

# **FirstNet in California**

## **Request for Information**

### **FirstNet in California Alternative Radio Access Network**

California Governor's Office of Emergency Services

Public Safety Communications

Document RFI 4133-6

**November 2016**

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## 1 Introduction

The California Governor's Office of Emergency Services (Cal OES) invites industry to respond to this Request for Information (RFI) and suggest compelling business models and approaches for the building, deployment, and operation of a state-deployed broadband statewide public safety Radio Access Network (RAN) within California as an alternative to the FirstNet deployed RAN.

The purpose of this RFI is to solicit information and suggestions from the public, including network service providers, operators, infrastructure providers, equipment manufacturers, system integrators, corporate finance organizations, consultants, and others, pertaining to a viable alternative state-deployed First Responder Network Authority (FirstNet)<sup>1</sup> RAN or "opt-out" implementation<sup>2</sup>. In addition to providing essential information to a potential RAN plan acquisition, a response to this RFI is necessary in order to assist California in determining levels of interest and technical capability within the business community to provide required equipment and/or services.

FirstNet was enacted by Congress and legislatively mandated in Title VI of the Middle Class Tax Relief and Jobs Creation Act of 2012 ("Act" or "Spectrum Act") to take all actions necessary to ensure the building, deployment, and operation of the FirstNet Nationwide Public Safety Broadband Network (NPSBN). The Spectrum Act provides a process by which a State may choose to "opt out" of the planned FirstNet deployment in its jurisdiction to build and operate its own RAN.

The California Public Safety Broadband Network (PSBN) will be designed to interconnect and interoperate with the FirstNet NPSBN. The FirstNet NPSBN will use Long Term Evolution (LTE) technology over a 20 MHz block of spectrum in the 700 MHz range called Band Class 14<sup>3</sup>. The spectrum license has been issued to FirstNet for two 10 MHz bands of paired spectrum at 758-768 MHz and 788-798 MHz, plus guard bands at 768-769 MHz and 798-799 MHz to mitigate interference from adjacent channels. This contiguous "D" block of spectrum has been designated specifically for Public Safety Entities<sup>4</sup> (PSE). California will use the same frequency block whether the RAN is a state-deployed RAN or FirstNet deployed RAN.

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<sup>1</sup> FirstNet is an independent authority within the National Telecommunications and Information Administration (NTIA), an entity of the U.S. Department of Commerce (DOC).

<sup>2</sup> The Spectrum Act section 6302(e) (2) (B) allows a state to "conduct its own deployment of a radio access network..."

<sup>3</sup> According to the FirstNet RFP, Section C.3, the spectrum provides "1) unencumbered nationwide access and use that is not limited to a defined geographical area; 2) Part 90 service rules governing the spectrum, which enables the use of higher powered devices that can improve coverage; and 3) spectrum that does not count against the sub 1 GHz spectrum screen restrictions for wireless carriers, enabling Offerors to bid on other spectrum." With respect to item 1, access to the spectrum, limited to the boundaries of California, would be applicable if California successfully negotiates a Spectrum Manager Lease Agreement (SMLA) with FirstNet as the result of an "opt-out" decision.

<sup>4</sup> A PSE is defined in Section 6001(26) of the Act as an "entity that provides public safety services" 47.U.S.C § 1401(26).



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The information gathered from the RFI responses will be useful in determining whether California should “opt-in” to a FirstNet-deployed RAN or “opt-out” and choose an alternative state-deployed RAN implementation; therefore this information is critical to California’s public safety stakeholders, as they evaluate all options to deliver mission critical data services to their agencies. This decision will be made by the Governor of California in terms of which option is in the best interest of the state of California including local, tribal, and state PSEs.

The RFI responses are vital to California’s public safety stakeholders as they consider all options to deliver mission critical data services to their agencies. Public input on alternative state-deployed RAN business models and technological solutions are necessary to make a thorough comparison of the FirstNet State Plan versus an “opt-out” plan RFI Guidelines

### **1.1 Instructions to Respondents**

All interested parties are requested to provide written responses to Appendix A, Appendix B, and Appendix C of this RFI based upon the Key Action Dates requirements.

The group reviewing the RFI responses may seek further clarification from respondents. This clarification may be requested in the form of verbal communications, in-person meetings, telephone, hand written correspondence, or email communication.

**Respondents to this RFI should not include any pricing information in their responses.**

#### **1.1.1 Response format**

Responses should follow the following format:

1. Responses should attempt to remain within a 100 page limit for direct responses to requested information. Responses should include any material or source references in the RFI response; this reference material will not count against the 100 page limit. Submissions should also include additional product and service specifications for Cal OES to reference as needed.
2. Cover letters and extraneous materials (brochures, etc.) will not be considered as part of the page count.
3. All electronic submissions must be in combinations of Microsoft Word and/or Excel applications. A USB drive containing softcopies of all printed materials should be included with two (2) master binder packages. Additional documentation can be appended to provide additional information such as high resolution pictures of facilities.
4. Responses should be printed on white paper (preferably non-glossy paper) with dimensions of 8.5 by 11 inches with right and left margin of approximately one (1) inch. Responses should use Times New Roman font with a size of eleven (11). Exceptions for paper and font sizes are permissible for graphical exhibits, which may be printed on white paper with dimensions up to 11 by 17 inches, and material in appendices.
5. Tabs should separate each section of the response.

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6. When responding to this RFI clearly label all proprietary information and any other limitations on disclosure.
7. Please refer to specific RFI questions by number in all responses.
8. FACSIMILE SUBMISSIONS WILL NOT BE ACCEPTED.

Questions or clarifications to this RFI must be received via email to the Contract Specialist cited on page 8 no later than **December 5<sup>th</sup>, 2016 at 5:00pm**. The opportunity for clarification of this RFI will not change the submission deadline date identified in **Section 2.2 Key Action Dates**. All questions and answers will be made available to all respondents in a FAQ format via an amendment to this RFI and may be subject to the Public Records Act.

**DISCLAIMER: READ BEFORE RESPONDING TO THIS RFI**

California is conducting market research as part of its planning for the potential acquisition of a state-deployed RAN in California.

- Responses to this RFI are not offers and cannot be accepted by Cal OES for the basis of forming a binding contract.
- Respondents are advised that Cal OES will not pay for any information or administrative cost incurred in response to this RFI. Respondents to this RFI are solely responsible for all expenses associated with responding to this RFI.
- Any information submitted to California in response to the RFI will not be returned to the respondent.
- This RFI is being issued solely for the gathering of information for planning purposes, and it does not constitute a Request for Proposal (RFP) or a promise to issue an RFP in the future.
- This RFI does not constitute a solicitation for services or products.
- Not responding to this RFI does not preclude participation in a future RFP, if one is issued. Submissions will be used by California to determine the maturity of the market and the state of the industry for applicability to meet the needs of a potential California's state-deployed RAN with FirstNet interoperability.
- Respondents are advised that the responses to this RFI may be subject to the Public Records Act.
- Respondents are requested to respond to the requirements based on actual or planned product or service offerings which are available for delivery within the next 18 months.

Cal OES, at its sole discretion, may invite some or all Respondents to conduct a presentation to Cal OES and/or engage in a conversation concerning state-deployed RAN solutions. The information provided by Respondents to this RFI may shape the requirements of future efforts for a state-deployed RAN in California.

Cal OES, at its sole discretion, may choose to ignore or to otherwise not consider or evaluate any responses, or any portion of a response, received as a result of this RFI.

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## 1.2 Key Action Dates

Listed below are the Key Action Dates and times within which actions should be taken or completed. If Cal OES finds it necessary to change any of these dates, an Addendum to this RFI will be posted on Cal eProcure at <http://www.caleprocure.ca.gov/pages/index.aspx>. Respondents must register with Cal eProcure to submit questions and receive question and answer sets that may be issued.

| Key Action                              | Date       | Time   |
|---|------------|--------|
| Release of RFI                          | 11/14/2016 | 7:00AM |
| Last Day to Submit Questions on the RFI | 12/5/2016  | 5:00PM |
| State Responds to Questions             | 12/19/2016 | 5:00PM |
| Last Day to Submit RFI Response         | 1/2/2017   | 5:00PM |

## 1.3 Official Contact

Submissions must be received via email by the Contract Specialist cited below no later than **January 2<sup>nd</sup>, 2017 at 5:00PM**. Responses must be submitted in both hard copy and soft copy (Microsoft Word and/or Excel) format. Hard copy submissions must be in the form of four binders with labeled section dividers that correspond with the RFI sections and worksheet tables. Soft copy submissions must be submitted on a USB drive.

All correspondence and questions related to this RFI shall be directed to:

Attention: **Nicole Finch, Contract Analyst**  
 California Governor's Office of Emergency Services  
 EMAIL: [Nicole.Finch@caloes.ca.gov](mailto:Nicole.Finch@caloes.ca.gov)  
 Phone: (916) 845-8164  
 Fax: (916) 845-8303

**Parcel Post (FedEx, UPS, etc.)  
 or Hand Delivered**

California Governor's Office of Emergency Services  
 Attn: Nicole Finch, Procurement  
 Address: 3650 Schriever Avenue, Mather CA 95655

## 2 Background

The Middle Class Tax Relief and Jobs Creation Act of 2012 contains landmark provisions to create the NPSBN to provide broadband communications for the police, firefighters, emergency medical service professionals and other public safety officials. Initially, the NPSBN will be used for sending data, video, images, and text, while providing location information. Eventually the NPSBN will support live video streaming along with voice over LTE (VoLTE) in the future.

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According to the Act, FirstNet is required to consult with the states during the planning and implementation of the network, this process is called “State Consultation”<sup>5</sup>. A key deliverable of the State Consultation process will be the state-specific network design<sup>6</sup> called the “State Plan” which FirstNet estimates will be delivered to the states sometime in the first half of 2017. Once a State Plan is delivered the Governor of each state has 90 days to decide to “opt-in” to a FirstNet deployed Radio Access Network (RAN)<sup>7</sup>, or to “opt-out” and build and operate its own RAN within their respective state. If a state chooses to opt-out, it’s RAN must connect back to the nationwide core, ensure interoperability between the state and the NPSBN, and utilize Band Class 14 radio spectrum.

Please note, a California deployed RAN is complicated by California’s topography which makes it difficult to provide wireless broadband to the most rural parts of California. Per the California Public Utilities Commission approximately 72% of the state is underserved or not served by commercial broadband communications today. Additionally, California has 109 federally recognized tribes in rural locations throughout the state where little to no broadband technology exists.

This RFI facilitates California’s investigation into the industry’s capability to build, deploy, and operate a state-deployed RAN. California is considering the industry’s readiness to provide services such as quality of service, priority, pre-emption, class of service, and cyber security. Information provided in response to this RFI will also be used to assess the viability of current market technical, managerial, operational, and support capabilities available, for use in determining requirements that should be set for the California state-deployed RAN. RFI responses will assist California in defining what objective requirements and potential business models are viable for a possible state-deployed RAN environment and may also be used to specify requirements for a potential future state-deployed RAN RFP.

## **2.1 Early Builder Integration**

Cal-OES asks respondents to advise California on the importance of a potential technical model that includes early builder assets. Specifically, recognizing the level of effort, strategy, and timelines required to acquire, integrate, and assimilate the early build equipment and services (“assets”) in the respective geographic areas.

Currently, the Los Angeles Regional Interoperable Communications System (LARICS) has deployed a Band Class 14 LTE network providing mobile coverage throughout most urban areas of Los Angeles County, California. LARICS is the largest early builder of a public safety dedicated broadband network approved and supported by FirstNet’s 700 MHz spectrum in California. LARICS has encountered some challenges building out their RAN such as California Environmental Quality

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<sup>5</sup> Section 6206(c) of the Act.

<sup>6</sup> Section 6306(e) of the Act.

<sup>7</sup> Spectrum Act section 6202(b)(2) indicates that the NPSBN RAN comprises “cell site equipment, antennas, and backhaul... that are required to enable wireless communications with devices.”

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Act (CEQA) requirements, political pushback when building infrastructure on city or county property, and concern of potential health hazards due to human exposure to radio frequency electromagnetic fields. At present time, the LARICS LTE network consists of 74 RAN sites plus 1 backhaul only site, both fixed and mobile (Cell-on-Wheels) and an Evolved Packet Core. The RFI should reflect a strategy acquire, integrate, and assimilate the LARICS early builder equipment and services (“assets”) in the respective geographic areas.

### 3 Objectives

The primary objective of this RFI is to solicit creative and collaborative business model recommendations for a *potential* public private partnership(s) (P3) to build a California deployed RAN. In the event California determines that an “opt-out” solution is in its best interest, the state deployed RAN will be required to interoperate with FirstNet.

It should be noted that the objectives for the FirstNet in California alternative RAN RFI are seen from a statewide perspective and, as such, are statewide in scope. However these objectives should not be viewed in isolation. The California state-deployed RAN will need to integrate with the FirstNet NPSBN and operate as a single network guaranteeing seamless interoperability between “opt-in” and “opt-out” states.

At a minimum, RFI respondents should consider the following objectives when making business model recommendations and responding to questions listed in **Appendix B**.

1. **COMPLY WITH FIRSTNET STATEMENT OF OBJECTIVES:** Responses should include business models that recommend how a California deployed RAN project would be able to address and comply with the FirstNet Statement of Objectives<sup>8</sup>:
2. **BUILD, DEPLOY, OPERATE AND MAINTAIN THE CALIFORNIA DEPLOYED RAN:** The business model should address how California would provide a statewide interoperable public safety broadband network that deploys broadband coverage to greater than 90% of the state’s geography using a phased delivery approach, ensuring network coverage 24/7, 365 days a year and complies with the technical requirements of FirstNet.
3. **FINANCIAL SUSTAINABILITY:** Perform all program objectives while minimizing the risk and use of resources to build, deploy, operate, and maintain the PSBN.
4. **COMPELLING AND COMPETITIVE PRICING PACKAGES:** Establish pricing structures to support services packages that include data, voice, messaging, streaming, and location services, and that promote optimum public safety subscribership while maintaining financial sustainability.

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<sup>8</sup> See the FirstNet RFP Section C “Statement of Objectives” available at <https://www.fbo.gov/index?s=opportunity&mode=form&id=33106ecc75222458a6e4405b0f66bd2e&tab=core&tabmode=list&=>

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5. **END USER DEVICES:** Provide 3<sup>rd</sup> Generation Partnership Program (3GPP) compliant Band Class 14 devices that leverage open standards and utilize architecture standards that operate seamlessly across multiple carriers on the PSBN, and roam onto partner networks (including non-band 14 networks), and interoperate with FirstNet's application ecosystem.
6. **APPLICATION ECOSYSTEM:** Support the FirstNet application ecosystem that provides public safety-relevant capabilities and services.
7. **ACCELERATE SPEED TO MARKET:** Achieve operational capabilities that include the provision of initial broadband capabilities, Band Class 14 capabilities, significant subscribership to the California PSBN, and substantial rural coverage milestones as part of each construction and deployment phase.
8. **SYSTEM HARDENING:** Provide a public safety broadband network infrastructure hardened to withstand environmental, cyber and other threats. The PSBN must comply with Federal Certified Intrusion and Protection System standards, Federal Information Processing Standard 140-2, and other federal hardening and cyber security standards.
9. **GRADE OF SERVICE (GoS), QUALITY OF SERVICE (QoS), AND QUALITY OF SERVICE, PRIORITY AND PREEMPTION (QPP):** Provide a solution that provides quality transmissions and allows priority and preemption for all PSBN users under tiered, national, regional, and local control.
10. **INTEGRATION OF NPSBN INFRASTRUCTURE ON A COST-REIMBURSEMENT BASIS:** Facilitate California's determination of the economic desirability of using or otherwise leveraging commercial, FirstNet, or other public infrastructure.
11. **ROAMING AND INTERNET ACCESS:** Ability for First Responders to receive LTE service from non-Band Class 14 commercial Evolved Node B (eNodeB) when outside coverage footprint of any Band Class 14 eNodeB(s). Public safety subscribers shall also have access to the global Internet. Users will use the Internet both as a way to access home network systems and to access other systems and services available over the public Internet, including but not limited to messaging systems and web servers. <sup>9</sup>
12. **MEET THE RECOMMENDED MINIMUM TECHNICAL REQUIREMENTS<sup>10</sup>:** Integrate with the NPSBN by meeting the Technical Requirements so that users operate without service interruptions, including when crossing opt-out/opt-in RAN service area boundaries, to ensure nationwide interoperability for the NPSBN.
13. **ADDRESS COVERAGE AREAS UNDERSERVED OR NOT SERVED BY COMMERCIAL BROADBAND COMMUNICATIONS TODAY.** Approximately 72% of the state has limited to no commercial broadband communications today. California has 109 Federally recognized tribes in locations throughout the state where little to no broadband technology exists.
14. **SUPPORT 99.99% NETWORK RELIABILITY.**

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<sup>9</sup> 700 MHz Public Safety Broadband Task Force Report and Recommendations, NPSTC, September 4, 2009.

<sup>10</sup>Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network NIST, Final Report, May 22, 2012.



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15. LIFE-CYCLE INNOVATION: Evolve the RAN solution—including products and services—and incorporate new 3GPP standards as they evolve and mature throughout the life of the contract.
16. COST EFFECTIVENESS.
17. EARLY ADAPTER INTEGRATION – Specifically, LARICS.
18. SERVICE MODEL & SUPPORT SYSTEMS.
19. TRIBAL CONSULTATIONS.

### 3.1 Additional Factors

FirstNet has adopted an objectives-based approach, rather than a fully requirements driven model, to its procurement and seeks “a comprehensive network solution covering each of the 56 states and territories”. The following additional factors should be considered when recommending business models for a California state-deployed RAN:

- Recommendations should strongly support the mission of PSEs throughout the state in densely populated urban areas as well as rural and mountainous communities.
- Maximize wireless broadband coverage and reliability throughout the state while ensuring adequate capacity in areas of high demand.
  - Interoperate seamlessly with other Band Class 14 networks.
  - Interoperate seamlessly with commercial networks, when beneficial to first responders.
- Develop a financial model which meets performance goals and minimizes ongoing operational and capital upgrade costs to PSEs through methods such as the:
  - Re-sale or leasing of excess capacity of the network:
    - Wireless capacity
    - Fiber capacity
    - Tribal communities
  - Achievement of capital and operational savings through use of public assets and P3s.
- Encourage the adoption of the network by those PSEs that benefit most from mission-critical broadband communications.
- Encourage adoption among allied (secondary) responders (utilities, transportation, public works, education, healthcare, etc.) whose timely actions may be critical to public safety.
- Deploy a high degree of transparency in the pricing of services and in the operation of the network.
- Address the topography challenges of California and deliver broadband services to rural and mountainous areas and tribal communities.
- Offer a wide range of services and a wide range of pricing/bundling options.
- Maintain the ability for state, tribal, and local jurisdictions to participate in network planning and development as it relates to:
  - Long term coverage objectives and fee structures.

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- QPP
- Security of the network.
- Defining resiliency and hardening requirements.
- Operate efficiently while leveraging both public and private resources.
- Encourage a rich ecosystem of devices and applications.
- Comply with all requirements of the Act.

## 4 Business Models Objectives

In **Appendix B**, Cal OES asks respondents to recommend potential business models while balancing objectives stated in Section 4. Specifically, California is looking for potential partners and/or vendors with core competencies and demonstrated experience in developing and sustaining public safety quality networks. Suggested business model objectives should reflect the following concepts:

- Consider economies of scale and scope, including the synergy value and speed of deployment associated with leveraging existing commercial mobile provider infrastructure.
- The value of leasing excess network capacity on a statewide scale, and combining such leasing with the contract for building-out and operating the network.
- The trade-offs between spectrum availability for public safety use and the value created through leasing excess network capacity to third parties.
- The technical, operational, and temporal considerations related to contracting for, gaining access to, and using potentially more than a thousand different public and private sites and other infrastructure with different owners, lessors, requirements, and equipment.
- The technical, operational, and speed of deployment considerations related to integrating the state-deployed RAN with FirstNet technologies and standards compliance.
- Providing certainty to Offerors in the procurement process in order to get the right price in light of the state's choice to "opt-in" or "opt-out".
- Promoting adoption by PSEs through competitive pricing, high quality service, customer support and training.
- Realistic plan to implement future upgrades and incorporate new technology standards to maintain cutting-edge broadband solutions for public safety.
- The compliance with complex provisions of the Act.
- The effect of all of the above factors, among other things, on the value a California state-deployed RAN can bring Californians.
- Risk mitigation in coverage areas where Band 14 frequency allocation needs to be coordinated with other states.



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## 4.1 General Approaches

Section 5.1 discusses General Approaches to possible business models. These ideas are provided to encourage thoughtful and detailed comments. All models proposed will require spectrum or capacity sharing of the Band Class 14 spectrum with each state<sup>11</sup>.

1. Public Sector Build/Own/Operate
  - a. A statutorily authorized entity representing the common interests of state, local and tribal governments, hires staff to deploy, operate and maintain the network.
  - b. A statutorily authorized entity representing the common interests of state, local and tribal government issues a (series of) RFP(s) for equipment and for the construction of the network (may include civil structures).
  - c. A statutorily authorized entity representing the common interests of state, local and tribal government sells devices, sells service, and supports the needs of PSEs.
2. Public Sector Build/Own and Private Sector Operate
  - a. This model is similar to model #1 except that the statutorily authorized entity representing the common interests of state, local and tribal government deploys and owns the infrastructure and then contracts with a private entity(-ies) to manage, operate and maintain the network and to sell devices and services.
3. Public/Private Partnership or P3
  - a. A private party provides the required capital and manages every aspect of the construction and operation of the network.
  - b. The state or a statutorily authorized entity representing the common interests of state, local and tribal government guarantees minimum revenue stream.
  - c. The state or a statutorily authorized entity representing the common interests of state, local and tribal government oversees certain key decisions (e.g., service pricing).
  - d. Estimated staffing levels required to support business model.

## 4.2 Specific Examples

The following business models are examples of possible approaches to the PSBN implementation in California.

1. Multi-Decade Services Contract (similar to current FirstNet RFP)
  - a. A single contract to construct and operate a Band Class 14 LTE RAN in the state of California.
  - b. This business model is similar to the business model described by FirstNet in the current FirstNet RFP.
  - c. Key attributes include:

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<sup>11</sup> Section 6302(e) of the Act designates the state as the entity authorized to apply to the NTIA to lease spectrum.

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- i. Comprehensive responsibility for construction and operation of the network, for customer acquisition and retention, for the collection of fees, and for selling or otherwise monetizing any excess capacity.
  - ii. A single payment of string or payments, determined at the time of contract award for the opportunity to use Band Class 14 spectrum and offer services.
  - iii. A requirement to absorb large positive and negative cash flows and manage the associated risk.
  - iv. A broad set of high-risk commitments to the PSEs, coupled with appropriate oversight.
  - v. Economics that resemble the purchase of spectrum in the longevity of the contract and in the latitude afforded the bidder.
  
2. Lease of Spectrum/Wholesale Services
  - a. A mobile operator, system integrator, or other entity leases the 2x10 MHz of Band Class 14 spectrum within California.
  - b. The agreement is similar to any other spectrum lease within the United States, except that it carries the obligation to offer Band Class 14 wholesale services to PSEs for a specified schedule of wholesale prices (e.g. \$/gigabyte (Gb) plus \$/connection/month, etc.).
  - c. The operator constructs a RAN at its own expense within what it considers an "economic coverage footprint". In all likelihood this means adding Band Class 14 radios and 700 MHz antennas and incremental backhaul to an existing cellular network.
  - d. The operator must offer capacity to PSEs on a priority basis at pre-negotiated wholesale rates. These rates might change over time on a pre-determined schedule or might be calculated as a function of the investment, the prevailing retail or wholesale price, or other metrics.
  - e. The operator may use carrier aggregation and other advanced radio access techniques to deliver bandwidth to PSEs using a combination of Band Class 14 spectrum and other operator owned/controlled spectrum.
  - f. The operator must offer access to the network to tribal communities for commercial services; provided PSEs are allowed unfettered access to the network on a priority basis.
  - g. The operator may sell any excess capacity to retail customers or to other mobile operators on a wholesale or roaming basis.
  - h. The operator must maintain the network in such a way that it meets the hardening/availability requirements of the state or a statutorily authorized entity representing the common interests of state, local and tribal government and of FirstNet.

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- i. The operator must “release” spectrum outside of its “coverage footprint” or must commit to cover more than 90% of the geographic area within California.
3. Fee for Services/Mobile Operator
- a. The state of statutorily authorized entity representing the common interests of state, local, tribal government pays a mobile operator, system integrator, or other entity to provide Band Class 14 service within the state.
  - b. The contract might include a portion of the state (e.g. very rural areas) or the entire state.
  - c. Payments reflect the cost of the network.
  - d. Payments are designed to cover all operating expenses and allow the mobile operator a reasonable return on incremental capital investment.
  - e. The state or a statutorily authorized entity representing the common interests of state, local and tribal government could, optionally, offer public (i.e. municipal bond, capital allocations, etc.) financing for some or all of the required capital investment.
  - f. The state or a statutorily authorized entity representing the common interests of state, local and tribal government owns 100% of the resulting Band Class14 capacity. The state or a statutorily authorized entity representing the common interests of state, local and tribal government consumes the portion required by PSEs and would be free to sell the rest.
  - g. This business model provides a highly predictable revenue stream to the mobile operator/system integrator.
  - h. The state or a statutorily authorized entity representing the common interests of the state, local and tribal government bears significant financial risk or reward if things do not unfold as planned or if results are exceptionally positive.
  - i. The state or a statutorily authorized entity representing the common interests of state, local and tribal government is free to sell the excess capacity at rates to the highest bidder.
  - j. Depending upon the geographic area covered, the revenue from the sale of excess capacity might exceed the cost of operating the network (producing a profit) or could fall short (producing a loss).
  - k. The mobile operator/system integrator/other party providing the service earns a predictable return but does not participate in the profit or loss or the overall enterprise.
  - l. If the network generates a profit then the state or a statutorily authorized entity representing the common interests of state, local and tribal government might decide to return the excess to PSEs in the form of reduced prices or end user subsidies or encourage reinvestment into the network to enhance both coverage and capacity. If the network loses money then the state or a statutorily authorized

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entity representing the common interests of state, local and tribal government might impose a user fee or might subsidize the network with state or other funds.

**4. Fee for Services/Site Owner**

- a. The state or a statutorily authorized entity representing the common interests of state, local and tribal government compensates local real estate owners (for example, local government, municipalities, school systems or other public entities) a fixed amount per month for the right to construct a cellular tower and operate a cell site, including backhaul infrastructure.
- b. The tower serves PSEs – first and foremost – but may serve others in the community as well, through roaming arrangements with local cellular providers. The site will include Band Class 14 radios and might also include other radios, if additional capacity is needed.
- c. This arrangement is similar to the site leases between tower owners and commercial cellular providers today.
- d. Many of the areas where new sites would be constructed are extremely rural. Constructing a site is likely to extend the reach of cellular service.
- e. This arrangement is likely to coexist with option (1), (2), or (3) above.

**5. Fee for Services/Site Construction**

- a. The state or a statutorily authorized entity representing the common interests of state, local and tribal government pays a site construction firm to erect towers and other telecommunications assets in remote areas.
- b. The site specification will be provided by the state or a statutorily authorized entity representing the common interests of state, local and tribal government or by a cellular operator contracted to operate the network, once contracted.
- c. The contract might or might not include installation and commissioning of equipment.
- d. This is similar to site construction contracts throughout the United States, except that the project would most likely be concentrated in uncovered rural areas.
- e. The project portfolio is likely to include “green sites” in remote locations, with limited or no road access and with no electricity. These would require some sort of renewable energy (solar and/or wind) plus deep discharge batteries and fossil fuel backup generators.
- f. This arrangement is likely to coexist with option (1), (2), or (3) above.

**6. Retail Distribution**

- a. The state or a statutorily authorized entity representing the common interests of the state, local and tribal government engages an experienced party to distribute service to PSEs in exchange for a margin on the revenue stream.

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- b. The party could be a chain store retailer but is more likely to be a full service Mobile Virtual Network Operator (MVNO) with experienced retail partners.
- c. Services include:
  - i. Selling mobile broadband service to PSEs
  - ii. Activation of devices
  - iii. Installation of vehicle-mounted devices
  - iv. Porting phone numbers
  - v. Billing, with enterprise reporting capabilities
  - vi. Comprehensive customer service
- d. Retail sales are separate from the operation of the network. The analogy in commercial cellular is the relationship between a facilities-based network operator and an MVNO.
- e. A number of advanced offerings are conceptually possible via an MVNO with the correct advanced enabling platform:
  - i. The party could provide commercial cellular service and Band Class 14 service under a single integrated offering.
  - ii. In an emergency situation, in a populated area, the party could provide PSEs with 100% of the Band Class 14 plus a large percentage of the nearby commercial capacity – resulting in a PSE offering that is far more capable than a Band Class 14 network alone.
  - iii. Similarly, an MVNO with a tightly integrated commercial network partner could use carrier aggregation and other advanced radio techniques to provide data rates to PSEs that greatly exceed the data rates possible with Band Class 14 spectrum alone.
- f. This arrangement is likely to coexist with a version of option (1), (2), or (3) above.
- g. Importantly, the state or a statutorily authorized entity representing the common interests of state, local and tribal government could enable competing retail distributors offering PSEs increased selection and providing the benefits of a competitive market.

There are certainly other models that may be of interest to California's stakeholders, if so please take the opportunity to describe in your responses as a part of Appendix B responses if desired.

### **4.3 Relationship Between Competing Procurement Approaches**

It might be helpful to think about these different procurement approaches via a matrix. Every private sector company has a set of skills. Any particular firm might or might not qualify as the prime contractor in a particular procurement model. In many cases the firm could participate as a subcontractor, and might prefer that role, especially if working with known business partners.

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A key question for those responding to the RFI is “Which procurement model is likely to be the most effective and will feel most natural to those in the industry?” Below is a matrix with possible procurement approaches for a variety of possible supplier roles.

**Table 1. Competing Procurement Approaches**

| Supplier Role  | Procurement Approaches (Not Mutually Exclusive) |                                |                                   |                             |                                  |                     |
|--|---|--------------------------------|-----------------------------------|-----------------------------|----------------------------------|---------------------|
|  | Public Sector Build/Own /Operate                | Multi-Decade Services Contract | Fee for Services/ Mobile Operator | Fee for Services/Site Owner | Fee for Services/Site Contractor | Retail Distribution |
| System Integrator                                    | ✓   | ✓                              |                                   |                             |                                  |                     |
| Regional Mobile Operator                             | ✓   | ✓                              | ✓                                 |                             |                                  | ✓                   |
| National Mobile Operator                             | ✓   | ✓                              | ✓                                 |                             |                                  | ✓                   |
| Source of Financing                                  | ✓   | ✓                              | ✓                                 | ✓                           | ✓                                |                     |
| Tower/ Real Estate Owner                             | ✓   |                                |                                   | ✓                           |                                  |                     |
| Construction of Sites                                | ✓   |                                |                                   |                             | ✓                                |                     |
| Installation and Commissioning of RAN Infrastructure | ✓   | ✓                              |                                   |                             | ✓                                |                     |
| Owner/ Operation of Long Haul Microwave/ Fiber       | ✓   |                                | ✓                                 | ✓                           | ✓                                |                     |
| Retail Sales/ Installation of Devices                | ✓   | ✓                              |                                   |                             |                                  | ✓                   |
| Customer Service                                     | ✓   | ✓                              |                                   |                             |                                  | ✓                   |

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| Supplier Role  | Procurement Approaches (Not Mutually Exclusive) |                                |                                   |                             |                                  |                     |
|--|---|--------------------------------|-----------------------------------|-----------------------------|----------------------------------|---------------------|
|  | Public Sector Build/Own /Operate                | Multi-Decade Services Contract | Fee for Services/ Mobile Operator | Fee for Services/Site Owner | Fee for Services/Site Contractor | Retail Distribution |
| Or Public Sector Build/Own / Private Sector Operate (P3) |   |                                |                                   |                             |                                  |                     |
| MVNO - Full Featured                                     | ✓   | ✓                              |                                   |                             |                                  | ✓                   |
| Mobile Virtual Network Enabler (MVNE)                    | ✓   | ✓                              |                                   |                             |                                  | ✓                   |

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## 5 Appendix A: Respondent Company Background Questions

### 5.1 Vendor Qualifications

Please provide narrative responses to the following vendor qualifications questions. This information is an important factor to better understand the skills and experience offered by your company.

Please provide narrative responses to the following business model questions. Note the page number, section number, and/or document in the “Reference” column below where your responses can be found.

| RFI Requirement No. | Description  | Reference |
|---------------------|--|-----------|
| 6.1.1               | What is the name of the company(ies) responding to this RFI (list each separately and provide the information asked for below for each company).   |           |
| 6.1.2               | What is your company’s principal line of business?   |           |
| 6.1.3               | Is it a private or public company listed on a stock exchange? If so, which?  |           |
| 6.1.4               | Approximate number of employees.   |           |
| 6.1.5               | Annual revenue/other financial Key Performance Indicators (KPI) you would like to share.   |           |
| 6.1.6               | Do you presently operate a wireless network in the United States?  |           |
| 6.1.6.1             | If so, please describe the coverage of your network and the approximate number of subscribers.   |           |
| 6.1.7               | Are you presently an LTE infrastructure manufacturer?  |           |
| 6.1.7.1             | If so, what are your principal product lines?  |           |
| 6.1.7.2             | If so, are you presently a supplier to one or more of the wireless carriers in the United States?  |           |
| 6.1.7.3             | If so, which carriers and what do you provide them?  |           |
| 6.1.8               | What unique strengths and capabilities do you bring to the table?  |           |
| 6.1.9               | What resources and commitments would you like to see from the state of California, local government, tribal government or from another partner for you to be most effective?   |           |
| 6.1.10              | What should the state of California and its stakeholders require or proscribe in a Request for Proposal (RFP) (e.g., what things should be clearly defined)?   |           |
| 6.1.11              | What should the state of California and its stakeholders NOT require or proscribe in an RFP (e.g. details that would represent regulatory overreach and would inappropriately constrain the freedom or respondents)? |           |
| 6.1.12              | Describe the extent of your company’s experience with the California Environmental Quality Act (CEQA) and Senate Bill No. 52   |           |
| 6.1.13              | Describe your past experience deploying and managing a RAN   |           |



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## 5.2 Expected Roles in the Wireless Broadband Ecosystem

To help us better understand your interest please complete the following matrix with check marks, indicating in which areas you are most likely to participate. Please place a check in either the “Yes” or “No” column.

| RFI Requirement No. | Role                            | Description  | Likelihood of Participation |    |
|---------------------|---------------------------------|--|-----------------------------|----|
|                     |                                 |  | Yes                         | No |
| 6.2.1               | Comprehensive Solution Provider | Facilitates both the construction and operation of the state-deployed RAN including many services required to provide support to PSEs; and, potentially, the sale of devices and for the customer service needs of PSEs. |                             |    |
| 6.2.2               | System Integrator               | Contracting for the many services required to provide support to PSEs; facilitating both the construction and operation of the RAN, potentially the sale of devices and for customer service needs of PSEs.              |                             |    |
| 6.2.3               | Regional Mobile Operator        | A mobile operator currently providing service in California or a portion of California. A regional operator typically provides services as a roaming partner to one or more larger national operators.                   |                             |    |
| 6.2.4               | National Mobile Operator        | A nationally branded mobile operator that provides service in California as well as most other parts of the United States.   |                             |    |
| 6.2.5               | Source of Financing             | An entity in the business of providing equity or debt capital to large projects. Financing may be associated with equipment, with a business entity, or with a state or local government (e.g. municipal bonds).         |                             |    |
| 6.2.6               | Tower/Real Estate Owner         | An entity that owns the real estate used for telecommunications (e.g. cellular towers, microwave towers, rooftops, and other rights of way).   |                             |    |
| 6.2.7               | Construction of Sites           | An entity that physically constructs sites, including various types of towers and monopoles and outdoor shelters and power supplies for telecommunications infrastructure.   |                             |    |

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| RFI Requirement No. | Role   | Description   | Likelihood of Participation |    |
|---------------------|--|---|-----------------------------|----|
|                     |  |   | Yes                         | No |
| 6.2.8               | Installation and Commissioning of RAN Infrastructure | An entity that physically installs telecommunications electronics, including commissioning a newly constructed site.  |                             |    |
| 6.2.9               | Operation of Long-Haul Microwave/Fiber Networks      | An entity that owns and/or operates long-haul communications links, either for internal purposes or for high volume/wholesale customers.  |                             |    |
| 6.2.10              | Retails Sales/ Installation of Devices               | An entity that sells wireless devices (mobile phones, tablets, USB dongles, hotspots, LMR radios, etc.) and potentially installs electronics (LTE and/or LMR radios) in first responder vehicles.                                 |                             |    |
| 6.2.11              | Customer Service                                     | An entity that handles all aspects of customer service (activation, porting of numbers, customer care, billing, etc.)   |                             |    |
| 6.2.12              | MVNO - Full Featured                                 | An entity that purchases network capacity from a facility-based provider and sells it to retail customers, along with all the required customer-facing capabilities.  |                             |    |
| 6.2.13              | Mobile Virtual Network Enabler (MVNE)                | An entity that provides network infrastructure and related services (e.g., provisioning, administration, Operations Support System (OSS)/Business Support System (BSS)) to enable MVNOs to offer services to their own customers. |                             |    |
| 6.2.14              | System Monitoring and System Level Control           | Describe how an entity handles all aspects of system monitoring, tracks outages and health of system and provides management of responses to system outages.  |                             |    |
| 6.2.15              | OTHER  | Please describe:  |                             |    |

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## 6 Appendix B: Business Models Questions

### 6.1 Potential Business Models

Cal OES seeks comment on the following questions. The FirstNet in California RFI is primarily interested in exploring creative business models that consider all opportunities that will leverage the right resources for the building, deployment, and operation of an efficient state-deployed RAN in California. This information is an important factor to better understand the skills and experience offered by your company.

Please carefully consider each of the potential business models described in Section 5, Potential Business Models, and any variations you might imagine.

Provide narrative responses to the following business model questions. Note the page number, section number, and/or document in the "Reference" column below where your responses can be found; also reference the "RFI Requirement No."

| RFI Requirement No. | Description   | Reference |
|---------------------|---|-----------|
| 7.1.1               | Describe a self sustaining business model that will maximize government funding and leverage all 20 MHz of Band 14 to build, deploy, operate, and maintain the NPSBN to serve public safety and secondary users, including making payments to FirstNet. D |           |
| 7.1.2               | Assess the strengths and weaknesses of each potential business model identified in 7.1.1.   |           |
| 7.1.3               | Include recommended staffing levels needed to support the business model identified in 7.1.1. Include key core staffing capabilities that are needed to support the business model.   |           |
| 7.1.4               | Describe a nuanced business model that is viewed as an opportunity by existing commercial providers, rather than a competitive threat. Consider how to encourage the private sector to actively participate.  |           |
| 7.1.5               | Identify a model that leverages all available resources to deploy a superior quality California RAN.  |           |
| 7.1.5.1             | <ul style="list-style-type: none"> <li>Consider how to leverage public sector assets (human and capital).</li> </ul>  |           |
| 7.1.5.2             | <ul style="list-style-type: none"> <li>Consider how to leverage private sector assets (human and capital).</li> </ul>   |           |
| 7.1.6               | Identify a technical model that will be interoperable with the NPSBN.   |           |
| 7.1.7               | What is the strengths/weaknesses/other considerations associated with your preferred business model(s)?   |           |
| 7.1.8               | What is the strengths/weaknesses/other considerations associated with the business model(s) you rejected?   |           |

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| RFI Requirement No. | Description  | Reference |
|---------------------|--|-----------|
| 7.1.9               | How does your preferred business model contribute to each of the following objectives?   |           |
| 7.1.9.1             | <ul style="list-style-type: none"> <li>Encouraging broad participation of a wide range of highly capable private parties with different skills sets.</li> </ul>  |           |
| 7.1.9.2             | <ul style="list-style-type: none"> <li>Providing first responders with flexible cost-effective services.</li> </ul>  |           |
| 7.1.9.3             | <ul style="list-style-type: none"> <li>Assigning risk to the parties most able to manage it.</li> </ul>  |           |
| 7.1.9.4             | <ul style="list-style-type: none"> <li>Leveraging the existing assets of the California's local, state and tribal stakeholders.</li> </ul>   |           |
| 7.1.9.5             | <ul style="list-style-type: none"> <li>Leveraging the existing assets and capabilities of commercial cellular providers and other commercial entities.</li> </ul>  |           |
| 7.1.9.6             | <ul style="list-style-type: none"> <li>Providing ancillary benefits, such as rural mobile broadband, and rural mobile voice coverage and extending the reach of 911 services by extending rural mobile voice coverage.</li> </ul>  |           |
| 7.1.9.7             | <ul style="list-style-type: none"> <li>Fairly compensating asset owners and motivating a broad range of public and private parties to participate in the deployment of the network.</li> </ul>   |           |
| 7.1.10              | Are there additional business models that California has not addressed?  |           |
| 7.1.11              | What else should California consider in selecting the most appropriate business model(s) for a potential future procurement?   |           |
| 7.1.12              | What current and future best practices, trends, and industry standards should California consider when deploying its PSBN?   |           |
| 7.1.13              | Include key core staffing capabilities that are needed to support the business model.  |           |
|                     |  |           |
| 7.1.15              | Discuss the pros and cons of incorporating the LARICS network into a future California PSBN and provide a high-level utilization plan for existing LTE assets in LARICS LTE network. LARICS may be contacted for information on their deployment and the contemplated system expansion.                      |           |
| 7.1.16              | Discuss architectural benefits and challenges related to Home Subscriber Server (HSS) authentication, connection to the Policy and Charging Rules Function (PCRF) at the FirstNet EPC but keeping all other user plane traffic, local authentication and public safety functions within the California PSBN. |           |
| 7.1.17              | FirstNet has developed a set of 16 objectives upon which it has framed its RFP (see FirstNet RFP Section C "Statement of Objectives."). Achieving various elements of these objectives will be critical to the success of any opt-out state. Please  |           |

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| RFI Requirement No. | Description   | Reference |
|---------------------|---|-----------|
|                     | comment on those objectives, and state which are relevant to your potential role in implementing a California RAN.  |           |
| 7.1.18              | The Act requires very specific reviews, approvals, and lease agreements through the Federal Communications Commission (FCC), the NTIA, and FirstNet for any opt-out state. Discuss the resources available and the role your organization would play in assisting the state to meet all regulatory requirements if you were the successful bidder in a formal California RFP? |           |
| 7.1.19              | Recommend RAN deployment strategies for a California PSBN that will attain acceptable interoperable wireless coverage for PSEs in densely populated urban and sparsely populated rural and tribal areas and that addresses California's geographic diversity and demographics.  |           |
| 7.1.19.1            | <ul style="list-style-type: none"> <li>Explain the methodology you would use to determine coverage needs and priority coverage areas.</li> </ul>  |           |
| 7.1.19.2            | <ul style="list-style-type: none"> <li>Recommend a phased deployment of sites that can ultimately reach target coverage requirements of 90% of the geographic state.</li> </ul>   |           |
| 7.1.19.3            | <ul style="list-style-type: none"> <li>Recommend how you would address the need to provide wireless broadband to the most rural parts of the state, specifically, but not limited to, northern and eastern California.</li> </ul>   |           |
| 7.1.19.4            | <ul style="list-style-type: none"> <li>Recommend how systems could be deployed within the State using different categories of site assets (e.g. non-commercial and commercial) and different design methodologies.</li> </ul>   |           |
| 7.1.20              | Develop a nuanced business model that is viewed as an opportunity by existing commercial providers, rather than a competitive threat.   |           |
| 7.1.21              | Consider how to encourage the private sector to actively participate.   |           |
| 7.1.22              | Consider flexible technical solutions that accommodate seamless connections to the FirstNet NPSBN, access all FirstNet features, support cyber security measures, and conform to FirstNet network performance requirements.   |           |
| 7.1.23              | Identify best practices, trends, innovations, and product/services in the deployment and operation of a RAN.  |           |
| 7.1.24              | Identify Service Level Agreements (SLA) and the circumstances under which they would be appropriate, should California deploy its own RAN.  |           |
| 7.1.25              | Recommend strategies to address the following infrastructure challenges:  |           |
| 7.1.25.1            | <ul style="list-style-type: none"> <li>California lacks existing infrastructure to provide a</li> </ul>   |           |

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| RFI Requirement No. | Description  | Reference |
|---------------------|--|-----------|
|                     | roadmap to install the necessary hardware for the network.   |           |
| 7.1.25.2            | <ul style="list-style-type: none"> <li>The majority of the existing commercial infrastructure in California does not meet public safety hardening requirements such as backup power and security.</li> </ul> |           |
| 7.1.26              | Recommend how a state-deployed RAN that would exceed commercially available rural coverage, in-building coverage, and quality of service (QoS). <sup>12</sup>  |           |
| 7.1.27              | Describe a model for determining user costs for services provided such that state, local, and territories can each clearly understand the costs associated to end users fees and costs.                      |           |

## 7 Appendix C: Technical Model Questions

Cal OES is interested in respondents' recommendations regarding the technical aspect of deploying a state-deployed RAN in California.

Respondents should address each of the technical questions described below and provide narrative responses. Note the page number, section number, and/or document in the "Reference" column below where your responses can be found; also reference the "RFI Requirement No."

| RFI Requirement No. | Description | Strongly Agree /Less Important |
|---------------------|-------------|--------------------------------|
|---------------------|-------------|--------------------------------|

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<sup>12</sup> Section 6302(e)(3)(D)(iii) of the Middle Class Tax Relief and Job Creation Act of 2012 instructs the states that chose to build their own Radio Access Networks to develop their alternative State Plans while complying with the QoS definitions of the NPSBN.

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| RFI Requirement No. | Description   | Strongly Agree /Less Important  |
|---------------------|---|---|
| 7.1.1               | Is it important for vendors to recommend state-deployed RAN technical solutions that integrate and interface with the FirstNet NPSBN yet exceeds IOC/FOC Band 14 and non-Band 14 coverage and capacity requirements?                      | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.2               | Advise if a state-deployed RAN should exceed existing commercial grade service levels achieving 99.999% availability over the IOC/FOC milestone timelines?  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.3               | Advise if a state-deployed RAN should have Service Level Agreements with the state-deployed RAN vendor?   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.4               | Should a state-deployed RAN include a technical model that acquires, integrates, and assimilates early builder assets such as the LARICS LTE network?   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.5               | Advise if your organization will be able to address Law Enforcement Applications Integration such as CLETS and CJIS that require physical and logical separation to maintain security standards compliance?                               | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.6               | Is it important that a vendor describe how they will partner with FirstNet to ensure the safety, security, and resiliency of the NPSBN and protection against cyber-attack including Identity Credentialing and Access Management (ICAM)? | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.7               | Is it important that we obtain information on a strategy for Quality of Service, Prioritization and Preemption (QPP) control?   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.8               | Is it important that a vendor provide a design for Band 14 and non-Band 14 areas of coverage that <i>exceeds</i> existing commercial cellular area coverage but at broadband data rates?  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.9               | Is it important that a vendor provide in-building Strategy Solutions design that exceeds existing commercial cellular area coverage and at broadband data rates?  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.10              | Is it important that a vendor provide a design for Band 14 and non-Band 14 areas of coverage in rural & mountainous areas that exceeds existing commercial cellular area coverage and at broadband data rates?                            | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.11              | Is it important that a vendor provide a design for Band 14 and non-Band 14 areas that includes coverage in Cross Border (interstate) areas that exceeds existing commercial cellular area coverage and at broadband data rates?           | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |



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| RFI Requirement No. | Description  | Strongly Agree /Less Important  |
|---------------------|--|---|
| 7.1.12              | Applications Ecosystem   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.13              | Device Ecosystem   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.14              | Equipment Performance Specifications                                   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.15              | Hardening  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.16              | Roaming  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.17              | Public Safety Answering Point Integration                              | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.18              | State Deployed RAN Integration   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.19              | Security Features  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.20              | Congestion Management Capabilities                                     | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.21              | Refresh Cycle  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.22              | Network Reliability  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.23              | Network Resiliency   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.24              | Network Redundancy   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.25              | Local Control  | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.26              | Deployment Phase and Timelines   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.27              | Growth and Deployables   | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.28              | Use of state assets, including tower sites, backhaul, and data centers | <input type="checkbox"/> Important<br><input type="checkbox"/> Less important |
| 7.1.29              | Early Builder Integration  | <input type="checkbox"/> Important  |



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| RFI Requirement No. | Description                                 | Strongly Agree /Less Important  |
|---------------------|---|---|
|                     |   | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |
| 7.1.30              | California Environmental Quality Act (CEQA) | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |
| 7.1.31              | Tribal Coverage and Capacity                | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |
| 7.1.32              | Local and Tribal Consultations              | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |
| 7.1.33              | Tribal Gaps                                 | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |
| 7.1.34              | Reports                                     | <input type="checkbox"/> Less important<br><input type="checkbox"/> Important |

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## 8 Appendix D: California's Priorities

The California FirstNet State Plan will be evaluated on "best value" based upon the evaluation criteria as stated below. A pass or fail scale will be used to create the final evaluation recommendation. When assessing the factors, if any portion of the factor fails the failed component must include the reason and recommendation on the Evaluation Summary table. If

**Evaluation Summary of California's Priorities**

|   | Factor                    |
|---|---------------------------|
| 1 | Coverage & Capacity       |
| 2 | Products & Architecture   |
| 3 | User Service Availability |
| 4 | Deployment                |
| 5 | Tribal                    |
| 6 | Operations Training       |
| 7 | User Cost                 |
| 8 | Business Management       |

**Evaluation Summary Details**

| Item # | Factor | Notes |
|--------|--------|-------|
|--------|--------|-------|

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| Item #     | Factor   | Notes |
|------------|--|-------|
| <b>8.1</b> | <b>Coverage and Capacity</b>   |       |
| 8.1.1      | Area of Coverage for Band 14 and Non-Band 14   |       |
| 8.1.2      | In-building Strategy Solutions   |       |
| 8.1.3      | Rural & Mountainous  |       |
| 8.1.4      | Cross Border (interstate)  |       |
| <b>8.2</b> | <b>Products &amp; Architecture</b>   |       |
| 8.2.1      | Applications Ecosystem   |       |
| 8.2.2      | Device Ecosystem   |       |
| 8.2.3      | Architecture infrastructure, Core, and Business/Operation Support Systems (B/OSS) & Backhaul, and Performance Specifications |       |
| 8.2.4      | Equipment Performance Specifications   |       |
| 8.2.5      | Hardening  |       |
| 8.2.6      | Roaming  |       |
| 8.2.7      | Public Safety Answering Point Integration  |       |
| 8.2.8      | State Deployed RAN Integration   |       |
| 8.2.9      | Security Features  |       |
| 8.2.10     | Congestion Management Capabilities   |       |
| 8.2.11     | Refresh Cycle  |       |
| <b>8.3</b> | <b>User Service Availability</b>   |       |
| 8.3.1      | Network Reliability  |       |
| 8.3.2      | Network Resiliency   |       |
| 8.3.3      | Network Redundancy   |       |
| 8.3.4      | Local Control  |       |

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| Item #     | Factor   | Notes |
|------------|--|-------|
| <b>8.4</b> | <b>Deployment</b>  |       |
| 8.4.1      | Deployment Phases and Timelines  |       |
| 8.4.2      | Growth and Deployables   |       |
| 8.4.3      | Use of state assets, including tower sites, backhaul, and data centers |       |
| 8.4.4      | Early Builder Integration  |       |
| 8.4.5      | California Environmental Quality Act (CEQA)                            |       |
| 8.4.6      | California Essential Services Act                                      |       |
| <b>8.5</b> | <b>Tribal</b>  |       |
| 8.5.1      | Coverage and Capacity  |       |
| 8.5.2      | Local and Tribal Consultations   |       |
| 8.5.3      | Tribal Gaps  |       |
| <b>8.6</b> | <b>Operations Training</b>   |       |
| 8.6.1      | End user device training   |       |
| 8.6.2      | Administrator training   |       |
| <b>8.7</b> | <b>User Cost</b>   |       |
| 8.7.1      | End User Fees  |       |
| 8.7.2      | Devices, Service Offerings, and Activation fees                        |       |
| 8.7.3      | Roaming charges  |       |
| 8.7.4      | Infrastructure, Leasing, and Core Network Build-out and User Fees      |       |
| <b>8.8</b> | <b>Business Management</b>   |       |
| 8.8.1      | Reports  |       |

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| Item # | Factor                      | Notes |
|--------|-----------------------------|-------|
| 8.8.2  | Customer Care and Marketing |       |

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## 9 Appendix D: Glossary

3GPP - 3rd Generation Partnership Project

The ACT - In February 2012, Congress enacted the Middle Class Tax Relief and Job Creation Act of 2012 (the Spectrum Act or the Act), containing provisions to create an interoperable NPSBN.

Asset - any tower, building or other facility, microwave link, fiber link, vehicle or other deployable that may be used in the architecture of the National Public Safety Broadband Network

BC 14 - Band Class 14

CAPEX - capital expenditures

COLT - Cell on Light Truck

COW - Cell on Wheels

dBm- Decibel-milliwatts

DOC - U.S. Department of Commerce

DPI – Deep Packet Inspection

EMS - Emergency Medical Services

EPC - Evolved Packet Core

FCC - Federal Communications Commission

FirstNet - First Responder Network Authority

GB – Gigabyte

HSS - Home Subscriber Server

ICAM - Identity, Credential and Access Management

IoT - Internet of Things

KPI – Key Performance Indicator

LMR - Land Mobile Radio

LTE - Long Term Evolution

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MHz – Megahertz

MVNE - Mobile Virtual Network Enabler

MVNE - Mobile Virtual Network Operator

NG 9-1-1 – Next Generation 911

NPSBN - National Public Safety Broadband Network or Nationwide Public Safety Broadband Network

NTIA - National Telecommunications and Information Administration

OPEX - Operational Expenditures

PCRF - Policy and Charging Rules Function

POC - Point of Contact

PSBN - Public Safety Broadband Network

PSCR - Public Safety Communications Research

Public Private Partnership - P3

PSE - Public Safety Entity - A PSE is defined in Section 6001(26) of the Act as an “entity that provides public safety services” 47.U.S.C. § 1401(26).

QoS – Quality of Service

QPP - Quality of Service, Priority and Pre-Emption

RAN - Radio Access Network

RFI - Request for Information - A procurement solicitation that seeks information from organizations or individuals regarding the scope of work defined in the RFI, in accordance with the terms listed in the RFI.

Respondent - Any organization or individual submitting a response to an RFI.

RFP - Request for Proposal

ROM - Rough Order of Magnitude

SLIGP - State and Local Implementation Grant Program

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SMLA - Spectrum Manager Lease Agreement

Solicitation - A document issued by a prospective buyer that requests competitive offers from organizations or individuals to sell the goods or services that are specified in the document. A solicitation typically results in an award of a contract or purchase order for the goods or services, based on an award methodology defined in the solicitation. Types of solicitations issued by State of California agencies include: Requests for Proposals (RFPs),

Spectrum Act - In February 2012, Congress enacted the Middle Class Tax Relief and Job Creation Act of 2012 (the Spectrum Act or the Act), containing provisions to create an interoperable NPSBN.

UAS - Unmanned Aerial System

UE - User Equipment

VNS - Vehicular Network System



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## 10 Appendix E: Summary of California’s Priorities

**Please note: The following information in Appendix E is for informational purposes only, it is not intended to be completed by Respondents to this RFI**

FirstNet State Plan will be evaluated on “best value” based on the evaluation criteria as stated below. A pass or fail scale will be used to create the final evaluation recommendation. When assessing the factors, if any portion of the factor fails the failed component must include the reason and recommendation on the Evaluation Summary table. If no response is provided the factor is marked as failed.

The State Plan should include information that describes their ability to meet Initial Operational Capability (IOC)/Final Operational Capability (FOC) Target Timeline for features, functions, and coverage related IOC/FOC milestones.

The California FirstNet State Plan Evaluation Form has two parts: Part 1) Minimum Requirements and Part 2) Major Categories with Weighting. Part 1: Minimum Requirements must be met with all “Pass” marks to move forward to Part 2: Major Evaluation Categories with Weighting.

### 10.1 Part 1: Minimum Requirements

The following items are a list of Minimum Requirements that are expected to be included in the FirstNet State Plan for California. Each requirement is mandatory and must successfully pass before Evaluators will proceed to Part 2.

| No. | Minimum Criteria   | Pass/Fail  |
|-----|--|--|
| 1.  | <p><u>Service Availability</u></p> <ul style="list-style-type: none"> <li>• The State Plan should include a description of a nationwide interoperable public safety grade broadband network architecture that will ensure network service 24 hours a day, 7 days a week, 365 days a year and exceeds commercial Tier 1 data rates.</li> <li>○ Includes service capacity to support geographically dispersed public safety usage throughout the life of the contract.</li> <li>○ Describe Service Level Agreements available in CA.</li> <li>• The State Plan should also include how FirstNet will provide increasing commercial grade service reliability over the IOC/FOC milestone timelines achieving 99.999% availability as measured in a rolling 12-month window within each reporting area.</li> </ul> | <input type="checkbox"/> Pass<br><input type="checkbox"/> Fail |

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|    |  |  |
|----|--|--|
| 2. | <u>Law Enforcement Applications Integration</u> <ul style="list-style-type: none"> <li>Provide architecture descriptions and operational solutions to address the need for “special care for special data”<sup>13</sup>. PSE networks such as CLETS and CJIS require physical and logical separation to maintain security standards compliance.</li> </ul>   | <input type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| 3. | <u>Cyber Security</u> <ul style="list-style-type: none"> <li><b>Application Security:</b> Describe how FirstNet will ensure the safety, security, and resiliency of the NPSBN, including protecting and monitoring the network against cyber-attack.</li> <li><b>Cyber Security and Incident Response:</b> Describe mitigation strategies and policies that will be implemented by FirstNet to defend against cyber threats and any pre-planned mechanisms in the event of a security breach.</li> <li><b>Architecture:</b> Describe how the FirstNet informational framework will address cyber security within informational domains that arise from partitioning information resources according to access control, need, and levels of protection required.             <ul style="list-style-type: none"> <li>Such as organizations that implement specific measures to enforce this partitioning and to provide for deliberate flow of authorized information between informational domains such as law enforcement applications like CLETS and CJIS.</li> </ul> </li> <li><b>Identity Credentialing and Access Management (ICAM):</b> Describe how FirstNet will ensure protection of end user identities and information from compromise.</li> </ul> | <input type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| 4. | <u>Prioritization and Quality of Service</u> <ul style="list-style-type: none"> <li><b>Quality of Service, Priority, and Preemption (QPP):</b> Describe the IP Network Priority strategy to provide consistent end-to-end treatment of Public Safety traffic, prioritization of NPSBN resources both over the air and within the IP network infrastructure by aligning the priority used by the NPSBN IP network and backhaul technology with the scheduling priority (QoS Class Identifier priority).             <ul style="list-style-type: none"> <li>Describe how the NPSBN will support the use of industry standard VPN and MVPN technology, while providing priority and QoS for encapsulated applications.</li> <li>Describe the 3GPP standard mechanisms used to control prioritization and QoS in LTE network and enforced on a user or class of users.</li> <li>Describe the nationwide scheme for assigning Access Classes to public safety users and secondary users following the 3GPP recommendations in TS 22.011, Section 4.2.</li> </ul> </li> </ul>  | <input type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| 5. | <u>User Cost</u><br>The State Plan shall include a detailed description of pricing schedules for services provided such that state, local, and territories can each clearly understand the costs associated to end users fees and costs.   | <input type="checkbox"/> Pass<br><input type="checkbox"/> Fail |

<sup>13</sup> The need for a “special care for special data” approach has been acknowledged by Special Notice issued by FirstNet; *FirstNet Cyber Security in Section 2.1 (g)* when it references another high security PSE system called the Criminal Justice Information System (CJIS). This section states... “It is expected that traffic and transactions governed by CJIS Security Policy will transit and potentially be acted upon within the NPSBN.”

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|           |   |  |
|-----------|---|--|
| <b>6.</b> | <p><u>Financial Stability</u><br/>Describe a self-sustaining business model that will maximize government funding and leverage all 20 MHz of Band 14 to build, deploy, operate, and maintain the NPSBN to serve public safety and secondary users, including making payments to FirstNet.</p> | <input type="checkbox"/> Pass<br><br><input type="checkbox"/> Fail |
|-----------|---|--|

**10.2 Part 2: Major Evaluation Categories with Weighting**

The following items are a Summary of Major Evaluation Categories with Weighting that are expected to be included in the FirstNet State Plan for California.

**Table X. Summary of Major Evaluation Categories with Weighting**

| Evaluation Categories       | Weight %     |
|-----------------------------|--------------|
| Coverage & Capacity         | 25           |
| Products & Architecture     | 15           |
| User Service Availability   | 10           |
| Deployment                  | 10           |
| Tribal                      | 10           |
| Operations Training         | 5            |
| User Cost                   | 20           |
| Business Management         | 5            |
| <b>TOTAL POSSIBLE SCORE</b> | <b>100 %</b> |

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| CRITERIA  | Meets/Does Not Meet (Y/N) | Points |
|---|---------------------------|--------|
| <b>1. Coverage &amp; Capacity</b>   |                           |        |
| <b>A.</b> Area of Coverage for Band 14 and Non-Band 14  |                           | TBD    |
| <b>B.</b> In-building Strategy Solutions  |                           | TBD    |
| <b>C.</b> Rural & Mountainous   |                           | TBD    |
| <b>D.</b> Cross Border (interstate)   |                           | TBD    |
| <b>2. Products &amp; Architecture</b>   |                           |        |
| <b>A.</b> Applications Ecosystem  |                           | TBD    |
| <b>B.</b> Device Ecosystem  |                           | TBD    |
| <b>C.</b> Architecture infrastructure, Core, and Business/Operation Support Systems (B/OSS) & Backhaul, and Performance Specifications        |                           | TBD    |
| <b>D.</b> Equipment Performance Specifications  |                           | TBD    |
| <b>E.</b> Hardening   |                           | TBD    |
| <b>F.</b> Roaming   |                           | TBD    |
| <b>G.</b> Public Safety Answering Point Integration   |                           | TBD    |
| <b>H.</b> State Deployed RAN Integration  |                           | TBD    |
| <b>I.</b> Security Features   |                           | TBD    |
| <b>J.</b> Congestion Management Capabilities  |                           | TBD    |
| <b>K.</b> Refresh Cycle   |                           | TBD    |
| <b>3. User Service Availability</b>   |                           |        |
| <b>A.</b> Network Reliability   |                           | TBD    |
| <b>B.</b> Network Resiliency  |                           | TBD    |
| <b>C.</b> Network Redundancy  |                           | TBD    |
| <b>D.</b> Local Control <ul style="list-style-type: none"> <li>○ Local control of local services.</li> <li>○ Local control of QPP.</li> </ul> |                           | TBD    |
| <b>4. Deployment</b>  |                           |        |

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|   |  |     |
|---|--|-----|
| A. Deployment Phasing and Timelines   |  | TBD |
| B. Growth and Deployables   |  | TBD |
| C. Use of state assets, including tower sites, backhaul, and data centers                                 |  | TBD |
| D. Early Builder Integration  |  | TBD |
| E. California Environmental Quality Act (CEQA) and the California Essential Services Act                  |  | TBD |
| <b>5. Tribal</b>  |  |     |
| A. Coverage and Capacity  |  | TBD |
| B. Local and Tribal Consultations   |  | TBD |
| C. Tribal Gaps  |  | TBD |
| <b>6. Operations Training</b>   |  |     |
| A. End user device training   |  | TBD |
| B. Local Control training, including provisioning, administration, activation/deactivation, and reporting |  | TBD |
| <b>7. User Cost</b>   |  |     |
| A. End User Fees  |  | TBD |
| B. Devices, Service Offerings, and Activation fees  |  | TBD |
| C. Roaming charges  |  | TBD |
| D. Infrastructure Leasing Fee   |  | TBD |
| <b>11. Business Management</b>  |  |     |
| A. Reports  |  | TBD |
| B. Customer Care and Marketing  |  | TBD |