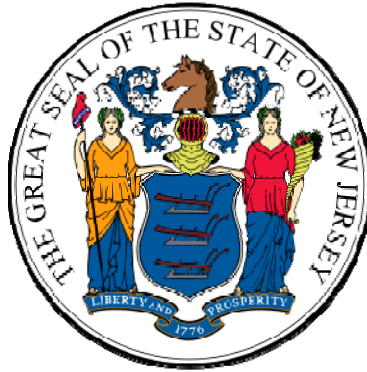# Office of Information Technology

300 Riverview Plaza, 1ˢᵗ floor
Trenton, New Jersey 08625

REQUEST FOR INFORMATION (RFI)

This document contains a Request for Information (RFI) for the provision of 700 MHz Public Safety Network (700 MHz PSN) to support the Public Safety Community, First Responders and Comprehensive Community Infrastructure (CCI) of the State of New Jersey. The information obtained from this RFI will be used by NJ-OIT along with existing consultancy as a basis for further discussion and the development of an RFP. Suppliers wishing to respond to this RFI should read this document carefully and follow the guidance for responding.

For 700 MHz Public Safety Network
(700 MHz PSN)

Response Due:

Tuesday, August 31, 2010 @ 05:00 p.m. (Eastern Time Zone)
ATTENTION: Adel W. Ebeid, CTO State of New Jersey
Phone (609) 984-4082
Adel.ebeid@oit.state.nj.us

Request for Information

1. Administrative Information

1.1 New Jersey Office of Information Technology (OIT)

The New Jersey Office of Information Technology (OIT) is the central IT organization that oversees the technology infrastructure for the executive branch of state government. OIT works closely with the state's IT Community to develop a comprehensive portfolio of online services and technology solutions that meet the needs of the state's diverse residents, businesses, government entities, and employees.

1.2 Broadband Technology Opportunity Program

The Broadband Technology Opportunity Program (BTOP) was established by the National Telecommunications and Information Administration (NTIA) to support the deployment of broadband infrastructure in unserved and underserved areas in the United States. BTOP is part of the American Recovery and Reinvestment Act of 2009 which is intended to:

- Stimulate job preservation and creation; promote economic recovery;

- Assist those most impacted by the recession;

- Provide investments needed to increase economic efficiency by spurring technological advances in science and health;

- Invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits;

- Stabilize state and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive state and local tax increases.

1.3 Proposed ARRA Funded State Broadband Network

Under the BTOP program, OIT has applied for funding to support the development of a statewide 700 MHz Public Safety Network (700 MHz PSN) coupled with a Middle Mile backhaul. Once awarded, the state will construct a network that provides a cost effective and secure broadband access to public safety community and first responders. In addition, to achieving ubiquitous interoperability among multiple public safety agencies, the network would allow the State to "stitch" together other comprehensive community infrastructure (e.g. academia, health, public libraries, etc). It's anticipated that the NTIA will make all grant awards by September 30, 2010.

The goal is to utilize the grant funds to deploy a dedicated network to improve the State's public safety posture, increase situational awareness and response, improve operational efficiencies, and offer public-safety-grade service features and applications. Deploying such a network would offer police, fire and EMS agencies the tools (network, devices and applications) to deliver more

effective and efficient public safety presence by solving the current interoperability issues that challenge our first responders today. The eventual network would allow for ubiquitous "anytime/anywhere" sharing of voice, data, and video amongst state, local and federal agencies to provide rich multimedia applications for improved on-scene decision-making.

2. Request for Information (RFI)

OIT is seeking product and services information with general cost requirements from qualified companies for furnishing 700 MHz PSN infrastructure to help the State achieve its vision and goals explained in Section-1. The purpose of this pre-funding inquiry is to give eligible entities within this market space an opportunity to inform the State on core competencies, latest available technology trends and solutions, and any additional technical information that may be relevant to the 700 MHz PSN effort.

Failing to submit a response to this RFI may limit a potential vendor's opportunity to submit any possible response to RFPs. While it is highly recommended that all eligible entities respond to this RFI if they wish to be considered for the 700 MHz PN project, responses to this RFI are considered non-binding proposals and are only used to assist the State perform its due diligence and gather information for planning and specification preparation purposes. For the purposed of this RFI, the 700 MHz PSN is defined by the following two layers:

1. LTE System (LTE RAN and IP based Core), where RAN (Radio Access Network) is based on 700 MHz LTE (4G wireless) technology, and IP core is based on 3GPP defined SAE (System Architecture Evolution).

2. Backhaul Support Network (based on optical fiber and microwave technology)

Realization of this technology suite will: (a) provide 4G wireless broadband access to first responders; (b) offer interoperability between multiple public safety disciplines; and (c) provide extensions to middle mile required to uplift Comprehensive Community Institutions (CCI). The network will operate in the frequency spectrum of 700MHz, in the Block D: 10 MHz (758-763 and 788-793 MHz). Backhaul components are Optical Fiber, and Microwave that will reside in the LMDS/MMDS spectrum (i.e. 27.5 GHz to 28.35 GHz) and (31 GHz to 31.3 GHz).

2.1 State's Specific Requirements

1) Deployment of dedicated statewide 700 MHz PSI-BWN based on LTE technology covering 99% of approximately 7,412 sq miles of the State of New Jersey.

2) Deployment must use structures owned or controlled by state agencies or local entities such as towers, buildings, or related locations. (The State of New Jersey has 198 towers that will be used for the LTE base stations).

3) Deployment must also leverage existing Middle Mile installations (fiber infrastructure, dark fiber and Microwave) and make only those extensions that are vital to achieve the

objectives. Existing Middle Mile installations may include, at a minimum, those provided by NJEDge and NJOIT Garden State Network.

4) Deployment shall be able to inter-work with existing access systems (fixed or mobile, broadband or narrowband, which are used by multiple public safety jurisdictions and disciplines) until such time agencies migrate to the proposed network.

5) Proposed solution must be future-proofed to facilitate future rollout of Next Generation 9-1-1 (NG 911).

6) Deployment shall offer interconnection points across all counties to accommodate CCI, so that while the Last Mile 700MHz LTE serves the public safety needs, the Middle Mile, (that is primarily provided to support 700MHz LTE), may also offer high speed, high capacity backbone to community anchored institutions with minimal new construction (e.g. using existing right-of-ways, existing cable/conduit runs, pole lines and other existing cable facilities that can be applied to the build-out).

7) Deployment uses 3GPP standard (at least Release-9) compliant LTE technology in 700 MHz Public Safety band.

2.2 LTE-System Service Requirements

1) The LTE System (LTE Radio and IP based Core) shall provide mobility functionality within and across the different access systems.

2) The LTE System shall provide enhanced performance (e.g. low communication delay, low connection set-up time and high communication quality).

3) The LTE System shall be able to efficiently support a variety of traffic models (e.g. user-to-user, user-to-group and traffic models generated by ubiquitous services).

4) The LTE System shall provide functionality to support outbound roaming subscribers on other regional LTE Systems and legacy networks.

5) The LTE System shall provide functionality to support inbound roaming subscribers from other regional LTE Systems and legacy networks.

6) The LTE System shall support service continuity between other regional LTE based public safety systems, between commercial LTE based system, and between 3GPP access systems and non 3GPP access systems whether the UE supports simultaneous radio transmission or not.

7) The LTE System service capability set shall include, as a minimum, support for the following categories of services: voice, video, messaging, data file exchange

8) The LTE System shall provide for efficient usage of system resources, especially of radio resources through both signaling and transport optimization (e.g. overhead, terminal power, radio resources, mobility state, signaling load).

9) The LTE System shall support efficient delivery of text-based broadcast messages received from a legacy CBC.

10) The LTE System shall be capable of uniquely identifying each device that connects via

3GPP access networks and 3GPP2 access networks. For a dual mode device supporting both 3GPP and 3GPP2 access technologies, there shall be a single persistent identifier used to identify the device. This device identifier shall be the same even when the device moves between 3GPP and 3GPP2 access types. Furthermore the LTE system shall meet the advanced features, including, security, Quality of Service, firewall protection, intranet access via static IP addresses, AAA access control, etc. as detailed in 3GPP TS 22.278.

2.3 LTE-System Implementation Requirements

1) The LTE (RAN) shall be capable of supporting instantaneous peak packet data rates of 100 Mbps on the radio access bearer downlink to the UE and 50 Mbps on the uplink.

2) The LTE System shall be capable of providing lower user and control plane latency (e.g. less than 5ms in ideal conditions).

3) The LTE system shall be capable of supporting large volumes of mixed (e.g. voice, data and multimedia traffic). Enhanced load balancing and steering of roaming methods should be used to minimize cell congestion.

4) The level of LTE system complexity and mobility management signaling shall be optimized to reduce infrastructure and operating costs. UE power consumption shall also be minimized accordingly.

5) For the LTE System the interruption time during handover of RT and NRT services shall be kept to minimum and shall not exceed the values defined in 3GPP TR 25.913.

2.3 Approximate User Base (in the State of New Jersey)

Last Mile

- Public Safety responders = 54,000

Interoperability

- Multiple public safety disciplines and jurisdictions = 2,072 (include police, fire, EMS, key federal and state entities).

Middle Mile

- Public Safety Answering Points in each of the state's 21 counties, and NJ State police dispatch centers onto the single broadband backbone.

- Provide interconnection points to cater for the broadband needs of Academia (about 2,573+ institutions), Healthcare (about 100 facilities), and Comprehensive Anchor Institutions (about 300 public libraries and scores of municipalities)

2.4 Information Being Requested

For the purposes of this initiative, the RFI process will be used to gather information and recommendations for:

- Deploying a dedicated 700 MHz PSN, and creating business models that would support

the successful implementation of the network;

- Acquiring Rough Order of Magnitude (ROM) Cost for this project; and
- Getting insight into the Responders capabilities, experience, and offerings.

3. RFI Assumptions:

- Committee is open to all technologies and alternatives/proposed solutions that provide priority to public safety and first responders.
- Responders can provide a solution for all or pieces of a solution (i.e., last mile, infrastructure, middle mile infrastructure, consumer grade devices).
- Solution complies with FCC requirement, NTIA policy, and with any conditions/restrictions on the use of spectrum under current FCC or PSST authorization.
- **A multi-vendor approach that would provide the State with a well-rounded proposal and allows for best-of-breed solutions to be presented is highly encouraged.**

Note: Link below is to NPSTC which contains insight into the Public Safety Spectrum Trust organization http://www.npstc.org/index.jsp.

4. Instructions for Responding to this RFI

4.1 Who May Respond

Responses from organizations in the industry, government or academia with practical knowledge of 700 MHz PSN used by First Responders are welcome. When it's time for the State to issue a subsequent Request for Proposals (RFP), all responders will be eligible to respond with detailed specifications.

4.2 How to Respond

One electronic copy in machine-readable format (MS Word format) should be sent to adel.ebeid@oit.state.nj.us. Please use the RFI template provided in Appendix 6-1 for your responses. Your proposal should also include:

- A cover letter which summarizes your response and includes areas to which you are responding and must also indicate if supporting documentation is included in your response.
- The response itself, covering any or all of the areas of information requested by this RFI.

It's encouraged that you limit the size of your response to approximately 50 pages including supporting documentation. Responses must be received no later than Tuesday, August 31, 2010 5:00 PM (ET).

4.3 RFI Response Contact, Review and Clarification Process

This RFI is issued with the intent to survey industry to obtain information that provides guidance, which may be used in the preparation of RFP. Based on those responses, the Review Committee will augment its roadmap which may result in one or more RFPs. To fully comprehend the information contained within a response to this RFI, the Review Committee may request further clarification in the form of brief verbal communication by telephone, written communication, electronic communication, or a presentation to the RFI Review Committee. Companies responding to this RFI shall designate a single contact within that company for receipt of all subsequent information regarding this RFI. The name of this contact will be made available to the Review Committee.

4.5 Distribution of RFI Responses and Copyrighted Material

Copies of all documentation submitted in response to this RFI will be available to the Evaluation Committee for review purposes. According to the State's Policies and Procedures, proprietary and confidential material shall not be included in any response to the OIT. If copyrighted material is sent in response to this RFI then a statement waiving that copyright for use by the OIT is required and a limited waiver of copyright that allows the OIT Review Committee to make up to twenty-five (25) copies for review purposes is required.

6. Appendix A (RFI Response Template)

6.1. Template for 700 MHz PSN RFI

1. General Information		
1.1	Firm Name:	
1.2	Street Address:	
1.3	City, State, Zip:	
1.4	Primary Business:	
1.5	Point of Contact:	
1.6	Title:	
1.7	Voice:	
1.8	Fax:	
1.9	Email:	
1.10	Willing to make a presentation at OIT if requested?	Yes No
1.11	Parent Company (PC) Name:	
1.12	PC Street Address:	
1.13	PC City, State, ZIP:	
1.14	PC Primary Business:	
2. Technical Information		
2.1.	Please explain how your company's technology or business models may fit within the growing paradigm shift towards LTE. Also elucidate your strategy on how you would meet or exceed OIT's specific requirements of 700 MHz PSN project listed in this RFI.	
2.2.	Explain your company's involvement in technical standards specifically 3GPP and how you are helping to shape the Long Term Evolution and LTE advanced (Fully 4G System). Is your system fully compliant with 3GPP specifications?	
2.3.	How would your solution meet the implementation requirements specified in this RFI? You may use the market size provided in this RFI as a guideline; however the solution must anticipate future expansions.	
2.4.	Please provide Rough Order of Magnitude (ROM) Cost for the following considering all the requirements provided in the RFI. (The intent of OIT is to outsource the operation and maintenance of the network while owning the governance aspects of the network. However, all data centers currently owned or being maintained by the various agencies will continue to be maintained by said agencies. Only the operation and maintenance of the network will be outsourced).	

	i. Deployment
	ii. Operation and Maintenance
	iii. Service/help Desk
	iv. Service Provisioning
	v. Other Components
2.5.	To help evaluate vendor proposals and capabilities please submit the network architecture, functional entities already in existence and those in the pipeline. Explain how the architecture would comply with later releases of 3GPP standard leading to advanced LTE. Also include what kind of device portfolio do you have and what would be best suited for our primary stakeholders (public safety, first responders, EMT, homeland security, etc).
2.6	Please explain why you think that your architecture and functional entities can achieve statewide coverage and ubiquity leveraging the existing infrastructure and assets, including NJEDge and GSN networks. Also how it can get multi-jurisdictions to communicate without a total system rebuilt.
2.7	Please explain how your proposed system architecture would evolve with technology advancements and how legacy networks within and among the jurisdictions would be replaced.
2.8	Please propose a time line for the completion of the project.
2.9.	The Review Committee highly encourages the multi-vendor partnership. Explain how you would deliver quality products that are truly multi-vendor, multi-platform, secure, reliable, and interoperable. (The committee would give priority to vendors that architect, design, develop and test their products certifying their level of interoperability).
2.10	Describe a unique experience where you have successfully collaborated to deliver a custom solution to meet a customer's goals.
2.11	Describe past successes you've had in building out similar networks.
2.12	In this deployment, provide a list of what you view as our responsibilities versus what you will do for us?
2.13	Based on your understanding of the scope of this project, what challenges or areas of concern do you have?
2.14	Explain what you could do to streamline the process of permits, approvals, waivers and make-ready work, and how do you deal with sites that have cultural, environmental or historically significant impact?
2.15	Provide a sample staffing model including level of expertise.