas.

Foresite Group understands that the Client would like a scope of work to complete a Broadband Network Design and Dynamic Financial Model to provide affordable broadband to the City of Lucas. This will include a detailed assessment and a roadmap of how the City can move forward with the creation of a broadband infrastructure that will be capable of up to 1 Gigabit end-user service speeds, with the capacity to increase bandwidth with minimal changes to the network as faster speeds are required.

The City of Lucas will receive a full Broadband Market Assessment complete with review of current assets, established service pricing, cost analysis, marketing strategies, business plans, and dynamic financial models for all possible service areas. We will outline in more detail our process in the following sections.

Foresite Group is enthusiastic about the possibility of working with Lucas, TX. This study will uncover opportunities that will enhance the quality of life for citizens, public safety, government efficiencies, and economic growth. It will also create a masterplan roadmap for executing the long-term goals of the community of Lucas, TX. We thank you for your time and consideration and look forward to working with you. Please do not hesitate contact me with any questions and we encourage you to get know us more by visiting our website at www.foresitegroup.net.

Sincerely,

Cody Miller

Cody Miller - Broadband Engineering Division Director
cmiller@fg-inc.net
770.368.1399

TABLE OF CONTENTS

PROJECT TEAM

CODY MILLER | Point-of-Contact + Project Manager
Austin, TX
cmiller@fg-inc.net

EXPERIENCE

Cody Miller is the Network Design Division Director with Foresite Group, Inc. With over 10 years of experience in the Engineering Industry he brings a vast knowledge of subsurface utility design and GIS based utility management systems. Cody has a Bachelor of Science in Surveying and Engineering Technology from the University of Houston. Before recently joining Foresite Group's Network Design team he was the Austin Telecom Manager at Black and Veatch. Cody is a Native Texan born and raised in Houston, Texas and currently resides in Austin, Texas.

- **CITY OF LAMPASAS MARKET ASSESSMENT - DIVISION DIRECTOR**
- **KENTUCKY INFORMATION HIGHWAY - KENTUCKY - GRAPHICS AND FIELD SUPERVISOR**
- **AT&T LIGHTGIG - MULTIPLE MARKETS - LEAD ENGINEER**
- **DALLAS LIGHTGIG - DALLAS, TX - LEAD ENGINEER**
- **GOOGLE FIBER - AUSTIN, TX - TEAM LEAD AND SENIOR DESIGNER**

ROLE AND RESPONSIBILITY

Cody will serve as the Point-of-Contact and Project Manager for this project, supporting the local area design center and establishing customer relationships. He will be the point of contact for technical consulting and will oversee processes and procedures, identifying necessary solutions to support design projects to completion. Cody will manage services from Foresite Group partners including but not limited to: data collection and coordination, market research, economic assessment and guidance, network design, architecture and service provision, integrated systems and technologies, etc., in support of the planning and design effort.

ERIK STEAVENS | Deputy Project Manager
SL King & Associates
esteavens@slking.com

EXPERIENCE

Mr. Steavens is Executive Vice President of S.L. King & Associates and has over 25 years of experience in infrastructure development. He has extensive Internal and External communication experience and participated as spokesman for multiple transit authorities. He has contributed at all levels of government including the USDOT, GDOT, TxDOT, State toll authorities and local government aviation and transit departments. Mr. Steavens has a Masters and Bachelors in Civil Engineering from the Georgia Institute of Technology.

- **SOUTH ORIENT RAILROAD OPERATIONS MANAGEMENT - TEXAS DOT**
- **STATE OF TEXAS RAILPLAN - TEXAS DOT**
- **MARTA SUSTAINABILITY PLAN - ATLANTA, GA**
- **HIGH SPEED RAILS FEASIBILITY STUDIES - GEORGIA DOT**

ROLE AND RESPONSIBILITY

Mr. Steavens will be the Deputy Project Manager for this project. He ensures that needs and requirements are achieved or exceeded, and will coordinate and facilitate with all project staff and stakeholders through the process of identifying necessary information, resources, and deliverables. Mr. Steavens brings a wealth of knowledge in the technology and infrastructure sector as well as his local knowledge with his experience in Collin County and the surrounding areas.

LEE COMER | Network Design Practice Leader
Birmingham, AL
lcomer@fg-inc.net

EXPERIENCE

Lee brings over 20 years of experience as a designer, supervisor, and project manager in the telecommunications industry. Lee earned his Bachelors and Masters of Industrial Design from Auburn University. Starting as a services technician, he progressed through various roles of responsibility and leadership including OSP Network Designer, Special Services Network Manager, Construction Supervisor, Senior Project Manager (PLS/U-verse), and Senior OSP Design Manager. He translates his knowledge of design, construction, and installation of communication networks into a comprehensive program.

- **HUNTSVILLE UTILITIES - HUNTSVILLE, AL - DIVISION DIRECTOR**
- **VERIZON ONE FIBER - NASHVILLE, TN - DIVISION DIRECTOR**
- **VERIZON ONE FIBER - CLEVELAND, OH - DIVISION DIRECTOR**
- **MASTEC – AUSTIN, TX – SENIOR PROJECT MANAGER**
- **AT&T – PROJECT LIGHTSPEED SOUTHEAST - SENIOR PROJECT MANAGER**
- **AT&T –OUTSIDE PLANT ENGINEERING - NETWORK MANAGER**
- **AT&T – SPECIAL SERVICES INSTALLATION AND MAINTENANCE - NETWORK MANAGER**

ROLE AND RESPONSIBILITY

Lee is a technical liaison who ensures that needs and requirements are achieved or exceeded, coordinating with all stakeholders through the process of identifying necessary information, resources, and deliverables. Lee manages services from partners including but not limited to: data collection and coordination, market research, economic assessment and guidance, network design, architecture and service provision, integrated systems and technologies, etc., in support of the assessment, planning and design effort.

CHRIS SKELTON | Manager of Technology Solutions
Birmingham, AL
cskelton@fg-inc.net

EXPERIENCE

Chris has over 24 years of experience in Telecommunications Engineering and Operations. He earned his Bachelor of Science in Electrical Engineering from The University of Alabama. Chris has served in many professional roles including: Special Projects Engineer, Corporate Staff Engineer, Engineering Manager, Operations Manager, Director of Engineering & Operations. Chris promotes team collaboration and uses his extensive background in telecom networks, engineering, and operations to develop solutions.

- **VERIZON ONE FIBER – VARIOUS MARKETS – MANAGER OF TECHNOLOGY**
  Managed city-wide Gigabit-per-second FTTH design project.
- **HUNTSVILLE UTILITIES FIBER NETWORK DEPLOYMENT – DIRECTOR OF ENGINEERING**
  Completing the design, engineering and construction support through the life of the project. This network will be owned and operated by the City and act as another utility revenue stream in conjunction with their city owned electricity, water and gas services.
- **COMCAST – BIG SOUTH REGION, DELTA REGION AND TUSCALOOSA, AL – DIRECTOR OF ENGINEERING OPERATIONS**

ROLE AND RESPONSIBILITY

Chris works with both Foresite and Clients to develop customized solutions for an efficient project. This may include strategies and support for: data collection & market assessment, financial modeling & evaluation, project sequencing & schedule trackers, network architecture guidelines, OSP construction guidelines, technology recommendations, material planning, and KPI reporting.

JR CAO | GIS Manager
Austin, TX
jcao@fg-inc.net

EXPERIENCE

JR is a GIS Manager for the Network Design team at Foresite Group, Inc. He was part of the design team responsible for the Austin Google Fiber Project and brings over 4 years as a designer, quality control specialist, and supervisor in the telecommunications industry. He is an integral part of technology solutions team and implements his passion for GIS and technology to improve the design process.

- **VERIZON ONE FIBER DENSIFICATION - SEATTLE, WA - SENIOR NETWORK DESIGNER**
- **AT&T – PROJECT LIGHTGIG MIDWEST – TEAM LEAD/PROJECT MANAGER**
  Served as the on-the-job instructor for ARAMIS, AT&T's design software. Managed the final design and data coordination for the LightGIG FTTH project, covering the Midwest Region (WI & MI). Included coordination with field resources, managing production through contract services, internal tracking, and deliverables.
- **DIGICEL - CARIBBEAN FTTH/FTTB - SENIOR NETWORK DESIGNER**
  Responsible for the network design for one of the largest FTTH/FTTB networks in the world covering Jamaica, Trinidad & Tobago, Guyana, and Bermuda. Engaged in the planning and design of the distribution network.
- **GOOGLE FIBER - AUSTIN, TX - NETWORK DESIGNER**
  Engaged in the city-wide Gigabit-per-second FTTH design project. Updated the method of procedures as the project evolved. Served as a quality control specialist providing guidance and feedback to contract services.

ROLE AND RESPONSIBILITY

JR is experienced with OSP design engineering and has been developing and implementing our transition in new technologies with mobile asset collection. He will serve as the GIS Project Manager for this project and will collaborate with both internal and external resources to move the GIS goals of the project forward.

CHRIS OWENS | Senior Designer
Birmingham, AL
cowens@fg-inc.net

EXPERIENCE

Chris Is a Senior Network Designer with Foresite Group, Inc. with over 15 years of Outside/Inside Plant Network Design experience. He has worked extensively throughout the Southeast coordinating with multiple local and state agencies, utilities and customers. His background in Outside Plant design began with copper service and is currently focused on the fiber networks of tomorrow.

- **AT&T PROJECT LIGHT GIG SOUTHEAST - SENIOR NETWORK DESIGNER**
  Deployment of 100% fiber service to all residential and commercial premises. Served as a network designer, an in house subject matter expert, and Quality Assurance for network and structure design. Assisted in training of field crews for data collection and route conflict resolution.
- **AT&T PROJECT LIGHTSPEED SOUTHEAST - SENIOR NETWORK DESIGNER**
  Design of Outside/Inside Plant U-Verse equipment sites including creation and delivery of construction packages. Coordinated with E911 for site addressing, local power providers for site service, and governmental agencies for permitting.
- **AT&T FIBER TO THE CELL(TOWER) SOUTHEAST - SENIOR NETWORK DESIGNER**
  Design of fiber network routes to the cell tower, ranging from one to 15 miles.

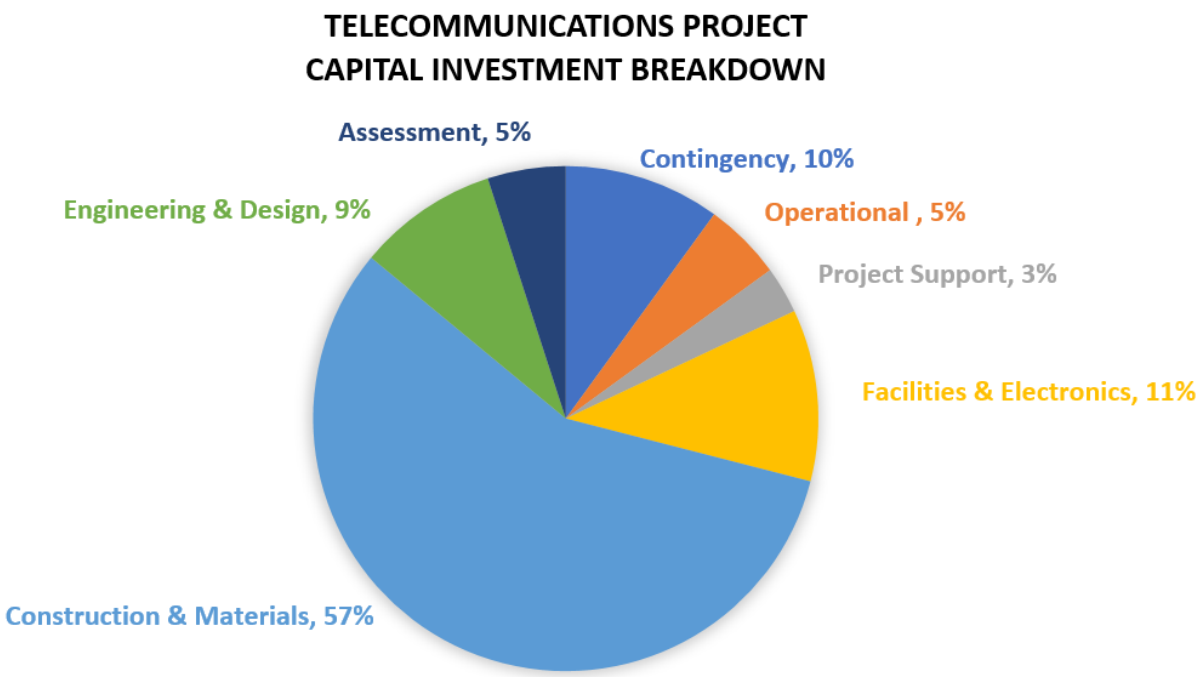
ROLE AND RESPONSIBILITY

Chris will be the Senior Network Designer for this project. He will lead all coordination and tasks associated with the Business Strategy and help produce deliverables. He will lead any design efforts and coordinate with the Project Manager's and production staff to ensure accuracy of the design.

PROJECT UNDERSTANDING & APPROACH

Foresite understands that the City of Lucas, TX is looking for a consultant to provide a Broadband Network Design and Financial Model for an FTTx project. We feel that we are uniquely qualified to ensure this project and the subsequent additional phases will be successful. The telecommunication industry is filled with abundant "propaganda" surrounding fiber networks and rural broadband. We have intimate knowledge of the telecom landscape from our years of serving our clients both large and small. We understand the challenges of creating a new network (translated as "new operational business unit") from scratch.

Part of what we've learned working with communities, towns, and municipalities is that education is a key to success. We believe that our first few meetings with any new group should focus on education and that if leadership is fully informed regarding telecom networks and fiber optics strategies, then tough decisions become easier. We don't want to provide a service and simply exit the market. We prefer to become a trusted partner that continues working for years to help our clients deploy future technologies using their fiber network. We are openly transparent about the problems we uncover and the solutions we suggest. We like to be subject matter experts. We pride ourselves on being advocates for our clients. We are nonpartisan to vendors and material suppliers. Instead of pushing a collection of products, we try to find the best solution that fits the need whether that's a financial goal or project related.



In a typical telecommunications project, as depicted in the chart above, construction labor and materials represent more than half the investment. Having quality partnerships with contractors and suppliers is critical to success. Over the years, we have worked with many best-in-class partners to create a fully comprehensive, turn-key process. We have a strong history of working together on large, market-wide network builds, and have an efficient and established program for collaborating successfully. Foresite Group's staff will ensure accountability and availability to project stakeholders. Foresite Group can also assist in staffing and developing a local workforce to maintain the network, design greenfield growth areas and implement new smart community applications over time.

TASK #1 - STRATEGY SESSION AND NEEDS ASSESSMENT

Our team will conduct an on-site strategy session with the City of Lucas and project stakeholders to discuss best practices in preliminary designing, city goals, and immediate needs. During this session a clear communication matrix will be created, roles and responsibilities will be identified, and milestones/timelines will be formed.

Foresite Group's senior network engineers, analysts, and management team will provide the City with the necessary information to make an educated decision on how to complete the network build-out in such a way as to facilitate future expansion in as cost-effective a manner as possible. Factors considered will include, but will not be limited to, aggregation of existing data on the city's infrastructure, development of a plan to help decrease cost/increase speed of network deployment, the facilitation of discussions with 3rd party dark fiber or conduit owners, a discussion of ideal construction methods for the particulars of various parts of the city, the forecasting of smart meter demand, connected traffic signals, and discussion of potential smart city applications made possible by the network.

TASK #2 – COMPILE GEODATABASE

Foresite Group uses different software solutions and processes throughout the lifetime of the program. Because of its versatility and functionality for gathering, managing and analyzing information represented in a geospatially accurate graphic interface, we begin by creating and populating a Geographic Information Systems (GIS) database.

The creation of the Database is a critical part of our process. This will provide the basis for almost all of our modeling for design which will inform the bill of materials. This also allows Foresite Group to incorporate any local data from the city or other utility owners in order to identify any risks associated with long lead permits or large geographic hurdles such as bedrock, large streams, rivers, or lakes. In short this will enable our team to create the most accurate geospatial representation we can with the maximum amount of data inputs.

CREATE A DATABASE

Based on the specific needs of the client and project stakeholders, Foresite Group will either select or create the best GIS database suited for this unique broadband program. An implementation may include an industry-standard commercial product, a custom-designed platform developed with a software partner, or a combination of the two, as best suited to the project's needs.

Foresite Group will develop a schema and data dictionary of the specific features that will be incorporated in the GIS database. This includes any objects of interest and any additional "attribute" data for those specific objects. Features with attributes will be incorporated throughout both LiDAR collection and extraction and also through our software-supported "Boots on the Ground" (BOG) process. With features added through the preliminary and detailed design process, this information can be stored and delivered in KMZ, SHP, or GDB formats and would be geo-referenced to use along with any private or public GIS data.

COLLECT AND INCORPORATE LOCAL DATA

Data from utility companies (power, water, gas, etc.), public entities (City, County, State or Federal), or other open sources will be incorporated into the GIS platform. This may include a geospatial realignment process for inferior or inaccurate data. During this process, we will recommend including "buffer zones" in the database that will create a visual depiction where new infrastructure can or cannot be placed. The time to complete this task is dependent on how accurate the current data is and the amount of readily accessible data. Through an in-depth review of the data provided or collected and subsequent execution of a field survey, Foresite Group will plan the constructible path.

TASK #3 – HIGH LEVEL DESIGN

PRELIMINARY DESIGN

As part of our value engineering process, Foresite Group's preliminary design is used to best enable a data-driven analysis of the costs and major impacts of various deployment strategies including:

- Route planning for network architecture and constructible path
- The amount of fiber, material, and equipment needed
- Optimal construction methods to maximize deployment speed and savings
- Active electronic equipment and sites
- Long lead permit avoidance
- Minimization of necessary traffic control
- Ease of maintenance
- Minimization of utility strikes

The preliminary design will reside in the GIS database, where it can be both desktop- and field-assessed. It will be revised as needed throughout the duration of the preliminary planning phase, serving as the foundation for the execution of the subsequent detailed design, construction packages, and permit and make ready engineering documents.

PRE-CONSTRUCTION RIDE OUT AND MAKE READY ASSESSMENT

Based on initial preliminary design output, Foresite Group will perform a Pre-Construction Ride Out (Pre-CRO) to analyze outside plant infrastructure placement for constructability, cost, and schedule efficiency. Due to weather conditions, accessibility, or physical obstructions, there are inherent limitations to the implementation of LiDAR-collected field data. Therefore, we may employ traditional field data collection commonly referred to as "Boots on the Ground" (BOG). To maintain speed, accuracy, and uniformity in our comprehensive field data collection, we use a variety of tools and processes during BOG activities (such as field-noting editable features and attributes in a tablet-based remote-access GIS application) so that our final data is consistent in content and format in the GIS database.

If applicable, the Pre-CRO may also include a Make Ready Assessment (MRA), a high-level visual check of poles for proposed strand attachment or overlash. This process will classify poles into a category to best determine total make ready effort and costs. Make Ready classification can be adjusted based upon information from the local market during the Strategy Session. Classification of poles could fall into the following categories:

- Green – No moves required, ready for attachment
- Blue – Communication moves required
- Yellow – Power violations, multiple communication moves, and possible power rearrangement
- Red – complete pole change-out, possibly including major power equipment reconfiguration.
- Black – High cost / prohibitively problematic

Based on this Pre-CRO and MRA information, Foresite Group will then create an updated preliminary design.

TASK #4 - BUSINESS PLAN

Upon completion of the previous tasks, Foresite Group's network analysts and management team will create a detailed business assessment of the market to provide the vested parties necessary information to make an educated decision on how to approach a complete network build-out.

Foresite Group will consult with our partners to provide the capabilities of voice, video, and data transmission service to all locations including homes, businesses and anchor institutes. With our collaborative approach and strategic planning, this Broadband Market Assessment will be a "Best in Class" approach to accommodate the needs over the lifetime of the City's network.

Foresite Group will deliver three different business models and deployment approaches for this task. These will vary in terms of costs and involvement for the City and those costs will be in the business plan in addition to the Dynamic Finacial Model. We will also provide supporting information for each approach outlining the risks, advantages and disadvantages of each as well as real world examples. Foresite Group will provide our recommended options as well as the following:

- Standardized specifications for infrastructure placement in the Right of Way
- Create "Dig Once Policy" or similar ordinance
- Create guidelines and templates for construction typical drawings

- Estimated budget for design-build
- Estimated schedule for design-build
- Phased build-out approach
- Network management – long term solution and benefits
- Network marketability – interconnection solution and services
- Greenfield growth
- Economic and community impact
- Network database recommendations
- Funding recommendations
- Private communities and Multi-Dwelling Unit (MDU) construction plan

TASK #5 – DYNAMIC FINANCIAL MODEL

Based on the information gathered in the previous four tasks, our team will create a custom financial pro forma that reflects the needs of the City and its Stakeholders. Our team will compile all information into different input categories that will be adjustable and provide overall cost based on different scenarios and approaches. Below are a few potential inputs for reference:

Physical area or distance, by adjusting this input and the extents of the project geographically can have the most significant costs impact as illustrated in the pie chart in the project understanding section. This will allow the city to model building out to every structure or possibly consider a pilot project in a smaller area.

Return on Investment, based on the initial build out area there could be various factors that surround what money is available for the city to build out. Different bonds, grants or private funding sources come with different interest rates.

Take rate, when building out a network there is always a consideration for how many people or subscribers will buy your service. Typically, a solid take rate for a Private ISP provider is around 35% - 40%. Take rates significantly impact the rate of return and can be much higher or lower based on certain market drivers.

Network Topology, different Networks can have different monetization methods. Single provider networks rely on one ISP to provide service to the market area or there could be an open access model which provides the ability for any ISP to "Lease Space" on the network therefore providing revenue from leasing the fiber and also charging a wholesale cost for the service as the infrastructure operator.

In addition to internet service providers, the network can have other entities, such as wireless carriers, enterprise customers, or companies providing an "Internet of Things" service like smart parking that can provide revenue for the Network Owner.

Operations and Maintenance, in house or third party operation of the network can impact the capital expenditure on the project. If the City does not have a network operation center capable of monitoring such a network, then a third party will need to be employed to monitor the network for incidences. The cost of constructing such a facility is extremely expensive and adds significant cost to smaller builds.

FIRM QUALIFICATIONS

COMPANY NAME Foresite Group, LLC

COMPANY ADDRESS 3000 E Cesar Chavez St, Suite 300, Austin, TX 78702 (Project Management + Staff)
3740 Davinci Court, Suite 100, Peachtree Corners, GA 30092 (Headquarters)

CONTACT INFORMATION Cody Miller; cmiller@fg-inc.net (preferred); o: 770.368.1399; c: 281.773.2864

COMPANY DESCRIPTION

Foresite Group was founded on January 24, 2003, in Norcross, Georgia. Foresite Group has over 190 associates in 14 offices nationwide, plus we engage additional local resources as needed for individual projects. We provide broadband engineering, civil engineering, landscape architecture, structural engineering, traffic engineering, and wireless services. A breakdown of our staffing is below:

- 26 Professional Engineers [PE]
- 19 Engineers-in-Training [EI/EIT]
- 50 CAD Drafters/Designers
- 20 GIS Database Engineering Analysts
- 10 Admin Professionals [IT, HR, Acct]
- 4 LEED AP/LEED GA
- 4 Landscape Architects [3 RLAs]
- 2 Traffic/Transportation Engineers
- 3 Structural Engineers
- 3 Telecom Subject Matter Experts

In addition to Foresite Group's 190 associates, we have many additional local resources that can be utilized for this project including our Dallas office who have completed several land development projects in Collin County. This will aid in keeping the project on schedule. We take our responsibility in shaping the communities where we live and work very seriously and are driven to produce nothing less than the best possible network designs for our clients. Since 2003, Foresite Group has completed over 7,000 engineering projects for public and private clients throughout the country.

SUMMARY OF EXPERIENCE

Our broadband engineering team focuses on serving local communities by working directly with power and utility providers, city/county/state municipalities, ISP and telecom providers, and private construction contractors. We have successfully planned and engineered over 20 million feet of fiber networks.

Foresite Group offers comprehensive consulting services to fully support our partner-clients throughout their project scope. Because of our multidisciplinary structure and wide range of services, we use a collaborative approach that allows us to consider the entire community rather than just a telecommunications network. Our philosophy is to understand the goals of our clients and integrate materials, systems, and technology through an interactive process to create solutions that exceed expectations.

Our project team also includes Erik Steavens from S.L. King & Associates (SLK). Erik will serve as the Deputy Project Manager. His knowledge, relationships, and experience with Collin County and the surrounding areas are invaluable. S.L. King & Associates serves as consultants and advisors to both the public and private infrastructure and facilities markets facing strategic decisions that impact current or future performance and needs. SLK provides professional services in planning, design, construction management, asset management, energy resource management and information technology. They are a certified Minority Business Enterprise (MBE), Small Business Enterprise (SBE), and Disadvantaged Business Enterprise (DBE) with over 20 governing bodies and agencies throughout the Country. Their staff of 50 consists of professional engineers, managers, inspectors, technicians, and administrative support personnel who serve as construction and program managers, planners and designers on projects for our clients.

COST OF SERVICES & PROJECT TIMELINE

PRICING

TASK	COST
Kickoff Meeting & Strategy Session	$2,400
Create Database	$6,000
High Level Design/Bill of Materials	$6,000
Business Plan	$24,000
Dynamic Financial Model	$24,000
TOTAL	**$64,400**

PROJECT TIMELINE

Below is an estimated schedule for Foresite Group's Broadband Network Design and Financial Model creation. The build out portion of the project schedule will be created based on the results of the Broadband Assessment and in conjunction with ongoing/upcoming infrastructure builds already planned within the City/County.

Please note timelines are subject to change as we receive new information. The Dynamic Financial Model task includes three recommendations and additional time to review with the city and its stakeholders.

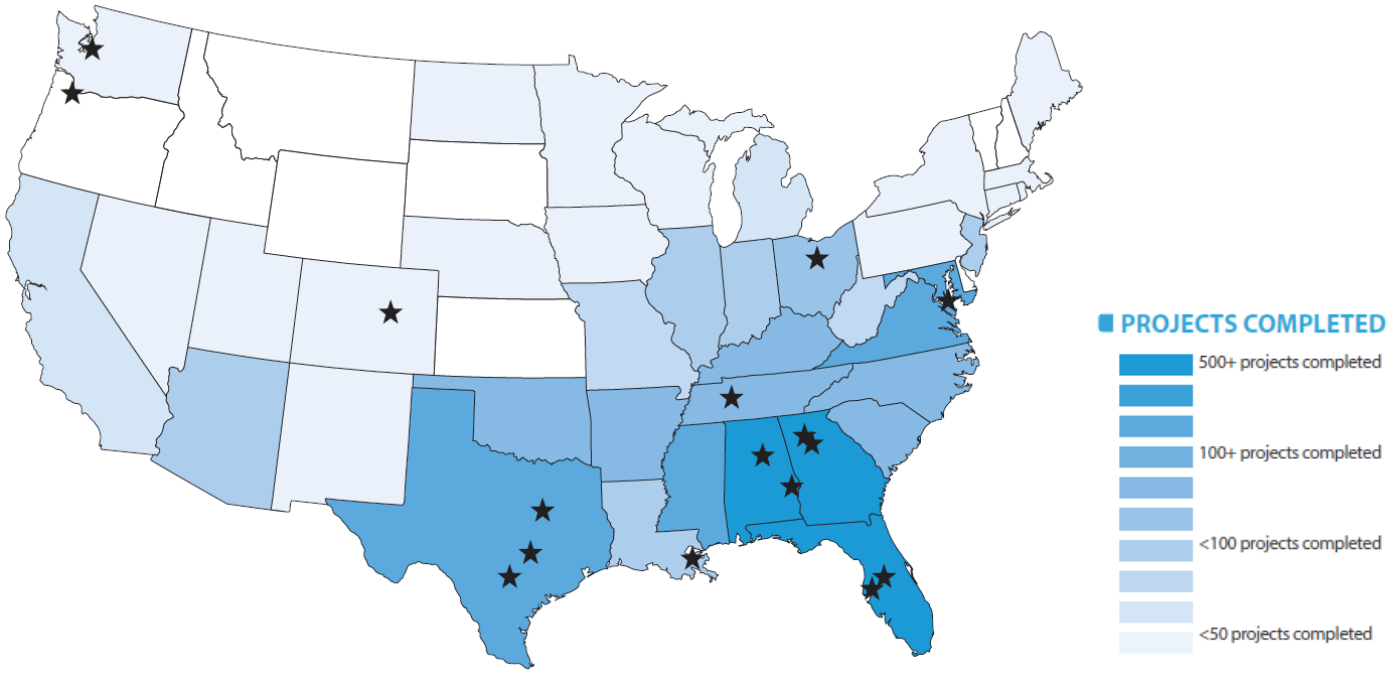
TASK	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Create Geo-database										
High Level Design										
Business Plan										
Dynamic Financial Model										

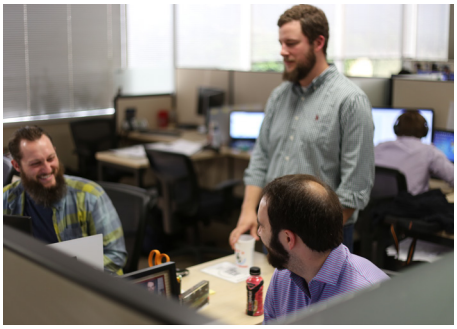
PROJECT EXPERIENCE

Foresite Group has the availability and capacity to complete this project. With over 190 professionals on staff, each project is given it's own specific project team to ensure this project is a priority. Foresite Group provides the most experienced staff in the industry and utilizes a combination of over 100 years of experience to create a road map to success. We use our successes and setbacks in the past to discuss best practices, work flows, technology advances, risk mitigation, project goals, objectives, timelines, milestones and deliverables. Our experts provide solutions for integrated broadband, as well as wireless and wireline networks. We help clients meet current needs while planning ahead for growth, future supply, and changing regulations.

When needed, our design team has extensive network design experience with Tier 1 clients, including Google Fiber, AT&T, and Verizon. In addition, our Gig-City municipal experience includes working with the Foundation for Louisiana and the City of New Orleans to design their fiber network, and the Huntsville utilities FTTH project, wherein Google Fiber is the anchor tenant and with whom we have an established and strong working relationship. Our team is well-versed in the evolution of different architectures and methods of fiber deployment, relying on practical experience using both industry-standard tools such as Autodesk AutoCad, Bentley Microstation, ArcGIS and associated APIs (application program interfaces), and client-specific native databases, programs, and processes.

The next few pages highlight our relevant experience including our current and past projects.





CITY OF LAMPASAS MARKET ASSESSMENT

PROJECT DESCRIPTION

The City of Lampasas is looking to build a fiber network to connect their city facilities and other anchor institutions while sizing their backbone to scale to all homes and businesses within the City and County of Lampasas. The City wants an Open Access Network to allow any number of service providers to offer Internet, VoIP, TV, and other services across their network encouraging healthy competition for all. Our team is responsible for the following:

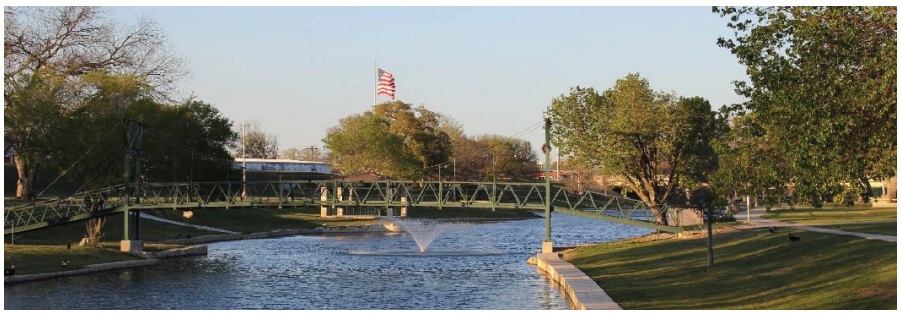
- On-Site Strategy Session
- Preliminary Design and Capital Cost Analysis
- Market Assessment Portfolio Creation

FIRM INVOLVEMENT

Foresite Group is working with the City of Lampasas to conduct a Market Assessment to determine construction costs for an institutional network and for a city-wide build. They are utilizing automated design software to derive these costs at a 95% accuracy. Our team is also creating multiple business plans to provide to the City options for a broadband strategic plan.

UNIQUE CAPABILITIES

Foresite Group is utilizing automated design software to derive construction cost estimates based on real data from the City. This will allow for better upfront costs and return on investment planning while also expediting the design process with work flow efficiencies.



LOCATION

Lampasas, Texas

SIZE (SQ MILES)

~6.5 sq mi
200,000 ft

TECHNOLOGIES USED

Automated Design, GIS Database Design

MAX AND TYPICAL BANDWIDTH

1 GBPS

USERS

Single Family Units, Duplexes, Tri-plexes, Quadraplexes, Multi-Dwelling Units, Small and large Business Units, Government Buildings, and Churches.

DATES OF SERVICES

October 2018

TOTAL VALUE

Confidential

KEY STAFF

Cody Miller - Project Manager
Jonathan Ramos - Senior GIS

REFERENCE

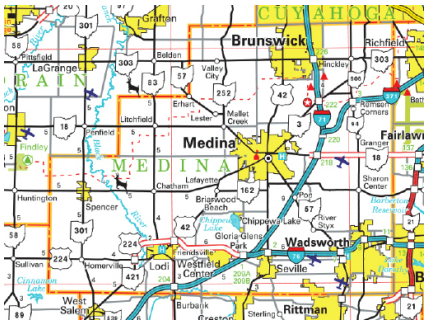
Mandy Walsh
Director of Economic Development
City of Lampasas
312 E 3rd Street
Lampasas, TX 76550
972.983.1411
mandy@cityoflampasas.com

"Foresite Group has been instrumental in efforts to increase and improve our technology infrastructure within our city. We have been pleased with their attentiveness, their professionalism and most of all, their passion for what they do. We discussed in length what our struggles with internet have been and the frustrations felt by our businesses. Following each discussion we could feel the genuine concern from their team and the desire to find a solution for us. We have been very pleased with this partnership and wouldn't hesitate to recommend their services." - Mandy Walsh

MEDINA COUNTY FIBER NETWORK

PROJECT DESCRIPTION

Medina County, Ohio is bringing a high-speed broadband network to homes and businesses in the Village of Seville, Town of Lodi, the Township of Guilford and the community of Westfield Center. The network will be open-access leasing space on the "Fiber Backbone" from the Medina County Fiber Network, owned by Medina County and operated by the Medina County Port Authority. The open-access model means multiple services and service providers can operate on the shared network. The residents and business owners will be able to choose from services including Internet, VoIP, TV, and Telehealth in previously underserved areas. Foresite Group is partnered with Median County Fiber Network to provide Engineering, Permitting, and Project Management services.



LOCATION
Medina County, OH

SIZE (SQ MILES)
~423 sq mi

TECHNOLOGIES USED
Automated Design, GIS Database Design, LiDAR Collection & Extraction

MAX AND TYPICAL BANDWIDTH
1 GBPS

USERS
Single Family Units, Duplexes, Tri-plexes, Quadraplexes, Multi-Dwelling Units, Small and large Business Units, Government Buildings, and Churches.

DATES OF SERVICES
December 2018 to September 2019

TOTAL VALUE
Confidential

KEY STAFF
Jon Ramos - Project Manager
Chris Kirkland - Senior Project Manager

REFERENCE
Medina County Fiber Network
David Corrado
CEO
144 N Broadway
Medina, OH 44256
330.722.9215
dcorrado@fibercounty.com

HUNTSVILLE UTILITIES

PROJECT DESCRIPTION

Huntsville Utilities is building out a fiber infrastructure network to all properties within the City limits of Huntsville, AL. Huntsville Utilities has designated fibers for their own use and "smart city" applications while leasing a portion to Google Fiber. Google will be providing the data content for all residents and businesses as a service provider. This network will be owned and operated by the City and act as another utility revenue stream in conjunction with their city-owned electricity, water and gas services. This model of fiber network deployment allows for the local residents to obtain gigabyte connectivity in areas not otherwise provided at a faster rate due to the City utility building the infrastructure and an anchor tenant providing service. Our team worked with The Broadband Group, which managed the construction and operation of the network.

FIRM INVOLVEMENT

Foresite Group is working with Huntsville Utilities to complete the design, engineering and construction support through the life of the project. Our design team is working with partners through the entire workflow including Preliminary (Indicative Design), Construction Ride Out (CRO), Detailed Design, Construction Package Creation, Construction Support, As-Built Posting, and Network Turnover. Foresite Group is also consulting with Huntsville Utilities and other stakeholders on the implementation of "smart city" applications and other innovative use cases.

UNIQUE CAPABILITIES

Foresite Group is working with our partners to implement automated design software throughout the design process. This will allow for better upfront costs and return on investment planning while also expediting the design process with workflow efficiencies. Our team is also working with Google Fiber to establish and define the data dictionary requirements for proper network database turnover.

LOCATION

Huntsville, Alabama

SIZE (SQ MILES)

~214.52 sq mi
7.1 Million ft of Cable Design

TECHNOLOGIES USED

Automated Design, GIS Database Design, Field Tablet Collection

MAX AND TYPICAL BANDWIDTH

1 GBPS

USERS

Single Family Units, Duplexes, Tri-plexes, Quadraplexes, Multi-Dwelling Units, Small and Large Business Units, Government Buildings, and Churches.

DATES OF SERVICES

January 2017 to present

TOTAL VALUE

Confidential

KEY STAFF

Lee Comer - Division Director
Patrick Hutto – Technology Director
Lara Till – Engineering PM
Jeff Hindman – Senior PM
Julia Shelton – Database PM

REFERENCE

Huntsville Utilities
Stacy Cantrell
Vice President of Engineering
112 Spragins St NW
Huntsville, AL 35801
256-535-1312
stacy.cantrell@hsvutil.org

"We set an aggressive schedule for both the design and construction of our city wide fiber network. Auto-design was necessary to get this underway quickly, but resulted in an often inefficient design with missing details. Foresite Group has been able to value engineer that design, resulting in significant savings in construction labor and materials. The quality of the construction prints has also made the construction process much smoother."
- Stacy Cantrell

FOUNDATION FOR LOUISIANA AND CITY OF NEW ORLEANS INSTITUTIONAL FIBER NETWORK

PROJECT DESCRIPTION

Foresite Group has begun the initial planning stages to build an institutional fiber network to all City and Government buildings and provide capacity to serve local schools and libraries. Foresite Group is also working with the Department of Public Works and the Sewerage and Water Board to place a fiber network to create wireless access points for smart meter data collection. The overall network for the City initiative will be roughly 3-5 miles of fiber and conduit placement, while the SWB and DPW will be reconstructing almost every road and sewer line. During the reconstruction and while the roads and sub-surface are opened, Foresite Group will be planning the placement of both conduit and fiber. The intent is to serve the municipality buildings, but we will be sizing the fiber cables to serve all households for a possible future fiber to the home (FTTH) project.

FIRM INVOLVEMENT

Foresite Group will be working with every department in the City of New Orleans and the Foundation for Louisiana to plan multiple future infrastructure projects and opportunities.

UNIQUE CAPABILITIES

Foresite Group is working with multiple Disadvantaged Business Enterprises (DBE) in the local New Orleans area. Our overall team is also coordinating with all project stakeholders to work on creating Work Force Development programs and economic development opportunities. Foresite Group will be working to implement a "Utility Academy" that will create local technical training while also building a local work force to participate in the multiple infrastructure projects that will be occurring in New Orleans over the next 10 years.

LOCATION

New Orleans, Louisiana

SIZE (SQ MILES)

City build out – estimated conduit and fiber miles are currently in the planning stages

TECHNOLOGIES USED

Comsof Simulator and Designer

MAX AND TYPICAL BANDWIDTH

1 GBPS

USERS

City owned and operated buildings, libraries and schools

DATES OF SERVICES

March 2017 to March 2018

TOTAL VALUE

$250,000

KEY STAFF

Lee Comer - Division Director
Patrick Hutto – Technology Director
Cody Miller – Division Director
Thuy Le Ho – Senior PM
Jon Ramos – Database PM

REFERENCE

Foundation for Louisiana
Tanya Gulliver-Garcia
Associate Director of Programs and Planning
4354 S Sherwood Forest Blvd
Suite 100
Baton Rouge, LA 70816
225-964-0049
tgarcia@foundationforlouisiana.org

TOWN OF BRECKENRIDGE

PROJECT DESCRIPTION

The Town of Breckenridge is looking to build a fiber network to connect all their homes, businesses, and Town facilities to provide high-speed connectivity to its citizens and visitors alike. The Town wants an Open Access Network to allow any number of service providers to offer Internet, VoIP, TV, and other services across their network encouraging healthy competition for all. Our team is responsible for the following:

- On-Site Strategy Session
- Preliminary Design & Capital Cost Analysis
- Demand Aggregation Study (COS Systems)
- LiDAR Collection & Extraction
- Master Fiber Development Plan

FIRM INVOLVEMENT

Foresite Group is working with the Town of Breckenridge to conduct a Market Assessment to determine construction costs for a city-wide build to all homes, businesses, and town facilities. They are utilizing automated design software combined with LiDAR Collection to derive these costs at a 95% accuracy. To help derive these costs they are partnering with COS Systems to launch a demand aggregation study which will determine the take rates of the citizens and businesses. The construction costs plus the take rates will give the Town a predetermined ROI spanning over a number of years. We will create multiple business plans to provide to the Town options for a broadband strategic plan which they can then decide which direction they would like to go.

UNIQUE CAPABILITIES

Foresite Group is utilizing automated design software and LiDAR Collection and Extraction to derive construction cost estimates. This will allow for better upfront costs and return on investment planning while also expediting the design process with work flow efficiencies.

LOCATION

Breckenridge, Colorado

SIZE (SQ MILES)

~6.0 sq mi

TECHNOLOGIES USED

Automated Design, GIS Database Design, LiDAR Collection & Extraction

MAX AND TYPICAL BANDWIDTH

1 GBPS

USERS

Single Family Units, Duplexes, Tri-plexes, Quadraplexes, Multi-Dwelling Units, Small and large Business Units, Government Buildings, and Churches.

DATES OF SERVICES

January 2018 to August 2019

TOTAL VALUE

Confidential

KEY STAFF

Cody Miller – Division Director
Jon Ramos - Project Manager

REFERENCE

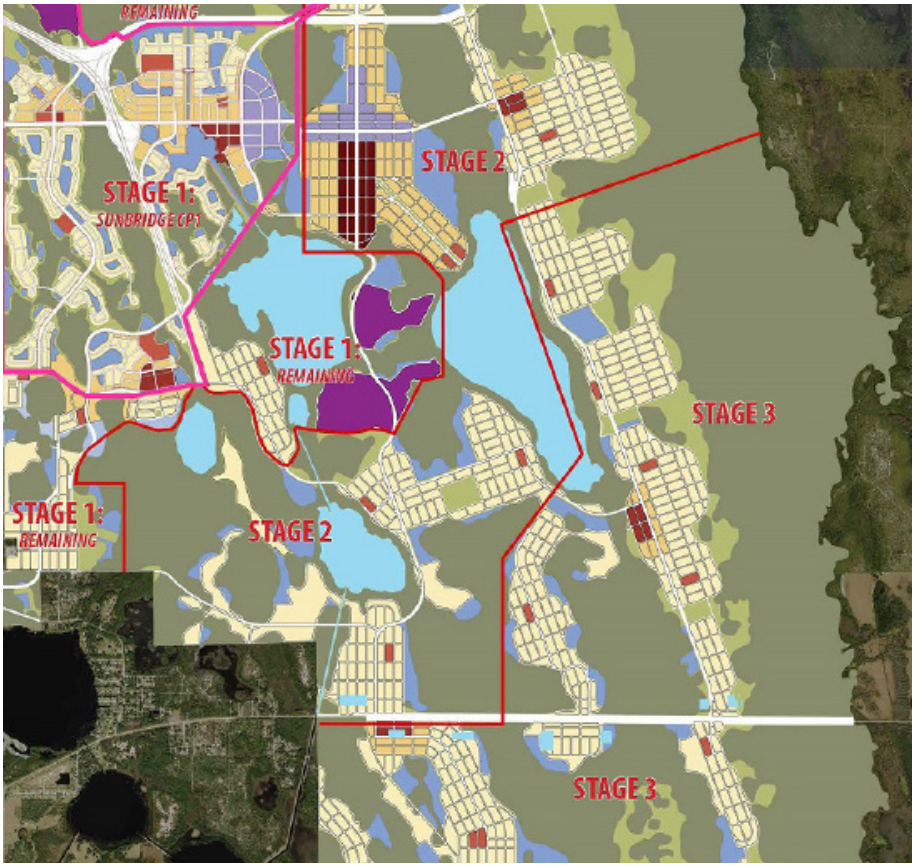
Town of Breckenridge
Brian Waldes
Director of Finance
150 Ski Hill Road
Breckenridge, CO 80424
970-453-3382
brianw@townofbreckenridge.com

SUNBRIDGE MASTER DEVELOPMENT COMMUNITY

PROJECT DESCRIPTION

832 Communications has engaged Foresite Group to bring best practices in broadband business models, network planning, design, and construction to build a fiber network to serve a new developing community.

Foresite Group is working to identify the goals of the project and create a detailed roadmap and plan to provide the vested parties the necessary information to make an educated decision to complete a network build out. Our team is currently creating multiple business plans to provide 832 Communications with options for a strategic network plan with the availability to include IoT and Smart City applications.



LOCATION

Sunbridge, FL

SIZE (SQ MILES)

TBD

TECHNOLOGIES USED

Automated Design, GIS Database Design, LiDAR Collection & Extraction

MAX AND TYPICAL BANDWIDTH

1 GBPS

USERS

Single Family Units, Duplexes, Tri-plexes, Quadraplexes, Multi-Dwelling Units, Small and large Business Units, Government Buildings, and Churches.

DATES OF SERVICES

February 2019 to present

TOTAL VALUE

Confidential

KEY STAFF

Lee Comer - Practice Leader
Patrick Hutto - Director of Technology
Chris Kirkland - Sr Project Manager

CLIENT

Tavistock

City of Lucas, TX

Board-Ready Study

Consulting Services Proposal

Prepared for:
Kent Souriyasak
kent@lucastexas.us
982.912.1213

Client Executive:
Heather Walther
Heather.walther@fujitsu.com
214.601.8339

Engagement Leader:
Blake Stovall
blake.stovall@fujitsu.com
214.864.3063

Quote Number:
2019-051004
Confidential and Proprietary

Fujitsu Network Communications, a global ICT company headquartered in Richardson, TX, is herein responding to The City of Lucas, TX (The City) Request for Proposal to execute a board-ready study for the implementation & operation of a broadband communications network.

Date: 01/24/2020

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Cover Letter

City of Lucas, TX
665 Country Club Road
Lucas, TX. 75002

Dear Mr. Souriyasak,

At Fujitsu, we believe that the quality of life within a community is directly influenced by the quality of the digital connection with the resources of the world. We seek to improve that quality of life in the communities we serve by bringing our network building and operating expertise to broadband network studies for our Municipal and Utility clients. Fujitsu studies are different because we are experienced in all aspects of designing, building, operating, and maintaining high quality, broadband networks.

We are pleased to respond to your RFP with a proposal for a Board Ready Study (BRS). The BRS will enable City leadership, board members and other community stakeholders to make informed technical and financial decisions about a broadband network implementation.

Fujitsu is backed by Fujitsu Limited, a global company with world-wide resources at our disposal; we operate out of Richardson, Texas. We understand local content and customer needs. We are committed to enriching the local economy with this project by using local resources where possible and engaging with the City communities.

Fujitsu will serve as your advisor during this proposed board-ready study activity and will provide the City the necessary information to deliver results On Time, On Budget, and Worry Free. We will ensure feasibility aligns with your financial targets and goals. Our experience and knowledge of broadband feasibility studies and deployments has taught us that each broadband project is unique.

Upon completing your review of our BRS proposal, Fujitsu looks forward to meeting with you and the Technology Committee and to present our approach as well as discuss the next steps toward creating a profitable, innovative and future proof network that will maximize investment while providing reliable and high quality services to your community. Should you have any questions or additional information requests, please contact me at the contact information below.

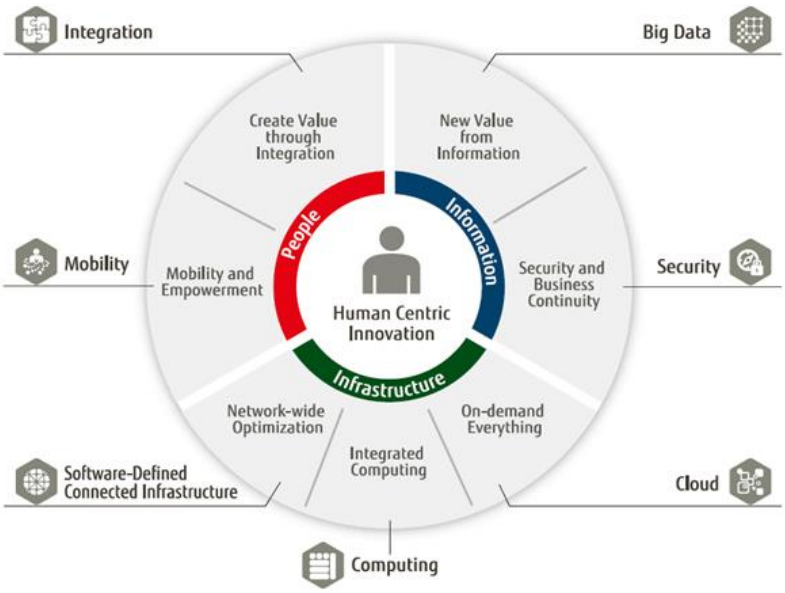
Thank you for your consideration. We are very confident the City of Lucas will see the benefits of our Board Ready Study and look forward to a long-term partnership.

Sincerely,

Heather Walther
Client Executive
Heather.walther@fujitsu.com
214.601.8339

About Fujitsu Network Communications, Inc.

Fujitsu Network Communications Inc. (FNC) is a subsidiary of Fujitsu Ltd., a financially durable $40 billion company with 80 years of heritage in global information and communication technology (ICT) industries offering a full range of technology products, solutions and services. We use our experience and the power of ICT to shape the future of society with our customers. 159,000 Fujitsu employees support customers in more than 100 countries. The cornerstone of Fujitsu's business strategy is its interlocked value chain of Technologies, Platforms and Services, creating value by building on a solid foundation of expertise at each link along the chain.



Fujitsu maintains a long-standing and highly regarded position as a market leader by providing customer specific networking solutions optimized to address their specific needs and financial goals. Fujitsu's corporate strategy is to lead the industry in telecommunications solutions, driving down the cost of delivering bandwidth for Internet and carrier services, and successful implementation of this strategy has resulted in major carriers deploying over 550,000 Fujitsu network elements across North America.

Fujitsu supports network operators and enterprise customers of all types and sizes with our vendor-neutral, custom professional service solutions that enable successful network transformation and integrated telecommunication solutions across North America.

Fujitsu's comprehensive consulting and integration services offer support at any network design, development, and maintenance stage. Its strengths in such areas as wired and wireless networks, IP/MPLS and Ethernet networking and complex communications systems integration allow Fujitsu to meet rapidly changing customer needs in today's connected and convergent global marketplace.

Executive Summary

Fujitsu's Board Ready Study uses industry knowledge, data analytics, and extensive proprietary databases that was created while leading telecommunications projects across the country. Our Board Ready Study allows for a detailed and methodical approach in order to lay out high level understanding of a prospective network project in target market. Within this approach, we are able to identify the right metrics to evaluate for the decision stakeholders to decide at a preliminary level if a broadband network project should be done. This business intelligence brings tremendous value to any prospective network planning effort, and with the experience Fujitsu has in pioneering such projects in the market, we offer financial modeling and forecasting solutions that have been proven to work in these unique opportunities. With both of these elements integrated into one solution, high level strategic financial and engineering planning can be done with an ease of mind, with both comprehensive empirical data and experience backing each step of your decision making.

The board-ready study is divided into three separate activities:

- Generation of market, customer and competitive profiles
- Generation of a business, strategy, planning and analysis
- Execution of stakeholder meetings and a final report presentation

Market, Customer and Competitive Profiles

The market, customer and competitive profile deliverable will be focused on summarizing the competition in terms of competitor presence, technology and speed tiers offered, as well as target customers based on population demographics, customer types (end consumer, property management, businesses) with additional layers of geographic detail included. In addition to providing a current state snapshot of the target market, these insights will uncover broadband availability and adoption gaps that spell opportunity for a new broadband provider.

Determine Geographic Scope for Market

By default, the market will be defined as the customer base physically located within the territory limits. We can increase or decrease the geographic scope as needed based on the desired network footprint.

The primary geographic unit of measure considered for market, consumer and competition profiles is the census tract. Census tracts are near equivalents to that of the different neighborhoods with respect to urban areas. They are also an ideal geographic measure of demographics and broadband statistics.

Primary Data Sources

The market profile deliverable is derived by data available in the public domain and via a proprietary analytical process to articulate insights. The FCC collects the most comprehensive statistics with regard to broadband adoption, competition presence and services attributes on a national scale. Not always fully accurate so we will sample and test data.

Other third party websites, including that of current broadband services providers, will be researched to ascertain localized details regarding competition pricing for end customers and businesses. We will also research via other methods such as mystery shopping and reviewing advertisements to aid discovery of local broadband pricing and services.

Fujitsu has developed a proprietary database and software tool that draws various industry and demographic statistics as well as quantitative results from broadband adoption research studies that provide insights into relative fiber deployment maturity, baseline target population and risk profiles for build phases for a selected utility. With full service in mind, Fujitsu understands our customer's need to evaluate multiple scenarios. Fujitsu will provide the initial financial model deliverable results to the City of Lucas plus additional dynamic and adjustable versions of the financial model not to exceed 10 total iterations in calendar year 2020. Additional

financial modeling beyond 10 iterations within 2020 can be arranged with your Fujitsu account team. You will find that our commitment, flexibility and expertise will aid you in making the right decision.

Deliverables

The market, customer and competitive profiles will be generated using statistical visuals that will include Excel tables/charts, Tableau-based thematic maps and other GIS maps sourced directly from the public domain. Figure 1 showcases the generation process of the different profiles.

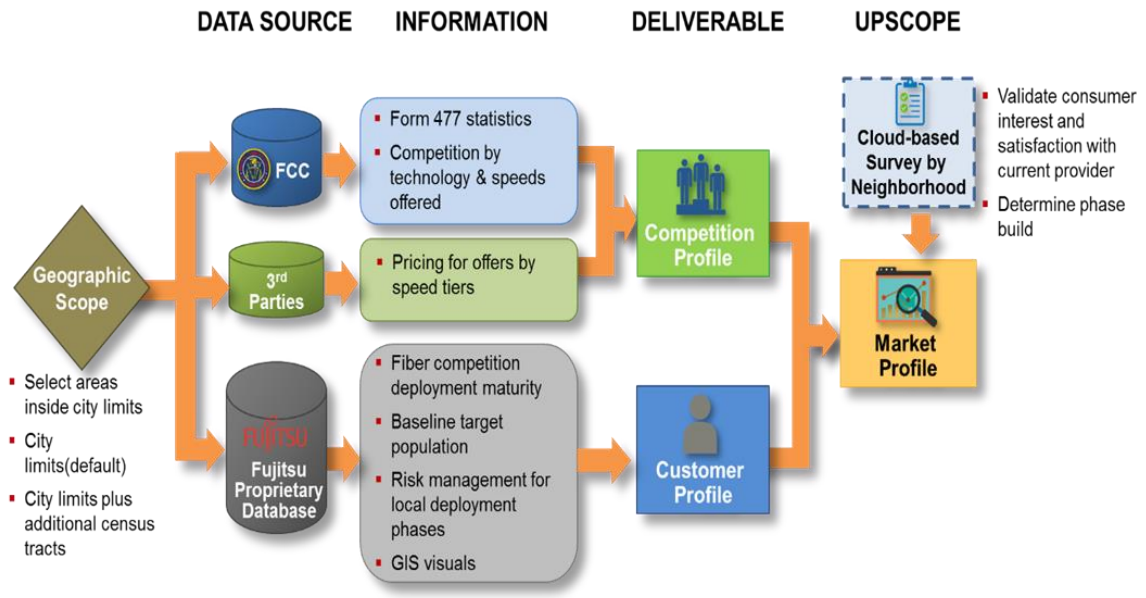


Figure 1: Market, Customer and Competitive Profiles Generation Process

Business Strategy, Planning, and Analysis

Business strategy, planning, and analysis is crucial for budgeting, forecasting, and analysis of major operations and projects that are being evaluated by leadership teams, boards, and committees. To best evaluate or prepare for a project, it is critical to thoroughly analyze every aspect of financial impact that could occur, either qualitative or quantitative. This effort and financial model deliverable will provide a very valuable step in understanding what is required to build and operate a fiber network.

Flexible and Robust Analysis

Using engineering parameters of the geographical area to be covered by the proposed broadband network build project, Fujitsu will develop a cost analysis of the required outside plant (OSP) cabling and materials as well as required active inside plant (ISP) electronics. This cost analysis is combined with a revenue analysis for the proposed network in the customer base to be served using industry standards business parameters as well as Fujitsu's real-life broadband network operational experience.

With numerous inputs comes the complexity of understanding their impact, but also weighting the information in relation to each other to accurately convey a prediction of the future. Ways of reducing risk and providing a clearer picture of probable outcomes can include various techniques such as Sensitivity Analysis and Monte Carlo simulations, which are done by Fujitsu. A major benefit of utilizing Monte Carlo simulations is the greater accuracy due to significantly more points of data used in a prediction.

The Board Ready Study uses this technique to provide a valuable prediction of financial success. Below in Figure 2 is an example of how likely a project would have a positive Net Present Value, and what value it would give, given random sample data (data is simply for illustration purposes and not actual project data):

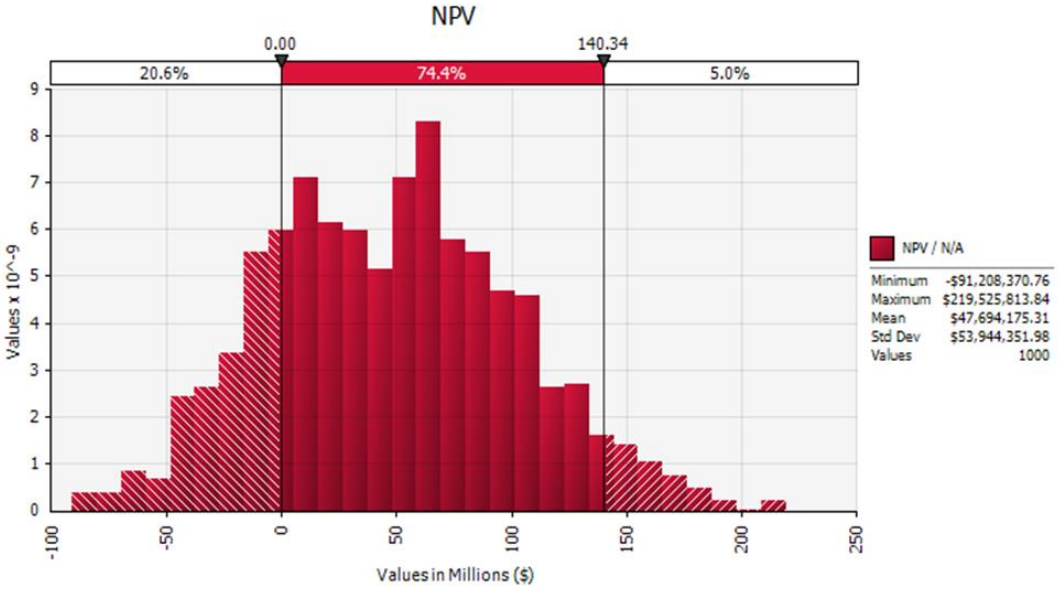


Figure 2: Project Financial Analysis Example

Evaluation Metrics and Deliverables

Following is a sample of metrics to be evaluated and financial analysis to be provided in the Board Ready Study:

- Cost Analysis
  - Design and Construction build-out estimates
  - Network Equipment
  - Ongoing Network Operations and Maintenance Expenses
  - OSS/BSS Projections
- Projected revenues
  - Customer Segments
  - Product/Service
  - Pricing Schemes
- Expected and Minimum Take Rates
- Operating Income and Cash flow
- Depreciation Schedule
- Debt Service
- Net Present Value (NPV)
- Return on Investment (ROI)
- Internal Rate of Return (IRR)
- Payback

Below in Figure 3 is a visual interpretation of the different metrics used in the generation of the proforma ROM financial analysis KPIs

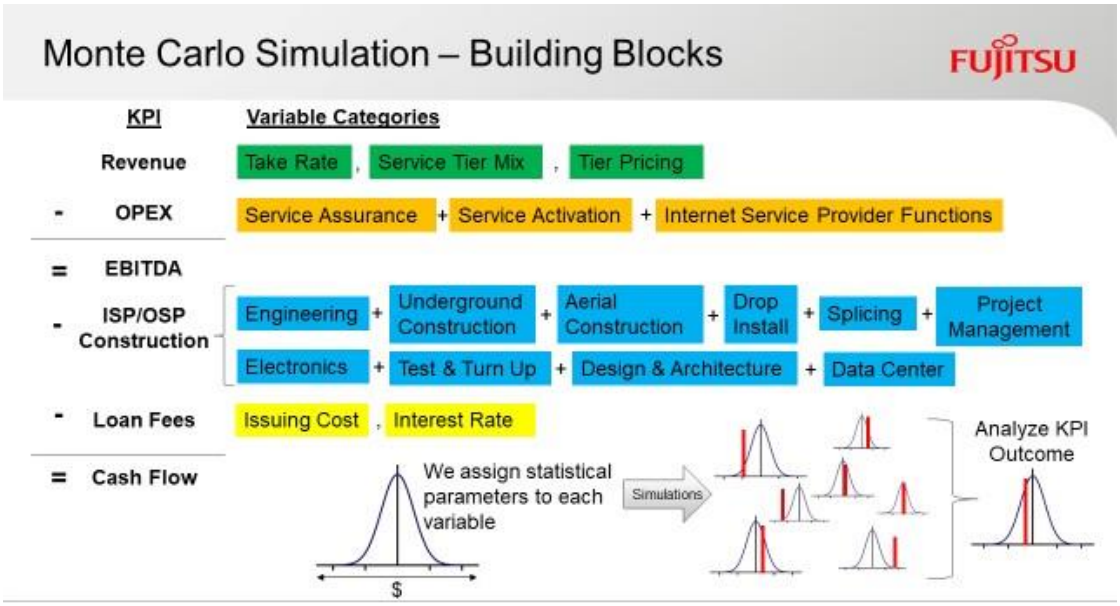


Figure 3: Building Blocks Used in Financial Analysis

Other relevant financial evaluation metrics can be reviewed to substantiate the Board Ready Study financial analysis. The financial analysis includes modeling based on model options presented above. The study analysis will be aligned to the stakeholder study objectives.

Interviews & Presentations

Initial kick-off Interview Meeting & Ad-hoc Data Collection Interviews

A Board Ready Study typically takes two months to complete, depending on the eventual scope of work to be completed. The initial stage of the Board Ready Study kicks off with a meeting with personnel stakeholders identified by the utility where the board ready study process is reviewed, key objectives outlined to successfully deliver the study in the committed timeframe. Partner coordination will be key to identify required team members and actions in the data collection process. Data collection activities will follow the process outlined in the previous section. During the data collection phase of this study, checkpoint meetings and ad-hoc data collection interviews will be scheduled to evaluate the collected data and allow stakeholders to support the board ready study progress according to the key objectives.

The Study is designed to be a collaborative effort between all stakeholders and Fujitsu. In order to provide the best result and maintain the expected schedule for the study, Fujitsu will have asks of the stakeholders involved. Some items may include:

- Open and timely communication with the stakeholders identified during the kickoff meeting
- Clear goal-setting and milestones that are laid out from the beginning from all parties
- Visibility into how the study results will need to be presented to key internal and external stakeholders to guide Fujitsu staff

The schedule of milestones shown below illustrates the collaborative approach of this process:

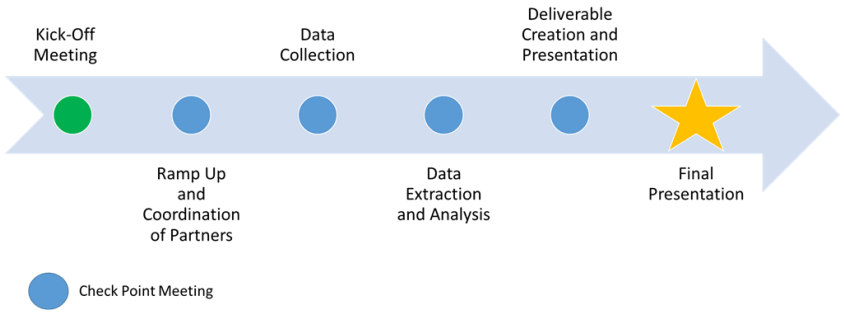


Figure 4: Typical Board Ready Study milestones timeline

Final Presentation & Report

The Board Ready Study results for the market assessment will be presented to all stakeholders in a mid-process meeting where all stekeholders will be able to review findings. A final presentation meeting for the pro forma financial analysis will be held with Q&A period to review the financial KPIs of the projected broadband network implementation. Following this final presentation, a final report will be presented to the customer with all supporting public database information.

Financial Model Tool Overview

Fujitsu uses specialized, proprietary software to produce broadband network financial models by modeling uncertainty in critical input variables.

The key advantages of this approach versus typical financial modeling are:

- Additional insight into a range of possible results for key performance indicators (KPI's) such as revenue, OPEX, CAPEX, net income and cash flow. Single data points like an average value for inputs offer only one output for a KPI. Not being able to capture a range of values for critical inputs risks inaccurately interpreting results from an unlikely outcome. This includes the likelihood of breaking even on cash flow.
- Prioritizing variables to focus on from a risk management perspective to reach desired KPI results. If the major impacting variables to KPI's are not identified and quantified, the appropriate risk mitigation actions may not be taken early and sufficiently to meet financial goals.

How it works

Fujitsu gathers input data from engineering and operations assessments, customer supplied information and insights from past broadband network deployments into a standardized template. Simulation parameters are used to vary inputs known to be subject to a degree of uncertainty. This uncertainty is directly modeled in variables such as prices, costs, take rates, etc.

Once these parameters are defined, Fujitsu uses Monte Carlo simulation to simulate thousands of possible values for each critical input. The range of values for each input contributes to a range of values for the corresponding KPI. It is common that the range of values appears like a normal distribution curve (figure 5).

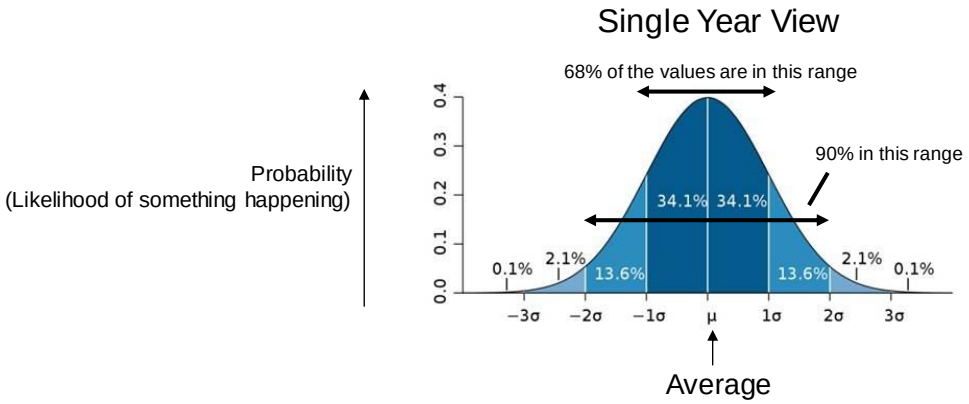


Figure 5: Normal Distribution Curve for an Annual KPI Value

Attributes of a Normal Distribution Curve

- Most possible values occur near the average
- 68% and 90% ranges represent confidence intervals
- 90% is read as you would expect the KPI to fall in this range 90% of the time based on the model
- Depending on appetite for risk, focus on certain confidence interval (90% is most common)

Results

Fujitsu provides a detailed analysis of KPI results (range of outcomes and largest contributing inputs to their variation) accompanied by detailed graphs and recommendations. Due to the proprietary and sophisticated nature of this tool, Fujitsu can make adjustments to inputs, re-run the simulation and provide results as per the customer request.

Analogy for why you should use a range of values for inputs: Aircraft cockpit design

In the 1940's-50's, the Air Force was designing cockpits for the latest iteration of fighter planes. In order to design the cockpit around the dimensions of a human pilot, they initially used the average value of pilots' various body measurements from the 1926 cohort. After these designs were implemented, there was a high incidence rate of pilots crashing. Studies eventually pointed towards cockpit configurations being inadequate for pilots to reach controls. As a result, the Air Force measured dozens of body dimensions for 4,000 pilots and discovered that not a single pilot matched the average measurement for all of the dimensions measured from the 1926 cohort. In other words, it was found that the "average" pilot does not exist. The Air Force changed it design requirement so that the cockpit was suitable for 90% of pilots according to every dimension measured. This 90% is a range of values for each dimension. Aircraft manufacturers applied their engineering ingenuity and designed features such as adjustable seats and pedals. Such design principles have evolved into the adjustable seat features we enjoy in our personal vehicles today.

Fujitsu Project Team

To provide the City with a Board Ready Study, Fujitsu will establish a dedicated team, led by the key personnel named below, to explore value-engineering solutions across a broad area of disciplines. Collaboration is a critical component to fine tune a broadband offering, and the team will seek to hold a number of working sessions with the City to further define and prioritize the initial and long-term needs and goals.

Blake Stovall
Private Broadband Practice
Engagement Manager

20+ yrs of Telecom
& Financial Experience

Trenton Parker
Capture Lead
25 yrs of Telecom
Experience

Ravi Battiprolu
Solution Architect V
19 yrs of Telecom
Experience

Jarrod Pantier
Solution Architect V
20 yrs of Telecom
Experience

Raymond Diaz
Financial Analysis
& Data Analytics
10+ yrs of Market
Research Experience

Fujitsu Team Past Project Experience

Project	Type of Project	Fujitsu Value Add
Fairlawn, OH	Municipality Broadband	Feasibility Study and Master Solution Integrator Maintenance and Operation Services
Traverse City Light & Power	Municipality Broadband	Feasibility Study and Master Solution Integrator Maintenance and Operation Services
Ipswich, MA	Municipality Broadband	Board ready study for potential broadband network
Kentucky Next Gen Telecom Highway	State Broadband Network	Network Architecture and Backbone Design
Belmont, MA	Municipality Broadband	Board ready study for potential broadband network

Proposal Pricing

The price for the Board Ready Study is defined in the table below:

DELIVERABLE	PART NUMBER	DESCRIPTION	PRICE
BOARD READY STUDY	NDI-CONSULT	• Market, Customer & Competitive Profiles (Market assessment) • Business Strategy, Planning, and Analysis Recommendations • Kick-off meeting, Ad-hoc checkpoint meetings & Final presentation meeting with pro forma financial analysis • Report	$23,454
		Total	**$23,454**

Pricing Notes:

1. For flexibility, pricing includes up to 10 scenario re-runs during calendar year 2020.
2. A Purchase Order is required for Fujitsu to start the board ready study work, and final payment by The City is due upon the final report delivery.
3. Fujitsu anticipates Board Ready Study to be complete within 2 months.

Fujitsu & The City of Lucas, TX Proposal Assumptions

- Fujitsu requests that the City provide additional GIS files for its current infrastructure. The additional detail will allow Fujitsu to apply a more precise prioritization of broadband network implementation.

References

Fujitsu has extensive experience with projects of this magnitude and complexity as shown in our past performances below. The projects listed below required the seamless integration of design engineering, installation, test and turn-up as well as program management services. Many projects also required onsite maintenance support, spares management, and NOC integration.

CITY OF FAIRLAWN – MUNICIPAL BROADBAND NETWORK

Relevance:

- Network Solution Integrator
- Network Design and Engineering
- Network Deployment
- Network Support / Operation
- Outside Plant Engineering and Construction

Network Solutions Integrator for Multi-Million Dollar FTTx Network Implementation	
Project Description	An Ethernet-based core infrastructure with a wireless overlay that connects residential and multi-dwelling units, as well as, small and large businesses; delivering at least 1Gbps of broadband connectivity over a 50 mile fiber network throughout the City of Fairlawn, OH.
Fujitsu's Role	Network Design and Implementation of a new city-wide FTTx network with 5 year ongoing Support and Operations.
Contract Dates	May 2016 – ongoing
Contract Value	$12M initial contract
Benefits for City wide network transport initiative	
Fujitsu's Value Add	Created a network platform that will allow the City of Fairlawn to create a ubiquitous network for residential and business connectivity. Prime Contractor / Single Point of Contact / Technical Expertise Local ongoing Operations and Support capability
Project References	Ernie Staten Deputy Service Director (330) 603 – 5615 statene@ci.fairlawn.oh.us

TRAVERSE CITY LIGHT & POWER

Relevance:

- Business Plan Development
- Network Design and Engineering
- Network Deployment
- Network Operation and Maintenance

Network Solutions Integrator for Multi-Million Dollar Fiber-To-The-Prem Network Implementation	
Project Description	Build upon an existing dark fiber network that connects the City's institutions to a city-wide, ubiquitous Fiber-to-the-Prem (FTTP) network. All Residents and Businesses to have access to competitive 1 Gbps, 10Gbps and Active Ethernet all-fiber services. The project is to be constructed in a phases with Fujitsu performing as the Program Manager and Design/Build/ Operate/Maintain partner.
Fujitsu's Role	Comprehensive Project development and Program Management of a Municipal FTTP Network. Fujitsu was selected to build the Business Plan and then execute all aspects of the approved Business Plan for city-wide FTTP. Fujitsu is providing the OSP Design and Engineering, Construction Management as well as the ISP data center design and Engineering and Implementation. Fujitsu is also implementing the Operational Support Systems and work flow processes for TCL&P.
Contract Dates	June 2019 – Ongoing
Contract Value	$4M initial Phase 1 contract
Benefits for the City-wide fiber network initiative	
Fujitsu's Value Add	Single entity and single contracted partner to manage the project from conception to service turn-up. Fujitsu Solution Architects are providing the Network Architecture and electronics and OSP equipment vendor selection working closely with the Utility. At the Utilities request, Fujitsu will transition the Operation of the new FTTP network in a Build/Operate/Transfer plan.
Project References	Scott Menhart CIO menharts@tclp.org 231-922-4940

COMMONWEALTH OF KENTUCKY – NEXT GENERATION KENTUCKY INFORMATION HIGHWAY (NG-KIH)	
	Relevance: • Network Solution Integrator • Network Design and Engineering • Network Deployment • Network Support / Operation
Network Solutions Integrator for Multi-Million Dollar Middle mile Network Implementation	
Project Description	An Ethernet-based core infrastructure that connects 1,097 Community Anchor Institutions (CAI); delivering between 1Gbps to 100Gbps of broadband connectivity over a 3,393 mile fiber network in the State of Kentucky.
Fujitsu's Role	Network Design and Implementation of a new state-wide middle mile fiber network with 10 year ongoing Support and Operations.
Contract Dates	September 2015 – Ongoing
Contract Value	$65M initial contract
Benefits for the state wide network transport initiative	
Fujitsu's Value Add	Created a network platform that will allow the Commonwealth of Kentucky to create a ubiquitous network for urban and rural equality. Experience in creating value between the private and public sector. Local ongoing Operations and Support capability.
Project References	"Confidential" - Available upon request

Attachment 1 – Key Resumes

Blake A. Stovall

An experienced technical leader, who motivates, trains and provides guidance to teams to ensure consistent results beyond expectations. Enjoy working with different teams/departments and have excellent communication skills. Extensive experience at project planning and giving presentations. Have a strong quality focus with talent for innovative solutions to problems. An organized self-motivator with a proven record of achievement and a relentless desire for improvement.

EDUCATION **Thomas Edison University**
Bachelor of Science, Nuclear Engineering – Year 1998
Served in United States military for six years. E-6 rank achieved.

RELEVANT PROFESSIONAL EXPERIENCE

FUJITSU NETWORK COMMUNICATIONS – Richardson TX. **2006 - Present**
Network Delivery Engagement Leader

- Work with rural markets across the United States to develop plans for broadband network build outs to underserved/unserved areas.
- Work with capture team to generate responses to RFPs. Have 70% win rate on initial board ready study proposals.
- 100% of submitted Board Ready Studies or Engineering Design Contracts have resulted in major services projects
- Track and manage projects once engaged by sales. Coordinate internal teams to deliver results for customer.

Centurylink Program Director

- Lead team of program managers, business developers, outside plant engineers, and inside plant engineers supporting all FNC CenturyLink projects.
- Expanded service into several major markets, including Virginia, Minnesota, Colorado, and Iowa. Displaced existing vendors in the new markets and greatly exceeded bookings goals.
- Responsible for forecasting and staff planning to account for growth in market share. Helped qualify and on board strategic vendor partners to assist with delivery of services.

Engineering manager

- Lead team of network engineers, field engineers, outside plant engineers, and inside plant engineers supporting all FNC services projects.
- Performed forecasting and headcount planning for all engineering services.

CETERUS NETWORKS **2003-2006**
Senior Test Engineer, System Verification Test

- Conducted in depth testing of Ethernet and SONET systems. Areas of test include alarms and PMs for SONET, DS1, DS3, GbE and E1 interfaces, 1+1 and 1:1 equipment protection, security, upgrades and fallbacks, GFP and VC operation, VLAN tagging, and synchronization including jitter and wander.
- Worked directly with software and hardware developers to analyze and resolve problems found on the equipment.
- Created test cases for all areas of the product based from the Product Requirements documents and Telcordia and ITU standards documents.

WHITE ROCK NETWORKS **2003-2006**
Senior Test Engineer, Design Verification Group

- Performed testing on numerous platforms. Areas of test included SONET alarms and PMs, UPSR, 1+1, timing and synchronization, DS1 alarms and PMs, DS3 alarms and PMs, GbE alarms and PMs, 10/100 alarms and PMs, CWDM and DWDM.
- Developed test cases for many areas of the product based on the Systems Requirements and standards documents.

Ravishankar Battiprolu

A Double CCIE (R&S, SP # 28997) and a certified PMP with 20+ years of varied experience in the field of Networking with experience in Network Design and Integration, Network infrastructure consulting, System integration, Solution Testing, Network Services, Technical pre-sales and Solution Consulting, Technical Account management and Project management across multiple market verticals and industry sectors including Internet Service Providers, Mobile Communications and Enterprise Customers.

Extensive experience in industry leading varied portfolio products from Cisco, Juniper and Nokia.

EDUCATION **University of Mumbai - India**
Bachelor of Science, Electronics and Telecommunications – Year 1999.

RELEVANT PROFESSIONAL EXPERIENCE

FUJITSU NETWORK COMMUNICATIONS – Richardson TX. **Sr. Solutions Architect**

- Presently, working in the capacity of Sr. Solution Architect – A subject matter expert for **Designing and Deployment** of fixed access Networks, LAN and **Service Provider WAN integration projects**, acting as a liaison to help through the engineering and execution processes for the various projects that are related to vertical markets, government and service providers. As a Solutions Architect, responsibilities include Network Architecture, planning, design, Implementation, operations and optimization.
- Perform analysis of highly complex network designs and Architecture. Build simulated network in test labs to resolve complex problems and compatibility issues.
- Work with the FNC program managers and cross functional teams, provide guidance, resolve technical issues, and be a subject matter expert to field staff, delivery teams and maintenance of the varied projects within Fujitsu.

CISCO SYSTEMS – SANJOSE CA USA & Mumbai INDIA

- Joined Cisco as part of Cisco Cat 6500 Engineering Business Unit and further in ASR9K engineering Business Unit in SJC CA USA: **TECHNICAL LEAD JAN 2006 – DEC 2015.**
- **Network Consulting Engineer** in Cisco's Asia Pacific Advanced Services – Mobility COE group : **Jan 2016 – April 2018.**
- Deployed LAN / WAN / Call center and SP edge Internet solutions for several reputed Service Providers and Enterprises around the world with expertise in Planning, Design and Deployment of projects and operations to resolve critical business issues.
- Worked extensively on IP networks and on various networking Layer 2 and Layer 3 protocols, testing L2 features on Catalyst 6500 Cisco switches , Cisco ASR9000 routers and other leading products with mix and match of media, with varied expertise in Solution Consulting, Solution testing and System Integration.

CAREER CERTIFICATIONS

- 2xCCIE.Cisco Certified Internet Expert # 28997 - Routing and Switching, Service provider.
- Cisco SP mobility specialization
- Certified Project management Professional
- JUNIPER CERTIFIED NETWORKING ASSOCIATE : JNCIA

Raymond Diaz

Data-savvy product manager with 11+ total years of professional experience; 8 years in strategic planning, sales analysis, marketing research, product management, international operations management and project management at a powersports manufacturing company and 3+ years in product management and analytics at a telecom manufacturing and services company.

EDUCATION

Arizona State University, W.P. Carey School of Business, Tempe, AZ
Master of Science in Business Analytics, 2016

Purdue University, School of Management, West Lafayette, IN
Bachelor of Science in General Management, 2006

RELEVANT PROFESSIONAL EXPERIENCE

FUJITSU NETWORK COMMUNICATIONS – Richardson TX. **June 2016 – Present**

- Managed a $10M+ P&L for cabinet/rack enclosure integration and parts/accessories for communications equipment, including product pricing, revenue forecasting and new product development
- Delivered market assessments for broadband network deployments to US & Canada clients using Tableau-based GIS visualizations and clustering census tracts based on demographic and key industry statistics
- Designed and executed financial pro forma analysis for clients using Monte Carlo simulation analytical techniques to summarize risk and business case implications to deploying a broadband network
- Mentored junior colleagues in analytical techniques for market assessments and Monte Carlo simulation

MERCURY MARINE (FOND DU LAC, WI) **July 2006 - May 2014**

PLM Project Manager

- Project Manager for Teamcenter PLM software implementation projects

Business Analyst: Sales

- Completed 10 “Deep Dive” projects that identified key success factors for growing market share profitably

Brunswick, Senior Analyst: Consumer Insights (Parent Company of Mercury Marine)

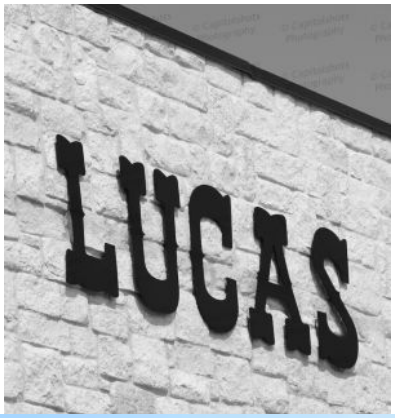
- Performed qualitative & quantitative analysis as well as research design for 8 marketing research studies including field work in 3 major US markets (Minneapolis, Chicago, Tampa)

Strategy Analyst: Strategic Planning

- Designed and delivered consolidated global industry market reports for Mercury and LifeFitness

Professional Qualifications

Market Research
Consumer Insights/ VoC
LSS Green Belt Training
Product Management
Analytics/Machine Learning
Data Mining/Statistics
Deterministic Optimization Modeling
International joint venture management
Project management
Cross-cultural leadership and communication
Palisade @Risk, Excel Solver
SPSS Modeler, Azure ML



City of Lucas, TX

Broadband Network Design & Financial Modeling

Prepared For: Kent Souriyasak
Assistant to the City Manager
City of Lucas
kent@lucastexas.us
(972) 912-1213

Prepared By: Courtney Violette
COO
O: 386.931.3520
E: cviolette@magellan-advisors.com
www.magellan-advisors.com

Table of Contents

Municipal Broadband Business & Financial Planning

- Retail Triple-Play Providers
- Open Access Providers
- Dark Fiber Utilities
- Public-Private Partnerships

Magellan Advisors provides comprehensive broadband market & financial planning services to assist public organizations make critical decisions about broadband business models and funding decisions.

Our tools provide decision support to help policymakers determine how their communities should be funded, through private operators, public grant programs and federal subsidies. We optimize large-scale broadband investment strategies to ensure they have the maximum community benefit and maintain strong financial sustainability.

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Cover Letter

January 24, 2020
Kent Souriyasak
Assistant to the City Manager

Dear Mr. Souriyasak,

Magellan Advisors is pleased to submit our response to The City of Lucas' Broadband Design and Financial Model. Magellan Advisors is the leading broadband and telecommunications design and consulting firm specializing in municipal FTTP broadband projects. For over 15 years we have developed financial models and business plans specific to municipal broadband projects. Our model has been utilized by communities in a variety of funding initiatives including municipal bonds, grants and loans leading to over 50 community broadband network builds across the US and Canada.

Magellan's team brings together the industry's best design engineering resources and experienced consultants who work to develop broadband plans and designs that are tailored for each community's needs. Our value comes from the knowledge and expertise we have gained designing and implementing FTTP networks across the US, resulting in millions of new homes and businesses connected to fiber over the past fifteen years. Our consultants proposed for the project with the City of Lucas have direct experience working in municipal broadband operations and finance. Our engineering resources are coupled with deep knowledge and experience of deploying, operating and managing municipal broadband networks. We drive significantly more value to our municipal and utility clients by combining our knowledge and expertise.

We are extremely familiar with the broadband market and infrastructure through our work in Texas, and have been retained by the following municipalities and organizations in Texas to develop comprehensive broadband designs, financial models and FTTP implementation plans similar to Lucas' project including:

City of Mont Belvieu, TX
City of Dayton, TX
City of New Braunfels, TX
City of Lake Jackson, TX
City of College Station, TX
City of Bryan, TX
Northeast Texas Consortium (NETnet) Tyler, TX

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 386.931.3520 or cviolette@magellan-advisors.com.

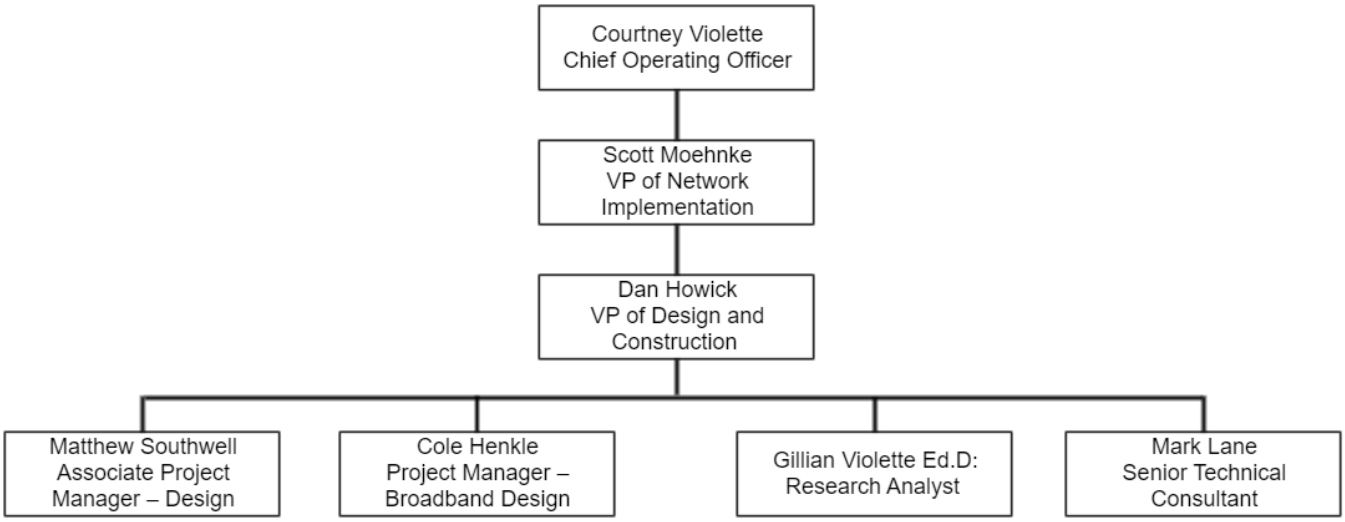
Sincerely,

Courtney Violette, COO, Magellan Advisors

Profile of Principal and Staff

Magellan's team for the City of Lucas, Texas is compiled of our leading professionals in municipal broadband, fiber and wireless design engineering, and broadband operations and financial models who specialize in understanding the strengths and risks of municipalities that undergo large broadband construction and operation projects. Led by Courtney Violette, COO of Magellan, the staff dedicated to Lucas includes a team that have worked together on successful broadband projects throughout Texas, including the Cities of Mont Belvieu and Dayton. Scott Moehnke will be a dedicated project manager for Lucas' project. Scott lives in the Houston area and managed the financial models and implementation of the Mont Belvieu network. Our professional engineering staff will be integrated into the Lucas project beginning at kick off and led by our VP of Design Engineering, Dan Howick. Magellan has support staff across the country ready to support all aspects of the City of Lucas Broadband Design and Financial Model. The below Chart, Bios and Resumes highlight the key staff and roles for the City of Lucas.

Organizational Chart



Staff Bios and Resumes

Courtney Violette: Chief Operating Officer

Courtney has led over one hundred municipal broadband planning and implementation projects across the country. 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 CIO for the City of Palm Coast. 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. Courtney holds an MA in Information Technology Management and a BS in Computer Science from Webster University.

Scott Moehnke: VP of Network Implementation

Scott is a 30-year veteran of the utility and telecommunications industries specializing in executive and operational management, business development, and information technology. Recently, Scott was Chief Operations Officer at Bristol Virginia Utilities (BVU), a municipal electric company known for being a global pioneer in triple play, and all-fiber broadband. BVU developed one of the first publicly owned fiber to the home networks in the United States, which became a model for others to follow in pursuing broadband goals. Prior to joining BVU, Scott established several consulting firms to assist telecom companies in all facets of business operations. He worked with Lafayette Utilities Service as lead project manager for their FTTH deployment. Scott holds a BS in Computer Science from the University of Texas, Austin.

Dan Howick: VP of Design and Construction

Dan Howick has over 20 years of experience working in the planning, layout and design of telecommunications networks, specializing in fiber optics. He works hand-in-hand with some of the nation's largest service providers and network owners who rely on his reputation and industry knowledge to help design and install advanced fiber-optic systems throughout North America. Dan's expertise in the Broadband industry focuses on fiber-optic networks in both the inside and outside plant environments. His roles have led to the successful design and construction of outside plant networks for carriers, the United States Government, local municipalities, and private networks. Dan excels in the areas of route planning and optimization, as-built recording and development, plant verification and documentation, as well as construction and construction management of the networks. Dan also has extensive experience in best practices, methods and procedures for design/installation in fiber optics including terminations, splicing and testing.

Cole Henkle: Project Manager: Broadband Design

Cole has over 6 years of experience designing fiber optic network. Cole manages the full life cycle of fiber optic design projects from inception to completion, managing all permitting activities and personnel in local and remote locations. Cole has also increased program efficiencies with the engineering planning and fielding departments. Cole creates and reports on monthly project progresses that include financial and deliverable status as well as client risk. He communicates consistently with clients to provide project updates and schedules. Cole is experienced with the following software: Google Suite, Microsoft Project, Excel, AutoCAD, SketchUp, Adobe InDesign. Cole graduated from Kansas State University with a Master of Architecture.

Matthew Southwell: Associate Project Manager: Design

Matthew Southwell has over 13 years in the telecommunications field. Matthew's career began as a U.S Army Sergeant where he worked on tactical communication systems, Sat-Com radio systems, and deploying weekly COMSEC key changes OTAR (Over the Air Rekeying) with newly deployed radio systems during two Operation Enduring Freedom deployments. Matthew's private sector work includes work with a Motorola radio distributor and contractor where he supported many Federal, State, and local County entities to include: Department of Homeland Security, Immigration and Customs Enforcement, Drug Enforcement Administration, Florida Highway Patrol, Greater Orlando Airport Authority, Orange County Sheriff's Office, and the Lake County Sheriff's Office. Matthew joined Magellan Advisors in 2016 as a telecommunication analyst where he has contributed his knowledge and technical expertise to over 65 broadband projects. Matthew's current role within Magellan includes analysis of client GIS data and mapping, creating conceptual network designs and costing estimates for future fiber builds. Matthew is a Certified Fiber to the Home Professional (CFHP) and holds a Business Management Degree with High Honors from Keiser University in Orlando, FL.

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 City in 2009. Mark received a bachelor's in computer science from the University of Tennessee.

Gillian Violette Ed.D.: Research Analyst

Gillian has over a decade of experience working in business management and sales in fields of pharmaceuticals, hospitality, insurance, and training and development. She has experience in managing human resource related functions, staffing, and project management. Gillian joined the Magellan team in the capacity of research, publication, and quality assurance in reporting. She holds a doctoral degree in Educational Leadership where her research focus was related to broadband Internet in K-12 schools and the digital divide, an MBA in Business Administration, and a BS in Business with a minor in Human Resources.

Courtney Violette, CISSP – Chief Operating Officer

Education:

Masters in Information Technology Management
Webster University – St. Louis, MO

Bachelor of Science in Computer Science
Webster University – St. Louis, MO

Strengths:

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

Certifications:

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

Courtney has over twenty years of executive management in telecommunications, consulting and government sectors. Experience in managing government telecommunication projects, strategic planning, technical architecture, implementation and operations. .

Magellan Advisors LLC – Orlando, FL
Managing Partner/Senior Consultant *- Magellan Advisors is a full service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations.*

Senior Consultant focused on Technology, Broadband Deployment and Government Services. Performs technical consultations in the specific areas of network implementation and management, telecommunications services and information security. Assists organizations in the development of strategic management/technical plans focusing on alignment of technology initiatives with that of the business units. Coordinate and manage Data/voice/video projects for clients to include the negotiation and provisioning of carrier services from major telecommunications and upstream providers.

City of Palm Coast – Palm Coast, FL
CIO - *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, managed full services department of IT professionals in areas of Network/Telecommunications, Application Development, Geographic Information Systems and Video Broadcasting. Managed the implementation of Palm Coast FiberNET, Florida's first municipal owned "carrier-class" open-access network. Created departmental goals and objectives that directly aligned with the organization's vision, values and strategic plans. Responsible for risk management, information security audits, physical security and all federal regulations related to organizational data and infrastructure.

Valencia College – Orlando, FL
Associate Professor - *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.*

Full-Time Professor of the Computer Engineering Technology Department specializing in instruction in areas of Telecommunications, Network Services and Information Security.

Scott B. Moehnke – VP of Network Implementation

Education:

BA Degree with Honors,
Computer Science
University of Texas Austin

Strengths:

Executive, Operational, and Project Management

- *Operational planning, execution and implementation in:*
  - *Fiber Optics / Broadband*
  - *IP Telephony*
  - *Telecommunications*
  - *Utility (Electric, Water, Waste Water)*
  - *Inside/outside plant operations*
  - *Network monitoring and support*
  - *Call center planning and operations*
- *Large-scale Project Management*
- *Business Strategy and Planning*
- *Project Sustainability*
- *Capital Asset Management*
- *Financial Management*
- *Customer Relations*
- *Business Analysis*
- *OSS/BSS selection and implementation*

Established professional with over 30 years of experience in executive management, project management and information technology related positions for various organizations involved in broadband/fiber, telecommunications, utility (electric, water, waste water), health and hospitality services. Expertise in executive and operational management, budgeting and fiscal responsibility, strategic planning, business development, organization structure emphasizing streamlined synergies, incorporation of new technologies as supported by cost benefit analyses, customer support and call centers, inside/outside plant, engineering, data center operations, networks, consumer and technical support, help desk, and software development.

Wide ranging experience is all facets of project administration for ventures from start-ups to large, multimillion dollar projects. Majority of projects have dealt with leadership from conception through implementation. Areas include Request For Proposal (RFP) creation, vendor liaison, RFP analysis, vendor award and contract, project coordination of tasks, vendors, in-house staff, and users during implementation/post-implementation periods. Also responsible for data conversions, operational processes, and concise tracking of expended time and costs to project budget. Managed $36M government grant for a telecommunications provider encompassing all aspects of operations, reporting, and interfacing to governmental entities.

Expert in leadership and team dynamics. Thrives in both independent and collaborative work environments. Participated in the following community broadband project: Chief Operating Officer Bristol Virginia Utilities for the town of Bristol, VA. One of America's first community broadband networks beginning in 2001, growing to over 60 million dollar project. Also in charge of Operations for a 90+ million dollar broadband project for the cities of Mooresville, Davidson and Cornelius, North Carolina.

BVU Authority – Bristol, VA.
Chief Operating Officer – Responsible for all day-to-day operational management for the company providing electric, water, and waste water services along with being a global pioneer in triple-play, and all-fiber broadband. Areas included customer service, inside and outside plant, construction, network operations, engineering, and OSS/BSS. Managed $36M Federal BTOP project to expand fiber network build out of 380 miles for SW Virginia. Also a key member of the executive team responsible for setting and implementing product development strategies. Bristol, VA won the National League of Cities Gold Award for the best sustainable community broadband network and the ICF 7 award for the best Community broadband network in America and top three in the world.

TSM & Associates - Houston, TX
Senior Partner – Managing partner of consulting firm specializing in executive management, business development, project management, information technology, and operational management for telecommunications, health and hospitality industries. During tenure, personally worked in executive and project management roles for a variety of companies and projects including manager charged with defining business requirements and best practices for a telecommunications service provider, revenue assurance auditing, designed and implemented integrity strategies to measure trends and deviations to quantify corrective actions to address discovered gaps. Also provided operational analysis for venture capitalist firms to identify potential issues affecting company which may put VC monies at risk or to establish minimum guidelines for investment.

Dan Howick – VP of Design and Construction

Education:

Outside Plant Engineer Courses
Brevard Community College – Melbourne, FL

Certifications:

- *Florida Licensed General Contractor*
- *Florida Licensed Excavation and Underground Utilities Contractor*
-

Dan Howick has extensive knowledge and experience in various fields in the telecommunications industry. His desire and proven expertise in the telecommunications industry is reflected in his work history credentials. Dan's background includes experience in managing various telecommunications projects specializing in network design and building infrastructure across North America. His involvement with projects has included every aspect from hands on experience working with network equipment to managing multi-million-dollar design and construction projects and personnel.

Magellan Advisors, LLC. – Orlando, FL
VP of Design and Construction- Magellan Advisors is a full-service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations. Responsibilities include the development and growth of the Design and Construction management division within Magellan. Includes oversight of division employees, resources and subcontractors, scheduling work and assigning personnel. Includes involvement with RFP's, bidding and acquiring work, client engagement and business development support. Responsibilities also include guidance on daily design and construction related issues, and daily interaction with clients on project reporting, scheduling and invoicing.

Danella Companies - Eastern US
Business Development Manager- Responsible for the success and growth within Danella, including client relations, as well as oversight of design and construction projects specifically related to fiber optic networks in an aerial and underground environment. Additional responsibilities included seeking out new ventures and clients to cover the Eastern United States for all 13 Danella divisions. Responsibilities included having in-depth knowledge of industry news and trends in the telecom, electric, and Internet of Things, smart city markets, working closely with marketing efforts, and establishing new and potential client business relations and following up with existing customers. Additional responsibilities include reporting of new business opportunities, cost estimating and P&L reporting for projects and working with all executive level division leaders in a team environment to compile the right resources and strategic needs for new projects on our existing geographic footprint and resources. Annual revenue between the 13 divisions was approximately 250 million per year.

Danella Construction Corp. - Melbourne, FL.
Design & Construction Manager - Responsible for overseeing daily operations, employees and projects for utility construction contracting throughout Florida. Job duties included estimating projects, reviewing and signing contracts, daily interaction with vendors and subcontractors, and scheduling work for employees. Additional responsibilities including finding new avenues for work, bidding and billing all projects. Timesheets of all employees were reviewed for accuracy and production, and monthly reports were completed for costing and project forecasts.

Utility Consultants Inc. - Orlando, FL.
Building Industry Consultant- Responsible for all community, marketing and business development activities. Achieved penetration rates of over 68% of community customers both residential and businesses as an over-builder of incumbents. Achieved sustainability and growth for 10 consecutive years bring community broadband project to positive cash flow in 24 months and operational profits by year three. Manages and oversees the FOCUS division that provides consulting services for other community broadband projects. Won the National League of Cities Gold Award for the best sustainable community broadband network and the ICF 7 award for the best Community broadband network in America and top three in the world.

NorthStar Communications Group - Orlando, Fl.
OSP Engineer – Responsibilities included engineering of multi-million-dollar high capacity fiber optic network for Level 3 Communications. Highly complex field engineering for 20-way conduit system, permitting for right of way use and construction in all applicable municipalities, reviewing and revising all engineering drawings received from drafting department, and generating weekly reports used for project scheduling and forecasting.

Fluor Daniel Telecom - Melbourne, Fl.
Outside Plant Engineer Technician **-** Job duties included, engineering of Bics, FITL, Safety, Distribution, Service Orders, Rehab, Pole Replacements, and Customer Complaint jobs for BellSouth. Submitted, maintained, and followed up on permits for jobs engineered. Input and updated job information into computer network-based software applications. Used computer knowledge and teamwork in assisting other engineers with their computer complications to help achieve goals and deadlines.

Cole Henkle – Project Manager – Broadband Design

Education:
Master of Architecture, Kansas State University

Skills and Proficiencies:

- *Leadership, Project Management, Public Speaking, Customer Service, Sketching, Google Suite, Microsoft Project, Excel, AutoCad, SketchUp, Adobe InDesign, Hand Drafting*

Cole Henkle has over 6 years of experience designing fiber optic network. Cole manages the full life cycle of fiber optic design projects from inception to completion, managing all permitting activities and personnel in local and remote locations. Cole has also increased program efficiencies with the engineering planning and fielding departments. Cole creates and reports on monthly project progresses that include financial and deliverable status as well as client risk. He communicates consistently with clients to provide project updates and schedules. Cole is experienced with the following software: Google Suite, Microsoft Project, Excel, AutoCAD, SketchUp, Adobe InDesign. Cole graduated from Kansas State University with a Master of Architecture.

Magellan Advisors, LLC. – Kansas City, MO
Project Manager – Broadband Design – Magellan Advisors is a full-service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations.

Actavo Engineering Services – Kansas City, MO
Project Manager – Manage all aspects of fiber optic design projects including bidding, scope negotiations, budgets, outside plant design, permitting, deliverables, geospatial data, and invoicing. Lead and manage a team of up to 50 colleagues domestically and abroad. Increase programmatic efficiencies and reduce ineffectual engineering time, planning, and fielding. Developed new employee training, methods of procedure, and performance review processes adopted company-wide. Deliver monthly business review meetings covering financial tracking, deliveries, and client risk opportunity. Report daily to client on project status, timelines, and risk. Coordinate with planning, engineering, delivery, sub-contractor, and construction teams.

Actavo Engineering Services – Kansas City, MO
Design Engineer and Team Lead – Led a team of ten design engineers to develop a scope of work and create construction drawings sets with AutoCAD Map 3D that contained basemaps and neighborhood fiber design drawings from inception to completion. Conducted feasibility analyses to determine the most profitable design changes, including extensions and re-routes. Developed the method in which build schedules were displayed visually to the contractor. Developed and delivered weekly presentations to design engineers, client representatives, and construction contractors.

Unique Stone Concepts –
Architectural Design Consultant – Conducted client consultations. Worked with end users, stone fabricators, installers, contractors, and designers to specify natural stone for a variety of building projects. Managed material orders and shipping schedules.

Berley Roofing and Contracting –
Roofing Administrator – Gained experience in residential roofing practices by working with contractors and sub-contractors to price bids. Maintained rental properties gaining experience in residential HVAC installations, electrical and framing.

Kansas State University –
Student Designer for Seaton Hall Lower Green Roof – Designed and detailed Seaton Hall green roof. Worked with professors to acquire grants. Collaborated with material suppliers and the university maintenance crew on installation.

Matthew Southwell – Associate Project Manager – Design

Education:

Business Management Degree with High Honors
Keiser University in Orlando, FL.

Strengths:

- *In-Depth Research*
- *Cloud-Based Mapping*
- *OSP Design/Costing*
- *Management & Leadership*
- *Quantitative Analysis*
- *Client Assessment*
- *Team Development*
- *Conflict Resolution*
- *G.I.S*
-

Memberships:

- *CHFP*

Matthew Southwell has over 13 years in the telecommunications field. Matthew's career began as a U.S Army Sergeant where he worked on tactical communication systems, Sat-Com radio systems, and deploying weekly COMSEC key changes OTAR (Over the Air Rekeying) with newly deployed radio systems during two Operation Enduring Freedom deployments. Matthew's private sector work includes work with a Motorola radio distributor and contractor where he supported many Federal, State, and local County entities to include: Department of Homeland Security, Immigration and Customs Enforcement, Drug Enforcement Administration, Florida Highway Patrol, Greater Orlando Airport Authority, Orange County Sheriff's Office, and the Lake County Sheriff's Office. Matthew joined Magellan Advisors in 2016 as a telecommunication analyst where he has contributed his knowledge and technical expertise to over 65 broadband projects. Matthew's current role within Magellan includes analysis of client GIS data and mapping, creating conceptual network designs and costing estimates for future fiber builds. Matthew is a Certified Fiber to the Home Professional (CFHP) and holds a Business Management Degree with High Honors from Keiser University in Orlando, FL.

Magellan Advisors, LLC. - Orlando, FL
Associate Project Manager/Design - Magellan Advisors is a full-service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations.

Led OSP design fulfillment across multiple project engagements to include, research, GIS mapping and costing analysis.

Magellan Advisors, LLC. - Orlando, FL
***Telecommunications Analyst* -** Provided broadband market and provider analysis. Assisted in conceptual network design, labor and material costing integrating geographical information systems.

Bandit Installations - Wake Forest, NC
***Installation Manager* -** Led team of technicians installing access control, card readers, electronic locks, and motion detection.

Wireless Technology & Equipment - Orlando, FL
***Installer II* -** Deployed and maintained public safety radio systems for local, state, and federal agencies.

Task Force Phoenix - Kabul, Afghanistan
***Communications Sergeant* -** Fielded and maintained secure Sat-Com, RF, and GPS technology during forward operations.

FLANG - US Army - Orlando, FL
***Sergeant-E5, Signal Support Systems Specialist-HHC 2-124 Infantry Battalion* -** Provided secure radio systems support for Tactical/Emergency Operations Centers.

Mark Lane – Senior Technical Consultant

Education:

Bachelors of Arts in Computer Science – University of Tennessee, Knoxville, TN

Extensive product-specific training and experience on Metaswitch platform, Microsoft Mediaroom, Microsoft Exchange, Ruckus Networks Wi-Fi, PRTG, and Aptilo Networks SMP.

Awards and Recognition:

- *Best Networked Hospitals Award -1995 Healthcare Technology*
- *Imagining Innovator Award – 1996 Healthcare Informantics*
- *100" Most Wired" Hospitals – 1997 Healthcare Technology*
- *Panelist at IEC Supercomm – June 2005*
- *Presenter FTTH Council for various fiber-based broadband services*
- *Bristol, VA selected as 2009 Intelligent Community Forum Top 7 finalist due to OptiNet broadband deployment*

Mark has over thirty years of experience in Information Technology and broadband service provider operations and management.

Magellan Advisors, LLC. – Denver, CO
Senior Technical Consultant - *Magellan Advisors is a full-service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations.*

Senior Technical Consultant focused on Technology, Broadband Deployment and Government Services. Performs technical consultations in the specific areas of network implementation and management, telecommunications services and information security. Assists organizations in the development of strategic management/technical plans focusing on alignment of technology initiatives with that of the business units. Coordinate and manage Data/voice/video projects for clients to include the negotiation and provisioning of carrier services from major telecommunications and upstream providers.

BVU OptiNet – Bristol, VA
Network Engineering Manager – Bristol Virginia Utilities is one of America's first community broadband networks beginning in 2001, growing to over 60 million-dollar project.

As Network Engineering Manager Mark spent 14 years responsible for the OptiNet network deployment, service delivery, and operational management of the network.

3rd Wave – 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 in October 1999 to Planet Systems, Inc.

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.

Gillian Violette, Ed.D. – Research Analyst

Education:

Ed.D. Educational Leadership
University of Central Florida – Orlando, FL

Masters in Business Administration
University of Central Florida – Orlando, FL

Bachelor of Science in Business Administration
University of Central Florida – Orlando, FL

Strengths:

- *Human Resources*
- *Project Management*
- *Training and Development*
- *Staffing*
- *Organizational Behavior and Management*
- *Operations Management*
- *Research and Writing*

Gillian has over a decade of experience working in business management and sales in fields of pharmaceuticals, hospitality, insurance, and training and development. She has experience in managing human resource related functions, staffing, and project management. Gillian joined the Magellan team in the capacity of research, publication, and quality assurance in reporting. She holds a doctoral degree in Educational Leadership where her research focus was related to broadband Internet in K-12 schools and the digital divide.

Magellan Advisors LLC – Orlando, FL
Research Analyst *- Magellan Advisors is a full service consulting and technology services firm, specializing in telecommunications planning, deployment and management for public and private sector organizations.*

Assists in fulfillment of client engagements, providing valuable insight and analysis into various tasks and components related to broadband projects. Provides support to project managers and leads in areas of Market Analysis and Research, GIS Mapping and Analysis, and other tasks as assigned. Supporting fulfillment activities where required. Takes the lead on research activities and corporate publications.

University of Central Florida – Orlando, FL
Research Assistant – *The University of Central Florida College of Education and Human Performance*

Part-time Research Assistant for an Assistant Professor of Personalized Learning and Educational Technology conducting interviews, creating reports, and organizing data for a research-based study of the implementation of the IStation software program in K-8 schools in Florida.

ProSolutions – Orlando, FL
Project Manager – *training and development for the hospitality industry*

Managed client projects of mystery shop calls on a monthly basis, including staffing, scheduling, quality control, **report** generation, and client support. In addition, provided mystery shop telephone calls to sales and catering managers in hotels across the United States and Puerto Rico, in person mystery shop calls to hotels in Orlando, FL; Baltimore, MD; Philadelphia, PA; and Aruba.

Florida Healthcare Plans – Holly Hill, FL
Staffing Coordinator – *large physician practice and insurance company*

Staffing for 12 physician offices and main insurance office in Volusia County, FL. Conducted employee searches, interviews, assessments, background checks, orientations and trainings, along with human resource project team collaboration, when necessary.

FFF – Temecula, CA
Account Executive – *pharmaceutical sales*

Outside sales position of intravenous blood plasma products contacting physician offices throughout Florida, Georgia, Alabama, and Mississippi.

Project Approach

Magellan's team understands the goal of the project for the City of Lucas is to have a dynamic financial model based on a design and model Lucas believes will be most successful both financially and for the community's needs. Magellan will deliver a detailed financial model that provides city leaders with the items necessary to project long-term investment and returns as well as providing our knowledge and experience to advise the City on the inherent risks that come with the business model, financials, design, construction and operations of a municipal broadband network.

The following tasks outline the scope of work proposed for the City of Lucas' Broadband Design and Financial Model based on our experience working with communities like Lucas and our proven process of delivering broadband network designs and financial models that our clients routinely use to apply for and receive funding for implementing networks in Texas and across the US and Canada.

Task 1: Project Kick off and Data Gathering/Review

At the onset of the project, Magellan will work with the City's project team to review the scope, set expectations and identify key milestones, deliverables and timelines in a formal project kick-off meeting. We want to understand your priorities for completion of the project to ensure work can be carried out quickly and efficiently and within the goals and objectives of the City's initiatives. Magellan will issue the City a formal data request that will include city assets that could be leveraged including any conduit, fiber or ROW access, as well as documentation from work the city has completed including the City's 2018 Technology and Communications Survey. Magellan will then begin to review all information gathered including the city's survey and speed test data as these will be important aspects of understanding the competitive market and the city's opportunities for take rates. We will build a work plan that lays out the timeline and milestones for the tasks of the project and deliverables. Our team will gather the City's project team's feedback on this plan and incorporate any changes as required by the specific needs of the City.

Market Analysis

Magellan understands that Lucas has done significant work to understand the competitive market in the City. In order to ensure we have valid data for the financial model and understand any changes in competitive pricing and market, Magellan will utilize our tools and access to databases to determine where Internet Service Providers assets are in the City. Our team will follow up with online tools to confirm the competitive pricing and any market changes in the City, as well as documented information and our knowledge of providers in Texas. If deemed necessary, Magellan will make an effort to engage providers to understand their goals for the City including any plans for upgrades in Lucas and/or opportunities to partner with the City to increase broadband capabilities throughout the City.

Task 2: Business Modeling

In order for Magellan to fully develop a financial model we need to understand the capital and operating costs which are directly tied to the business model the city deploys. Magellan's team will workshop with the City of Lucas' team to understand the various broadband business models the City should consider. We will base our recommended models on our understanding of the city from the data gathering in task 1, the understanding that the Project is a complete "green field" deployment with no existing equipment,

staff, organization, or infrastructure of any kind, and that the city would like to understand the options and risks associated with business models besides full retail FTTH including infrastructure provider and public private partnership.

Task 3: Technology Analysis

Magellan believes that fiber–optic technology is the gold standard for futureproofed, high speed broadband networks and that networks should support as much fiber technology as possible, particularly in the backbone of the network. We also believe that wireless technologies have made great strides and if supported by a fiber network can be a cost-effective strategy to achieve last mile connectivity that supports end users whose business case would be difficult in a FTTP model. Magellan's consultants will work with Lucas' team to understand the community, its goals and any opportunities to combine technologies for a better business case. We will outline the challenges and risks related to integrating additional technologies and utilize our experience with mixed deployments to advise Lucas on the "best fit" technology or technologies for its proposed network.

Task 4: Conceptual Network Design and Costing

In order to understand the capital costs for the design and build of a Lucas broadband network Magellan's team will develop a conceptual design and related costing for the City. Magellan's Engineering Procurement and Construction (EPC) team will provide a team of subject matter experts to complete quality deliverables for the design portion of this project. The overall network engineering recommendations will be based on the needs of the residents, businesses, and anchors that will utilize it. This will determine the bandwidth, performance, redundancy and scalability requirements along with solutions-specific requirements. Magellan will recommend infrastructure that best aligns with the needs found in the course of the study, and believes it should be capable of supporting the following:

- Gigabit-capable with a path to 10-gigabit
- High-performance, dedicated connectivity
- Reliable and redundant
- Flexible to support multiple technologies, such as GPON and Active Ethernet simultaneously
- Flexible to support multiple third-party providers for backhaul – WISPS, 5G etc.
- Scalable to support future growth, density and bandwidth requirements
- Multi-service in design – voice, video, data, with the necessary QOS management
- Administratively lean
- Smart City applications

Task 5. Adjustable, Dynamic Financial Model

Magellan will enhance its proven, parameter driven, financial modeling application to develop the desired financial modeling tool as described within the RFP. Magellan's current financial model is investment-grade quality and has been used as the key driver by our clients in obtaining funding. We routinely utilize our financial models to support utility and municipal revenue bonds, general fund loans, bank loans and other types of financing. We realize the importance of accurate estimates and documented assumptions for each cost and revenue item in the financial model.

Magellan's current financial model addresses all the key areas needed for in-depth financial analysis of a broadband project. Our current model allows users to dynamically build scenarios encompassing:

1. Revenue
    a. Creation of service/packages, installation/activation fees, and equipment rental fees for residential, commercial, and anchor institutions including setting of initial pricing and projected yearly prices changes
    b. Projected yearly community growth by percentage or fixed number for residences, businesses, and anchor institutions
    c. Subscriber uptake by year for residents, businesses, and anchor institutions
    d. Service/package allocation for residents, businesses and anchor institutions (e.g. for the residences that take service for a given year, a percentage will take service/package A, a percentage will take service/package B, and so on).
    e. Equipment rental allocation percentage for residents, businesses and anchor institutions.
    f. Calculation of needed bandwidth for broadband services based on oversubscription rate

2. Operating expenses
    a. Creation of cost of services matrix identifying service cost item, expected cost, and projected annual change
    b. Creation of sales, general, and administrative (SGA) cost matrix identifying SGA cost item, expected cost, and projected annual change

3. Per premise connection costs (drops)
    a. Material costs such as clamshells, fiber drop to premise, inside wire, etc.
    b. Equipment (e.g. Optical Network Terminals (ONT's), router gateways, backup batteries)
    c. Labor costs including drop fiber installs, equipment install and configuration, inside wiring

4. Capital Expense
    a. Fiber buildout costs for backbone and distribution laterals (materials, labor, and contingency) by mileage per year
    b. Initial network equipment, installation, and software costs with refresh/renewal costs
    c. New building or building upgrade costs for administrative offices, network operations, and warehousing
    d. Costs for data center racks, cabinets, raceways, etc.
    e. IP services and IP block purchases

f. General equipment such as vehicles, trenchers, OTDR's, splicing trailer
g. Wireless equipment
h. System costs (network management, OSS/BSS, etc.)
i. Project and construction management

5. Staffing
    a. Ability to list job descriptions along with job parameters including hourly/salary, full/part time, hourly rate or yearly salary, social security rate, retirement rate, insurance costs, workman's comp expense, auto allowance, staffing agency costs, and miscellaneous overheads
    b. Creation of staffing table based on job description and Full-time Equivalents (FTEs) per year. Allows for partial year staffing.
    c. Displays yearly staffing costs based on parameters above

6. User defined financial assumptions
    a. Setting of depreciation lifetimes for Customer Premise Equipment (CPE), network equipment, and infrastructure elements (e.g. towers, fiber, etc.)
    b. Calculation of operating reserve fund, renewal and replacement fund, and capital expansion fund based on desired percentages
    c. Annual inflation adjustment percent

7. Borrowing
    a. Allows input of anticipated borrowing factors (term, interest rate) for fiber and plant, network equipment, CPE equipment, and working capital.

8. Based on the information input into the model as described above, our modeling will create:
    a. Detailed pro forma for the years modeled
    b. Borrowing summary with principal and interest payment schedule
    c. Financial analysis matrix
    d. Staffing costs
    e. Service, installation, and equipment rental revenues by item and year
    f. Incremental and cumulative demand schedules
    g. Demand forecasts for residential, business, and anchor sectors
    h. Dashboards (see below) of key financial parameters including needed funding, payback period using and not using free cash flow, cumulative free cash flow over modeling period along with graphical representation of the modeling period by year of (1) EBITDA/Net Income, (2) Cumulative Unrestricted Free Cash Flow, (3) Debt Balance, (4) Annual Unrestricted Free Cash Flow, and (5) associated Residential, Business, and Anchor subscriber growth

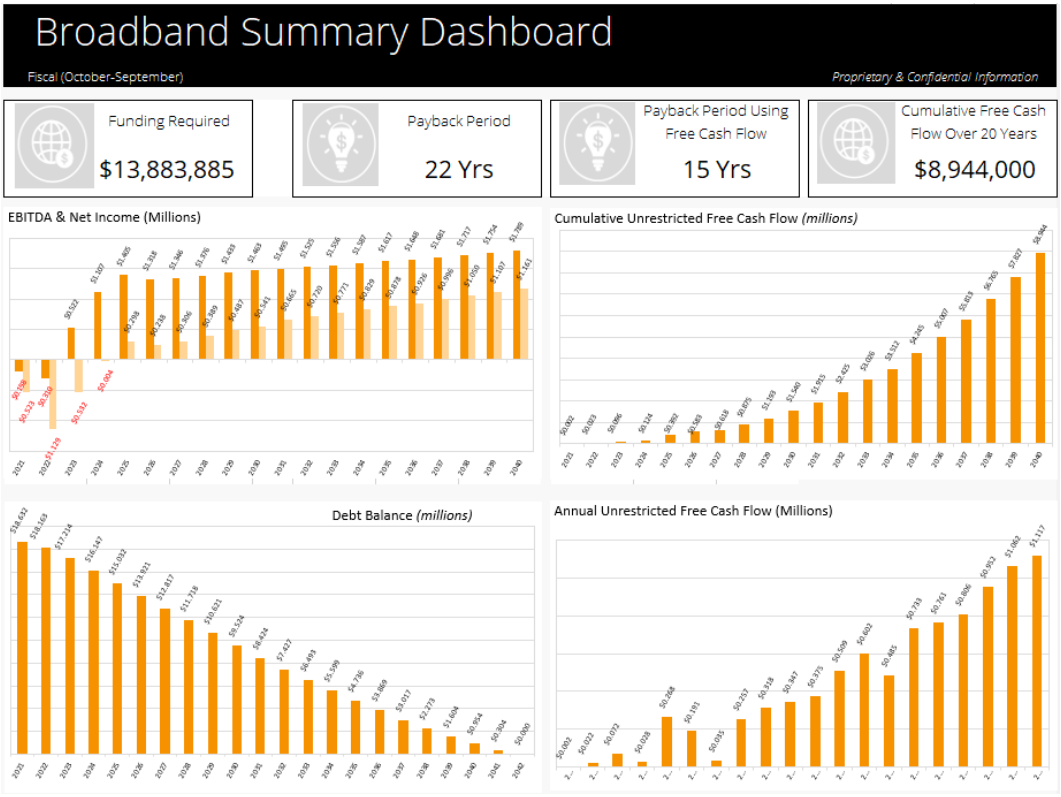
Examples of a few of the model outputs:

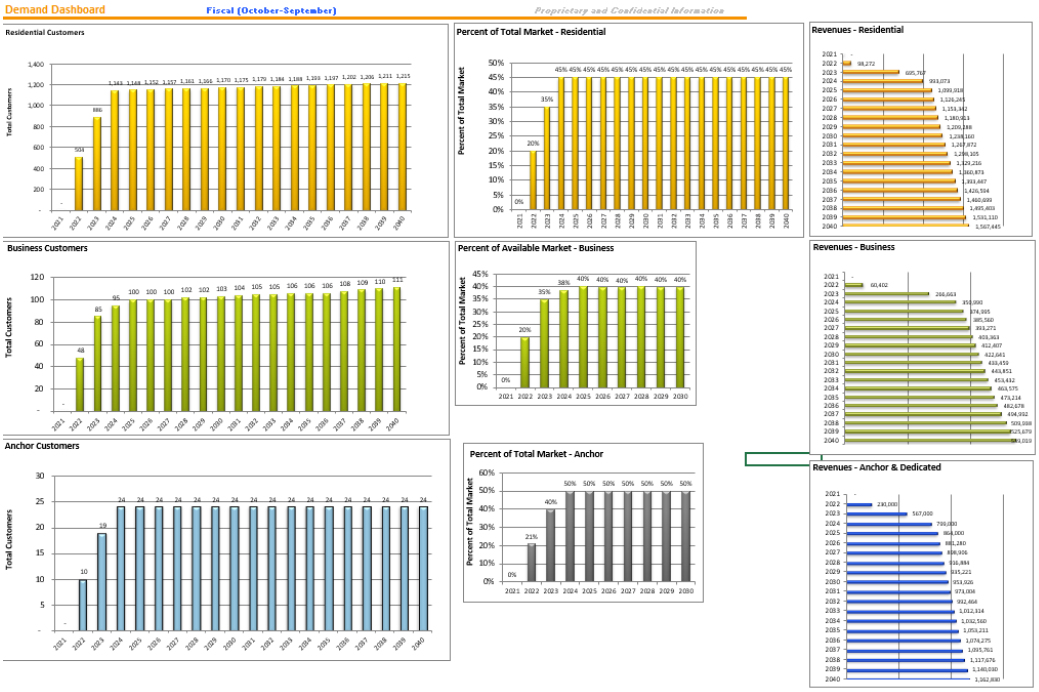
Pro Forma — Core Only-Buried — Fiscal (October-September)

Year #	2020-2021 1	2021-2022 2	2022-2023 3	2023-2024 4	2024-2025 5
EBITDA	$ (198,400)	$ (309,701)	$ 521,664	$ 1,107,318	$ 1,404,787
Depreciation & Amortization					
Depreciation	$ 324,857	$ 616,773	$ 672,782	$ 723,319	$ 724,188
Amortization	$ -	$ -	$ -	$ -	$ -
Subtotal: Depreciation & Amortization	$ 324,857	$ 616,773	$ 672,782	$ 723,319	$ 724,188
EBIT	$ (523,257)	$ (926,475)	$ (151,118)	$ 383,999	$ 680,599
Interest					
Borrowings	$ -	$ 202,641	$ 381,175	$ 387,922	$ 382,266
Subtotal: Interest Expenses	$ -	$ 202,641	$ 381,175	$ 387,922	$ 382,266
NET INCOME	$ (523,257)	$ (1,129,116)	$ (532,294)	$ (3,923)	$ 298,333
Debt Principal Payments					
Borrowings	$ -	$ 248,397	$ 481,217	$ 548,696	$ 603,066
Subtotal: Principal Payments	$ -	$ 248,397	$ 481,217	$ 548,696	$ 603,066
Reserve Fund Requirements					
Operating Reserve Fund	$ -	$ -	$ -	$ 10,357	$ 9,341
Renewal & Replacement Fund	$ -	$ -	$ -	$ 1,438	$ 1,830
Capital Expansion Fund	$ -	$ -	$ -	$ 718	$ 915
Subtotal: Annual Reserve Fund Requirements	$ -	$ -	$ -	$ 12,511	$ 12,086
Subtotal: Cumulative Reserves	$ -	$ -	$ -	$ 12,511	$ 24,597
Capital Spending					
Capital Budget	$ 5,789,749	$ 5,349,377	$ 739,664	$ 505,096	$ 8,680
Other					
Subtotal: Capital Spending	$ 5,789,749	$ 5,349,377	$ 739,664	$ 505,096	$ 8,680
TOTAL NON-OPERATING, CAPEX AND RESERVES	$ 5,789,749	$ 5,597,774	$ 1,220,881	$ 1,066,302	$ 623,832
Cash Flow					
Beginning of Year	$ -	$ 1,600	$ 23,496	$ 95,942	$ 123,894
Add: Net Income	$ (523,257)	$ (1,129,116)	$ (532,294)	$ (3,923)	$ 298,333
Add: Depreciation	$ 324,857	$ 616,773	$ 672,782	$ 723,319	$ 724,188
Add: New Funding	$ 5,789,749	$ 5,349,377	$ 739,664	$ 505,096	$ -
Less: Non-Operating, CAPEX and RESERVES	$ 5,789,749	$ 5,597,774	$ 1,220,881	$ 1,066,302	$ 623,832
End of Year Cash Flow - Pre Working Capital	$ (198,400)	$ (759,139)	$ (317,233)	$ 254,132	$ 522,584
Add: Addl Working Capital	$ 200,000	$ 800,000	$ 500,000	$ -	$ -
Less: Working Capital Principal/Interest	$ -	$ 17,365	$ 86,825	$ 130,238	$ 130,238
End of Year Cash Flow Final	$ 1,600	$ 23,496	$ 95,942	$ 123,894	$ 392,346
End of Year Cash Flow Final 20 Yr Total	$ 8,944,000				

Borrowing Summary — Fiscal (October-September)

	Year #	Total	2021 1	2022 2	2023 3	2024 4
Total Capital Assets						
20 Yr - Fiber Plant & Facilities		$ 9,235,903	$ 4,314,343	$ 4,321,561	$ -	$ -
10 Yr - Network Equipment		$ 2,428,880	$ 875,400	$ 540,000	$ 368,160	$ 263,000
5 Yr - Home Equipment		$ 1,171,800	$ -	$ 487,816	$ 371,504	$ 236,096
	Total	$ 12,836,583	$ 5,789,749	$ 5,349,377	$ 739,664	$ 505,096
Total To Be Financed						
20 Yr - Fiber Plant & Facilities		$ 9,235,903	$ 4,314,343	$ 4,321,561	$ -	$ -
10 Yr - Network Equipment		$ 2,052,560	$ 875,400	$ 540,000	$ 368,160	$ 263,000
5 Yr - Home Equipment		$ 1,095,416	$ -	$ 487,816	$ 371,504	$ 236,096
15 Yr - Working Capital		$ 1,500,000	$ 200,000	$ 800,000	$ 500,000	$ -
	Total	$ 13,883,885	$ 5,989,749	$ 6,149,377	$ 1,239,664	$ 505,096
Financing - Fiber Plant & Facilities	20	Total Interest:	$ 3,761,061	Total Principal:	$ 9,235,903	
Series A - 20 Year, 3.50%	3.50%					
2021 Interest			$ 172,002	$ 165,820	$ 159,625	
2022 Interest				$ 151,255	$ 145,306	
2021 Principal			$ 173,777	$ 179,959	$ 186,154	
2022 Principal				$ 152,815	$ 158,164	
Financing - Network Equipment	10	Total Interest:	$ 415,456	Total Principal:	$ 2,052,560	
Series B - 10 Year, 3.50%	3.50%					
2021 Interest			$ 30,639	$ 28,027	$ 25,324	
2022 Interest				$ 18,900	$ 17,289	
2023 Interest					$ 12,886	
2024 Interest						
2021 Principal			$ 74,620	$ 77,232	$ 79,935	
2022 Principal				$ 46,030	$ 47,641	
2023 Principal					$ 31,382	
2024 Principal						
Financing - Home Equipment	5	Total Interest:	$ 111,655	Total Principal:	$ 1,095,416	
Series C - 5 Year, 3.50%	3.50%					
2021 Interest			$ -	$ -	$ -	
2022 Interest				$ 17,074	$ 13,890	
2023 Interest					$ 13,003	
2024 Interest						
2021 Principal			$ -	$ -	$ -	
2022 Principal				$ 25,281	$ 26,166	
2023 Principal					$ 19,253	
2024 Principal						
Financing - Working Capital	15	Total Interest:	$ 453,564	Total Principal:	$ 1,500,000	
Series D - 15 Year, 3.50%	3.50%					
2021 Interest			$ 7,000	$ 6,637	$ 6,262	
2022 Interest				$ 28,000	$ 26,543	
2023 Interest					$ 17,500	
2021 Principal			$ 10,365	$ 10,728	$ 11,103	
2022 Principal				$ 41,460	$ 42,911	
2023 Principal					$ 25,913	
Annual Capital Asset Financing						
Annual Interest		$ 4,294,183	$ -	$ 202,641	$ 381,175	$ 387,922
Annual Principal		$ 12,383,885	$ -	$ 248,397	$ 481,217	$ 548,696
Subtotal Debt Service		$ 16,678,068	$ -	$ 451,038	$ 862,393	$ 936,618
Annual Working Capital Financing						
Annual Interest		$ 453,564	$ -	$ 7,000	$ 34,637	$ 50,311
Annual Principal		$ 1,500,000	$ -	$ 10,365	$ 52,188	$ 73,327
Subtotal Debt Service		$ 1,953,564	$ -	$ 17,365	$ 86,825	$ 130,238
Total Annual Interest		$ 4,747,747	$ -	$ 209,641	$ 415,813	$ 438,233
Total Annual Principal		$ 13,883,885	$ -	$ 258,762	$ 533,405	$ 620,623
Total Debt Service		$ 18,631,632		$ 468,403	$ 949,218	$ 1,066,855





Comparison of Magellan's Cost Model to City of Lucas Requested Functionality

As described above, Magellan's current financial model addresses much of the requested functionality as outlined in the City of Lucas' RFP document below:

Requested Functionality	Current Magellan Financial Model
Model must allow entry of costs and revenues preferably by month or quarter across a recommended time horizon	Model is based on a unit of time structure with calculations over twenty units. Currently our standard model utilizes a unit of time as a year with calculations over twenty years. However, the model can be utilized to use month or quarter time units with an enhancement to allow more than twenty timeframes. Model is separated into multiple categories such as customer demand, service revenues, installation revenues, equipment rental revenues, operating costs, capital costs, staffing costs, etc.
Costs and revenues need to be groupable by categories to be determined by the City and selected consultant at the Kickoff Meeting and Work Session.	Revenues are broken out into residential, commercial, and anchor institutions with definable products and services for each category. Also supports categorizing services into Internet, phone, and video. Each service has a modifiable rate entry with automatic rate adjustments over time. Operating costs are user definable and can be based on fixed costs with automatic increases, and percentage of other elements such as miscellaneous costs based on 3% of revenue. Capital costs currently have categories for network design, backbone buildout, distribution buildout, premise drops, network equipment, general equipment, wireless, new buildings and

Requested Functionality	Current Magellan Financial Model
	building improvements. Costs can be labelled as labor, materials, and contingency. Costs can be outlaid over multiple years with refresh and renewal costs input.
Model must yield graphs of costs and revenues, separate or together, over time and by category.	Currently Magellan has several graphs related to financial and demand factors.
Model must yield summary tables by component or category.	Model has tables containing each revenue and cost component over the selected time frame with summary.
Model must yield cost and revenue schedules (i.e. amortization tables) across time as desired by the City.	Model calculates principal and interest payments over selected time frame for up to four categories (fiber installation, network equipment, premise equipment, and working capital. Model also calculates depreciation based on factors set by client.

Magellan expects that modifications will need to be made to address some of the specifics regarding multiple timeframes and output reports, but we feel that our current model encompasses a large majority of the requested components.

Task 6: Risks and Recommendations

Magellan's team will develop a risks analysis for the City that provides detailed risks around the business model, construction, operations and maintenance of the proposed broadband network. Magellan will provide a detailed rationale based on our experience working with municipal broadband providers and learning from what other cities similar to Lucas have developed, as well as the probability and rationale of the risks associated with Lucas' project. We will then provide the City with key recommendations for next steps and action plans to move forward with expanding broadband in Lucas.

Miscellaneous and Other

Magellan's team will provide Lucas with any additional key details we believe they should consider prior to delivering a final work product. These may include risks surrounding financial model, funding, technology, construction, operations and sales and marketing.

Task 7: Funding Identification

Implementing our Broadband Financial Sustainability Model in this project will enable Lucas to understand key financial information related to funding alternatives. We will model projected capital and operating costs related to buildout and implementation of broadband infrastructure. We will also identify potential system revenues generated by the investments in this infrastructure to understand how these cash flows will support future operating and capital costs as the infrastructure expands.

The goal of this approach will be to provide the City recommendations it should consider for funding including municipal bonds, public private partnerships as well as ant other municipal options for funding.

Task 8: Work Product Deliverables

Magellan's final deliverable and work products for the City of Lucas' broadband design and financial model will include an adjustable, dynamic financial model. Conceptual network design and ESRI shapefiles and a formal risk analysis and recommendations for the City as well as key detailed information collected throughout the project will be part of a final deliverable package to the City of Lucas.

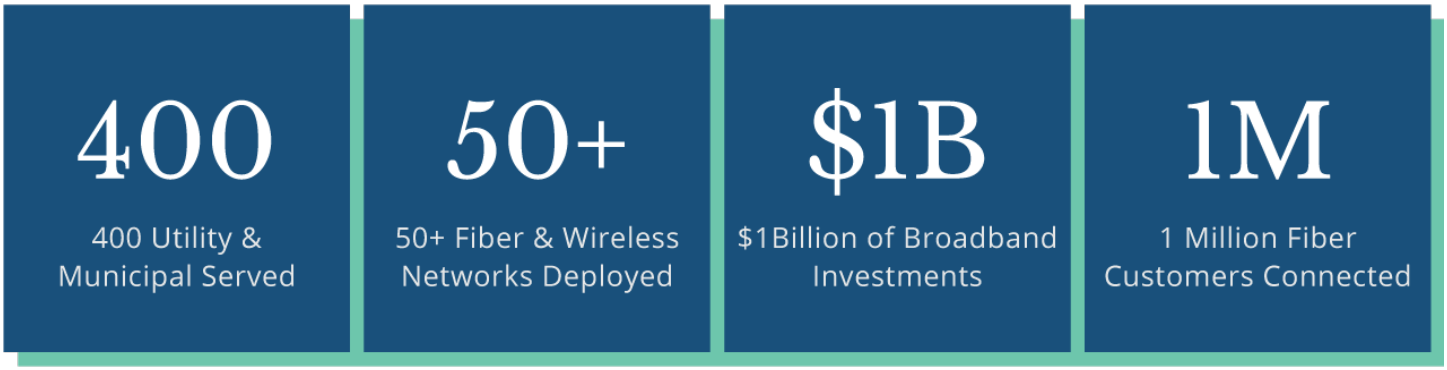
Magellan's team will be available to present to City Council if desired by the City's leadership, and regularly presents to city councils and mayors across Texas and the US.

Background & Experience

Magellan Advisors, LLC is a Denver-based firm with local offices in Houston, Orlando, Miami, Los Angeles, and Kansas City. Magellan's primary address is 999 18th Street, Suite 3000 Denver, CO 80202. Magellan's web address is www.magellan-advisors.com. Magellan Advisors, LLC was founded in January of 2004 and has been in operation as a Florida Limited Liability Company since inception. Magellan maintains a staff of 40 full and part time employees. Magellan's office number is 888.960.5299. The contact for this contract is COO Courtney Violette, 386.931.3520, cviolette@magellan-advisors.com. Magellan Broadband Solutions is a division of Magellan Advisors, LLC.

Magellan Advisors is the only firm that provides comprehensive fiber network development for municipalities, utilities and cooperatives. We are a full spectrum planning and implementation firm that assists our clients to develop transformational fiber and wireless networks for their communities. We provide the full spectrum of planning, consulting, engineering, procurement, construction management and operations, giving our clients a turnkey partner to see their projects from concept to completion. Over 400 utilities, municipalities and coops utilize Magellan's services to plan and deploy their networks nationwide.

We partner with our utility and municipal clients every step of the way, whether they are deploying institutional fiber networks, implementing fiber to the home or modernizing utility communications. We are a hands-on firm with strong project management abilities and implementation expertise to manage the heavy lift of deploying fiber networks.



We take a very consultative approach to building fiber networks, helping our clients make the best decisions to minimize costs and maximize benefit to the community. We specialize in developing multi-purpose fiber networks to support electric grid modernization, municipal connectivity, wireless attachment and fiber to the home. Through development of over 50 municipal fiber and broadband networks, we have refined an approach that enables our clients to build state-of-the-art infrastructure to serve community needs and simultaneously create a platform for next-generation broadband.

Our professionals bring years of experience from the broadband, telecom, information technology and government sectors. We are thought leaders and real-world implementers of broadband and smart city networks that keep communities competitive in the digital world.

Key Customers

Municipal Electric Utilities & Coops

Glendale Water & Power	CA	Hudson Electric	OH
Riverside Public Utilities	CA	City of Westerville	OH
Rancho Cucamonga Utilities	CA	Rock Falls Electric Utility	IL
City of Sacramento	CA	Newport Utilities	TN
Orlando Utilities Commission	FL	Sequachee Electric Membership Corporation	TN
Salt River Project	AZ	Meriwhether Lewis Electric Cooperative	TN
Bartow Utilities	FL	Morrisville Utility Systems	TN
Holyoke Gas & Electric	MA	Lenoir City Utilities	TN
Chicopee Electric Light	MA	Middle Tennessee Electric Membership Corporation	TN
Winter Park Electric	MA	Vermont Transmission Company	VT
Hamilton Electric	OH	Morrisville Electric	VT
Westerville Electric	OH	Burlington Electric Department	VT
Rock Falls Electric Utility	IL	Waverly Utilities	IA

Municipalities

City of Rancho Cucamonga	CA	City of Wellington	FL
City of West Hollywood	CA	City of Hallandale Beach	FL
Rancho Santa Fe	CA	City of Port Orange	FL
City of Riverside	CA	City of Lakeland	FL
City of Davis	CA	Atlanta Beltline	GA
City of West Sacramento	CA	City of Davenport	IA
City of Woodland	CA	City of Waverly	IA
City of El Segundo	CA	City of Ketchum	ID
City of Birmingham	AL	City of Rock Falls	IL
City of Tuscaloosa	AL	City of Minden	LA
City of Fort Morgan	CO	City of Baltimore	MA
City of Wray	CO	City of Columbia	MO
City of Fort Collins	CO	City of Missoula	MT
City of Centennial	CO	City of Cornelius	NC
City of Yuma	CO	City of Haywood	NC
City of Bartow	FL	City of Mooresville	NC
City of Winter Garden	FL	City of Davidson	NC
City of Clermont	FL	City of Highlands	NC
City of Wilton Manors	FL	City of Syracuse	NY
City of Jupiter	FL	City of Rochester	NY
City of Daytona Beach	FL	City of Hamilton	OH
City of Winter Haven	FL	City of Sumter	SC
City of Winter Park	FL	City of Dayton	TX
City of Sunrise	FL	City of College Station	TX
City of Fort Lauderdale	FL	City of Bryan	TX
City of Palm Coast	FL	City of New Braunfels	TX
City of Cocoa	FL	City of Mont Belvieu	TX
City of Palm Beach Gardens	FL	City of Bristol	VA
City of Ormond Beach	FL	City of Walla Walla	WA

Counties

Yolo County	CA	Missoula County	MT
Strathcona County, Alberta, Canada	CA	Land of Sky Regional Council	NC
Sonoma County	CA	Niagara County Airport Stakeholder Group	NY
Yuma County	CO	Port of Whitman County	WA
Seminole County	FL	Port of Walla Walla	WA
Flagler County School District	FL	Pierce County	WA
South Florida Regional Council	FL	Marion County	WA
Columbia County	GA	Niobrara County	WY
Boone County	MO	Converse County	WY

MAGELLAN ADVISORS

Portfolio of Services

BROADBAND FEASIBILITY STUDIES
Community Needs Assessments
Business Models & Financial Planning
Market Analysis & Current Environment
Design & Engineering
Network Analysis & Inventory
Opportunity, Risk & Benefit Analysis

BROADBAND DESIGN ENGINEERING
FTTH, FTTP, Metro & Long-Haul Fiber
Routing, Switching & MPLS
Fixed Wireless, Microwave & Wi-Fi
Internet, Voice & Video Integration
GPON Active Ethernet & WDM
BSS/OSS Network Management Systems

SMART CITY PLANNING
Asset Assessments
Smart City Solutions Needs Assessments
Strategic Smart City Planning
Vendor Selection
SCADA Consulting
IT Governance

NETWORK IMPLEMENTATION
Standards & Specifications
Sales & Marketing
Vendor Selection & Management

NETWORK IMPLEMENTATION (CONT.)
Construction Management & Inspections
Installation & Activations
Operations & Customer Service

PUBLIC POLICY & GOVERNANCE
Right-of-Way Management Ordinance
Dig Once & Joint Trench Policies
Wireless Ordinance & Guidelines
Telecommunications Master Funding
Fiber Ordinance & Guidelines
Internal & External Working Groups

BUSINESS MODELS & PARTNERSHIPS
Dark Fiber, Open Access, Triple Play
Partner Recruitment & RFQs
Feasibility Analysis of Business Models
Advocacy & Negotiation in Partnerships
Public-Private Partnership Development
Opportunity, Risk & Benefit Analysis

PROJECT MANAGEMENT
Procurement & Contract Negotiation
Construction Management
Network Commissioning & Certification
Content Acquisition & Agreements
Sales, Marketing & Business Development
Business & Operations Management

Design Engineering Qualifications

Magellan brings the industry's best design resources, specifically tailored for municipal and utility broadband providers. Our value comes from the knowledge and expertise we have gained designing and implementing backbone, FTTP and FTTH networks across the US, resulting in millions of new homes and businesses connected to fiber over the past ten years and laying the groundwork for Smart City connections. Our engineering resources are coupled with deep knowledge and experience of deploying, operating and managing municipal broadband networks. We drive significantly more value to our municipal and utility clients by delivering:

1. A futureproofed design that supports the growing bandwidth requirements and diverse applications that will support the long-term needs of the City, it's citizens and businesses;
2. A more cost-efficient engineering design that optimizes the use of existing infrastructure including usable conduit, reducing overall construction and deployment costs;
3. A rapid design process, that allows our clients to design and build in a step-by-step process and move into construction quickly and efficiently;
4. Attention to any unique topographical issues that the City would face and strategies to accommodate the environmental challenges specific to each community; and,
5. Construction administration services, as needed, to manage the RFP, construction inspections and oversight for Phase II.

Magellan has assembled the most seasoned team of experts who bring local knowledge of fiber network design and implementation to projects across North America. Combined, our team has worked on over 50 municipal broadband design and construction projects, including the engineering of over 1,000,000 fiber customers connected and thousands of miles of backbone fiber. We manage this team through constant collaboration, both internally and with our clients. Our goals are to ensure the best levels of service are achieved by bringing our subject matter experts together to provide you with the most experienced team of design experts available.

Project Timeline

Magellan proposes a four-month timeline to complete the scope of work detailed below for the City of Lucas.

Task	Description	Month 1	Month 2	Month 3	Month 4
1	Kick off and Data Gathering				
2	Business Models				
3	Technology Analysis				
4	Conceptual Network Design & Costing				
5	Develop a Dynamic, Adjustable Financial Model				
6	Broadband Risks and Recommendations				
7	Funding Identification				
8	Final Work Product				

Cost of Services

The total cost to the City of Lucas for a Broadband Design and Financial Model is **$56,625** and includes all work to be completed by Magellan for the City as stated in this Proposal. Magellan will bill the City in 4 equal monthly payments, with a 10% hold until project completion. Magellan will bill on the first day of the month for the current month's services. We will be onsite three times for meetings. Our daily per diem is $65. Travel and incidental expenses will be billed as incurred at a not to exceed rate of $5,000. Invoices are payable on net 30 terms from the date of invoice.

Task	Description	Hourly Price	Hours	Total
1	Kick off and Data Gathering	$175	45	$7,875
2	Business Models	$175	10	$1,750
3	Technology Analysis	$175	15	$2,625
4	Conceptual Network Design & Costing	$175	40	$7,000
5	Develop a Dynamic Adjustable Financial Model	$175	130	$22,750
6	Broadband Risks and Recommendations	$175	10	$1,750
7	Funding Identification	$175	15	$2,625
8	Final Work Product	$175	30	$5,250
	Travel and Incidental Expenses (not to exceed)			$5,000
	TOTAL (NOT TO EXCEED)		295	$56,625

Design and Engineering

Magellan Advisors provides Design Engineering services to our clients at the rates shown below.

Description	Per Ft.
Underground	$1.25
Aerial	$1.00

Similar Projects

City of Mont Belvieu, TX – FTTH Feasibility Study, Business Plan and Turnkey Implementation
Magellan was engaged by the City of Mont Belvieu, TX to furnish a full turnkey solution to provide all services necessary for the City to deliver retail and wholesale fiber-optic services to the residents and businesses in Mont Belvieu including Project Management and Construction Management. These services represent all the functions needed to rollout a new fiber-optic based business. Services include a detailed business plan to support funding, designing and building the network, development of a data center, selection/installation of all network equipment, engagement of personnel for the new business, creation of all needed RFP's and vendor selections, selection of all critical software such, all back-office processes, creation of marketing strategies and sales channels, testing of network and services, oversee beta testing with select customers, oversee and monitor production rollout and overall project management.

City of Dayton, TX – Broadband Feasibility Study
The City of Dayton, Texas is a community lying Northeast of Houston, Texas in Liberty County with a population of nearly 8,400. The City of Dayton is anticipating significant economic development growth driven by proposed new industrial and business parks. In 2019, the City of Dayton contracted with Magellan Advisors to conduct a Broadband Feasibility Study. Recommendations were then provided as a result of the Study to bring Gigabit broadband to the City of Dayton. The City of Dayton is finalizing its Bond Funding for the project, and anticipates kicking off the project in April 2020.

Marshfield Utilities, WI – Broadband Feasibility Study and Financial Modeling
Magellan was engaged by Marshfield utilities in 2019 to develop a broadband feasibility study and financial modeling for a FTTP network. Magellan worked with MU leadership to understand the market, demographics and opportunities for MU to deploy broadband services to its customers. All assumptions were built into Magellan's financial model and examined in to a phased approach so MU leadership could understand the opportunities to target businesses and residents in the city and then expand to its larger rural service territory.

City of Hillsboro, OR – FTTH Design and Turnkey Deployment
The City of Hillsboro, Oregon has engaged Magellan Advisors in the project management, design services, construction management, and procurement of services for Fiber-to-the-Home deployment for the planned 50-mile Backbone Network and 100-mile Fiber-to-the-Home Network. Within the scope of services, Magellan has partnered with the City to establish project schedules, provide continual project updates, assist the City to develop and issue RFPs for multiple FTTH in new development areas and oversee selected contractors during all phases of the Fiber Network Implementation for the client by providing project and construction management services

City of Portsmouth, VA – Fiber Implementation Plan and Turnkey Deployment
In 2016, Magellan was contracted by the City of Portsmouth to develop a Fiber Master Plan aimed at connecting over 70 city and Portsmouth school facilities in an effort to significantly increase the amount of network bandwidth to each site, while reducing long-term operating costs. Magellan performed Enterprise Network Architecture and Design as part of the planning process, which identified a 46-mile fiber build, and an investment of over $8 million over the next several years. The City of Portsmouth has extended

the contract with Magellan which includes full Design and Engineering services as well as Project Management/Construction Management for the turnkey implementation over a 5-year period. Adoption of the Fiber Master Plan led the City to budget over $8 million to implement the network as defined through this engagement.

City of Boulder, CO – Fiber to The Home Design and Turnkey Deployment
Magellan Advisors was retained by the City of Boulder, Colorado to provide project management and design services to implement a 55-mile Backbone Fiber Optic Network. Within the scope of services, Magellan has partnered with the City to conduct all pre-liminary design services to optimize the network route. During the planning phase, Magellan worked directly with multiple departments within the City to ensure the network met the needs of the City and maximized the use of existing infrastructure. Magellan also assisted in the City to secure permitting for the project. In addition to final design services, Magellan has been tasked to provide the City with bid services to assist in securing a contractor to install the network.

References

City of Mont Belvieu, TX – FTTH Feasibility Study, Business Plan and Turnkey Implementation
Contact: Nathan Watkins
Title: City Manager
Phone: 281.576.2213 ext. 228
Email: nwatkins@montbelvieu.net
Timeline: 2015 - Present

City of Dayton, TX – Broadband Feasibility Study
Contact: Theo Melacon
Title: City Manager
Phone: (936) 258-2642
Email: citymanager@daytontx.org
Timeline: 2019 - Present

City of Hillsboro, OR – FTTH Design and Turnkey Deployment
Contact: Greg Mont
Title: Information Services Director
Phone: 503-681-5401
Email: greg.mont@hillsboro-oregon.gov
Timeline: 2018 - Present

Appendix A: Business & Financial Planning Brochure

Municipal Broadband Business & Financial Planning

- Retail Triple-Play Providers
- Open Access Providers
- Dark Fiber Utilities
- Public-Private Partnerships

Magellan Advisors provides comprehensive broadband market & financial planning services to assist public organizations make critical decisions about broadband business models and funding decisions.

Our tools provide decision support to help policymakers determine how their communities should be funded, through private operators, public grant programs and federal subsidies. We optimize large-scale broadband investment strategies to ensure they have the maximum community benefit and maintain strong financial sustainability.

Magellan Advisors' Broadband Financial Sustainability Model

Our tools provide deep analytics around broadband demographics, usage, adoption and growth. We use this information to evaluate potential broadband investments across regions to determine the financial and nonfinancial outcomes of public and private funding. This data enables policymakers to make clear delineations on what areas should be targeted for funding programs. Using a valuation-based approach, policymakers can easily determine the impact of broadband investments in specific geographies, at a census tract, city, county, regional or statewide level. We also aggregate data into our easy to use dashboard that tracks investments across jurisdictions, giving policymakers a high-level performance-tracking tool for their broadband programs.

- Demographic Analysis
- Business & Industry Evaluation
- Economic Development Analysis
- Community Anchor Analysis
- Underserved & Unserved Analysis
- Fiber To The Premise & Wireless Options

Our industry-leading Broadband Financial Sustainability Plans incorporate market, demand, cost, revenue, and funding factors to build a complete financial picture of investments for the policy organization. They provide important funding support tools that are many times utilized in federal, state and local grant applications. These tools also assist policymakers track the progress of broadband investments by monitoring their financial performance. This helps policymakers understand the impact of broadband investments in communities across their regions and where to focus future funding programs.

- ARPU Analysis
- Uptake and Growth Analysis
- Demand Aggregation Strategies
- Financial Return On Dollars Invested
- Community Value On Dollars Invested
- Regional Economic Impact Analysis

FTTH & Wireless Investment Decision Support

Magellan's broadband market & financial planning tools model large-scale wireline and wireless investments across diverse markets and varied demographics. Our models provide the decision support tools to determine how, when and where to finance broadband investments. They give policy makers, government organizations and private providers the insight needed to invest wisely and with the right financing strategies.

Our services enable policymakers determine the right mix of grant, loan and direct investment across their jurisdictions. Our models have helped state, regional and local government organizations across the country make sustainable investments in their communities that increase economic development improve educational services and support healthcare initiatives. Our plans have supported over $250 million in federal and state investment in broadband nationwide.

01

Financial Model & Assumptions

- Fiber & Wireless Costs
- Operational Budgeting
- Demand Forecasting
- ARPU Analysis
- Capacity Planning
- Revenue Forecasts
- Renewal, Replacement & Expansion Programs

02

Pro-Forma Development

- GAAP & GASB Compliant
- Revenue, Cost & Margin
- Depreciation & Amortization
- Dynamically Linked to Support Decision and Scenario Analysis

03

Sustainability Review & Planning

- Sensitivity & Scenario Analysis
- Financial Ratio Analysis
- Cost of Capital Evaluation
- Risk Analysis
- Reserve Requirements
- Capital Allocation

04

Funding-Ready Financial Plan

- Pro-Forma Support
- Project Valuation
- Support for Funding Options Include Public Grant and Loan Programs, Traditional Bank Financing and Public/Private Structures

Lit Communities

City of Lucas, TX
Request for Proposals
Broadband Network Design and Financial Model

January 24, 2020

Attn: Kent Souriyasak Assistant to the City Manager City of Lucas
Email: kent@lucastexas.us

Greetings Mr. Souriyasak,

This letter and the following proposal are the formal expression of interest on behalf of Lit Communities and our partners to work with the City of Lucas, TX (the "City") to achieve the ultimate goal of providing a high-level design and financial model to assess existing and future broadband needs for the City's residents and businesses. Lit Communities' model allows the City to determine the cost of installation, operation, and maintenance of a broadband network and provides a way to calculate revenues generated from retail services and third-party network access. We have successfully deployed this model in communities across the country, and are confident we can provide the City with a tool that takes into account industry and network assumptions, outline the risks and propose recommendations for a successful deployment.

Our passionate and committed team possess a depth of experience on behalf of both public and private entities in designing broadband networks and creating the financial models that ensure for a successful network deployment. Lit Communities' financial models and business plans provide municipalities with the necessary data and the next steps to create a city wide network. We also bring an understanding of how to leverage a variety of potential funding sources, such as Infrastructure Investment Funds, Community Reinvestment Act obligations of local banks, and any applicable grant funding, in order to make successful business cases for broadband infrastructure investment in sparsely populated rural communities.

We are confident that our exceptional team, world class partners, comprehensive qualifications and experience, proven approach, and passion for bridging the digital divide are the right fit for this project, and we eagerly await your response to our proposal.

Sincerely,

Brian Snider

Brian Snider
Chief Executive Officer of Lit Communities
brian@litcommunities.net
334.714.1439

Table of Contents

1. Profile of Lit Communities

Lit Communities' dedicated team for the City has deep experience in the broadband industry.

- Brian Snider, *CEO,* will lead the Lit Communities team on this project. Brian has over 15 years of experience in wide area network deployments having led the build out of the entire Southeast US for AT&T's U-verse release, Google Fiber's builds in Austin, Salt Lake City, San Antonio, and Huntsville, Verizon's network densification in Seattle, San Francisco, Cleveland, Nashville, and Knoxville.

Name	Title	Experience (Years)	Contact information
Brian Snider	**Chief Executive Officer**	**15**	**brian@litcommunities.net** **334.714.1439** **Location: Chelsea, AL**

Brian previously worked as Director of Fiber Delivery at Byers Engineering in addition to creating the Network Design Practice Area at Foresite Group. Brian has over 15 years of experience in wide area network deployments, having led the build outs of the entire Southeast US for AT&T's U Verse release, Google Fiber's builds in Austin, Salt Lake City, San Antonio, and Huntsville, Verizon's network densification in Seattle, San Francisco, Cleveland, Nashville, and Knoxville, in addition to numerous municipal projects throughout the country. Brian has worked with a core team to create a process that brings community broadband into the 21st century.

Experience Highlights:

Medina County, OH; Practice Area Leader*/CEO	July 2017 - Present
Broomfield, CO; Practice Area Leader*	November 2017 - March 2018
Breckenridge, CO; Practice Area Leader*	January 2018 - April 2019
Lampasas, TX; Practice Area Leader*	February 2018 - June 2018
Google Fiber - Multiple Cities; Practice Area Leader*	January 2013 - October 2016
Mastec - 5G Deployment Verizon; Practice Area Leader*	January 2017 - November 2018
Huntsville Utilities FTTH Network; Practice Area Leader*	January 2017 - November 2018

- Rene Gonzalez, *CSO*, has over 16 years of experience working with communities and for state agencies regarding various aspects of grant programs and will research and provide funding options for the City which will be included in the Financial Model.

Name	Title	Experience (Years)	Contact information
Rene Gonzalez	**Chief Strategy Officer**	**16**	**rene@litcommunities.net 956.346.3439 Location: San Antonio, TX**

Rene has over 16 years of experience in project management, strategic planning, project development and federal and state grant consulting for public works and infrastructure projects. He has worked in both the private and governmental sectors, which provides a unique ability to strategically align the needs of clients with opportunities to leverage financial assistance from the federal and state governments. Over the course of his career, he has assisted various municipalities and government entities on obtaining more than $38 million in grant funding for critical infrastructure projects. Rene is a strong supporter of efforts to curtail the digital divide in communities across the United States and is the Chair of the Steering Committee for the Digital Inclusion Alliance of San Antonio and a member of the Advisory Committee for the City's Digital Divide Assessment survey..

Experience Highlights:

- Jackson County, FL: Director of Grant Services/CSO — November 2018 - Present
- Medina County, OH; Director of Grant Services*/CSO — July 2018 - Present
- ATNI/Navajo Tribal Utility Auth; Director of Grant Services* — November 2018 - April 2019
- Neighborly; Director of Grant Services* — January 2019 - June 2019
- Robstown, TX - Comprehensive Master Plan; PM* — March 2014 - March 2015
- Robstown, TX - FEMA Hazard Mitigation Action Plan; PM* — March 2014 - March 2017

- Lindsey Brannon, *Chief of Staff and Director of Finance,* brings over 10years of experience in banking and broadband financing to this Team and she will assist Brian in developing the Financial Model.

Name	Title	Experience (Years)	Contact information
Lindsey Brannon	**Chief of Staff & Head of Finance**	**11**	**lindsey@litcommunities.net 561.719.2084 Location: New York, NY**

Lindsey Brannon has 11 years of finance experience, including nine years of banking and two years of startup positions. Most recently, Lindsey was the Head of Finance at Neighborly, where she led the firm's broadband project finance efforts and public finance bond transactions. Prior to Neighborly, she was a Public Finance Investment Banker at J.P. Morgan where she worked on over $6 billion of senior managed bond issuances for some of the largest and most complex municipal issuers. Lindsey also worked for three years in J.P. Morgan's Private Bank providing investment, credit, and trust and estate services to Fortune 500 and financial services executives. Lindsey graduated from The University of Chicago with a B.A. in Public Policy Studies and is a CFA Level I Candidate.

Experience Highlights:

● Medina County, OH; Head of Finance* / Chief of Staff	December 2018 - Present
● South Portland, ME Broadband; Head of Finance*	April 2019 - October 2019
● Katahdin, ME Broadband; Head of Finance*	February 2018 - October 2019
● Stockton, CA Broadband; Head of Finance*	May 2019 - October 2019
● Ammon, ID Fiber LID #2; Head of Public Finance*	January 2018 - January 2019
● Various U.S. Minibond Transactions; Head of PF*	August 2017 - November 2018
● Various U.S. Municipal Bond Transactions; Associate*	October 2011 - August 2017

- Jessica Fowler, Chief Client Officer, has over 12 years of public service as an elected official and deep experience working and supporting municipalities who are invested in bringing fiber to their communities. She will support Brian in managing the project schedule and scope, schedule and lead meetings and provide overall project management for this work as well as serve as the day to day contact for the City.

Name	Title	Experience (Years)	Contact information
Jessica Fowler	**Chief Client Officer**	**12**	**jessica@litcommunities.net** **860.309.0987** **Location: Sharon, CT**

Jessica has extensive experience serving as a municipal leader with five years of work in the fiber network space advocating for community- owned networks. She has appeared on several panels representing leaders and has testified at governmental hearings on issues of access for rural communities. Jessica understands how important fiber is and the urgency of having it available and affordable for cities and towns overlooked by incumbent carriers. In addition to her government work, Jessica served for three years as COO for a construction management firm developing health centers in several areas of the country and is passionate about utilizing tele-health platforms to deliver health-care to hard to reach areas.

Experience Highlights:

● NorthwestConneCT, Chair	June 2015 - November 2019
● Town of Sharon, CT, Selectman	November 2013 - November 2019
● Chief Operating Officer, Project Delivery Associates	March 2016 - November 2019

Work histories and capabilities follow for other members of the Lit Communities Team:

Name	Title	Experience (Years)	Contact information
Lauren Bender	**Chief Operating Officer**	**6**	**lauren@litcommunities.net 512.743.5612 Location: Denver, CO**

Lauren has worked in the Outside Plant telecommunications industry for 6 years in a variety of different roles ranging from design engineering, to project management, and business development. Her passion for Open Application Networks led to her becoming a co-founder of Lit Communities, and she helped to develop strategic, technological processes and operating procedures to first engage municipalities on the topic of broadband, and then successfully implement plans to bring these communities into the digital era. With a Bachelor of Science in Urban and Regional Planning and Geographic Information Science (GIS) certification from Texas State University – Lauren has a unique approach to working with communities on their broadband efforts, one that is open and engaging to the public, yet backed by data analytics and thoughtful planning on the private side.

Experience Highlights:

- Medina County, OH; Business Development Director*/COO — July 2017 - Present
- Broomfield, CO; Business Development Director* — November 2017 - March 2018
- Breckenridge, CO; Business Development Director* — January 2018 - April 2019
- Lampasas, TX; Business Development Director* — February 2018 - June 2018
- FTTH Projects Caribbean; Project Manager/Network Eng.* — October 2014 - October 2016
- Google Fiber, Austin TX; Designer OSP Team Lead* — July 2013 - October 2014

Name	Title	Experience (Years)	Contact information
Roger Wilson	**Chief Deployment Officer**	**25+**	**roger@litcommunities.net 303.489.4476 Location: Denver, CO**

Roger has been involved in telecom deployments and network operations for the last 25 years. Roger has led three national network deployments, as well as several regional and market level construction projects for both wireline and wireless broadband technologies. Roger is recognized as an experienced and seasoned executive with over 45 years of leadership experience in both the military and telecommunications industry. Roger was also overall responsible for the Huntsville Utility/Google Fiber project in Huntsville Alabama. This experience has provided a unique management perspective on how to provide network services that meet and exceed expectations. Prior to 1995, Roger served his country in the United States Army and retired as a Lieutenant Colonel after 23 years of service. Roger holds a B.A. from Texas Christian University and a M.S. from Long Island University in Brooklyn, NY (at West Point).

Experience Highlights:

● Medina County, OH; Senior PM*/Chief Deployment Officer	July 2017 - Present
● Breckenridge, CO; Senior Project Manager*	January 2018 - August 2019
● Broomfield, CO; Senior Project Manager*	November 2017 - March 2018
● Lampasas, TX; Senior Project Manager*	February 2018 - June 2018
● Huntsville Utilities FTTH Network; Senior Project Manager*	January 2017 - November 2018

Name	Title	Experience (Years)	Contact information
Ben Lewis-Ramirez	**Chief Marketing Officer**	**10**	**ben@litcommunities.net** **512.775.1351** **Location: Denver, CO**

Ben has over 10 years of executive management experience in the outside plant engineering and construction industries, with a focus in business development and strategic planning for the past 3 years. Ben is a vocal advocate for the open application business model, and has published numerous magazine articles and blog posts on the subject, in addition to speaking about it at conferences and other events around the country. Ben brings an entrepreneurial mindset to his work, from co-founding a rainwater collection and landscaping company, to becoming an ISA Certified Arborist to create, implement, and manage tree survey programs for large scale FTTX builds in both Google Fiber and AT&T markets. Ben has worked with some of the best companies and people in the OSP industry in a variety of capacities, from field work, to design engineering, to overall project management.

Experience Highlights:

● Medina County, OH; Business Development Director*/CMO	July 2017 - Present
● Broomfield, CO; Business Development Director*	November 2017 - March 2018
● Breckenridge, CO; Business Development Director*	January 2018 - April 2019
● Lampasas, TX; Business Development Director*	February 2018 - June 2018
● Google Fiber, Austin TX; Designer OSP Team Lead*	January 2016 - October 2016
● Byers Engineering; Field Survey Manager*	July 2015 - January 2016

2. Project Approach

Lit Communities' goal is to create a viable Financial Model that will enable the city to take the next step towards building out a city wide network. Lit's assessment will enable the City of Lucas' to meet its goal to provide access to all of the City's residents and businesses and will position the City to take the next steps towards final design, engineering, construction and operation of a network. Our team will also identify funding options that the City can consider when determining how to finance the network. Costs to deploy, construct and operate the City of Lucas' Broadband Network along with preliminary data on offerings and pricing are standard deliverables Lit includes in all analyses it performs.

Lit Communities has thoroughly reviewed the Scope of Work for the Broadband Network Design and Financial Model provided by the City of Lucas. Our project team understands the City's primary scope is the development of a "dynamic, adjustable Financial Model" that will allow the City to evaluate the financial feasibility of a municipally owned broadband network. Regarding the development of broadband network financial models, our team is greatly experienced preparing this deliverable for a range of communities, both small and large, throughout the United States. From the planning and design perspective, our team utilizes state-of-the-art software applications to inform the costs associated with our proprietary financial models, including deployment costs. We understand that the City of Lucas' Broadband Network Financial Model will require such analysis to backup the assumptions made in the model.

The following narratives explain our project approach for each of the seven activities/tasks included in the City's RFP:

A. Guidelines

Lit Communities understands that we will work collaboratively with the City to review the guidelines and define all the tasks that will be performed as well as create the Gantt chart for the purpose of identifying the Critical Path, illustrate task dependencies, evaluate resources, and project risks. Our goal is to establish a baseline schedule for the work that provides the greatest amount of awareness regarding the tasks and activities at hand and utilize the schedule to not only keep the project on track, but to also communicate with the City and stakeholders regarding progress and completion of milestones.

Lit and the City will schedule a kickoff meeting once all contracts have been executed. The purpose of this meeting will be to;

- establish the overall goals of the project,
- create a point of contact list,
- define the service area boundaries,
- complete an overview and schedule for each task,
- define all data needed and available, including the agreed upon format to transfer of all files.

To get started in planning the network, Lit will create a base map of the agreed upon service area. Our team will coordinate with the City to send all GIS and AutoCAD files, including base

map features, available to Lit through an agreed upon share file platform. The City will also deliver an official address database and for all demand points including homes, businesses, key anchor institutes, sub-stations, and future wireless locations. Lit's team will evaluate all data and provide feedback to ensure accuracy for all future tasks.

B. Work Product Deliverables

Lit Communities understands the deliverable requested by the City of Lucas and will work collaboratively throughout the entire process to ensure that the final product is adjustable, flexible, and inclusive of assumptions listed in the RFP as well as additional factions identified through the completion of the preliminary design. The model will be accompanied by a draft and final report that will include a listing of risks and recommendations for successful broadband deployment, operations and maintenance, and additional aspects identified during the process.

C. Adjustable, Dynamic Financial Model

Lit Communities will develop a detailed and dynamic Financial Model for the City of Lucas, which will be easily adjustable by the City to illustrate various funding and deployment scenarios. To inform the City's model, Lit Communities will perform a high-level preliminary design to enable a data driven analysis of the costs and major impacts during the deployment of the network including;

- value engineering,
- selecting active electronic equipment and sites,
- the amount of fiber, materials, and electronics needed,
- ratio of underground and aerial network placement,
- long lead permit avoidance,
- minimization of necessary traffic control,
- constructability in congested areas,
- ease of maintenance and future access,
- minimization of utility strikes

The preliminary design will be produced using automated design software based on data provided from the City during the Kick-off Meeting. This automated design software combines quantitative analysis with machine learning to generate designs that are optimized for cost efficient network deployment. This reduces planning and design time with subsequent material and labor cost savings. This software is fully customizable to accommodate design parameters for any network architecture. Please note that the output will be more accurate with the most recent GIS data from multiple sources.

Following completion of the preliminary design, incorporation of data and guidelines provided by the City, and analysis of surrounding backhaul fiber infrastructure, Lit Communities will transition to the creation of the detailed and adjustable financial model to provide the vested parties the necessary information to make an educated decision to complete the network build out. With the

evolution of fiber optic networks, there are several technical and financial options available to evaluate. Recognizing that many community leaders do not have specialized knowledge or experience related to fiber optic network planning, design, and management, Lit will gather information and provide guidance to the Client regarding options for;

- network ownership,
- network management and operation,
- network architecture and serviceable scope,
- network marketing and build out sequencing

Lit will consult with our partners to provide the capabilities of different revenue sources across a solid infrastructure foundation. With our collaborative approach and strategic planning, the network will be “best in class” to accommodate unforeseen needs over the lifetime of the system. Lit will also use data obtained to develop requirements for the network to support various “smart city” applications. This will include traffic signals, streetlight mounted sensors, parking sensors, water meter sensors and the antenna collection sites for these applications.

Based on all the information and work completed in the preliminary design and Financial Model, Lit will prepare a draft comprehensive business plan with detailed financial modeling for a fiber to the premise network. There are many avenues to consider for funding a project of this scope and the exact blend of financial sources can only be determined once the data is compiled into a business plan. Lit will provide our rolled up details of the investment, recommendations, financing options, architecture, risks and mitigations, and other data as derived throughout the proposed agreement with the City of Lucas.

Lit Communities will coordinate a strategy session with the City of Lucas to review the Financial Model and draft report and discuss best practices in municipal broadband network planning, design, construction, funding and a deployment schedule to complete connectivity. Lit will give an overview of the results of all tasks and outline the business plan and financial model while answering questions the City might have. Lit will discuss its recommendations for next steps to keep the project moving forward and the required amount of cash flow required for successful deployment. The Strategy Session will be held locally at the Client’s location and should include all primary stakeholders.

D. Assumptions and Supporting Information

Our team understands the importance of being aware of assumptions that will drive the Financial Model prepared for the City of Lucas. Through the completion of past financial models for broadband network deployment, our team is experienced identifying assumptions that are required to gain greater certainty of the scenarios and data provided by the model.

Lit Communities agrees to include, but not be limited to, the following assumptions included in the City of Lucas’ RFP:

- Fiber network plan and deployment
- Right-of-way assumptions and estimates
- Real estate assumptions and estimates
- Physical facilities summaries and costs
- Network-related equipment summaries and costs
- Maintenance equipment summaries and costs
- Organization personnel requirements and related cost estimates
- In-source and out-source recommendations and related cost estimates
- Operating income and cash flow
- Projected revenues and benefits
- Expected and minimum take rates
- Operational expenses
- Depreciation schedule
- Construction build-out cost estimates
- Network design (i.e. preferred equipment, technologies, and topology design)
- Product offerings and pricing structure
- Consumer and business retail pricing plans (i.e. installation fee and recurring access charge by tier)
- Marketplace pricing plans
- Website design costs
- Branding, communications and marketing
- Network implementation duration and timing
- All other assumptions and supporting information

E. Risks and Recommendations

We understand that the successful development of the City's Broadband Network will require a thorough identification, review, and analysis of recommendations, internal risks and external risks that could pose a threat to the City's successful deployment of their network. Combined with a sound and flexible financial model, a clearly defined risk management strategy is integral to the mitigation of key risks that can impact the network's growth and sustainability. Our team will identify, assess, and prioritize risks to minimize, monitor, and control the probability/impact of these events. Our team will identify potential risks as well as the triggers that cause them, assess the impact and probability of their occurence. Through this process, we will outline strategies to mitigate and/or reduce the impact of probable risks in order to provide the greatest likelihood of avoiding their negative impact.

F. Miscellaneous and Other

Our team understands that additional information related to the City's Financial Model may be required to provide greater awareness of opportunities and risks when deploying a broadband network. Through the completion of the risk identification and mitigation process in Task E., our team will identify additional internal and external factors that might impact opportunities for the

network to scale in a feasible manner as well as risks that may pose a threat to the network's development.

G. Funding Identification

Following the completion of recommendations for broadband deployment in Task E., Lit Communities will identify various funding sources that can be utilized for the network's final design plans and construction. Our team is highly experienced in the evaluation of specific funding sources for broadband deployment and creation of the "capital stack" of options for municipalities and public-private partnerships for funding opportunities for over 15 federal broadband grant programs from the following agencies:

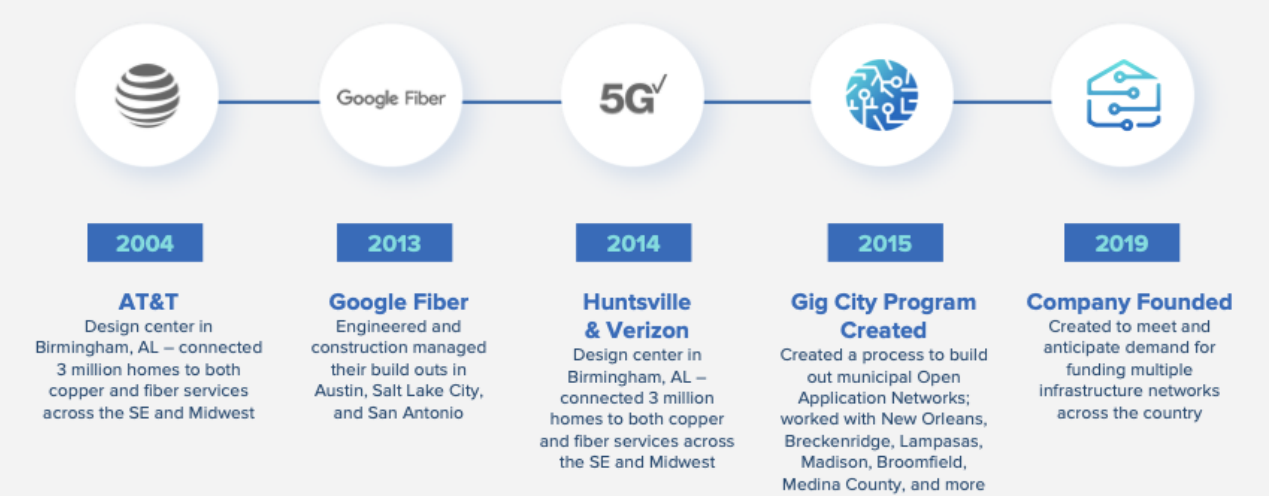
- Federal Communications Commission - Universal Service Administrative Company
- Office of Library Services - Institute of Museum and Library Services
- United States Department of Agriculture - Rural Development
- United States Department of Commerce - Economic Development Administration
- United States Department of Housing and Urban Development
- United States Department of Labor - Employment and Training Administration

For each of the grants identified by our team, we will create funding synopses that can be utilized by the City to fund various aspects of the broadband network, including eligible applicants, eligible project activities, deadlines, and special requirements. Additionally, our team will work closely with the City of Lucas to evaluate additional municipal funding options including debt/loans, municipal bonds, and private equity investment.

3. Lit Communities' Qualifications

Lit Communities ("Lit") is a Limited Liability Corporation founded in April of 2019 by an experienced executive team. Lit's headquarters and sole office is located at: 164 Lake Chelsea Drive, Chelsea, Alabama 35043. Lit's founding executives worked together on network deployments for large private companies before establishing a municipal broadband consultancy group at some of the group's former employer, Foresite Group.

Lit Communities was originally formed to both provide market and needs assessments and to exist as an infrastructure investment and network asset ownership group which could invest in opportunities that had been identified as viable through the consultancy. Lit Communities maintains an active broadband deployment consultancy and owns last mile network infrastructure as well. Our background in both large private telecommunications projects as well as more community oriented broadband projects gives us a unique advantage. Below is a timeline of our company's founding.



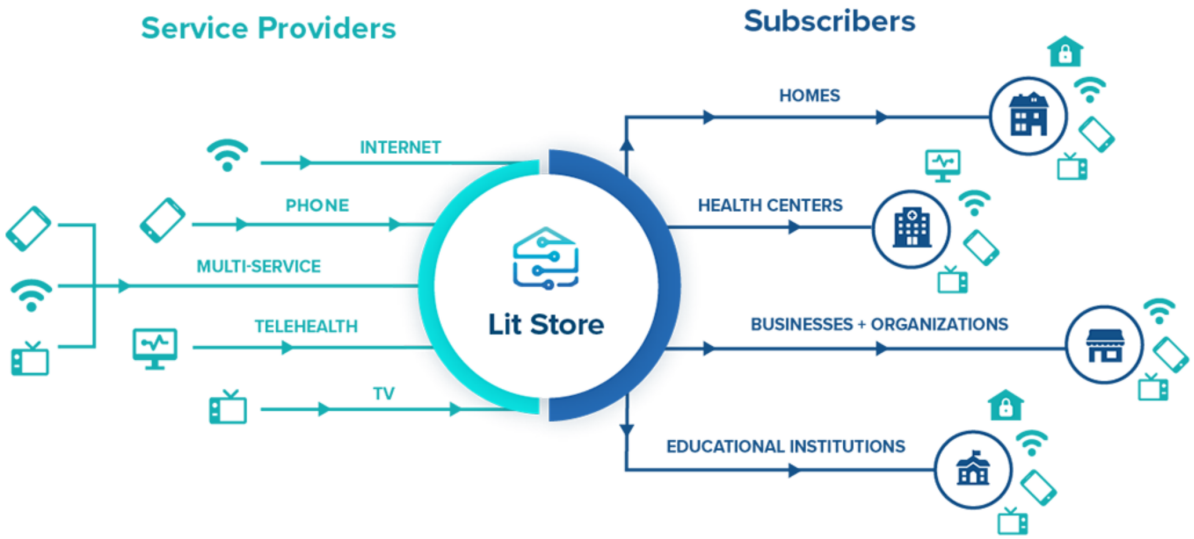
We leverage our extensive industry experience with wide area network deployments, and our relationships with the best technology and Original Equipment Manufacturer ("OEM") partners in the world, to determine highly accurate construction and material cost estimates. This is paired with a demand aggregation process, in which we assess the likely take rates and necessary network capacity to support all potential present and future subscribers, including backhaul for wireless carriers in support of 5G deployments, and various smart city and public safety applications.

Our process for making this determination, which we call our Community Assessment Process, is born from decades of experience as design engineering vendors for tier one providers like AT&T, Verizon, and Google Fiber. The end goal of the consulting work we do on behalf of communities

around the country is the creation of a financially viable roadmap to an open application broadband network. Our consultancy therefore supports and informs our efforts on the infrastructure side of our business, where we invest in the construction and operation of open application networks.

Lit Communities is a vocal advocate for the open access/Open Application model, our business is based upon it, and our executive team has written and spoken about it extensively in the public forum. We have strong working relationships with UTOPIA, NoaNet, iFIBER, Docity, and numerous other providers comfortable operating in the open access environment, and have OEM and technology partners that understand and support our efforts as well. This, combined with our world class partners SNG and Vetro, and years of experience overseeing the engineering design of wide area networks for both private and public clients, makes us a consulting partner able to deliver highly accurate cost estimates and models.

The Open Application model (see graphic below) with which we operate our networks allows for multiple revenue streams unassociated with the traditional triple play of internet, phone, and television services. We can therefore make viable business cases for fiber optic network deployments on behalf of communities whose incumbent providers cannot, and then actually make those networks a reality by building them ourselves.



The Lit Communities team, under previous employers, have demonstrated an ability to successfully work with municipalities, internet service providers and broadband infrastructure owners to produce the following outcomes:

Past Project Experience	Status/Notes
Breckenridge, Colorado January 2018 - April 2019	Completed **Community Assessment, including Financial Modeling and Business Plan** and network is now being

	constructed with service expected to begin in 2020
Lampasas, Texas February 2018 - June 2018	Completed **Community Assessment, including Financial Modeling and Business Plan** and City is partnering with a provider to first bring fiber to a location so it can begin building a backbone network to connect all City facilities
Huntsville, Alabama January 2017 - November 2018	Completed **Community Assessment, including Financial Modeling and Business Plan** and detailed Design of a complete network in partnership with Huntsville Utilities for lease to Google Fiber. Total network was 7.1 million feet of fiber design
Medina County, Ohio July 2017 - Present	Completed **Community Assessment, including Financial Modeling and Business Plan** and working with County to raise funding to build a last mile fiber to the home network to all residents and business owners
New Orleans, Louisiana March 2017 - Present	Completed **Community Assessment, including Financial Modeling and Business Plan** and City is now building a backbone network to connect all City facilities and partner with last mile providers to lease services
Roanoke Valley Broadband Authority, VA December 2019 - Present	Ongoing **Community Assessment, including Financial Modeling and Business Plan** for the City of Salem, VA which includes demand assessment, engineering and design of a last mile fiber to the home network for all residents and business owners and the financial model and business plan to support the network. Additional Community Assessments to be performed in Roanoke County, Roanoke City and Botetourt County.
Broomfield, Colorado November 2017 - March 2018	Completed **Community Assessment, including Financial Modeling and Business Plan** and City is almost done building a backbone network to connect all City and water substations.
State of Alabama (EDPA) January 2017 - January 2018	Completed study for a state backbone network with previous company but due to strict NDA's we are unable to discuss the scope of results in this response. Lit Communities can execute a similar NDA with The City of Shelby and get approval from EDPA to discuss in more detail if warranted.
AT&T, Google Fiber and Verizon 2004 - 2013	Our team has completed Planning, Design and Construction Management for networks across Alabama and the entire Southeast for AT&T, multiple Tier 1 City projects for Google Fiber and most recently Verizon's fiber densification projects for future 5G deployment

4. Cost of Services and Timeline

The Cost Proposal and Timeline tables listed below are broken into five tasks that will include all items listed in Section 2 Project Approach.

Cost Proposal

Task	Description	Unit of Measure	Units	Unit Cost	Total Cost
1	Kick Off Meeting and Data Collection/Review	Each	1	$2,500	$2,500
2	Preliminary Design - Setup	Each	1	$1,500	$1,500
3	Preliminary Design - Execution	Demand Points	2,127	$1	$2,127
4	Financial Model and Business Plan	Each	1	$12,500	$12,500
5	Draft/Final Report Strategy Sessions	Each	2	$1,750	$3,500
				Total	**$22,127**

Timeline

	Duration (Weeks)															
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Task No. 1 - Kickoff Meeting and Data Collection/Review																
Task No. 2 & 3 - Preliminary Design (Setup and Execution)																
Task No. 4 - Financial Model and Business Plan																
Task No. 5 - Draft/Final Report Strategy Sessions																

5. Previous and Current Projects

Medina County, OH

Project: Medina County, OH

Date: July 2017 - Present

Size: 423 mi^2, 92 miles of fiber

Budgeted Cost: $55 MM

Anticipated Deadline: 12 months for construction of phase 1 and 3 years for phase 2

Scope: Build out of FTTH/B for approximately 44,000 residents and businesses

Network Type: Open Access; Aerial & Underground Build

Technologies used: Automated design, LiDAR collection & extraction, Smart City Applications

Initial Services: Internet: 100/100 Mbps, 250/250 Mbps, 1 Gig; Telehealth

Middle Mile: Medina County Fiber Network ("MCFN") is an Open Access middle mile ring connecting all major cities within the County serving large and medium businesses. MCFN, launched in 2011, has 13 carriers offering services across the County's infrastructure. In 2017, Dave Corrado, CEO of MCFN, met Brian Snider, CEO of Lit, and devised a plan to bring fiber to homes and businesses.

Firm Involvement: Lit Communities and its capital provider are joint owners of this project. Lit is bringing the most efficient team together to light this network, working with partners from the engineering side to the operations and maintenance. Lit is partnering with MCFN, leasing strands to build last mile connectivity to the residents and small businesses of the County. Lit formed the capital structure for this project with no request to the County to pay for any of it.

Phase 1: Funding secured of approximately $8 million without any capital expenditures by cities/towns or the County. ~ 6,500 residents and businesses

Key Personnel: Brian, Lauren, Ben, Rene, Roger, Jessica, Lindsey

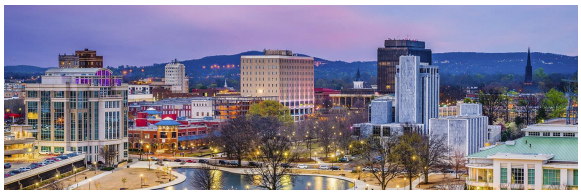
Reference: David Corrado - CEO; Medina County Fiber Network, 144 N. Broadway, Medina, OH 44256; Phone: 216.832.7059; E-mail: dcorrado@fibercounty.com

Project Relevance:

- ✅ **Planning/Design**
  - ***Financial Modeling***
  - Drawings & Shapefiles
  - Public Poles Utilization
  - Field and Site Surveys
  - Aerial & Underground
  - Coordination with County officials
  - Permitting
  - Right of Way Analysis
  - Industry Best Practices Application
  - Provide GPS references
- ✅ **Construction**
  - Identify installation method
  - Work with Contractor on personnel, equipment, safety standards
  - Oversee Contractor to meet deadlines
- ✅ **Fiber Splicing, Testing Documentation, Labeling**
- ✅ **OSP Infrastructure**
- ✅ **Site Restoration**
- ✅ **Project Management**
- ✅ **Secure O&M Partner FTTP**
  - Secure ISPs/XSPs who offer broadband, competitive pricing, next gen services, customer support

Huntsville Utilities, AL

Project: Huntsville Utilities, AL



Date: January 2017 - November 2018

Size: 215 mi^2, 7.1 million feet of fiber design

Budgeted vs. Total Cost: $95 MM / $112 MM

Deadline vs. Completion: In progress - all right of way construction planned to be completed in early 2020

Network Type: Dark fiber GPON lease to Google Fiber as anchor tenant

Technologies used: Automated design, LiDAR collection & extraction, Smart City Applications

Services: 1 Gig Internet

Project Background: Huntsville Utilities ("HU") built out a fiber infrastructure network to all properties within the City limits of Huntsville, AL. HU designated fibers for their own use and "smart city" applications to improve the communication capabilities of the water, electric, and natural gas systems, while also leasing a portion to Google Fiber. Google provides the data content for all residents and businesses as a service provider. The network is owned and operated by the City and acts as another utility revenue stream in conjunction with their city owned electricity, water and gas services. This model of fiber network deployment allows for the local residents to obtain Gig connectivity in areas not otherwise provided at a faster rate due to the City utility building the infrastructure and an anchor tenant providing service.

Firm Involvement: Members of Lit Communities worked on this project with their previous employers, Foresite Group, Inc and The Broadband Group. They supervised the design, engineering, and construction through the life of the project. Brian and his team were able to efficiently engineer the network to bring HU back within their planned budget. He also consulted with HU on the implementation of Smart City applications and other innovative use cases for the fiber network.

Key Personnel: Brian, Lauren, Ben, Roger

Reference: Stacy Cantrell - Vice President of Engineering, Huntsville Utilities; 112 Spragins St NW, Huntsville, AL 35801; Phone: 256.535.1312; E-mail: stacy.cantrell@hsvutil.org

Project Relevance:

- ✅ **Planning/Design**
  - ***Financial Modeling***
  - Drawings & Shapefiles
  - Route Optimization
  - Public Poles Utilization
  - Field and Site Surveys
  - Aerial & Underground Coordination with
  - County officials
  - Permitting
  - Right of Way Analysis Industry Best Practices
  - Application Provide GPS references
- ✅ **Construction**
  - Identify installation method
  - Work with Contractor on personnel, equipment, safety standards
  - Oversee Contractor to meet deadlines
- ✅ **Fiber Splicing, Testing Documentation, Labeling**
- ✅ **OSP Infrastructure**
- ✅ **Site Restoration**
- ✅ **Project Management**
- ✅ **Secure O&M Partner**
- ✅ **FTTP**
  - Secure ISPs/XSPs who offer broadband, competitive pricing, next gen services, customer support
  - Install equipment

Broomfield, CO

Project: Broomfield, CO

Date: November 2017 - March 2018

Size: 34 mi^2

Budgeted Cost: $60K for study and planning

Total Cost: $60K for study and planning - city is building out a backbone network for $8MM based on final analysis

Technologies used: Automated design, Smart City Applications

Bandwidth: 1 Gig

Project Background: The City and County of Broomfield, CO looked to build a fiber network to connect their city and county facilities, as well as other anchor institutions. They also wanted to know what a network could look like if they scaled to connectingall homes and businesses with the County. Broomfield wanted to focus on a phased approach with the ultimate goal being to create a Master Fiber Development Plan.Members of our executive team were responsible for the following: On-Site Strategy Session, Preliminary Design & Capital Cost Analysis, Market Assessment PortfolioCreation, Master Fiber Development Plan. The plan was finalized in March of 2018 and Broomfield has constructed the first phase of our suggested plan.

Firm Involvement: Members of Lit Communities executive team worked with the City and County of Broomfield to create a Master Fiber Development Plan. This included estimating cost of construction for an institutional backbone ring, combined with an estimate to build a full FTTH/B network throughout the County. Utilizing auto design software we ensured cost estimates were delivered at 95% accuracy. During this project, we worked with the municipality to create a Dig Once Ordinance. We ultimately delivered multiple business plans to Broomfield from which they chose the right path forward for their community.

Key Personnel: Brian, Lauren, Ben, Roger

Reference: Ernesto Chavez, Information Technology Director, City and County of Broomfield, CO; One Descombes Drive, Broomfield, CO 80020; Phone: 303. 438.6241; E-mail: echavez@broomfield.org

Project Relevance:

- ✅ **Planning/Design**
  - ***Financial Modeling***
  - Drawings & Shapefiles
  - Route Optimization
  - Public Poles Utilization
  - Field and Site Surveys
  - Aerial & Underground Coordination with City/County officials
  - Permitting
  - Right of Way Analysis Industry Best Practices
  - Application Provide GPS references
- ✅ **Consulting**
  - Identify installation method
  - Work with City/County on OSP, personnel, equipment, safety standards.
  - Assist City/County in the creation of a “Dig Once” policy

Appendix A: Lit Communities Competitive Advantage

Our Unique Model & Technology Transforms Communities

- ✅ Separation of infrastructure and services
- ✅ Community campaign drives adoption and allows for transparency for capital provider
- ✅ Multiple service providers, including leasing 5G small cells
- ✅ Ability for users to instantly add & change of services through Software Defined Network
- ✅ Neutral Operator
- ✅ Non-ISP owned / operated
- ✅ Wholesale neutral operation
- ✅ Telehealth-ready-HIPAA-compliant
- ✅ Option for network takeout through future Community Purchase

The Process

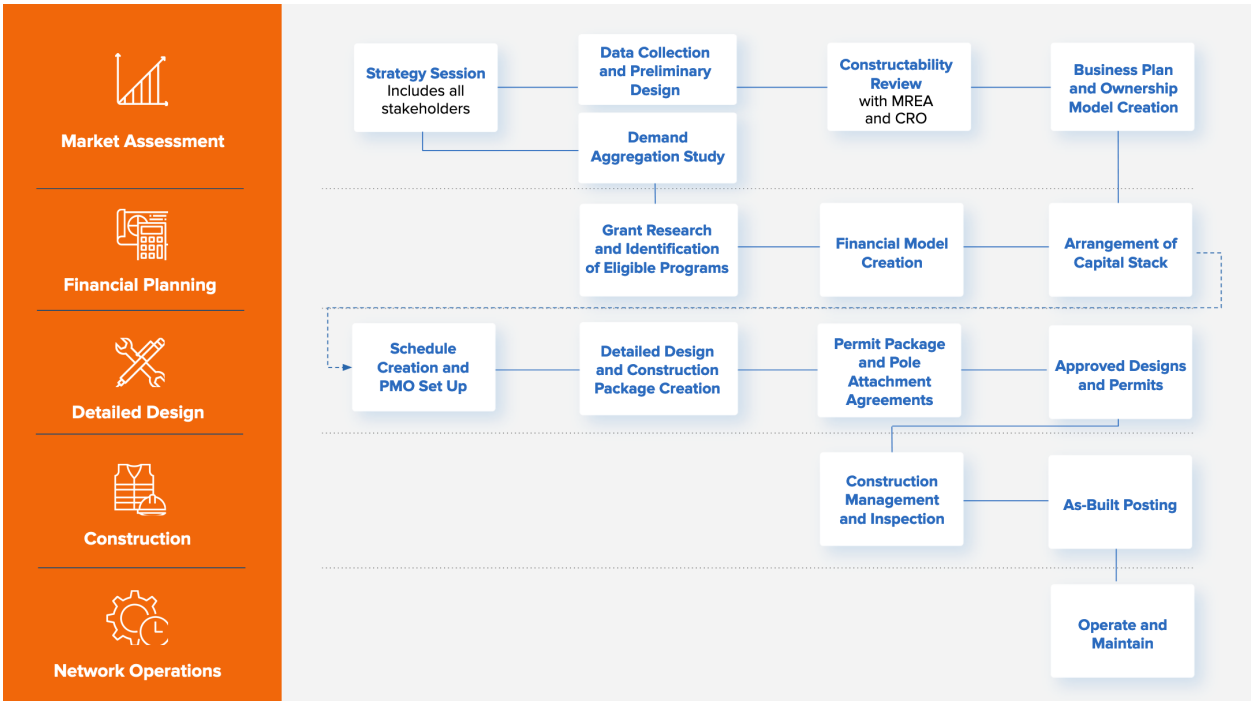
Community Assessment
Analyze cost through network designs and demand through community engagement

Design and Engineering
GIS design, construction packages, permits, and construction management

Construction
Aerial including Make Ready, Underground, Installation

Operations and Maintenance
Community communication and involvement to ensure connectivity is secure and maintained daily

Expansion
Adding smart city applications and growing to new greenfield areas – we are creating a living ecosystem



The Providers (XSPs)

Internet, Voice, and CATV

Anchor tenant "Burn in Fee" for initial networks and wholesale fees for internet, voice, and cable TV services paid monthly

Telehealth

Services offered as per monthly fee for application and then fee per doctor visit. Wholesale fees are split between doctors, service provider, and owner

Smart Home Apps

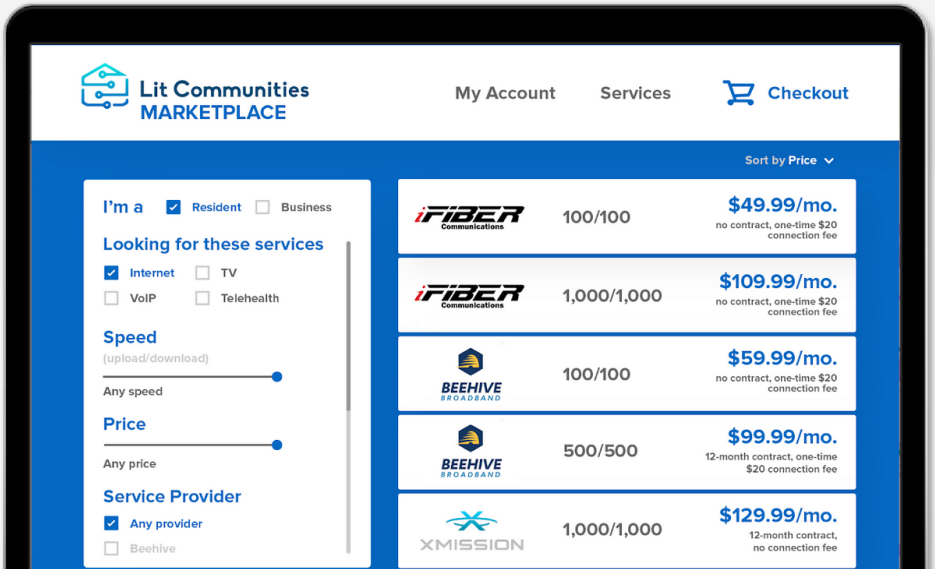
Smart home packages from automated lighting, AC, garage doors, music controls, monitoring, schedule, health tracking, even your refrigerator will be a service wholesale fee

City and Dark Fibers

Spare dark fiber and conduits are leased to wireless providers like Verizon and we build a smart city strategy and system in place for the community for added revenue

The Fiber Marketplace

The App Store for your home or business



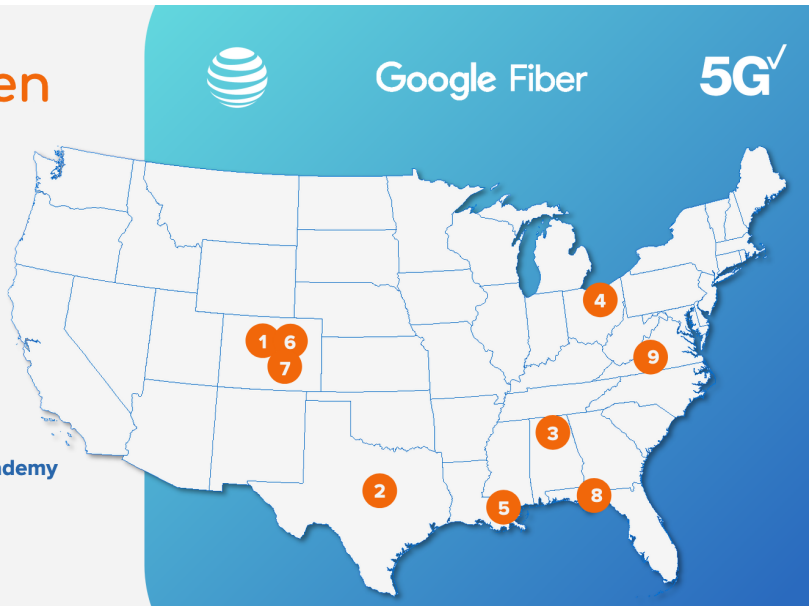
Policies and Planning

- Dig Once/Open Trench Policy
- One Touch Make-Ready
- Streamlined Permitting Process and Franchise Fees
- Conduit Standards for Greenfield Developments
- Wireless and Small Cell Policy
- Utilize GIS and Interagency Communication

OUR EXPERIENCE

Where We've Been

1. Breckenridge, CO
2. Lampasas, TX
3. Huntsville, AL
4. Medina County, OH
5. New Orleans, LA
6. Broomfield, CO
7. Colorado Springs, CO/Air Force Academy
8. Jackson County, FL
9. Salem, VA



Lit Communities Team

Brian Snider,
Chief Executive Officer

Lauren Bender,
Chief Operating Officer

Ben Lewis- Ramirez,
Chief Marketing Officer

Rene Gonzalez,
Chief Strategy Officer

Roger Wilson,
Chief Deployment Officer

Jessica Fowler,
Chief Client Officer

Lindsey Brannon,
Chief of Staff & Head of Finance

mission broadband
Connecting America's Communities

Proposal to City of Lucas, TX

for

Broadband Network Design

& Financial Model

January 24th, 2020

Proposal to City of Lucas, TX
For Professional Broadband Consulting Services
by Mission Broadband, Inc.

Contact Information:

James (Jim) E. Rogers, Jr.
President, ProInfoNet
President, Mission Broadband, Inc.
145 Exchange Street, Suite 4
Bangor, ME 04401
jrogers@missionbroadband.com
207-947-3636

John Dougherty
Vice President/General Manager Mission Broadband, Inc.
145 Exchange Street, Suite 4
Bangor, ME 04401
johndougherty@missionbroadband.com
207-922-4102

Cover Letter

We are pleased to provide a response to the City of Lucas **Broadband Network Design and Financial Model Request for Proposal (RFP).**

This proposal is being submitted by Mission Broadband, Inc., a division formed within ProInfoNet, a company founded by Jim Rogers in 1995 as an independent technology consulting firm. Our team has provided superior consulting services to its clients across the United States for the past 24 years.

Our Mission Broadband division was formed to focus on the needs of broadband within municipalities. The combined resources and experience of ProInfoNet and Mission Broadband strongly qualifies us for the City of Lucas **Broadband Network Design and Financial Model Request for Proposal.** Our team has many years of telecommunications and data networking design, build and implementation experience, including municipal network builds.

Mission Broadband, Inc. (hereafter referred to as Consultant), is well positioned to develop the Broadband Network Design and Financial Model solicited in the Request for Proposal. Consultant's approach will be an iterative process of collaborating with the City of Lucas and project stakeholders to conduct a variety of data gathering tasks and research that will guide the development of a versatile financial model. The financial model developed will encompass all aspects of network construction and operation allowing for variations in key data related to expenses and revenues. Many factors will be considered in developing

the financial feasibility of a city-wide broadband network deployment to include; take rates, variations in end user costs, outside plant facilities, rights of way, central office facilities, electronics, maintenance and repair costs, etc.

Consultant's team of professionals has managed large fiber projects and understands the operational and financial models that drive network builds and ongoing operational services. Through active listening and participation sessions, we work with our client on the gathering and analyzing of data. These studies are often the baseline for financial modeling and our RFP process, which allows Consultant to solicit creative solutions to meet the client's needs in all areas of network design, construction, operation and ownership. The Consultant's RFP Process utilizes a rating system based on vendor experience, technical merit, cost, compliance, etc. to help our clients determine the best vendor solution for their project. RFP data is often a key component to our financial modeling. Consultant can provide more information on this option at the City's request.

Our approach is vendor and technology neutral. Consultant takes an open and creative approach to each project and seeks to solve municipal broadband needs in the most efficient and transparent manner. Consultant will work with the City of Lucas to develop financial analysis tools which will feed the business model to determine overall project costs, best buildout scenarios, take rates, revenue sharing, return on investment (ROI), etc. We value our relationships with our clients and work diligently to deliver outstanding customer service. We look forward to working with the City of Lucas' team to develop a flexible financial analysis tool to evaluate the best approach to realizing a municipal broadband network.

Our executive team of Jim Rogers, president of Mission Broadband, Inc., Trevor Gordon, Senior Vice President of Mission Broadband, Inc., John Dougherty, Vice President & General Manager of Mission Broadband, Inc., Mike Reed, Director of External Affairs of Mission Broadband, Inc., and Mark Van Loan, Network Engineer have over 120 years of experience in the telecommunications, networking and internet / broadband fields of technology. Our team understands broadband services and the technologies utilized to deliver the desired outcome for the City of Lucas's Request for Proposal (RFP). Our executive team has worked in the telecommunications industry and their experience includes managing the design, building and maintenance of telecommunication and broadband networks. The team also had financial responsibility of modeling and budgeting for these networks.

Please accept this proposal on behalf of Mission Broadband, Inc. We look forward to working with the City of Lucas on the successful development of a **Broadband Network Design and Financial Model.**

Name:	John E. Dougherty
Title:	Vice President and General Manager
Address:	Mission Broadband, Inc. 145 Exchange Street, Suite 4 Bangor, ME 04401
Telephone:	207-922-4102
Email:	johndougherty@missionbroadband.com

Signature: 

Overview of Proposed Process

Consultant's approach to the development of a robust financial model involves a deep level of engagement with the municipality and its stakeholders. Consultant will: create a project plan to include a communication strategy and a regular project meeting cadence with City officials; develop a data gathering tool to be used for collecting information from stakeholders; interview key stakeholders identified by the City; build a financial analysis tool which will be designed to allow variations of costs and revenue options; develop financial modeling that will have a variety of inputs for short and long term analysis of various financial scenarios.

Through an iterative process with all involved stakeholders, Consultant will conduct data gathering exercises and research to gather the information required to support realistic financial modeling. Consultant's process for data gathering and research for this project may include (but is not limited to):

Data Gathering:

- Develop data gathering tool (used in meetings).
- Lead stakeholder meetings (business leaders, anchor institutions, Health-Care providers, education stakeholders, City Council, Broadband Committee, City Manager etc.)
- Determine users of network (residential, business, wholesale, utilities, anchor institutions etc.).
- Determine application usage and bandwidth requirements.
- Determine end user cost expectations.
- Determine performance requirements of a broadband network.
- Determine visual and aesthetic requirements.
- Analyze data collection information.
- Evaluate and summarize input from stakeholders.
- Evaluate and determine technology options and solutions for a broadband network that would match and meet the needs of the City and its stakeholders.
- Assess different network topologies that could be utilized to accommodate the needs of the City and its stakeholders.

Research and Analysis:

- Competitive Environment / Current Providers
  - Technology Deployed
  - Pricing Trends
  - Assets
  - Lifecycle

- Potential Municipal Network
  - Take Rates
  - Subscriber Pricing
  - Revenue Opportunities
  - Capital Expense
  - Operational Expense
  - Potential Public-Private Partnerships
  - Usage Models
  - Risk Analysis & Recommendations
  - Security Requirements

- City of Lucas Fiber-Optic Broadband Advantages
  - Analyze geographic benefits
  - Smart City infrastructure availability
  - Dark fiber and wholesale
  - Economic development
  - Accommodate areas growth plans
  - Healthcare
  - Public Safety
  - K-12 Education
  - Post-Secondary Education

- Future proofing technology infrastructure
- Regulatory process
  - Permit requirements
  - Fees
  - Rights of Way
  - Indefeasible Rights to Use
  - Approvals (Local, State, Federal)

- Research available funding and grant opportunities

Consultant is vendor neutral and technology neutral, which allows for all options to be reviewed and analyzed in a fair and open manner. Although not requested in the City of Lucas RFP, Consultant could use a comprehensive RFP process to obtain firm costs associated to broadband network engineering and design, construction, service providers, operations, electronics to operate the network, end user electronics, etc. Our RFP process allows for respondents to be creative in their responses so we can obtain the best options for the City of Lucas for today's needs and future technological advancements. Consultant can provide more information on this option if the City of Lucas is interested.

Consultant will use industry experience and expertise to develop initial high-level design and financial models for a municipal broadband network. Financial modeling will include options for grants and revenue from subscribers to help determine projected build options and Return on Investment (ROI). The financial modeling process will allow for creativity and flexibility as it pertains to construction design, private-public partnerships, take rates, monthly recurring costs (MRC), non-recurring costs (NRC), ownership models, Operation Expense (OPEX), Capital Expense (CAPEX), etc. Consultant uses our industry expertise to work with clients and help them understand all the areas of cost and revenue streams for a municipal

broadband network. This work can help the City of Lucas govern which areas are built-out with in a pre-determined time table.

Consultant would guide all options through the financial modeling and resulting data analysis to create a holistic view of a municipal broadband network deployment project. All elements of expense and revenue will be captured in the financial analysis tool, resulting in a business model to be used as a guideline by the City of Lucas and Consultant to assess their broadband project. As part of the project, Consultant will share all findings with the core City project team. Consultant will develop a final report to be presented to City officials.

As the City of Lucas' broadband network progresses into further stages of development, Consultant will continue to assist as recommended by the City. Consultant is well versed with contract negotiations and can represent the City of Lucas on all contract negotiations with potential partners. Consultant is a professional project manager and can provide project management services for the City throughout the entire build-out process.

TECHNOLOGY RECOMMENDATIONS

Consultant is vendor and technology neutral, however, for a greenfield municipal network deployment in the City of Lucas, we recommend a fiber network to every premise in the community with enough capacity to support 25% growth over the next 10-20 years. Consultant recommends a Fiber-to-the-Premise (FTTP) GPON architecture with Active Ethernet capabilities as being the most flexible and future proofed architecture available. While other technologies such as copper, TVWS, and Fixed Wireless could provide broadband access at speeds sufficient for some of today's users, and more rapidly than an FTTP deployment, fiber-based access provides the most resilient and scalable method of connecting premises to the Internet. Fiber based access will provide the speeds necessary to support current and emerging applications regardless of the bandwidth requirements or the direction of traffic flows (upstream vs downstream).

Note: Should Consultant be awarded the contract for this project Consultant is open to discussing alternate deployment technologies with potential partners.

EXPERIENCED PROJECT TEAM

Jim Rogers, President ProInfoNet and Mission Broadband, Inc.

Jim Rogers is a true pioneer in his field. After founding ProInfoNet, an independent telecommunications and computer consulting firm, in 1995, Jim revolutionized network functions for his entire customer base.

He implemented a strategic combination of technology and best practices to benefit medium and large enterprises in New England by reducing costs and increasing both value and efficiency. ProInfoNet' s current list of more than 180 clients spans the country. Since its founding, his companies have developed and successfully negotiated over 500 technology, network and broadband RFP's. Through his RFP process, Jim's companies have successfully supported the installation of networks to over 4000 locations throughout the United States utilizing a broad range of network technologies.

In 2007, in direct response to the Federal Communications Commission's creation of the Rural Health Care Pilot Program (RHCPP), a program designed to provide an infrastructure for rural healthcare providers to

connect electronically to their urban counterparts, Jim founded the New England Telehealth Consortium (NETC).

Once established, Jim applied for NETC funding as part of the RHCCP and in an unprecedented response, the FCC awarded NETC 24.6 million dollars.

Today NETC is a non-profit member organization with more than 1,100 healthcare participants across Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island. ProInfoNet managed the initial implementation and continues as the managing agent of the multi-state network. Thanks to Jim's leadership, NETC members have saved millions of dollars in networking costs and received additional network value through the NETC membership.

Prior to founding ProInfoNet, Jim spent 15 years in the private business sector, managing information technology and telecommunications in Maine. He holds a Bachelor of Science from the University of Maine and has served as adjunct faculty at Husson University, teaching courses in Telecommunications and Information Technology.

John Dougherty – Vice President and General Manager

John Dougherty has over 30 years' experience in Telecommunications, Internet and Networking services. John was the Vice President of operations for a Maine based CLEC and responsible for the build out of their Fiber-To-The Premise to numerous communities. John has also directly project managed fiber builds, central office installations and data center designs as well as many Wide-Area Network (WAN) installations. John has a solid working knowledge of Telecommunications infrastructure as well as a solid understanding of the technologies designed to provide Internet services to residents and businesses. John is a graduate of Electrical Engineering Technology – Associates, from the University of Maine. Before joining Mission Broadband, John owned a consulting and project management company working on network solutions with companies such as Oxford Networks, NASCAR, LL Bean and various broadband companies, helping these companies design and implement a variety of technologies to include FTTP, fixed wireless and cellular solutions.

Michael Reed - Director of External Affairs

Michael Reed has over 40 years in the telecommunications industry working in the Northeast (30 years in Vermont). Prior to starting his consulting firm, he has held a number of management positions with NYNEX, TDS Telecom, FairPoint Communications and as State President for Consolidated Communications in Maine, New Hampshire, and Vermont. Mr. Reed's experience includes Network operations, Outside plant operations, large project management, community and public relations, regulatory and legislative affairs. Mr. Reed has recent experience (4-5) years with solicitations for and experience with municipal projects to expand broadband. His experience includes meetings with town officials, responding to RFPs, evaluating broadband expansion in towns and advising suggested solutions.

Trevor Gordon - Senior Vice President

Trevor Gordon manages operations overseeing all back-office functions that keep the companies running. Trevor boasts over 30 years in business and technology management with extensive telecommunications, marketing and sales, operations and financial management of medium to large businesses. Trevor spent

many years in the management and operations of large corporations including CarMax, H.E. Murdock, Pride Golf Tee and Kmart. Trevor holds a Bachelor of Science degree in Business Administration from the University of Maine.

Mark Van Loan - Network Engineer

Mark Van Loan has held a career in technology for over 30 years, in a variety of positions including hands on technical roles, Sales Engineering and Project Management roles, and mid and senior level management in the areas of Information Technology and Telecommunications. Working in the Telecommunications industry in New England Mark has played key roles in the areas of Network Operations, Customer Service and Technical Support and has provided oversight and management of key operational functions including Field Services, Transport, Switching, Network Engineering and Network Operations Center. Mark has an associate degree in Computer Science and is well-versed in Service Provider as well as Enterprise networking technologies, having held many industry certifications in networking prior to joining management. While at Oxford Networks and FirstLight Mark held Director and VP roles leading teams tasked with expanding and supporting fiber transport, distribution and access networks throughout New England.

The project team members of Jim, John, and Trevor all worked together on the ProInfoNet NETC project, creating RFP's, selecting vendor, negotiating contracts, and implementing a 320-site network utilizing a variety of technologies to Healthcare providers in the northeast. Many sites were rural, and this project also included providing services to several islands off the coast of Maine. This team has worked together over the years in a variety of capacities designing and implementing different technology solutions.

Along with the management team directly assigned to this project, another 8 staff members are available to assist with the City of Lucas project including members from our accounting team, engineering team, project management team and administrative support team.

REFERENCES & QUALIFICATIONS

Mission Broadband, Inc. is currently working a project for the Town of New Shoreham, RI which involves creating a technology and vendor neutral, open and competitive RFP for the design and implementation of an Island Wide Broadband Network. Previous work for this client is similar to the work needed for the City of Lucas. Listed below you will see the projects broken out individually. Our team has negotiated with the local power company an Indefeasible Rights to Use (IRU) contract for multiple strands of fiber. We also helped design and implement, through our RFP process, an FTTP Network for the anchor institutions as well as negotiating with an Internet Service Provider to provide Gigabit bandwidth. A contract was also negotiated with a construction firm to build and maintain this network.

Reference Project:

Client Name: Town of New Shoreham/Block Island

Consultant role: Lead Consultant, Development of comprehensive RFP

Contract dates: 6/2019 through Current – the RFP process is nearly completed, and the project will be moving into the vendor negotiation phase.

Project description: Create a survey and data gathering instrument to solicit feedback from the

community and stakeholders in support of an Island Wide FTTP network to all 1800 structures. Develop a comprehensive RFP to solicit the design, construction and ongoing operation of an island wide FTTP network. Also included in the RFP is the design of a scalable transport solution utilizing fiber to the mainland and connectivity to Internet Service Providers at a co-location facility in Providence, RI.

Timeline met: Yes

Reference: Amy Lewis Land, Director of Finance, financedirector@new-shoreham.com, 401-466-3208

Michele Spero, Information Technology Manager, itsupport@new-shoreham.com, 401-835-0803

Reference Project:

Client Name: California Telehealth Network (CTN)

Project description: Meet CTN's goal to help a 16,000 resident unserved and underserved area (Kern Valley) in California design a broadband network.

Our project engaged the public and anchor institutions to gather initial requirements, draft the network design and RFP, manage the competitive bidding process, and perform vendor response analysis that was used to make a vendor selection.

Consultant role: Lead Consultant

Contract dates: 3/27/2015 through 4/15/2016

Services performed: Our project engaged the public and anchor institutions to gather initial requirements, draft the network design and RFP, manage the competitive bidding process, and perform vendor response analysis that was used to make a vendor selection.

Timeline met: Yes

Reference: Eric Brown, President of CTN, browne@ochin.org, 310-365-1450

Reference Project:

Client Name: Town of New Shoreham/Block Island

Consultant role: Lead Consultant

Contract dates: 1/18/2018 through 2/19/2018

Project description: Determine E-Rate and Healthcare Connect Fund subsidy network design options to build private fiber for the Town of New Shoreham's School, Library, Medical Center, Town Hall and Public Safety facilities.

Services performed: Collect data, interview and document New Shoreham project goals, draft two network designs, draft two funding request plans, socialize the network design with FCC and USAC, determine timeline and procedures required to obtain FCC subsidies, present findings.

Timeline met: Yes

Reference: Amy Lewis Land, Director of Finance, financedirector@new-shoreham.com, 401-466-3208

Michele Spero, Information Technology Manager, itsupport@new-shoreham.com, 401-835-0803

Reference Project:

Client Name: Town of New Shoreham/Block Island

Project description: Write and distribute RFPs for the Implementation of private fiber for the Town of New Shoreham. Analyze Vendor responses and provide recommendations.

Consultant role: Lead Consultant

Contract dates: 2/19/2018 through 6/9/2019

Services performed: Write and distribute RFPs for the Implementation of private fiber for the Town of New Shoreham and utilization of the Healthcare Connect Fund for Broadband services at eligible sites. Sites connected to the initial fiber build include: School, Library, Medical Center, Town Hall, Public Safety. Analyze Vendor responses and provide recommendations.

Timeline met: Yes

Reference: Amy Lewis Land, Director of Finance, financedirector@new-shoreham.com, 401-466-3208

Michele Spero, Information Technology Manager, itsupport@new-shoreham.com, 401-835-0803

Reference Project:

Client Name: Maine General Health

Project description: Network Design and RFP for large health care network

Consultant role: Lead Consultant

Contract dates: 2/2/2016 through current

Services performed: Design network, procure federal funds, draft RFPs, analyze vendor responses, assist in vendor selection, assist in contract negotiation.
Timeline met: Yes, on multiple RFP projects

Reference: Danny Burgess, CIO, dannyburgess@mainegeneral.org, 207-624-4245

Reference Project:

Client Name: New England Telehealth Consortium (NETC)

Project description: Design and implement a large 3 state health care network.

Consultant role: Lead Consultant, Contract Creation and Negotiation, Project Management

Contract dates: 11/1/2006 through Current

Services performed: Design Network, procure $25M in federal funds, draft RFPs, analyze vendor responses, Assist in Vendor Selection, Contract creation and negotiation with 8 winning vendors, project management to implement a Carrier Ethernet/Internet network for 320 non-profit health care sites throughout Maine, New Hampshire and Vermont.

Timeline met: Yes

Reference: Brian Thibeau, President, bthibeau@outlook.com, 207-941-1040

Red Hutchinson, Vice President, red.hutchinson@gmail.com, 603-581-9111

Reference Project:

Client Name: Webber Group

Project description: Design and implement a 38 site multi-state private network including: WAN services, dark fiber, PBX, voice services, LAN and Internet.

Consultant role: Lead Consultant

Contract dates: 3/11/2002 through 4/12/2013

Services performed: Design multiple networks (voice, data, video, Internet, wireless, cellular and dark fiber), draft RFPs, analyze vendor responses, assist in vendor selection, assist in contract negotiation, project management and implementation for 38 site multi-state networks.

Timeline met: Yes, on multiple RFP projects

Reference: Tim Smith, VP of Finance (retired), timsmith@outlook.com, 207-570-0024

Reference Project:

Client Name: Northern Maine Medical Center

Project description: Network Design and RFP for frontier rural health care network

Consultant role: Lead Consultant

Contract dates: 3/20/2007 through current

Services performed: Design services bases and dark fiber network, procure federal funds, draft RFPs, analyze vendor responses, assist in vendor selection, assist in contract negotiation, project management and implementation of a voice, data and internet network.

Timeline met: Yes, on multiple RFP projects

Reference: Adam Landry, Director of IS, adam.landry@nmmc.org, 207-834-1303

ESTIMATED TIMELINE AND COST

Consultant is capable of starting this project within two weeks of an executed agreement. The outline below highlights the milestones in this project and associated timelines and costs for each milestone. Many of the tasks outlined below will run concurrently and the total estimated timeline for this project is 3-4 months. Consultant is agreeable to negotiating a billing schedule where payments are made over a period of time.

Project Milestones	Timeline	Owner	Estimated Cost
Develop Project Plan	1 Week	MBI	$5,000
Conduct Stakeholder Meetings	3 Weeks	MBI	$15,000
Research and Analysis	4 Weeks	MBI	$20,000
Compile Results of Research	2-3 Weeks	MBI	$12,500
Develop Broadband Network Design	2-3 Weeks	MBI	$12,500
Develop Financial Model Options	3 Weeks	MBI	$15,000
Develop and Present Final Report and Financial Model to City of Lucas	1 Week	MBI	$5,000
Project Sub Total			$85,000
Project Travel			$18,000
Project Total			$103,000

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mission broadband

Connecting America's Communities

RFP Acknowledgement to Lucas, TX

Broadband Network Design

& Financial Model

Request for Proposal (RFP)

January 24th, 2020

REQUEST FOR PROPOSAL (RFP)

BROADBAND NETWORK DESIGN & FINANCIAL MODEL

CITY OF LUCAS
665 Country Club Road
Lucas, Texas 75002

I. INTRODUCTION

The City of Lucas, Texas, is accepting proposals from qualified firms for a Broadband Network Design and Financial Model. The purpose of the study is to provide a high-level design and financial model for existing and future broadband needs. The study will assess 1) the cost of installation, operation, and maintenance of a broadband network; and 2) the revenues generated from retail services and third-party network access. The Work Product Deliverables for the study will include a financial model that allows dynamic adjustments in cost and revenue assumptions across a recommended time horizon.

The anticipated schedule for the RFP process is:

ACTIVITY	PLANNED DATE
RFP Published	December 16, 2019
Q&A	January 8, 2020
Proposals Due	January 24, 2020
Proposal Review	January 25 – February 10, 2020
Proposal Recommendation	February 11, 2020
Proposal Selection	February 20, 2020
Award Notification	February 24, 2020
Kickoff Meeting & Work Session	to Be Determined
Draft Study Report	May 2020
Final Study Report	June 2020

Mission Broadband Acknowledged – please see accompanying proposal.

II. BACKGROUND INFORMATION

The City has a 2010 census population of 5,166 and estimated 2018 population of 7,955. The community is growing two percent annually and has added 68 homes to the City and 94 homes to its extraterritorial jurisdiction in 2018. There are currently 2,127 households located within the City. The community has been experiencing the expansion of residential neighborhoods since 1996. The median household income is $151,188 (in 2017 dollars) and the average market value of homes is $624,357 (based on 2019 certified taxable values from the Collin Central Appraisal District). The community is primarily comprised of large residential lots and low-density housing. The City holds minimal commercial activity and continues to remain as a bedroom community within the Dallas metroplex.

In 2018, the City conducted a Technology and Communication Survey which received a total of 400 responses regarding current Internet service and satisfaction levels. In 2019, the City developed an Internet speed test to collect data from residents who reported actual Internet speeds, current providers, types of infrastructure, and address location. There were 503 household responses which makes up approximately 24 percent of total households. The Internet speed test mapped geolocation reports of Internet speeds and service providers on a single map of the City. Based on the reported data, the results showed that over 60 percent of households had a downlink data rate below 25 Mbps and an uplink data rate below 10 Mbps.

The Internet speed test revealed reports of 25 Internet service providers throughout the City. The southern section of the City consists of households with quality broadband service that is mainly provided by Frontier Communications. The northern section of the City consists of underserved areas with multiple providers servicing various households. The infrastructure within these underserved areas range from fiber and copper lines to wireless equipment. There is no clear indication or confirmation from incumbent Internet service providers on where their infrastructure is installed.

Many new and developing subdivisions have installed fiber optic cables; however, this situation leaves older households with inadequate Internet service and the inability to access any nearby broadband infrastructure. The City's Technology Committee has contacted AT&T, Frontier Communications, Suddenlink, Rise Broadband, Grayson Collin Communications, etc., to discuss possible solutions to improve Internet service throughout the City. The consensus amongst incumbent providers regarding improving Internet service throughout the City is that no private sector entity shows any interest in utilizing its own capital to deploy broadband resources to support high speed Internet access due to low density housing.

Mission Broadband Acknowledged

III. SPECIAL CONSIDERATIONS

The City is considering the possibility of a municipally owned broadband network and offering Internet service as a public utility. Although Fiber to the Premise (FTTP) would be the optimal solution, it is not the City's intent to limit the study to FTTP only. While FTTP is certainly one of the primary options to consider, the consultant should review other commercially available technologies. The consultant should also note the advantages and disadvantages of technologies that offer lower service levels that may become obsolete much earlier than fiber.

Although the study should include information on high speed Internet offerings of incumbent providers and market rate competition, the City is not concerned at this time with creating a residential survey and customer satisfaction with incumbents. The commonly performed customer surveys and related feasibility analysis are not requested at this time.

The consultant must specify in the response to this RFP the technology solutions it intends to recommend to the City and the reasons supporting this recommendation. The City anticipates that funding for a possible broadband network may be funded through municipal bonds in which voters may determine the outcome of funding through a bond election.

Mission Broadband Acknowledged – please see accompanying proposal.

IV. SELECTION PROCESS

The selection of the consultant will be accomplished through the following process by the City:

1. City staff and the Technology Committee will review all proposal submittals. Selection may be made strictly from the information provided in the RFP. However, the City reserves the right to conduct interviews with, and request presentations from any, all or some respondents.

2. The Technology Committee will meet in a public forum to discuss and select the proposal for recommendation to the City Council to consider hiring the services of a consultant to conduct a broadband network design and financial model.

3. Selection of the most qualified consultant will be based upon qualifications following the submission requirements.

4. The City Council will consider the Technology Committee's recommendation for the selected proposal and, if approved, City staff will send out the award notification to the selected consultant.

5. Contract negotiations with the consultant that was selected as the most highly qualified to arrive at a mutually acceptable (fair and reasonable) contract price based on the proposal fee submitted as part of the submission requirements. If the City and consultant are unable to reach such an agreement, negotiations will cease, and negotiations will begin with the proposer chosen as the next most qualified provider and so on until an agreement is reached.

Mission Broadband Acknowledged

V. SCOPE OF WORK

The primary scope of work is a dynamic, adjustable Financial Model that will span a recommended time horizon which will allow the City to consider the financial feasibility of a broadband network. While the City is not directly requesting a detailed plan and design for the installation, operation and maintenance of a broadband network, the consultant is expected to provide supporting evidence for its Financial Model, including all assumptions made and the basis for those assumptions. As such, the consultant should perform sufficient planning and design to support its Financial Model.

Mission Broadband Acknowledged – please see accompanying proposal.

A. Guidelines

The following guidelines are provided to the consultant as an example of what the consultant may expect if selected. Additional guidelines may be provided or developed in a kickoff working session after the City selects the prevailing proposer.

- Data gathered through the City's 2018 Technology and Communication Survey and the 2019 Internet Speed Test.
- GIS data from the City relating to existing water and utility right-of-way and easements.
- Broadband network will support access to customers for multiple advanced services providers (e.g. data, telephony, telemetry, etc.).
- Broadband network will support multiple third-party providers for backhaul (e.g. 5G, WISPs, etc.).
- Project is a complete "green field" deployment with no existing equipment, staff, organization, or infrastructure of any kind.
- Other guidelines to be determined with the selected consultant during the kickoff meeting and work session, and as required.

Mission Broadband Acknowledged

B. Work Product Deliverables

The primary Work Product Deliverable is an adjustable, dynamic Financial Model. However, various basic supporting information and assumptions used to develop this model are expected. The deliverables may include but are not limited to 1) risks and recommendations toward a successful broadband deployment; 2) ongoing broadband operations and maintenance; and 3) miscellaneous details.

Mission Broadband Acknowledged

C. Adjustable, Dynamic Financial Model

The City does not specify the format of the Financial Model. The proposer can select any format desired which may be an Excel spreadsheet, web-based, or other application. However, the model must be dynamic and easily adjustable by the City to determine various financial scenarios. The consultant will populate the Financial Model with all costs and revenues for all categories and components to provide results and recommendations.

The consultant will provide recommendations to the City that should include full financial feasibility for broadband deployment across a recommended time horizon desired by the City. Additionally, the consultant will work with City to refine the recommendations based upon various scenarios with respect to structuring funding to support a broadband deployment.

As such, the Financial Model must deliver the following:

- Model must allow entry of costs and revenues preferably by month or quarter across a recommended time horizon.

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- Costs and revenues need to be groupable by categories to be determined by the City and selected consultant at the Kickoff Meeting and Work Session.

Mission Broadband Acknowledged

- Model must yield graphs of costs and revenues, separate or together, over time and by category.

Mission Broadband Acknowledged

- Model must yield summary tables by component or category.

Mission Broadband Acknowledged

- Model must yield cost and revenue schedules (i.e. amortization tables) across time as desired by the City.

Mission Broadband Acknowledged

D. Assumptions and Supporting Information

The consultant should provide a list of all assumptions driving the Financial Model that is recommended. These assumptions must be rooted in reality; reflect a realistic timeframe in which a cost or revenue is realized; and all supporting information to justify the assumptions are expected to be included.

Mission Broadband Acknowledged

The consultant should fully support its recommended Financial Model and be prepared to make dynamic adjustments and adaptations with the City upon delivery of the work product.

A non-exhaustive list of assumptions and supporting information is below:

- Fiber network plan and deployment
- Right-of-way assumptions and estimates
- Real estate assumptions and estimates
- Physical facilities summaries and costs
- Network-related equipment summaries and costs
- Maintenance equipment summaries and costs

- Organization personnel requirements and related cost estimates
- In-source and out-source recommendations and related cost estimates
- Operating income and cash flow
- Projected revenues and benefits
- Expected and minimum take rates
- Operational expenses
- Depreciation schedule
- Construction build-out cost estimates
- Network design (i.e. preferred equipment, technologies, and topology design)
- Product offerings and pricing structure
- Consumer and business retail pricing plans (i.e. installation fee and recurring access charge by tier)
- Market place pricing plans
- Web site design
- Branding, communications and marketing
- Network implementation duration and timing
- All other assumptions and supporting information

Mission Broadband Acknowledged

E. Risks and Recommendations

The consultant should provide a detailed list of key recommendations with detailed rationale for those recommendations. Similarly, the consultant should provide a list of risks associated with the project with detailed rationale for those risks. Inasmuch as possible, the consultant should quantify the recommendations and risks, including the probability of occurrence.

Mission Broadband Acknowledged

F. Miscellaneous and Other

The consultant is encouraged to provide as much information as possible, including that not specifically requested in this document, to ensure the City has full knowledge and understanding of the opportunities and risks associated with deploying a broadband network.

Mission Broadband Acknowledged

G. Funding Identification

Based on the recommendations for broadband deployment options, the consultant will identify and evaluate various resources that can be utilized by the City in the pursuit of a broadband network. These recommendations should consider municipal bonds, initial costs to the City, public-private partnerships, infrastructure investments, and any other municipal options for funding.

Mission Broadband Acknowledged

VI. SUBMISSION REQUIREMENTS

Interested and qualified firms are invited to submit a proposal that demonstrates their experience in performing projects of this scale and complexity. Qualified firms should submit one (1) electronic copy in PDF format of the completed proposal by 5:00 pm on Friday, January 24, 2020.

Please title your e-mail "[Firm Name] Proposal - Broadband Network Design and Financial Model" and send the proposal to:

Kent Souriyasak
Assistant to the City Manager
City of Lucas
kent@lucastexas.us
(972) 912-1213

Mission Broadband Acknowledged

All proposals should include documentation that include the following information:

- Profile of the firm's principal and staff to be assigned to this project along with a brief description of experience and expertise offered by each firm member. This should include a designation of the project manager, and the resumes of the project manager, principal and staff having a major role in the project.

  Mission Broadband Acknowledged – see accompanying proposal.

- A narrative project approach that conveys an understanding of the project objectives and scope of services, and how the firm will meet expectations for the study.

  Mission Broadband Acknowledged – see accompanying proposal.

- A summary demonstrating the firm's qualifications and ability to satisfy areas identified in the section "Scope of Work" and specifically, the firm's ability to provide anticipated professional services as required to successfully complete the Broadband Network Design and Financial Model.

  Mission Broadband Acknowledged – see accompanying proposal.

- A proposed cost of services and a timeline for completing the project to identify major deadlines.

  Mission Broadband Acknowledged – see accompanying proposal.

- A list of successfully completed projects and current projects under development managed by the firm comparable to this project.

  Mission Broadband Acknowledged – see accompanying proposal.

VII. EVALUATION FACTORS

Selection of the most qualified firm will be evaluated on the following criteria:

1. Direct professional experience with municipalities that offer or are considering broadband services;

2. Evidence of competent design, work plan, technical engineering capacity, and project management;

3. Demonstrated experience developing financial and business models for broadband initiatives;

4. Qualifications of assigned staff experienced with similar complex projects;

5. Responsiveness to the proposal, communicating an understanding of the overall project and services required;

6. Timeline for completion; and

7. Cost and clarity of project budget.

Mission Broadband Acknowledged.

VIII. QUESTIONS

Any questions regarding this RFP shall be submitted to Kent Souriyasak, Assistant to the City Manager by e-mail at kent@lucatexas.us or phone at (972) 912-1213.

Mission Broadband Acknowledged.

JANUARY 24, 2020

City of Lucas, TX

Broadband Network Design and Financial Model

Request for Proposals

For more information contact:

Lori Sherwood, Esq.
Director of Broadband Development
303-882-1566
lori.sherwood@vantagepnt.com

VANTAGEPNT.com 605-995-1777
2211 N Minnesota Street Mitchell SD 57301

Table of Contents

Kent Souriyasak
Assistant to the City Manager
City of Lucas

Dear Mr. Souriyasak:

Thank you for the opportunity to provide a bid response for the City of Lucas Broadband Network Design and Financial Model Request for Proposals (RFP).

Vantage Point Solutions, Inc., (VPS) is a customer-focused, technology-driven engineering and consulting firm serving the telecommunications and financial industries. Combining professional engineering, technical expertise and extensive regulatory knowledge, we develop the most technically advanced and economically viable solutions customized for our clients. VPS has three main divisions, Engineering, Consulting and Outside Plant Operations that all work together to meet our clients' needs.

At VPS we tailor each project to fit the individual needs of the client. There are over 300 fulltime employees on staff at VPS. The team leaders at VPS offer an invaluable amount of industry expertise. Leaders are hands-on, working directly with clients to find customized solutions.

Lori Sherwood, VPS Director of Broadband Development will be the Project Lead. Lori is an attorney who has over 15 years of municipal broadband experience including directing the nationally recognized One Maryland Inter-County Broadband Network (ICBN) that deployed 800 miles of fiber infrastructure and connected over 650 community anchor institutions across 9 local government jurisdictions. Lori's biography is included, and her contact information is provided below:

Lori Sherwood
Director of Broadband Development
1462 E. Riverbend St.
Superior, CO 80027
lori.sherwood@vantagepnt.com
303-882-1566

We recognize that RFPs and proposals may contain information that could be further clarified and/or refined through in-person meetings. As you work through this process, we would be delighted to come to your offices for an in-person interview (at our cost) to further discuss the information contained in this response as well as our qualifications to complete the project.

Thank you for your consideration. If you have any questions, please do not hesitate to contact us.

Sincerely,

Chad Glanzer
President
Direct: 605.995.1741

Qualifications

Vantage Point Solutions, Inc. (VPS) is a premier telecommunications engineering and consulting corporation providing a full range of services. VPS integrates state-of-the-art technical solutions to balance emerging technology with regulatory effects. VPS uniquely offers solutions for engineering, consulting, and outside plant under one roof.

Vantage Point Solutions was established in 2002. Our primary office is located in Mitchell, SD as we serve more than 600 clients in 44 states and 8 foreign countries. VPS has the experience in network planning, engineering and business development capacity. Our experience spans all geographies and terrains.

VPS staff members are more than employees, they are owners. Our employee owners are committed to client satisfaction because client success is their success. As an employee-owned company, our staff is rewarded when our company excels. We hire employees who understand this culture of commitment and who are willing to dedicate their efforts toward the overall success of Vantage Point Solutions. This translates into a positive work environment and a high satisfaction level for our clients.

VPS has the tools necessary to successfully complete this project. With consultants that specialize in broadband feasibility, professional engineers and regulatory experts under the same roof, we are able to understand the big picture. We offer a level of experience and expertise that will give you peace of mind throughout the entire project. Team members help you make smart decisions in the most timely, cost-effective manner possible. More than anything we care about your success and are available to serve you from the beginning to the end of every project. You will experience a level of customer service that goes above and beyond your expectations. At VPS we don't stop at good enough. **That's simply your Vantage Point advantage.**

Overall, Vantage Point has helped municipalities, electric utilities, for-profit companies, not-for-profit cooperatives, tribal entities and community organizations across the country design and deploy networks working in all different terrains and technology types. VPS has worked extensively with both incumbent and competitive providers, local stakeholders, municipalities, federal and state agencies, and others. VPS regularly assists with broadband planning, design, feasibility, financing, regulatory, marketing, construction and turn up aspects of voice, data, video, and wireless projects.

In almost every project, VPS works with a diverse group of community partners and stakeholders. This includes, tribal governments, county and city staff, schools, libraries, public safety agencies, first responders, medical facilities, economic development entities and others.

At VPS, the consulting division works with the engineering and outside plant services group to conduct feasibility studies that often includes but is not limited to the following services:

A Sampling of Broadband Consulting, Regulatory and Engineering Services	
▪ Business Plans and Feasibility Studies ▪ Stakeholder Outreach ▪ Partnership Agreements ▪ Dark Fiber Assessments ▪ Strategic and Long-term Planning ▪ Market Assessments ▪ Financing and Funding Analysis ▪ Grant Applications	▪ Public-Private Partnership Development ▪ Provider Outreach ▪ Budgeting and Forecasting ▪ State Utilities and FCC Regulatory Compliance, Support and Filings ▪ FCC Auctions Assistance and Bidding ▪ Contract Development ▪ Industry Trends
Engineering Services	
▪ Existing Infrastructure Assessments and Asset Review ▪ Coverage and Site Analysis ▪ Wireless Backhaul Analysis ▪ Network Architecture Design ▪ Strategic Network Planning ▪ Emerging Technology Implementation	▪ Fiber and Wireless Engineering ▪ Video Headend and Signal Distribution ▪ Fiber Optic Transport Network Design ▪ Voice, Data, and Video Integration ▪ IP Network Security Assessments ▪ Backup Power System Design ▪ Network Grounding Assessments

Working together, the VPS team conducts feasibility studies (including municipal) that often includes but is not limited to the following tasks:

- Stakeholder Outreach
- Residential and Business Surveys
- Existing Asset Review
- Strategic and Business Planning
- Business Modeling
- Network Modeling (Last-Mile vs. Middle-Mile)
- Cost Analysis and Financing Options (including grant funding)
- Discussion of Municipal Network Trends
- Market Analysis
- Feasibility Studies
- Legal and Regulatory Compliance
- Policy and Municipal Code Development

VPS staff have also assisted clients in applying for over 100 grants and loans for broadband projects - **all of which required detailed financial models and business plans.** In all, these federal and state grant funding programs total over 1.6 billion dollars secured for VPS clients. Having completed hundreds of feasibility studies for a variety of clients across the country all in different geographic areas and terrains – VPS has encountered every type of challenge that communities face.

Because of this experience, VPS will be able to identify key issues and find opportunities for the City to consider cost effectively.

The benefit to you is that VPS does not just specialize in conducting broadband feasibility studies – VPS has designed, engineered and implemented networks for hundreds of clients including municipalities.

The VPS philosophy is to ensure that the process is collaborative with the client. VPS will not pursue unrealistic solutions or recommend options that are not desirable for the City.

Municipal Broadband Experience and References

Over the past five years, local governments all across the country have been busy conducting broadband feasibility studies, deploying networks and finding ways to implement strategic solutions that will increase broadband accessibility, affordability and community services. In addition to the vast industry experience VPS brings to the table, VPS has also assisted many different communities across the country with a wide variety of broadband projects. As a result, VPS has extensive knowledge of all aspects of the current municipal broadband landscape across the country. These projects include:

- Conducting Municipal Broadband Feasibility Studies
- Developing Municipal Financial Model and Business Plans
- Developing a Business Plan for a non-profit entity established by a municipal consortium
- Negotiating Public Private Partnership Agreements
- Consulting on Establishing Dark Fiber Leasing programs including drafting Dark Fiber Licensing Agreements
- Engineering Municipal Networks
- Serving as both an on-call consultant for wireless technology deployments and evaluating single applications for new towers for a number of municipalities. This includes conducting a third-party review of wireless facilities applications submitted from wireless carriers.

Additionally, Project Lead, Lori Sherwood is also a Board Member of the National Association of Telecommunications Officers and Advisors (NATOA) – an Association that represents local government interests in telecommunications. In her role with NATOA, Lori Co-Chairs the Policy and Legal Committee and is well-versed in legal and regulatory issues that impact local governments.

1. **City of Greeley**

VPS is currently serving as the Broadband Program Manager for the City as they consider multiple broadband models. This includes working directly with the citizen Task Force and assisting with presentations on various models under consideration including City-run ISP, PPP, establishing grant programs and other hybrid models. As a part of this project, VPS completed a Financial Model for a City-run ISP. In early 2019, VPS worked with the City in a separate project to conduct Provider Outreach Meetings in order to ascertain the viability of various Public-Private Partnership (PPP) models.

Brian P Sullivan
Application Services Manager
Information Technology
970-350-9310
brian.sullivan@greeleygov.com

2. **City of Hudson Oaks, Texas**

VPS assisted the City of Hudson Oaks with engineering for a FTTP broadband network deployment. Services provided include network design and engineering, staking, outside plant services, construction oversight, RFP development, consulting, cost development and other tasks as assigned. This project is a Public-Private Partnership collaboration between the City of Hudson Oaks and a private sector ISP that will be serving as the service provider for residential and business customers.

Chad Janicek,
Assistant City Administrator
City of Hudson Oaks
682-229-2400
chad.janicek@hudsonoaks.com

3. **Harney County, Oregon**

VPS conducted a broadband feasibility study for multiple communities. This included conducting comprehensive community outreach, conducting market analysis including a residential survey, evaluating existing broadband infrastructure, providing information on municipal broadband network models, evaluating financing opportunities and regional coordination, providing a high-level network design and making recommendations that included multiple options for the community to consider.

Kerry Opie, County Court Assistant
Office of Judge Pete Runnels
Harney County Court
541-573-6356
kerry.opie@co.harney.or.us

Project Team

VPS will not be utilizing any subcontractors for this project. Lori Sherwood, VPS Director of Broadband Development will be the project lead for the City. Lori is an attorney with over fifteen years of experience. Lori has been with VPS for four years and has conducted many municipal broadband feasibility studies for VPS clients among other things. Lori has also developed public-private partnership agreements, ROW agreements, pole attachment agreements and other legal contracts that relate to a broadband deployment and implementation.

In her capacity as Project Lead, Lori will work closely with the VPS team to assign the various components of the project to our internal subject matter experts. Lori will be responsible for coordinating all aspects of the project (internal and external) throughout the life of the project. Lori will manage timelines, coordinate the various technical disciplines within VPS, lead recurring conference calls and any necessary on-site meetings, and track action items. Although the City may interface with multiple technical experts from VPS, Lori will be the main point of contact with general questions and concerns related to the project.

In addition, VPS Director of Consulting, Kristy Szabo will direct the development of the Dynamic Financial Model and Business Plan. Below are the biographies for Lori and Kristy. Biographies of other relevant VPS personnel are provided in **Appendix A.**

Lori Sherwood, JD

DIRECTOR OF BROADBAND DEVELOPMENT

Lori Sherwood has actively worked in municipal broadband and telecommunications for over 15 years. Lori's prior work experience includes serving as Of Counsel with the Denver law firm of Kissinger & Fellman, P.C., where she specialized in local governments, information technology, telecommunications, community broadband networks, legislation, lobbying &federal affairs. Prior to that, Lori worked for Howard County, Maryland – as Cable Administrator & then as Broadband Program Director for the One Maryland (ICBN) initiative ($100 million broadband stimulus). Lori is a nationally recognized leader and a Member of the Board of Directors for the National Association of Telecom Officers and Advisors (NATOA).

"Every community is unique. We work with you to find the right set of broadband solutions for your community."

EDUCATION

Bachelor of Arts in Anthropology from The American University. Juris Doctorate, Cum Laude, from University of Baltimore School of Law. Admitted to MD Bar.

Kristy Szabo

DIRECTOR OF CONSULTING

With more than 20 years of experience in business finance, Kristy Szabo is an expert on valuations for ILEC and CLEC operations, wireless operations and CATV systems. She has developed many historical financial analysis, financial forecasting, budgets and feasibility studies. Kristy has been involved in securing grant funds for broadband networks in numerous state and federal grant programs, including the RUS Broadband and Traditional Loan and RUS Community Connect Grant programs, in addition to assisting clients obtain financing through CoBank, RTFC, and CFC. Kristy has been a bidder and worked directly with the FCC's auction system during several spectrum auctions and has helped numerous clients secure new licenses. Kristy continues to work with the FCC on the wireless side by filing regulatory filings and license applications. Prior to joining Vantage Point, Kristy spent 10 years in banking and financing; in-depth financial experience that brings a unique set of skills to the wide array of financial consulting projects.

"Our clients depend on our expertise. It's not just a job to us. It's our responsibility."

EDUCATION

Bachelor of Arts Degree in Accounting from Dakota Wesleyan University

Approach to Scope of Work

When it comes to developing and expanding municipal broadband networks, there is no one-size-fits-all model. Proper planning is crucial to the success of any network deployment. VPS has two main goals with this project. First – completing a Broadband Network Design and Financial Model requires a collaborative process. VPS will work with the City to ensure that City perspectives, needs and goals are met within the timeline set out by the project. This includes conducting an on-site Strategic Planning Workshop to kick-off the project. Second, VPS will then develop a high-level network design and present the City with a comprehensive report that includes a detailed business plan and financial model.

VPS will develop a model that accomplishes the following:

- Conducts a Strategic Planning Workshop and Kick-off Meeting
- Takes into account the Special Considerations listed in the RFP
- Takes into account smart city needs and considerations for inclusion of future technology
- Develops a high-level network design based on a model of Fiber-to-the-Premise (FTTP)
- Presents a draft of the financial model to enable discussion and adjustments
- Generates a Final Report with a blueprint that sets out viable comprehensive specific strategies and goals and a realistic timeline for achieving them

Why a FTTP Model is a Preferred Starting Point

Both wireless and wireline broadband service providers have benefited from significant technology advances, but *wireline* technologies have historically been capable of speeds many times faster than the best *wireless* technologies. Fiber optic cable has been used by service providers for more than forty years to build high-speed broadband networks, primarily for long haul transport routes. Over the last ten to fifteen years, fiber has also been used to increase broadband speeds to the customer because no other technology can deliver as much broadband speed. With FTTP, the broadband speed provided is not dependent upon cable length, but electronics, and each new generation of FTTP electronics allows service providers the ability to offer significantly higher broadband speeds over greater distances without having to make significant changes to their outside plant architecture. There is no foreseeable end to the amount of bandwidth that can be provided over fiber cables.

There are many reasons why fiber is the best technology to construct modern network or upgrade existing networks. Fiber is immune to electromagnetic interference, provides the most reliable services, and minimizes operational expenses. Therefore, it delivers the best voice and broadband services available for today and the foreseeable future. Over the last several years, increases in copper prices, advances in technology, and growth in broadband demand have all worked together to make FTTP a more economical wireline technology for providing broadband. Not only is a fiber network less expensive to deploy, maintain, and upgrade than other wireline technologies, but it has superior broadband capabilities, such as being able to offer telecommuting, telemedicine services, and telepresence. All of these factors make it clear that copper is a dying technology in the telecommunications industry. It would be unwise for companies to utilize copper or coax in their network deployments going forward, except in certain very limited situations.

Once fiber infrastructure is in place, service providers are able to increase the broadband by simply upgrading the electronics on the fiber cable, which represents a relatively small portion of the overall fiber network investment. Fiber technology will allow higher speeds to be delivered to customers over time with minimal incremental investment, making it the best technology for meeting future broadband service needs.

The amount of bandwidth per customer is significantly greater for a FTTP network when compared to a wireless network. Using the technologies available today, the bandwidth delivered to a customer can be more than 100 times greater than what is possible over a wireless network under similar conditions. The bandwidth advantage for FTTP will increase significantly in the coming years due to technology advances with the electronics.

Fiber optic cable is the most-costly to construct. However, it is also an enabling technology that allows for growth. A lion's share of the FTTP investment is the cable facilities, which typically has a 30+year life, compared to the wireless infrastructure, which has a greater portion of the investment associated with faster-depreciating infrastructure. When placement costs are included over a 30-year life, the cost savings for a wireless network are significantly reduced or eliminated.

Additionally, it may be beneficial to consider a model that includes some wireless technologies in order to cost-effectively reach some end-users. As such, VPS will include a technology review during the Strategic Planning Workshop and in the Final Report. However, specific route designs for wireless technologies would not be evaluated at this time. This would be conducted in a later engineering phase when engineers would walk the network routes and determine the need and feasibility for inclusion of such technologies on-site.

Below VPS provides our innovative approach to the Scope of Work detailed in the RFP.

Scope of Work

The project will commence with a Kick-off Strategic Planning Workshop. The workshop will be critical for setting the project schedule for all of the tasks listed in the RFP scope as well as setting dates for additional meetings and calls. Prior to the Workshop, VPS will provide an agenda and a list of documents and data needed to begin the project. Additional detail on the Workshop is provided below.

Task 1: Strategic Planning Workshop

The purpose of the Strategic Planning Workshop is to actively explore different models and potential network designs through a robust discussion before developing the high-level network design and financial plan. VPS proposes leading a half-day Strategic Planning Workshop that presents the information gathered from the first set of tasks. The workshop would include detailed discussion regarding:

- An overview of national trends with respect to municipal networks (last-mile and middle-mile)
- Review of different models – both business and operating
- Review of network and technology types including wireless, wireline and open access considerations
- Potential services and partners
- Non-traditional options including pilot projects to address gaps and adoption issues
- Funding and financing options
    - Stakeholder or potential third-party contributors
    - Grant funding options
    - Establishing a PPP, if viable
    - Capital, revenue bond and municipal self-funding options
    - Other strategies for encouraging private investment

Task 2: High-level Network Design

VPS will develop a high-level design for a greenfield FTTP network. This will include developing a GIS based map that includes last-mile connections to all the identified locations (homes, businesses, facilities and anchor institutions) in the City of Lucas. The design and Capital Expenditure (Cap-Ex) information developed in this task will be the base for the development of a Dynamic Financial Model and Business Plan.

Task 3: Development of a Dynamic Financial Model and Business Plan

VPS will develop a Dynamic Financial Model and Business Plan based on data and information received from the City, the Task 2 High-Level Network Design and the Strategic Planning Workshop that includes the following:

- **10 Year Forecast** that includes:
  - Estimated market penetration, service offering rates, take rates, and information (VPS will not be conducting a survey)
  - Capital expenditure costs and depreciation
  - Balance sheet, income statement (operating revenues, expenses) and cash flows

- **Forecasted financial schedule with:**
  - Projected Balance Sheet
  - Projected Income Statement
  - Projected Cash Flow
  - Projected ROR on Investment

- **Projected Capital Expenditures -** This summary will detail the cost of the property, plant, equipment and real estate as needed, to provide service over the years of the plan for the customers anticipated.

- **Projected Depreciation Schedule –** This will detail the depreciation expense on investments made throughout the study. Rates are based upon regular business practices and industry standards.

- **Projected Personnel Expense –** VPS will use industry experience and knowledge to determine positions, salaries and total personnel expense needed.

- **Projected Operating Expenses** – This includes necessary operational expenses including but not limited to: network operations, contracted inside wiring, leased facilities, billing, maintenance, and various other corporate, legal, accounting, marketing and customer operating expenses, will be detailed in the business plan.

- **All assumptions and supporting information** including what is listed in Section D of the RFP.

Additional City Requirements for the Dynamic Financial Model

In addition to the above, the City also requires additional information. VPS proposes to confirm the exact information at the Strategic Planning Workshop. This includes:

- Costs and revenues by month or quarter across the 10-year forecast
- Costs and revenues groupable by categories.
- Graphs of costs and revenues

- Summary tables
- Cost and revenue schedules

Caveats

VPS understands the City's desire for an easily and quickly adjustable, Dynamic Financial Model of a format of the vendor's choosing. VPS proposes to meet the City's needs with the following caveats:

- VPS will develop the financial model utilizing excel spreadsheets. VPS will provide the data and information as a PDF with all the assumptions listed.
- VPS will not disclose or deliver an open excel spreadsheet that shows VPS proprietary formulas, calculations and tools. The Final Report will contain PDFs.
- VPS will support "speedy" changes to the model as needed through the life of the project, to end no later than June 30, 2020 (or on the agreed upon date four months following contract award) on the following conditions:
    - VPS and the City will discuss all changes that need to be made prior to adjusting the model and confirm this in writing via email.
    - VPS will make changes within 48 business hours of the discussion for each change presuming that a change requires an adjustment to line items already built into the plan. Adding new line items may take up to 96 business hours.
    - VPS will provide all versions of the dynamic financial plan as part of the Appendix in the Final Report.
- Additional changes requested after the delivery and presentation of the Final Report shall be scoped and quoted at an additional cost.
- VPS will deliver a draft of the financial report in person no later than May 15, in order to allow for discussion and adjustment.

Task 4: Final Report and Recommendations

VPS will provide a comprehensive Final Report that includes all the data and information detailed above. **This includes an assessment of benefits and risks including a rationale for each.** In addition, VPS will also provide recommendations on model selection, partner opportunities and funding.

VPS will present the final report on-site.

Timeline

The VPS Team has full availability and is committed to completing this project on-time by no later 4 months following contract award anticipated to be approximately June 30, 2020.

Fees

VPS proposes a flat fee structure for this project that includes all expenses including travel for three on-site visits (Strategic Planning Workshop, Draft Business Plan presentation, and the Final Report Presentation.

Total Fee: $58,500

VPS Ref: 19-243

APPENDIX A – VPS Key Personnel

In addition to our executive leadership, we have hundreds of telecom experts ready to meet and exceed your needs. As a client you will have a point of contact with management regardless of your project. Below are additional biographies for personnel relevant to this project.

Larry Thompson, PE

CEO

Larry is a licensed professional engineer and has been designing satellite, wireless, and wireline broadband networks for more than 30 years. Prior to founding Vantage Point Solutions in 2002, Larry held several engineering and management positions with TRW's Space and Defense Sector, CyberLink Corporation, and Martin Group. Over the years he has helped his clients successfully manage technical, regulatory, and financial challenges when deploying wireless and wireline networks. Larry is a frequent speaker at state and national conferences and a frequent expert witness at utility commission and legal proceedings relating to telecommunication technology and regulatory matters. He is also a member of the FCC's Broadband Deployment Advisory Committee.

"We're building networks for applications that haven't even been invented yet."

EDUCATION

Bachelor of Arts in Physics from William Jewel College. Bachelor of Science in Electrical Engineering and Master of Science in Electrical & Computer Engineering from University of Kansas

LICENSED PROFESSIONAL ENGINEER

Chad Glanzer, PE

PRESIDENT

Chad Glanzer has more than 25 years of industry experience. At VPS he works extensively with clients, developing long range plans and assisting in the strategic implementation of them. He is an expert strategic planner and understands the necessity of research when developing a business plan. He serves as a vital resource in all aspects of CLEC implementations, including feasibility studies based upon site specific cost estimates. He is also a key player in the development of local, regional and statewide network architecture designs that deploy broadband technology for video, voice and data applications.

"Our people, seeing them grow personally and their commitment to our clients' projects; to me, that's Vantage Point."

EDUCATION

Bachelor of Science in Engineering from South Dakota School of Mines and Technology

LICENSED PROFESSIONAL ENGINEER

Doug Eidahl, JD

VP OF LEGAL AND REGULATORY

Doug has been an active participant in the industry since 1987. He provides financial and regulatory services for ILECs, CLECs, wireless, CATV, independent organizations and regional/statewide transport networks. He has been a strong proponent for the advancement of telecommunications and economic development in rural America his entire career. He gained legal and regulatory experience from his position as the former General Counsel for the South Dakota Public Utilities Commission (SDPUC) and operating experience from his position as CEO of James Valley Telecom (ILEC) and Northern Valley Com (CLEC). He understands the regulatory impacts and business considerations for the deployment of new technologies, services and architectures.

"Our passion is providing broadband and advanced telecommunications services across America, enhancing the quality of life and economic development for communities and citizens."

EDUCATION

Bachelor of Science in Criminal Justice from University of SD. Master of Public Administration from USD. Juris Doctorate from USD School of Law. Admitted to the SD Bar, US District Court, District of SD, and US Court of Appeals-DC Circuit

Brian Enga, PE

SR. TECHNOLOGY LEADER

Brian Enga is a licensed Professional Engineer and part of the Senior Technology Leadership team at Vantage Point Solutions. He has been working in the telecommunications industry for more than 15 years and has project managed multimillion dollar broadband network deployments. He is experienced in providing engineering, technical research, plans and specifications development, vendor evaluation, project management, and final inspection services. Brian has engineered a variety of broadband networks technologies and has been a pioneer in deploying IP video networks.

"It takes a lot of moving parts to help our clients reach their goals. Our team works together to make sure it happens."

EDUCATION

Bachelor of Science degrees in Electrical Engineering and Engineering Physics from South Dakota State University

LICENSED PROFESSIONAL ENGINEER

Todd Sapp

VP OF OUTSIDE PLANT

Todd Sapp has been working in outside plant operations for 30 years, first as an inspector, working his way to resident and on to director and currently vice president. He is a hands-on leader, dealing directly with clients from the beginning to the end of each project. He personally attends pre-staking, pre-bid, and pre-construction meetings, ensuring that each project exceeds client expectations. He thoroughly understands how to design and deploy fiber networks. Some of the architectures he is familiar with include VDSL, FITL, and FTTH. At VPS he oversees both the OSP and CAD departments, consisting of over 100 staff, and more than 8,000 miles of construction per year.

"Details matter. Build things right the first time."

TRAINING

Various OSP Symposiums

CLIENT REFERENCES

South Slope - Iowa
Shawnee - IL
WesTex - TX

Item No. 03

City of Lucas
Technology Committee Request
February 11, 2020

Requester: Assistant to the City Manager Kent Souriyasak

Agenda Item Request

Consider cancelling the Technology Committee meetings on March 10, 2020 and April 14, 2020.

Background Information

The purpose of the Technology Committee is to research internet solutions and provide recommendations to the City Council. The Technology Committee will present their recommendation for the selected proposal in response to the Request for Proposal (RFP) for Broadband Network Design and Financial Model at the February 20 City Council meeting. The City Council will consider the Technology Committee's recommendation to hire the services of a consultant to conduct a broadband study.

By cancelling the Technology Committee meetings on March 10 and April 14, this will allow time for the selected consultant to research, prepare and complete the broadband study. The goal is to have the consultant complete a draft of the broadband study by early May for the Technology Committee to review the draft at their scheduled meeting on May 12.

Attachments/Supporting Documentation

NA

Budget/Financial Impact

NA

Recommendation

City staff recommends cancelling the Technology Committee meetings on March 10, 2020 and April 14, 2020 to allow time for the selected consultant to research, prepare and complete a broadband study.

Motion

I make a motion to approve/deny cancelling the Technology Committee meetings on March 10, 2020 and April 14, 2020.