

**REDACTION NOTES:**

Please be advised the material in this document is redacted as in accordance with 1 V.S.A. § 317(c)(9) as “trade secrets.”

There are two areas of redactions that are not based on 1 V.S.A., but rather in accordance with federal law 47 U.S.C. § 1426(d)(2) exempt from FOIA requirements. Those redactions are on page 6 under the “Cons” heading and on page 9.

Charts located on page 8, 30, 31, and 32 contain information redacted under both of the statutes referenced above.

## Independent Review

### Radio Access Network

### OPT-IN or OPT-OUT

For the  
State of



Submitted to the  
State of Vermont, Office of the CIO  
By

Coeur Business Group



November 15, 2017

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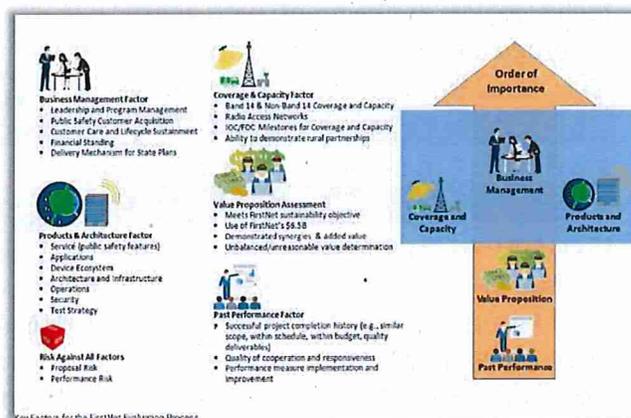
# 1. Executive Summary

## Project Summary

Coeur Business Group (CBG) was contracted by the State of Vermont Agency of Digital Services (ADS) to conduct an independent review of the state’s two alternatives for a Statewide Radio Access Network (RAN).

Alternative one is the FirstNet State Plan as submitted by the National Telecommunications and Information Administration (NTIA) and AT&T. Alternative two is a solution proposed from a competitive solicitation (8/30/17) by the State of Vermont to identify alternatives to the FirstNet State Plan. Rivada and its consortium response was selected for this review. FirstNet’s proposal will be referred to as an OPT-IN proposal, and Rivada’s as an OPT-OUT proposal.

These OPT-IN and OPT-OUT solutions were reviewed using the following criteria developed from both Critical Success Factor interviews conducted with key contributors outlined in section 4.1 and objectives spelled out by FirstNet’s Key Factor of Success Map. In all interviews coverage was the #1 factor in considering a solution. This is due to Vermont’s mountainous topology and rural make up. Today 80-85% of first responders use Verizon services because of coverage.



CBG reviewed all available documentation these provided on Vermont’s FirstNet Portal, the RFP response from Rivada and other documents provided from contributors and general internet review. Information for details around portions of AT&T’s solution were not available, or access was limited. Likewise, the Rivada proposal is in an RFP format and has not been through any negotiated steps towards final resolution.

Supported within this document is our recommendation to OPT-IN. This was determined by reviewing Public Safety coverage, the provider’s business, their supporting business models, degree of risk in implementing the plan, proposed federal penalties, opportunities for Vermont, technologies deployed, support of disaster recovery and scale. We also bring some points to the table that we believe Vermont should formally request from FirstNet.

If Vermont were to OPT-OUT, we provide supporting information to assist in that decision. This includes; points of contract discussion, stronger financial model, technology considerations, implementation risk minimization, market opportunities, legal review and risk sharing if Vermont were to OPT-OUT.

## OPT-IN

### Background

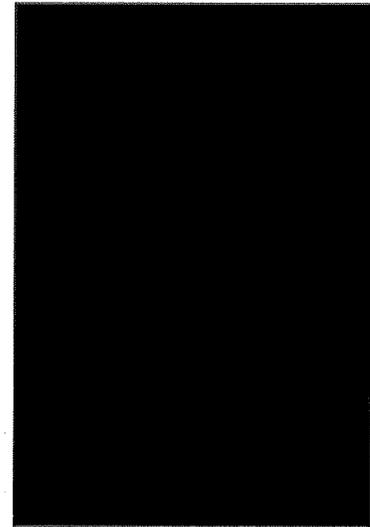
The FirstNet RAN Plan is a comprehensive plan that is a result of 4+ years of requirement development, planning and national supplier solicitation, which resulted in a competitive Federal bid. AT&T was

selected in March, and awarded in June 2017. Since that award, FirstNet provided a state specific RAN plan to Vermont. Within that plan, Vermont will provide assignment of the band 14 Spectrum to FirstNet-AT&T (GAO report says possible national value at \$60B). As previously described, the FirstNet Proposal from AT&T has been thoroughly built and vetted within the Federal contract administration, however Coeur/Vermont doesn't have access to:

- AT&T Agreement
- AT&T penalty details
- AT&T's use of valuable spectrum in band 14 and 700Mhz ranges, and pay FirstNet use fees.
- Utilization of back-bone facilities of AT&T's or failover redundancy plans.

### Pros

Coeur used AT&T Vermont First Network Portal, additional support documents and interviews with various people identified in section 3.1 for its review. The RAN plan from AT&T is well documented in its technological deployment, with annual expected improvements of coverage and band 14 deployment through the first 5 years of the plan. AT&T has also committed that they will build [REDACTED] additional sites that are currently in progress. That would bring total cell sites from AT&T to [REDACTED]. That enhances their current reported outdoor coverage of; [REDACTED] area and [REDACTED] of population. AT&T should also be motivated to accomplish these goals for their BAU commercial offerings, and FirstNet penalties to AT&T, however there are still concerns of "real" coverage areas (in buildings, rural and mountainous areas). This was echoed in GAO June 2017 report as well.



The following are benefits to Vermont in an OPT-IN scenario, by participating with at least 31 States that have chosen to OPT-IN at the time of this document.

- Sharing national pooled pricing
- Sharing best practices
- Benefiting from technology and capital commitments
- Working with an established telecom company

### Cons

It is explained that FirstNet will penalize AT&T for not meeting timelines of deployment, but Vermont doesn't have the specifics surrounding those penalties, nor does it appear that Vermont will be provided any concessions/penalties from FirstNet, or AT&T if timelines are missed.

There is also a concern that Vermont's state specific requirements and desire to partner with AT&T could be drowned out by the states with larger population centers. It's also apparent that Vermont's topology and rural population have additional needs for first responder coverage. As we point out in the "Pros" section, AT&T has made commitments to improve coverage, but these need to be independently reviewed by Vermont's PUC propagation reviews of cellular coverage, and the additional details of the committed sites. It's recognized that FirstNet Single Point of Contact (SPOC) is already collaboratively working with other New England states (Maine, up-state New York, Rhode Island, New Hampshire and

Massachusetts) in a pooled manner to have a louder voice at the table, and minimize impacts of being a smaller state with unique requirements.

**OPT-OUT**

**Background**

It is recognized that the OPT-OUT proposal used to review is only a response to a solicited RFP. Unlike, the AT&T proposal that had been through FirstNet’s requirements and Federal contract negotiation; the Rivada proposal is being reviewed as submitted 9/25/17, and does not contain a final negotiated solution. Based on the timeline to respond to the RFP, Rivada’s participation at a Federal level has enabled them to respond to Vermont’s request for a proposal very robustly.

Overall, Rivada covered the timelines and task associated with the RFP, and proposed to create Rivada-Vermont LLC [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

They also include [REDACTED] as selected partners in their proposal. [REDACTED] plan outlines a target coverage of [REDACTED] of the area and [REDACTED] of the population with [REDACTED] This is well below AT&T’s number of sites.

[REDACTED]

A key element of Rivada’s business model and pricing to [REDACTED]  
[REDACTED]

The non-band 14 license is not currently held by Vermont, and [REDACTED] is only committing to prices for [REDACTED]. The revenue sharing model of band 14 needs to be legally reviewed.

As you can see in [REDACTED] coverage map, their proposed non-band 14 has several coverage gaps, which raises concerns about timely adequate coverage, adoption and revenue. They also intend to expedite their rollout through other rural partnership agreements with [REDACTED] and [REDACTED], which we believe is intended to jump start their existing reciprocal roaming agreements and fill other gaps of coverage, but there are no maps that could demonstrate that coverage.

**Pros**

The Rivada Proposal is attractive, as it allows for Vermont to potentially develop a collaborative plan that would be customized to Vermont’s unique needs. It allows Vermont to be at a table by themselves and prioritize the needs and directions of a first responder network for Vermont. Rivada acknowledges they would be responsible to meet interoperability standards and open interfaces with devices from the FirstNet efforts. The Rivada plan also provides [REDACTED]

[REDACTED] however legal review of this would need to be made.

Rivada's approach is to collaborate with Vermont in planning and in potential integrations with the state's telecom infrastructure. In doing so, Rivada desires to create a public/private partnership. This could allow Vermont to maximize integration, recognizing there are restrictions of end user commercialization of FirstNet Network.

**Cons**

The biggest con of the Rivada proposal is that this consortium of players have no previous experience in building and operating a network under this partnership. Secondly, yet equally crucial, is that FirstNet has imposed a great deal of financial burden upon the states for OPT-OUT decisions if certain targets are not met. At the time of the document, there are several challenges at a state and national level stating that the penalties outlined in the Spectrum Manager Lease Agreement (SMLA) Summary are not legal or well supported.

Below are the maximum levels of the [REDACTED] Summary:

[REDACTED]

When the scope of financial risk and experience for a RAN build from a newly formed consortium are combined, Rivada's delivery becomes paramount. Assumptions within their financial plans must be deeply scrutinized, and the upsides of a public-private venture would need to be fully explored to insure benefits counter-balance the risk mentioned above. The financials, implementation and technology plans must be developed and accepted by FirstNet before an OPT-OUT plan could begin implementation. We expect planning and contract negotiation to take 120-200 days prior to the plan being presented to FCC and NTIA for approvals and implementation.

### 1.1 Cost Summary

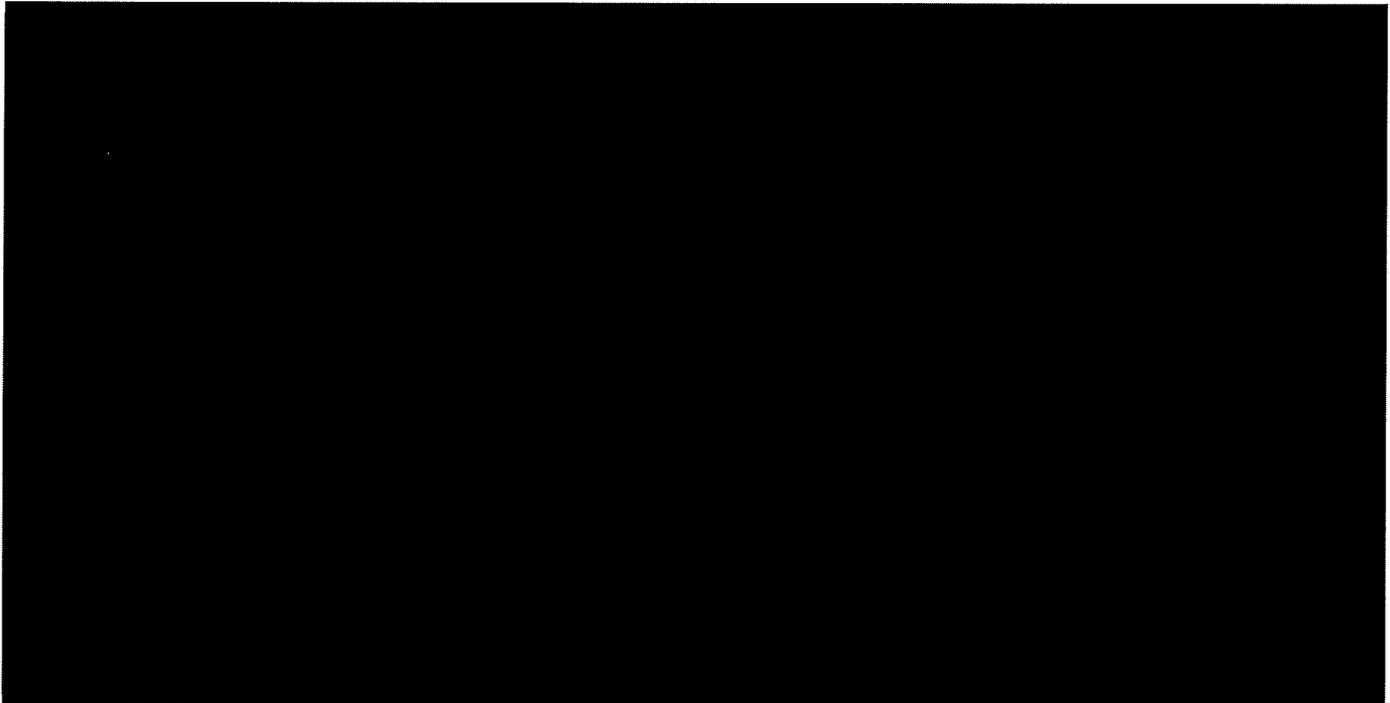
	OPT-IN	OPT-OUT
Total Activity Lifecycle:	25 Years	25 Years
5 Year Benefits	\$ 3.18M	\$ 3.66M
5 Year Lifecycle Costs:	<b>\$ 2.3M</b>	<b>\$ 4.275M</b>
New Annual Operating Costs in YR5:	<b>\$ .375M</b>	<b>\$ . 675M</b>
% Year Net Present Value (2% discount)	\$ .737M	<b>-\$ .658</b>
Funding Source(s) and Percentage Breakdown if Multiple Sources:		\$20-25M Grant

### 1.2 Disposition of Independent Review Deliverables

Deliverable	OPT-IN Highlights	OPT-OUT Highlights
Acquisition Cost Assessment	Release the Band 14 Spectrum, slow ramp hire additional support levels	Release \$20-25M NTIA Grant, the Band 14 Spectrum and Hire external assistance in Partnership formation
Technology Architecture Review	3 OPT-IN 4 DRAW	1 OPT-OUT 4 DRAW
Implementation Plan Assessment	6 OPT-IN 2 DRAW	0 OPT-OUT 2 DRAW
Cost Analysis and Model for Benefit Analysis	5 Year NPV - \$737, 651	5 Year NPV – <b>(658,635)</b>
Impact Analysis on Net Operating Costs in Year 5	<b>(\$375,000)</b>	<b>(\$675,000)</b>

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### 1.3 Identified High Impact & Occurrence Risk by option



H represents HIGH impact to Plan, or High Probability to Occur 7-10, M - Medium (4-6) and L - Low (1-3)

### 1.4 Other Key Issues

- A. This review involves 2 solutions that are at different stages of actualization. The AT&T solution that has been provided to the states thru FirstNet is the result of several years of requirement gathering and the culmination of Federal contraction negotiation. The Rivada solution is the result of their participation in the RFP at the federal level, and submitted to Vermont as a State Plan, but it has not gone thru any contract negotiations, nor challenges to its financial and business models.

### 1.5 Recommendation

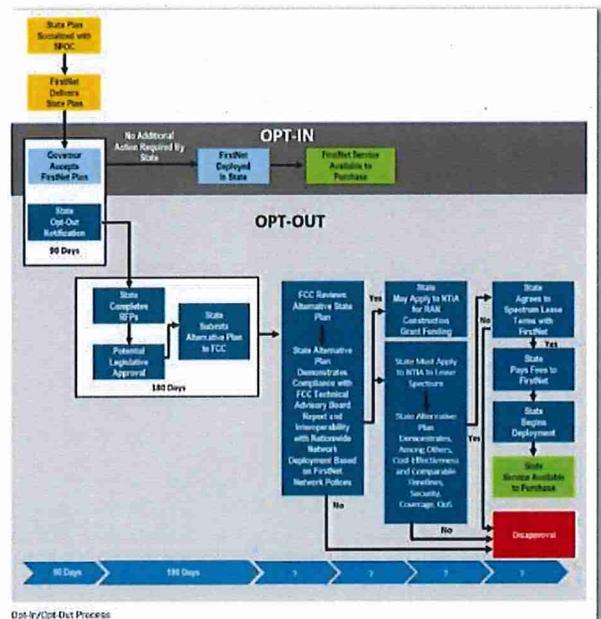
Below is an aggregate view of Risk and General Assessments. Risk are views for each option by using a scale of Low, Medium and High. The green shading represents a positive aggregate advantage and yellow represents equal scoring, or draw. Economic Development is scored in the inverse, as an opportunity view.

Area	Category	OPT-IN	OPT-OUT
Risk Assessments	Business		
	Technology		
	Financial		
	Economic Development		
General Assessment	Cost Benefit Analysis		
	Business Case Financials	n/a	
	Technology Architecture		
	Implementation Plan		
	Operating Cost Impacts		
	Potential of State Synergy		
	Coverage		

From this review, we recommend for Vermont to OPT-IN, but should address and close the following items with FirstNet/AT&T.

- Complete the detailed coverage commitments from AT&T, with Vermont PUC validation.
- Formally request FirstNet to pay penalties to Vermont if FirstNet commitments are missed.
- Request for the Federal Private-Public partnership to be disclosed and shared with Vermont, including Spectrum use and sharing of revenues.
- Request agreements and business plans to be equally transparent, and support State staffing requirements
- Request joint planning meetings with AT&T to discuss synergies and opportunities in Vermont for State tower placement

If the state were to consider an OPT-OUT option it would need to invest \$500-750,000 immediately to development of a comprehensive Technology and Telecommunication RAN plan for the State, which would be used to guide 120-200 days of discussions and planning with Rivada for a private-public partnership. Vermont would also need to concurrently attempt to address and close all the risk gaps associated with implementation execution, penalties, and build a stronger collaborative business case. During this approximate 6 months, Vermont’s Public Safety network enhancements would not proceed, and there is potential that Vermont’s OPT-OUT Plan would not be approved, or not able to complete the plan. FirstNet could say this is a late OPT-IN in the first year, and could charge up to [redacted] according to the [redacted]. We don’t believe they would do that, but there is a provision for this to occur.



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## 1.6 Independent Reviewer Certification

I certify that this Independent Review Report is an independent and unbiased assessment of the proposed solution's acquisition costs, technical architecture, implementation plan, cost-benefit analysis, and impact on net operating costs, based on the information made available to me by the State.

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Independent Reviewer Signature

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Date

## 1.7 Report Acceptance

The electronic signature below represents the acceptance of this document as the final completed Independent Review Report.

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State of Vermont Chief Information Officer

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Date

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## 2. Scope of this Independent Review

### 2.1 In-Scope

The scope of this document is fulfilling the requirements of Vermont Statute, Title 3, Chapter 45, §2222(g):

*The Secretary of Administration shall obtain independent expert review of any recommendation for any information technology initiated after July 1, 1996, as information technology activity is defined by subdivision (a) (10), when its total cost is \$1,000,000 or greater or when required by the State Chief Information Officer.*

Coeur Business Group (CBG) has been requested to review the FirstNet OPT-IN proposal awarded to AT&T against that of Rivada's response to an RFP OPT-OUT proposal provided to the State of Vermont. CBG was asked to prepare this review in the format of an Independent Review, which is typically to support the decision for a single supplier and seeks independent review/validation according to the State Statute previously referenced.

The independent review report includes:

- A comprehensive analysis of OPT-IN FirstNet and OPT-OUT Rivada RAN Solution
- A technology review of the OPT-IN and OPT-OUT plans
- A review of the OPT-IN and OPT-OUT implementation plans
- A cost/benefit analysis of OPT-IN and OUT-OUT plans
- An overall risk assessment of OPT-IN and OPT-OUT plans

### 2.2 Out-of-Scope

It is recognized that this Independent Review is not a typical single provider review, as Coeur Business Group is being asked to compare the OPT-IN solution from FirstNet and AT&T, and the OPT-OUT solution as presented by Rivada in a RFP. Furthermore, based on the size of the solution, \$20M+ grant, \$50M+ in capital and 25 year commitment and the timeframe to complete the review (4 weeks), it has been agreed there will be limits to some of the detail that is typical in an Independent Review. As previously mentioned, there are limits to the details of AT&T's solution and the Rivada solution is only in a RFP format. Other details that are also limited include:

- Federal and State Laws governing FirstNet OPT-IN or OPT-OUT rules
- Financial details that are not available from FirstNet or Rivada's proposals
- Complete Depth of Technical and Operational details not available
- Detailed conditions of financial assumptions for all 25 years of the agreement
- Acknowledge that certain AT&T information is retained at a Federal level within FirstNet and has already been negotiated at that level, and the RFP from Rivada has not been negotiated to a final stage for Vermont.

### 3. Sources of Information

#### 3.1 Independent Review Participants

Name	Employer and Title	Participation Topic(s)
Mark Peterson	Coeur Business Group Exec Partner	Executive Partner
Tim LaFaver	Coeur Business Group Sr Partner	Engagement Lead
Jeff Johnson	Coeur Business Group Sr Partner	Technical Lead
John Quinn	CIO – ADS State of Vermont	Critical Success Factor (CSF) Interview
Tom Anderson	Commissioner Vermont DPS	CSF and Departmental
Darwin Thompson	Director Share Services	CSF and ADS Telecom
Frank Costantino	Director – ADS and PSBC	CSF, PSBC, ADS
Dan Manz	PSBC - EMS	CSF, PSBC, EMS
Erica Bornemann	Director Emergency Mgmt. - DPS	DPS, Emergency Preparation
Terry LaValley	Director DPS and PSBC Chair	DPS, Radio, FirstNet, PSBC
Steve Locke	Fire Chief and PSBC	Fire, PSBC
Barb Neal	E911 Board	E911 and PSBC
Stephen Whitaker	Telecom Advocate	Federal, Local, Historical, Legal Perspectives
Ken Jones	Economist/PSBC Dept. Commerce	Discussion of Economic Dev.

#### 3.2 Independent Review Documentation

Document Name	Description	Source
RFP Issued by State of Vermont	Issued August 30, 2017 and RFP request a State RAN.	DPS Team
Rivada Response to RFP	Rivada’s Proposal	DPS Team
AT&T FirstNet Portal	Access to AT&T FirstNet Portal	DPS Team
AT&T Offer to Vermont	Great Coverage offer to Vermont from AT&T	DPS Team
FirstNet Spectrum Lease Agreement	Penalties and Spectrum lease agreement if State OPTs Out	DPS Team
Rivada Exparte	June 12, 2017 Rivada Petition to FCC	Internet
Congressional Research Service	January 2017 Document prepared for members of the US Congress	Internet
GAO Report to US Senate	June, 2017	Internet
Numerous other Documents	Placed into EPMO Project/Engagement Portal	S. Whittaker, Internet, Other
ITU BB Impact on Economy	Macro view of BB penetration on economy	Internet

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## 4. Project Information

### 4.1 Historical Background

Communications systems are essential for public safety officials, especially first responders such as police officers, firefighters, and emergency medical-services personnel. Whether conducting daily operations, overseeing planned events, or responding to emergencies, public safety officials rely on these systems to gather and share information and coordinate their efforts. However, we have previously reported that first responders often have difficulty communicating among agencies because existing systems lack interoperability—that is, first responders may lack the capabilities that allow them to communicate with their counterparts in other agencies and jurisdictions with differing systems.

The Middle Class Tax Relief and Job Creation Act of 2012 (the 2012 Act) created the First Responder Network Authority (FirstNet) within the Department of Commerce’s (Commerce) National Telecommunications and Information Administration (NTIA), and required it to establish a nationwide, interoperable public-safety broadband network (hereafter, the network). The 2012 Act provided FirstNet with \$7 billion to fund the network’s initial build-out and set aside spectrum for the network to operate on. Key to the network’s success, given its purpose, is its reliability, security, and interoperability. To inform its work, FirstNet must consult with state and local, federal, and tribal stakeholders. Since 2012, FirstNet has completed several tasks to plan for the build-out of the network, the most significant of which was the issuance of a request for proposal (RFP) to solicit proposals from private companies to build, operate, and maintain the network. From these proposals, FirstNet selected AT&T as its network contractor and awarded it a multi-billion dollar, 25-year contract in March 2017.

Since this selection at a Federal level, FirstNet and AT&T have offered the states and OPT-IN plan and Vermont issued an RFP for a state only plan interfacing with the national plan and meeting FirstNet’s guidelines. Vermont has until December 28, 2017 to decide if they want to OPT-IN, or select to OPT-OUT with the Rivada plan, yet to be negotiated.

### 4.2 Project Goal

Build a state of art Radio Access Network (RAN), utilizing Band 14 700 MHz and other wireless technologies to operating a public safety network across 55 states and territories and tribal nations for first and second tier responders. The RAN consists of radio base station infrastructure installed at cell sites, which enables wireless user equipment and devices to connect to the nationwide public safety broadband network.

By using standardized commercial broadband cellular technology with a nationwide distributed Core network, FirstNet will provide the public safety community with 21st century communication tools to enhance operational capabilities and improve the safety of first responders as well as the citizens they serve. The network will support public safety applications via a dedicated mobile application store and will accommodate an ever-evolving ecosystem of user devices, including smartphones, laptops, tablets, and ruggedized specialty devices. The network is planned to be available wherever and whenever needed –with both physical and operational redundancy and hardening. Its public safety-grade features,

combined with its continuously evolving standards-based wireless technology, will help fulfill public safety’s critical mission needs.

### 4.3 Project Scope

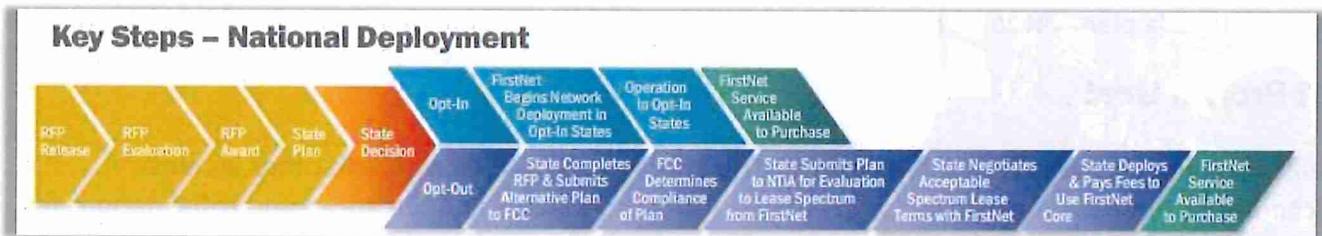
This project involves the design, buildout and management of a Radio Access Network focused on Public Safety first responders (Fire/Police/EMS) that would expand coverage, applications, devices and technologies in Vermont for 25 years and interconnect to other states and a national network. The first five years of this plan is to expand coverage and launch Band 14 700Mhz services as quickly as possible, and provide new lower cost and priority services to those first responders.

#### 4.3.1 Major Deliverables

1. Deploy new towers to improve coverage
2. Deploy Priority and Preemptive Services
3. Deploy Band 14/700Mhz services
4. Deploy and Market Devices/Applications and Services available within each discipline (Fire/Police/EMS)
5. Deploy and Manage an online and Customer Care Service Model to Vermont

### 4.4 Project Phases, Milestones and Schedule

Currently, Governor Phil Scott is responsible to make the decision to either OPT-IN or OPT-OUT by December 28, 2017. It is also noted that there are several gubernatorial, judicial and legislative efforts taking place in DC, in the states and territories to push for delays and more disclosure of the contract between FirstNet and AT&T. Below is a set of steps and considerations for Governor Scott.



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## 5. Acquisition Cost Assessment

Acquisition cost can't be looked at in a traditional manner. There is no capital cost needed in either OPT-OUT or OPT-IN Plans. Both plans require the State of Vermont to surrender its NTIA grant of \$20-25M and its license of Band 14 to the provider of its RAN solution.

In both plans the state will need to add additional resources or contractors/consultants to perform various functions of support, planning, administering Vermont's Telecom-Technology RAN Plan and deployment, but we don't see those as acquisition cost.

1. Cost Validation: Reviewed all FirstNet and RFP documents and held conversations with people mentioned in Section 3
2. Cost Comparison N/A
3. Cost Assessment N/A

## 6. Technology Architecture Review

**1. State’s Strategic Plan:** Describe how the proposed solution aligns with each of the State’s IT Strategic Principles:

1) Leverage successes of others, learning best practices from outside Vermont  
 OPT-IN: The FirstNet proposal is one that embraces a nationwide view. Their partner AT&T is a nationwide carrier and can leverage applications from many sources via their application developer environment.

OPT-OUT: Rivada brings lots of ‘outside’ expertise to Vermont along with leveraging the Application development environment as in the OPT-IN scenario.

2) Leverage shared services and cloud-based IT, taking advantage of IT economies of scale

NA

3) Adapt the Vermont workforce to the evolving needs of state government

NA

4) Apply enterprise architecture principles to drive digital transformation based on business needs

OPT-IN: AT&T, as the Network Partner, is one of the world’s largest carriers serving large enterprise customers. Their architecture principle’s embrace innovation, reliability, and high securing standards.

OPT-OUT: Rivada proposes an Industry standard architecture that should allow for normal technology evolution over time. The business drivers may be less on this network due to the regional nature vs. AT&T’s nationwide First Responder and commercial demands.

5) Couple IT with business process optimization, to improve overall productivity and customer service

NA

6) Optimize IT investments via sound Project Management

NA

7) Manage data commensurate with risk

NA

8) Incorporate metrics to measure outcomes

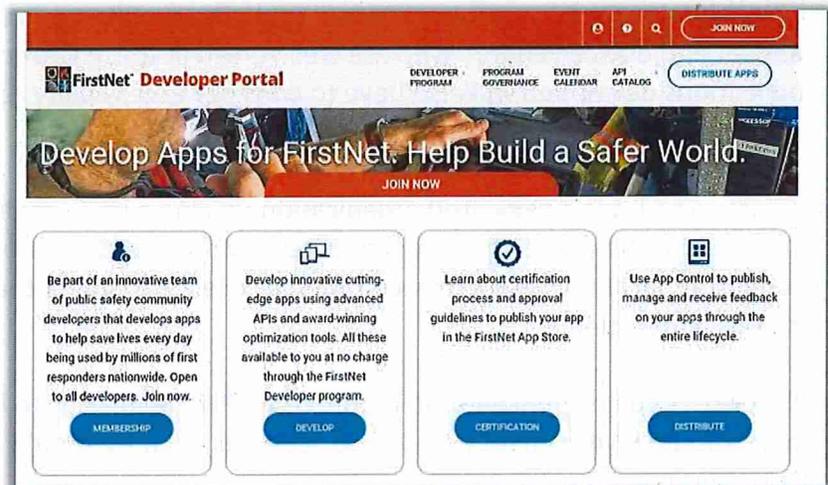
Both proposals will meet SLA’s by tracking KPI’s within their maintenance systems.

**2. Sustainability:** Comment on the sustainability of the solution’s technical architecture (i.e., is it sustainable?).

The architecture presented is one based on worldwide standards and used across all major telecom networks. It should be sustainable as the rest of the world generally aligns with this architecture as well.

OPT-IN: AT&T as the telecom partner is a big advocate of standard’s based solutions. They are already well down the path of planning for the next RAN evolution to an 5G network which will be a natural progression for their commercial as well as the FirstNet Solutions.

They are also offering an open network approach to application development which will allow for their solution to address new innovations in the first responder community. AT&T has almost a decade of experience in this open network approach to new applications.



Here's a view of the developer website @<https://developer.firstnet.att.com/firstnet>

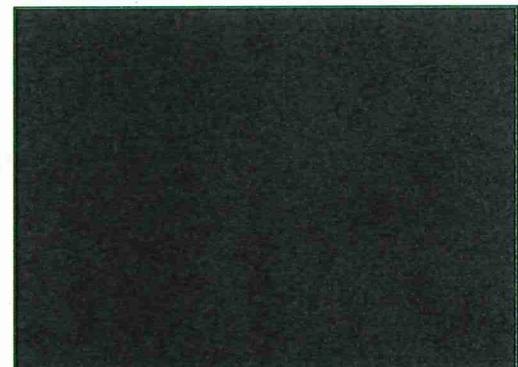
OPT-OUT: Rivada will follow the same Industry standard as a mandate to the FirstNet requirements. As a dedicated First Responder network, it has less drivers than the commercially based OPT-IN network for evolution and sustainability.

Advantage: OPT-IN

- 3. **Security:** Does the proposed solution have the appropriate level of security for the proposed activity it will perform (including any applicable State or Federal standards)? Please describe. Security is a mandatory component to any network – wireless or wireline today. There was little evidence found on the details of the security plans in either proposal.

OPT-IN: FirstNet will employ all the learning of the AT&T Security network that they deliver to the largest Business/Enterprise customers today. This experience is a valuable piece of the solution AT&T brings to FirstNet.

OPT-OUT: Rivada laid out their Cybersecurity plan lead by a team of competent vendors – lead by [REDACTED]. They have the challenge of putting all the pieces together across a complex network without direct experience in doing this across a live network. The partners and their roles are shown in the table.



Advantage: Slight advantage to OPT-IN

- 4. **Compliance** with the Section 508 Amendment to the Rehabilitation Act of 1973, as amended in 1998: Comment on the solution's compliance with accessibility standards as outlined in this amendment. Reference: <http://www.section508.gov/content/learn>

Little evidence found in either proposal towards compliance in this area. Much of this will fall to the handset and device vendors who are well versed in these Government requirements. However, the applications developed will also have to consider accessibility requirements outlined in the Government regulations.

OPT-IN: AT&T has a dedicated organization dealing with Compliance with these guidelines. They run every product/application through this review organization prior to placing the product/application/device into commercial use. We expect that that would be extended to any FirstNet application.

OPT-OUT: Little evidence found in this area. Rivada intends to lean heavily on the FirstNet Applications Development and Device activities, so they should have little trouble falling in line with the requirements.

Advantage: Slight advantage to OPT-IN

**5. Disaster Recovery:** What is your assessment of the proposed solution’s disaster recovery plan; do you think it is adequate? How might it be improved? Are there specific actions that you would recommend to improve the plan?

The disaster recovery plans outlined in the proposals are consistent with what the Commercial RAN networks offer. Battery back-up for short term (8 Hours), diesel generators at key sites. Both proposals call for management of the options through periodic testing, etc.

OPT-IN: AT&T will offer access to deployable diesel generators and to a fleet of portable cell sites that can be deployed with full Satellite connectivity if needed. AT&T has hundreds of deployable(s) (usable at no cost) and FirstNet is dedicating another 72 for FirstNet use only. FirstNet will manage these resources.

OPT-OUT: Rivada offer a [redacted] solution representing [redacted]. They plan to offer it two ways: [redacted] can be towed to the needed location and set-up in [redacted] minutes [redacted] will provide [redacted] on site very [redacted]. Rivada is also proposing [redacted]

Advantage: No discernable advantage.

**6. Data Retention:** Describe the relevant data retention needs and how they will be satisfied for or by the proposed solution.

Not much evidence found in the either proposal on data retention.

OPT-IN: AT&T does have a track record on data retention for their commercial network to meet various government/law enforcement requirements. We suspect these are fully available to the FirstNet solution.

OPT-OUT: Little evidence found on Data retention for the Rivada solution

Advantage: No discernable advantage due to lack of information

**7. Service Level Agreement:** What are the post implementation services and service levels required by the State? Is the vendor proposed service level agreement adequate to meet these needs in your judgement?

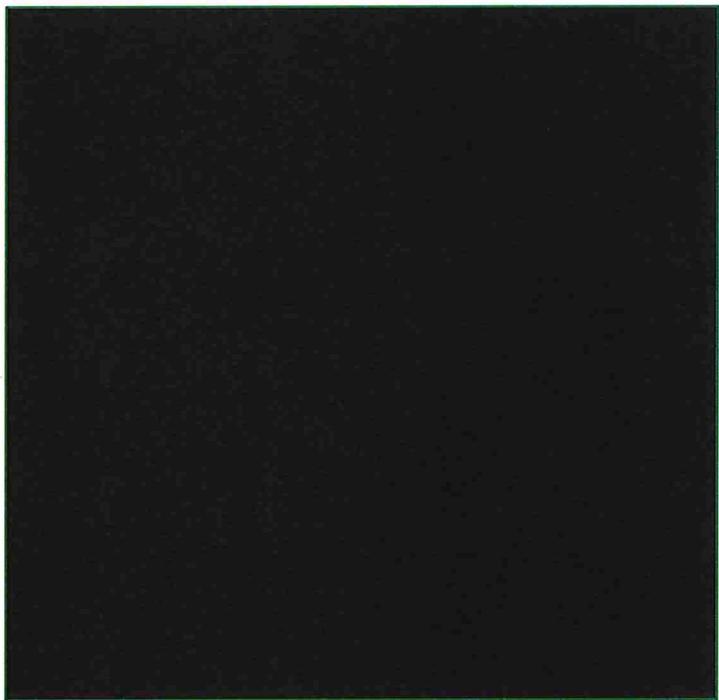
Both proposals included network architectures that are supported by traditional network redundancy at various hierarchal levels to ensure network SLA's are achieved. Both support spares inventories to align with SLA's as well.

OPT-IN: Little evidence of SLA details included in the FirstNet proposal. AT&T does state a goal of Network reliability/availability of [REDACTED] which is supported by the historical availability of their commercial LTE network.

OPT-OUT: Rivada will provide [REDACTED]  
[REDACTED] where Vermont's executive office and the PSEs can monitor [REDACTED]  
[REDACTED] to verify SLA achievement; as well as manage their communication needs and profiles. [REDACTED]

[REDACTED] These systems and processes allow Vermont to effectively manage their first responders' services and accounts as well as communicate effectively to all concerned PSEs the real-time status of the network.

The [REDACTED] works with Vermont's public safety leadership on adherence to [REDACTED]



Advantage: OPT-OUT – based on amount of information in proposal.

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**8. System Integration:** Is the data export reporting capability of the proposed solution consumable by the State? What data is exchanged and what systems (State and non-State) will the solution integrate/interface with?

Not much evidence found in the either proposal on data exchange.

OPT-IN: Little evidence found in FirstNet proposal on this topic.

OPT-OUT: Little evidence found on Data retention for the Rivada solution

Advantage: No discernable advantage due to lack of information

## 7. Assessment of Implementation Plan

### 1. The reality of the implementation timetable

OPT-IN: Given that AT&T has statewide coverage today, they are ready for service almost immediately. They are proposing an [REDACTED]

[REDACTED] They will be adding the band 14 spectrum to their existing sites. They should be able to achieve that in a 5-year program. Their data suggests it will be most completed within 36 month of OPT-IN notice. The biggest challenge is that AT&T will be dealing with expansion across the entire nation. AT&T's Proposed coverage is shown in the figure along with the list town/site names.



OPT-OUT: Rivada will start service via an [REDACTED] This will be in place while they [REDACTED] They will have the benefit of utilizing [REDACTED]

[REDACTED] While they have strong experience among their owner companies and partners, building a new network will be quite challenging. Many agreements and organizational structures must be formed. A more daunting task than the OPT-IN solution. We also see potential issues surrounding their roaming models, and it treats the band 14 network as an island.



Advantage: OPT-IN

### 2. Readiness of impacted divisions/ departments to participate in this solution/project (consider current culture, staff buy-in, organizational changes needed, and leadership readiness).

OPT-IN: AT&T has experience with projects of this size. They essentially converted their entire network form 3G technology to 4G/LTE, so they know how to do large projects. Their organizational structure is in place should be sufficient along with a Project Management organization dedicated to FirstNet buildout.

OPT-OUT: Although strong partners make up the Rivada team, they will be starting a new organizational structure and require many agreements be put into place to get this proposal off the ground. They have many of the organizational structures drawn up in their proposal, but they are yet to be formed.

Advantage: OPT-IN

3. Do the milestones and deliverables proposed by the vendor provide enough detail to hold them accountable for meeting the Business needs in these areas:

In general, not as much evidence found in this area as we would like to see, but AT&T has extensive experience in deploying new technology and network expansions. This project scope is smaller than other projects they have done (e.g., LTE Deployment).

A. Project Management

OPT-IN: Little detailed evidence found in this area. The FirstNet build proposal is lacking details, although AT&T has considerable experience with large project management. The OPT-IN option requires significantly less build as it relies on embedded infrastructure and expanding it.

OPT-OUT: Rivada is comprised of a set of owners and partners with lots of experience across many of the work disciplines for this project. There is little experience to measure their abilities here as a team.

Advantage: OPT-IN based on experience and organizational structure.

B. Training

Little detailed evidence found in either proposal in this area.

OPT-IN: For FirstNet/AT&T, we don't see the need for lots of additional training as the technology is similar to the commercial network.

OPT-OUT: Rivada, as a startup company along with its many partners will have much training to get their new company up and running. Some of this challenge will be mitigated if they get several states committed to their solution.

Advantage: OPT-IN

C. Testing

Little detailed evidence found in this area.

OPT-IN: With the larger commercial base of AT&T, structured testing is expected and should be sufficient for this project.

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OPT-OUT: Testing should also be expected within the consortium of Rivada, but we are slightly concerning that they may initially suffer from defining roles, which is crucial in testing.

Advantage: No discernible advantage

D. Design

Little detailed evidence found in either proposal in this area.

OPT-IN: AT&T has years of design experience and RF engineers capable of handling expanding to the Band 14 design.

OPT-OUT: Rivada's partners have lots of design experience

Advantage: No discernible advantage

E. Conversion (if applicable)

NA

F. Implementation planning

Little evidence was found that supports the detailed implementation in either proposal.

OPT-IN: AT&T has years of experience in implementation planning and the implementation within Vermont will align similarly with those in the other OPT-IN states, so

OPT-OUT: The partners that comprise the Rivada proposal have strong track records in previous projects. What is unknown is how they will come together as an organization with agreements and organization structure present as 'chart ware' only. They should possess the necessary tool set to have success in planning the deployment.

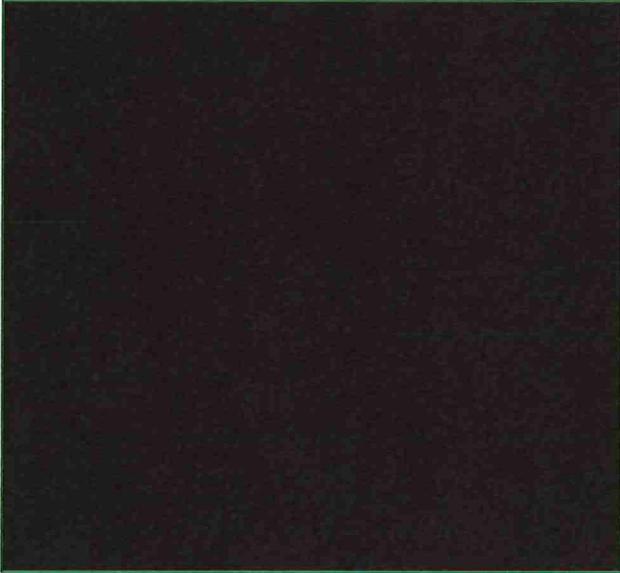
Advantage: OPT-IN

G. Implementation

Little evidence was found that supports the detailed implementation in either proposal.

OPT-IN: AT&T has years of implementation experience including the task of converting their network over to a LTE based architecture that essentially replaced/upgraded every component of the network. As a nationwide carrier, they have a large network implementation capability.

OPT-OUT: Rivada has done a good job of outlining an organization structure required for implementing their proposal, but has no real track record in live network builds. Each of their partners has had success, but not as the entity that is making the proposal. They have a real challenging aligning rolls, signing agreements, and executing on the many task to achieve successful implementation. Their Program management structure is shown below:



Advantage: OPT-IN

- 4. Does the State have a resource lined up to be the Project Manager on the project? If so, does this person possess the skills and experience to be successful in this role in your judgement? Please explain.

Vermont should utilize the EPMO processes deployed within ADS for either OPT-IN or OPT-OUT decisions. An OPT-IN decision would require an increment of one EPMO resources, plus the potential need for an external consultant to perform Independent Validation and Verification (IV&V) functions through at least the first three years of build and deployment of the FirstNet commitments. For an OP-OUT decision, the EPMO will need to increase resources to 3-4 EPMO resources, plus additional IV&V resources, and possibly additional telecom technical support resources.

## 8. Cost Benefit Analysis

- 1. Analysis Description:** For Benefits, this analysis used reduced wireless rates and the potential of some other network savings to off load voice/data requirements to the RAN. For Cost, this analysis included incremental headcount and overlay consulting services for the State’s Cost/Benefit Analysis.

It should also be noted in this review the financial stability of an OPT-OUT Plan business case must be strong, as it is expected be self-supporting, and would need to be reviewed and approved by FirstNet. We don’t have access to AT&T’s business case to FirstNet to review, but we’ve included some concerns in our review of Rivada’s plan in the additional comments section below.

- 2. List any assumptions made in your analysis**

**BENEFITS** CBG assumes that there would be downward price/cost pressures to monthly subscription rates; \$10/month for AT&T and \$15/month for Rivada. This analysis also assumed that penetration would begin year 1 at 10% to 80% in year 5 with AT&T, and would not start until year 2 at 10% with Rivada and end at 70% in year 5. For Cost/Benefit Analysis, we used 5000 First Responders and 5000 Secondary Responders. An additional \$200K/year was added to demonstrate off loaded traffic from traditional voice/data requirements, and these don’t start until year 3.

**COST** Below are the resource assumptions made that for increase Staff, using a conservative \$75k yr. loaded labor rate. Additional consulting fees of \$300K for OPT-IN and \$450K for OPT-OUT decisions.

**OPT IN RESOURCE MODEL**

	Incremental HC				
	2018	2019	2020	2021	2022
State Perm Staff.....	3	4	4	4	4
State Temp Staff.....	3	2	2	0	0
State EPMO Staff.....	1	1	1	1	1

**OPT OUT RESOURCE MODEL**

	Incremental HC				
	2018	2019	2020	2021	2022
State Perm Staff.....	4	6	8	8	8
State Temp Staff.....	7	4	4	4	0
State EPMO Staff.....	3	2	2	2	1

- 3. Funding:** The primary funding for OPT-OUT solutions come from passing on the funds from the NTIA grant expected to be between \$20-25M. It may be determined that some of these resources can be used in helping the state overlay resources to the plans. In the OPT-OUT plan Rivada also proposes

[REDACTED]

In an OPT-IN solution, there are potential funds available thru SLIGP 2.0 to cover all, or some of the cost. We don’t count either in Cost/Benefit Models. The savings from Network Convergence is a conservative number and could be increased as partnering with OPT-OUT partner, or if AT&T is open in participate in planning and partnering with Vermont’s telecom plan.

- 4. Costs vs. Benefits:** Do the benefits of this project (consider both tangible and intangible) outweigh the costs in your opinion? There are additional opportunities to quantify economic benefits of improved broadband coverage and how that might impact education, economic (job

growth/business expansion/state growth), but that is not in the scope of this review. There are several studies that need to be extrapolated for Vermont. It is also recognized that are definitive telecom cost for the state and investments made in separate facilities within the various departments. These could be thoroughly reviewed for consolidation in sharing across departments and the potential of collaborating those investments into OPT-IN or OPT-OUT cost models, hence reducing cost to the state, but again, this is not in the scope of this project.

**Additional Comments on the Cost Benefit Analysis:**

1. Not included in this Vermont Cost Benefit review are the overriding risk of the spectrum cost, penalties of penetrations and OPT-BACKIN cost if Vermont were to OPT-OUT.
2. We don't include the potential off sets from revenue sharing in OPT-OUT models, nor do we include SLIGP funding in an OPT-IN model.
3. **Contract Negotiation Considerations** As previously mentioned, Rivada's solution is only at a proposal stage and it has yet to begin any type of two-way negotiation/exploration and does not include discussions surrounding the potential of a collaborative partnership. We believe that this would take at least 120-200 days allowed for the state to prepare its plan if it were to elect to OPT-OUT, which means detailed Plans would need to be developed simultaneous to contract negotiations. Also worth noting is Rivada Networks placed a [REDACTED] into their bid, but we're unclear of the capacity of Rivada-Vermont, or its financial relationships to parent companies to support these size penalties. This is crucial as Vermont would need to transfer FirstNet penalties to any OPT-OUT provider.
4. **Financial Assumption Review** - Rivada explains their plan is a no cost plan to Vermont, and has the premise to provide additional capacities on a wholesale basis. Further review of how these monies could be used would need additional legal interpretation. [REDACTED] and [REDACTED] in the subsequent [REDACTED] of the relationship. Their first assumption of NTIA funds is under estimated by \$3-8M. As mentioned earlier, the Rivada plan state that Vermont would [REDACTED] [REDACTED] After legal approval, these could be earmarked to support additional personnel of the State to support OPT-OUT plan. [REDACTED], Rivada expects to gain; [REDACTED] [REDACTED] [REDACTED] [REDACTED]

As wholesale and other categories represents 63.73% of the revenues, Vermont would need to explore these in much more details as they are significant assumption in their viability of their business model. As they would be partnering with [REDACTED] and [REDACTED], we're not sure the how they would capture this much from Verizon, AT&T or other carriers within the state.

Rivada also has an [REDACTED] under another category, which seems high for generally unclassified. Finally, they only budgeted [REDACTED] [REDACTED] As a percentage of total expenses that only represents .89% and is low for a new business build.

## 9. Impact Analysis on Net Operating Costs

### 1. Net Operating Cost Impact.

OPT IN

	Year ending...					TOTAL
	2018	2019	2020	2021	2022	
<b>Personal Services Costs (Salaries &amp; Benefits)</b>						
State Perm Staff.....	(225,000.0)	(300,000.0)	(300,000.0)	(300,000.0)	(300,000.0)	(1,425,000.0)
State Temp Staff.....	(225,000.0)	(150,000.0)	(150,000.0)	0.0	0.0	(525,000.0)
State EPMO Staff.....	(75,000.0)	(75,000.0)	(75,000.0)	(75,000.0)	(75,000.0)	(375,000.0)
<b>Services &amp; Supplies/Capital Outlay Costs</b>						
State Data Center Costs						
Consulting Services.....	150.0	150.0	0.0	0.0	0.0	300.0
<b>Total Costs</b>	<b>(524,850.0)</b>	<b>(524,850.0)</b>	<b>(525,000.0)</b>	<b>(375,000.0)</b>	<b>(375,000.0)</b>	<b>(2,324,700.0)</b>

OPT-OUT

	Year ending...					TOTAL
	2018	2019	2020	2021	2022	
<b>Personal Services Costs (Salaries &amp; Benefits)</b>						
State Perm Staff.....	(300,000.0)	(450,000.0)	(600,000.0)	(600,000.0)	(600,000.0)	(2,550,000.0)
State Temp Staff.....	(525,000.0)	(300,000.0)	(300,000.0)	(300,000.0)	0.0	(1,425,000.0)
State EPMO Staff.....	(225,000.0)	(150,000.0)	(150,000.0)	(150,000.0)	(75,000.0)	(750,000.0)
<b>Services &amp; Supplies/Capital Outlay Costs</b>						
State Data Center Costs						
Consulting Services.....	150,000.0	100,000.0	100,000.0	100,000.0	0.0	450,000.0
<b>Total Costs</b>	<b>(900,000.0)</b>	<b>(800,000.0)</b>	<b>(950,000.0)</b>	<b>(950,000.0)</b>	<b>(675,000.0)</b>	<b>(4,275,000.0)</b>

- The operating cost reflected above is a result of the staff headcounts and consulting expenses outlined in Section 8 of this document. The headcounts use an average load labor rate of \$75K/year, which reflects a ~25% premium of average salary cost of State of Vermont employees.
- In OPT\_IN model Vermont could be eligible for SLIGP funding to off-set state resources. In the OPT-OUT plan Rivada provides a [REDACTED] that would comfortably cover these additional overhead cost, if permitted and revenue goals are met. We don't include either of these off sets.
- In the included business case and assumptions, we see discounted (2%) breakeven for OPT-OUT in Year 4, and Year 3 in OPT-IN decision.

## 10. Risk Assessment & Risk Register

Attachment 2 is the completed Risk Register that was worked through participants in the creating this Independent Review. As stated previously, the majority of OPT-OUT mitigation action items are to insure they're included in; contract, negotiation, planning, legal, financial and technical reviews. The OPT-IN Risk are actions that need to be made with FirstNet and/or AT&T directly.

Year ending...

Discount rate

2.0%



**OPT OUT CASH FLOW**

	2018	2019	2020	2021	2022	TOTAL
<b>BENEFITS / GAINS</b>						
Wireless Penetration	0%	10%	35%	55%	70%	
Reduced Wireless Rate	\$0	\$180,000	\$630,000	\$990,000	\$1,260,000	\$3,060,000
Network Convergence	\$0	\$0	\$200,000	\$200,000	\$200,000	\$600,000
Benefit item 3.....	\$0	\$0	\$0	\$0	\$0	\$0
Benefit item 4.....	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Benefits/Gains</b>						

**COST ITEMS** inflows (outflows)

**Personal Services Costs (Salaries & Benefits)**

State Perm Staff.....	(\$300,000)	(\$450,000)	(\$600,000)	(\$600,000)	(\$600,000)	(\$2,550,000)
State Temp Staff.....	(\$525,000)	(\$300,000)	(\$300,000)	(\$300,000)	\$0	(\$1,425,000)
State EPMO Staff.....	(\$225,000)	(\$150,000)	(\$150,000)	(\$150,000)	(\$75,000)	(\$750,000)

**Services & Supplies/Capital Outlay Costs**

<b>State Data Center Costs</b>						
Consulting Services.....	\$150,000	\$100,000	\$100,000	\$100,000	\$0	\$450,000
<b>Total Costs</b>						

**CASH FLOW SUMMARY** inflows (outflows)

Cash inflows (outflows)

Benefits and Gains.....	\$0	\$180,000	\$830,000	\$1,190,000	\$1,460,000	\$3,660,000
Costs.....	(\$900,000)	(\$800,000)	(\$950,000)	(\$950,000)	(\$675,000)	(\$3,600,000)
<b>NET CASH FLOW</b>	(\$900,000)	(\$620,000)	(\$120,000)	\$240,000	\$785,000	\$60,000
Cumulative Net CF .....	(\$900,000)	(\$1,520,000)	(\$1,640,000)	(\$1,400,000)	(\$615,000)	\$60,000



NPV

Discounted Cash Flow

At 2.0%.....	(\$882,353)	(\$595,925)	(\$113,079)	\$221,723	\$710,999	(\$658,635)
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**Cost/Benefit Continued**

**OPT IN CASH FLOW**

Discount rate **2.0%**

Year ending ...

	2018	2019	2020	2021	2022	TOTAL
<b>BENEFITS / GAINS</b>						
Wireless Penetration	10%	25%	40%	60%	80%	
Reduced Wireless Rate	\$120,000	\$300,000	\$480,000	\$720,000	\$960,000	\$2,580,000
Network Convergence	\$0	\$0	\$200,000	\$200,000	\$200,000	\$600,000
Benefit item 3.....	\$0	\$0	\$0	\$0	\$0	\$0
Benefit item 4.....	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Benefits/Gains</b>	<b>\$120,000</b>	<b>\$300,000</b>	<b>\$680,000</b>	<b>\$920,000</b>	<b>\$1,160,000</b>	<b>\$3,180,000</b>

**COST ITEMS inflows (outflows)**

**Personal Services Costs (Salaries & Benefits)**

State Perm Staff.....	(\$225,000)	(\$300,000)	(\$300,000)	(\$300,000)	(\$300,000)	(\$1,425,000)
State Temp Staff.....	(\$225,000)	(\$150,000)	(\$150,000)	\$0	\$0	(\$525,000)
State EPMO Staff.....	(\$75,000)	(\$75,000)	(\$75,000)	(\$75,000)	(\$75,000)	(\$375,000)

**Services & Supplies/Capital Outlay Costs**

<b>State Data Center Costs</b>	\$150	\$150	\$0	\$0	\$0	\$300
Consulting Services.....						
<b>Total Costs</b>						

**CASH FLOW SUMMARY inflows (outflows)**

<b>Cash inflows (outflows)</b>						
Benefits and Gains.....	\$120,000	\$300,000	\$680,000	\$920,000	\$1,160,000	3180000
Costs.....	(\$524,850)	(\$524,850)	(\$525,000)	(\$375,000)	(\$375,000)	(\$2,324,700)
<b>NET CASH FLOW</b>	<b>(\$404,850)</b>	<b>(\$224,850)</b>	<b>\$155,000</b>	<b>\$545,000</b>	<b>\$785,000</b>	<b>\$855,300</b>
Cumulative Net CF.....	(\$404,850)	(\$629,700)	(\$474,700)	\$70,300	\$855,300	\$855,300

**Discounted Cash Flow**

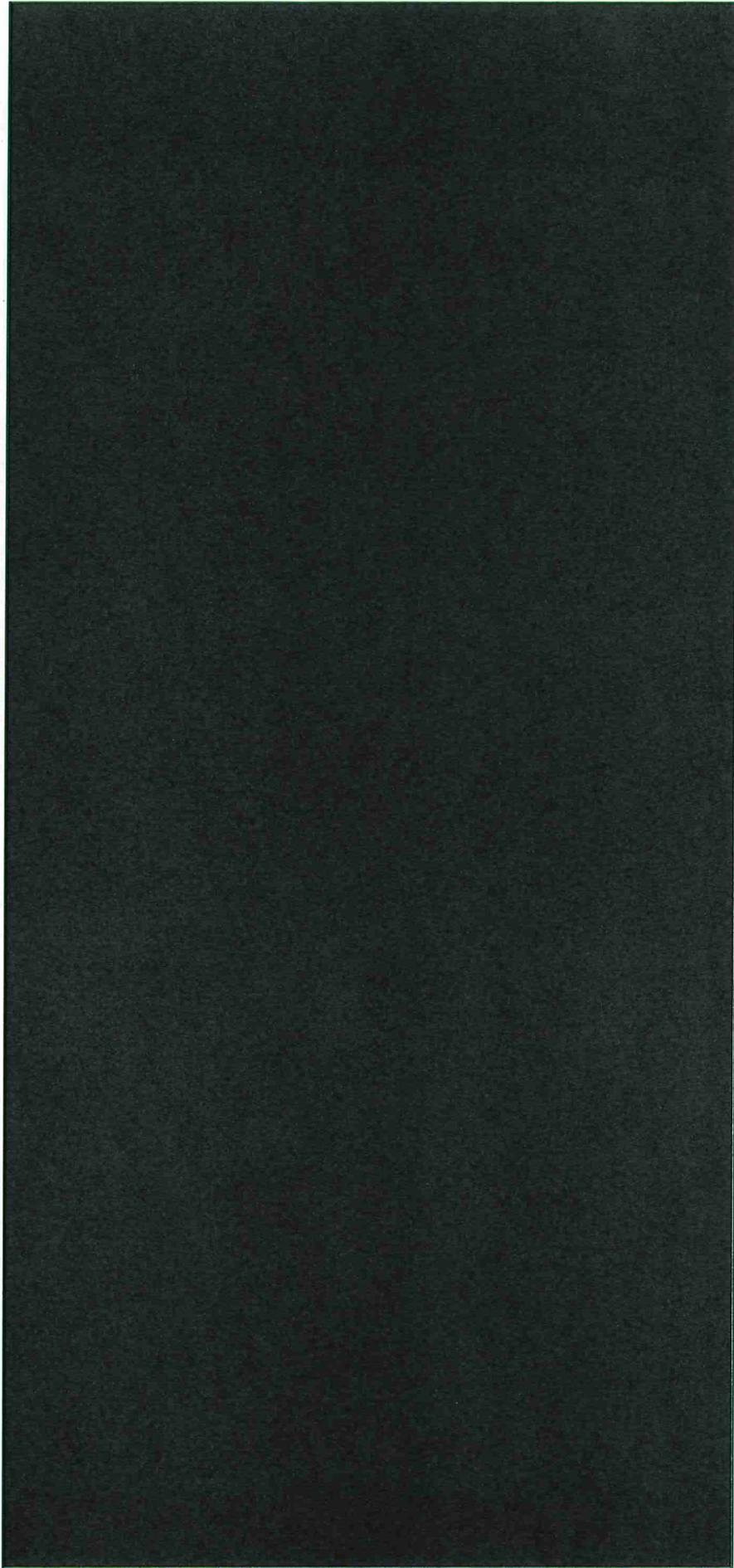
At 2.0%.....	(\$396,912)	(\$216,119)	\$146,060	\$493,623	\$710,999	\$737,651
<b>NPV</b>						

Information is confidential and proprietary between the State of Vermont and Coeur Business Group

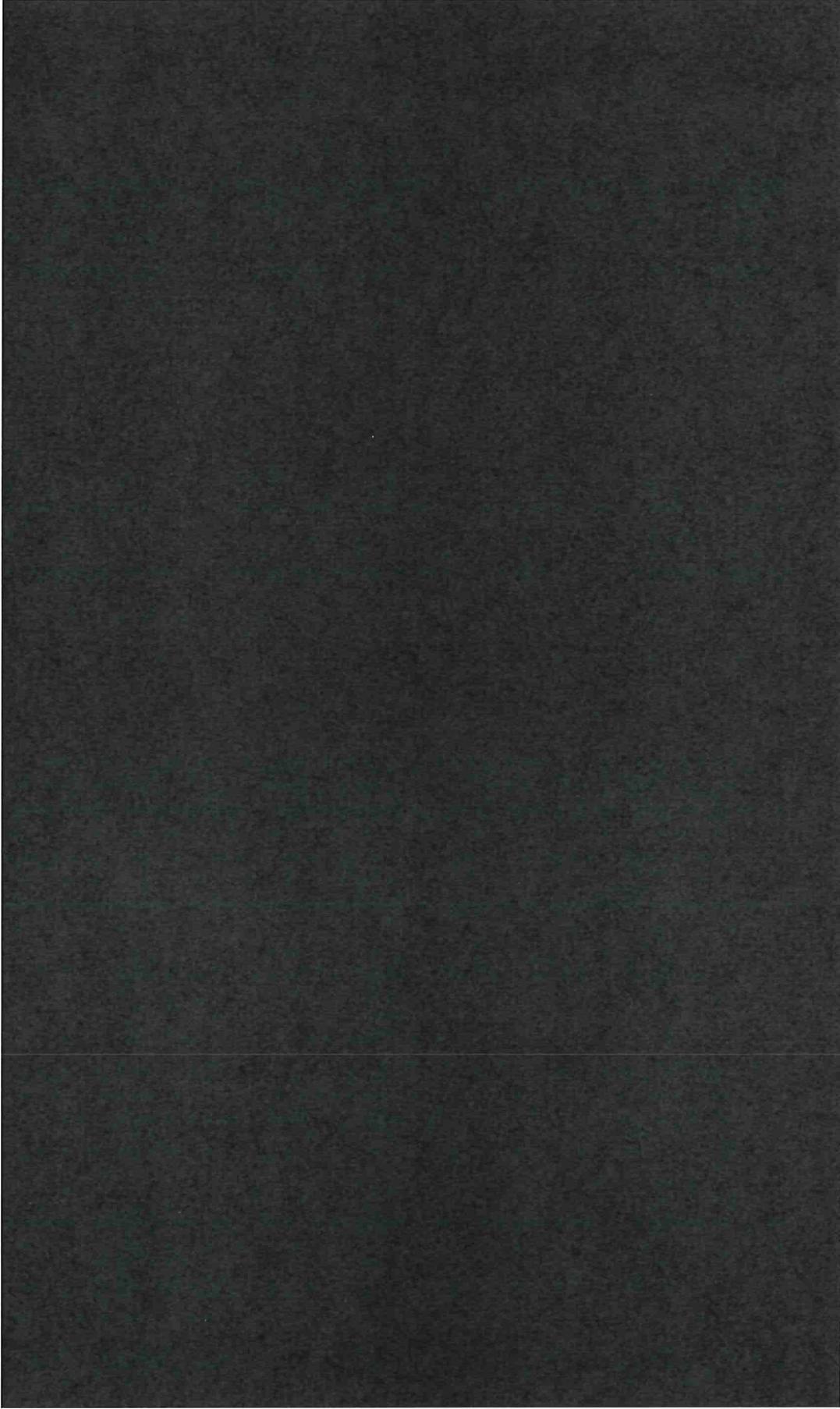


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Attachment 2 - RISK REGISTER  
TECHNOLOGY



TECHNOLOGY (CONTINUED)



BUSINESS, FINANCE and ECONOMIC DEVELOPMENT

