

**COVER SHEET – AGENDA ITEMS #R5 and #R6**

For Commission Meeting: June 20, 2016

“Consulting Contract for Community Needs & Interests Ascertainment”

And

“Consulting Contract for Public Institutional Partners Needs Assessment  
And Future Network Planning”

**Staff Recommendation:**

Staff recommends that the Commission approve:

- (R5) Consulting Contract with Paula Manley for Community Needs & Interests Ascertainment; and,
- (R6) Consulting Contract with CTC Technology & Energy for Public Institutional Partners Needs Assessment and Future Network Planning

**Background**

The MHCRC has for several years recognized the changing landscape for our communities and local governments around communications technology. During its past two retreats, the Commission discussed more specifically a long-term planning process to work with our jurisdictions and communities to discover and identify opportunities, needs and roles as we all adapt to the continually evolving landscape.

Another aspect driving the Commission’s desire to look to the future is that franchise renewal windows for Frontier and Reliance Connects opened January 2016 (with expiration dates in December 2018) and the Comcast and Century Link franchise renewal windows open January 2019 (with expiration December 2021). This will be the first time in the history of the Commission and our jurisdictions that two franchises with separate companies expire at the same time and multiple franchises expire over the course of three years across all the jurisdictions.

What are the next steps towards a collective planning process? The Commission discussed this question at its 2015 and 2016 retreats. As you may recall at the 2015 retreat, the Commission identified key principles to guide its future planning efforts; among those was “being community-needs driven.”

This also dovetails with the federal law that mandates cable franchise public benefits be grounded in an ascertainment of community needs. Some Commissioners may recall that the last community needs ascertainment was conducted in 2008-2010, the *Our Voice, Your Communications Technology* initiative, with a total cost of nearly \$120,000.

In anticipation of beginning the planning efforts, the MHCRC included funds in both the current fiscal year budget (FY15-16: \$40,000) and next fiscal year budget (FY16-17: \$50,000) for consulting resources aimed at engaging our jurisdictions, the I-Net stakeholders and key community leaders and stakeholders in the process.

In order to implement the first phase of the planning process, staff worked through the various aspects of a long-term planning process to determine the shorter-term resources and skills needed to discover and ascertain the needs, opportunities and interests of our communities and local governments around communications technology.

The two contracts recommended for approval at the June meeting represent months of staff research and internal work sessions, and discussions with key institutional stakeholders, several commission members and other cities.

**Contract with Paula Manley**

Total contract amount: \$20,000 (FY15-16 budget)

Contract duration: June 2016 - June 2017

Most Commissioners are familiar with Paula and her skill set from her facilitation of the MHCRC annual planning retreat over the past several years.

Staff believes Paula has a unique set of knowledge and skills to design and conduct an ascertainment of the Commission's Jurisdictions' and communities' current and future communications technology needs and interests. She has knowledge of the Commission and its work, an understanding of the community media and technology landscape, and a grounding in Multnomah County and its various communities. She also has engaged in numerous community needs ascertainments and strategic landscape assessments for nonprofits and media arts organizations. She is a skilled interviewer and listener and a strong writer.

Based on her professional background in needs assessment and facilitation, Commissioner Dicile consulted with staff on the process and contract scope of work.

Summary Scope of Work (for more detail, see attached contract pages 5-6)

Paula will work with MHCRC staff and Commissioners to design and implement an ascertainment primarily focused on the MHCRC Jurisdictions and related community leaders. Interviews and other data collection methods will also be opportunities to build greater awareness of existing cable-related public benefits and communications technology opportunities.

**Contract with CTC**

Total contract amount: \$40,000 (FY15-16: \$20,000 and FY16-17: \$20,000)

Contract duration: June 2016 - September 2017

CTC is a highly respected firm with considerable experience and intellectual resources providing independent financial, strategic, and technical research and guidance to state and local governments, non-profits, universities, and municipal utilities about communications networks.

Staff sought the input of the I-Net stakeholders group in defining the scope of work for this consultant contract and in selecting a firm for the contract. The stakeholder group includes network and information services staff from Multnomah County, Home Forward, Multnomah Education Service District, Portland Public Schools, Metro, Cities of Gresham and Portland, MHCC, and PCC. Commissioner Hansen also provided input on the contract scope of work.

CTC offers a unique combination of qualifications and capabilities in broadband and cable sectors for financial analysis, feasibility studies, engineering, needs assessment and network strategic planning. (See attached “CTC Information for MHCRC” for detail of the firm’s qualifications)

Summary Scope of Work (for more detail, see attached contract pages 5-7)

CTC will primarily work with MHCRC staff, the City of Portland Bureau of Technology Services and public institutional partners to assess needs, identify challenges and opportunities and prepare strategic options to address public institutions’ future broadband capacity and network connectivity needs. CTC will also produce a short “think piece” for the MHCRC and others to use to help inform the Commission’s local governments and communities about implications, opportunities and future policy related to the communications technology and broadband landscape.

For purposes of the network planning project, public institutional partners include:

Multnomah County (including Multnomah County Library)  
Home Forward  
Multnomah Education Service District (including six school districts in Multnomah County)  
Portland Public Schools  
Metro  
City of Gresham  
City of Troutdale  
City of Fairview  
City of Wood Village  
Mt. Hood Community College  
Portland Community College  
District Courts  
City of Portland BTS

Other institutions outside of Multnomah County may be included, as necessary, as the public partners identify needs, challenges and opportunities.

### **Contract Process - Background**

Both Paula Manley and CTC are established, woman-owned consulting businesses. Under City of Portland contracting procedures, agencies can direct contract with a woman-owned business for up to \$50,000 without conducting a formal RFP process. In accordance with the contracting procedures, staff informally researched qualified firms and believe these two consultants are well positioned to carry out the work efficiently and effectively.

#### Attachments:

- (R5) Consulting Contract with Paula Manley for Community Needs & Interests Ascertainment; and,
- (R6) Consulting Contract with CTC Technology & Energy for Public Institutional Partners Needs Assessment and Future Network Planning
- CTC's Information re: Qualifications and Experience

Prepared By: Julie S. Omelchuck  
June 15, 2016

**MT. HOOD CABLE REGULATORY COMMISSION  
AGREEMENT FOR PROFESSIONAL SERVICES**

**MHCRC Community Technology Needs and Interest Ascertainment**

This contract is between the Mt. Hood Cable Regulatory Commission ("Commission") and Paula Manley Consulting, hereafter called "Consultant." The Commission's Project Manager for this contract is Julie S. Omelchuck.

**Effective Date and Duration**

This contract shall become effective on June 20, 2016. This contract shall expire, unless otherwise terminated or extended, on June 30, 2017.

**Consideration**

- (a) Commission agrees to pay Consultant a sum not to exceed \$20,000 for accomplishment of the work.
- (b) Interim payments shall be made to Consultant according to the schedule identified in the STATEMENT OF THE WORK AND PAYMENT SCHEDULE.

=====

**CONSULTANT DATA AND CERTIFICATION**

Name (print full legal name): Paula Rae Manley

Address: 1332 SE 50<sup>th</sup> Ave, Portland OR 97215

Employer Identification Number (EIN): 46-1758384

**[INDEPENDENT CONTRACTORS: DO NOT PROVIDE SOCIAL SECURITY NUMBER (SSN)**

**- LEAVE BLANK IF NO EIN]**

City of Portland Business Tax Registration Number: 666508

Citizenship:	Nonresident	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		
	alien				
Business Designation (check one):	<input type="checkbox"/> Individual	<input checked="" type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Partnership	<input type="checkbox"/> Corporation	
<input type="checkbox"/> Limited Liability Co (LLC)	<input type="checkbox"/> Estate/Trust	<input type="checkbox"/> Public Service Corp.	<input type="checkbox"/> Government/Nonprofit		

Payment information will be reported to the IRS under the name and taxpayer I.D. number provided above. Information must be provided prior to contract approval.

=====

**TERMS AND CONDITIONS**

**1. Standard of Care**

Consultant shall perform all services under this contract using that care, skill, and diligence that would ordinarily be used by similar professionals in this community in similar circumstances.

**2. Effect of Expiration**

Passage of the contract expiration date shall not extinguish, prejudice, or limit either party's right to enforce this Contract with respect to any default or defect in performance that has not been corrected.

### 3. Order of Precedence

This contract consists of these Terms and Conditions, the Statement of Work and Payment Schedule, and any exhibits that are attached. Any apparent or alleged conflict between these items will be resolved by using the following order of precedence:

a) these Terms and Conditions; b) Statement of Work and Payment Schedule; and c) any exhibits attached to the contract.

### 4. Early Termination of Contract

- (a) The Commission may terminate this Contract for convenience at any time for any reason deemed appropriate in its sole discretion. Termination is effective immediately upon notice of termination given by the Commission.
- (b) Either party may terminate this Contract in the event of a material breach by the other party that is not cured. Before termination is permitted, the party seeking termination shall give the other party written notice of the breach, its intent to terminate, and fifteen (15) calendar days to cure the breach. If the breach is not cured within 15 days, the party seeking termination may terminate immediately by giving written notice that the Contract is terminated.

### 5. Remedies and Payment on Early Termination

- (a) If the Commission terminates pursuant to 4(a) above, the Commission shall pay the Consultant for work performed in accordance with the Contract prior to the termination date. No other costs or loss of anticipated profits shall be paid.
- (b) If the Commission terminates pursuant to 4(b) above, the Commission is entitled all remedies available at law or equity. In addition, Consultant shall pay the Commission all damages, costs, and sums incurred by the Commission as a result of the breach.
- (c) If the Consultant justifiably terminates the contract pursuant to subsection 4(b), the Consultant's only remedy is payment for work prior to the termination. No other costs or loss of anticipated profits shall be paid.
- (d) If the Commission's termination under Section 4(b) was wrongful, the termination shall be automatically converted to one for convenience and the Consultant shall be paid as if the Contract was terminated under Section 4(a).
- (e) In the event of early termination the Consultant's work product before the date of termination becomes property of the Commission.

### 6. Assignment

Consultant shall not subcontract, assign, or transfer any of the work scheduled under this agreement, without the prior written consent of the Commission. Notwithstanding Commission approval of a subconsultant, the Consultant shall remain obligated for full performance hereunder, and the Commission shall incur no obligation other than its obligations to the Consultant hereunder. The Consultant agrees that if subconsultants are employed in the performance of this Agreement, the Consultant and its subconsultants are subject to the requirements and sanctions of ORS Chapter 656, Workers' Compensation.

### 7. Compliance with Applicable Law

Consultant shall comply with all applicable federal, state, and local laws and regulations. Consultant agrees it currently is in compliance with all tax laws. Consultant shall comply with Title VI of the Civil Rights Act of 1964 and its corresponding regulations as further described at: <http://www.portlandoregon.gov/bibs/article/446806>.

### 8. Indemnification for Property Damage and Personal Injury

Consultant shall indemnify, defend, and hold harmless the Commission, its officers, agents, and employees, from all claims, losses, damages, and costs (including reasonable attorney fees) for personal injury and property damage arising out of the intentional or negligent acts or omissions of the Consultant, its Subconsultants, suppliers, employees or agents in the performance of its services. Nothing in this paragraph requires the Consultant or its insurer to indemnify the Commission for claims of personal injury or property damage caused by the negligence of the Commission. This duty shall survive the expiration or termination of this contract.

### 9. Insurance

Consultant shall obtain and maintain in full force at Consultant expense, throughout the duration of the Contract and any warranty or extension periods, the required insurance identified below. The Commission reserves the right to require additional insurance coverage as required by statutory or legal changes to the maximum liability that may be imposed on Oregon cities and/or other affected jurisdictions during the term of the Contract.

- (a) Workers' compensation insurance as required by ORS Chapter 656 and as it may be amended. Unless exempt under ORS Chapter 656, the Consultant and all subconsultants shall maintain coverage for all subject workers.

Required and attached //  Proof of exemption (i.e., completion of Workers' Compensation Insurance Statement)

- (b) General commercial liability (CGL) insurance covering bodily injury, personal injury, property damage, including coverage for independent contractor's protection (required if any work will be subcontracted), premises/operations, contractual liability, products and completed operations, in per occurrence limit of not less than \$1,000,000, and aggregate limit of not less than \$2,000,000.

Required and attached //  Waived by Director or designee //  Reduce by Director or designee

- (c) Automobile liability insurance with coverage of not less than \$1,000,000 each accident, and an umbrella or excess liability coverage of \$2,000,000. The insurance shall include coverage for any auto or all owned, scheduled, hired and non-owned auto. This coverage may be combined with the commercial general liability insurance policy.

Required and attached //  X Waived by Director or designee //  Reduce by Director or designee

- (d) Professional Liability and/or Errors & Omissions insurance to cover damages caused by negligent acts, errors or omissions related to the professional services, and performance of duties and responsibilities of the Consultant under this contract in an amount with a combined single limit of not less than \$1,000,000 per occurrence and aggregate of \$3,000,000 for all claims per occurrence. In lieu of an occurrence based policy, Consultant may have claims-made policy in an amount not less than \$1,000,000 per claim and \$3,000,000 annual aggregate, if the Consultant obtains an extended reporting period or tail coverage for not less than three (3) years following the termination or expiration of the Contract.

Required and attached //  X Waived by Director or designee //  Reduce by Director or designee

Continuous Coverage; Notice of Cancellation: The Consultant agrees to maintain continuous, uninterrupted coverage for the duration of the Contract. There shall be no termination, cancellation, material change, potential exhaustion of aggregate limits or non renewal of coverage without thirty (30) days written notice from Consultant to the Commission. If the insurance is canceled or terminated prior to completion of the Contract, Consultant shall immediately notify the Commission and provide a new policy with the same terms. Any failure to comply with this clause shall constitute a material breach of Contract and shall be grounds for immediate termination of this Contract.

Additional Insured: The liability insurance coverages, except Professional Liability, Errors and Omissions, or Workers' Compensation, shall be without prejudice to coverage otherwise existing, and shall name the Commission and its officers, agents and employees as Additional Insureds, with respect to the Consultant's activities to be performed, or products or services to be provided. Coverage shall be primary and non-contributory with any other insurance and self-insurance. Notwithstanding the naming of additional insureds, the insurance shall protect each additional insured in the same manner as though a separate policy had been issued to each, but nothing herein shall operate to increase the insurer's liability as set forth elsewhere in the policy beyond the amount or amounts for which the insurer would have been liable if only one person or interest had been named as insured.

Certificate(s) of Insurance: Consultant shall provide proof of insurance through acceptable certificate(s) of insurance, including additional insured endorsement form(s) and all other relevant endorsements, to the Commission prior to the award of the Contract if required by the procurement documents (e.g., request for proposal), or at execution of Contract and prior to any commencement of work or delivery of goods or services under the Contract. The Certificate(s) will specify all of the parties who are endorsed on the policy as Additional Insureds (or Loss Payees). Insurance coverages required under this Contract shall be obtained from insurance companies acceptable to the Commission of Portland. The Consultant shall pay for all deductibles and premium. The Commission reserves the right to require, at any time, complete, certified copies of required insurance policies, including endorsements evidencing the coverage the required.

Subconsultant(s): Consultant shall provide evidence that any subconsultant, if any, performing work or providing goods or service under the Contract has the same types and amounts of coverages as required herein or that the subconsultant is included under Consultant's policy.

#### **10. Ownership of Work Product**

All work product produced by the Consultant under this contract is the exclusive property of the Commission. "Work Product" includes, but is not limited to: research, reports, computer programs, manuals, drawings, recordings, photographs, artwork and any data or information in any form. The Consultant and the Commission intend that such Work Product shall be deemed "work made for hire" of which the Commission shall be deemed the author. If for any reason a Work Product is deemed not to be a "work made for hire," the Consultant hereby irrevocably assigns and transfers to the Commission all right, title and interest in such work product, whether arising from copyright, patent, trademark, trade secret, or any other state or federal intellectual property law or doctrines. Consultant shall obtain such interests and execute all documents necessary to fully vest such rights in the Commission. Consultant waives all rights relating to work product, including any rights arising under 17 USC 106A, or any other rights of authorship, identification or approval, restriction or limitation on use or subsequent modifications. If the Consultant is an architect, the Work Product is the property of the Consultant-Architect, and by execution of this contract, the Consultant-Architect grants the Commission an exclusive and irrevocable license to use that Work Product.

Notwithstanding the above, all pre-existing trademarks, services marks, patents, copyrights, trade secrets, and other proprietary rights of Consultant are and will remain the exclusive property of Consultant.

#### **11. EEO Certification**

In the event Consultant provides in excess of \$2,500.00 for services to the Commission in any fiscal year, Consultant shall obtain EEO certification from the City of Portland.

#### **12. Equal Benefits**

Consultant must comply with the City's Equal Benefits program as prescribed by Chapter 3.100 of the Code of the City of Portland. The required documentation must be filed with Procurement Services, City of Portland, prior to contract execution.

#### **13. Successors in Interest**

The provisions of this contract shall be binding upon and shall inure to the benefit of the parties hereto, and their respective successors and approved assigns.

#### **14. Severability**

The parties agree that if any term or provision of this contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular term or provision held to be invalid.

#### **15. Waiver**

The failure of the Commission to enforce any provision of this contract shall not constitute a waiver by the Commission of that or any other provision.

#### **16. Errors**

The Consultant shall promptly perform such additional services as may be necessary to correct errors in the services required by this contract without undue delays and without additional cost.

#### **17. Governing Law/Venue**

The provisions of this contract shall be interpreted, construed and enforced in accordance with, and governed by, the laws of the State of Oregon without reference to its conflict of laws provisions that might otherwise require the application of the law of any other jurisdiction. Any action or suits involving any question arising under this contract must be brought in the appropriate court in Multnomah County Oregon.

#### **18. Amendments**

All changes to this contract, including changes to the scope of work and contract amount, must be made by written amendment and approved by the Commission to be valid. Any amendment that increases the original contract amount by more than 25% must be approved by the Commission to be valid.

#### **19. Business Tax Registration**

The Consultant shall obtain a City of Portland business tax registration number as required by Portland City Code 7.02 prior to beginning work under this Contract.

#### **20. Prohibited Conduct**

The Consultant shall not hire any Commission employee who evaluated the proposals or authorized the award of this Contract for two years after the date the contract was authorized without the express written permission of the Commission and provided the hiring is permitted by state law.

#### **21. Payment to Vendors and Subconsultants**

The Consultant shall timely pay all subconsultants and suppliers providing services or goods for this Contract.

#### **22. Access to Records**

The Consultant shall maintain all records relating to this Contract for three (3) years after final payment. The Commission may examine, audit and copy the Consultant's books, documents, papers, and records relating to this contract at any time during this period upon reasonable notice. Copies of these records shall be made available upon request. Payment for the reasonable cost of requested copies shall be made by the Commission.

#### **23. Audits**

- (a) The Commission may conduct financial and performance audits of the billings and services specified in this agreement at any time in the course of the agreement and during the three (3) year period established by paragraph 22. Audits will be conducted in accordance with generally accepted auditing standards as promulgated in Government Auditing Standards by the Comptroller General of the United States Government Accountability Office.
- (b) If an audit discloses that payments to the Consultant exceed the amount to which the Consultant was entitled, the Consultant shall repay the amount of the excess to the Commission.

#### **24. Electronic Signatures**

The Commission and Consultant may conduct this transaction, including any contract amendments, by electronic means, including the use of electronic signatures.

#### **25. Merger Clause**

This Contract encompasses the entire agreement of the parties, and supersedes all previous understandings and agreements between the parties, whether verbal or written.

#### **26. Dispute Resolution/Work Regardless of Disputes**

The parties shall participate in mediation to resolve disputes before conducting litigation. The mediation shall occur at a reasonable time after the conclusion of the Contract with a mediator jointly selected by the parties. Notwithstanding any dispute under this Contract, the Consultant shall continue to perform its work pending resolution of a dispute, and the Commission shall make payments as required by the Contract for undisputed portions of the work. In the event of litigation no attorney fees are recoverable.

No different dispute resolution paragraph(s) in this contract or any attachment hereto shall supersede or take precedence over this provision.

**27. Progress Reports:** / **Applicable** /**X/ Not Applicable**

If applicable, the Consultant shall provide monthly progress reports to the Project Manager as described in the Statement of the Work and Payment Schedule.

**28. Consultant's Personnel:** / **Applicable** /**X Not Applicable**

If applicable, the Consultant shall assign the personnel listed in the Statement of the Work and Payment Schedule for the work required by the Contract and shall not change personnel without the prior written consent of the Commission, which shall not be unreasonably withheld.

**29. Subconsultants**

The Consultant shall use the subconsultants identified in its proposals. The Consultant shall not change subconsultant assignments without the prior written consent of the Chief Procurement Officer of the City of Portland. The Commission will enforce all social equity contracting and Minority, Women and Emerging Small Business (M/W/ESB) subcontracting commitments submitted by the Consultant in its proposals. Failure to use the identified M/W/ESB subconsultants without prior written consent is a material breach of contract.

For contracts valued \$50,000 or more, the Consultant shall submit a Monthly Subconsultant Payment and Utilization Report (MUR), made part of this contract by reference, reporting ALL subconsultants employed in the performance of this agreement. An electronic copy of the MUR may be obtained at: <http://www.portlandoregon.gov/bibs/45475>.

**30. Third Party Beneficiaries**

There are no third party beneficiaries to this contract. Enforcement of this contract is reserved to the parties.

**31. Conflict of Interest**

Consultant hereby certifies that, if applicable, its contract proposal is made in good faith without fraud, collusion or connection of any kind with any other proposer of the same request for proposals or other Commission procurement solicitation(s), that the Consultant as a proposer has competed solely on its own behalf without connection or obligation to, any undisclosed person or firm. Consultant certifies that it is not a Commission official/employee or a business with which a Commission official/employee is associated, and that to the best of its knowledge, Consultant, its employee(s), its officer(s) or its director(s) is not a Commission official/employee or a relative of any Commission official/employee who: i) has responsibility in making decisions or ability to influence decision-making on the contract or project to which this contract pertains; ii) has or will participate in evaluation or management of the contract; or iii) has or will have financial benefits in the contract. Consultant understands that should it elect to employ any former Commission official/employee during the term of the contract then that the former Commission official/Consultant employee must comply with applicable government ethics and conflicts of interest provisions in ORS Chapter 244, including but not limited to ORS 244.040(5) and ORS 244.047, and the Commission's Charter, Codes and administrative rules, including lobbying prohibitions under Portland City Code Section 2.12.080.

=====

**STATEMENT OF THE WORK  
AND PAYMENT SCHEDULE**

**SCOPE OF WORK**

The Contractor shall design, conduct and report on an ascertainment of the Commission's Jurisdictions' and communities' current and future communications technology needs and interests.

The goals of the ascertainment process are to:

- ▶ Provide data and guidance to the Commission and its Jurisdictions for cable franchise renewals and other communications technology policy initiatives and decisions.
- ▶ Build greater awareness of existing cable-related public benefits and communications technology opportunities.

Specific services will include:

- ▶ Facilitate discussions with Commission staff and, as necessary, commission members and others identified by the Commission Project Manager, to identify key ascertainment questions.
- ▶ Design an ascertainment process and plan, in consultation with the Commission's Project Manager, which incorporates appropriate data collection and engagement strategies, anticipating a mix of methods such as surveys and interviews, and that maximizes ascertainment activities and materials to

build greater awareness of existing cable-related public benefits and communications technology opportunities.

- ▶ Vet the draft ascertainment plan with key individuals identified by the Commission’s Project Manager.
- ▶ Conduct the ascertainment in accordance with the agreed upon implementation plan.
- ▶ Analyze ascertainment data to identify trends, findings and other information related to the ascertainment key questions.
- ▶ Produce a draft report, which identifies ascertainment results; documents the process; and provides trends, data analysis and findings, and vet the draft with Commission staff and, as necessary, commission members and others identified by the Commission Project Manager.
- ▶ Provide a final report for public distribution.

Commission Project Manager and staff will:

- ▶ Provide sufficient time to collaborate with Contractor and other invited project team members to participate in development of the ascertainment plan and the plan implementation.
- ▶ Schedule and arrange logistics for interviews, work sessions and other data collection methods as needed.
- ▶ Encourage timely participation by public and community partners in surveys, interviews and other aspects of Consultant’s work for the Commission.
- ▶ Cover printing and other costs related to distribution of the report and any related documents.

Deliverables:

1. Key ascertainment questions that guide the ascertainment design.
2. Ascertainment process plan, including implementation work plan and related time frames.
3. An ascertainment report, including results, analysis, findings and trends.

**CONSULTANT PERSONNEL**

The Consultant shall assign the following personnel to do the work in the capacities designated:

<b>NAME</b>	<b>ROLE ON PROJECT</b>
Paula Manley	Consultant

**SUBCONSULTANTS**

*None*

**COMPENSATION**

The maximum that the Consultant can be paid on this contract is \$20,000 (hereafter the “not to exceed” amount.). The “not to exceed” amount includes all payments to be made pursuant to this contract, including reimbursable expenses, if any. Nothing in this contract requires the Commission to pay for work that does not meet the Standard of Care or other requirements of the Contract. The actual amount to be paid Consultant may be less than that amount.

The Consultant is entitled to receive progress payments for its work pursuant to the Contract as provided in more detail below. The Commission will pay Consultant based on these invoices for acceptable work performed and approved until the “not to exceed” amount is reached. Thereafter, Consultant must complete work based on the Contract without additional compensation unless there is a change to the scope of work. It is Commission policy to pay its vendor invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, vendors shall execute the Commission’s standard ACH Vendor Payment Authorization Agreement. Upon verification of the data provided, the Payment Authorization Agreement will authorize the Commission to deposit payment for services rendered or goods provided directly into vendor accounts with financial institutions. All payments shall be in United States currency.

Any estimate of the hours necessary to perform the work is not binding on the Commission. The Consultant remains responsible if the estimate proves to be incorrect. Exceeding the number of estimated hours of work does not impose any liability on the Commission for additional payment.

If work is completed before the “not to exceed” amount is reached, the Consultant’s compensation will be based on the Consultant’s bills previously submitted for acceptable work performed and approved.

**PAYMENT TERMS:** Net 30 Days

### **Hourly Rates**

The billing rate shall not exceed \$185/Hour.

### **Standard Reimbursable Costs**

The following costs will be reimbursed without mark-up:

- Meeting materials (e.g., copies of handouts, flip chart pads for focus group sessions, etc.)

### **Subconsultant Costs**

None

### **Progress Payments**

The Consultant shall submit to the Commission’s Project Manager invoice(s) for work performed by the Consultant. The invoice(s) shall be on Consultant’s letterhead, signed and dated by an authorized representative of the Consultant and addressed to “MHCRC c/o City of Portland.” The invoice shall contain the Commission’s Contract Number and set out all items for payment including, but not limited to: the name of the individual, labor category, direct labor rate, hours worked during the period, and tasks performed. The Consultant shall also attach photocopies of claimed reimbursable expenses, if applicable. Prior to initial billing, the Consultant shall develop a billing format for approval by the MHCRC Project Manager.

The Commission shall pay all amounts to which no dispute exists within 30 days of receipt of the invoice. Payment of any bill, however, does not preclude the Commission from later determining that an error in payment was made and from withholding the disputed sum from the next progress payment until the dispute is resolved.

### **ACH Payments**

It is the Commission’s policy to pay its Consultant invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, Consultants shall execute the Commission’s standard ACH Vendor Payment Authorization Agreement which is available on the Commission’s website at: <http://www.portlandoregon.gov/bfs/article/409834>.

Upon verification of the data provided, the Payment Authorization Agreement will authorize the Commission to deposit payment for services rendered directly into Consultant accounts with financial institutions. All payments shall be in United States currency.

**WORKERS' COMPENSATION INSURANCE STATEMENT**

**IF YOUR FIRM HAS CURRENT WORKERS' COMPENSATION INSURANCE, CONTRACTOR MUST SIGN HERE:**

I, undersigned, am authorized to act on behalf of entity designated below, and I hereby certify that this entity has current Workers' Compensation Insurance.

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Entity: \_\_\_\_\_

**IF YOUR FIRM DOES NOT HAVE CURRENT WORKERS' COMPENSATION INSURANCE, CONTRACTOR MUST COMPLETE THE FOLLOWING INDEPENDENT CONTRACTOR CERTIFICATION STATEMENT:**

As an independent contractor, I certify that I meet the following standards:

1. The individual or business entity providing labor or services is registered under ORS Chapter 701, if the individual or business entity provides labor or services for which such registration is required;
2. Federal and state income tax returns in the name of the business or a business Schedule C or form Schedule F as part of the personal income tax return were filed for the previous year if the individual or business entity performed labor or services as an independent contractor in the previous year; and
3. The individual or business entity represents to the public that the labor or services are to be provided by an independently established business. Except when an individual or business entity files a Schedule F as part of the personal income tax returns and the individual or business entity performs farm labor or services that are reportable on Schedule C, an individual or business entity is considered to be engaged in an independently established business when four or more of the following circumstances exist. Contractor: check four or more of the following:

- \_\_\_\_\_ A. The labor or services are primarily carried out at a location that is separate from the residence of an individual who performs the labor or services, or are primarily carried out in a specific portion of the residence, which portion is set aside as the location of the business;
- \_\_\_\_\_ B. Commercial advertising or business cards as is customary in operating similar businesses are purchased for the business, or the individual or business entity has a trade association membership;
- \_\_\_\_\_ C. Telephone listing and service are used for the business that is separate from the personal residence listing and service used by an individual who performs the labor or services;
- \_\_\_\_\_ D. Labor or services are performed only pursuant to written contracts;
- \_\_\_\_\_ E. Labor or services are performed for two or more different persons within a period of one year; or
- \_\_\_\_\_ F. The individual or business entity assumes financial responsibility for defective workmanship or for service not provided as evidenced by the ownership of performance bonds, warranties, errors and omission insurance or liability insurance relating to the labor or services to be provided.

\_\_\_\_\_  
Contractor Signature

\_\_\_\_\_  
Date

**FOR COMMISSION USE ONLY**

**PROJECT MANAGER-COMplete ONLY IF CONTRACTOR DOES NOT HAVE WORKER'S COMPENSATION INSURANCE**  
ORS 670.600 Independent contractor standards. As used in various provisions of ORS Chapters 316, 656, 657, and 701, an individual or business entity that performs labor or services for remuneration shall be considered to perform the labor or services as an "independent contractor" if the standards of this section are met. The contracted work meets the following standards:

1. The individual or business entity providing the labor or services is free from direction and control over the means and manner of providing the labor or services, subject only to the right of the person for whom the labor or services are provided to specify the desired results;
2. The individual or business entity providing labor or services is responsible for obtaining all assumed business registrations or professional occupation licenses required by state law or local government ordinances for the individual or business entity to conduct the business;
3. The individual or business entity providing labor or services furnishes the tools or equipment necessary for performance of the contracted labor or services;
4. The individual or business entity providing labor or services has the authority to hire and fire employees to perform the labor or services;
5. Payment for the labor or services is made upon completion of the performance of specific portions of the project or is made on the basis of an annual or periodic retainer.

\_\_\_\_\_  
Commission Project Manager Signature

\_\_\_\_\_  
Date

**CONSULTANT SIGNATURE:**

This contract may be signed in two (2) or more counterparts, each of which shall be deemed an original, and which, when taken together, shall constitute one and the same Agreement.

The parties agree the Commission and Consultant may conduct this transaction, including any contract amendments, by electronic means, including the use of electronic signatures.

I, the undersigned, agree to perform work outlined in this contract in accordance to the STANDARD CONTRACT PROVISIONS, the terms and conditions, made part of this contract by reference, and the STATEMENT OF THE WORK made part of this contract by reference; hereby certify under penalty of perjury that I/my business am not/is not in violation of any Oregon tax laws; hereby certify that my business is certified as an Equal Employment Opportunity Affirmative Action Employer and is in compliance with the Equal Benefits Program as prescribed by Chapter 3.100 of Code of the Commission of Portland; and hereby certify I am an independent contractor as defined in ORS 670.600.

**Paula Manley Consulting**

BY: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**MT. HOOD CABLE REGULATORY COMMISSION:**

By: \_\_\_\_\_  
Chair

Date: \_\_\_\_\_

Approved as to Form:

By: \_\_\_\_\_  
MHCRC Legal Counsel

Date: \_\_\_\_\_

**MT. HOOD CABLE REGULATORY COMMISSION  
AGREEMENT FOR PROFESSIONAL SERVICES**

**Public Institutional Partners Network Planning Project**

This contract is between the Mt. Hood Cable Regulatory Commission ("Commission") and CTC Technology & Energy, hereafter called "Consultant." The Commission's Project Manager for this contract is Julie S. Omelchuck.

**Effective Date and Duration**

This contract shall become effective on June 20, 2016. This contract shall expire, unless otherwise terminated or extended, on September 30, 2017.

**Consideration**

- (a) Commission agrees to pay Consultant a sum not to exceed \$40,000 for accomplishment of the work.
- (b) Interim payments shall be made to Consultant according to the schedule identified in the STATEMENT OF THE WORK AND PAYMENT SCHEDULE.

=====

**CONSULTANT DATA AND CERTIFICATION**

Name (print full legal name): CTC Technology & Energy

Address: 10613 Concord St., Kensington, MD 20895

Employer Identification Number (EIN): 52-1442373

**[INDEPENDENT CONTRACTORS: DO NOT PROVIDE SOCIAL SECURITY NUMBER (SSN)**

**- LEAVE BLANK IF NO EIN]**

City of Portland Business Tax Registration Number: 697881

Citizenship: Nonresident alien  Yes  No

Business Designation (check one):  Individual  Sole Proprietorship  Partnership  Corporation

Limited Liability Co (LLC)  Estate/Trust  Public Service Corp.  Government/Nonprofit

Payment information will be reported to the IRS under the name and taxpayer I.D. number provided above. Information must be provided prior to contract approval.

=====

**TERMS AND CONDITIONS**

**1. Standard of Care**

Consultant shall perform all services under this contract using that care, skill, and diligence that would ordinarily be used by similar professionals in this community in similar circumstances.

**2. Effect of Expiration**

Passage of the contract expiration date shall not extinguish, prejudice, or limit either party's right to enforce this Contract with respect to any default or defect in performance that has not been corrected.

**3. Order of Precedence**

This contract consists of these Terms and Conditions, the Statement of Work and Payment Schedule, and any exhibits that are attached. Any apparent or alleged conflict between these items will be resolved by using the following order of precedence:

a) these Terms and Conditions; b) Statement of Work and Payment Schedule; and c) any exhibits attached to the contract.

#### 4. Early Termination of Contract

- (a) The Commission may terminate this Contract for convenience at any time for any reason deemed appropriate in its sole discretion. Termination is effective immediately upon notice of termination given by the Commission.
- (b) Either party may terminate this Contract in the event of a material breach by the other party that is not cured. Before termination is permitted, the party seeking termination shall give the other party written notice of the breach, its intent to terminate, and fifteen (15) calendar days to cure the breach. If the breach is not cured within 15 days, the party seeking termination may terminate immediately by giving written notice that the Contract is terminated.

#### 5. Remedies and Payment on Early Termination

- (a) If the Commission terminates pursuant to 4(a) above, the Commission shall pay the Consultant for work performed in accordance with the Contract prior to the termination date. No other costs or loss of anticipated profits shall be paid.
- (b) If the Commission terminates pursuant to 4(b) above, the Commission is entitled all remedies available at law or equity. In addition, Consultant shall pay the Commission all damages, costs, and sums incurred by the Commission as a result of the breach.
- (c) If the Consultant justifiably terminates the contract pursuant to subsection 4(b), the Consultant's only remedy is payment for work prior to the termination. No other costs or loss of anticipated profits shall be paid.
- (d) If the Commission's termination under Section 4(b) was wrongful, the termination shall be automatically converted to one for convenience and the Consultant shall be paid as if the Contract was terminated under Section 4(a).
- (e) In the event of early termination the Consultant's work product before the date of termination becomes property of the Commission.

#### 6. Assignment

Consultant shall not subcontract, assign, or transfer any of the work scheduled under this agreement, without the prior written consent of the Commission. Notwithstanding Commission approval of a subconsultant, the Consultant shall remain obligated for full performance hereunder, and the Commission shall incur no obligation other than its obligations to the Consultant hereunder. The Consultant agrees that if subconsultants are employed in the performance of this Agreement, the Consultant and its subconsultants are subject to the requirements and sanctions of ORS Chapter 656, Workers' Compensation.

#### 7. Compliance with Applicable Law

Consultant shall comply with all applicable federal, state, and local laws and regulations. Consultant agrees it currently is in compliance with all tax laws. Consultant shall comply with Title VI of the Civil Rights Act of 1964 and its corresponding regulations as further described at: <http://www.portlandoregon.gov/bibs/article/446806>.

#### 8. Indemnification for Property Damage and Personal Injury

Consultant shall indemnify, defend, and hold harmless the Commission, its officers, agents, and employees, from all claims, losses, damages, and costs (including reasonable attorney fees) for personal injury and property damage arising out of the intentional or negligent acts or omissions of the Consultant, its Subconsultants, suppliers, employees or agents in the performance of its services. Nothing in this paragraph requires the Consultant or its insurer to indemnify the Commission for claims of personal injury or property damage caused by the negligence of the Commission. This duty shall survive the expiration or termination of this contract.

#### 9. Insurance

Consultant shall obtain and maintain in full force at Consultant expense, throughout the duration of the Contract and any warranty or extension periods, the required insurance identified below. The Commission reserves the right to require additional insurance coverage as required by statutory or legal changes to the maximum liability that may be imposed on Oregon cities and/or other affected jurisdictions during the term of the Contract.

- (a) Workers' compensation insurance as required by ORS Chapter 656 and as it may be amended. Unless exempt under ORS Chapter 656, the Consultant and all subconsultants shall maintain coverage for all subject workers.

X Required and attached //  Proof of exemption (i.e., completion of Workers' Compensation Insurance Statement)

- (b) General commercial liability (CGL) insurance covering bodily injury, personal injury, property damage, including coverage for independent contractor's protection (required if any work will be subcontracted), premises/operations, contractual liability, products and completed operations, in per occurrence limit of not less than \$1,000,000, and aggregate limit of not less than \$2,000,000.

X Required and attached //  Waived by Director or designee //  Reduce by Director or designee

- (c) Automobile liability insurance with coverage of not less than \$1,000,000 each accident, and an umbrella or excess liability coverage of \$2,000,000. The insurance shall include coverage for any auto or all owned, scheduled, hired and non-owned auto. This coverage may be combined with the commercial general liability insurance policy.

X Required and attached //  Waived by Director or designee //  Reduce by Director or designee

- (d) Professional Liability and/or Errors & Omissions insurance to cover damages caused by negligent acts, errors or omissions related to the professional services, and performance of duties and responsibilities of the Consultant under this contract in an amount with a combined single limit of not less than \$1,000,000 per occurrence and aggregate of \$3,000,000 for all claims per occurrence. In lieu of an occurrence based policy, Consultant may have claims-made policy in an amount not less than \$1,000,000 per claim and \$3,000,000 annual aggregate, if the Consultant obtains an extended reporting period or tail coverage for not less than three (3) years following the termination or expiration of the Contract.

X Required and attached //  Waived by Director or designee //  Reduce by Director or designee

Continuous Coverage; Notice of Cancellation: The Consultant agrees to maintain continuous, uninterrupted coverage for the duration of the Contract. There shall be no termination, cancellation, material change, potential exhaustion of aggregate limits or non renewal of coverage without thirty (30) days written notice from Consultant to the Commission. If the insurance is canceled or terminated prior to completion of the Contract, Consultant shall immediately notify the Commission and provide a new policy with the same terms. Any failure to comply with this clause shall constitute a material breach of Contract and shall be grounds for immediate termination of this Contract.

Additional Insured: The liability insurance coverages, except Professional Liability, Errors and Omissions, or Workers' Compensation, shall be without prejudice to coverage otherwise existing, and shall name the Commission and its officers, agents and employees as Additional Insureds, with respect to the Consultant's activities to be performed, or products or services to be provided. Coverage shall be primary and non-contributory with any other insurance and self-insurance. Notwithstanding the naming of additional insureds, the insurance shall protect each additional insured in the same manner as though a separate policy had been issued to each, but nothing herein shall operate to increase the insurer's liability as set forth elsewhere in the policy beyond the amount or amounts for which the insurer would have been liable if only one person or interest had been named as insured.

Certificate(s) of Insurance: Consultant shall provide proof of insurance through acceptable certificate(s) of insurance, including additional insured endorsement form(s) and all other relevant endorsements, to the Commission prior to the award of the Contract if required by the procurement documents (e.g., request for proposal), or at execution of Contract and prior to any commencement of work or delivery of goods or services under the Contract. The Certificate(s) will specify all of the parties who are endorsed on the policy as Additional Insureds (or Loss Payees). Insurance coverages required under this Contract shall be obtained from insurance companies acceptable to the Commission of Portland. The Consultant shall pay for all deductibles and premium. The Commission reserves the right to require, at any time, complete, certified copies of required insurance policies, including endorsements evidencing the coverage the required.

Subconsultant(s): Consultant shall provide evidence that any subconsultant, if any, performing work or providing goods or service under the Contract has the same types and amounts of coverages as required herein or that the subconsultant is included under Consultant's policy.

#### **10. Ownership of Work Product**

All work product produced by the Consultant under this contract is the exclusive property of the Commission. "Work Product" includes, but is not limited to: research, reports, computer programs, manuals, drawings, recordings, photographs, artwork and any data or information in any form. The Consultant and the Commission intend that such Work Product shall be deemed "work made for hire" of which the Commission shall be deemed the author. If for any reason a Work Product is deemed not to be a "work made for hire," the Consultant hereby irrevocably assigns and transfers to the Commission all right, title and interest in such work product, whether arising from copyright, patent, trademark, trade secret, or any other state or federal intellectual property law or doctrines. Consultant shall obtain such interests and execute all documents necessary to fully vest such rights in the Commission. Consultant waives all rights relating to work product, including any rights arising under 17 USC 106A, or any other rights of authorship, identification or approval, restriction or limitation on use or subsequent modifications. If the Consultant is an architect, the Work Product is the property of the Consultant-Architect, and by execution of this contract, the Consultant-Architect grants the Commission an exclusive and irrevocable license to use that Work Product.

Notwithstanding the above, all pre-existing trademarks, services marks, patents, copyrights, trade secrets, and other proprietary rights of Consultant are and will remain the exclusive property of Consultant.

#### **11. EEO Certification**

In the event Consultant provides in excess of \$2,500.00 for services to the Commission in any fiscal year, Consultant shall obtain EEO certification from the City of Portland.

#### **12. Equal Benefits**

Consultant must comply with the City's Equal Benefits program as prescribed by Chapter 3.100 of the Code of the City of Portland. The required documentation must be filed with Procurement Services, City of Portland, prior to contract execution.

#### **13. Successors in Interest**

The provisions of this contract shall be binding upon and shall inure to the benefit of the parties hereto, and their respective successors and approved assigns.

#### **14. Severability**

The parties agree that if any term or provision of this contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular term or provision held to be invalid.

**15. Waiver**

The failure of the Commission to enforce any provision of this contract shall not constitute a waiver by the Commission of that or any other provision.

**16. Errors**

The Consultant shall promptly perform such additional services as may be necessary to correct errors in the services required by this contract without undue delays and without additional cost.

**17. Governing Law/Venue**

The provisions of this contract shall be interpreted, construed and enforced in accordance with, and governed by, the laws of the State of Oregon without reference to its conflict of laws provisions that might otherwise require the application of the law of any other jurisdiction. Any action or suits involving any question arising under this contract must be brought in the appropriate court in Multnomah County Oregon.

**18. Amendments**

All changes to this contract, including changes to the scope of work and contract amount, must be made by written amendment and approved by the Commission to be valid. Any amendment that increases the original contract amount by more than 25% must be approved by the Commission to be valid.

**19. Business Tax Registration**

The Consultant shall obtain a City of Portland business tax registration number as required by Portland City Code 7.02 prior to beginning work under this Contract.

**20. Prohibited Conduct**

The Consultant shall not hire any Commission employee who evaluated the proposals or authorized the award of this Contract for two years after the date the contract was authorized without the express written permission of the Commission and provided the hiring is permitted by state law.

**21. Payment to Vendors and Subconsultants**

The Consultant shall timely pay all subconsultants and suppliers providing services or goods for this Contract.

**22. Access to Records**

The Consultant shall maintain all records relating to this Contract for three (3) years after final payment. The Commission may examine, audit and copy the Consultant's books, documents, papers, and records relating to this contract at any time during this period upon reasonable notice. Copies of these records shall be made available upon request. Payment for the reasonable cost of requested copies shall be made by the Commission.

**23. Audits**

- (a) The Commission may conduct financial and performance audits of the billings and services specified in this agreement at any time in the course of the agreement and during the three (3) year period established by paragraph 22. Audits will be conducted in accordance with generally accepted auditing standards as promulgated in Government Auditing Standards by the Comptroller General of the United States Government Accountability Office.
- (b) If an audit discloses that payments to the Consultant exceed the amount to which the Consultant was entitled, the Consultant shall repay the amount of the excess to the Commission.

**24. Electronic Signatures**

The Commission and Consultant may conduct this transaction, including any contract amendments, by electronic means, including the use of electronic signatures.

**25. Merger Clause**

This Contract encompasses the entire agreement of the parties, and supersedes all previous understandings and agreements between the parties, whether verbal or written.

**26. Dispute Resolution/Work Regardless of Disputes**

The parties shall participate in mediation to resolve disputes before conducting litigation. The mediation shall occur at a reasonable time after the conclusion of the Contract with a mediator jointly selected by the parties. Notwithstanding any dispute under this Contract, the Consultant shall continue to perform its work pending resolution of a dispute, and the Commission shall make payments as required by the Contract for undisputed portions of the work. In the event of litigation no attorney fees are recoverable. No different dispute resolution paragraph(s) in this contract or any attachment hereto shall supersede or take precedence over this provision.

**27. Progress Reports: /  / Applicable / X Not Applicable**

If applicable, the Consultant shall provide monthly progress reports to the Project Manager as described in the Statement of the Work and Payment Schedule.

**28. Consultant's Personnel: /  / Applicable / X Not Applicable**

If applicable, the Consultant shall assign the personnel listed in the Statement of the Work and Payment Schedule for the work required by the Contract and shall not change personnel without the prior written consent of the Commission, which shall not be unreasonably withheld.

**29. Subconsultants**

The Consultant shall use the subconsultants identified in its proposals. The Consultant shall not change subconsultant assignments without the prior written consent of the Chief Procurement Officer of the City of Portland. The Commission will enforce all social equity contracting and Minority, Women and Emerging Small Business (M/W/ESB) subcontracting commitments submitted by the Consultant in its proposals. Failure to use the identified M/W/ESB subconsultants without prior written consent is a material breach of contract.

For contracts valued \$50,000 or more, the Consultant shall submit a Monthly Subconsultant Payment and Utilization Report (MUR), made part of this contract by reference, reporting ALL subconsultants employed in the performance of this agreement. An electronic copy of the MUR may be obtained at: <http://www.portlandoregon.gov/bibs/45475>.

**30. Third Party Beneficiaries**

There are no third party beneficiaries to this contract. Enforcement of this contract is reserved to the parties.

**31. Conflict of Interest**

Consultant hereby certifies that, if applicable, its contract proposal is made in good faith without fraud, collusion or connection of any kind with any other proposer of the same request for proposals or other Commission procurement solicitation(s), that the Consultant as a proposer has competed solely on its own behalf without connection or obligation to, any undisclosed person or firm. Consultant certifies that it is not a Commission official/employee or a business with which a Commission official/employee is associated, and that to the best of its knowledge, Consultant, its employee(s), its officer(s) or its director(s) is not a Commission official/employee or a relative of any Commission official/employee who: i) has responsibility in making decisions or ability to influence decision-making on the contract or project to which this contract pertains; ii) has or will participate in evaluation or management of the contract; or iii) has or will have financial benefits in the contract. Consultant understands that should it elect to employ any former Commission official/employee during the term of the contract then that the former Commission official/Consultant employee must comply with applicable government ethics and conflicts of interest provisions in ORS Chapter 244, including but not limited to ORS 244.040(5) and ORS 244.047, and the Commission's Charter, Codes and administrative rules, including lobbying prohibitions under Portland City Code Section 2.12.080.

=====

**STATEMENT OF THE WORK  
AND PAYMENT SCHEDULE**

**SCOPE OF WORK**

Contractor shall work with the Commission's Project Manager, and in consultation with the City of Portland Bureau of Technology Services staff, to implement the following scope of work:

Task 1: Produce a well-researched, interesting booklet that will help inform the Commission's local governments and communities about implications, opportunities and future policy related to the communications technology and broadband landscape.

Time Frame: June-September 2016

- Research and explore future-focused thinking and visionaries in the communications technology and broadband field.
- Identify learnings, best practices and case studies from other communities and local governments in the areas of regulation, public policy, cable TV franchise renewals and digital equity and inclusion initiatives and programs.
- Identify trends and environmental factors that might shape the broadband landscape for local communities.
- Produce graphics and other ways to present technical, economic and culture concepts, findings and trends that are easy to understand and informative for public officials and community members.
- Provide a ready-to-print written booklet, using the Commission's style and visual guide.

Task 2: Conduct an on-site project work session with Public Institutional Partners.

Time Frame: July-September 2016

- Collaborate with Commission Project Manager and other project team members to finalize work session agenda, goals and objectives.
- The work session will, among other things: Present an overview of relevant case studies and best practices in public sector broadband; enable Contractor to understand the Public Institutional Partners' long-term vision and needs; identify and seek guidance on any potential hurdles or areas of concern; discuss funding, financing, and partnership issues; discuss potential impact of Comcast franchise renewal in 2021; discuss potential shared-cost and other buildout opportunities; review project schedule, key milestones, and deliverables; discuss broadband technologies; and review potential interconnection with regional broadband efforts

Task 3: Conduct a needs assessment of current and future broadband capacity demand, connectivity and infrastructure of Public Institutional Partners.

Time Frame: September 2016 - April 2017

- Prepare an online survey for Public Institutional Partners, with the goal of understanding their fiber needs, constraints and challenges and to identify common concerns among Public Institutional Partners and concerns unique to any individual Public Institutional Partners.
- To fully understand the Public Institutional Partners' operational needs for broadband connections and service, conduct up to 10 interviews onsite or by teleconference with representatives from Public Institutional Partners to clarify and amplify survey responses and other factors.
- Perform an assessment of the Public Institutional Partners' current infrastructure to determine and document any requirements related to capacity, performance, continuity of operations, sites, hierarchy of sites, segmentation, interconnection and interoperability.
- Identify any current or potential future network or service gaps.

Task 4: Prepare and present a comprehensive project report and strategic roadmap.

Time Frame: May – September 2017

- Develop strategic options for meeting Public Institutional Partners' future needs and filling identified gaps, including, among other things, timelines for action; high-level recommendations for cooperative network governance among Public Institutional Partners; funding options and costs; and risk assessment.
- Vet options with Public Institutional Partners to develop findings and recommendations.
- Produce a report, which includes ascertainment results, documents the process, and provides trend and data analysis and findings.
- Present the report at one onsite Public Institutional Partners' meeting and one onsite Commission meeting.

For purposes of the network planning project, Public Institutional Partners include:

Multnomah County (including Multnomah County Library)

Home Forward

Multnomah Education Service District (including six school districts in Multnomah County)

Portland Public Schools

Metro

City of Gresham

City of Troutdale

City of Fairview

City of Wood Village

Mt. Hood Community College  
Portland Community College  
District Courts  
City of Portland BTS

Commission Project Manager and staff will:

- Provide sufficient time to collaborate with Contractor and other invited project team members to plan and carryout the agenda for the project work session.
- Provide contact information for Public Institutional Partners.
- Coordinate logistics for the on-site project work session.
- Schedule and arrange logistics for in-person and teleconference interviews with Contractor and Public Institutional Partners.
- Encourage timely participation by Public Institutional Partners in surveys, interviews and other aspects of Contractor's work for the Commission.
- Provide sufficient time to assist in the overall project and in the development of the strategic options, as necessary.
- Cover printing and other costs related to production and distribution of the report and any related documents.

**SUBCONSULTANTS**

NONE

**COMPENSATION**

The maximum that the Consultant can be paid on this contract is \$40,000 (hereafter the "not to exceed" amount.). The "not to exceed" amount includes all payments to be made pursuant to this contract, including reimbursable expenses, if any. Nothing in this contract requires the Commission to pay for work that does not meet the Standard of Care or other requirements of the Contract. The actual amount to be paid Consultant may be less than that amount.

The Consultant is entitled to receive progress payments for its work pursuant to the Contract as provided in more detail below. The Commission will pay Consultant based on these invoices for acceptable work performed and approved until the "not to exceed" amount is reached. Thereafter, Consultant must complete work based on the Contract without additional compensation unless there is a change to the scope of work. It is Commission policy to pay its vendor invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, vendors shall execute the Commission's standard ACH Vendor Payment Authorization Agreement. Upon verification of the data provided, the Payment Authorization Agreement will authorize the Commission to deposit payment for services rendered or goods provided directly into vendor accounts with financial institutions. All payments shall be in United States currency.

Any estimate of the hours necessary to perform the work is not binding on the Commission. The Consultant remains responsible if the estimate proves to be incorrect. Exceeding the number of estimated hours of work does not impose any liability on the Commission for additional payment.

If work is completed before the "not to exceed" amount is reached, the Consultant's compensation will be based on the Consultant's bills previously submitted for acceptable work performed and approved.

**PAYMENT TERMS:** Net 30 Days

## **Hourly Rates**

The billing rates shall not exceed those set forth below:

### **Labor Category Rate**

Director of Business Consulting / Engineering: \$170

Principal Analyst / Engineer: \$160

Senior Project Analyst / Engineer: \$150

Senior Analyst / Engineer: \$140

Staff Analyst / Engineer: \$130

Communications / Engineer Aide: \$ 75

## **Standard Reimbursable Costs**

Consultant shall not charge for any travel or expenses.

## **Progress Payments**

On or before the 15<sup>th</sup> of each month, the Consultant shall submit to the Commission's Project Manager an invoice for work performed by the Consultant during the preceding month. The invoice(s) shall be on Consultant's letterhead, signed and dated by an authorized representative of the Consultant and addressed to "MHCRC c/o City of Portland." The invoice shall contain the Commission's Contract Number and set out all items for payment including, but not limited to: the name of the individual, labor category, direct labor rate, hours worked during the period, and tasks performed. The Consultant shall stamp and approve all subconsultant invoices and note on the subconsultant invoice what they are approving as "billable" under the contract. The billing from the prime should clearly roll up labor and reimbursable costs for the prime and subconsultants – matching the subconsultant invoices.

The Commission shall pay all amounts to which no dispute exists within 30 days of receipt of the invoice. Payment of any bill, however, does not preclude the Commission from later determining that an error in payment was made and from withholding the disputed sum from the next progress payment until the dispute is resolved.

The Consultant shall make full payment to its subconsultants within 10 business days following receipt of any payment made by the Commission to Consultant.

## **ACH Payments**

It is the Commission's policy to pay its Consultant invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, Consultants shall execute the Commission's standard ACH Vendor Payment Authorization Agreement which is available on the Commission's website at: <http://www.portlandoregon.gov/bfs/article/409834>.

Upon verification of the data provided, the Payment Authorization Agreement will authorize the Commission to deposit payment for services rendered directly into Consultant accounts with financial institutions. All payments shall be in United States currency.

**WORKERS' COMPENSATION INSURANCE STATEMENT**

**IF YOUR FIRM HAS CURRENT WORKERS' COMPENSATION INSURANCE, CONTRACTOR MUST SIGN HERE:**

I, undersigned, am authorized to act on behalf of entity designated below, and I hereby certify that this entity has current Workers' Compensation Insurance.

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Entity: \_\_\_\_\_

**IF YOUR FIRM DOES NOT HAVE CURRENT WORKERS' COMPENSATION INSURANCE, CONTRACTOR MUST COMPLETE THE FOLLOWING INDEPENDENT CONTRACTOR CERTIFICATION STATEMENT:**

As an independent contractor, I certify that I meet the following standards:

1. The individual or business entity providing labor or services is registered under ORS Chapter 701, if the individual or business entity provides labor or services for which such registration is required;
2. Federal and state income tax returns in the name of the business or a business Schedule C or form Schedule F as part of the personal income tax return were filed for the previous year if the individual or business entity performed labor or services as an independent contractor in the previous year; and
3. The individual or business entity represents to the public that the labor or services are to be provided by an independently established business. Except when an individual or business entity files a Schedule F as part of the personal income tax returns and the individual or business entity performs farm labor or services that are reportable on Schedule C, an individual or business entity is considered to be engaged in an independently established business when four or more of the following circumstances exist. Contractor: check four or more of the following:

- \_\_\_\_\_ A. The labor or services are primarily carried out at a location that is separate from the residence of an individual who performs the labor or services, or are primarily carried out in a specific portion of the residence, which portion is set aside as the location of the business;
- \_\_\_\_\_ B. Commercial advertising or business cards as is customary in operating similar businesses are purchased for the business, or the individual or business entity has a trade association membership;
- \_\_\_\_\_ C. Telephone listing and service are used for the business that is separate from the personal residence listing and service used by an individual who performs the labor or services;
- \_\_\_\_\_ D. Labor or services are performed only pursuant to written contracts;
- \_\_\_\_\_ E. Labor or services are performed for two or more different persons within a period of one year; or
- \_\_\_\_\_ F. The individual or business entity assumes financial responsibility for defective workmanship or for service not provided as evidenced by the ownership of performance bonds, warranties, errors and omission insurance or liability insurance relating to the labor or services to be provided.

\_\_\_\_\_  
Contractor Signature

\_\_\_\_\_  
Date

**FOR COMMISSION USE ONLY**

**PROJECT MANAGER-COMplete ONLY IF CONTRACTOR DOES NOT HAVE WORKER'S COMPENSATION INSURANCE**  
ORS 670.600 Independent contractor standards. As used in various provisions of ORS Chapters 316, 656, 657, and 701, an individual or business entity that performs labor or services for remuneration shall be considered to perform the labor or services as an "independent contractor" if the standards of this section are met. The contracted work meets the following standards:

1. The individual or business entity providing the labor or services is free from direction and control over the means and manner of providing the labor or services, subject only to the right of the person for whom the labor or services are provided to specify the desired results;
2. The individual or business entity providing labor or services is responsible for obtaining all assumed business registrations or professional occupation licenses required by state law or local government ordinances for the individual or business entity to conduct the business;
3. The individual or business entity providing labor or services furnishes the tools or equipment necessary for performance of the contracted labor or services;
4. The individual or business entity providing labor or services has the authority to hire and fire employees to perform the labor or services;
5. Payment for the labor or services is made upon completion of the performance of specific portions of the project or is made on the basis of an annual or periodic retainer.

\_\_\_\_\_  
Commission Project Manager Signature

\_\_\_\_\_  
Date

**CONSULTANT SIGNATURE:**

This contract may be signed in two (2) or more counterparts, each of which shall be deemed an original, and which, when taken together, shall constitute one and the same Agreement.

The parties agree the Commission and Consultant may conduct this transaction, including any contract amendments, by electronic means, including the use of electronic signatures.

I, the undersigned, agree to perform work outlined in this contract in accordance to the STANDARD CONTRACT PROVISIONS, the terms and conditions, made part of this contract by reference, and the STATEMENT OF THE WORK made part of this contract by reference; hereby certify under penalty of perjury that I/my business am not/is not in violation of any Oregon tax laws; hereby certify that my business is certified as an Equal Employment Opportunity Affirmative Action Employer and is in compliance with the Equal Benefits Program as prescribed by Chapter 3.100 of Code of the Commission of Portland; and hereby certify I am an independent contractor as defined in ORS 670.600.

**CTC Technology & Energy**

BY: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**MT. HOOD CABLE REGULATORY COMMISSION:**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Chair

Approved as to Form:

By: \_\_\_\_\_ Date: \_\_\_\_\_  
MHCRC Legal Counsel

June 14, 2016

Ms. Julie S. Omelchuck  
Program Manager  
MHCRC & Office for Community Technology  
Via e-mail: [julieo@mhcrc.org](mailto:julieo@mhcrc.org)

*Subject: CTC's Qualifications and Experience*

Dear Julie:

CTC Technology & Energy (CTC) is pleased to provide the attached description of our qualifications and experience.

We do not perform "cookie cutter" work, and do not view our clients' goals as a series of cookie-cutter needs. Engaging with CTC means receiving customized analysis and the level of time, consideration, and care required to provide you with the answers you need. CTC is widely recognized for broadband network engineering and business analysis and has a track record of success supporting municipal government clients.

Please do not hesitate to contact me if I can provide any additional information.

Best Regards,



Joanne S. Hovis | President

## Contents

1. Description of Project Team .....	1
2. Description of Experience.....	2
About CTC.....	2
Representative Past Projects .....	4
3. References .....	13
Appendix A: Staff Resumes .....	14
Joanne S. Hovis, Esq.   President and Director of Business Consulting.....	14
Andrew Afflerbach, Ph.D., P.E.   CEO and Director of Engineering.....	19
Thomas J. Asp, BSEE, MBA   Principal Engineer and Analyst .....	24
Charlie Hamm   GIS Specialist and Staff Engineer .....	28
Marc Schulhof   Senior Analyst and Technical Writer.....	30

## ***1. Description of Project Team***

Our key team members include the following staff—who are supported, if a given project schedule requires us to add resources, by our team of highly qualified staff analysts and engineers. Complete resumes for each staff member are attached in Appendix A below.

**Joanne Hovis, CTC's President and Director of Business Consulting**, leads all strategic and business planning tasks. An attorney who has provided network business model analysis and recommendations for some of the largest public broadband networks in the country, she is a recognized authority on the broadband market and community broadband topics—and on the evolving role of government in the provision of communications services to the public. Ms. Hovis has extensive experience developing business case and business model scenarios for public sector broadband initiatives. She leads the CTC team that advises the Commonwealth of Kentucky, the states of New Mexico, New York, Connecticut, and Massachusetts, the cities of Atlanta, San Francisco, Seattle, and Washington, D.C., and the statewide broadband networks in Colorado, Maryland, and Pennsylvania.

**Andrew Afflerbach, Ph.D., P.E., CTC's Director of Engineering**, oversees all technical research and analysis. Dr. Afflerbach has developed institutional networks for cities and counties, overseen the build-out of last-mile fiber networks, and works extensively on regional public safety networks. He is an experienced network planner who understands the business and financial implications of various network designs.

**Tom Asp, MBA, a Principal Engineer and Analyst**, leads all financial analysis tasks. He has more than 25 years of nationwide experience as an engineer and analyst. His experience includes telecommunication system design and evaluation of network feasibility. Mr. Asp has developed financial statements and prepared quantitative business plan analyses for public sector clients nationwide. He also has extensive experience presenting to local and state government officials, conducting needs assessment interviews, and facilitating stakeholder sessions.

**Charlie Hamm, a GIS Specialist and Staff Engineer**, develops all necessary maps and data analysis. He works with a range of geographic design programs—including AutoCAD, ESRI ArcGIS, and Google Earth—to enable large-scale network design and construction projects, as well as to illustrate geographic data for feasibility studies. He creates databases and maps to support network route planning, utility pole attachment, and permit application processes.

**Marc Schulhof, a Principal Analyst and CTC's senior technical writer**, writes all project deliverables. He has more than 20 years of experience in technical writing, financial journalism, and public and corporate communications. Prior to joining CTC, Marc was the worldwide editor-in-chief of CIO program websites at IBM.

## 2. Description of Experience

### About CTC

CTC is an established, woman-owned consulting firm that offers a unique combination of qualifications and capabilities in broadband financial analysis, business planning, engineering, and network strategic planning. Founded in 1983, we have extensive experience providing independent financial, strategic, and technical, guidance for public and non-profit communications networks, including those of state and local governments, non-profit consortia, universities, and municipal utilities.

CTC offers extensive experience and expertise in all aspects of feasibility studies, needs assessment, strategic and business planning, and network engineering. We have conducted similar assessments—including market surveys, business plans, engineering analyses, and financial pro formas—for public sector clients nationwide, including the cities of Palo Alto, San Francisco, Santa Cruz, and Seattle.

In Palo Alto, for example, CTC developed both a fiber-to-the-premises (FTTP) master plan and a wireless network plan. In the FTTP engagement, we worked with the City's Information Technology and Utilities departments to research and prepare a strategic plan that outlines the feasibility of expanding the City's existing fiber system to provide citywide FTTP.

In Santa Cruz, CTC performed a technical and financial feasibility analysis of multiple approaches to introducing FTTP and expanded middle-mile services in the City.

Many of our engagements have focused on low-risk public sector strategies to expand existing broadband infrastructure to promote economic development, enhance the availability of high-bandwidth services to local businesses, and increase broadband competition.

We specialize in helping clients develop phased approaches for implementing fiber networks to meet their needs; we are particularly experienced with helping communities to identify private partners for broadband communications initiatives. Our goal in these engagements is to develop relationships in which the private partner shares the risk of expanding a network to serve the community's broader needs. In these engagements, too, we are vigilant about protecting the

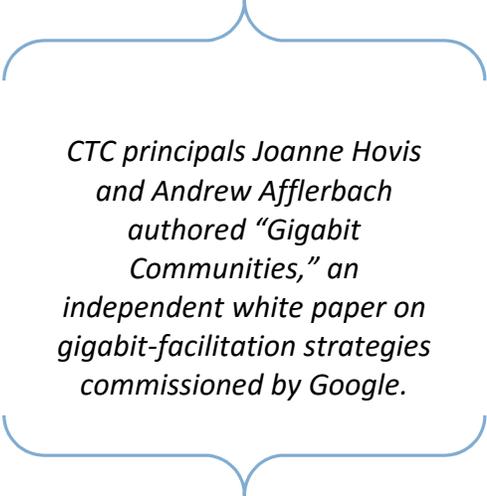


*We are in an industry that is changing by the day with respect to regulatory frameworks, technology, and potential business models. What distinguishes CTC is that we are engaging those issues every day, developing new strategies for leveraging public and private sector investment to benefit the local community.*



community's interests, and managing the community's risk with respect to partner financing and operations.

CTC is a highly respected firm with considerable experience and intellectual resources. Our reputation rests on our track record of providing independent, objective, and unbiased guidance. For more than three decades, we have served the public sector in evaluating its broadband deployment efforts and in bringing an independent, sometimes critical, eye to communications efforts.



*CTC principals Joanne Hovis and Andrew Afflerbach authored "Gigabit Communities," an independent white paper on gigabit-facilitation strategies commissioned by Google.*

CTC principals Joanne Hovis and Andrew Afflerbach authored "Gigabit Communities," an independent white paper on gigabit-facilitation strategies ([www.Gigabit-Communities.com](http://www.Gigabit-Communities.com)) commissioned by Google.<sup>1</sup> Ms. Hovis and Dr. Afflerbach also co-authored, with the New America Foundation's Open Technology Institute, a report on local broadband networks: "The Art of the Possible: An Overview of Public Broadband Options."<sup>2</sup> That study was recently cited in President Obama's report on municipal fiber networks, "Community-Based Broadband Solutions: The Benefits Competition and Choice for Community Development and High Speed Internet Access."<sup>3</sup>

Ms. Hovis, Dr. Afflerbach, and other CTC staff have also authored guides on community fiber development for the New America Foundation, Utilities Telecommunications Council, and Tennessee Valley Public Power Association. These and other key documents are available in the library on our website.<sup>4</sup>

We have a robust roster of national and international clients, and our workload reflects that success. As we have proven over the past three decades, however, we are adept at managing our clients' needs and our staffing levels. We pride ourselves on our track record of completing projects on time, regardless of the size or complexity of the tasks at hand. We commit to providing an exceptional level of service and to meeting your timeline.

---

<sup>1</sup> While this work was commissioned and supported by Google, CTC's analysis was entirely independent and focused on promoting city needs, rather than those of Google or any other network deployer. CTC and Google agreed contractually that CTC had complete editorial control over the content of the work. We are proud of our strong relationship with Google, but maintain independence as part of our mission to serve public sector clients.

<sup>2</sup> <http://www.ctcnet.us/publications/the-art-of-possible-an-overview-of-public-broadband-options/>

<sup>3</sup> [http://www.whitehouse.gov/sites/default/files/docs/community-based\\_broadband\\_report\\_by\\_executive\\_office\\_of\\_the\\_president.pdf](http://www.whitehouse.gov/sites/default/files/docs/community-based_broadband_report_by_executive_office_of_the_president.pdf)

<sup>4</sup> [www.CTCnet.us/library](http://www.CTCnet.us/library)

Engaging with CTC means receiving customized analysis and the level of time, consideration, and care required to provide you with the answers you need. This level of service is complemented by our proven ability to communicate our findings and recommendations—in high-quality written reports and engaging in-person presentations—to decision-makers, elected officials, citizens, and other interested project stakeholders.

### ***Representative Past Projects***

As the examples below illustrate, we offer demonstrated experience and qualifications in the areas of network strategic planning, financial analysis, and business planning. These are just a few of the hundreds of client projects CTC has successfully completed over the past 32 years. Many additional examples are available on request.

**City of Albuquerque, New Mexico:** CTC developed a strategy for connecting the City's key stakeholders and locations with a network that will have the most impact on its economic development and digital inclusion goals. CTC surveyed candidate network routes and developed a system-level design and pricing estimates for the construction and operation of fiber infrastructure. Our strategic design maximized potential economic development, minimized budgeting risks, and positioned the City for future network expansion. CTC then prepared the technical portions of an RFP for the City's procurement process to identify an expert partner for the proposed fiber and wireless construction.

**Arlington County, Virginia:** CTC currently is designing and managing the construction of ConnectArlington, the last-mile fiber network that will connect approximately 80 of the County's government buildings, schools, and public safety facilities. CTC staff members, including an on-site project manager, are overseeing every aspect of the project, from network mapping to construction supervision and acceptance.

CTC has also developed the business plan and strategy for the County's dark fiber leasing initiative, and is currently preparing an RFP for the County's use in selecting a fiber broker. This third-party broker innovation is the first of its kind among public entities in the United States.

Additionally, CTC staff are providing critical input into the design and testing for other phases of the County's self-managed fiber construction project, which will ultimately have close to 60 miles of backbone fiber.

**City of Atlanta:** CTC currently is advising the City on strategic and tactical approaches it can take to plan, build, and operate its own fiber network to cost-effectively serve its internal needs, promote private sector broadband investment, and enable competition in the City's residential and business broadband markets. We are assisting the City in its discussions with Google Fiber

and other telecommunications providers about options for joint build and partnership, and providing technical due diligence for the City.

**City of Boston:** In an ongoing engagement, CTC is analyzing the City's strategic options for deploying fiber optics to connect public schools throughout the City. CTC's business analysts and engineers reviewed the engineering that the City had already completed; the stakeholders' previously identified needs and concerns; the extent of existing City infrastructure assets; and the general scope of the fiber network envisioned by the City. We are now exploring a wide range of public and public-private options for maximizing the benefits of the City's planned investment to get direct fiber connectivity to selected schools.

**City of Culver City, California:** CTC developed a high-level network strategy, design, and business model framework to support Culver City's planning of a fiber optic backbone and fiber optic connections to key economic development sites. The proposed strategy is designed to ensure that broadband infrastructure in Culver City evolves over time to meet the needs of its businesses and public institutions.

Over the course of this project, CTC met with key city staff to review economic development objectives; reviewed the potential to leverage existing fiber and conduit assets in serving the city's identified target areas; facilitated discussions with business stakeholders and other community representatives to understand their perceptions regarding availability, reliability, and affordability of broadband services; researched the region's available services and costs; prepared a preliminary fiber network design to provide redundant connectivity in the city's target areas; and developed a business model framework to guide the city's decision-making.

**State of Delaware:** CTC has provided communications engineering consulting services to the State Department of Transportation for almost 20 years. Most recently, our engineers and business analysts wrote the statewide master plan for deploying an integrated broadband fiber and microwave network.

**District of Columbia:** CTC performed a business case and technology analysis for DC-Net, a fiber optic telecommunications network that provides voice and data services for the District of Columbia government. The network consists of resilient, interconnected fiber optic rings that will eventually connect more than 400 government buildings in the District, including Police Department, Emergency Management Agency, and Fire Department radio towers.

CTC's independent assessment analyzed public safety, government, and educational uses of the network. The project tasks included asset mapping and network description; cost comparison to leased/managed services; functional and technical comparison between dark fiber and

alternatives; leveraging the ability to resell to other entities; identifying support mechanisms; and determining recommended business practices.

CTC serves in an ongoing role as strategic fiber advisor to the City, and is leading the technical team conducting FirstNet planning for the District.

**EAGLE-Net:** CTC reviewed the business plan and financial models of EAGLE-Net, an intergovernmental network organization serving more than 170 communities across Colorado. We analyzed the cost assumptions and projections, and proposed refinements as merited by economic changes in the service area and local market. We proposed a pricing structure for service to anchor tenants and suggested potential future network opportunities and appropriate strategies to capture additional users, both last-mile providers and anchor institutions. We prepared marketing and sales plans designed to realize revenues necessary to sustain the EAGLE-Net enterprise in the future.

*CTC recently completed a statewide project with the Commonwealth of Kentucky in which we provided consulting and planning services in support of the governor's proposed statewide, next-generation fiber optic network. The Commonwealth announced a \$250 million to \$350 million concessionaire agreement with a private sector partner in late 2014.*

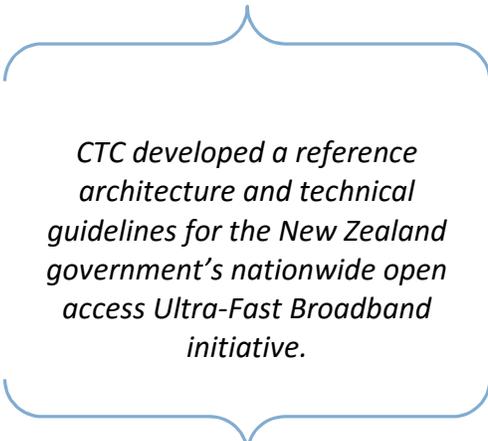
**Town of Holly Springs, North Carolina:** CTC conducted a broadband needs assessment and developed a strategic approach and return on investment (ROI) analysis for the town's proposed fiber network implementation. Our team of project managers, outside plant engineers, and network engineers then designed and oversaw implementation of a middle-mile fiber network serving the town's community anchor institutions (e.g., schools and libraries) and major economic development partners. The first sites on the 19-mile network went live in June 2014.

**Kansas Statewide Broadband Initiative:** CTC supported the Kansas Statewide Broadband Initiative (KSBI), a program of the Kansas Department of Commerce, in a major analysis of broadband availability and usage across the state. The scope of work included a broadband needs assessment of schools, libraries, and hospitals, completed in 2013, and two additional reports on the broadband market in the residential and commercial sectors. All three reports were delivered to the state legislature.

**Commonwealth of Kentucky:** CTC recently completed a statewide project with the Commonwealth of Kentucky in which we provided consulting and planning services in support of the governor's proposed statewide, next-generation fiber-optic network.

CTC engineers performed a technical assessment of the state’s current network plans, developed a strategy for fiber construction, and provided detailed guidance on network operations. Our business analysts assessed the state’s current network financial models, refined projections, and collaborated on the development of a sustainable governance and business model.

CTC also developed an RFI to identify potential fiber collaborators for the Commonwealth. The RFI attracted responses from more than a dozen candidates—including service providers, technology companies, equity partners, and concessionaires—and made it possible for the CTC team to refine the Commonwealth’s business model and develop an RFP that more closely fit the business model and the firms’ capabilities. The Commonwealth announced a \$250 million to \$350 million concessionaire agreement with a private sector partner in December 2014.



*CTC developed a reference architecture and technical guidelines for the New Zealand government’s nationwide open access Ultra-Fast Broadband initiative.*

**Keystone Initiative for Network Based Education and Research (KINBER):** CTC provided KINBER, a statewide fiber optic network in Pennsylvania and recipient of a \$99.6 million federal grant, with extensive support in developing their business model and pricing schedule. Our team conducted interviews with KINBER project stakeholders to assess the statewide market for networking services. We combined this information with our existing, in-depth knowledge of public sector networking initiatives, markets, and pricing schedules. We then presented different business model scenarios based on varying take rates of the networking services offered. We gave preliminary marketing advice and conducted initial outreach on behalf of KINBER to potential new members. CTC also prepared engineering advice for how to cost-effectively provide networking services.

**City of Lawrence, Kansas:** CTC evaluated the state of broadband in Lawrence and proposed strategies for expanding network infrastructure to serve homes, businesses, and the public sector. In our project report, “Enhancing Broadband in Lawrence: A Range of Strategic Options,” we identified ways in which Lawrence can maximize its current assets to encourage future technology development. It analyzes the existing communications environment in Lawrence and provides recommendations with respect to various options to leverage the City’s existing fiber optic infrastructure. (That report is available on our website: <http://www.ctcnet.us/wp-content/uploads/2014/01/LawrenceBroadbandReport.pdf>.) Following up on that engagement,

we also recently evaluated issues and concerns for the City's consideration as it evaluates whether to require open access on privately funded fiber in the City.

**City of Lexington, Kentucky:** CTC prepared a high-level fiber-to-the-premises (FTTP) network design and cost estimate for the Lexington-Fayette Urban County Government in Kentucky. CTC currently is helping the City negotiate a potential broadband public-private partnership.

**Maryland Inter-County Broadband Network (ICBN):** CTC was the lead engineer for the development of the ICBN project, a \$72 million sub-grantee of the One Maryland Broadband Network (see below). We designed and engineered ICBN fiber routes for four large counties. In addition, a CTC Principal Engineer served as Portfolio Manager for the project across nine counties. He was the lead technical consultant overseeing the grant funds to build 800 miles of fiber optics and connect approximately 650 community anchor institutions.

**Commonwealth of Massachusetts:** CTC President Joanne Hovis advises the Massachusetts Technology Cooperative on a wide range of broadband issues, including last-mile network deployment, business planning, and managing statewide stakeholder relationships.

**National Capital Region (NCR) Interoperability Program:** CTC provided the concept, engineering design, and project management for the National Capital Region Interconnection Network—a 120-mile public safety network interconnecting 19 fiber-optic based government networks in the greater Washington, D.C. region. This network was conceived as a backbone for interoperable communications that could take advantage of existing fiber infrastructures the governments already controlled.

**State of New Mexico:** CTC wrote a guidebook for New Mexico's local governments to lead them through the business, financial, and strategic planning necessary to implement city- or county-owned broadband networks. We are currently engaged in developing a statewide strategic plan for deployment and adoption of broadband in the State, as well as in preparation of regional implementation plans.

**State of New York:** CTC currently is designing New York State's public-private partnership model—a key element in Governor Cuomo's \$500 million "Broadband for All" initiative, which aims to deliver 100 Mbps services to every home and business in the state.

**Government of New Zealand (Crown Fibre Holdings):** CTC developed a reference architecture and technical guidelines for the New Zealand government's open access Ultra-Fast Broadband initiative. The project included establishing requirements for vendors bidding on the design, construction, and operation of a planned nationwide fiber network that will connect at least 75 percent of the country's population.

**One Maryland Broadband Network (OMBN):** Working closely with the Maryland Department of Information Technology (DoIT), CTC provided strategic guidance and was the lead engineering and business planning consultant in conjunction with the development of OMBN's successful \$115 million federal grant application. Our services included network architecture, plant engineering, and detailed project preparation, with a focus on expanding the state's existing fiber optic network to reach underserved areas and achieve other program goals. CTC also provided extensive business planning, business modeling, and pro forma preparation.

**City of Palo Alto:** In two current, parallel projects, CTC is developing both a fiber-to-the-premises (FTTP) master plan and a wireless network plan for the City of Palo Alto. In the FTTP engagement, we are working with the City's Information Technology and Utilities departments to research and prepare a strategic plan that outlines the feasibility of expanding the City's existing fiber system to provide citywide FTTP. In the wireless engagement, we are conducting a system-level requirements analysis and a needs assessment, and recommending wireless technologies, network designs, and business models.

CTC previously provided strategic guidance and advice to the City of Palo Alto on expanding its dark fiber network to create opportunities for enhanced municipal and commercial services. We assessed how to leverage existing infrastructure to promote commercial wireless broadband deployment and improve municipal Smart Grid and public safety technologies. We also prepared a framework for how to establish a public-private partnership to encourage greater wireline infrastructure construction.

**City of Raleigh:** CTC recently completed a project with the City of Raleigh to develop a roadmap for meeting the city's future networking needs. CTC engineers performed a technical assessment of the city's network plans, developed a strategy for fiber construction, and providing detailed guidance on middle-mile network operations. Our business analysts assessed the city's current network financial models, refined those projections, and created a sustainable business model that will enable the city to capitalize on excess fiber to create revenue and other community benefits. CTC also supported the city on the completion of its Google Fiber Checklist.

**City and County of San Francisco:** CTC currently is developing technical specifications for a municipal "dig once" policy to facilitate the cost-effective expansion of broadband infrastructure throughout the city.

We previously prepared a series of path-breaking analyses of the feasibility of the City building and operating a fiber-to-the-premises (FTTP) network—including a system design and detailed analysis of candidate architectures and open access models. The project also included analysis of multiple business models and business recommendations customized for San Francisco's unique circumstances.

CTC also provided ongoing consulting and strategic guidance with respect to an FTTP pilot and related technology projects, and helped the City with business planning, financial analysis, and engineering design to support its preparation of an extensive application for federal grant funding. The market research analysis provided measurements to predict emission reductions and other ancillary benefits of facilitating work-at-home initiatives through an FTTP implementation.



CTC has performed market research and developed a feasibility study, a business case analysis, and an “off-the-balance-sheet” benefits analysis for a proposed fiber network in Seattle.

**Schools, Health & Libraries Broadband (SHLB)**

**Coalition**—To support SHLB’s filing with the FCC in the matter of E-rate modernization, CTC developed a methodology, conducted engineering and geographic analysis, and prepared a nationwide assessment of the cost to construct fiber to every unserved school and library in the country.<sup>5</sup> Chairman Wheeler specifically mentioned to our client the importance of our model in the FCC’s E-rate analysis, and the model was cited in the FCC’s just-released report on E-rate modernization.<sup>6</sup>

**City of Seattle / Seattle City Light:** CTC currently is supporting the city with business, technical, and strategic guidance as it explores options for FTTP network deployment in light of the changing national marketplace and emergence of new business models.

This engagement follows on multiple significant projects we have completed with the city and its electric utility over the past six years. CTC has previously performed market research and developed a feasibility study, a business case analysis, and an “off-the-balance-sheet” benefits analysis for a proposed fiber network.

The first study, “FTTP Municipal Broadband Risks and Benefits Evaluation,” included an internal needs analysis; market research of both residential and business customers; an assessment of competing services and technologies; and an evaluation of the business case and business risks.

Following on that report, CTC researched and wrote an “FTTP Benefits Evaluation,” which explored the benefits of FTTP beyond the traditional balance sheet, including cost avoidance, monetary savings, and environmental impact. Notably, this report was one of the first of its kind to qualify and quantify (where possible) community-wide benefits of ubiquitous broadband

---

<sup>5</sup> <http://www.ctcnet.us/news/shlb-submits-ctc-study-to-fcc/>

<sup>6</sup> “In the Matter of Modernizing the E-rate Program for Schools and Libraries,” WC Docket No. 13-184, Second Report and Order and Order on Reconsideration, FCC 14-189, adopted December 11, 2014, at 44.

connectivity, such as enabling increased telecommuting, reductions in greenhouse gas emissions, and positive impacts on vulnerable populations such as the elderly and low-income residents.

In the third phase of this project, CTC advised the Mayor of Seattle regarding the U.S. communications market and business planning strategies for a citywide fiber enterprise. CTC led and facilitated a business planning working group comprised of the Mayor's senior staff, the directors of the city's electric and water/sewer utilities, and the city's Chief Technology Officer.

**Cities of Urbana and Champaign / University of Illinois:** CTC has been the strategic and business planning consultant to Urbana, Champaign, and the University of Illinois for more than five years—since the coalition first conceived of constructing a middle-mile fiber network to connect community anchor institutions. We prepared the network's successful federal Environmental Assessment, which enabled construction to begin. Following construction of the federally funded middle-mile project, we wrote a request for information (RFI) to enable the cities and the university to identify a private partner that would finance and operate an FTTx expansion of the network to serve 100 percent of the community. We evaluated potential partners' proposals, then helped to negotiate with two partners to reduce the community's risks and ensure that a partnership will achieve the coalition's policy goals for economic development and digital inclusion.

As a result of the coalition's final partnership—which *Telecompetitor* has called “a particularly good deal for the community”<sup>7</sup>—UC2B has secured an open access Gigabit FTTx network buildout that will protect its public policy interest by providing the same opportunity for access to the entire community. In return, UC2B's partner—the ISP and network operator iTV3—gets value through access to UC2B's existing middle-mile infrastructure (which it will operate) and the foundation of a significant last-mile consumer network.

Commenting on the partnership, FCC Chairman Wheeler said that it “provides a valuable model for communities and companies throughout the country and a demonstration of the creativity that is stimulated when localities are free to work with the private sector to improve broadband offerings.”<sup>8</sup>

**City of Vallejo, California:** CTC recently was awarded a contract by the City to develop a fiber optic master plan to guide the feasibility, long-term planning, budgeting and implementation of a municipal broadband network. In our technical analysis and planning, we will conduct a detailed

---

<sup>7</sup> <http://www.telecompetitor.com/urbana-champaign-gigabit-network-will-open-access/>

<sup>8</sup> <http://www.fcc.gov/document/fcc-chairman-tom-wheeler-stmt-uc2b-and-itv-3-gigabit-announcement>

investigation of the City's existing conduit. And in our business planning tasks, we will focus on serving commercial customers—and on a model that will be self-funding over time.

**City of Westminster, Maryland:** CTC prepared a fiber feasibility study and business case for the City of Westminster in 2012 and 2013. Our report, which focused on maximizing available backbone network connectivity, included a technical design and cost estimates for two last-mile FTTP pilot projects (one focused on residential customers, one focused on businesses).

Following the city's decision to move forward with the pilot projects, CTC is currently providing support on a range of fiber infrastructure engineering, network design, construction oversight, and quality assurance tasks.

We also assisted the city in identifying a private partner to assume operating risk in providing services to the public over the city's FTTP infrastructure; the city announced its public-private partnership in mid-January. For more details, see CTC's website:

<http://www.ctcnet.us/blog/maryland-city-announces-groundbreaking-fiber-partnership-with-internet/>.

### **3. References**

We invite you to contact the following references about the quality, independence, and timeliness of CTC's work. Many additional references are available on request.

#### **City of Palo Alto, California**

Mr. Jim Fleming  
Management Specialist  
(650) 566-4586, [Jim.Fleming@CityofPaloAlto.org](mailto:Jim.Fleming@CityofPaloAlto.org)

#### **City and County of San Francisco**

Mr. Brian Roberts  
Senior Policy Analyst, Department of Telecommunications & Information Services  
(415) 581-4061, [brian.roberts@sfgov.org](mailto:brian.roberts@sfgov.org)

#### **City of Culver City, California**

Ms. Michele Williams  
Chief Information Officer  
(310) 253-5950, [Michele.williams@culvercity.org](mailto:Michele.williams@culvercity.org)

#### **Seattle City Light**

Ms. Carol Butler  
Director, Corporate Performance Division, Seattle City Light  
(206) 615-1249, [carol.butler@seattle.gov](mailto:carol.butler@seattle.gov)

#### **City of Seattle**

Mr. Tony Perez  
Director, Office of Cable Communications  
(206) 386-0070, [Tony.Perez@Seattle.gov](mailto:Tony.Perez@Seattle.gov)

## ***Appendix A: Staff Resumes***

### ***Joanne S. Hovis, Esq. | President and Director of Business Consulting***

Joanne Hovis is President of CTC. She is an attorney and business planner with a two-decade background in communications and broadband. Ms. Hovis is a recognized authority on the broadband market and community broadband topics—and on the evolving role of government in the provision of communications services to the public.

Ms. Hovis leads the CTC team that advises the states of New Mexico and Kansas; the cities of San Francisco, Washington, D.C., and Seattle; the American Recovery and Reinvestment Act (ARRA) funded UC2B (Champaign and Urbana, Illinois) and ICBN (central Maryland) networks; and the statewide broadband networks in Colorado, Maryland, and Pennsylvania. She advises the University of Illinois, Case Western Reserve University, and a number of other institutions regarding broadband planning.

Ms. Hovis also oversees all ongoing CTC research and analysis for local government clients and frequently provides business planning and analysis for communications networking initiatives such as San Francisco's planned fiber network and the public safety communications network currently under development in the Washington, D.C. metropolitan area. She also leads CTC's consulting on the federal E-Rate and Healthcare Connect Fund programs.

Ms. Hovis serves as Immediate Past President of the National Association of Telecommunications Officers and Advisors (NATOA), which represents local governments and promotes community interests in communications matters. She is a member of the boards of directors of the Benton Foundation and OneCommunity, and is a charter member of the United States Unified Community Anchor Network (U.S. UCAN) project's Task Force on Community Anchor Network Economic Models. She is also CEO of the Coalition for Local Internet Choice (CLIC).

Ms. Hovis previously worked as an attorney with Jenner & Block in Chicago and Mintz, Levin, Cohn, Ferris, Glovsky, & Popeo PC in Washington, D.C. At those firms, she worked on complex communications and litigation projects for such clients as Salomon Brothers and AOL.

#### **Business Planning and Feasibility Analysis**

Ms. Hovis leads all of CTC's business planning efforts. She has spearheaded projects that explore a range of business models by which government clients can leverage their existing assets to build, expand, and incentivize broadband expansion. She is sought nationwide as an expert in municipal ownership and operational broadband business models, fiber and wireless markets, and public-private partnerships. Among the projects she has led are:

- **City of Seattle.** Ms. Hovis advised the Mayor of Seattle regarding the U.S. communications market and business planning strategies for a citywide enterprise. She reported the public subsidies a network would require, and delivered a full assessment of opportunities and

risks. The report included internal needs analysis, statistically significant market research, an assessment of competing services and technologies, and an evaluation of the business case and financial risks. Ms. Hovis led further analysis of the benefits of FTTP beyond the traditional balance sheet, including cost avoidance, monetary savings, and environmental impact. She led and facilitated a business planning working group comprised of the Mayor's senior staff, the directors of the city's two utilities (electric and water/sewer), and the city's CIO.

- Ms. Hovis advises the **State of New Mexico's Department of Information Technology** on broadband planning. She led a team of writers and analysts that produced a guidebook for New Mexico's local governments to guide them through the business, financial, and strategic planning necessary to implement city- or county-owned broadband networks. The book-length guidebook offers specific instructions for localities to research and document the telecommunications infrastructure in their communities, and discusses strategies for exploring public-private partnerships for broadband expansion.
- Ms. Hovis is working with the **State of Kansas Department of Commerce** on a large-scale needs assessment of the state's network infrastructure. She is conducting major market surveys among three core sectors across the state (residents, businesses, and community anchor institutions) to evaluate the current uses and needs of broadband infrastructure. She is also developing a strategy for the evolution of Kan-ed, the state-created broadband program that serves schools, hospitals, libraries, and higher education institutions.
- Ms. Hovis has advised officials in the **District of Columbia** government on a range of telecommunications and fiber-optic projects for almost a decade. She worked with the Office of the Chief Technology Officer (OCTO) to create a business plan and strategy for building a municipal fiber-optic network with a wireless overlay in the least-served wards of the city. She performed a business case and technology analysis (including five-year projections) for DC-Net, a fiber-optic telecommunications network that provides voice and data services for the District of Columbia. She analyzed governmental, educational, and public safety uses of the network. The project tasks included asset mapping and network description; developing a cost comparison to leased/managed services; identifying opportunities to resell to other entities; identifying support mechanisms; and determining recommended business practices. She performs an ongoing role as strategic fiber adviser to the Chief Technology Officer and the Director of DC-Net, and supports planning for the network's future—including expanding the network to a broader array of end users.
- Ms. Hovis advises the **Urbana-Champaign Big Broadband (UC2B) Coalition (University of Illinois and the cities of Champaign and Urbana)** on a wide range of business and strategic planning issues. She is currently evaluating the private sector bids to build out last-mile fiber connections in the cities. She took a leading role in preparing UC2B's successful application for a federal Broadband Technology Opportunities Program (BTOP) stimulus grant to support its proposed FTTP network.
- Ms. Hovis provided extensive business planning, market assessment, and strategic planning for the **City and County of San Francisco**. Ms. Hovis served as a key adviser to the city's Chief Information Officer. She conducted an independent evaluation of the

feasibility of San Francisco constructing and operating a municipal FTTP network to serve businesses and residences. As a first step toward the FTTP network, she worked with the City to plan a migration of the leased telecommunications services connecting 250 government facilities to a City middle-mile fiber-optic network; she also supported the city's application for BTOP funding. She reviewed cost and pricing factors associated with using leased telecommunications services and circuits provided by private vendors, as compared with migration to government-owned fiber optics. She projected the return on investment and total cost of ownership (including a wide range of costs from deployment to staffing to maintenance to financing to cutover expenses). She evaluated potential efficiencies to be realized through in-house rather than outsourced provision of services and circuits.

- Ms. Hovis led a feasibility study of the **City of Ocala, Florida's** fiber-optic enterprise. She explored the potential range of business models and services that the city could implement to leverage its existing fiber-optic network and staff skill sets. She performed a competitive assessment of existing private sector broadband services and conducted market research with statistically significant surveys of the local commercial and residential sectors to assess current and future demand for high-speed connectivity. She proposed logical expansion strategies derived from in-depth analysis of financial costs, business models, and potential benefits to the community of multiple options.
- Ms. Hovis performed an expert assessment of the business and marketing plan for Utah's inter-jurisdictional network, **UTOPIA**. She led a strategy session with key stakeholders, collected relevant background material, performed an analysis of UTOPIA market research and marketing models, and independently evaluated UTOPIA's business plan. At the direction of UTOPIA leadership, her work focused on improving the participating UTOPIA communities' ongoing cash flow.
- Ms. Hovis devised a business strategy and wrote a business plan for **KINBER**, the BTOP-funded statewide backbone and middle-mile fiber infrastructure focused on the higher education and healthcare sectors in Pennsylvania. One highlight of the KINBER strategy was developing an actionable plan to increase early cash flow.
- Ms. Hovis developed a broadband feasibility study for **Garrett County, Maryland** with a specific focus on maximizing the benefits and use of the fiber backbone being built by the BTOP-funded One Maryland Broadband Network (OMBN) project.

#### Grant Planning & Management

Ms. Hovis' expertise includes the many funding opportunities available to local government broadband planners through the federal government and other sources. She has guided clients through the grant process, from application writing to fund management.

Ms. Hovis' grant work has included:

- Supporting more than a dozen clients in securing American Recovery and Reinvestment Act (ARRA) funds through the Broadband Technology Opportunities Program (BTOP). Successful applicants included including the \$22.5 million Urbana-Champaign Big Broadband (UC2B) project, the \$115 million One Maryland Broadband Network (OMBN),

the \$32.1 million OpenCape project in Cape Cod, and Washington, D.C.'s \$17.5 million Community Access Network (DC-CAN).

- Securing additional National Telecommunications & Information Administration (NTIA) funds from the **Public Safety Interoperable Communications (PSIC)** grant program on behalf of public health and public safety communications projects in the National Capital Region (NCR), encompassing Washington, D.C. and almost two-dozen surrounding jurisdictions.
- Developing a successful application to the **Appalachian Regional Commission (ARC)**—a partnership among federal, state, and local government—for Garrett County, Maryland.
- Providing business case development and ongoing business planning support to significant **Urban Areas Security Initiative (UASI)** grant-funded projects in the NCR.
- Advising a number of clients on **Rural Utilities Service (RUS)** grant applications, and reviewing business plans and projections that make use of RUS loan funds for entities such as UTOPIA, the regional non-profit open access fiber network in suburban and rural Utah.

### Speaking and Advocacy

Ms. Hovis is in wide demand as a speaker and expert source on broadband deployment issues. She has testified before the U.S. Congress on matters of broadband deployment and policy; has been interviewed by publications including *Business Week*, the *Washington Post*, and the *Baltimore Sun*; and has been featured on the C-SPAN show “The Communicators.”

She has provided expert presentations to the Federal Communications Commission, National League of Cities, Technology Policy Summit, the University of Illinois, Case Western Reserve University, the New America Foundation, and the Congressional Internet Caucus.

Ms. Hovis recently authored “Gigabit Communities: Technical Strategies for Facilitating Public or Private Broadband Construction in Your Community”—an independent report sponsored by Google and intended as a guide for local government leaders and planners.

### **EDUCATION**

***Juris Doctor, with honors***, University of Chicago Law School, 1994

- Patino Fellow, awarded for academic achievement and community service, 1991–94

**Bachelor of Arts, with distinction**, University of Wisconsin, Madison, 1990

- General Distinction and Distinction in the Major, 1990
- Dean’s List, 1988–1990
- Weinstein Award, 1990
- Hebrew University of Jerusalem, Davis Institute for International Studies, 1989

### **PROFESSIONAL CERTIFICATIONS/LICENSES**

Member of Illinois Bar Association, Member of District of Columbia Bar Association

**ORGANIZATIONS**

- Coalition for Local Internet Choice, CEO
- National Association of Telecommunications Officers and Advisors, Immediate Past President
- Benton Foundation, Director
- OneCommunity, Director
- United States Unified Community Anchor Network, Task Force on Community Anchor Network Economic Models, Charter Member

**PRIOR TO COMING TO CTC IN 1997**

1996–1997    Litigation/Communications Attorney, Mintz, Levin, Cohn, Ferris, Glovsky, & Popeo P.C., Washington, D.C.

1994–1996    Litigation Attorney, Jenner & Block, Chicago

### ***Andrew Afflerbach, Ph.D., P.E. | CEO and Director of Engineering***

Dr. Andrew Afflerbach specializes in planning, design, and implementation of communications infrastructure and networks. His expertise includes emerging fiber and wireless technologies and state-of-the-art networking applications.

As Director of Engineering, he oversees all engineering work performed by CTC Technology & Energy. He is a licensed Professional Engineer in the Commonwealth of Virginia and the states of Delaware, Maryland, and Illinois.

Dr. Afflerbach has planned and overseen implementation of a wide variety of government and public safety networks, including the infrastructure of state and metropolitan area governments. He prepared extensive technical analyses for submission to the Federal Communications Commission (FCC) and policymakers on national fiber expansion to underserved schools and libraries, on due diligence for the IP transition of the telecommunications infrastructure, and on potential technical frameworks for wireless network neutrality. He also recently served as a senior adviser to Crown Fibre Holdings, the public entity that is directing New Zealand's national fiber-to-the-home project.

#### **Broadband Planning and Engineering**

Dr. Afflerbach has architected, designed, and overseen implementation of numerous broadband networks for local and state governments, including those of Washington, D.C.; Crown Fibre Holdings (Government of New Zealand); San Francisco; the Commonwealth of Kentucky; the Delaware Department of Transportation; the Maryland Transportation Authority; St. Louis Park, Minnesota; and many large counties.

#### **Advisory Services**

Dr. Afflerbach advises a wide range of policy think tanks, U.S. federal agencies, and non-profits regarding the engineering issues underlying key communications issues. For example, he:

- Leads the technical team conducting FirstNet planning for the District of Columbia (Washington, D.C.).
- Serves as key technical advisor to the Commonwealth of Kentucky as it deploys its statewide Next Generation Kentucky Information Network.
- Provided expert testimony to the U.S. Federal Communications Commission (FCC) in the matter of the preparation of the national broadband plan as a representative of the National Association of Counties (NACo) and the National Association of Telecommunications Officers & Advisors (NATOA).
- Served as expert advisor regarding broadband deployment to the U.S. Conference of Mayors, NACo, National League of Cities, and NATOA in those organizations' filings before the FCC in the matter of determination of the deployment of a national, interoperable wireless network in the 700 MHz spectrum.
- In connection with the FCC's ongoing Open Internet proceeding, advised the New America

Foundation regarding the technical pathways by which “any device” and “any application” regimes could be achieved in the wireless broadband arena as they have been in the wireline area.

- Provided expert technical advice on the 700 MHz broadband and AWS-3 proceedings at the FCC for the Public Interest Spectrum Coalition (including Free Press, the New America Foundation, Consumers Union, and the Media Access Project).
- Prepared technical reports and analysis regarding fiber construction for submittal to the FCC, in connection with preparation of the National Broadband Plan, by NATOA, the City and County of San Francisco, and the Schools, Health, and Libraries Coalition.
- Served as technical advisor to the Naval Exchange in its evaluation of vendors’ broadband communications services on U.S. Navy bases worldwide.
- Advised the U.S. Internal Revenue Service regarding the history of broadband and cable deployment and related technical issues in that agency’s evaluation of appropriate regulations for those industries.
- Advised, during the height of the broadband “open access” debate, a variety of public interest associations and communities, including the City of Los Angeles and Stanford University, regarding the technical means by which cable networks could be opened to competition.
- Advised the Stanford Law School Center for Internet and Society on the technical issues for their briefs in the *Brand X* Supreme Court appeal regarding cable broadband.
- Provided technical advice to numerous non-profits, associations, and agencies as diverse as the Center for Internet and Society at Stanford Law School; the Internal Revenue Service, the Alliance for Community Media, the William Penn Foundation, the Center for Digital Democracy, and the FCC’s Local and State Government Advisory Board (LSGAC).
- Has been invited to speak about communications technologies before such organizations as the Public Technology Institute, American Association of Community Colleges, ICMA, ILCMA, and the Practicing Law Institute.
- Developed curricula for a variety of organizations, including the University of Maryland, the United States Department of Transportation, and the George Washington University.
- Has taught courses and delivered seminars regarding communications for numerous educational and government institutions.

#### *Public Safety Network Interoperability and Interconnection*

Dr. Afflerbach served as lead engineer and technical architect for planning and development of NCRnet, a regional fiber-optic and microwave network that links public safety and emergency support users throughout the 19 jurisdictions of the National Capital Region (Washington, D.C. and surrounding jurisdictions), under a grant from the U.S. Department for Homeland Security’s Urban Areas Safety Initiative. He wrote the initial feasibility studies that led to this project for regional network interconnection.

#### *Smart Grid*

Dr. Afflerbach and the CTC team provided expert testimony and advisory services to the Public

Service Commission of Maryland regarding Advanced Metering Infrastructure (AMI). CTC provided objective guidance to the staff as it evaluated AMI applications submitted by three of the state’s investor-owned utilities (IOUs). This contract represented the first time the PSC staff had asked a consultant to advise them on technology—a reflection of the lack of standards in the Smart Grid arena, and the magnitude of the investment that the utilities were proposing.

*Instruction/Expertise*

Dr. Afflerbach has served as an instructor for the U.S. Federal Highway Association/National Highway Institute, the George Washington University Continuing Education Program, the University of Maryland Instructional TV Program, ITS America, Law Seminars International, and the COMNET Exposition.

He teaches and helped develop an online graduate-level course for the University of Maryland. He developed and taught communications courses and curricula for ITS America, COMNET, and University of Maryland. His analysis of cable open access is used in the curriculum of the International Training Program on Utility Regulation and Strategy at the University of Florida.

Dr. Afflerbach has also prepared client tutorials and presented papers on emerging telecommunications technology to the National Fire Protection Association (NFPA), NATOA, the National League of Cities (NLC), the International City/County Management Association (ICMA), and the American Association of Community Colleges (AACC). He also taught college-level astrophysics at the University of Wisconsin.

**EMPLOYMENT HISTORY**

1995–Present	CEO/Director of Engineering, CTC Previous positions at CTC: Principal Engineer, Senior Scientist
1990–1996	Astronomer/Instructor/Researcher University of Wisconsin–Madison, NASA, and Swarthmore College

**EDUCATION**

**Ph.D.**, Astronomy, University of Wisconsin–Madison, 1996  
**Master of Science**, Astronomy, University of Wisconsin–Madison, 1993  
**Bachelor of Arts**, Physics, Swarthmore College, 1991

**PROFESSIONAL CERTIFICATIONS/LICENSES**

Professional Engineer, Commonwealth of Virginia and states of Delaware, Maryland, and Illinois

**HONORS/ORGANIZATIONS**

- Association of Public-Safety Communications Officials (APCO)
- Board of Visitors, University of Wisconsin Department of Astronomy
- National Association of Telecommunications Officers and Advisors (NATOA) Technology and Public Safety Committees
- Armed Forces Communications and Electronics Association (AFCEA)
- Society of Cable and Telecommunications Engineers (SCTE)

- Institute of Electrical and Electronic Engineers (IEEE)
- Charleston Defense Contractors Association (CDCA)
- NASA Graduate Fellow, 1993–1996. Research fellowship in astrophysics
- Elected Member, Sigma Xi Scientific Research Honor Society
- Eugene M. Lang Scholar, 1987–1991, Swarthmore College

#### **SELECTED PUBLICATIONS, PRESENTATIONS, and COURSES**

- “Mobile Broadband Networks Can Manage Congestion While Abiding By Open Internet Principles,” prepared for the New America Foundation’s Open Technology Institute – Wireless Future Project, November 2014.
- “The State of the Art and Evolution of Cable Television and Broadband Technology,” prepared for Public Knowledge, November 2014.
- “A Model for Understanding the Cost to Connect Schools and Libraries with Fiber Optics,” prepared for the Schools, Health & Libraries Broadband Coalition, October 2014.
- “The Art of the Possible: An Overview of Public Broadband Options,” prepared jointly with the New America Foundation’s Open Technology Institute, May 2014.
- “Understanding Broadband Performance Factors,” with Tom Asp, Broadband Communities magazine, March/April 2014.
- “A Brief Assessment of Engineering Issues Related to Trial Testing for IP Transition,” prepared for Public Knowledge and sent to the FCC as part of its proceedings on Advancing Technology Transitions While Protecting Network Values, January 2014
- “Gigabit Communities: Technical Strategies for Facilitating Public or Private Broadband Construction in Your Community,” prepared as a guide for local government leaders and planners (sponsored by Google), January 2014
- “Critical Partners in Data Driven Science: Homeland Security and Public Safety,” submitted to the *Workshop on Advanced Regional & State Networks (ARNs): Envisioning the Future as Critical Partners in Data-Driven Science*, Internet2 workshop chaired by Mark Johnson, CTO of MCNC, Washington, D.C., April 2013
- “Connected Communities: How a City Can Plan and Implement Public Safety & Public Wireless,” submitted to the International Wireless Communications Exposition, Las Vegas, Nevada, March 2013
- “Cost Estimate for Building Fiber Optics to Key Anchor Institutions,” prepared for submittal to the FCC by the National Association of Telecommunications Officers and Advisors and the Schools, Health, and Libraries Coalition, September 2009.
- “Efficiencies Available Through Simultaneous Construction and Co-location of Communications Conduit and Fiber,” prepared for submittal to the FCC by the National Association of Telecommunications Officers and Advisors and the City and County of San Francisco, 2009, referenced in the National Broadband Plan.
- “How the National Capital Region Built a 21st Century Regional Communications Network” and “Why City and County Communications are at Risk,” invited presentation at the FCC’s National Broadband Plan workshop, August 25, 2009.
- “Existing and Emerging Broadband Technologies,” NATOA Conference, October 2007.

- “An Assessment of the Technical Capabilities of the AWS-3 Spectrum,” expert report prepared for Free Press, December 2007.
- “An Engineering Assessment of Select Technical Issues Raised in the 700 MHz Proceeding,” expert report prepared for FCC filing for Free Press and Media Access Project (Public Interest Spectrum Coalition), May 2007.
- “Understanding FiOS and U-Verse Architecture,” presented at NATOA’s Policy and Legal Conference, Washington, D.C., spring 2007.
- “Fiber to the Premises and Fiber to the Node,” *Journal of Municipal Telecommunications Policy*, Fall 2006.
- “Communications Infrastructure Primer,” presented to the National Fire Protection Association, Miami Beach, FL, 2006.
- Supplemental Report, “Technological Analysis of Open Access and Cable Systems,” <http://www.aclu.org/Privacy/Privacy.cfm?ID=17507>, prepared for American Civil Liberties Union and Stanford Law School Center for Internet and Society, 2005.
- *Affordable Telecommunication Networks for Local Government*, International City/County Management Association, November 2004.
- “Telecommunications and ITS: What You Need To Know,” prepared curriculum for two-day training course for the University of Maryland, 2001.
- “Technological Analysis of Open Access and Cable Systems,” prepared for ACLU, 2001.
- “No Pipes: Wireless Broadband,” *Journal of Municipal Telecommunications Policy*, 2001.
- “Interactive PEG: Technical Strategy for Implementation,” *Community Media Review*, 2000.
- “Telecommunications and Intelligent Transportation Services,” two-day training course, presented in multiple cities for the US Department of Transportation/ITS America, 1999.
- “Building Integrated Voice, Data, and Video Networks for the Local and Wide Area,” two-day training course, presented for the University of Maryland, 1999.
- “Integrated Data, Video & Voice Broadband Networks,” week-long training course, presented at the COMNET Exposition, Washington, DC, and January, 1999.
- “LANs: Design and Installation of Networks that Support Voice, Data, and Video Applications,” multi-day training course, presented for the George Washington University Continuing Engineering Education Program, 1996; 1997; 1998; 1999.
- *Cable Network Technology: A Primer for Local Officials*, International City/County Management Association, September 1998.
- “I-Nets and the Internet,” Infotech Report, August 1998.
- “Integrated Data, Video & Voice Broadband Networks” and “Design & Implementation of Metropolitan Area Networks (MANs),” presented at the 1998 COMNET Exposition.

***Thomas J. Asp, BSEE, MBA | Principal Engineer and Analyst***

Mr. Asp specializes in evaluating connectivity (voice, video, and data) options and recommending effective solutions for clients throughout the United States. He holds more than 25 years of experience as an engineer and analyst in communications and public power systems. His experience includes electric and telecommunication system design, network feasibility, evaluation of the financial impact of projects on operations, and provision of expert testimony.

Mr. Asp is recognized as an expert in evaluating and offering recommendations regarding municipal broadband communications systems. He has been actively involved with telecommunication market research and feasibility analysis for over a decade, both with CTC and previously as a partner at the public accounting firm of Virchow Krause (Baker Tilley). Mr. Asp also has significant experience in the communications industry working in the areas of cellular, cable TV, broadband, and mobile radio, including as a product manager in the Cellular Mobile Telephone, Automatic Meter Reading, and Distribution Automation industries.

***Broadband Networks (Wired and Wireless)***

Mr. Asp is regarded as one of the premiere analysts in the United States regarding municipal planning and deployment of broadband systems to meet economic development, digital inclusion, and other needs. He has assisted numerous local governments, municipal utilities, and municipal consortia to evaluate their communities' communications needs and determine the financial parameters and business case for meeting those needs.

In this area, Mr. Asp's experience includes preparing connectivity feasibility studies for municipal networks, including economic analysis, market assessment, technology review, vendor analysis, and business plan development. He has assisted numerous communities with evaluating the feasibility of advanced connectivity services alternatives including provider partnerships and city-owned networks. He has reviewed options under cable franchise agreement for municipal purchase and operation. Mr. Asp has reviewed offerings and operations of incumbent telecommunications providers and assisted in negotiations with incumbent telecommunications providers to enhance availability of existing services and to encourage new and innovative offerings.

Some select examples of his projects include:

- Provided Jackson (Tennessee) Energy Authority an independent evaluation of responses to JEA's 2010 request for proposals (RFP) soliciting vendors to provide wholesale voice services. With JEA staff input, he developed the evaluation system and scoring matrix to ensure a balanced approach that best met JEA's needs. Responses were evaluated on the basis of strategic fit, operational fit, reliability, and overall cost; recommended two respondents as finalists for further consideration by JEA; and assisted JEA in negotiating with those finalists. As a final step in the process, CTC presented to JEA management a written report recommending the "best-fit" vendor.

- Completed a business and technology plan for Los Angeles Department of Water and Power (LADWP) to determine the feasibility of expanding the connectivity services offered to the businesses and institutions over the Department's fiber network. Included in the analysis was a valuation of additional fiber routes that LADWP acquired from the City of Los Angeles.
- Developed a business plan for the Commonwealth of Kentucky's Next Generation Kentucky Information Highway. The plan identified strategies for deploying a sustainable network, potential pricing for lit and dark services, and the impact of grants and variations in construction costs.
- Served as a business consultant to the City and County of San Francisco. Investigated the feasibility of the city building and operating a fiber-to-the-premises (FTTP) network to every home and business in San Francisco. The project included an analysis of multiple business models and business recommendations customized for San Francisco's unique circumstances.
- Developed a business case analysis for DC-Net, a District-owned and operated fiber optic telecommunications network that provides voice and data services. The network consists of resilient, interconnected fiber optic rings that connect more than 400 government buildings in the District, including Police Department, Emergency Management Agency, and Fire Department radio towers.
- Conducted a feasibility study, a business case analysis, and an "off-the-balance-sheet" benefits analysis for a fiber-optic network proposed by the mayor of the City of Seattle. The first study, FTTP Municipal Broadband Risks and Benefits Evaluation, sponsored by Seattle City Light, included the following elements:
  - Internal needs analysis
  - Market research of both residential and business
  - Assessment of competing services and technologies
  - Evaluation of the business case and business risks

Following on that report, Mr. Asp researched and wrote an FTTP Benefits Evaluation for the City, which explored the benefits of FTTP beyond the traditional balance sheet, including cost avoidance, monetary savings, and environmental impact.

- Performed an expert assessment of a business and marketing plan for Utah Telecommunication Open Infrastructure Agencies (UTOPIA's) open access FTTP network. The project included a strategy session with key stakeholders, collection of relevant background material, an analysis of UTOPIA market research and marketing models, and an independent evaluation of UTOPIA's business plan. Mr. Asp's work focused on improving the participating UTOPIA communities' ongoing cash flow and increasing participation of households and businesses in those communities.
- Prepared a fiber optic business plan for Richland Utilities, Washington to meet the needs of city facilities, the electric utility, schools, hospitals, banks, and other institutions. Work included preparation of various business models, review of operational requirements, and preparation of pro-forma financial statements.
- Provided extensive business planning assistance to the State of Maryland's One Maryland program, which lead to build an interconnected fiber-optic broadband network that

reaches every county and city in Maryland and will provide backbone and middle-mile capacity for commercial carriers.

- Managed project assisting Bountiful City, UT with the development of a business plan for a citywide wireless network. This project included the review of a conceptual design, reviewing proposed business relationships and staffing, and conducting a cost-benefit analysis.
- Project manager in assisting Ames, IA with the review of existing architecture, development of a network design, and preparation of detailed cost estimates for the acquisition and installation of WiFi hot spots and supporting infrastructure. This project has now moved into implementation preparations.
- Led consulting team in investigating several WiFi deployment models, development of a business plan (including market research and financial analysis), and development of a partnership RFP for St. Louis Park, MN. Mr. Asp assisted the city to pilot the network and then prepared specifications and bid documents to identify both integrators and operators for the network.
- Assisted the City of Tucson, AZ with a wireless feasibility study that included market research, competitive industry assessment, internal and external needs assessments, financial analysis, and the development of a business plan.
- Assistance in the implementation of an Institutional Fiber Network (I-Net) for Norwich Public Utilities in Norwich, CT. Project included development of a plan and strategy for the Fiber Optic Enterprise.

#### DA, AMR, SCADA

In the areas of Distribution Automation (DA), Supervisory Control and Data Acquisition (SCADA), mobile radio, and Advanced Metering Infrastructure (AMI), Mr. Asp has assisted municipal utilities and public power cooperatives with extensive evaluative and design services. Specifically, he has prepared evaluations and submitted recommendations on AMI alternatives and benefits. He has assessed existing and evolving technologies and services to support AMI and DA for electric utilities and has developed and directed demonstration plans to test technologies to support distribution automation -- including providing recommendations for establishing vendor alliances, performing research and designs networks to combine multi-utility communications, and outlining, evaluating, and recommending communication requirements and options for electric utility DA, SCADA, mobile radio, and AMI.

#### **TESTIMONY & VALUATION**

In addition to assisting over 80 communities and counties in evaluating financial opportunities to provide voice, data, and video services, Mr. Asp has provided financial and technical testimony and expert advice. Some examples include:

- Conducted an exhaustive business case analysis and prepared expert witness testimony on behalf of the City of Alameda in a federal court case involving the business practices, business results, and ultimate sale of its fiber optic enterprise. The testimony included a

comparative analysis of business models employed by municipal fiber networks nationwide and a review and valuation of several recent cable business transactions.

- Maryland Public Service Commission regarding Baltimore Gas & Electric's application for deployment of AMI and smart grid technologies. Written and sworn testimony included an analysis of smart grid technologies, vendor development, and impact to rates.
- Pacific Gas & Electric regarding the financial and technical viability of the use of Broadband over Power line (BPL) for Automatic Meter Reading (AMR) and support of new business opportunities. Mr. Asp prepared a report in anticipation of being called to testify before the California PUC
- The City of Lebanon, OH in connection with a dispute over an Assessment of Infrastructure Connectivity Fee with home-builders and Time Warner Cable. The Assessment and disposition regarded the reasonableness of the connection fee assessed to each new home by the municipal telecom department
- The City of Marshal, MO in determination of the value of the incumbent cable television system owned and operated by Time Warner.

#### **EDUCATION**

**Bachelor of Science**, Electrical Engineering, North Dakota State University, 1979

**Master of Business Administration**, University of St. Thomas, St. Paul, 1989

## ***Charlie Hamm | GIS Specialist and Staff Engineer***

Charlie Hamm works with a range of geographic design programs—including AutoCAD, ESRI ArcGIS, Google Earth, Microsoft Streets and Trips, and Quantum GIS—to enable large-scale network design and construction projects, as well as to illustrate geographic data for feasibility studies. He creates databases and maps to support network route planning, utility pole attachment, and permit application processes.

### **EXPERIENCE**

**Columbia Telecommunications Corporation, GIS Specialist/Staff Engineer, 2011 – present**

Charlie researches, aggregates, and manipulates data to create maps essential to projects. His specific client engagements have included the following:

#### *Prince George's County, Maryland*

- Created GIS shapefiles to document the locations of cellular antennas within the county

#### *Inter-County Broadband Network (ICBN)*

Provided GIS map management and design for the ICBN, a sub-grantee of the State of Maryland's federally funded One Maryland Broadband Network (OMBN):

- Used Visio to generate splice matrices for the contractors connecting fibers in Prince George's, Montgomery, and Anne Arundel counties
- Created GIS maps based on data developed during the update to the project's Environmental Assessment
- Developed overview maps of the ICBN build for project managers
- For a related fiber-to-the-premises (FTTP) project in a portion of Anne Arundel County:
  - Entered field notes into GIS
  - Generated bills of materials (BOMs)
  - Applied for environmental, county, and state permits
  - Used Visio to generate splice matrices for contractors

#### *Garrett County, Maryland*

- Analyzed data on availability of broadband service to identify unserved areas
- Created shapefiles in ESRI ArcGIS for incorporation into the county's GIS database

#### *Arlington County, Virginia*

- Assist county and CTC engineers in creating system-level drawings of last-mile engineering for ConnectArlington, the county's municipal fiber network
- Oversee incorporation of countywide fiber optic design into county's GIS database

#### *Carroll County, Maryland and Spotsylvania County, Virginia*

- Analyzed residential cable service to determine compliance with the counties' franchise agreements and develop strategies for franchise renewal negotiations
- Converted Bentley data into GIS format for analysis of broadband service

*National Capital Region Interoperability Program*

- Create and update as-built documentation for the NCRnet fiber network in Visio
- Provide ongoing mapping support for expansion of NCRnet
- Acted as primary point of contact for the construction contractor that built a grant-funded Maryland Department of IT fiber link connecting two sites

*Northern Illinois University (NIU)*

- Geocoded survey results to generate GIS maps

*U.S. Postal Service (USPS)*

- Searched the National Broadband Map database to identify and analyze data related to broadband connectivity near postal facilities nationwide
- Manipulated CSV files for multiple states to create maps of broadband service availability based on the FCC's definition of underserved areas

*Anne Arundel County, Maryland*

- Performed OTDR and power meter testing for fiber acceptance

**James Madison University, Research Assistant, 2010**

- Created a GIS map of student enrollment for the campus

**Virginia Department of Game and Inland Fisheries, Extern, 2009**

- Measured and recorded fish data

**EDUCATION**

**James Madison University**

B.S., Geographic Science, 2011

- Dual concentration in Applied Geographic Information Science (AGIS) and Environmental Concentration, Sustainability and Development (ECSD)

**ESRI Training Courses**

- Learning ArcGIS Desktop, 2010
- Creating and Maintaining Metadata Using ArcGIS Desktop, 2010
- Cartographic Design Using ArcGIS 9, 2009

**Software Skills**

- AutoCAD, ESRI ArcGIS, Google Earth, GPS Pathfinder Office
- Microsoft Streets and Trips, Quantum GIS, Remote sensing software

## ***Marc Schulhof | Senior Analyst and Technical Writer***

Marc Schulhof has more than 20 years of experience in technical writing, financial journalism, and public and corporate communications. Marc's excellent editorial skills and his extensive experience with analyzing IT and business topics have enabled him to play an integral role in supporting a range of research and writing projects, including:

- Master plans (business and engineering)
- Needs assessments
- Feasibility studies
- Survey instruments
- Expert witness testimony
- Federal grant applications
- Requests for proposal
- Cellular tower siting reports
- Letters, press releases, and website content

Prior to joining CTC, Marc was the worldwide editor-in-chief of CIO program websites at IBM, where he established editorial direction for 36 country-specific CIO websites and worked with local editors to update each site's mix of multimedia content. He also wrote and edited feature articles and white papers on information technology and business topics.

Marc's experience also includes his role as a global editor at PricewaterhouseCoopers Consulting, where he wrote and edited reports on a variety of technology and business topics, and served as editor of the PwC-sponsored *BusinessWeek Online Handheld Edition* daily news summary for mobile device users. As an associate editor at *Kiplinger's Personal Finance Magazine*, he researched, analyzed, and wrote about a range of complex financial issues.

### **EDUCATION**

**Bachelor of Science**, Journalism, Northwestern University

**Master of Science**, Journalism, Northwestern University