



CONSULTANT SERVICES PROPOSAL FOR  
**TOWN OF BARRINGTON, NH**

**PUBLIC SAFETY RADIO  
COMMUNICATIONS STUDY**

MAY 3, 2021



Submitted by:

**Communications Design Consulting Group, LLC**  
9 Tibbetts Rd • Barrington, NH 03825 • 603/905.9406



## Communications Design Consulting Group, LLC

Wireless & Technology Planning, Design & Management for Public Safety  
9 Tibbetts Road, Barrington, NH 03825  
603/905.9406  
[www.cdcg-consultants.com](http://www.cdcg-consultants.com)

May 3, 2021

Mr. Conner MacIver  
Town Administrator  
Town of Barrington  
333 Calef Highway  
Barrington, NH 03825

Dear Mr. MacIver:

On behalf of Communications Design Consulting Group, LLC [CDCG], we sincerely appreciate this opportunity to submit a proposal for the study and recommendation for a Public Safety radio communication system upgrade for the Town of Barrington.

We are confident that upon review of our proposal, the Town of Barrington will be convinced our qualifications demonstrate that CDCG can fully meet the Town's requirements, as well as their expectations.

CDCG is committed to ensuring that our clients are completely satisfied with the quality of the consulting services and support they receive on an ongoing basis. Our clients should feel they have made the right choice and should be happy to recommend us.

CDCG has assisted numerous cities, counties, and state agencies providing similar services for their communications systems projects. Our team has extensive experience in identifying those requirements and developing realistic solutions to meet client expectations.

CDCG's proposed project team consists of senior engineering personnel with experience in the analysis, development, and implementation of public safety and public service communications systems, as well as 9-1-1 Centers.

We are an independent consulting firm, and are not affiliated with any provider of communications equipment or systems. Our sole focus is to provide the highest level of managed, technically competent, engineering and communications consulting services. This unbiased position provides our clients a capable partner in meeting their communications objectives. CDCG perceives its client role as their "in-house engineer."

We truly welcome the opportunity to work with the Town of Barrington on this critical communications system project. CDCG's experience, technical competency, project tools; and, above all, its staff will enable us to serve the needs of the Town's initiative. If you have questions, or would like to meet, please contact me at 603/905.9406 or via email at [nboucher@cdcg-consultants.com](mailto:nboucher@cdcg-consultants.com).

Thank you - respectfully submitted,

A handwritten signature in black ink that reads "Normand H. Boucher".

Normand H. Boucher  
Principal Consultant

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## 1.0 EXECUTIVE SUMMARY

CDCG is an independent communications consulting firm that has served a wide array of Public Safety clients nationwide for over 17 years

## 1.1 Point of Contact

**Communications Design Consulting Group, LLC [CDCG]**  
is based at 9 Tibbetts Road, Barrington, NH 03825.

Normand H. Boucher  
Principal Consultant  
can be reached at 603.905.9406  
or at [nboucher@cdcg-consultants.com](mailto:nboucher@cdcg-consultants.com)







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## 1.2 Executive Summary - Proposal Content Overview

The proposed tasks for the Town of Barrington are broken into three phases, and submitted for Barrington Project Team's review addressing our plan to complete a comprehensive needs assessment; procurement specifications including assisting in the bid process, vendor selection, and contract negotiations; as well as implementation assistance to upgrade Public Safety radio infrastructure and related sub-systems that will be part of the Town's communications 'modernization' plan.

In general, the proposed tasks include the following phases:

### Phase-I

**Conduct Needs Assessment** – This effort will be to identify requirements for an upgraded radio system and technology needs to update the Town's next generation radio system. This includes identifying all systems impacted, deficiencies, and necessary budget and schedule to develop a Communications Plan.

### Phase-II

**Procurement Specifications, Evaluation, and Negotiation** – For this effort, and based on the accepted Communications Plan, CDCG will write a custom RFP specific to Barrington's needs that is non-proprietary, ensuring an open bid process for prospective vendors to bid on. This includes technology systems and services as well as developing a transition plan.

### Phase-III

**Implementation Assistance, Testing, and Acceptance** – In this effort, CDCG will assist the Town with contractor implementation oversight and monitoring, including attending vendor meetings, the review of contractor submittals, periodic inspections, acceptance testing and review as-built documentation and final acceptance.

The subsequent sections describe in more detail the proposed work plan for each of these phases.

## 1.3 Who Are We

CDCG is an independent consulting firm whose primary services are focused on State, County, and Local Municipal Government clients relating to all aspects of public safety and public service communication systems. We have no business relationships with any firm that provides networks, equipment, or services.

CDCG follows communication and engineering industry standards, guidelines, and best practices in our planning and design efforts. We are a member of the Project Management Institute [PMI], and agree with PMI Code of Ethics and Project Management principles, utilizing project management methodologies. CDCG's primary goal is to partner with our client to control risks, schedule, and costs for effective system purchase and implementation.





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In order to ensure a complete analysis of our client's communications needs in a rapidly changing technical environment, CDCG typically partners with other independent consultants or specialist to provide public safety consulting services. This allows us to leverage our team's experience capabilities while ensuring overall efficiencies.

Our core group of team members, who have worked together successfully on multiple communications projects nationwide for more than 25 years, is comprised of senior professionals – engineers, public safety consultants, technical specialists allowing us to build a team that specifically meets the needs of the clients we serve.

#### 1.4 Our Vision

CDCG recognizes that its clients need and require objective and unbiased advice and recommendations. As an independent consulting firm, CDCG's vision is to be honest and fair in all client and vendor relationships with a focus in ensuring trust among all team members. Our main agenda is to listen to all client concerns, from top management to the end user level. CDCG strives to understand and meet client expectations and recognizes that it must work closely with the client team, ensuring that their best interest is always supported.

CDCG is committed to ensuring that our clients are completely satisfied with the quality of the consulting services and support they receive on an ongoing basis. Our clients should feel they have made the right choice and should be happy to recommend us.

This proposal is made without any connection with any other proposer submitting a proposal for the same work. No person is acting, or employed by the Town of Barrington or the State of New Hampshire, is directly or indirectly interested in the proposal, or in any contract that may be entered into to which the proposal relates, or in any other portion of the profits therefrom.

#### 1.5 Project Methodology

In summary, CDCG will conduct an examination and evaluation of Barrington's Public Safety radio systems, equipment, connectivity, communications console, and related facilities.

CDCG proposes to achieve the Town goals by meeting the following high level objectives:

1. **Facilities Objective** – Assist in determining if existing radio transmitter site facilities are capable to provide sufficient service for existing and future operations, especially for signal coverage - are there risks and hazards to equipment and systems that may lead to the loss of communications?
2. **Technical Objective** - Determining the technical requirements for upgraded radio communications system technology and equipment currently in service. Is it capable of providing reliable service now and the distant future? Current technology platforms or legacy technology? Identify physical or technical obsolescence: old, worn out equipment subject to failure, or no longer supported by manufacturers' or appropriate for reliable public safety communications.





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3. **Operational Objective** - Determine the optimal operational configuration for a town-wide Public Safety radio communications system is in place, or needs to be improved for Dispatch and First Responder operations. Review analog and/or digital voice modulation and how integrated.
4. **Cost Objective** - Determine the cost of upgrading or replacing the Public Safety radio system, ensuring cost efficiencies in determining design concepts. Identify economic obsolescence: is it more expensive to maintain and operate than newer technology? What is the cost for technology improvement?

For us to understand the current workings, systems, and infrastructure of the Town's radio network, we will conduct staff interviews, do site evaluations, perform document reviews, and make field visits. In summary, this information-gathering phase will include:

1. A kick-off meeting with key team members
2. Identify Project goals and objectives
3. Review current system topology and connectivity
4. Perform site visits and assess all infrastructure equipment and inventory
5. Review frequency issues and FCC licenses
6. Provide detailed coverage analysis for mobile, portable and alert paging receivers
7. Submit various design options
8. Identify capital expenditure and recurring cost for the recommended updated system
9. Develop procurement specifications and assist in the bid process
10. Assist in the implementation of the approved system

CDCG will submit a comprehensive Communications Plan and report with appropriate recommendations, including the capital cost to implement, as well as and the recurring cost needed to operate an effective Town of Barrington Public Safety communications system.

## 1.6 Our Team Qualifications

For this engagement, Norm Boucher will be the Project Manager [PM], and will be the primary technical consultant, serving as the primary day-to-day contact responsible for the completion of tasks identified in this proposal.

As previously cited, CDCG partners with senior engineers and consultants in providing multiple discipline expertise to various communications technology tasks. Other consulting staff may be utilized on this project as directed by Mr. Boucher. A brief synopsis of the CDCG team members is provided below.

Our team has been involved in numerous small to large-scale public safety communication networks nationwide. Our staff has worked together on many projects, easily complimenting each other with each individual understanding roles, especially in meeting our client's time objectives and the quality of deliverables.

CDCG believes that its team is uniquely qualified to perform the necessary tasks. The team includes personnel who are successful on their own. Unlike some consulting companies with large full time staff that must





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maintain high utilization rates, our team includes only those members that can directly contribute to the tasks required. This eliminates the temptation to assign staff because of low utilization rather than direct contribution to the project.

Together, we will provide assurance that we as a team will not drive system functionality or solutions; but provide Barrington with technical data and knowledge needed to make suitable decisions in a way that will include a result with common-sense operational success.

<b>PRINCIPAL ENGINEER &amp; PROJECT MANAGER</b>	<b>Normand Boucher Communications Design Consulting Group, LLC [CDCG]</b>
<p>Mr. Boucher, as an experienced Public Safety LMR communications engineer is in his third decade of providing Public Safety communications consulting services. He fully understands current industry trends and client issues, with experience in the planning, designing, and implementation of public safety communications systems. This includes a history of successful projects in systems of all sizes, ranging from small municipalities to large scale statewide networks.</p> <p>He has personally been involved in numerous radio systems, microwave, including P25 and DMR radio projects. His technical expertise includes specification and implementation of trunked and conventional radio, analog and digital systems; site acquisition, FCC licensing, radio propagation analysis, interference analysis and mitigation, and project management.</p>	

<b>RF ENGINEER &amp; PROJECT MANAGER</b>	<b>Anthony "Chick" Langone Langone &amp; Associates</b>
<p>Mr. Langone is an experienced Communications Engineer and Project Manager, with experience in analog/digital radio systems and 9-1-1 center technology, trunked system design, microwave, fiber, and radio site development/upgrades as well as in system maintenance definitions and specification.</p> <p>His experience includes comprehensive range of radio communications design and implementation skills and expertise provided to both the Dispatch Center and Radio Communications community. Based on this experience and knowledge of the complex nature of Public Safety and Homeland Security Communications, Mr. Langone has offered advice to clients with challenging situations, resulting in the development of successful strategies to effectively and successfully accomplish their communications objectives.</p> <p>He has over 35 years of experience in Public Safety communications, recently completed the implementation of a multi-Town [Onondaga, Oswego, Madison, Lewis, and Cayuga] UHF Project-25 system located in central New York. The regional network is comprised of 60 transmitter sites with well over 10,000 users currently operating on the system.</p>	







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#### SITE ACQUISITION AND SITING SPECIALIST

**Blake T. Haskell**  
**J.D. Hunter, Inc.**

Mr. Haskell specializes in communications site acquisition, and provides advisory services to property owners as well as and government agencies on issues pertaining to wireless siting and public safety communications issues.

Mr. Haskell also has experience in tasks relating to coordinating approvals and access to communications sites, including identifying federal, state, and local regulatory requirements such as NEPA, FEMA, EHP, FAA, as well as local zoning for the proposed sites. He also develops site agreements and MOUs as required.

He has extensive experience working with diverse organizations including Law Enforcement, Fire Services, EMS, and hospitals and other agencies to develop mutually agreeable documents for the installation of new or upgraded equipment.

Prior to founding J. D. Hunter, Inc., Mr. Haskell worked in the wireless industry as a Real Estate and Zoning Manager for various telecommunications carriers [AT&T Wireless, Bell Atlantic, Arch Wireless, and LCC Wireless,]. He has dealt with all aspects of site development and network design, implementation and integration.

He currently has several wireless facilities under various stages of development in Connecticut, Massachusetts, New Hampshire, Maine and Vermont. Consulting services to several Massachusetts communities and agencies on telecommunications and 9-1-1 Center management issues and Grant Writing.

Mr. Haskell has worked with both Mr. Langone and Mr. Boucher on several Public Safety communication Northeast projects for several years.

#### FCC REGULATORY SPECIALIST

**Mr. Norm Coltri**  
**NRC Telecom, Inc.**

As principal at NRC Telecom, Norm Coltri provides consulting services with emphasis on frequency acquisition and spectrum management. He participates with the various NPSPAC Regional Planning committees to reduce interference while maximizing frequency reuse, and applies engineering analysis based upon EIA/TIA TSB-88 and other standards to frequency licensing proposals.

Mr. Coltri specializes in FCC frequency analysis and research; prepares and files FCC applications, waivers and Special Temporary Authorities [STA] for public safety licensees; has relationships with FCC licensing staff to discuss complex licensing projects; has participated in industry associations to develop strategies for obtaining additional spectrum or protecting existing spectrum allocations for public safety.

Norm's prior experience includes sixteen years with RCC Consultants and Black and Veatch, Inc. lastly serving as Regulatory Specialist. Responsibilities included assisting with the location and licensing of LMR spectrum, much in highly spectrally impacted areas of the country. Norm also served twenty-nine years with the New Jersey State Police providing engineering support for the development of a statewide 800 MHz trunked radio system, then as police frequency coordination for all agencies within the state. He was also a regional local advisor for APCO.

Norm was court recognized as an expert witness in the area of RF interference. He also served as a Commissioner on the NJ 9-1-1 Commission to foster the development of the first statewide emergency number calling network. Since entering private consulting, Mr. Coltri has participated in numerous public safety and critical infrastructure projects within the US.





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#### 9-1-1 & DISPATCH COMMUNICATIONS SPECIALIST

Michael Allen, ENP

Mr. Allen's career spans two decades of public safety communication that includes having served as the Director of 9-1-1 Emergency Communications Center for the County of Oswego, NY. Under his direction, he provided the guiding vision in the development and construction, as well as the management of an efficient Communications Center with a staff of 32 persons and a \$2.5-million annual budget.

He is fully cognizant in all aspects of Public Safety dispatch center operations and management that include call-taking, dispatching, staffing, scheduling, budgeting, personnel management, policies, training, procedures, and technology.

Technology includes communications dispatch console and associated sub-systems, such as Next-Gen PSAPs, GIS/mapping, 14-site trunked radio system; a 21-site county-wide microwave system; County-wide telephone system; broadband fiber optic network; and, Computer Aided Dispatch.

Mr. Allen also led a consortium of six [6] counties in central New York in the development and implementation of best practices, policies, and shared services of a regional radio communications system of 10,000 users.

Mr. Allen was also Co-Chair, Communications Interoperable Working Group, for the New York Department of Homeland Security and Emergency Services. The Working Group formed to develop policy and best practices for Statewide Communications Interoperability. Other tasks include Statewide ESI-Net Exploratory and Development Discussion; Next Gen Deployment; and is author of White Papers explaining emerging technologies including a Statewide ESINet, and State coordination of NG 9-1-1 Services.

#### SENIOR TECHNOLOGIST

Chris Achtschin  
CSA Solutions, Inc.

Mr. Achtschin is a Senior Technologist with decades of public safety and commercial communications experience. He has a strong background in radio and microwave system technical equipment/processes, and has installed and maintained multiple radio communications systems. Other areas of technical specialty includes IP/Ethernet systems and fiber networks.

He has engaged in the systems integration and support engineering for over twenty-five years, and has constructed and maintained IT communications systems for end-user environments. He typically assist the CDCG project team with all IT and radio network related tasks regarding network testing and troubleshooting ensuring reliable and robust network.

Mr. Achtschin previous employment includes supporting, planning and upgrade of a public safety communications system in his 15-year service to Yates County, NY. He also maintained microwave system equipment for MCI Communications. In recent years, Mr. Achtschin has been providing ongoing consulting services in the area of planning and implementation technical assistance to various Counties in the State of New York, and has assisted CDCG in numerous projects in support of CDCG clients technical issues.





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#### FCC COMMUNICATIONS ATTORNEY

#### John E. Logan, Lawyer

John E. Logan provides advice and advocacy to public agencies and corporations with regard to telecommunications matters. His law practice is built on his service in the federal government where he held senior positions at both the Dept of Justice and the FCC.

He has assisted both Mr. Boucher and Mr. Langone in difficult and complex spectrum licensing issues. He has pursued on behalf of public safety clients waivers; exceptions to FCC rules to provide additional channel capacity or flexibility in deploying wide area communications systems; or, request for special regulatory actions from the FCC.

Mr. Logan is the former Acting Chief of the Cable Services Bureau at the FCC. Mr. Logan was appointed Deputy Chief of the Bureau in 1996. During his tenure, Mr. Logan oversaw many of the Commission's rulemakings involving competition in telecommunications. He also supervised the Cable Services Bureau's enforcement efforts. He testified on behalf of the Commission before the Congress on several occasions. Prior to his position in the Cable Bureau, Logan was Deputy Director of the Commission's Office of Legislative Affairs where he represented the Commission during Congress' consideration of legislation that became the Telecommunications Act of 1996.

Mr. Logan received his undergraduate degree in economics from the Univ of Pennsylvania, cum laude, and his law degree from Rutgers Law School with Honors. He is admitted to the Bar of the District of Columbia, New York, and New Jersey and lives in DC.





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## 1.7 CDCG Project References

To demonstrate our experience on past projects, we briefly describe related references for the Town's project team. The references provide reviewers with specific information to contact previous clients regarding our abilities and performance during the project engagement. We are submitting three [3] references, additional references can be provided.

Project Reference-1: WEST HARFORD, CT			
Contact	Prime Consultant	Project Team	Description of Project
Keith Victor Project Manager  50 South Main St West Hartford, CT  <a href="mailto:KVictor@WestHartfordCT.gov">KVictor@WestHartfordCT.gov</a>	Communications Design Consulting Group, LLC [CDCG]	Norm Boucher & Chick Langone	Replacement of end-of-life Motorola SMARTNET 800 MHz trunked radio system with a P25 TaitNet trunked system
<b>Services Provided</b>	<p>CDCG was selected by the Town of West Hartford to provide consulting services to assist the Town in the final project planning to migrate their legacy [2] site 800 MHz SMARTNET analog system to a Project-25 Phase-1 system.</p> <p>The replacement system is a seven [7] channel, three [3] site simulcast system. The project began in 2016 with CDCG reviewing and verifying that the Town's procurement specification [written by others] to ensure an open procurement specification, guaranteeing a competitive process. CDCG assisted the Town in the bid process and contract negotiations, with the Town selecting Marcus Communications, Inc. to provide a TaitNet P25 trunked infrastructure with Harris, E.F. Johnson and Tait subscribers. The project also includes SAIE microwave radio, Avtec Scout communication console, and Zetron fire alerting system.</p> <p>CDCG also assisted the Project Manager in system implementation, coordinated monthly project status meetings, monitored vendor progress, maintained project schedule, technical assistance and resolving vendor conflicts.</p> <p>The system was completed in late 2020.</p>		
<b>Project Status</b>	Completed - providing ongoing project support		







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#### Project Reference-2:

#### TOWN OF WINDSOR, CT

Contact	Prime Consultant	Project Team	Description of Project
<p>Paul Goldberg Project Manager Fire Administrator/EMD</p> <p>Town of Windsor 275 Broad ST Windsor, CT 06095</p> <p>860-285-1983 <a href="mailto:goldberg@townofwindsorct.com">goldberg@townofwindsorct.com</a></p>	<p>Communications Design Consulting Group, LLC [CDCG]</p>	<p>Norm Boucher</p>	<p>Replacement of end-of-life E. F. Johnson MultiNet trunked radio system with Motorola ASTRO-25, P25 Phase-2 trunked system</p>
Services Provided	<p>CDCG was selected by the Town of Windsor to provide consulting services to assist the Town in the implementation of their legacy three site 450 MHz E. F. Johnson Multi-Net analog trunked system to a 700 MHz Project-25 Phase-2 system.</p> <p>The project also included a three [3] site, UHF Motorola TRBO DMR radio system for the Town of Windsor public schools.</p> <p>The replacement public safety system is a five [5] channel, Motorola ASTRO-25 three [3] site simulcast system. The project began in 2018 with CDCG assisting the Windsor project manager with technical assistance, reviewing and approving vendor documents and drawings, factory testing, and field coverage testing. Assisted in FCC licensing.</p> <p>The project also includes 11 GHz Aviat microwave radio links and Motorola MC7500 communication console.</p> <p>The system was completed in October 2020.</p>		
Project Status	Providing ongoing project support		





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#### Project Reference-3:

#### CITY OF PORTLAND, ME

Contact	Prime Consultant	Project Team	Description of Project
<p>Andrew Dziegielewski Emergency Communications Director  Portland Regional Communications Center  109 Middle Street  Portland, ME 04101  (207) 874-8575  andrewd@portlandmaine.gov</p>	<p>Communications Design Consulting Group, LLC [CDCG]</p>	<p>Norm Boucher and Chick Langone</p>	<p>CDCG has provided communication consulting services to the City of Portland since 1997, resulting in three major communications projects</p>
<b>Services Provided</b>	<p>1. 1997 - 1999 / The City operated an archaic conventional VHF system that was experiencing failures, poor coverage performance, and unreliable lease telephone lines. Developed Needs Assessment, System Design, Procurement Specifications, FCC licensing, and Implementation oversight for upgrading a to 7-channel 800 MHz trunked network, and new communications dispatch console. The system utilized fiber optic network for connectivity from the radio sites to the 91-1 Center. The network chosen was a three [3] site Motorola SMARTNET transmitter simulcast analog system with approximately 1,100 users.</p> <p>2. 2006 - 2008 / Based on Nextel Communications interference to public safety systems, the City was mandated by The FCC to change frequencies [800 MHz Rebanding]. This resulted in the replacement of most subscriber radios and the retuning of the infrastructure at the expense of Nextel. Equipment sub-systems not capable of operating on the new frequencies were replaced, including the Network Management and Vehicular Repeater Systems.</p> <p>3. 2015 - Ongoing / The City was experiencing end-of-life issues with the Motorola SMARTNET system. As a result, CDCG developed a Feasibility Study to identify system issues and to recommend course of action. Tasks included performing coverage analysis using TSB-88 standard for inside heavy buildings; increased channel capacity from 7 channels to 10; assisted in the development of an EOC to mirror dispatch operations; and FCC licensing. Site connectivity was to expand the fiber optic network. CDCG developed procurement specifications, assisted in bid process and contract negotiations, oversight of system acceptance testing and implementation support. The network chosen was a 5-site transmitter simulcast Project-25 Phase-1 digital system.</p>		
<b>Project Status</b>	Completed. Providing ongoing consulting support		





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### PAST EXPERIENCE EXAMPLES

STATES	COUNTIES	CITIES & TOWNS	UTILITIES	OTHER
Delaware Office of Technology	Albany County, NY	Acushnet, MA	Baltimore Gas & Electric, MD	AMTRAK
Delaware DoITT	Baltimore County, MD	Andover, MA	Boston Water & Sewer, MA	Brown University, RI
Delaware DPS - DIVCOM	Calhoun County, AL	Asheville, NC	Central & Southwest Utilities, TX	Central MA EMS, MA
Florida JTF Statewide Radio System	Cayuga County, NY	Atkinson, NH	Central Maine Power Co.	Columbia Spectrum Management, MD
Mass. Dept. of Conservation & Recreation	Carroll County, NH	Atlanta, GA	EPRI, DC	Dartmouth College, NH
Mass. Dept. of Health - EMS Services	Chemung County, NY	Auburn, ME	Florida Power & Light Seabrook	Franklin Regional Council of Governments [FRCOG], MA
Mass. Exec. Office of Public Safety & Security	Chenango County, NY	Boston, MA	Long Island Lighting, NY	Franklin Regional Transit Authority, MA
Nebraska State Comm. Plan	Clark County, NV	Brattleboro, VT	New England Power Corp, MA	Glaxo, Inc., NC
New Hampshire Governor's Radio Task Force	Clinton County, NY	Carlisle, MA	Niagara Mohawk Power Corp, NY	JFK Airport, NY
Rhode Island Dept of Administration DoIT	Franklin County, VT	Cumberland, ME	Northeast Utilities, CT	Mass Bay Transit Authority [MBTA], MA
Rhode Island Dept of Corrections	Franklin County, MA	Falmouth, ME	NY State Electric & Gas, NY	Merrymount Council of Gov., ME
Rhode Island Dept of Transportation	Grand Isles County, VT	Fairhaven, MA	Public Service Electric & Gas, NJ	Northeast MA Homeland Security Region [NERAC]
Rhode Island Emergency Management	Greene County, NY	Fort Lauderdale, FL	Southwest Electric Power Co, LA	Boston - Mayor's Office of Emergency Preparedness
Rhode Island Public Transit Authority	Howard County, MD	Franklin, MA		Maryland Institute of EMS Services [MIEMSS]
Vermont DPS CJS	Lamoille County, VT	Freeport, ME		Metropolitan Area Planning Council [MAPC], Boston, MA
	Lewis County, NY	Gorham, ME		Metro Washington Airport Authority [MWAA], DC
	Livingston County, NY	Groton, MA		Southeast MA Homeland Security Region [SRAC]
	Loudon County, MD	Hanover, NH		Upper Eastern Shore Counties, MD
<b>INTERNATIONAL</b>	Madison County, NY	Las Vegas, NV		
Techno-Sciences, Inc. / Morocco	Maui County, HI	Lebanon, NH		<b>Subject Matter Expert [SME] - OTHER COMPANIES</b>
Unilux-JV / Trinidad & Tobago	McHenry County, IL	Lewiston, ME		ACD Telecom, Inc.
	Middlesex County, NJ	Maitland, FL		ACG, Inc.
	New Castle County, DE	Mattapoisett, MA		ARCADIS, Inc.
	Niagara County, NY	Narragansett, RI		ArdentMC, Inc.
	North Hampton County, PA	No. Providence, RI		Computer Analysis Associates, LLC
	Oneida County, NY	Norwich, VT		CCMS, Inc.
	Onondaga County, NY	New York, NY FDNY		CSA Consulting
	Oxford County, ME	New York, NY DoITT		CTGi, Inc.
	Oswego County, NY	Peabody, MA		DiDonato Consulting Services, Inc.
	Palm Beach County, FL	Peekskill, NY		J. D. Hunter, Inc.
	Penobscot County, ME	Providence, RI		Green Mountain Communications, Inc.
	Piscataquis County, ME	Portland, ME		Isotope, Inc.
	Putnam County, NY	Seekonk, MA		L3 Communications, Inc.
	Rensselaer County, NY	South Portland, ME		Langone & Associates
	Sacramento County, CA	Syosset, LI, NY		Ossipee Mountain Electronics, Inc.
	Sagadahok County, ME	Stamford, CT		RCC Consultants, Inc.
	Schenectady County, NY	Tewksbury, MA		Robbins-Gioia, Inc.
	Seneca County, NY	Waterford, CT		Ross & Barunzinni
	Suffolk County, NY	Wilmington, DE		MACRO Inc.
	Waldo County, ME	Westford, MA		Malcolm-Pirnie, Inc.
	Warren County, NY	West Hartford, CT		Nelson Communications, Inc.
	Washington County, NY	Windsor, CT		NYSTEC Corporation
	Washington County, RI	Yarmouth, ME		Roaming Intelligence, LLC
	Yates County, NY			Touchstone. LLC
				Towpath, LLC
				Vogel Consulting Group
				Wildan Homeland Solutions, Inc.



**Communications Design Consulting Group, LLC**

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## 2.0 PROJECT TOOLS FOR ANALYSIS AND SYSTEM DESIGN

The CDCG Project Team utilizes a variety of software and engineering RF planning and analysis tools to accomplish specific radio system design tasks. These include, but not limited to radio propagation prediction and analysis, microwave path calculation and analysis; signal measurements; infrastructure loading analysis, and intermodulation [IM] interference analysis. Descriptions of our planning tools are provided below.

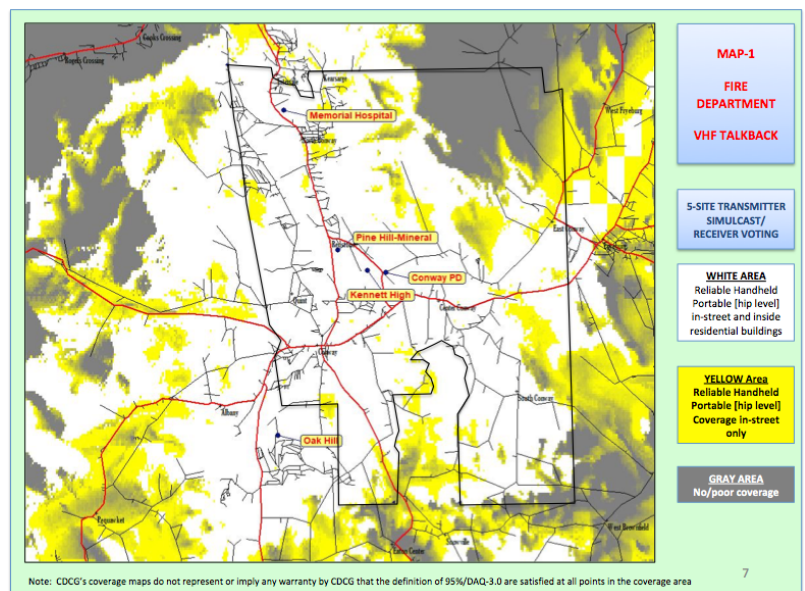
### 2.1 Coverage Prediction and Analysis [provided in SOW]

The Project Team can provide a Mapbook of computer generated coverage predictions maps for the existing and/or new radio sites to enhance coverage requirements.

The Mapbook will show various coverage maps based on mobile, handheld portables, alert paging, as well as talk-in, talk-back, in-building and in-street scenarios.

Designs factors such as local environmental noise floor; DAQ; area reliability; antenna losses; simulcast propagation delay performance [TDI]; and, voted receiver joint probability improvement are considered, all to ensure realistic coverage prediction.

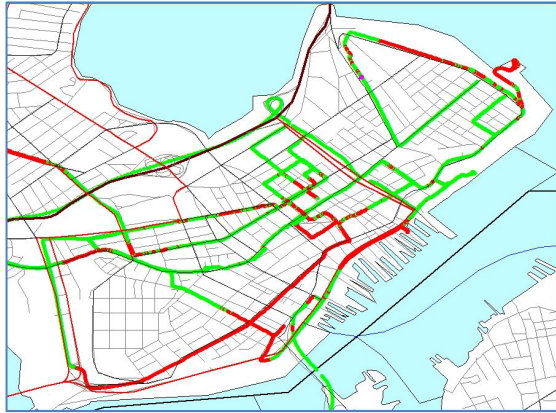
The Project Team engineers are experienced in radio propagation prediction and analysis using industry-accepted software modeling tools. The Project Team uses RadioSoft CommStudy-2 software. Coverage prediction parameters will conform to public-safety design standards [95% reliable coverage with a DAQ-3.4 [3.0 analog] [Delivered Audio Quality] per TIA/EIA-TSB88], or a Bit-Error-Rate of 2%. The ComStudy software has several mathematical propagation equations, based on electromagnetic theory, to model coverage in time and location. These models include Longley-Rice, Okumura, Epstein-Peterson, and Bullington, which are proven general-purpose models that can be applied to a variety of radiowave engineering problems encountered in radio system design coverage.







## 2.2 Signal Measurement Capabilities [Option]



The Project Team has precision field strength measurement equipment for performing radio communications system talk-out coverage surveys to provide real-time coverage of transmitter sites or radio system. The Project Team can map out coverage for existing or proposed transmitter sites. Surveys are performed using either existing base station facilities, or by installing equipment on a temporary basis at proposed base station sites.

## 2.3 Intermodulation [IM] Analysis [Option]

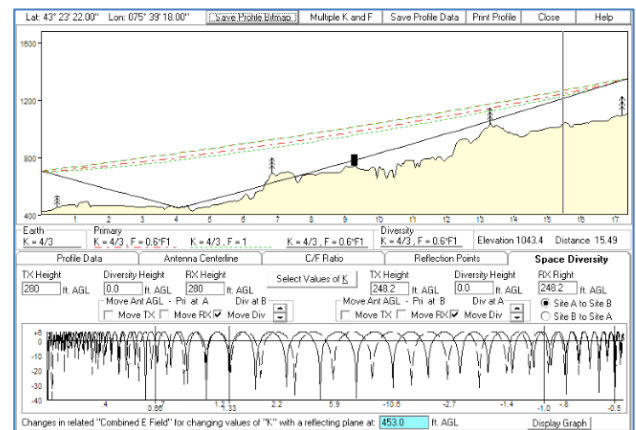
The Project Team utilizes Intermodulation IM interference software [F-Intermod] to calculate IM products of transmitters at a communications site. This tool is used to guide the proper design for antenna placement and to mitigate IM interference that may desense site receivers. Although not an exact science due to the multiple variables involved, results may be difficult to understand or interpret, but general knowledge of IM interference at a site can identify potential interference impact to receivers in the system design, as well as identifying equipment that may be needed to mitigate interference.

## 2.4 Microwave Path Design, Performance and Reliability Calculation [provided in SOW]

The Project Team uses Micropath, which is a computer based microwave engineering tool used to develop path profiles between the proposed sites to analyze and assess transmission path reliability. Micropath also provides a technical baseline and calculates microwave path transmission characteristics, to maximize reliability and availability performance using solid transmission engineering principals.

Our computerized path analysis is based upon the following technical parameters:

- Propose path clearances for antenna centerlines based on profile elevations, uniform tree heights, and calculated for various values of earth curvature [K].
- Fresnel Zone clearances, making sure that all clearances over the path are at least  $0.6F1$  to ensure free space propagation. From this information, the initial parabolic antennas sizes can be calculated.
- Calculation of path performance and reliability [system up time]. Calculation and analysis of signal levels for each path. This analysis determines





system performance as a function of the path length, type of terrain, and climate characteristics of the area.

- Determine composite fade margin requirements for each path to indicate how much signal attenuation can be expected. The path data sheets generated will assist in determining the overall operating condition of the path, and also will be used in obtaining microwave frequencies and FCC licensing.

Micropath is used as a preliminary analysis tool. Final path design is completed after the microwave vendor completes the physical path survey.

## **2.5 Microwave Path Performance Using Drone Technology [Option]**



CDCG can provide various Drone surveys to enhance site studies of the communications compound, tower, antenna overviews, as well as microwave path analysis. Our Drone Operator is an experienced FAA certified Part-107 Small Unmanned Aircraft Remote Pilot Operator.

Our Drones are DJI's Inspire 1v2 units that use a dual positioning system [GLONASS + GPS], which enables higher precision while giving the unit a point to hover.

The Drone has a built-in 4k camera with 360° filming capability that can capture images with a maximum resolution of 4608 x 3456 @ 16MP, as well as capture 4K video @ 30fps. They are also equipped with a gimbal that allows for interchangeable lens to enhance image capture.

For site surveys, CDCG can provide video and/or pictures of the communication site compound; determine tower heights, as well as antenna type and heights installed on the structures or rooftops. Close up images can be taken to zoom on specific tower locations or antennas.

For short microwave paths, and in lieu of the computer generated microwave path profile and clearance analysis, CDCG can provide field verified microwave line-of-sight path performance using a Drone to validate path profile elevations, terrain heights, and all natural and manmade path obstructions. The Drone is used to establish actual antenna height centerlines. The Drone(s) have precision camera system that can zoom to capture distance images, and to analyze hops up to 10 miles based on clear weather conditions and visible antenna structures.

## **2.6 System Capacity – Radio Channel Traffic Analysis [provided in SOW]**

For First Responders, a poor Grade-of-Service [GOS] means blocked calls resulting in communications delays. To reduce or eliminate system call delays, there needs to be sufficient number of radio channels to meet user demands under all types of operating conditions. Operating conditions are typically expressed in terms of average busy hour during emergency peak loading, and the non-busy hour.

The GOS modeling is based on operational variables drawn from system data, typically from radio system management statistics. If no statistics are available, the Project team will determine the number of radio channels needed. It also identifies the probability of call waiting times, and probability of a call answered in





the target time. The Project Team uses Erlang/mobile values extrapolated from past analysis for Law Enforcement, Fire, and EMS services. The Project Team uses Erlang-C software analysis tool to examine key operational parameters such as Busy Hour and average call durations to

Erlang-C [traffic intensity] is used as it assumes that busy calls [blocked] go into queue. Blocked calls are delayed by holding them in queue until a voice channel is available [for trunked radio systems]; and, calls dropped if conventional radio system. The Project Team generally designs service level and channel capacity for 99% availability with a maximum delay in queue of 1-second.

### 2.7 Project Reporting [provided in SOW]

The Project Team can utilize a web-based tool to provide the client staff with current project status, activity and project documents. This is typically a Dropbox file sharing tool [proposed], but may include a summary project management tracking site that would include project timelines, task & actions, risk & issues, and project documents [option]. The Project Team and the client will identify the appropriate tool.

### 2.8 FCC and Communication Site Databases [Option]

The Project Team can identify frequencies in any frequency band and file applications to license them for clients. The FCC makes the final decision on granting licenses.

We subscribe to, and have access to various databases for frequency research and site identification in specific geographical areas and can provide custom searches. Database includes the FCC Universal Licensing System, SpectrumWatch, and Percon Corp Datalinks, as well as commercial site databases.

**System Loading Analysis**  
Worst Case Busy Hour

Calculate the number of channel required to reach desired service level

Yellow Box = User Input	Earthquake/5yr/ML/Plows
Blue Box = Output Calculations	
Incoming call rate	5210 # PTT calls per hour
Worst case busy hour	
Average call duration	1.5 seconds
Required service level	99.0% P= 0.01
Probability of system access	
Max delay	1 seconds
Traffic Intensity	2.17 Erlangs
Required Number of Channels:	6 Voice Channels
Probability a call waits	2.59%
Probability call is answered in target time	99.80%

Uses Erlang-C formula; Erlang-C assumes busy call goes in queue





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## 3.0 TOWN OF BARRINGTON RADIO STUDY OBJECTIVES AND WORK PLAN

The following Work Plan describes the tasks required to assist the Town of Barrington in developing a strategic Communications Plan. The plan will address the Town's requirements for an upgraded radio system.

### 3.1 Phase-1 – Needs Assessment / Radio Study Work Plan

CDCG will assist the Town of Barrington in determining the strategy to upgrade the Town's radio communications systems for the participating departments. CDCG will identify the technical requirements, operational changes, and the financial implications of recommendations, now and in the future, for the consideration. Above all, the selected system must have the flexibility to support and manage the Town's radios communications needs going into the future.

#### 3.1.1 Kickoff Meeting with the Town of Barrington Project Team

CDCG will meet with the Town's Project Team to identify goals and objectives in preparation for project kickoff and to define the performance requirements for future upgrades or replacements. This includes identifying the study team members Barrington representatives who can provide needed information. Develop and agree to a complete list of tasks, timetables and deliverables and finalize strategies for the performance of the project, and discuss any other aspect of the project deemed relevant by the Town of Barrington.

#### 3.1.2 Develop Project Management Plan

CDCG will submit a basic Project Management Plan that details our timelines and steps needed in order to complete the project within the proposed schedule. The Project Plan will include major objectives, milestone start/completion dates, and minor tasks required to complete the project in a timely manner. The Project Plan will also discuss key risks and strategy for resolution. We are submitting a tentative timeline in Section-4.1.

#### 3.1.3 Review Current System and Issues

This initial step is very important as it categorizes the current communications environment of the user base, and is part of the baseline information that is needed to develop an upgraded system. This task approach will be from an end user perspective, whose operational requirements will be backfilled with the appropriate solution and equipment needed to fulfill their communications requirements.







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**Review documentation** – existing reports, methods, inventories, budgets, audits, FCC licenses, and other related documents.

**Interviews.** We will use purpose designed interview instruments to ensure consistency in methodology. This will also allow us to quickly tabulate results. We will interview the Town of Barrington radio planners, Law Enforcement, Fire, EMS and School officials, and other Town Stakeholders.

We plan to conduct face-to-face interview meetings but can schedule Zoom meetings where applicable or desired.

CDCG will understand and verify:

- Town of Barrington 's operating philosophy and organizational needs regarding the radio system
- How major dispatch functions are performed
- The flow of information through the various locations and dispatch points
- The strengths and weaknesses of the current system, functionality required in the new system, and ancillary hardware and software to be considered in the design process
- Maintenance problems and concerns relating to the existing radio system and how eliminated in the new system
- Interconnecting radio sites and the dispatch center, network topology, routing and capacity
- Existing systems and subsystems to determine their availability and viability in an updated communications system
- Existing physical facilities and those that may be in the planning stage for availability and viability to support dispatch and radio communications
- Review requirements for analog and/or digital modulation
- Impact on existing Communications Center / Dispatch Operations or equipment
- Subscriber inventory, specialized needs for portable radios, mobile equipment types and tier of subscriber radios equipment and features such PTT ID and encryption

### 3.1.4 Perform Site Visits and Assess all Infrastructure Equipment

It is essential that system equipment be inspected to determine if there are any physical, functional, or economic obsolescence.

Radio systems must provide high reliability during adverse situations and minimal delays during busy periods. Communications system, equipment and software are susceptible to failures. Vulnerabilities that may affect or interrupt service will be identified and addressed to reduce or eliminate potential risks and hazards.

Our specific approach to the site visits is to determine the following vital questions:

- Is there equipment space available in the equipment room
- Is there antenna mounting space available on the tower
- Is there sufficient primary AC and back-up power reliability and capacity
- Is there any other site improvements that may be required





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In summary, areas to be inspected are

- **Structural:** Inside/outside building hazards that may potentially damage or impact equipment facilities; secure location for equipment; access requirements; fuel tank locations and protection; and structural integrity of communication towers
- **Equipment:** Secure cabinets and racks; equipment/sub-equipment redundancy and backup; equipment diagnostics; network management system; grounding and lightning protection
- **Facilities:** Secure and clean equipment room; UPS and emergency generators; primary power; grounding and bonding; temperature control; power surge & lighting control protection; facilities monitoring; identification of non-structural hazards
- **Network:** Protection/security of critical voice/data/IP links; redundancy, alternate routing; backup locations; coverage overlap; re-routing; network management; remote access, encryption and encryption keys, and software security.

CDCG will provide an assessment of the site conditions in the Communications Plan and Report.

### 3.1.5 Review Frequency Issues

CDCG will review the existing Town of Barrington channel plan and the use of existing radio frequencies. We will also assess communications with adjacent municipalities or other public safety entities, use of available channels for wide-area, tactical, fire ground, or joint operations.

CDCG will inventory the FCC database for existing Town of Barrington FCC licenses and examine the frequency authorizations, to determine how they may be implemented in the upgraded system, and to determine license technical parameters, data accuracy and completeness.

We will identify frequency issues in the report.

We will also conduct preliminary, high level assessment of potential new frequencies that may be available to the Town.

### 3.1.6 Provide Detailed Coverage Analysis for Mobile, Portable, and Alert Paging

Reliable signal coverage is paramount to operating a successful radio system.

CDCG will conduct an in-depth analysis of signal coverage to determine what changes are needed to provide reliable coverage throughout the Town and region. This will be performed using computer coverage prediction software. CDCG will provide computer generated coverage predictions maps for the existing and/or new radio sites to identify coverage requirements.

CDCG engineers are experienced in radio propagation prediction and analysis using industry-accepted software modeling tools. Coverage prediction parameters will conform to public-safety design standards [95%





reliable area coverage with a DAQ-3.0/3.4 (Delivered Audio Quality) per TIA/EIA-TSB88]. Please refer to Section-2.0 for detailed description of our tools and capabilities.

For Town coverage analysis, CDCG will provide a Mapbook Report with computer generated coverage prediction maps for the existing and/or new radio sites needed to enhance coverage requirements in the Town.

The Coverage Mapbook will show various coverage maps based on mobile, handheld portable radio worn at the hip, alert paging, as well as talk-in, talk-back, in-building and in-street scenarios. If required, time delay interference [TDI] based on simulcast delays in overlap areas, will also be analyzed.

### 3.1.7 Provide Conceptual Design Options

In this phase, CDCG will develop solutions to upgrade Public Safety communications. We will identify all of the critical technical performance objectives, and develop the performance requirements for system operation and maintenance. CDCG understands the need to develop a solution based on defined requirements and available solutions rather than making a premature determination. It is clear that any appropriate solution would include:

- Facilities with adequate space to meet the expected growth
- High reliability backhaul (IP/Ethernet, fiber optic, microwave, etc.)
- High reliability radio coverage for handheld portable radio (using existing sites, or additional sites to provide reliable regionwide coverage, if needed)
- High reliability system architecture; system protection, survivability, and redundancy
- Adequate channel [frequencies] capacity for current & future needs, for both normal and busy conditions
- A means to address current requirements NOT met
- How to transition from the old system to new system

### 3.1.8 Subscriber Upgrade

The subscriber radio in many ways is the most critical component of the radio system. While the core infrastructure equipment is highly complex, it is the subscriber that is the *“face of the system”* to the user community. If the subscriber configuration is inadequate or difficult to use, the user community is likely to judge the system as a failure. CDCG has performed the specification, procurement support, and fleet deployment/transition for many public safety agencies.

Moreover, specialized needs for subscriber equipment will be gathered from the representative officials. Other key information to be collected/developed will include user group information, operational groups, user ID, incident plans, interoperability, and roamer requirements.

Sample hardware elements include but not limited to:





**Hand-Held Portable Radio:** covert accessories, external [wired & Bluetooth] microphone/headsets, encryption, Intrinsically-Safe radio, channel scan functions, vehicular repeater [if required], location GPS, , etc.

**Mobile Radio:** Encryption, Ambulance Fire Apparatus configurations, fire audio panel, scan function, encryption, mobile computing, Wi-Fi programming, location GPS, etc.

### 3.1.9 Identify Capital Expenditure and Recurring Costs

A budgetary cost estimate will be developed using current vendor pricing. The budgetary estimate will outline the various components of the proposed system and will address system development, procurement, implementation, as well as maintenance. The cost estimate provided will be comprehensive, providing the Town with a complete picture of all costs associated with system implementation and its ongoing maintenance and operational support.

Cost items to be included are:

- Radio infrastructure and connectivity
- Facilities remodeling cost estimates, if needed
- Center technology/equipment/sub-systems, if needed
- Recurring operating and maintenance cost

### 3.1.10 Town of Barrington Communications Plan and Report

CDCG will prepare a draft of the Communications Plan report, with an executive summary identifying all of the work completed to date. The Plan will delineate the various facilities and technology alternatives available to the Town.

The report will also include the identified needs and requirements of the Town, including existing site conditions, coverage maps, connectivity, system design diagrams, budgetary cost estimates, and time schedules.

Other issues, such as implementation strategies for the short and long term will also be presented. CDCG will present a draft report to the Town's Project Team for their comments and modification, and if appropriate, will assist the Town Project Team in a presentation to appropriate officials.

### 3.1.11 Prioritize Communications System Needs

CDCG will assist the Town in prioritizing the system needs as follows:

- based on its relative value to its planners and management
- its applicability to provide relief to existing or near future problems
- its near term or long term deployment based on current and future budget appropriations





There may be key or critical system elements that may need to be implemented in the short term to provide relief to identified problems or issues that the Town may be facing. These will be taken into consideration and prioritized based on budgets and/or funding resources.

CDCG recognizes that other issues may need to be considered in the implementation plan. This includes dependencies on budgets and funding resources; or other potential constraints that may require the system to be implemented over a shorter or longer time period.

**Deliverable:** CDCG will prepare for the Town of Barrington a draft of the Communications Plan and Report for review and comment and will modify the document to incorporate the Town of Barrington's changes. Upon final approval by the Town of Barrington, the RFP will be issued to the qualified vendors.

Note that there will be two sub-reports: one dedicated to coverage – Coverage Mapbook; and another for microwave radio system configuration should this be the accepted solution.

## 3.2 Phase-2 • RFP Development and System Procurement

CDCG will develop a specification package for the design, engineering, and implementation of an upgraded/replacement Public Safety communications system for the Town of Barrington.

### 3.2.1 Preparing Procurement Specifications Document

Once the Town of Barrington approves the appropriate communications solutions provided in the Communications Plan report, CDCG will finalize the conceptual system design and will work with the Town of Barrington to develop a Performance Specification Document [PSD] for the proposed radio system upgrade and/or replacement. The PSD will include functional, performance, and technical requirements necessary for qualified radio system vendors to provide a proposal that meets the needs of the Town. The PSD elements will include:

- Project Schedule
- Coverage requirements
- Equipment and Software requirements
- Facilities requirements
- Alert Paging & Fire Station alerting
- Installation labor
- Spare parts inventories
- Site preparation
- System and Network Testing
- Acceptance Procedures
- Technical and User Training
- Cutover Plan
- Warranty and Cost
- Maintenance and Cost
- Administration

In addition, CDCG will:

- Prepare functional and technical specifications
- Provide recommendations for contractual terms & conditions
- Provide clear definitions of vendor responsibilities and project completion/acceptance requirements.
- Coordinate with Town of Barrington procurement officials





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- Prepare vendor response forms and documentation format requirements
- Develop evaluation methodology and proposed weighting for Town of Barrington review
- Attend pre-proposal meeting
- Respond to vendor questions
- Assist in vendor selection
- Assist in Vendor contract negotiations

Through the years, CDCG has developed and fine-tuned an approach to specification and procurement that we have found to have strong benefit in the following areas:

- Clear requirements for Proposers
- Clear definition of responsibilities
- Clear and consistent response format
- Straightforward and objective application of evaluation criteria
- Efficient and effective scoring methodology
- Efficient and reliable evaluation process
- Clear itemized list for use in contract negotiations
- Results that are acknowledged by Vendors to be a fair process

CDCG will assist the Town of Barrington in conducting a pre-proposal vendor conference and will provide technical support regarding the system specifications. In conjunction with the pre-proposal conference, CDCG will also accompany the Town of Barrington and prospective Vendors on a site tour to allow vendors to inspect existing and potential new site facilities to assist in their system design. CDCG will recommend specific answers to vendor questions relating to the technical specifications of the system.

### 3.2.2 Evaluation and Award

Following release of the Town of Barrington's procurement document to the vendors, CDCG will work with representatives of the Town of Barrington to develop vendor proposal evaluation criteria. This grading matrix will serve as the basis for evaluating vendor proposals.

Upon receipt of vendor proposals, CDCG will assist the Town of Barrington in a comprehensive evaluation of each proposal, and will develop an evaluation summary report that outlines the technical and cost evaluation, technical clarification, and an engineering recommendation for the proposed system that best meets the Town of Barrington's requirements.

CDCG will meet with the Town of Barrington to review the results of the evaluations. Evaluation documents will be collated and CDCG will provide formal documentation describing Offeror technical compliance and objective score.

### 3.2.3 Assist in Contract Negotiations

One additional benefit to the CDCG documentation methodology is that it provides a list of items for contract negotiations as a result of the evaluation process.

Assistance to the Town of Barrington throughout the contract negotiation process will be provided. CDCG will develop a list of technical negotiation issues and present that list to the Town of Barrington. CDCG will







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provide technical review and approval recommendations for acceptance testing. CDCG will attend contract negotiation meetings at the Town of Barrington's request, and will provide overall quality assurance of Contractor compliance documents.

At the point when all negotiations are concluded and a contract document has been agreed upon, CDCG will submit a formal award recommendation. If required, CDCG will provide a formal presentation for Town of Barrington officials recommending project approval.

**Deliverable:** CDCG will prepare for the Town of Barrington a draft of the Procurement Specification Document [PSD] for review and comment and will modify the document to incorporate the Town of Barrington's changes. Upon final approval by the Town of Barrington, the RFP will be issued to the qualified vendors.

After receiving the feedback on the specifications and evaluation criteria, CDCG will meet with the Town of Barrington to review the comments provided on these documents. CDCG will incorporate the comments provided and the results of the meeting into the final System Specifications and Evaluation Criteria and deliver that document to the Town of Barrington.

### 3.3 Phase-3 • System Implementation and Vendor Oversight

During the implementation period, Barrington and its project staff will face challenges as the implementation progresses. These challenges will be the result of conflicting demands arising from sponsoring a project while trying to manage one's daily job responsibilities. CDCG is providing pricing to assist the Barrington Project Manager in decision-making; and when needed, to be on-site to coordinate or monitor vendor activity. Including close technical support during through the implementation phase.

The CDCG project team is experienced overseeing of implementation plans, as well as managing external project influences that often threaten timely project completion, and will help the Barrington team to manage implementation, testing and acceptance.

We propose that our responsibility will be to act as an agent for Barrington with the selected contractor to provide a smooth transition to the new/upgraded system.

Based on these assumptions, CDCG proposes to spend time on-site with the vendor during critical milestones during the installation phase. The day-to-day management of the project will lie with Barrington. We estimate overall involvement for Barrington to be 75%, and 25% for CDCG, subject to Barrington's approvals. The Town and CDCG can also discuss alternatives depending on the Town requiring more or less participation during implementation.

At the commencement of this phase, CDCG will meet with Barrington's project team and to finalize objectives; the proposed implementation plan; and requirements with the Barrington's project team and with the selected vendor.





CDCG proposes to support Barrington by leading or participating in major technical milestones that will take place during the project construction cycle. Our response outlines the various specific elements to provide assistance with vendor implementation management, installation inspections, overseeing vendor acceptance tests, training, and cut over process.

One of our goals is to identify problems before they become critical. This includes determining their causes and providing recommendations for their solution.

On behalf of Barrington, CDCG will plan and coordinate weekly or monthly status meetings between Barrington and the radio contractor to discuss work done, work in progress, and to solve any issue that may affect the schedule or system performance. We will also coordinate the resolution of problems and provide progress reports to the Barrington's Project Manager as needed.

Note that CDCG supports the concept of the Town managing and controlling project meetings and the accompanying agenda and schedule, as opposed to the selected vendor governing or directing meetings.

At certain points during the project, CDCG may hold weekly vendor conference calls to ensure that critical work is progressing.

Note that the implementation effort is challenging to estimate, as we do not know what the final system configuration, design, as well as who the selected vendor is, thus unclear the level of effort needed to complete the implementation tasks.

The selected vendor will drive the implementation schedule based on their final system design, installation resources, and the manufacturing effort involved. This presents difficulties in accurately estimating the required hours for vendor oversight, inspections, testing, cutover and acceptance; especially project disruptions or delays incurred by the vendor or other unanticipated events.

The hours submitted in our proposal is based on past project experience. CDCG is prepared to discuss and refine the scope to Barrington's satisfaction based on the level of participation needed.

### **3.3.1 Basis of Proposed Implementation Cost**

Expected CDCG tasks as follows:

- Finalize Project Implementation Plan with Barrington project team and the contractor
- Final system planning with successful vendor; radio, microwave, and other sub-systems
- Review detailed plans for equipment locations and for contractor compliance with specifications
- Transmitter site visits evaluation with successful vendor
- Attend Detailed Design Review [DDR] meeting of system and components with successful vendor; develop final equipment list before equipment order





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- Attend progress meetings on an approximate monthly basis; besides regular contact with project team personnel and/or weekly conference calls
- Prepare and submit to Barrington meeting minutes, detailed plans, calendar, and milestones during implementation
- Weekly vendor project calls [as project dictates]
- Respond to vendor questions and issues
- Work with Barrington to obtain tower site owner approvals; requirements, negotiation, documents, drawings,
- Assist vendor in tower structural analyses
- System staging; assumes local, test participation & approval of results
- Console implementation task [mostly Barrington responsibility]
- Review and approve vendor invoices
- Monitor project budget; reconcile any contract disputes
- Change Order management
- Radio/microwave system performance testing; equipment & coverage
- General supervision/monitoring of system installation activity [sites, towers, etc.]
- Ensure Barrington is provided all appropriate drawings, and operational and maintenance Subscriber programming; review templates & code plugs
- Assist in any claims resolution to ensure that all items are 100% operational prior to the end of warranties
- Final acceptance testing; site inspections, confirm vendor compliance, provide final acceptance after all issues of non-compliance are resolved; resolve vendor/contract conflicts to Barrington satisfaction
- Finalize cutover plan and monitor
- Review the system performance to decide if the system satisfies the goals and objectives; determine that the selected vendor is in full compliance with specification requirements
- Ensure that the contractor provides final as-built documentation
- Assure Barrington's satisfaction with the system, prior to recommendation of system acceptance
- Final system acceptance, project closure; final meeting

Success of the Barrington radio system project must be based on sound management principles that see the completion of an activity within the constraints of time, cost, and performance. Project success is dependent upon the efforts of the Town of Barrington, the consultant, and the radio contractor. All of whom share a responsibility to ensure the successful completion of project activities within these constraints.





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#### 4.0 PROPOSED PROJECT COSTS, SCHEDULE, RESUMES AND ASSUMPTIONS

Our proposal is based upon our understanding and interpretation of the Town of Barrington 's requirements identified in a meeting with the Town Administrator. We have made every effort to accurately estimate the cost of this proposal based on the information provided

Costs for this project reflects the scope of work outlined in our Work Plan. The Town's Project Team may elect to increase or decrease the scope of work proposed, at which time the final contract price shall be negotiated and adjusted accordingly between the Town Project Team and CDCG.

CDCG plans to invoice a percentage of the contract on a periodic basis according to the approved payment schedule. CDCG is open to other payment methods that the Town may suggest.

Anticipated expenses necessary for the execution of the project have been estimated as part of CDCG's price proposal.

Town of Barrington Cost Proposal			
PHASE-1 Study and Communications Plan Report	Technology, Radio System Planning, Budgetary Cost Estimates, and Recommendations Report.	-	\$1.00
PHASE-2 Specification & Bid Process	Procurement Specification, Pre-Bid Conference, Vendor Selection & Contract Negotiations	-	**To Be Determined
PHASE-3 System Implementation	Assist the in implementing the selected vendor and solution	-	** To Be Determined
Notes		Mileage Expense	\$0.00
1. CDCG hourly rate: \$150.00			
2. **TBD – Effort and cost based on the outcome of Phase-1			
Phase-1 Project Total			\$1.00





## 4.1 Project Schedule

We are providing a tentative schedule that outlines the specific Phases to be completed, and the estimated duration of each task based on our previous experience on similar projects. CDCG is prepared to discuss additions, deletions, or changes that may be necessary to fulfill the needs of the Town.

CDCG will be ready to commence the project within one week after Notice to Proceed.

The following proposed project timeline is a high level schedule of expected activity that will be detailed into a Work Breakdown Structure [WBS] GANTT chart upon completion of the project kick off meeting.

**Barrington Radio Study Timeline:** As required, the Draft Communications Study Report to be submitted to the Town of Barrington approximately eight [8] weeks from Notice to Proceed.

**Specification and Bid Process Timeline:** Approximate timeframe from Notice to Proceed to vendor award is approximately three [3] months.

**System Implementation Timeline:** We anticipate that the project can be completed within 6 to 8-months; however, the successful vendor will drive the schedule based on available man-power resources, manufacturing timelines, as well as third party equipment deliveries.

## 4.2 Proposal Assumptions

- The fees and rates contained herein shall remain valid for 60 days from the date of this proposal.
- CDCG assumes that the Town will appoint a project manager to oversee the project and to coordinate activities.
- CDCG fees are based on the estimated hours, travel and expenses included in the pricing for the Scope of Work defined in this document. Should the Town, at any time during the project, desire services that are outside the agreed upon scope of work, CDCG will prepare a quotation outlining the estimated effort, resources required, and cost for the requested service. Upon approval of the quotation, CDCG will provided the desired services at the agreed upon cost.
- Reimbursable expenses, such as travel and mileage, office supplies, paper, and printing/copying costs are included in our proposal.
- Regarding FCC Regulatory services, CDCG will provide a summary review of existing FCC frequencies and licenses.
- CDCG will NOT perform frequency research availability under this contract. Should a frequency research and licensing effort be desired to expand or replace frequencies, CDCG and the client will jointly develop a scope of work and CDCG will provide a quotation based on the agreed to effort.
- Our effort does not include local planning or zoning efforts, leasing or licensing of any sites, or engineering efforts required for co-channel short-spacing, commercial interference analysis, or analysis of the effects of new tower sites on existing AM transmission facilities.
- We have NOT provided services for Electrical, Mechanical, Structural, Civil, or other design engineering specifically requiring a registered Professional Engineering review, certification, or seal for





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these services unless explicitly stated in this proposal; however, should the Town Project Team desire these services, CDCG can provide the desired services at the agreed upon cost.

- CDCG's fees do not include physical microwave path surveys; historical or environmental impact studies; soil exploration and analysis; or land survey or legal fees.
- All regulatory fees [FAA, FCC, Frequency Coordination, etc.] are assumed to be the responsibility of the Town
- The Town Project Team, at any time and for any reason, upon written notice to CDCG, may terminate all or any part of the services identified in the SOW. The Town Project Team will reimburse CDCG all allowable costs incurred prior to receipt of the termination notice, for which costs CDCG can provide the Town Project Team with reasonable supporting documentation and for which CDCG has not received prior reimbursement or payment.
- CDCG will work with the Town Project Team to accommodate the project schedule.
- CDCG maintains both General and Professional Liability Insurance.

#### 4.3 Staff Resumes

Staff resumes were submitted in a previous document, 'CDCG *Statement of Qualifications*'; however, we can provide resumes upon request.

