Vermont Public Safety Communications System: Options & Plan Recommendations

Final Report

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Vermont Public Safety Communications Task Force

MissionCriticalPartners

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1 Executive Summary

Since the inception of 911 in 1968, public safety officials have consistently leveraged technological advancements to enhance the efficiency and effectiveness of emergency responses. However, these advancements have often occurred in isolated silos, a natural byproduct of limited collaboration within the emergency communications ecosystem.[1] As the public safety communications landscape continues to evolve rapidly, it has become increasingly critical for states like Vermont and their public safety stakeholders to adopt a holistic and strategic approach. By fostering collaboration and aligning efforts across the ecosystem, Vermont can significantly improve public safety outcomes and build a more resilient communications infrastructure.

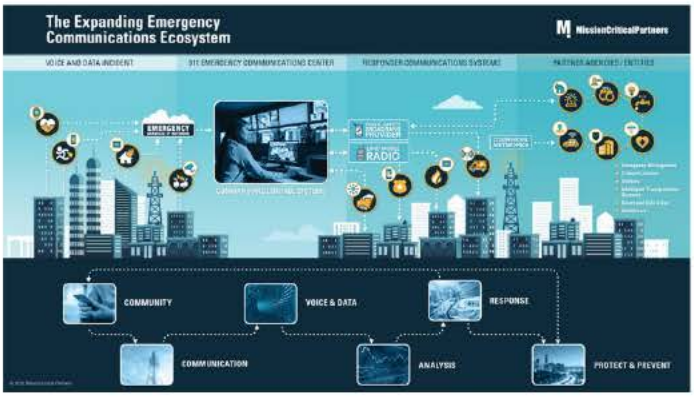

Figure 1: Emergency Communications Ecosystem

In many cases, the pace of change within the public safety communications landscape is outpacing the ability of agencies to adapt. This has left smaller communications centers, despite their dedication and training, increasingly vulnerable and at risk of being left behind. Regardless of size, communications centers that are unwilling to explore or cannot afford their options due to funding limitations or other challenges, regardless of their specific location, run the risk of exacerbating the problem—placing the best interests of Vermont residents and visitors on a precipice. Such inaction can create gaps within the broader ecosystem, heightening risk exposure and introducing points of failure into a system that may otherwise appear efficient and effective on the surface.

Essentially, there are 37 independently operated ecosystems (six public safety answering points [PSAPs][2] and 31 dispatch centers) that interact and/or coordinate with each other at various levels.

These centers serve a population of 642,464 people in the state of Vermont, which is considerably more than some places in the country that have double the population with only one or two PSAPs and no regional dispatch centers.

Within the current Vermont environment there is a clear separation of the roles of PSAPs and dispatch centers as well as the functions performed by call-takers and dispatchers. Through physical regionalization, the functions of PSAPs and dispatch centers can be combined aligning call intake and dispatch functions for police, fire, and emergency medical services (EMS) to provide direct dispatch (also known in Vermont as single-stage call handling; see Appendix I).

Per NENA: "Direct Dispatch is the performance of 9-1-1 service wherein upon receipt of an emergency call, a PSAP telecommunicator transmits, without delay, transfer, relay, or referral, all relevant available information to the appropriate public safety personnel or emergency responders."

[1] A public safety communications ecosystem can be defined as the network and tools that help public safety agencies like emergency communications centers, police and fire departments, and EMS agencies communicate. Each agency has its own unique configuration (e.g., facilities and staff) but they may also be able to communicate with neighboring agencies. These connected but separate configurations form individual ecosystems within the larger environment. An enlarged version of the graphic can be found in Appendix M.

[2] Except as it relates to the mode of call intake and its relationship to the life cycle of the emergency that is inclusive of call intake through dispatch, the evaluation of the statewide 911 system was not included in the scope of this project, nor was an assessment of the statewide 911 system conducted as a part of this work.

This public safety communications system configuration presents inherent challenges and risks, particularly related to the transfer of 911 calls. For instance, based on an average of 90 seconds per transfer, handling approximately 78,516 calls annually through a two-stage process (Appendix I) results in an estimated 1,963 hours of avoidable call processing time. The challenges and risks were articulated throughout the inventory and assessment report and contributed to the overall assessment Model for Advancing Public Safety® (MAPS®)[3] score of [redacted] out of 10. The outcomes of the MAPS analysis are a factor that is used to help frame the future proposed solutions for meeting the intent of Act 78 for the planning and implementation of a reliable, secure, and interoperable statewide public safety communications system.[4]

The *Vermont Public Safety Communications System Inventory and Assessment* (inventory and assessment report) serves as a foundational resource for shaping the system's future opportunities and design considerations outlined in this plan. When available, readers are encouraged to familiarize themselves with the full inventory and assessment report prior to proceeding with this document. When this is not possible, at a minimum, readers are encouraged to familiarize themselves with the trends and insights and regionalization benchmark criteria roadmap sections. For ease of access, these two sections, which summarize a significant amount of information upon which recommendations herein were customized, have been inserted into this document as Appendix A and Appendix B, respectively. The content of the appendices were compiled based on the data and information gathered through execution of the stakeholder engagement strategy that included, but was not limited to, surveys and questionnaires, multiple workshops, and listening and strategy sessions. The results informed the development of Mission Critical Partners'® (MCP) recommendations and a comprehensive plan for a reliable, secure, and interoperable statewide public safety communications system that is:

- Equitably and sustainably financed and universally accessible by all people throughout the state, and
- Enhances, strengthens, and builds upon previous efforts and initiatives.

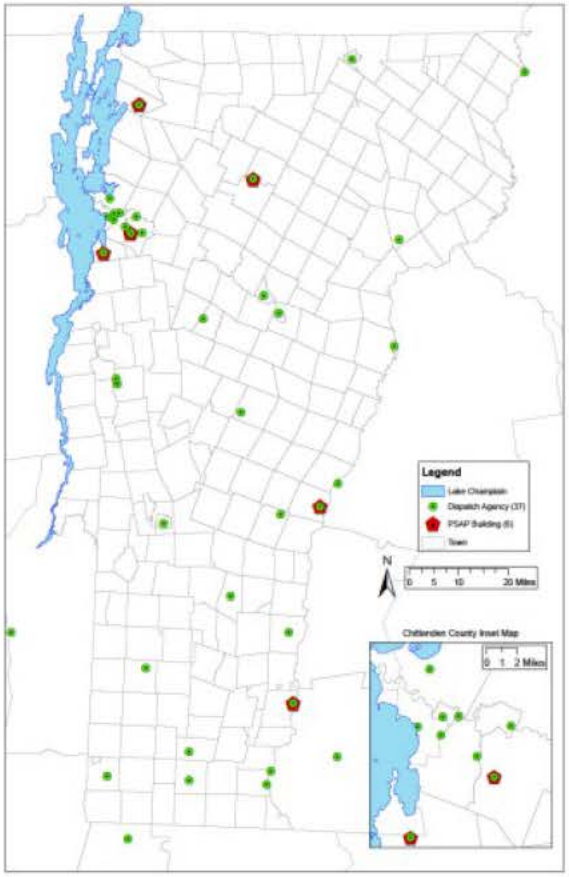

Figure 2: Vermont PSAP and Dispatch Center Locations

While MCP's assessment found significant opportunities for improvements across the state[5], it is important to note that several of the recommendations build on successful local, regional, and state initiatives. This includes

[3] MAPS is a proprietary assessment methodology developed internally by MCP for determining where an organization stands regarding numerous critical factors. See Section 2 for a detailed description of the MAPS methodology.
[4] Use of language such as direct reference to a "statewide public safety communications system" while it acknowledges the legislative language used in Act 78, use in this document is not intended to imply the creation of a public safety communications system owned and operated solely by the State of Vermont.
[5] These recommendations are focused on public safety communications. Because communications centers are hosted in law enforcement facilities, MCP is in no way implying that the law enforcement and fire/EMS organizations are not providing excellent field service to their constituents.

training requirements and standards for 911 call-takers and effective regional PSAPs, for example. Based on national standards and best practices, MCP has crafted an array of practical and achievable recommendations, customized for the state of Vermont's unique operating picture.

MCP acknowledges that the emergency communication centers statewide—PSAPs and dispatch centers alike—have often operated under constrained budgets and staff have shown great dedication in the light of various challenges these budget shortfalls can present (e.g., limited staffing, technology upgrades, etc.). Recognizing that some recommendations may be more complex than others, MCP has given significant consideration to cost impacts and identified where the State may achieve significant benefits with minimal expense.

MCP's conclusions that the state's public safety communications system can benefit from significant improvement are supported by several key areas of concern highlighted in the inventory and assessment report, gleaned from PSAP, dispatch center, field, elected official, and public stakeholder feedback, and are the focus of improvement in this communications system plan.[6]

- Lack of a cohesive statewide system: The findings validate the significant gap in the absence of a comprehensive and coordinated reliable, secure, and interoperable statewide public safety communications system. This lack of a unified system hinders the ability to effectively address the challenges faced by public safety agencies across Vermont. The findings align with the State's vision to develop a comprehensive plan that outlines a clear roadmap for achieving a reliable, secure, and interoperable statewide public safety communications system.
- Operational inefficiencies and lack of strategic inclusion: Operational inefficiencies and a lack of strategic inclusion[7] are a key area for improvement. Adhering to standards, implementing best practices, and fostering collaboration among public safety agencies to enhance operational efficiency and promoting inclusion of stakeholders in decision-making processes are needed.
- Staffing shortages and inefficiencies: Staffing shortages and inefficiencies are a major challenge for public safety agencies. The industry standard requires a minimum of two qualified telecommunicators on duty at all times, but many agencies struggle to meet this requirement. The findings support the need for a robust staffing strategy for adequate staffing levels to meet operational demands and maintain efficient service delivery.
- Training gaps and dispatcher health and wellness: A need for effective statewide training requirements for both public safety answering points (PSAPs) and dispatch centers to equip public safety communications personnel with the necessary skills and knowledge to effectively provide call-taking and dispatch services was identified. Strategies to address dispatcher health and wellness, such as providing adequate support and resources, are needed.
- Technological limitations and infrastructure issues: Technological limitations and infrastructure issues are significant barriers to effective communication. The findings support investing in modern technology and infrastructure upgrades to enhance the reliability, security, and interoperability of the public safety communications system.
- Lack of failover/backup capabilities: A limited number of agencies possess or operate failover and/or backup capabilities. This presents a potential problem if one or more agencies—particularly

[6] Refer to footnote #2 for supporting clarifications.
[7] Strategic inclusion indicates the strategic planning process for emergency communication agencies. This can be achieved through a strategic planning process specific to just the emergency communication function within an agency, and/or the inclusion of information specific to the emergency communication function within an agency's overall strategic plan.

PSAPs—are rendered technologically inoperable or the facility is damaged or otherwise uninhabitable. The findings support a statewide minimum standard for failover and backup capabilities to allow for appropriate continuity of operations during normal day-to-day operations and times of disaster.

- Fragmented public safety wireless environment: Systems are operating across various technology platforms and frequency bands. While some digital, Project 25 (P25)-compliant land mobile radio (LMR) networks exist, the majority of systems operate in analog mode, primarily in the ultra-high frequency (UHF) band for law enforcement and the very high frequency (VHF) band for fire and emergency medical services (EMS) agencies. Limitations of commercial cellular coverage in rural and mountainous areas of the state contribute to the identified challenges.
- Cybersecurity vulnerabilities: A critical need for a dynamic cybersecurity posture to protect sensitive data and ensure the resilience of the public safety communications system was identified. The evolving threat landscape highlights the need for continuous evaluation and adjustment of security measures. The findings support implementing real-time monitoring, regular threat assessments, and adaptive strategies to address emerging vulnerabilities.

MCP's findings underscore the need for a collaborative approach to address the challenges faced by many communications centers, including staffing shortages, outdated technology, and limited resources. The report further highlights the importance of addressing the state's fragmented wireless communications system and the need for robust cybersecurity measures to protect sensitive data and ensure the continued operation of critical communication systems. The information provided, although not complete as some agencies either did not or were unable to provide requested information, indicates that across all PSAPs and dispatch centers, 282 full-time and 82 part-time staff are employed who handle an average of 242,932 calls[8] made on 911 lines and 541,279 incidents per year. Based on a number of variables highlighted throughout the inventory and assessment report, the cost for these services ranges between $27,169,576 and $34,556,502. These costs would increase by approximately $2,914,478—for a total of $39,688,422—if recommended staffing adjustments to meet industry standards were implemented. This does not include the State's costs for providing 911 call-handling equipment (CHE), the Valcour computer-aided dispatch (CAD) system, or mandatory 911 call-taker training. However, as an example, from the cost of staff alone, physical facilities-based regionalization could save upward of $4,051,737.

Addressing the findings from the inventory and assessment and implementing the recommendations contained within this report for the desired reliable, secure, and interoperable statewide public safety communications system requires a collaborative approach, involving stakeholders from various agencies and organizations.

When developing the options presented in Section 3, MCP focused on the following public safety communications systems optimization goals, which reflect a combination of industry standards, best practices, MCP's experience, and very important feedback from stakeholders received through the stakeholder engagement strategy[9] and synthesized in the trends and insights section of the inventory and assessment report (Appendix A). While the optimization goals are not presented in priority order, even the smallest changes to any goal will positively impact the state's public safety communications posture including the overall MAPS score, which can indicate improvements in emergency response.

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[8] "Call is a generic term referring to any request for public safety assistance, regardless of the media used to make that request. This term may appear in conjunction with specific media, such as "voice Call," "video Call," "text Call," or "data-only Call" when the specific media is of importance…." https://kb.nena.org/wiki/Call

[9] Video recordings of regional town hall meetings and community listening sessions can be accessed at: https://dps.vermont.gov/committees-boards/communications

- Standardize processes to promote community education, trust, and support
- Reduce call for service processing times
- Eliminate occurrences where one dispatcher is on duty at a time
- Eliminate occurrences where unqualified/underqualified personnel are working in the PSAP/dispatch centers (e.g., sworn personnel without adequate training)
- Improve staffing to provide enhanced coverage 24 hours a day, seven days a week (24/7)
- Reduce staffing shortages
- Improve dispatcher workspace environment
- Reduce operational complexity of the combined call-taker/dispatcher position, which can improve training success rates[10]
- Minimize budget competition between field and dispatch personnel
- Recognize operational and capital cost savings
- Eliminate duplicative support services
- Decrease wireless communications coverage challenges by decreasing the number of land mobile radio (LMR) coverage "dead zones"
- Provide for fair and equitable funding of services—particularly relating to incident dispatch—across all participating jurisdictions
- Increase intrastate collaboration and communication
- Eliminate some cost duplication to operate the 37 separate and independent PSAPs and dispatch centers assessed
- Provide a shared quality assurance/quality improvement (QA/QI) program
- Assure more consistent and effective service delivery regardless of where residents and visitors reside in the state
- Provide greater opportunities for interagency response, backup, situational awareness, and data sharing
- Provide for improved continuity of operations (COOP) and disaster recovery (DR) plans
- Improve radio communications and interoperability among responders of all public safety disciplines
- Adhere to training and QA requirements to improve service and reduce mistakes
- Decrease the number of points of infiltration for cybersecurity risks
- Reduce 911 and emergency call transfers[11], [12]
- Eliminate call workflows (two-stage call handling) that inherently include two or more 911 and emergency call transfers in favor of single-stage call handling and direct dispatch[13]

[10] Training for a role that combines both call-taking and dispatching responsibilities is more challenging compared to first training as a call-taker, gaining on-the-floor experience, and then training as a dispatcher.
[11] Transfers cannot be eliminated unless all agencies join in regionalization efforts.
[12] See footnote #2 above
[13] MCP has found that eliminating double transfers is a best practice. This finding is supported by states such as Florida that have such requirements incorporated into their state 911 plan. Florida E-911 Plan, Section 3.2.3(B), says the following about double transfers: "With a transferred call, the caller must never be procedurally required to talk with more than two people: the primary PSAP 911 call taker and the call taker at the remote agency. There shall be no inherent double transfers."

A consistent message heard across all stakeholder engagement activities was widespread dissatisfaction with numerous components of the existing public safety communications system and a strong desire for improvements (e.g., lack of Valcour CAD fire/EMS functionality, staff vacancy rates, lack of standardization, etc.). Based on the inventory and assessment results, there are numerous opportunities for the stakeholders to realize their desire for change. As the process moves forward, the critical question will be whether stakeholders can maintain consistent commitment and resolve to make the difficult decisions necessary to see these improvements through to completion and support communications centers, many of which have built the best they can with limited resources and budgets. Dynamics that can make it difficult for stakeholders to maintain consistent commitment include ever-changing inter-municipal politics, state versus local politics, and the relationship between a governor's office and the legislature. Additionally, a state's stance on business development, environmental and social issues, and public safety priorities may come factors.

To achieve the desired future state will require decisions regarding policy and operations, technology and shared systems, along with physical regionalization decisions. The term regionalization, as used throughout this report, is defined by the National Association of State 911 Administrators (NASNA) as "two or more communities (or organizations, or agencies) that join together in a formal, mutually-beneficial working relationship to optimize services provided to the customers of their communities (or organizations, or agencies)"[14]

Categorically, based on the trends and insights presented in the inventory and assessment report, there are three complementary forms of regionalization that could deliver meaningful operational efficiencies across the state:

- *Tier 3 – Policy and operations*
- *Tier 2 – Technology and shared systems*
- *Tier 1 – Physical (facility-based)*

Progress on any optimization goal will help create a sustainable roadmap for a gradual progress-based approach to continuous improvement and advance the State's initiative to the desired future state. However, there are five options that MCP encourages the State to adopt, which are anticipated to have exponentially the greatest impact toward the development of a reliable, secure, and interoperable statewide public safety communications system that is equitably and sustainably financed and universally accessible by all people throughout Vermont.

Realistically, if the state began with the top three, it is feasible that there would be significant positive impacts. However, it must be emphasized that all five are essential to success.

Additional details regarding the suggested path forward, including the mechanics on how to use this plan to evaluate other options, are contained in Section 4, System Design Plan Summary. This approach can facilitate using the system design plan to resolve identified key areas of concern and positively impact the public safety communications optimization goals previously noted—creating the desired secure, reliable, interoperable statewide public safety communications system. It is noteworthy that selected options may have cascading effects opening, limiting, or eliminating altogether future options, which is why it is essential to carefully evaluate all pathways presented in Section 3.

Decisions to regionalize ultimately rest with local authorities and their willingness to look past what they hypothesize they will lose in favor of focusing on what can be gained through the various tiers of regionalization.

[14] NASNA - 911 Regionalization - Tools and Information

Where stakeholders tend to focus on their local control, to address the frustrations expressed during data collection interviews and stakeholder engagement will require them to think of the larger picture including people that reside outside of their professional area of responsibility. Regionalization is very complex and the planning extensive, especially for a statewide initiative that requires participation, collaboration, and cooperation from local stakeholders. If coordinated and planned properly, there are many advantages to regionalization of each dispatch center with a PSAP as highlighted throughout this systems design plan.

The temporary Public Safety Communications Task Force (Task Force), created by the General Assembly[15], remains steadfast in its mission to oversee and manage all aspects of developing, designing, and implementing a secure, reliable, and interoperable statewide public safety communications system. This system should serve Vermont's public safety agencies, residents, and visitors by ensuring the protection of life and property.

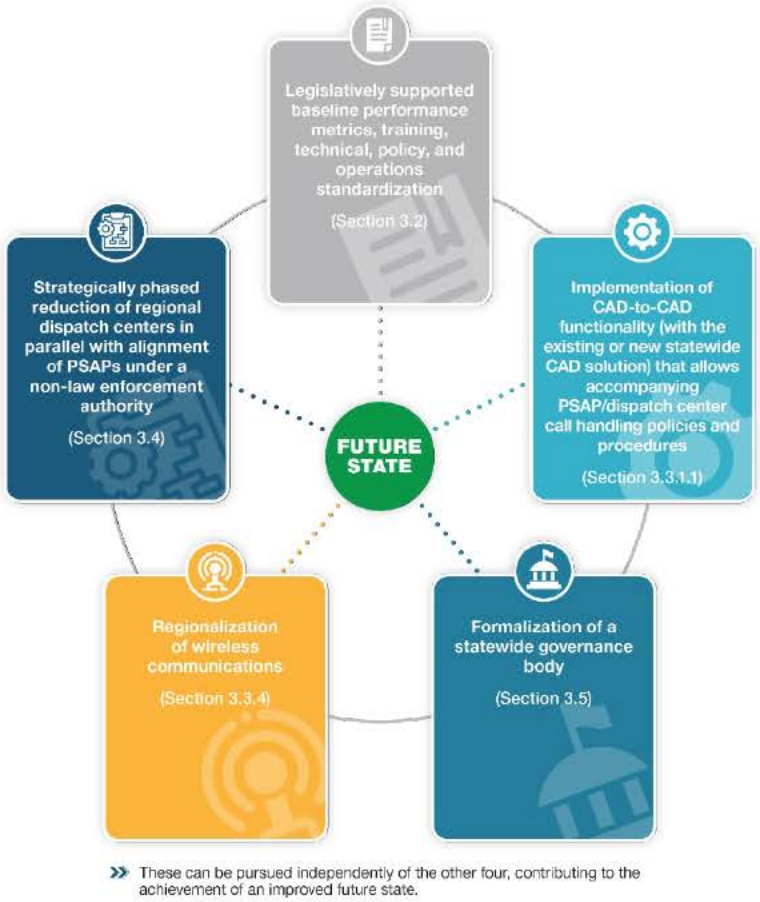


Figure 3: Statewide Optimization Goals

The options and pathways contained herein outline strategies to address challenges and mitigate risks, enabling steady progress toward improving the system's assessment score and advancing the Task Force's mission.

2 System Design Planning Methodology

As a reminder, during the inventory and assessment process, MCP focused on 11 factors[16], identified for each communications center, paying special attention to determining opportunities to achieve efficiencies that would mutually benefit the collective of 37 communications centers as well as the field responders and communities they serve.

The data and information provided ranged from hard numbers (quantitative data) to opinions and anecdotal input (qualitative data). For data that was more quantitative, MCP relied on established public safety metrics to assess and evaluate factors related to public safety communications center operations. Where data was

[15] Pages from H-0494 As Passed by Both House and Senate Official_c114toc116.pdf
[16] Refer to Section 3 of the inventory and assessment report for additional details.

qualitative or metrics have not previously been established, MCP drew on its collective industry experience and awareness of best practices to create those metrics and assess the status of the communications centers.

MCP endeavored to make clear where analysis and findings are based on measurable, quantitative data and where MCP necessarily draws its findings and subsequent recommendations from inherently more subjective evaluations. MCP's years of experience have demonstrated that subjective assessments—backed by thoughtful and unbiased comparisons with public safety and private industry best practices, along with industry exposure—are just as meaningful and important as hard, quantitative evaluations. Properly utilized, subjective input involves a critical review process that avoids reliance on unsubstantiated opinions. Both approaches are essential in determining the current state of communication centers and prioritizing actions to address critical risks effectively.

The recommendations proposed in this report were developed based upon the information garnered through data collection and research that resulted in the inventory and assessment report, an analysis that measured findings to national standards and best practices, as well as MCP's industry experience and knowledge.

- Standard – something established by authority, custom, or general consent as a model or example[17]
- Best Practice – a procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption[18]
- Industry Experience – primarily involves a minimum of ten years of combined education, work experience, and specialization in a respective industry or market segment

The inventory and assessment enabled Task Force members, contracted vendors, and stakeholders to identify opportunities, detailed within this system design plan, to support the development of a reliable, secure, and interoperable statewide public safety communications system. MCP used a structured five-part strategic recommendations framework designed to help develop practical, actionable, and sustainable recommendations as follows:

- Current state
  - Statements from the inventory and assessment report identifying key inefficiencies and gaps in the delivery of public safety communications services within the current configuration.
- Future state
  - Based on our analysis, define a clear vision for the desired future state as defined in Act 78, ultimately improving the overall operational performance of the State's public safety communications system.
- Case for Change
  - Articulate the rationale for implementing recommendations, highlighting the operational, financial, and public safety benefits of each proposed recommendation/pathway.

[17] Standard Definition & Meaning - Merriam-Webster
[18] Best practice Definition & Meaning - Merriam-Webster

- Barriers to Success
  - Identify potential barriers to successful implementation, such as budget constraints, resistance to change, governance options, giving up local control, or technical limitations along with proposed strategies to mitigate risks.
- Way Forward
  - Outline key initiatives that may help achieve the desired future state including steps, timelines, and resource requirements.

The options outlined are not sequential steps, but flexible pathways—each tailored to align with Vermont's unique operational and fiscal realities. The concept of 'good, better, even better' does not imply that all options must be pursued; rather, the right solution may begin at any point, depending on local readiness and capacity.

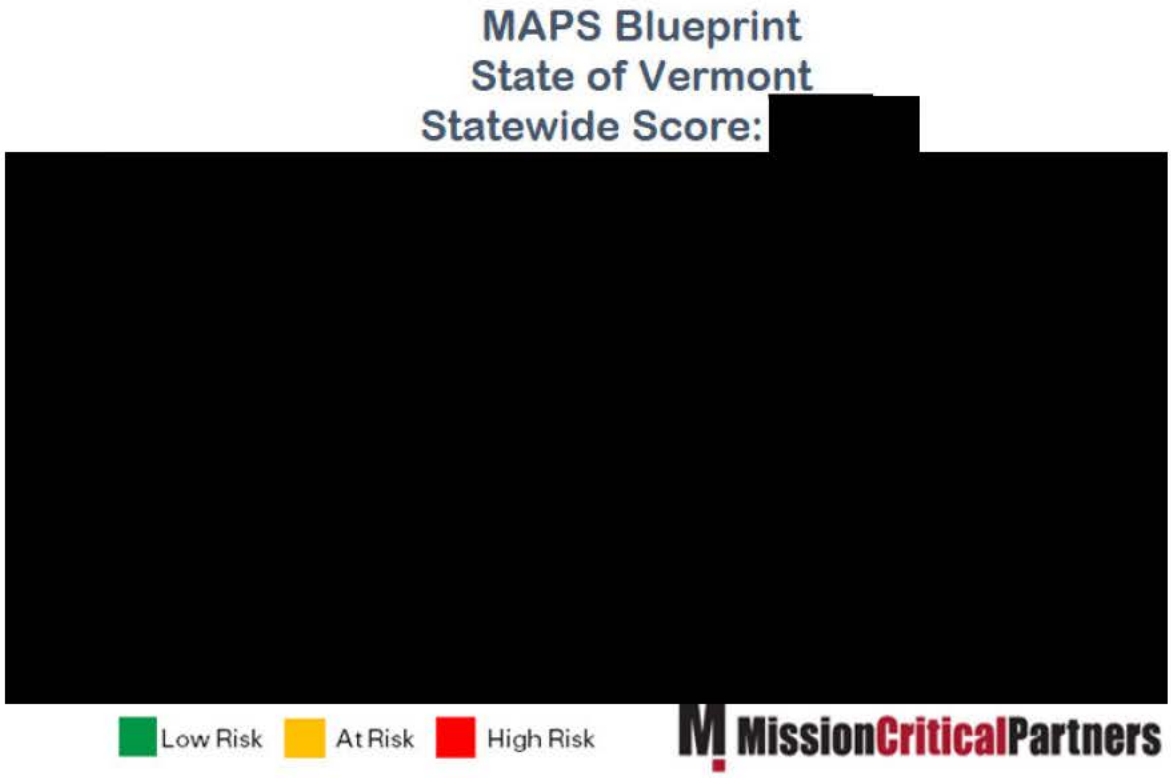
While the options are listed sequentially, and are presented as a "good, better, even better" (Option 1, Option 2, Option 3) format, it should not be construed that the options are "steps" or each must be accomplished. In some cases, the first option may not be necessary and the second option makes more sense. In other cases, a third option (or even a second option) may not be palatable or fiscally responsible in the immediate term.

MAPS Assessment Considerations and Methodology

MCP's MAPS is a proprietary assessment methodology developed internally for determining where an organization stands regarding numerous critical factors. Applying this specific approach, the data collected focused on assessing each communications center's current inventory and operational landscape across 11 operational factors. Attention was paid to the relationship between governance and organizational structure, operations, personnel levels, training, leadership and planning, quality assurance (QA) and quality improvement (QI), technology systems, response alternatives, facilities, and cybersecurity to measure each factor's impact on each communications center's ability to meet industry metrics.

3 System Design Future Opportunities and Considerations

As shown below, Vermont's statewide MAPS average assessment score was [redacted] on a 10-point scale.



While several paths forward exist, maintaining the current configuration is not a viable option. Based on MCP's findings, the public safety communications system, as presently structured, suffers from significant inconsistency and limited usability—making at least some degree of regionalization across policy, operations, and core technology essential. The constant evolution and changing ecosystem, specifically as it relates to advancements in technology, creates opportunities for regional partnerships between PSAPs and dispatch centers that previously were untested and novel.

Technological advancements will be a facilitating factor for the operational advantages that regionalization (as defined in Section 1, Executive Summary) affords, such as improved roaming profiles, better COOP and DR plans, and increased sharing of data, software, and radio channels—possibly offering an opportunity to reduce the number of communications centers in the state. This will require a greater amount of stakeholder participation, collaboration, administrative oversight, and governance than exists today. Just by the fact that the State and current communications centers that participated in the inventory and assessment (even though the process may have been uncomfortable), recognize the value of exploring alternatives to the current state means benefits can be realized. Benefits include the opportunity to learn where communications centers, wireless communications, and cybersecurity postures currently stand within the ecosystem, to receive insight into where the ecosystem is going locally, regionally, statewide and nationally, and to discover how the State and communications centers can best leverage each agency's strengths to provide a best-in-class solution to serve the constituents and field responders across the state

Essentially, there are 37 ecosystems serving a population of 642,464 people in the state—considerably more than some places in the country that have double the population with only one or two PSAPs and no regional dispatch centers—which has inherent challenges and areas of risk that are articulated throughout this system design plan.

Regionalization has the potential to help mitigate risk throughout the state and offer operational and fiscal efficiencies and economies of scale.

Future public safety system design opportunities and considerations establish a baseline that allows leadership and stakeholders involved with the State to have a clear vision, goals to attain that vision, and metrics by which success can be measured. Key trends and insights along with detailed inventories of each PSAP and communications center operating within the state (found in the inventory and assessment report) are the basis for the system design plan recommendations in this report. A holistic analysis of the trends and insights and inventories has identified multiple opportunities to improve service levels and operations through a combination of organic and legislatively supported regionalization.

The goal of this report is to focus on how the State, each PSAP, and each dispatch center, through a variety of regionalization options, can transform Vermont's public safety communications challenges and risks, identified in the inventory and assessment report, into opportunities. It is important to keep the following six factors at the forefront, as these were consistently emphasized during interviews with stakeholders:

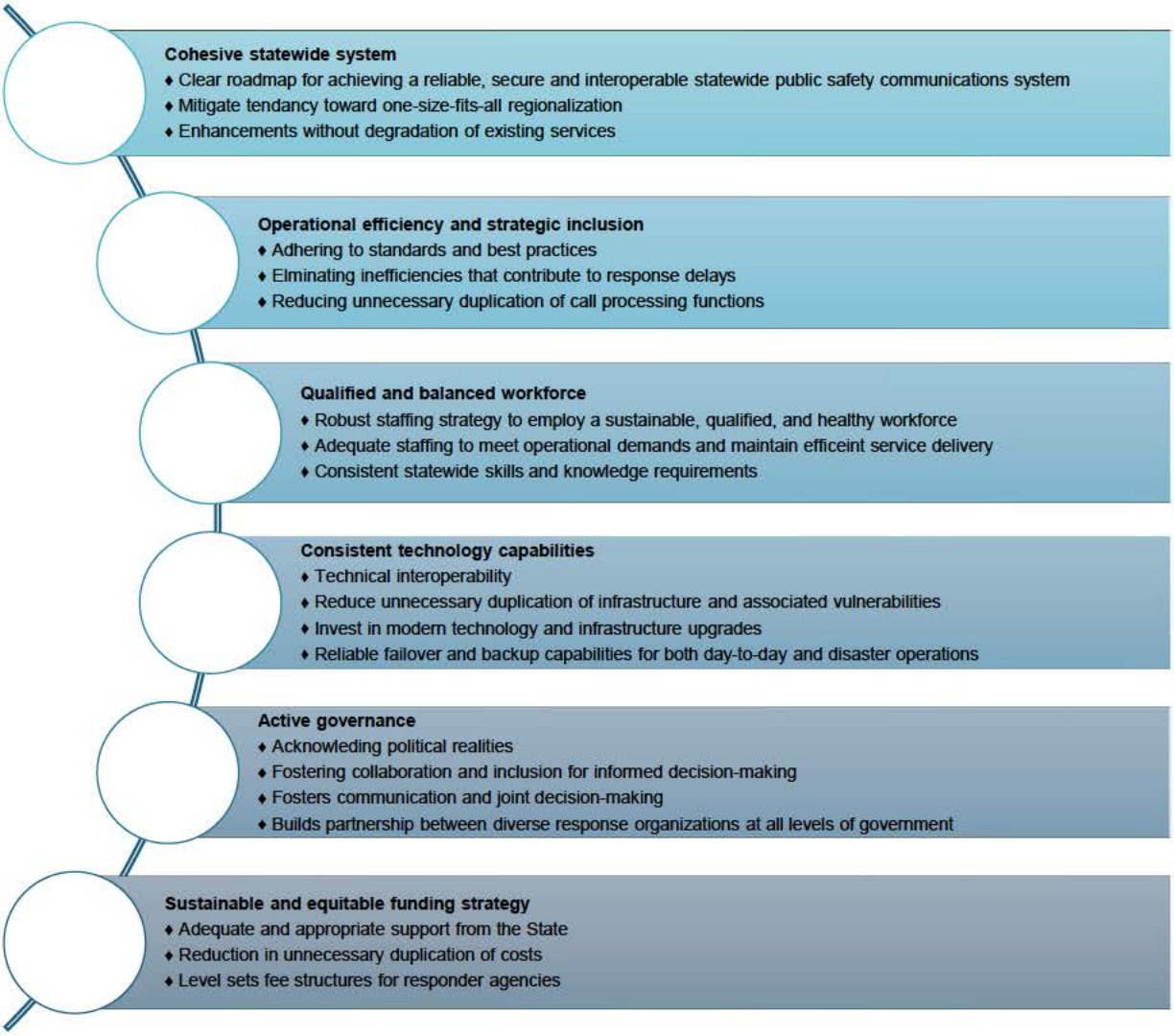


Figure 4: Vermont Stakeholder Priorities

3.1 Organic and Inorganic Approaches to Regionalization

Regionalization, as defined by NASNA (see Section 1, Executive Summary) can be achieved inorganically, which occurs when there are outside forces at play (e.g., state mandate such as in Illinois[19] and Ohio[20]) or it can occur organically. Organic regionalization is more natural and evolves out of a voluntary, cooperative effort to improve the emergency response, such as in Nebraska and Palm Beach County, Florida, where no mandates exist. While some small-scale regionalization efforts have emerged out of necessity, larger and more complex regionalization initiatives are unlikely given Vermont's strong preference for local control. The challenge, therefore, is to encourage agencies to set aside political considerations and focus on the potential benefits

[19] Illinois General Assembly - Illinois Compiled Statutes
[20] Section 128.03 - Ohio Revised Code | Ohio Laws

rather than perceived losses. By shifting the focus to the collective gains, agencies can work together to achieve regionalization that enhances the effectiveness and efficiency of emergency communications services delivered across the state. Given the desire for local control and the current political climate[21]—understandably driven in part by past experiences with regionalization—in Vermont, pure organic regionalization is likely to be a challenge. The challenge, like for regionalization initiatives around the country, is how to encourage agencies to put aside politics and focus on what they can gain—rather than hypothesizing on what they have to lose—and come together to achieve regionalization to improve the emergency communications services that are delivered daily throughout the state.

The challenge, therefore, is to encourage agencies to set aside political considerations and focus on the potential benefits rather than hypothesizing on losses. By shifting the focus to the collective gains, agencies can work together to achieve regionalization that enhances the effectiveness and efficiency of emergency communications services delivered across the state.

A study conducted in 2010 by the Communications, Security, Reliability and Interoperability Council (CSRIC)[22] identified five values of consolidation, shown in Figure 5; regionalization has the same values. These values not only hold true today, but they are also areas identified in this report where opportunities exist to gain efficiencies and improve services regionally and throughout the state. The values highlighted below can be leveraged through organic regionalization in the form of policies and operations, technologies, and facilities.

Figure 5: Values of Regionalization

- Shared Resources – Shared resources include policies, operations, and any other support services (e.g., information technology [IT], geographic information system [GIS], administration, and human resources [HR]).

[21] The term "political climate" in this context refers to various political dynamics that have across the country historically influenced and could continue to influence regionalization efforts. These dynamics include inter-municipal politics, state versus local politics, and the relationship between a Governor's office and the legislature. Additionally, factors such as a state's stance on business development, environmental and social issues, and public safety priorities are also considered. It is important to recognize that these elements may have played a role in the past and may need to be navigated in the future to promote the success of regionalization as it can contribute to building a statewide public safety communications system in Vermont.

[22] WORKING GROUP 1A (fcc.gov)

- Elimination of Duplicate Costs – Duplicate costs related to administration, operations, technologies, and facilities may be significantly reduced and, in many cases, eliminated through regionalization. Funding is prioritized based on regional planning and strategic initiatives.
- Coordinated Responses – Having fewer PSAPs or dispatch centers would help to better coordinate responses, such as joint agency responses and automatic and mutual aid. Examples include multi-jurisdictional responses to wildland fires, pursuits, and mass casualty incidents, all of which require the dispatch centers to coordinate their agencies' responses with other entities.
- Greater Interoperability – Interoperability, as well as reliability and security, expands with regionalization, reducing points of failure and intrusion, enabling the sharing of mission-critical equipment and technologies (e.g., computer-aided dispatch [CAD], radio).
- Effective and Efficient Service – Efficiencies will often occur, and service levels improve, when regionalization is properly executed. Call transfers are often reduced as the number of PSAPs and dispatch centers decreases as there is typically less opportunity for misroutes and situational awareness may be improved through regionalization. There are often improvements that can be gained in all functional areas of a communications center (operations, personnel and workforce, training, performance management, leadership and planning, technology, facilities, and organizational structure) as the number of communications centers decreases.

As consultants, MCP can help increase the awareness of the risks and help explore opportunities associated with the current state and make recommendations that may mitigate those risks, but as a state, county, region, municipality, or individual agency, stakeholders will need to decide if the cost associated with the proposed solutions to mitigate the risk outweighs the cost of not mitigating the risk. That is, what are the variety of outcomes worth compared to the one-time and recurring costs of change, including transformational change that may be required to achieve a secure, reliable and interoperable statewide public safety communications system? While MCP believes that the solutions explored below are not only feasible but warranted, those questions are not ones that a consultant can answer directly but can help decision-makers with informed decisions through a structured look at risk awareness that includes:

- Acknowledgement of the current state
- Exploration of future state options
- Case for change
- Barriers to success
- Suggested way forward

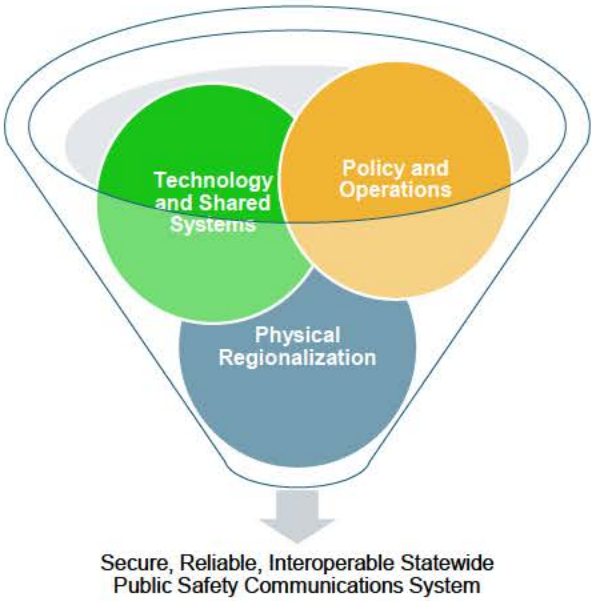
A holistic analysis of the findings and recommendations contained in the inventory and assessment report has identified opportunities within the state that warrant exploration to improve service levels and operations through a combination of organic and legislatively mandated regionalization with the intent to improve emergency response outcomes. Although legislation can be effective to set performance metrics, establish operational and technological standardization and capabilities, and, where warranted, reduce the number of communications centers across the state, it is generally more successful when there is a combination of organic (voluntary) participation in regionalization efforts supported by state-level legislation.

Absent even a baseline level of policy and operations-based regionalization, there are a multitude of opportunities stakeholders at all levels can support to contribute to improved emergency response statewide. To accomplish this, Vermont local, regional, and state entities, like others across the country, will continue to balance finite human and capital resources with competing priorities. This system design plan, through a matrix strategy approach to regionalization, has the potential to reduce operating costs by improving economies of

scale and reducing redundant and duplicate services, equipment, and facilities, including the reduction or elimination of ongoing maintenance and replacement costs.

There are three complementary forms of regionalization that, based on the *trends and insights* contained in the inventory and assessment report, would offer operational efficiencies within the state:

- Tier 3 – Policy and operations
- Tier 2 – Technology and shared systems
- Tier 1 – Physical (facility-based)



The three tiers of regionalization are interrelated and may be executed sequentially or concurrently. As more initiatives are deployed within each tier, the benefits are typically experienced exponentially. Priority planning should be given to physical facilities-based regionalization because it offers the highest number of benefits to both responders and citizens; however, in the absence of that or in conjunction with physical regionalization planning and execution, other forms of regionalization (technology and shared systems and policy- and operations-based) will improve emergency response outcomes and long-term cost efficiencies.

As NASNA notes: *"There is more than one way to regionalize, as evidenced by how existing regional 911 systems differ from one another. For example, some have consolidated multiple Public Safety Answering Points (PSAPs) into a few regional PSAPs serving a large geographic area. Others have a single regional PSAP serving a large geographic area. Still, others have regionalized virtually by sharing the 911 infrastructure and technology without consolidating PSAPs or creating a large regional call center."*[23], [24]

Formal and even informal governance at the regional level engages stakeholders in that region to think about the greater good, identify gaps, plan strategically, and pool resources where appropriate.

A key to organic regionalization is recognizing that there are efficiencies to be gained and then working to establish shared and common practices regionally throughout the state. Entities—PSAPs, dispatch centers, and their respective agencies—are encouraged to realize that the benefits far outweigh any perceived losses, including those related to local control. Some dispatch centers have already pursued and achieved organic regionalization and, in exchange, have realized these benefits (e.g., St. Albans PSAP). Most dispatch centers, however, have not pursued such a venture to date. Ultimately, streamlining and reducing communications centers should be a long-term strategy for achieving the State's goals; however, in the interim and until there is stakeholder alignment, MCP agrees with a tiered approach. By laying building blocks that begin operations and

[23] NASNA - 911 Regionalization - Tools and Information
[24] In the context of this quote, *regional 911 systems* refer to regionalized call-taking and dispatch operations, and not a 911 call-handling system/network.

policy and technology and shared systems-based regionalization, physical facilities-based regionalization will be easier to achieve downstream.

The following sections outline a vision that supports a matrix strategy approach of both organic and inorganic regionalization of a statewide public safety communications system that includes the three tiers (policy and operations, technology and shared systems, and physical [facility-based]).

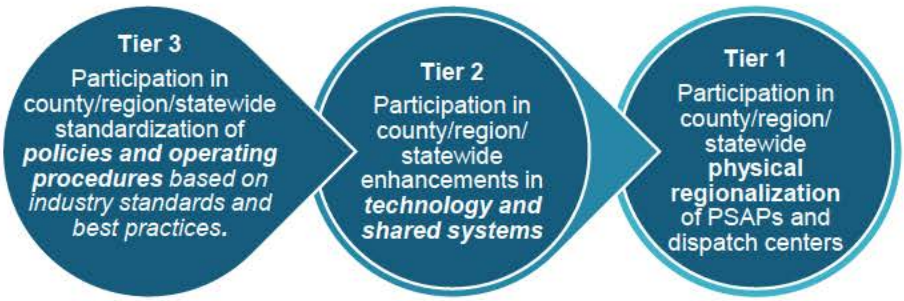


Figure 6: Tiered Approach to Regionalization

Among the many identified through the inventory and assessment process, the opportunities range from the broadest perspective of policy and operations-based regionalization, through to the more focused and budget conscious technology and shared systems-based regionalization, and, finally, the most focused regionalization based on the reduction of the number of communications centers. Whether they occur independently or in parallel with each other, exploring and committing to implementing a matrix strategy approach is expected to put the state on the pathway toward the desired reliable, secure, and interoperable statewide public safety communications system, regardless of where stakeholders may find themselves on the spectrum of motivation to participate, budget impacts, capabilities, and local control.

3.2 Policy and Operations-based Regionalization (Tier 3)

Although differences may exist in centers to address local needs, the job of individuals performing call-taking and dispatching functions, and the core elements necessary to support their mission-critical work is similar throughout the state. Industry standards and best practices exist for emergency telecommunicators nationwide, which speaks to the similarities in core tasks and functions that exist in public safety telecommunications work more broadly. MCP identifies three elements of policy and operations-based regionalization: operations, support, and workforce. These elements may overlap to some degree but can be considered separately to provide focus and develop strategy.

The findings highlighted in the inventory and assessment report identified certain themes throughout the state related to operations—there are inconsistencies in the fundamental implementation of telecommunicator tasks that result in different levels of service to citizens across the state; support available in each center is highly variable, leaving some centers better positioned to focus on important tasks that are outside of (but vital to) the mission-critical work.

MCP determined multiple areas where policy and operations-based regionalization could offer consistent and interoperable operational efficiencies and strategic inclusion, regardless of any individual agency's interest in technology or physical regionalization.

Figure 7: Policies and Operations-based Regionalization

3.2.1 Support

Support services are those tasks that are outside of the primary operation of answering emergency calls and dispatching field responders, such as technology support (e.g., general IT, GIS, and radio systems), performance management, training and administrative, clerical, and facilities staff. Siloing support services can be costly to organizations that are individually responsible for hiring and paying support staff; the lack of adequate support staff in key roles can challenge the reliability, security, and interoperability of each public safety communications ecosystem. Handling support services at an individual level can hinder overall capabilities and the consistency and quality of emergency dispatch because of resource challenges related to staffing, funding, and task saturation. Providing these services at a regional level enables agencies to pool their resources more effectively, resulting in a cost-efficient approach that enhances service capacity. This model allows the respective services to focus solely on participating agencies rather than being stretched across all agencies within a given locality.

Performance management focuses on the continuous improvement of a communication center's output through aligning employee performance with organizational objectives and expectations. Performance management includes many elements, from planning and setting expectations and developing staff, to monitoring, rating, and rewarding performance. Successful performance management includes in-person interaction and communication, policy development, and QA program implementation to establish and measure key performance indicators (KPIs).

Key Trends and Insights

- Of the 37 communications centers, 18 reported having some sort of QA program. Among them, two centers reported having a formal, standards-based program that is regularly executed; three reported informal programs, and 13 indicated that QA activities occur only in response to issues as they arise.

- The State provides a robust, well-maintained GIS mapping service and system for all PSAPs; dispatch centers and response agencies can access the same GIS data via the VCGI[25] open portal. It was highlighted as a priority resource.
- The reliance on local government control limits the available staff to perform support functions like HR, QA, report administration, or clerical work. These duties often fall on an employee with other primary duties.

The PSAPs and dispatch centers receive support from the State (and the Vermont Enhanced 911 Board [911 Board]) and their localities on areas such as the Vermont State Police (VSP) radio system, GIS mapping, and Valcour CAD, but must support many of their infrastructure and administrative needs independently. This independent management of support systems results in significant differences between the systems used and services provided and a duplication of efforts that would benefit from economies of scale and a more streamlined approach.

Performance management is essential in a communications center where the results of poor performance management can have detrimental effects. As noted in the inventory and assessment report, there is a need to improve performance management, particularly QA, across the state.

Support Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Standardized QA	Use current QA process and resources (in accordance with the *Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points*[26] and expand the service to a review of calls received on 911 (PSAPs) *and* administrative lines (PSAPs and dispatch centers) and radio dispatches (PSAPs and dispatch centers)	Use an external third-party QA service, agreed upon by all stakeholders, that is provided statewide	Create a formal, codified statewide QA plan and program[27] for call-take, dispatch, and policy adherence using national standards
	Strengths		

[25] Vermont Center for Geographic Information
[26] APCO/NENA ANS 1.107.1.2015, published jointly by the Association of Public-Safety Communications Officials (APCO) International and the National Emergency Number Association (NENA)
[27] A QA "Program" denotes a holistic approach that includes policies, processes, expectations, workflows, measurable metrics, standardized reporting, and other elements for call intake and dispatch phases of an incident.

Support Options			
	• Requires less training or resources to stand up the program beyond call-taking for PSAPs • Encourages consistency in call-taking processes across PSAPs • Encourages consistency in dispatching processes across PSAPs and dispatch centers • Adheres to training and QA requirements to improve service and reduce mistakes	• Removes the bulk of QA duties from state, local, or regional staff • Creates an out-of-the-box baseline that can be merged at the state level when resources become available • Provides timely reviews and feedback for all calls statewide	• Allows all stakeholders to have a voice in creating a Vermont-specific program • Is based on existing national standards and best practices that guide the planning and program • Standardizes performance statewide regardless of the geographical area of the caller or PSAP • Allows agencies to have control over QA within defined standards • Provides a shared QA/QI program
	Challenges		
	• Is not developed for functions beyond call-taking • May be existing resource challenges to wide implementation • Reports of minimal QA at the PSAPs • Requires access to dispatch center CAD data and logging systems	• Can be costly • Requires all communications centers to adopt the same medical, fire, and police call-taking protocols	• May be costly and time-consuming to develop • Requires a standard review form or software application that may or may not be in place
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Support and Administrative Roles	Statewide committee develops a list of the necessary support positions; individual	Statewide committee identifies positions, writes job descriptions, and develops salary structures	Share support roles, like HR and administrative roles, regionally with oversight by regional stakeholders

Support Options			
	communications center handles all hiring		
	Strengths		
	• Allows communications centers to focus hiring efforts on the support roles they prioritize • Allows local control over the roles, responsibilities and pay structure within a respective organization • Eliminates duplicate support services	• Supports buy in and statewide collaboration through joint development of position and job descriptions • Offers pay equity and level sets responsibilities in same job classification • Creates well-written job descriptions for each position that are the same across the state • Provides focus for hiring at each communications center	• Provides stable and consistent support for key positions • Maximizes economies of scale • Centralizes responsibility for key roles and provides dedicated staff to perform the functions • Allows more efficient delivery of support services through dedicated personnel who can focus on support-specific duties • Streamlines staffing needs by maximizing services through fewer agencies
	Challenges		
	• Does not improve existing silos of service due to differing roles, responsibilities, and pay structures • Continues to promote opportunities to move from communications center to communications center • May not encourage communications centers to shift support duties from other employees, such as	• May be a time and resource intensive development process • Does not support economies of scale • May not solve staffing shortages in these key areas for each individual communications center	• Results in less control at the communications center level for support services • Creates the potential for delays in the completion of tasks and/or response to administrative / technical requests because of limited staff serving a larger area

Support Options			
	dispatchers or deputies • Does not improve staffing challenges or efficiencies		
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
GIS	Continue to use existing system and existing staff structure	Enhance state's GIS data by incorporating regional or municipality data not currently included	
	Strengths		
	• Is seen as a strength by many stakeholders • Provides up-to-date and consistent information to all communications centers • Leverages economies of scale	• Enhances state's base GIS data by incorporating local GIS layers that are not already incorporated in the data (e.g., special hazards, helipad/landing zone locations, hazardous materials storage locations, etc.) • Provides additional GIS data to enhance emergency responses statewide	
	Challenges		
	• May involve a single point of contact or failure because all updates and data repositories are handled by one agency	• Introduces the potential for each system to have different information • Introduces the potential for different levels of service based on geographic location • May be time and resource heavy at the communications center level	

Support Options			
		• Introduces the potential for updates to be delayed because of shared local resources/bandwidth • Is no policy directing local responsibilities, level/type of local input, and GIS standards to follow (thus local GIS data is not uniform statewide)	

Standardized QA

The 911 Board currently completes only call-taking QA for the *six* PSAPs, with dedicated staff and processes in place to perform this function; an in-house form *is* completed *for* the reviews. The current system could be expanded to include *a* review of calls for service received by all *communications* centers on 911 and administrative lines without a tremendous overhaul to the existing QA system. Expansion of QA to include calls taken by dispatch centers could be built in the existing system, but would require additional staff and adoption of standardized call-taking expectations in communications centers across the state; standardization of call process techniques could also involve statutory changes related to statewide adoption and compliance to these standards.

The PSAPs use APCO guide cards to standardize information gathering for medical, fire, and police 911 calls only. This standardized call-taking platform is necessary to complete QA reviews and to expand this service outside of 911 calls at the PSAP*s* requires all *dispatch* centers to adopt the same dispatch policies and procedures that properly align with the APCO call-taking guide cards. Software applications also exist and are seen as a logical next step to a manual form; software applications streamline the QA process, save time, and standardize the feedback process for review. Vendors are also available to take over QA review completely—including, most recently, artificial intelligence (AI)-supported QA automation—offering solutions to QA that could provide more consistent and timely reviews for 911 call-taking and could also be used for administrative calls.

Although QA reviews historically focused on call-taking functions only, there has been a shift industry-wide to expand QA to include all aspects of call processing, such as documentation, CAD updates, unit status changes, and dispatching actions. APCO/NENA ANS 1.107.1.2015, *Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points*, offers a vendor-agnostic recommendation to create an inclusive QA program. This standard, developed by subject-matter experts and industry leaders, is considered best practice. Since call-taking is only one part of a telecommunicator's performance, it is highly recommended that communications centers look beyond call-taking to align performance with organizational and industry goals and that the concept of QA includes the establishment of policies, processes, and expectations for QA and employee actions.

Stakeholders are encouraged to collaborate on creating a robust statewide QA program based on industry standards and best practices including policies and procedures and establishing benchmarks and rating criteria to provide all communications centers statewide an objective means to measure operational performance. A

broad QA program could also provide more statistical data on how the state and sub-regions perform holistically that could make service delivery levels more consistent and reduce risk.

Support and Administrative Roles

Many communications centers reported the inability to hire dedicated staff to perform support functions like clerical work, HR, or performance management. These roles, while not mission-critical, are essential to a healthy emergency communications system; without dedicated positions, the tasks are assigned to employees with other primary duties that take precedence over the support functions. A lack of focus in support areas such as training, performance management, or records and certifications maintenance challenges a communications center's ability to identify gaps in performance or employee needs that could improve retention, or can put the communications center at risk by not meeting benchmarks.

The first step in level-setting communications centers' abilities to provide adequate support across the state, thereby level-setting service to all citizens, is to identify the key roles that should be filled. That would encourage everyone to have a QA reviewer or a custodian of records, for example, but does not direct the roles and responsibilities that these positions have. A job description, including job specifications, is the primary tool used to meet this need—it helps an organization attract and hire the best candidates and is pivotal in setting expectations for the position and identifying mission creep within a job classification. A standard, well-defined job description provides the foundation for equity in support services across communications centers. APCO offers guidance on some of the core competencies for support roles such as a QA evaluator, training coordinator, or public safety technician; the respective standards provide a baseline for developing job descriptions and identifying the service expectations for these roles.

Identifying key roles and writing job descriptions, while important, does not solve the staffing problems many communications centers across the state are experiencing. If support roles are identified, and their duties agreed upon by a committee of 911 and dispatch stakeholders, a next step would be to fill these roles with the expectation that they could serve multiple centers that would then not have to fill these positions independently.

GIS

The State aggregates data provided by municipalities and provides the data to each of the six PSAPs; dispatch centers statewide can obtain and utilize the same GIS information via the VCGI open portal. The GIS system and process was an area that was highly regarded by all PSAPs and dispatch centers interviewed. There are few options for GIS stewardship as it is typically managed at either the state or local level. NENA has several standards and information documents[28] that the State can use to assess areas where it may improve, but current processes align with NENA and National Highway Traffic Safety Administration (NHTSA)[29] recommendations for GIS stewardship and support the communications centers by offering manpower to handle aggregation and updates statewide.

3.2.2 Operations

Policies, procedures, protocols, workflows, operational configurations, and planning activities are components that enable the emergency communications systems to function at the highest level and with utmost equity. Effective policies and procedures are essential to risk management in a communications center. There are opportunities within the state to establish more uniform policies and procedures based on industry standards

[28] https://www.nena.org/page/standards#DataManagement
[29] https://www.911.gov/projects/gis-in-911/

and best practices and to improve service delivery by streamlining workflows through a combination of operational and technological or facilities-based collaboration (see Sections 3.3 and 3.4 of this report).

Protocols or call guides support the call-handling and dispatch process and are important to improving service levels and providing equitable, statewide emergency services; establishing statewide dispatch policies and procedures that correspond to the existing call-taking protocols is an example of policy and operations-based regionalization. These tools, especially emergency medical dispatch (EMD), provide pre-arrival instructions when warranted and, in many cases, increase the safety of citizens and field responders. The use of protocols provides structure to standardize a caller's experience, regardless of where they live or who answers their call; call processing and dispatch performance (including all radio traffic from the moment an incident is dispatched until it is deemed under control or complete) can be objectively assessed by the agency through a holistic QA program that aligns with national standards and best practices.

Formal planning for communications centers encompasses several critical components, including strategic planning (with both short- and long-term financial considerations), change management, and continuity of operations. Deficiencies in any area can significantly impact the center's effectiveness, highlighting the urgent need for improvements in operational hours, workstation availability, and staffing levels. Addressing these gaps is essential to ensure reliable communication and an effective emergency response.

Key Trends and Insights

- For 33 of the 37 communications centers, operational and staffing deficiencies pose significant challenges.
- Four communications centers do not operate 24/7.
- Ten communications centers handle less than or equal to 1% of the state's total estimated incident volume (541,279) each, which is an average of one incident every 97 minutes. Seventeen communications centers handle less than or equal to 3% each.
- Of the state's total 911 calls, 32.3% (78,516) are transferred to dispatch centers.
- Based on an average of 90 seconds per transfer, handling approximately 78,516 calls annually through a two-stage process results in 1,963 hours of avoidable call processing time.
- EMD is only provided on 911 calls by the six PSAPs and one out-of-state communications center.
- All the communications centers that completed the survey reported performing numerous functions that are outside of mission-critical emergency communications work.
- Local police departments govern 28 of the 31 in-state and two of the six out-of-state dispatch centers.

Of the state's estimated total incident volume of 541,279, 10 communications centers handle less than or equal to 1% of the state's incident volume each, 13 centers handle between 1% and 2.5% each, and eight centers handle between 2.51% and 5.0% each. These figures include two PSAPS (indicated by a single *) and five out-of-state dispatch centers (indicated by a double **) in Figure 9. Additionally, four centers handle between 5.01% and 7.50% each, one center handles between 7.51% and 10.00%, and one center handles 10.01% or higher.

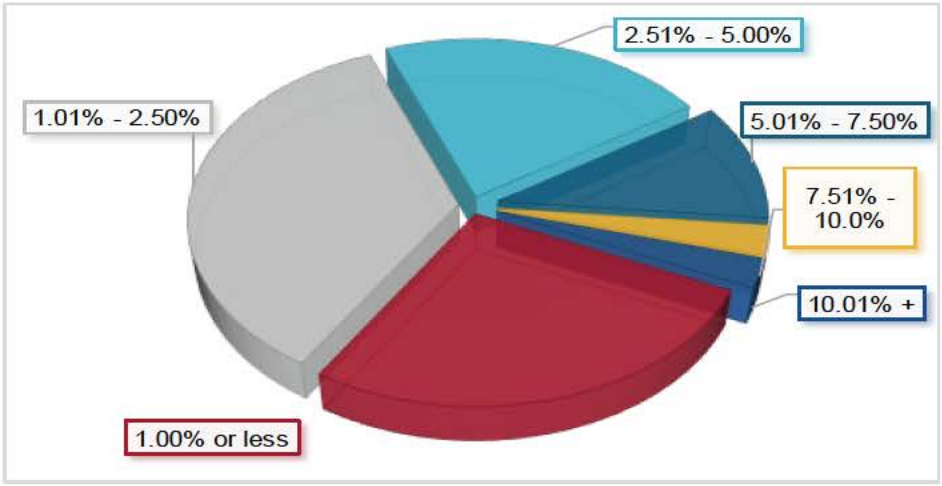


Figure 8: Percentage of Statewide Incident Volume Breakdown by Number of Agencies

Together, 31 (of the 37) communications centers cumulatively handle 52.57% of the total statewide incident volume and six centers cumulatively handle the remaining 47.43%—the five highest volume centers manage a significant portion of incidents, highlighting an uneven workload among the dispatch centers.

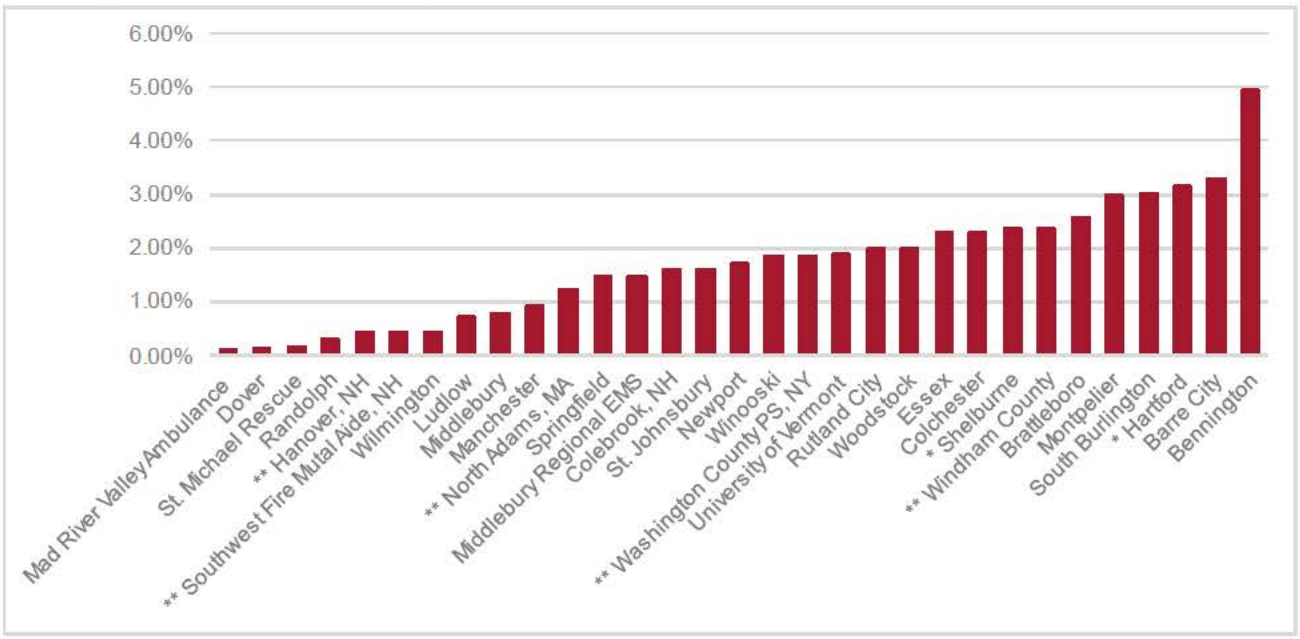


Figure 9: Agencies Serving 5% or Less of Total State Incident Volume

In MCP's experience, when multiple PSAPs operate within close proximity, a higher risk of call transfers occurring regularly exists due to misrouted 911 calls or the need to transfer the call to one or more dispatch centers for the initiation of law enforcement, fire, or EMS response. However, the PSAP-to-dispatch center (two-stage call handling) dispatch model that is prevalent in the New England states results in dispatch centers

handling 100% of their emergency calls through inbound transfers. Between 2021 and 2023, the state's six PSAPs annually received an average of 242,932 911 calls and transferred 32.3% (78,516 calls) to dispatch centers. This high reliance on transfers underscores the need for efficient call transfer systems—when transfers must occur—to ensure timely and effective emergency responses. While call transfers are part of operational procedures, the reliance on transfers cannot be addressed through operational or technology lenses alone; this topic is addressed through physical consolidation options in Section 3.4.

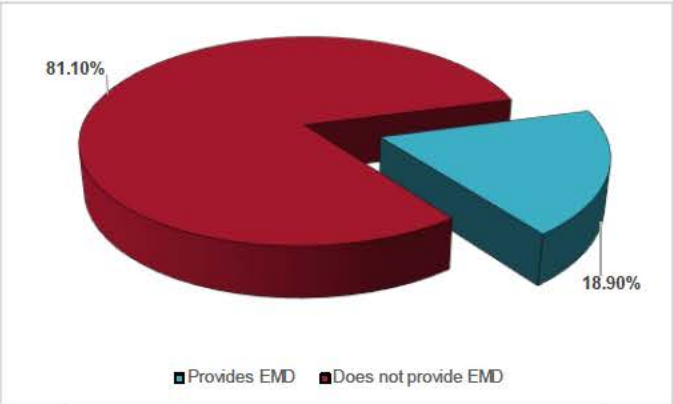


Figure 10: Agencies Providing EMD

To add to this, operational configurations and staffing deficiencies create further inefficiencies, such as delays in contacting and dispatching resources; see Appendix J: Emergency Incident Response Workflow for a step-by-step depiction of this process. These deficiencies pose significant risks when a critical event—such as a shooting—occur while only one dispatcher is on duty, which is the case in 59.5% of centers statewide[30]. When the single telecommunicator on duty must also perform a host of functions unrelated to dispatch or call-taking, the delays could become more pervasive. Even during routine incidents, a single telecommunicator must handle all call-taking duties[31]; radio traffic for all law enforcement, EMS, and fire responders; new incoming incidents; and other agency-specific ancillary duties in many cases, causing a dangerous situation for responders and citizens alike. Staffing configurations that may help alleviate some of these deficiencies are addressed in Section 3.2.3.

In the current system, only six PSAPs and one out-of-state communications center provide EMD. Consequently, the remaining 30 centers (81.1%) are unable to provide important medical instructions when necessary—requiring them to contact a communications center that does EMD-related care, such as telephone cardiopulmonary resuscitation (T-CPR) or other potentially life-saving instructions (see Appendix A). This dependence could lead to delays in emergency response times and highlights the need for a more distributed and accessible EMD service across all communications centers.

Operations Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Policies and Procedures	Local development and implementation of policies and procedures related to call-taking and dispatch functions	State and local collaboration to develop a list of policies and procedures for communications centers to use as a guide	Convene a stakeholder committee to develop statewide policies and procedures and require adoption by both PSAPs and dispatch centers through legislative action

[30] Thirty-three centers (89.2%) have a minimum staffing per shift of less than or equal to the recommended standard of two per shift, while 22 centers (59.5%) have only one per shift.
[31] Emergency call-taking duties are handled in PSAPs only; dispatch centers process only incoming non-emergency calls and calls transferred to them by a PSAP.

Operations Options			
	Strengths		
	• Allows for local control • May save time, money, and resources as no changes are required • Maintains current practices	• Provides guidance on policy development based on industry standards and best practices • Creates a focus on policies, procedures, and practices that can promote a reduction in transfers • Saves time for agencies by allowing the State to do research • Allows agencies to maintain local control while improving documentation and direction for operations • Increases intrastate collaboration and communication	• Improves coordinated responses and service levels • Allows for coordinated procedures to reduce transfers • Closes or narrows the gap for agencies in the state that do not currently have standard operating procedures (SOPs) • Increases the consistency of services throughout the state by aligning operational policies and procedures • Reduces errors and risk exposure • Improves buy-in by involving stakeholders in the development of policies and procedures • Allows for policies and procedures to be developed based on industry standards and best practices with a focus on emergency communications functions • Streamlines the update process • Eases QA reviews because of consistency

Operations Options			
			• Provides for more consistent and effective service delivery
	Challenges		
	• Allows operational inefficiencies to persist • Lacks uniformity in service provision • May not promote implementation of standards and best practices • Duplicates work • Does not promote continuous improvement in service delivery or awareness of industry standards	• May not encourage adoption of policies • Introduces the potential that information contained in policies and procedures may maintain disparate service delivery in areas where operational processes are different for the same tasks • Means less focus on implementing best practices within the policy and procedure documents	• Is time consuming to convene a committee and develop policies
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Protocols	Local or regional adoption of protocol system at the agency's discretion	State recommendation of protocol system and/or preferred vendor without legislative action to adopt	Statewide adoption of a single protocol system for medical, fire, and police call processing and accompanying statewide dispatch procedures
	Strengths		
	• Is under local control • Does not require communications centers that use a protocol system to alter operations	• Narrows the gap between communications centers that do not currently use protocols • Improves consistency between communications centers that choose to	• Improves service consistency and standards of care throughout the state (e.g., citizen and responder safety, pre-arrival instructions) • Reduces errors and risk exposure

Operations Options			
		adopt the recommendation	• Simplifies training process and offers economies of scale for call-take training • Streamlines QA by having one benchmark to measure all communications centers to • Aligns all communications centers with industry standards and best practices • Reduces need to transfer calls from communications center to center that provides EMD because all communications centers can process any call • Reduces the workload for communications centers that currently perform EMD by expanding the number of staff who can provide medical instructions • Promotes community education, trust and support
	Challenges		
	• Does not promote consistent service to citizens statewide regardless of geographic location	• Does not promote consistent service to citizens statewide regardless of geographic location	• Is costly to implement and will require continuous funding to maintain

Operations Options			
	• Is expensive to implement the systems for smaller communications centers • Introduces the potential that areas do not benefit from life-saving instructions for police or fire emergencies	• Introduces the potential that areas do not benefit from life-saving instructions for police or fire emergencies	• Is time- and resource-intensive if the State chooses to develop its own protocols based on national standards
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Planning	Continue local control over all strategic, continuity of operations, leadership planning, and other planning activities	State-led training and workshops on planning-initiatives and leadership training	Statewide COOP plan
	Strengths		
	• Allows local control over the execution of planning initiatives	• Allows local control over the execution of planning initiatives • Allows communications centers to easily access training for succession planning and to prepare emerging leaders • Offers exposure to industry best practices at a reduced cost through economies of scale • Allows all communications centers to access resources that help them develop strategic plans • Provides for improved COOP and DR plans	• Aligns all communications centers under one plan to maintain mission-critical services across the state • Offers greater awareness and mitigation against disruptive events (like cyberattacks) at the local level • Provides staff with consistent information to prepare for or understand their role in a disruptive event • Offers all centers access to up-to-date information and best practices without taxing their resources

Operations Options			
			to research, plan, or prepare • Improves collaboration • Provides awareness to each PSAP and/or dispatch center of their backup in case of a disaster or technical failure
	Challenges		
	• Requires each communications center to expend local resources for training, planning, and implementation of planning initiatives and events • Creates gaps in operational continuity between agencies	• Requires communications centers to expend local resources to engage in planning processes • May impact planning due to staffing shortages locally	• Requires statewide collaboration and buy-in

Based on MCP's industry experience, call transfers generally take 90 seconds on average[32]. Transfers have inherent risks because callers may be lost in the transfer or may be transferred to multiple locations—either because they were sent initially to the wrong PSAP or the call had to be transferred a second or third time because it involved other agencies. Often, callers must convey their information to call-takers more than once because they were transferred to another agency for dispatch, which can extend the amount of time it takes to get proper field responders dispatched. Using a factor of 90 seconds to calculate the time it takes to transfer approximately 78,516 calls annually is 1,963 hours of unnecessary call processing time.

Regional policies and procedures focused on operational processes can reduce the time spent on call transfers by aligning agencies under a common process. Common expectations could alleviate the caller having to repeat themselves, which would align with national standards. Examples of operational policies and procedures that would be appropriate for statewide collaboration and adoption include the point at which a call is transferred, how the call is transferred (such as a warm transfer[33] with a certain set of information), or policies related to operational workflow that would define the intake point and how the information is provided to the dispatch point. These complimentary operational policies would reduce the transfer rate and should be accompanied by technical changes like a CAD-to-CAD interface. Policies and procedures for the transfer of 911 calls exist in the 911 Board's PSAP Operations Manual, Section 6.0.6. These policies and procedures are applicable only to

[32] Specific call transfer times for Vermont were not assessed as part of this report; the use of a 90-second average for call transfers is derived from several hundred studies conducted nationwide by MCP from 2009 through 2024.
[33] The process of a warm transfer involves the original party remaining on the line to announce the call to the second party.

PSAPs for the initial transfer of a 911 call to a dispatch center; additional policies and procedures (or the expansion of the existing policies and procedures) should be created to govern a second or subsequent transfer of a 911 call between additional agencies.

3.2.3 Workforce

Hiring and retaining an adequate workforce to effectively manage the workload remains one of the greatest challenges in public safety communications today. The cost impacts of steady turnover are crippling communications centers across the country. Hiring and onboarding processes are time-consuming and costly. It is anticipated that challenges related to sustaining a stable workforce, especially in 37 individual communications centers, will only increase as technology advances and public expectations continue to grow. These challenges, especially for smaller agencies with a limited workforce and resources, are detrimental and ultimately not sustainable.

In analyzing the current state of the communications centers providing 911 and dispatch services to the state, MCP identified several areas where regionalization may bring operational efficiencies.

Key Trends and Insights

- Retention rates across communications centers show significant variation, ranging from 16.7% to 100%, with an average of 79% assumed for non-reporting agencies. Notably, nine centers (24.3%) have a staff retention rate of 75% or lower.
- Staffing levels across 29 reporting communications centers reveal a significant gap between authorized and required staffing, with 18 communications centers, including three PSAPs, having recommendations to increase their authorized strength to meet the national standard of a minimum of two telecommunicators on duty.
- Vermont communications centers face critical understaffing, with 59.5% operating below the recommended two telecommunicators on duty and 34.7% operating with just two.
- While many communications centers have formalized training programs, there is a lack of mandatory and standardized statewide training and certification outside of call processing certifications that are required for PSAP staff only.

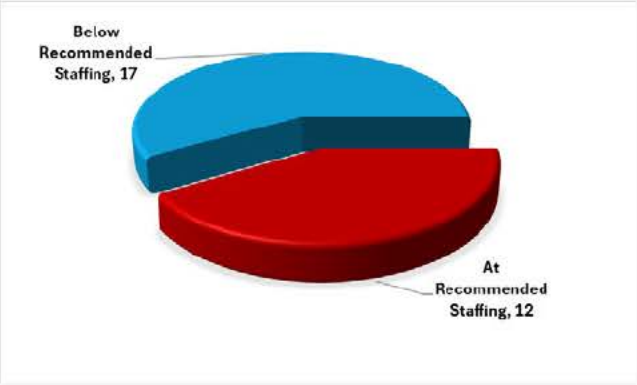


Figure 11: Agency Recommended Staffing

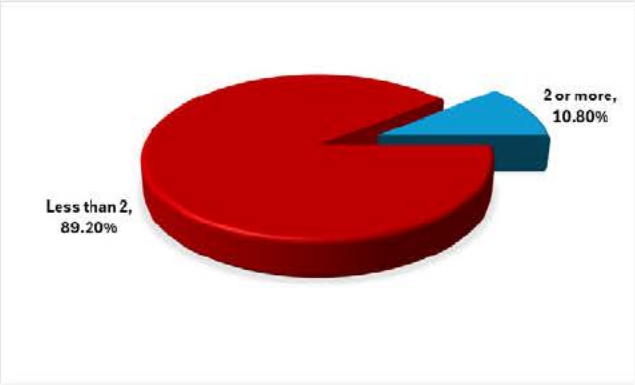


Figure 12: Staff on Duty Per Shift

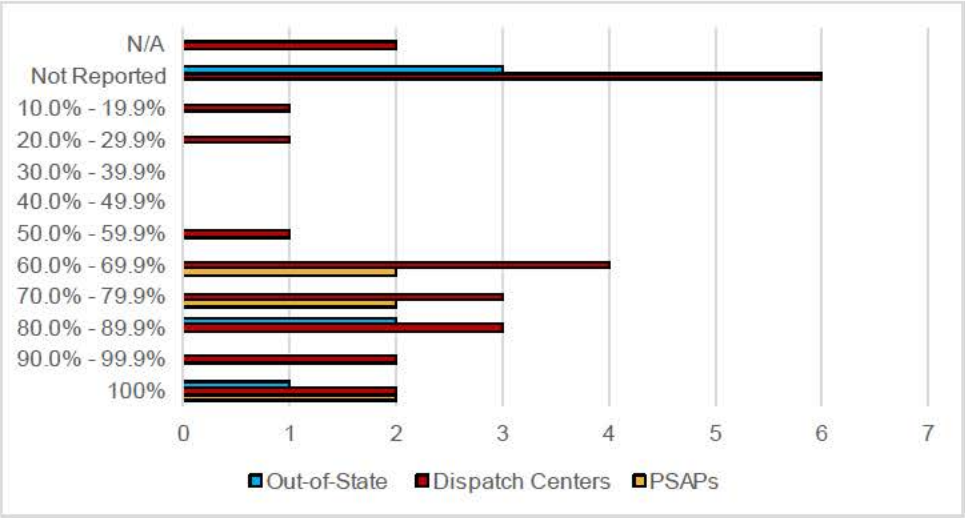


Figure 13: Agency Retention Rates (2021 – 2023)[34]

Staffing levels in Vermont's communications centers are critically low, with 33 centers (89.2%) meeting or falling below the standard of two telecommunicators on duty. This includes PSAPs and out-of-state centers, indicating a widespread issue that needs urgent attention as the current state is jeopardizing effective emergency response. Many communications centers operate with minimal staffing, which can be a challenge when it is not mathematically possible to cover even a single dispatch position without overtime or allowing personnel basic activities such as vacation time or even restroom breaks without having to take a radio with them.

Communications centers relying on neighboring centers to support their operations in the event of an evacuation or other significant event resulting in call surge, with little to no training on agency-specific procedures, are inherently at greater risk than communications centers with more robust minimum staffing requirements.

Disparities in retention rates indicate a challenge in maintaining consistent staffing levels, which can impact the quality and continuity of service. Addressing this issue is crucial for operational stability and efficiency.

With 282 full-time and 82 part-time authorized dispatchers across all PSAPs and dispatch centers, there is still a need for 66 additional full-time employees to align with the national standard of maintaining a minimum of two telecommunicators on duty 24 hours per day. Current systemwide vacancies total 30 (11.7% vacancy rate); including the recommended staffing increases this number to 96 (27.6% vacancy rate). This shortfall highlights the urgent need for improved staffing to promote the effective dispatch of emergency response and/or the need for agencies to consolidate operations.

It is important to recognize that while staffing decisions and changes should involve collaboration with collective bargaining units, they should not be entirely dictated by them. For example, factors such as allotted break times and time off can directly impact staffing requirements, pay scales, and how personnel are utilized within the operational environment. There is significant competition among communications centers from a recruiting standpoint as the centers continue to compete against each other with a limited applicant pool.

[34] Retention statistics are not applicable for two agencies because they are single employee dispatch operations. No retention information was received from four dispatch centers and two out-of-state agencies.

There is consistency among the PSAPs regarding 911 call-taker training because of 911 Board requirements; however, this does not extend to the dispatch function. As noted in the inventory and assessment report, the 911 Board has minimum requirements that align with national standards and best practices for 911 call-takers; the 911 Board provides that training at no cost to the PSAPs.

Workforce Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Recruiting and Hiring	Hire at the local level for all job classifications	Create standard job classifications, associated job descriptions that promote the reclassification of telecommunicators as first responders, and couple these with centralized job posting websites or portals[35] that all communications centers can access	Create a statewide hiring plan that includes creative solutions such as social media and community engagement
	Strengths		
	• Remains under local control • Creates the potential for homegrown team environment	• Creates consistent and thorough job descriptions that meet national standards such as APCO's core competency suite • Promotes consistent expectations for each job classification • Reduces the likelihood of job hopping • Creates a pool of applicants for all communications centers to draw from • Creates a "one-stop-shop" for applicants • Creates clarity for applicants to self-	• Leverages economies of scale for the use of funding and resources such as hiring platforms • Engages a larger candidate pool • Allows for consistent messaging to candidates about emergency communications work • Gives all agencies the opportunity to demonstrate the benefits of public service, regardless of resources available at the local level

[35] A centralized job posting website or portal does not replace each agency's hiring process; The intent of this recommendation is to (a) make the classifications and job descriptions standard across the state and (b) have a centralized repository for every agency's and/or jurisdiction's postings. It is not intended to be the only place the jobs are posted.

Workforce Options			
		• eliminate early in the process • Eliminates occurrences where unqualified personnel are working in the communications centers • Improves retention in emergency communications by recognizing the telecommunicator's role as a public safety partner	• Closes the gap on the use of technology for recruiting and hiring • Contributes to improved staffing to provide enhanced coverage 24/7 • Introduces the potential to reduce staffing shortages
	Challenges		
	• Allows vacancies to persist • May involve long process because smaller agencies have fewer staff to engage in the hiring process • Requires financial and human resources at each communications center	• Requires collaboration and buy-in across jurisdictional and political boundaries • Requires funding for a single hiring platform that all agencies can use • Means rural areas may still struggle to find staff who can work in person	• Requires statewide collaboration and buy-in • Requires human and financial resources to implement a broad, statewide plan
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Standardized Training for New Hires and Current Employees	Allow each region to create a training program specific to their perceived needs	Create a list of approved training programs for new hires and for professional development for each communications center to choose from	Develop a statewide certification program for all job classifications
	Strengths		
	• Remains under local control	• Provides direction for communications centers with no training program	• Expands current statewide training beyond call-taking education

Workforce Options			
	• Assures ability to incorporate locally specific knowledge • Allows agencies to use their experienced employees and institutional knowledge to develop future employees	• Provides a list of training that each employee should have (by job classification) based on APCO core competencies • Socializes training expectations with a requirement	• Standardizes training and performance expectations across job classifications and across the state • Allows communications centers to access industry-approved training at a fraction of the cost • Demonstrates the value of each employee and the value that the state/region/locality places on the work done by public safety communications professionals (call-takers and dispatchers) • Promotes succession planning • Centralizes training and continuing education administration
	Challenges		
	• Is possible that training remains inconsistent across the state • Does not assure training meets national standards or best practices • Does not promote retention as training and/or programs are informal with little oversight	• Does not close the gap for communications centers with limited training resources	• Requires staff to maintain certifications and training requirements

Workforce Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Staffing	Continue current staffing practices	Hybrid staffing in physical location	Hybrid staff remotely
	Strengths		
	• Allows for local control • Means a potentially shorter commute for employees	• Creates continuity of operations • Improves staffing levels in one or two seat communications centers • Allows staff to work in different locations during inclement weather or other difficult conditions • Creates a larger pool of staff available to work during high volume events • Improves collaboration and awareness of other communications centers' work environment • Positively impacts retention for staff who move away from their home location and who want to stay in the public safety telecommunications field	• Introduces the potential for cost-savings when there are unforeseen vacancies or surges in workload requiring supplemental staff • May support staffing in communications centers with a very low call volume (where supported by technology) • Promotes consistent service statewide • Supports continuity of operations • Increases retention by offering the chance to retain one's job during or after an in-state move
	Challenges		
	• Does not support retention • Perpetuates current staffing problems • Leaves some communications	• Must be coupled with standard operating procedures for consistency • May be challenging to assimilate for an	• Means the potential loss of homegrown team • Is a challenge to implement cultural expectations when staff are not in-house

Workforce Options			
	centers understaffed or unable to meet industry standards and/or best practices • Perpetuates pay disparities for staff in the same/similar job classifications within the state	employee joining a different center • Introduces complexity to QA and performance management	• May require additional technology

Using best practices for recruiting, selection, and hiring can improve retention and, thus, reduce the costs of onboarding. Maintaining starting pay in a similar range within the state could deter job hopping. A "one-stop shop" for recruiting and selecting applicants, including the development of a common statewide application that can be submitted online could be considered as a shared and/or outsourced resource with the final hiring and progression left to a respective communications center. Examples of improving the hiring efficiency include the following:

- Develop a recruitment repository for sharing recruiting materials among jurisdictions
- Develop a statewide recruiting consortium, including shared services for hiring (e.g., joint applicant testing/screening)

To improve retention, several centers in recent years have substantially increased their wages—some by more than 20%.

The State should work with the communications centers to calibrate wages to reduce recruiting competition.

Using the 911 call-taking training requirements as a baseline, the State could create additional call-taking and dispatch training requirements and expand them to all centers in the state that want to remain in operation. There are also continuing education requirements and other training needs outside of basic certification that the State should support. Improving the training approach can provide the following opportunities:

- Leveraging the training provided by the 911 Board and developing joint training curriculums and other training resources can improve the overall dispatcher success rate and performance.
- Joint training initiatives can reduce cost impacts on individual communications centers through shared staff and by combining resources to administer training (e.g., shared classes).
- Centralized training can provide operational consistency including the ability for communications centers to support each other in overflow, surge, and disaster events.

Policy and operational regionalization may provide the following staffing-related opportunities:

- Shared staff can provide a level of consistency that does not exist today.
- Shared staff could offer cost-savings when there are unforeseen vacancies or surges in workload requiring supplemental staff.
- Where supported by technology, shared staff may provide an opportunity to supplement staffing in centers with a very low call volume.

3.3 Technology and Shared Systems-based Regionalization (Tier 2)

Public safety dispatch operations are heavily dependent on IT infrastructure, computer systems, and multiple applications. Outside of physical consolidation or collocation, another form of regionalization that can be leveraged to improve emergency response is a technology and systems-based regionalization.

Dispatch centers that are unwilling or unable to participate in physical consolidation under one organizational structure or co-locating in a single facility could fail to realize the benefits that other agencies/localities have/will realize through regionalization (e.g., operational, financial, technology, strategic, etc.). Leveraging the technology and shared systems already in place as well as future enhancements could help to improve emergency response outcomes and reduce operating costs in some cases. For example, call or data transfers, which are highlighted in Section 3.2.2, may be reduced through CAD-to-CAD capabilities or by consolidating Valcour CAD systems.

Although there is room to expand the program, the State is already engaged in technology and systems-based regionalization. These alternatives are foundational forms of regionalization that can help pave the way to physical consolidation and, at the same time, reduce costs and risks inherently associated with maintaining the six PSAPs answering all 911 calls and 31 dispatch centers, including six out of state agencies. This could also resolve the issue of redundancy and failover resulting in primary PSAPs serving as backup centers[36] in the future—for both call-taking *and* dispatching rather than just call-taking, which the PSAPs currently do—to move toward improving uptime and therefore emergency response.

Technology and shared systems-based regionalization have already made considerable progress in the state with the 911 CHE in use within the six PSAPs, and the statewide VSP radio system. While this is a great start, virtualization and regionalization can also include other systems such as logging recorders, CAD systems, and fire station alerting (FSA) systems.

Cloud technologies and hosted software eliminate the need for in-house servers and the associated building space, utility expense, and IT maintenance and support. With the shared CHE systems already in place, operations would be enhanced by allowing the current PSAP operational design to change with additional layers of failover and redundancy (e.g., CAD, radio, logging recorder, etc.). Governance is already in place within the state to provide for the sharing of technology infrastructure and costs (e.g., Valcour CAD/RMS[37]).

There has been an emphasis in recent years on how people can contact 911 using a variety of methods outside of making traditional wireline phone calls. Within the PSAP, there must be continued focus on how calls can be answered, paying particular attention to remote call-taking. As regionalization continues, remote call-taking may be more appealing for current and future employees, potentially preventing long commute times in more rural areas where dispatch operations have been regionalized with a PSAP, and being more competitive with certain private sector jobs. The traditional way of tethering employees to a workstation for 8-, 12-, or 16-hour shifts is not as tolerated as it was just a few years ago. The industry should continue to leverage emerging technology that can support different and more efficient ways of processing calls. Not only does this present an opportunity for an increased hiring pool, but it also provides a viable approach (and rapidly becoming the nationwide technology best practice) for continuity of operations.

Strengths and challenges related to a virtual (technology-based) regional consolidation are outlined in the following table.

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[36] In the event of a PSAP failure (or even if there is no 911 call-taker available for any reason), 911 calls seamlessly and automatically route to an available call-taker at one of the five other PSAPs.
[37] Records management system

Table 1: Virtual Regionalization Strengths and Challenges

	Strengths	Challenges
Economics	• Is an option for any agency that is not ready to commit to physical consolidation • Are potential cost savings for participating agencies	• Requires capital expenditure; cost savings may not be immediately realized • Is more complex with shared systems than standalone systems • Will have related cost impacts to consolidate systems and technologies
Service	• Retains agency autonomy • Allows participating entities to serve as backup centers • Reduces/eliminates data transfers	• May not be agreement on data to be shared, particularly with out-of-state agencies
Mutual-aid Communication	• Allows data to be shared for situational awareness, mapping, and other systems, if governance allows • Improves interoperability • Leverages CAD-to-CAD and other integration and interfaces	• May be disagreements on systems and configuration • May be some issues as not all agencies are on the same CAD system and the ones that are do not share data between them
Other Considerations	• May provide a foundation for physical consolidation	• Requires more sophisticated cybersecurity on shared systems as there are more points of entry

A redundant, resilient, sustainable network is the foundation of shared technology. Throughout the state, a robust 911 Emergency Services Internet Protocol (IP) network (ESInet) is provided by INdigital as part of the hosted CHE solution; this network is not owned by the 911 Board. A robust network that can support additional applications beyond the CHE is highly desirable to enable information sharing among agencies. Technologies accessing such a network might include regional CAD, FSA, PSAP-to-PSAP ringdown lines, and other IP-based public safety applications.

If the 911 Board approves a new PSAP, that facility would be connected to the ESInet, at a cost to the State, for the purpose of 911 call-taking only. Expansion of the ESInet to host other systems is technically possible; however, as it stands today, 30 V.S.A. § 7054[38] would not allow expenditure of 911 funds for such an expansion. If the authority for such an expansion did exist, there would be significant contractual issues at play and a decision by the 911 Board to allow that expansion would require a comprehensive risk analysis to mitigate any potential risk to the 911 system itself.

[38] https://legislature.vermont.gov/statutes/section/30/087/07054

CAD-to-CAD interfaces are another integral consideration, as the capability exists to share calls for service (CFS) data between disparate systems, preventing duplicate entries and data entry errors.

3.3.1 Mission-Critical Systems

3.3.1.1 CAD, Mobile, and AVL

In most communications centers throughout the country, important caller information, such as the caller's name and location, are provided when the caller dials 911; in turn, that data integrates into the CAD system to begin the CFS (CAD incident). This automatic integration saves data entry time by adding caller information into the newly created incident and prevents typing errors.

A mobile application in a response vehicle is an extension of the CAD system. It provides data to responders in the field on a mobile device, such as an in-vehicle laptop computer or tablet, so personnel can see the related incident information. Mobile applications have the capability to allow units to status themselves when responding to a scene, when on scene, or when clearing, Additionally, mobile applications have a map element that allows responders to see the location of a call and other units responding to their call; the application also can provide turn-by-turn directions. The mapping program can denote points of interest such as businesses, parks, trails, and other GIS layers that can be provided by the agencies.

Automatic vehicle location (AVL) recommends the closest units to a call based on a unit's proximity to an incident location. AVL uses global positioning of a unit and then utilizes the road network to determine which units are closest. Additional attributes such as speed limits, one-way streets, and bridge weight can assist in the determination, if the application is so equipped.

Key Trends and Insights

- Automatic number identification and automatic location identification (ANI/ALI) data does not spill into the CAD system to begin an incident (i.e., CFS).
- Stakeholders and end-users expressed that it is their experience that data is currently not shared between CAD systems appropriately, even if the communications centers use the same CAD system.[39]
- The Valcour CAD system does not contain many common features used for fire/EMS dispatching; namely, it lacks the ability to display automatic unit recommendations based on preprogrammed, CAD table-based response plans—by unit or agency—commonly referred to as run cards.
- Stakeholders and end users reported the Valcour CAD system has an automatic refresh that complicates call entry and, at times, causes errors. Network congestion and/or firewall settings could be a contributing factor to their experience.[40]
- The Valcour CAD system requires that the dispatcher knows the agency to enter an incident; the caller's location does not assist with this decision.

[39] CrossWind Technologies staff report that data sharing is turned on by default among agencies and was an initial design criterion of the system; no requirement from the State exists to share data with other CAD systems.
[40] CrossWind staff reported four trouble tickets referencing auto-refresh issues; all were resolved. If additional issues exist, trouble tickets have not been submitted.

- Currently, in Valcour CAD, all incidents are sorted by the time received, not by the assigned priority, which would assist in bringing the high priority incidents to the top of the pending queue list.[41]
- Stakeholders and end users reported that it is their experience that the Valcour CAD system is limited in its statistical and reporting capabilities, which are necessary for a modern-day communications center.[42]
- Other CAD systems in use in Vermont include CSI, Spillman (Motorola Flex), Symposium, TriTech (CentralSquare), and Tyler Technologies, all with enhanced functionality; New Hampshire agencies that dispatch Vermont resources utilize IMC, CSI, and Symposium.[43]
- Some functionality in the Valcour CAD system that stakeholders believe is missing may actually be available for use today. This suggests a communication gap in effectively informing stakeholders and end users about system capabilities and how to use them.

After receiving a demonstration of the Valcour CAD system from VSP, it is apparent that the system hampers a user's workflow. Most CAD systems work the opposite of how Valcour CAD was presented. When adding a new incident into the Valcour CAD system, the user must select the area of the incident (rather than entering the location of the incident and the system geo-validating that incident to determine the area of response). This is a huge paradigm shift in the way every other CAD system works. This means the user must determine the area of the incident, without the assistance of geo-validation based on the calling party's location, to determine if the incident is within their jurisdiction of responsibility due to identical addresses existing throughout the state—the correct area must be selected from a dropdown list. This process is cumbersome, delays incident entry, and, subsequently, can cause errors if the inappropriate agency is selected.

There is also no capability to build fire/EMS response plans so the system can determine and automatically display what resources are required for a specific incident based on the caller's geo-validated location and the incident type (e.g., automated unit recommendations). This is a common feature in any multi-discipline CAD system. This limitation impacts the ability to expeditiously notify agencies and create functional assignments that meet the needs of those agencies. Currently, the manner of accomplishing this task in the Valcour CAD requires each agency to upload documents that are attached to each call type for viewing. During the dispatch process, this requires the dispatcher to take the following or similar steps:

- Open and view the attached document
- Determine the type(s) and quantity of apparatus required for the specific incident type
- If an agency/locality response list (commonly referred to as a fire box card) is also uploaded, open this document to determine the response area of the incident and which agencies in the response list must be dispatched
- If the agencies to be dispatched are not within the dispatch responsibility of the center in question, make at least one telephone call to a neighboring dispatch center to request the needed apparatus to be dispatched

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[41] CrossWind reports a near term update will provide this functionality.
[42] CrossWind representatives noted that the Valcour Report Builder was implemented in 2015 and refactored/optimized in 2017. A total of 1,640 reports have been built by the user base and CrossWind, and 255 of them are available to all users. Representatives did acknowledge that the expansive volume of available reports in the system make it difficult to know which report to select and what information that report will provide.
[43] The New York and Massachusetts agencies that dispatch Vermont resources did not provide this information.

Numerous agencies noted during stakeholder engagement that this process is time-consuming and causes significant delays in dispatching fire and/or EMS resources to an incident—particularly for incidents such as structure fires or vehicle accidents. In such cases, the dispatcher may need to place five or six telephone calls to neighboring dispatch centers to coordinate the necessary response resources (as seen in Appendix J). Stakeholders reported that these additional calls can take as long as six to eight minutes to complete, particularly in dispatch centers staffed by a single dispatcher.

While the above descriptions of deficiencies are a concern, another concern is getting any deficiency changed or updated. MCP was advised by several stakeholders that it took two years to get new functionality so the Valcour CAD system could share the Master Name data with the RMS. According to CrossWind Technologies staff, this functionality was included in the initial build, and only a single Master Name table has been maintained since. However, discrepancies between stakeholder and end-user experiences suggest that CrossWind's current communication methods with its client base may be insufficient. Without improvement, these shortcomings are likely to continue causing misunderstandings or misrepresentations.

CAD, Mobile, and AVL Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Core Data Transfer	Provide ANI/ALI data integration, working with each CAD vendor to set up their systems to receive and import the data to begin a CFS	Implement CAD-to-CAD interface, with PSAPs continuing to transfer the caller to the dispatch center	Implement CAD-to-CAD interface, with PSAPs handling all call intake, supported by a policy that callers are not being transferred
	Strengths		
	• Transfers ANI/ALI data when the call is transferred to another agency • Reduces the possibility of incorrectly entering an incident location and/or callback information into the CAD system • Provides ANI/ALI data, if the technical ability exists, if agencies request this service from the 911 Board	• Allows dispatch centers to receive information directly, reducing the need to obtain duplicate information • Improves the time from call transfer to incident dispatch • Reduces the complexity of dispatching multiple resources to emergency incidents (as seen in Appendix J)	• Greatly improves the time from 911 call receipt to incident dispatch • Eliminates the possibility that a call may be dropped during the transfer process • Allows the entry of an incident for a neighboring jurisdiction rather than transferring a call, which saves time • Improves incident entry times

CAD, Mobile, and AVL Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
			• Reduces call transfers for better caller experience • Improves mutual aid responses through reducing incident entry times • Reduces the complexity of dispatching multiple resources to emergency incidents (as seen in Appendix J) • Provides for enhanced situational awareness from a county/regional perspective • Reduces the strain on 911 personnel • Reduces errors • Assists with records requests
	Challenges		
	• Requires phone trunks and equipment to support the transfer of data • May pass development costs to the State and/or agencies	• Requires the caller to still be transferred to the dispatch center for further call processing, possibly delaying response • Is still possible that the call may be dropped during the transfer process, requiring the dispatch center to recontact the caller to receive information	• Is possible that field responders request information that the dispatch center does not have • May pass development costs to the State and/or agencies

CAD, Mobile, and AVL Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
		• May pass development costs to the State and/or agencies	
Essential Public Safety Discipline Functionality	Expand participation in the existing Valcour user group to develop and implement a feature and functionality strategy	Develop and implement essential functionality (e.g., response plans) for fire and EMS dispatching with existing CAD systems	Develop and issue a request for proposal (RFP) for a statewide CAD system that supports all public safety disciplines
	Strengths		
	• Allows stakeholders to provide input into the future development of the Valcour CAD system • Provides features and functionality not currently available • Improves or enhances end-user experience once future developments are complete • Allows stakeholders to provide input for better integration with existing applications used for dispatching incidents (e.g., RapidSOS, Active, etc.)	• Provides response plans to support fire and EMS dispatching • Eliminates the need to consult large response plan binders as the primary method of determining response units • Saves precious seconds during life-threatening emergencies • Improves responder's dispatch to on-scene time	• Provides a statewide CAD system that meets the needs of all responders (EMS, fire and law enforcement) • Introduces stakeholders to new features and functionality currently missing from the Valcour CAD system • May provide future support for remote or hybrid call-taking and/or dispatching operations
	Challenges		
	• Requires stakeholders' time to attend additional meetings • May pass future feature or functionality development costs to	• Requires personnel's time to enter the large number of existing response plans into the system	• Requires time to develop and procure a CAD system • Requires funding from the State or all the agencies to implement

CAD, Mobile, and AVL Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
	the State and/or agencies • Requires time to upgrade Valcour CAD functionality	• Requires time to upgrade Valcour CAD functionality	a statewide CAD system • Requires an interface to Valcour RMS
Statistics and Reporting Capabilities	Develop and implement common statistical and reporting capabilities	Create a regional data repository so agencies can share data for dashboards and reporting	Continue the implementation of the statewide data lake, so agencies can share data for dashboards and reporting
	Strengths		
	• Allows for better reports to track all facets of the CFS • Provides access to previously inaccessible information to be used during short- and long-term strategic planning	• Improves situational awareness at the local, regional, and state levels • Provides access to previously inaccessible information to be used during short- and long-term strategic planning	• Improves situational awareness at the local, regional, and state levels • Provides access to previously inaccessible information to be used during short- and long-term strategic planning
	Challenges		
	• Introduces possibility that vendor-provided reports are different than what is required by communications center management • May require communications center management to learn specific techniques for data or report management if reports are customized	• Requires hardware and network connectivity to share data between agencies • Could be costs associated with data conversion and the creation of the data repository and dashboards • Is a risk that some agencies may not wish to participate or share data	• Requires hardware and network connectivity to share the data between agencies • Are costs to maintain and update the data lake system • Is a risk that some agencies may not wish to participate or share data • Must be CJIS-compliant, which may add additional

CAD, Mobile, and AVL Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
		• Must be CJIS[44]-compliant, which may add additional development or maintenance costs	development or maintenance costs

The transfer of ANI/ALI information when a 911 call is transferred between PSAPs or dispatch centers is a common industry standard that most centers throughout the country already leverage. This capability has been available for several decades in all call-handling solutions and is not only a time saver when beginning a CFS but retains the data and times consistently between the CHE and CAD systems.

Throughout the data collection interviews, dispatch centers statewide provided the same overall feedback of the Valcour CAD system, making statements such as "it's not a true CAD" or "it doesn't have any features for dispatching fire or EMS." A primary difference between the dispatching of law enforcement and fire/EMS incidents is the vast and drastic number of resources required to manage a fire incident. Fire agencies statewide differ in their approaches to responding to fire calls. For example, a municipal fire department that uses a hydrant system may not need to utilize tankers[45] to fight a structure fire, whereas a rural fire department without a hydrant system would require several tankers on an initial structure fire dispatch. Many such examples exist—the use of rescue apparatus, aerial/ladder trucks, and other various types of specialty apparatus. Conversely, for most law enforcement responses, officers are notified of an incident via the radio and they respond; most incidents require only one or two units. The number of different law enforcement resource types is limited.

Valcour CAD system users statewide reported significant difficulties in pulling statistics and generating reports, which are critical functions for efficient dispatch operations. The Valcour CAD system's user interface has also been widely criticized by end users for being ineffective and unfriendly, with issues such as the inability to perform basic tasks like resizing columns or reorganizing information. Users also reported issues such as frequent crashes and data loss; however, these problems may stem from network congestion or intermittent internet connectivity at the communications center.[46] These shortcomings have forced many users to adopt workarounds, such as using notepad for CAD notes or external spreadsheets for data analysis, increasing a dispatcher's workload and frustration.

[44] Criminal Justice Information Services
[45] Fire apparatus, sometimes resembling a commercial tanker truck, that carries large quantities of water for firefighting purposes.
[46] CrossWind representatives note that if the State's firewall is experiencing heavy bandwidth usage or traffic, this will cause Valcour to run slowly for user agencies as it is a web-based product. If a PSAP or dispatch center is disconnected from the State's firewall for any reason, the agency must connect to the internet using another method to access Valcour CAD, thus giving the impression that the CAD system itself is "down."

3.3.1.2 RMS

An RMS and CAD system are used for entirely different purposes but inherently work together.

A CAD system is normally the entry point for all CFS, which then, once geo-validated, will recommend the appropriate resources to respond to calls based on their location and type. This leads to a more efficient utilization of resources and quicker response times.

CAD-to-RMS interfaces normally send the initial incident data with all associated unit assignments and times to either a law or fire RMS so it can leverage the details and reuse the data to begin an incident report. Most CAD systems can be configured to send the data to both disparate systems, so agencies do not have to call the communications center to obtain this information, saving valuable time and resources.

Several CAD systems check warrants through an RMS when entering details for a person or vehicle, which is done automatically to save steps and, therefore, time.

Key Trends and Insights

- Law enforcement RMS is the driver of the Valcour CAD system
- Most current CAD systems feed CFS and notational data to RMS.
- Stakeholders and end users reported the Valcour RMS is limited in its statistical and reporting capabilities, which are necessary for a modern-day communications center.[47]

RMS Options			
Area of Interest	**Option 1**	**Option 2**	**Option3**
CAD to RMS Data Flow	Ensure RMS data is integrated and shared between Valcour CAD and non-Valcour CAD agencies	Create a regional data repository so agencies can share data for dashboards and reporting	Continue implementation of the statewide data lake, so agencies can share data for dashboards and reporting
	Strengths		
	• Allows for critical information such as persons, warrants, and vehicle data to be parsed and shared among agencies • Integrates law enforcement, fire,	• Improves situational awareness at the local, regional, and state levels. • Provides access to previously inaccessible information to be used during short-	• Improves situational awareness at the local, regional, and state levels. • Provides access to previously inaccessible information to be used during short- and long-term strategic planning

[47] CrossWind representatives noted that the Valcour Report Builder was implemented in 2015 and refactored/optimized in 2017. A total of 1,640 reports have been built by the user base and CrossWind; of those, 255 are available to all users. CrossWind representatives acknowledged that the expansive volume of available reports in the system makes it difficult to know which report to select and what information the respective report will provide.

RMS Options			
	and EMS data with RMS • Improves situational awareness • Improves emergency response outcomes	and long-term strategic planning	
	Challenges		
	• Requires time to develop CAD-to-RMS interface • May pass development costs to the State and/or agencies • Will be costs associated with network connections between agencies	• Requires hardware and network connectivity to share data between agencies • Will be costs to maintain and update the data repository or dashboards • Is risk that some agencies may not wish to participate or share data • Must be CJIS-compliant, which may add additional development or maintenance costs	• Requires hardware and network connectivity to share data between agencies • Will be costs to maintain and update the data lake system • Is risk that some agencies may not wish to participate or share data • Must be CJIS-compliant, which may add additional development or maintenance costs

Although the Valcour CAD system is essentially an extension of RMS, there are other ways to share data between any CAD system and RMS, if the Valcour CAD is replaced.

All CAD systems have the capability to be configured to transfer the CFS data to any fire, EMS, or law RMS so it shares the exact data related to the incident up to the point the data is transferred. This data is commonly sent to RMS and used to begin an incident report, so the data stays accurate and does not need to be replicated.

The Valcour RMS seems to meet the needs of the law enforcement responder community; these users have been integral in making feature suggestions to improve the RMS product and some basic CAD features used by law enforcement responders. Fire and EMS agencies are on a separate fire RMS and do not currently leverage data in the way that law enforcement does. A standard CAD system can be configured to send the CFS to all records systems.

3.3.1.3 Logging Recorder

A logging recorder is "a voice-band audio recorder which records to and plays from a permanent storage media such as tape or disk. Logging recorders are typically multi-channel so as to simultaneously record from several sources."[48]

Key Trends and Insights

- There are at least six disparate logging recorder systems used by Vermont communications centers.
- One agency self-reported that it does not have a logging recorder and does not record telephone or radio traffic.

There is currently no statewide standard for logging recorder functionality or its use. As such, a mixture of logging recorders is used. As there is no state policy or legislation requiring the recording of radio and phone traffic, the decision is left to the individual agencies and/or jurisdictions. There should be a state standard for recording all radio and telephone traffic. The benefits are responder safety, evidentiary value, QA, and complaint resolution. Additionally, instant recall recorders should be mandatory at each working dispatch position to allow dispatchers to immediately access recorded information.

All 911 calls are recorded by the 911 Board as part of the hosted Next Generation 911 (NG911) call-handling solution. No additional state funding is provided to PSAPs or dispatch centers for the provision of dispatch channel recording, as is typically seen with many localities, regions, and states nationwide. Agencies that elect to employ digital recording of telephone calls and/or radio dispatch transmissions do so using local funding only. At least one agency reported during data collection efforts that it did not record any telephone calls or radio dispatch transmissions.

Logging Recorder Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Digital Logging Recorder Standard	Develop a statewide digital logging recorder standard requiring the recording of all law enforcement dispatch channels	Develop a statewide digital logging recorder standard requiring the recording of all dispatch channels (EMS, fire, and law enforcement)	Memorialize digital logging recorder standard in state statute, requiring the recording of all dispatch channels (EMS, fire, and law enforcement)
	Strengths		
	• Enables QA/QI efforts for law enforcement incidents • Provides a mechanism to comply with legal and/or Freedom of	• Enables QA/QI efforts for all incidents • Provides a mechanism to comply with legal and/or FOIA requests	• Enables QA/QI efforts for all incidents • Provides a mechanism to comply with legal and/or FOIA requests

[48] NENA Master Glossary V15

Logging Recorder Options			
	Information Act (FOIA) requests • Provides for the completion of agency investigations	• Provides for the completion of agency investigations	• Provides for the completion of agency investigations
	Challenges		
	• Makes the cost to implement a digital logging recorder the responsibility of individual agencies • May be viewed as an unfunded mandate, which is resisted	• Makes the cost to implement a digital logging recorder the responsibility of individual agencies • May be viewed as an unfunded mandate, which is resisted	• Takes time to complete the state-level legislative process, delaying implementation • Makes the cost to implement a digital logging recorder the responsibility of individual agencies • May be viewed as an unfunded mandate, which is resisted

As a best practice, the public safety communications industry should be conducting QA/QI activities on approximately 2% of all incidents monthly as listed above. To meet the processes outlined in the standard, agencies would need to perform QA on both incoming emergency phone calls (as appropriate) *and* radio traffic of the same incident. Digital recorder technology can record both today, and more such as screen captures and keystrokes; however, due to the lack of a digital recorder standard, many agencies in the state have not implemented this valuable technology (beyond the implementation provided to PSAPs by the 911 Board) because of the associated costs. To conform to this level of QA, telephone and radio systems would need to be recorded so the audio can be reviewed later.

3.3.1.4 Telephone (CHE or Administrative)

Evaluation of the State-provided 911 CHE was not included in the scope and was not conducted during this project.[49] ANI and ALI information is automatically displayed to a call-taker when receiving a 911 call. (This information could also be presented to the dispatcher, which occurs in small centers where staff have dual roles of call-taker and dispatcher.) ANI is "the telephone number associated with the call origination."[50] ALI information includes "the caller's telephone number, the address/location of the telephone, and supplementary emergency services information of the location from which a call originates."[51]

[49] Refer to Footnote #2 for supporting clarifications.
[50] ANI (Automatic Number Identification) - NENA Knowledge Base
[51] ALI (Automatic Location Identification) - NENA Knowledge Base

Key Trends and Insights

- ANI/ALI data is only provided to the dispatchers at the six PSAPs.
- Dispatch centers to which a call is transferred typically do not receive ANI/ALI data.

It was determined during data collection, however, that ANI/ALI data was not being provided to dispatch centers. During call transfers from PSAPs to dispatch centers, the information is not transferred automatically due to CAD system limitations. CrossWind representatives initially indicated that they were not aware of a need for this function but expressed willingness to begin exploring its implementation. To initiate this process, a preliminary meeting was scheduled for April 2025. Additionally, the 911 Board holds the authority to approve the release of ANI/ALI information to dispatch centers upon request. Many dispatch centers expressed the desire to receive ANI/ALI data on transferred calls to improve emergency response.

Telephone Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
Core Data Transfer	Provide an ANI/ALI data integration, working with each CAD vendor to set up their systems to receive and import the data to begin the CFS	Create a statewide data network (separate from the ESInet) that supports the use of regional systems and/or data transfer	
	Strengths		
	• Transfers ANI/ALI data when the call is transferred to another communications center • Reduces the possibility of incorrectly entering incident location and/or caller information into CAD	• Supports the use of regional/shared systems • Provides a robust and reliable network infrastructure • Enables the transfer of data across agencies to improve emergency response outcomes	
	Challenges		
	• Requires phone trunks and equipment to support the transfer of data • May pass development costs to the State and/or agencies	• Introduces the potential of upfront and/or ongoing costs to be unaffordable • Is possible that development time may take several years to fully implement	

Telephone Options			
Area of Interest	Option 1	Option 2	Option 3 – N/A
		• Is possible that technical difficulties may be encountered due to the area's geography	

ANI/ALI information is crucial to an appropriate emergency response. While it is a critical need for PSAPs, dispatch centers can still obtain great benefit from receiving ANI/ALI data.

3.3.1.5 Fire Station Alerting (FSA) and Paging

FSA and paging are systems and technology that are designed to notify fire and EMS stations of incidents to which their response is required. FSA systems allow communications center staff to alert one or more fire and/or EMS agencies simultaneously.

FSA can be integrated with a communications center's CAD system; in turn, this technology integration can expedite agency notifications. Additionally, third-party FSA technology can notify stations for response with audio and visual alerts, open station doors, and turn off appliances, if so integrated.

FSA can reduce the stress of audible notification by slowly building up to full volume instead of an immediate loud bell or voice notification. This type of notification has been studied, and results have found less stress on responders during the immediate alerting cycle.

FSA systems allow dispatch staff to alert one or more fire and/or EMS agencies of a pending incident.

Key Trends and Insights

- At least seven FSA systems are being used to alert fire stations/personnel in Vermont.
- Only two of the seven systems being used are solely for alerting fire stations.
- There is no standardized alerting method used statewide.
- The lack of CAD-to-CAD interfaces and no-call-transfer policy results in delays alerting fire/EMS stations across multiple dispatch centers or jurisdictions.

Fourteen communications centers report using some level of FSA to dispatch fire/EMS resources—ranging from tone and voice paging integrated into the LMR system to over-the-top (OTT) or ancillary applications such as ActiveAlert (formerly known as Active911), IamResponding, and others.

Collectively the number of disparate systems results in a lack of standardization statewide. This lack of standardization leads to the need for a dispatcher to place telephone calls to neighboring dispatch centers to request resources (some agencies reported that upward of five calls must be made regarding a structure fire). The need to place telephone calls to neighboring agencies is two-fold: no CAD-to-CAD interface is in place

between PSAPs and dispatch centers and no "no-call-transfer" policy[52] is in place. These factors result in delays in requesting appropriate resources from mutual-aid partners.

FSA and Paging Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
Core Data Transfer	Implement CAD-to-CAD interface with PSAPs, continuing to transfer the caller to a dispatch center	Implement CAD-to-CAD interface, with PSAPs handling all call intake, supported by a policy that callers are not being transferred	
	Strengths		
	• Allows dispatch centers to receive incident data prior to: – PSAP transferring caller to dispatch center – Neighboring dispatch center calling to request resources • Decreases timeframe from when a 911 call is received to when resources are dispatched • Automates mutual-aid requests, reducing calls the originating dispatch center must make to receive assistance • Improves emergency response outcomes	• Allows dispatch centers to receive a dispatchable incident with complete caller information (based on call-taking policies) more quickly • Decreases timeframe from when a 911 call is received to when resources are dispatched • Automates mutual-aid requests, reducing calls the originating dispatch center must make to receive assistance • Improves emergency response outcomes	
	Challenges		

[52] A no-call-transfer policy allows for a call-taker to process a 911 call from outside of their jurisdiction as if the call were in their jurisdiction. Through technology, once the call information has been entered into a CAD system, the information is displayed at the dispatch center workstation in the jurisdiction where the incident has occurred. There is no need to transfer the 911 caller or place a telephone call to the dispatch agency.

FSA and Paging Options			
	• Introduces the possibility that a dispatch center has a dispatchable incident prior to being able to ask clarifying questions of the original caller	• Is a risk that if a dispatch center requires additional information or caller follow-up, it must contact the caller outside of the original 911 call	

FSA stems typically include fail safes for redundancy and reliability, such as back-up power and alternate communications methods during disruptions. Given the existing systems and methods in use, these fail safes are largely unused or not available.

3.3.1.6 GIS and Mapping

Mapping is an integral part of both CAD and mobile applications and must be extremely accurate to assist users both by visually displaying where units and calls for service are and other extended functionalities.

Key Trends and Insights

- Unlike CAD systems used by other agencies with more robust mapping integration, Valcour CAD's mapping capabilities are limited, only showing units and calls on the map.
- Mobile users with Valcour CAD report using Google maps on their mobile phone for the best accuracy.
- With NG911, a robust public safety mapping application is inherent to the success of communications center operations.

Currently GIS data is created by each municipality, which also has the responsibility to update and keep it current. The GIS data is then provided to the State and the 911 Board. The 911 Board oversees the GIS data used by and provided to the PSAPs. VCGI provides a public portal for citizens to access mapping information; dispatch center and local GIS staff are permitted to access the GIS data through this portal as well.

Several agencies are currently outsourcing the mapping process, using a third-party vendor to assist them in compiling their data and providing up-to-date mapping. Other agencies report their staff using personnel cell phones to obtain mapping information from commercial sources.

One agency is using a Spillman CAD system that can track law enforcement officers in real-time; this feature is not available in the Valcour CAD system. Following VSP staff follow-up, it was determined that this functionality is limited for VSP Westminter and VSP Williston by troopers who do not permit their location data to be shared.

GIS and Mapping Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
Mapping Integration/ Enhancements	Expand the use of RapidSOS and integrate into existing Valcour CAD system	Replace Valcour CAD/mapping with a robust third-party mapping system	
	Strengths		
	• Introduces RapidSOS caller location information, which is typically more accurate than ANI/ALI data • Makes additional information available to dispatchers to assist with incident dispatching	• Improve emergency response outcomes through additional enhancements and functionality • Makes additional information available to dispatchers statewide to assist with incident dispatching • Provides more accurate/additional information for caller location with the RapidSOS integration	
	Challenges		
	• Shows only units and calls with a color-coded icon in the Valcour CAD system • May pass development costs to the State and/or agencies	• May be cost prohibitive if a system must be implemented from the ground up	

Robust mapping platforms on many CAD systems today provide a visual snapshot of where all CFS and units are located and can recommend the closest units to a call. Advanced capabilities include the ability to initiate a call from the map, update a unit status from the map, temporarily add road closures and send that information to all other users, and provide point-to-point directions to field units.

There are many instances where AVL has assisted in locating personnel that are "in trouble" and getting assistance to them quickly. Additionally, AVL can be used to assist an agency in investigating citizen complaints—namely complaints such as "no one came by my house to investigate." AVL archiving can show

that an officer did indeed respond to the area to investigate. It is recommended that all Vermont agencies embrace the use of AVL and the benefits it provides.

The mapping applications should support multiple GIS layers with the capability to turn them on and off on demand.

3.3.2 Over-The-Top (OTT) and Integrated Applications

OTT applications are provided over the internet and generally provide an enhanced service that is not available from a product's vendor. These applications provide a specific benefit to communications center staff and field responders alike.

Key Trends and Insights

- There are multiple different and disparate systems being used by most agencies.
- Most agencies have implemented RapidSOS cameras for responders.
- Agencies use a multitude of platforms to enhance their operations and responses as the CAD system does not provide specific functionalities.

Agencies within Vermont use a variety of supporting technologies including RapidSOS (some with integrated Axon cameras for responders), which seamlessly integrates the real-time or near real-time location of first responders wearing Axon body cameras onto the RapidSOS Portal map, enhancing situational awareness at communications centers. Other OTT applications include:

- ActiveAlert (formerly known as Active911), First Due, and IamResponding provide varying types of dispatch information to responders, allow agencies to track personnel enroute to the station or scene, and have pre-fire planning documents, etc.
- eDispatch provides digital voice alerts to responders (similar to those received on tone and voice paging devices).
- Prepared allows for live video of an incident from a cell phone caller.
- Spotted Dog, a cloud-based CAD-to-mobile platform, provides two-way communication between dispatchers and responders.
- Sinirji, a communications platform, provides responders with real-time dispatch, incident, and location data.

Most of these systems are being used to fill the gap caused by a mobile/AVL application that is not fully integrated into the CAD system and/or mapping or FSA methods that do not completely meet responders' needs.

OTT and Integrated Applications Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
Enhanced Applications	Develop a statewide workgroup of regional representatives to determine appropriate	Standardize which systems are recommended by the state and provide access	

OTT and Integrated Applications Options			
	systems to standardize statewide	to these systems via a statewide contract vehicle	
	Strengths		
	• May allow for cost savings across agencies as recommended products are standardized • Enhances an agency's current capabilities	• May allow for cost savings across agencies as recommended products are standardized • Improves an agency's purchasing experience through a statewide purchasing contract vehicle • Enhances an agency's current capabilities	
	Challenges		
	• May be viewed as an unfunded mandate, which is resisted • Requires time to attend additional meetings	• May be viewed as an unfunded mandate, which is resisted • May require an upgrade or change to a new system • May be hesitancy to replace existing systems viewed as working appropriately	

3.3.3 Non-Call Processing and Dispatch Systems

Non-call processing and dispatch systems or tasks are typically issues that have arisen where the easy or quick solution has been to assign the responsibility to communications center staff. The ancillary duties—such as attending to walkup window requests or monitoring security system and/or holding cell cameras—are not typically tasks associated with a communications center. While some agencies nationwide have assigned these ancillary duties to communications center staff out of necessity, these tasks still contribute to the overall workload and have the potential to take away from time spent on mission-critical tasks.

Key Trends and Insights

- All reporting communications centers are responsible for opening doors to facilities and bay station doors, with one using key fobs and keypads for exterior/interior doors at the municipal building and another unlocking Knox boxes.
- Most agencies monitor security cameras.
- Some agencies monitor alarm systems.
- Some agencies monitor holding cells
- Some agencies have walk-up windows.
- One agency can control traffic lights.

Most communications centers surveyed perform a variety of peripheral duties for their respective agencies such as monitoring a walk-up window (assigned locally) or monitoring those in custody. These ancillary duties must be identified to determine what staff (new or existing) would handle them if an agency no longer continues its dispatch operations.

Non-Call Processing and Dispatch System Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3 – N/A**
Ancillary Duty Transition	Collaborate with local agencies to determine the best path forward to complete ancillary duties	Collaborate with state and local stakeholders to determine the best method of consolidating ancillary functions at a statewide or regional level, where appropriate (e.g., local alarm monitoring)	
	Strengths		
	• Is best left to individual agencies to determine their path forward to meet the needs of the local community	• Introduces the possibility of consolidated monitoring for cameras and similar systems regionally or at the state level, which could expedite responses • May not be necessary to hire additional staff if functions are monitored/performed at the state level or regionally	
	Challenges		

Non-Call Processing and Dispatch System Options			
	• Introduces the possibility that new staff may need to be hired to perform the functions that dispatchers used to handle • Is risk that local agencies perceive this as a complete loss of autonomy	• Is risk that additional job duties given to communications center staff can become overwhelming, even for larger consolidated centers • Introduces the possibility that new staff may need to be hired to perform the functions that dispatchers used to handle • Is a risk that local agencies perceive this as a complete loss of autonomy	

The options above are only applicable if a local agency no longer has dispatch staff to perform that agency's ancillary duties in the event of closure and/or consolidation of dispatch operations.

Emerging technologies are fundamentally transforming how emergency communications centers operate, deliver services, and drive continuous improvement. Automated call attendance solutions are increasingly being implemented to categorize and prioritize incoming calls more efficiently, enabling call-takers and dispatchers to focus on high-acuity incidents.

Advancements in real-time translation and transcription technologies are improving accessibility by facilitating communications with non-English-speaking and hearing-impaired callers, thereby reducing language and auditory barriers during emergencies. Additionally, artificial intelligence is being integrated into QA/QI processes—automating the evaluation of call-handling, assessing adherence to protocols, and generating actionable feedback to inform training and enhance operations.

Collectively, these technologies—as well as those yet to be developed—have the potential to transform PSAPs and dispatch centers into more efficient, inclusive, and data-informed 911 environments across the state.

3.3.4 Public Safety Land Mobile Radio (LMR) Communications

Key Trends and Insights

- The public safety wireless environment within Vermont is fragmented across technology platforms and frequency bands.
- While there are some digital, P25-compliant LMR networks, most systems operating do so in analog mode in either the UHF band or VHF band, with most law enforcement agencies operating in UHF and most fire and EMS agencies operating in VHF.

  - Project 25, or P25, is a suite of standards developed by APCO for public safety LMR systems and subscriber devices (e.g., mobile and portable radios, radio consoles, etc.). The overarching objectives of the standard are to enhance interoperability between agencies, increase spectrum efficiency, and to reduce costs by increasing flexibility in purchasing radios to operate on the system by allowing any P25-compliant radio to operate on any P25-compliant LMR system. This removed the strict proprietary features that existed prior to P25 whereby the only radios that would operate on a given system were radios manufactured by the system vendor. P25 is the nationally accepted standard for public safety LMR systems.

- The state system, which is the system primarily used by VSP and the Fish and Wildlife Department, currently operates in analog UHF and VHF, but plans are underway to upgrade to a 10-zone digital simulcast system.
  - Simulcast will be an upgrade to the current configuration. Simulcast is a feature that enhances the coverage footprint of the system because when a transmission is made from dispatch, the transmission is broadcast over multiple sites simultaneously, thus giving field users the benefit of coverage from all those sites. Systems that operate in digital mode, as opposed to analog, experience overall better voice quality and digital systems are also capable of encryption.
- The State also operates and maintains the Vermont Communications (VCOMM) system, which was established for the purpose of providing interoperability between agencies using disparate LMR systems; however, there are challenges with VCOMM that render its current utility questionable.
  - Due to challenges with users utilizing the system for purposes outside of interoperable communications, as well as issues concerning channel interference, the VCOMM system exists in a dormant state and must be activated remotely using a dual-tone multi-frequency (DTMF) code. Most users are unaware of the activation procedure.
- The State currently has a statewide public safety communications governance structure in place, the Emergency Communications Advisory Council (ECAC), created by executive order; however, the understanding is that it is currently not active as there were never any appointments made to it, but it could be leveraged to be a component of a future statewide governance structure.
- The Vermont Community Broadband Board (VCBB), within the Department of Public Service, is administering the state's participation in the Broadband Equity Access and Deployment (BEAD) Program[53]. The state is in line to receive approximately $229,000,000 in funding for infrastructure deployment to support high-speed internet service to unserved and underserved areas. There may be potential synergies with the BEAD Program to utilize some of the deployed broadband infrastructure toward LMR expansion.

[53] Broadband Equity Access and Deployment Program | BroadbandUSA

Public Safety Land Mobile Radio (LMR)

As determined during the data collection phase of this project, the state's public safety communications LMR environment is fragmented across the state with many LMR systems supporting the different agencies. The systems vary across technology platform, with most being analog but with some digital, and spectrum band, with fire and EMS largely utilizing VHF and law enforcement largely utilizing UHF. There are approximately 122 VHF channels in use across the state where each channel is used by a single agency and an additional 235 other VHF channels that are shared by multiple agencies. In the UHF band, there are currently 243 channels licensed to individual agencies, and an additional 34 UHF channels that are shared by multiple agencies. Of all the LMR systems, there are a small number of digital P25 systems, primarily used by law enforcement. These systems could be leveraged for further buildout.

The Vermont Department of Public Safety (DPS) Radio Technology Services (RTS) unit operates a statewide system that is in the process of being expanded from 39 to 49 sites and moving to a 10-zone simulcast configuration within each of the ten VSP zones. The system is supported by a microwave backhaul network that should be leveraged in future statewide LMR buildout. The VCOMM system experiences issues due to its current operational posture as well as training issues on its use across the state.

LMR Channel Licensing Requirements:

To utilize the channels required for operating an LMR network, an effort must be undertaken to identify any potentially available channels within the spectrum band (VHF, UHF, 700/800 megahertz [MHz]) the system will operate on. Once potential channels have been identified, a coordination effort must be conducted to ensure the channels will not interfere with other existing licensed systems in the U.S. For VHF and UHF locations north of Line A, the virtual line that encompasses about the northern half of the state, the applications will then be sent to Industry Canada to determine the potential for interference to Canadian operations. Frequencies in the 700/800 MHz pools have U.S.-primary frequencies predefined in a border sharing agreement and are thus easier to license. Once the coordination process is successfully completed, the channels can then be licensed for use through the Federal Communications Commission (FCC) as required.

Governance is a critical element in addressing LMR deficiencies across the state. Robust governance is a mechanism of collaboration across all stakeholders enabling them to work for the greater good by pooling resources and increasing efficiencies. The best public safety communications governance structures operate in a "bottom-up" fashion as opposed to "top-down." The recommendations presented below, specifically regarding building out a regional "system of systems" approach will require consolidation of VHF and UHF channels for use in the systems. Collaboration will be required to determine which channels could be leveraged for the approach, and then having the agencies currently holding licenses to those identified channels be willing to use them on the regional systems.

The table below contains three potential options for consideration in working toward a more robust and higher functioning public safety LMR environment. The options are explained in more detail in the section below.

Public Safety LMR Options				
Area of Interest	**Option 1**	**Option 2**	**Option 3**	**Option 4**
LMR Infrastructure Improvement	Construct "system of systems" establishing simulcast systems in UHF/VHF within each VSP zone	Construct "system of systems" establishing simulcast systems in UHF/VHF within each county	Construct statewide 700/800 MHz digital trunked P25 LMR network	Continue planned expansion of current statewide system by adding 10 VELCO sites and establishing 10 simulcast zones in both UHF and VHF
	Strengths			
	• Improves coverage significantly • Leverages the State's current plans to upgrade its system to ten simulcast zones within the VSP zones • Could apply a phased approach the same as Option 2	• Improves coverage significantly if done correctly • Could apply a phased approach by deploying simulcast analog initially so all current radios could still be utilized, and then plan to migrate to digital P25 as budgets allow	• Are ample radio frequency (RF) channels available • Is a much smaller risk of interference than VHF/UHF • Could establish one unified statewide system • Provides advanced technology, including trunking and automatic roaming, and facilitates statewide interoperability	• Is the least expensive of all options • Provides a baseline system upon which future coverage expansion can occur • Provides better coverage than currently experienced
	Challenges			
	• Has an unknown availability of channels in VHF/UHF	• Has an unknown availability of channels in VHF/UHF for simulcast	• Requires more infrastructure, resulting in more costs, than VHF/UHF; nearly all the current mobile	• Has an unknown availability of channels in VHF/UHF

Public Safety LMR Options				
	• Requires agencies that hold existing channel licenses to allow them to be used on the system	• Requires agencies that hold existing channel licenses to allow them to be used on the system • Requires 13 or 14 simulcast zones, as opposed to ten zones (if using the VSP zones)	and portable radios for all first responders would need to be replaced	• Requires agencies that hold existing channel licenses to allow them to be used on the system • [redacted]

Building/Expanding of a New LMR Network

Building a public safety LMR network, or expanding and upgrading an existing LMR network, is a very complex and expensive task involving many considerations, both regulatory and non-regulatory. From a regulatory perspective, the system must be licensable in accordance with FCC regulations for RF licensing and use. Other regulatory issues can be introduced for radio site development under the National Environmental Policy Act (NEPA) and the State Historical Preservation Office (SHPO).

From a non-regulatory perspective, there are many factors to be considered, which, while not codified as mandatory requirements, would be considered best practices that have been widely adopted across the country. Examples of these would be ensuring all radio sites are properly grounded in accordance with the Motorola R56 grounding standard (or equivalent) and that all tower structures comply with structural loading standards for public safety under the most current revision to American National Standards Institute (ANSI)/ Telecommunications Industry Association (TIA)-222[54] for class 3 structures. Failure to follow these standards will introduce risk to the performance and reliability of the LMR network. Beyond these standards and best practices, decisions need to be made on levels of coverage, level of reliability, and system capacity.

When building an LMR system, the best method of defining the system requirements involves an in-depth stakeholder engagement effort. Stakeholders would include first responders, dispatchers, agency technical staff if available, and elected officials and/or decision-makers within the agency(ies). Nationally accepted standards for the reliability of public safety LMR systems are "five 9s" up time (i.e., the system is on-line and functional 99.999% of the time). System capacity can be determined by examining current system radio traffic and conducting an analysis of that traffic to determine the number of channels needed to accommodate the number of users.

[54] As of October 2,2023, the current revision is ANSI/TIA-222-I, *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures*.

LMR Coverage Requirements and Frequency Bands

The coverage requirement for public safety, from a best practice perspective, is 95% reliability within the designated coverage area. This means that a system user should be able to have a successful communication within the coverage area at least 95% of the time. The level of coverage is a significant decision that needs to be made before beginning the procurement process. Most first responders use two types of radios when conducting their duties—mobile radios, which are radios mounted in vehicles, and portable radios, which are handheld radios that first responders usually carry on their person in a holster mounted on their hip. The table below illustrates the current coverage levels provided by the DPS RTS statewide system. The lowest percentages were zone are **bolded**.

VSP Zones	No. of Sites	Site Configuration	Mobile		Portable	
			Outbound	Inbound	Outbound	Inbound
A1	8	2 TX/RX, 6 RX	[redacted]			
A2	2	1 TX/RX, 1 RX				
A3	5	3 TX/RX, 2 RX				
A4	7	3 TX/RX, 4 RX				
A5	6	3 TX/RX, 3 RX				
B1	5	3 X/RX, 2 RX				
B2	3	3 TX/RX				
B3	4	4 TX/RX				
B4	3	2 TX/RX, 1 RX				
B5	2	2 TX/RX				

Note: In the table above, the total number of sites is reflected as 45, as opposed to the 39 sites referenced previously. The reason for the difference is there are receive only (RX) sites that are not reflected in the original 39.

In addition to mobile and portable coverage, some agencies want some level of in-building coverage. Mobile radios transmit at a higher power output than portable radios, thereby requiring less infrastructure to attain 95% mobile coverage than portable coverage. In-building coverage can significantly increase the amount of infrastructure to attain the desired coverage. Systems can be designed to provide coverage in basic wood frame residential buildings, which would be the lowest level, all the way through commercial buildings such as malls, schools, hospitals, and prisons that are constructed with steel and/or concrete. The higher level of coverage required, the more infrastructure necessary to provide that coverage and therefore the higher the cost.

Another consideration for construction of an LMR network is the spectrum band to be used for the system. The FCC has dedicated channels in VHF, UHF, and 700/800 MHz frequency bands for public safety use.

Propagation characteristics vary for each band, as VHF generally requires the least amount of infrastructure as compared to UHF and 700/800 MHz, and UHF requires less infrastructure than 700/800 MHz. VHF is the oldest public safety band and the least organized; therefore, it is more subject to interference from users of other systems. Locating suitable VHF channels can be challenging. 700/800 MHz tends to provide better in-building coverage penetration than VHF and UHF. Since 700/800 MHz is the newest public safety band and is well organized, there should easily be sufficient channels for any system design, and the risk of interference is minimized in this band.

Changing spectrum bands from a legacy system to a new system will generally require the replacement of all mobile and portable radios used on the legacy system.

Another consideration revolves around digital or analog systems. Most systems in use across the state currently operate in conventional analog mode. Digital audio clarity can be better and more consistent throughout the entire coverage area when compared to analog audio. In an analog system, experienced users can determine in advance when they are nearing the limits of radio coverage as the amount of receiver noise present increases proportionately as the signal levels decrease. In a digital system, the audio quality remains clear as the receiver moves away from the transmitter and signal levels decrease in strength. Only when the radio signal strength decreases to the point where the digital bit error rate (BER) becomes excessive does the audio quality begin to deteriorate. When the radio user is at this point, the drop out of radio communications is quite abrupt when compared to the gradual degradation of an analog system. Digital systems are capable of being encrypted, while analog systems cannot. Encryption is often desired by law enforcement agencies for officer safety reasons as well as CJIS security reasons (refer to the inventory and assessment report for further information).

LMR Architecture and Standards

A final consideration for public safety LMR is whether to build a system that conforms to APCO P25 standards. P25 is the widely accepted standard for public safety LMR networks and the interoperability standard for digital two-way wireless communications products and systems. The P25 standard was created by and for public safety and federal communications professionals to provide specifications for the design of communications systems so that all purchasers of P25-compatible equipment operating in the same frequency band can communicate with each other. A P25 system can be used in conventional or trunked mode of operation. In a trunked mode of operation, the radio traffic is automatically assigned to an available repeater by the trunked system controller. P25 systems operate in digital mode.

Radio Trunking:

Trunking is a radio technology that allows for each site to operate a pool of frequencies and dynamically assign a frequency out of the pool to be used for the duration of a radio call. Because frequencies are dynamically assigned, these systems allow for a large number of talkgroups, which function the same way as a radio channel, but are not always strapped to the same frequency. Additional talkgroups can be provisioned without the need of purchasing additional equipment, which is the case with conventional systems. Trunking systems also allow for roaming between different radio sites, providing seamless communication for users operating across a wide area with many different radio sites, each operating on different frequencies. Trunking networks provide an extremely high level of flexibility, allowing for many different user groups and disciplines to operate on a shared system. The primary limitation with trunking is cost, with subscriber radios typically costing several thousand dollars more per radio when compared to conventional radios.

For the three options above, the recommendations for Options 1 and 2 for VHF and UHF entail building the system in conventional mode due to the technical complexities involved in finding VHF channels that are suitable for trunking, but the recommendations for Option 3 for 700/800 MHz would be to build the system in trunked mode. P25 systems utilize one of two potential protocols for handling radio channels: frequency division multiple access (FDMA), known as P25 Phase 1, and time division multiple access (TDMA), known as P25 Phase 2. Phase 1 systems allow for one talkpath per dispatch channel, while Phase 2 systems allow for two talkpaths per dispatch channel, nearly doubling the system capacity. If the current P25 systems within the state were built in Phase 1, as all early P25 systems were, then the recommendation would be to initially build the new system in Phase 1 for better compatibility. There are a number of technical considerations to this decision, however, which would need to be thoroughly vetted with stakeholders prior to making the final decision.

The original goals of the P25 standards (and their benefits) are as follows:

- *Allow effective, efficient, and reliable intra-agency and inter-agency communications* so organizations can easily implement interoperable and seamless joint communication in both routine and emergency circumstances.
- *Ensure competition in system lifecycle procurements* so agencies can choose from multiple vendors and products, ultimately saving money and gaining the freedom to select from the widest range of equipment and features.
- *Provide user-friendly equipment* so users can take full advantage of their radios' lifesaving capabilities on the job—even under adverse conditions—with minimal training.
- *Improve radio spectrum efficiency* so systems will have enough capacity to handle calls and allow room for growth, even in areas where the spectrum is crowded, and it is difficult for agencies to obtain licenses for additional radio frequencies.

It is important to note that there is frequent confusion among radio system users about the adoption and use of P25. While P25 does establish a common air interface (CAI) between radio equipment from different manufacturers, it does not specify a particular frequency band for operation. This means that if an agency operates VHF P25 radio equipment and a neighboring agency operates UHF or 700/800 MHz P25 radio equipment, they still will not be able to communicate with one another directly over the air due to the different frequency bands. Some form of multi-band radio or cross-band patching or linking of the radio systems will be required to allow the two agencies to communicate with one another by radio.

LMR Network Procurement Strategy

When looking to build a new LMR network, two general approaches can be taken in this regard: competitive procurement or sole source. A competitive procurement is often the preferred approach within government due to the high system cost and the desire to ensure the best value is being provided by the selected vendor. Sole source is often used when a vendor is already in place for a legacy system with whom the system stakeholders are comfortable and there is a desire to expand the capabilities of the existing system.

When conducting a competitive procurement, there are two general approaches that can be taken. One entails developing a system design and putting that into an RFP document asking vendors to build according to the design, and the other is developing a requirements-based document where coverage, capacity, reliability, operational, and functional requirements are put in the document and the vendor is then asked to design a network that will meet those requirements. The latter is the more highly recommended approach as it places all the risk of system performance on the vendor, whereas the former approach places risk for system performance on the entity issuing the RFP.

The aforementioned information is provided for context in understanding some of the many considerations and processes involved in building LMR networks. Three potential recommendations for the State to consider in addressing LMR improvement for public safety are discussed below.

LMR Network Options

DPS RTS currently operates a statewide LMR network that operates in both the UHF and VHF bands, connected with a microwave backhaul network. RTS is currently in the planning stages of adding ten new sites to the system and migrating to a P25 simulcast environment with ten simulcast zones that will align with the ten VSP barracks zones. Any future path should leverage this system and the affiliated backhaul network as a foundation. In developing the conceptual framework for budgetary estimates for the first three potential options, MCP used all the current DPS radio sites and then added other existing sites as indicated in the FCC database, and, in some cases, added new greenfield sites[55] to attain the coverage level being sought. In working to develop a design for implementation, existing local agency radio sites should be prioritized for use where feasible, followed by other existing radio sites, prior to constructing greenfield sites to reduce capital costs to the extent possible. These conceptual designs sought a coverage level of 95% mobile coverage reliability within each coverage area.

Options 1 and 2 in the table above are similar in nature in that they involve a phased approach to reaching statewide communications utilizing the P25 platform. The approaches require the initial construction of simulcast zones in VHF and UHF across the state for the use of local emergency responders leveraging mixed mode repeaters that support both analog and P25 conventional operations. The mixed mode configuration will allow the system to operate in either analog or P25 conventional mode, with the repeaters repeating the signal format of whatever mode the inbound radio traffic is using. With this mode of operation, users will be able to continue using their existing analog radios in the near term, and transition to the P25 mode once subscriber radios are updated, without any changes being required to the fixed infrastructure.

Option 3 involves constructing a new 700/800 MHz P25 trunked statewide LMR network. The strengths of this system would be the opportunity to construct a consolidated statewide network for all state and local emergency responders. In 700/800 MHz, there would be enough available channels to accommodate all the capacity first responders within the state would need for both dispatch and tactical traffic, and a trunked system is more spectrally efficient than a conventional system. Paging could be conducted on the new P25 system using P25 pagers, but it would entail replacing all existing pagers. The biggest weakness of this approach is the high cost. Because of the nature of how 700/800 MHz propagates compared to VHF and UHF, a statewide 800 MHz system would require more radio sites than VHF and UHF, which would require more engineering, system hardware, backhaul, and ongoing maintenance. Additionally, most radios currently in use across the state would not be able to be used in 700/800 MHz and would need to be replaced with new radios, in addition to the replacement of pagers.

Under both Options 1 and 2, the State would continue with its plans of moving to P25 simulcast while the local systems are built out. In developing the models for these systems, the existing State sites formed the foundation for these systems, with additional sites added to achieve the desired coverage level of 95% mobile. In some of the very rural areas of the state that currently lack coverage, greenfield sites were added to attain the desired coverage level because there are no existing sites in these locations.

The difference in the two options is the configuration of the simulcast zones, where one would entail building out the zones using the ten VSP zones, and the other would use the 14 counties as the zone boundaries. One

[55] A greenfield site is a location that would require an acquisition of the land and construction of a new tower at a location where there currently is no tower.

strength of both approaches is that they will allow most radios currently in use to continue to be used while the system(s) operate in analog mode—thereby significantly reducing the overall cost initially. This approach will also allow for the consolidation of channels to be more efficient in the use of spectrum and dispatching operations.

These approaches envision the need for a minimum of two UHF channels per zone, providing a dispatch and tactical channel for law enforcement, and a minimum of one VHF channel per zone for fire/EMS dispatch/paging and an additional VHF channel per zone for tactical use by fire/EMS (also installed in the dispatch consoles). MCP understands that some zones, particularly in and around Chittenden and Lamoille counties, could require additional channels dependent on operational and capacity needs. MCP recommends a traffic study to confirm where additional simulcast channels may be needed in each operational area.

One challenge with the approach of staying in VHF and UHF is the identification and licensing of appropriate channels that could be used for a simulcast system. This challenge is exasperated in Vermont as the state shares a border with Canada, and approximately one half of the state falls north of Line A, which requires frequency coordination with Canada, as well as domestic frequency coordination, which is required by the FCC in all cases. In light of this, the more channels required, the more challenging it will be to identify the appropriate channels. If this approach is chosen, one of the first steps recommended is to engage a company that specializes in spectrum acquisition and licensing to conduct the spectrum search process. The additional licensed VHF and UHF channels could be maintained for tactical talk-around channels, which would not be monitored by communications centers. Agencies would still be able to maintain their existing conventional radio systems to be used as additional tactical channels with the understanding that some existing frequencies will likely need to be repurposed to support the new simulcast systems.

These options provide significant improvements for communications in Vermont including the following:

- Greatly enhanced coverage over a wider area without the need to regularly change channels
- Simplified unit dispatching from a reduced quantity of dispatch centers
- Improved system reliability through overlapping site coverage, redundant backhaul, and hardened radio sites
- Improved interoperability through shared channels
- Reuse of existing subscriber equipment including mobiles, portables, and pagers
- Flexibility to add additional sites in the future to fill specific coverage gaps that may be identified
- Potential for UHF equipment to share existing VSP antennas/lines through the use of expanded combiners and multicouplers

MCP recognizes that there are currently some P25 systems in operation within the state. MCP recommends those systems continue to operate as P25 systems while the initial analog simulcast systems are built. The next phase of this approach would be to plan and implement a statewide upgrade of all systems to P25 in conventional mode. Since this would entail the replacement of most radios used by first responders, stakeholders could plan this process from a budgetary perspective, allowing as much time as they deem necessary.

Once the transition to P25 is complete with fielded radios being fully upgraded to be P25-capable, the other existing P25 systems could be integrated into the overall system, as well as the State's system. For this reason, if the path followed is to align the initial simulcast zones with the state's ten VSP zones, then the integration of the ultimate P25 system with the state would be more seamless. That said, integration with the state system would still be possible regardless of the selected configuration of the local simulcast zones.

For the budgetary estimates, MCP assumed that all potential approaches would leverage the State's existing microwave backbone. As additional sites are added to reach the desired level of coverage, MCP assumed those sites would then be connected via new microwave. There are opportunities, however, based on information collected during the inventory and assessment process, to use existing fiber within the state. This would be dependent on the location of the sites and their proximity to existing fiber and whether that fiber is available for use. As the State continues with the BEAD Program, there may be additional opportunities to leverage any new fiber that will be deployed as part of that effort. If feasible, it would be beneficial to secure an indefeasible right of use agreement for government to a portion of this new fiber.

Whichever option is chosen for further examination and planning, governance and collaboration will be a critical element for success. The VHF and UHF channels that would be suitable for the simulcast systems will need to be identified from among the existing licensed channels in the state, as there are no additional channels available. Those licensees will need to be willing to provide these channels for use on the new systems. It will also be necessary to execute memoranda of understanding between various agencies at the state and local levels to share resources such as existing towers and other infrastructure. It will take robust collaboration and cooperation of all stakeholders to drive Vermont to a desired future state of emergency communications.

Option 4 was added after developing rough order of magnitude (ROM) cost estimates for Options 1, 2, and 3, and determining the very high potential costs of each option. Option 4 consists of continuing with the RTS plan of expanding the current statewide LMR system by adding ten sites—sites that already exist and are owned by the Vermont Electric Power Company (VELCO)—and transitioning to ten simulcast zones in both UHF and VHF corresponding to the 10 VSP zones. Even though this configuration only realizes approximately 82% composite statewide coverage in UHF and 76% statewide coverage in VHF, it would provide baseline infrastructure that could be leveraged for further coverage expansion in future years as funding can be obtained.

Dispatching and Cost Modeling

From a dispatching perspective, the ideal circumstance involves one dispatch center per simulcast zone, which would reduce the risk of contention between multiple dispatch centers trying to transmit on the same radio channel at the same time; however, this is not a requirement as proper training could mitigate the risk of contention. More than one dispatch center can operate within the same simulcast zone dispatching different agencies, but there would be a need for training and robust SOPs to mitigate channel contention issues. Channel contention occurs when two or more dispatch centers use the same channel and multiple centers try to access the channel simultaneously. It is also not a requirement that a dispatch center is physically located within a simulcast zone where they have dispatching responsibilities as connections to the system can be made at any location within a reasonable distance.

From a cost model perspective, multiple approaches have been taken across the country concerning a statewide LMR network that is used by state and local entities. Some states take responsibility for the construction, operation, and maintenance of the system but have it built to a mobile coverage standard. If local entities wish to have a portable coverage standard, or even more robust in-building coverage, they are invited to add the required infrastructure at their cost, and the state would then take over the responsibility of the ongoing operation and maintenance of the new infrastructure. For local participation, some states charge a fee to locals based on the number of radios that will be used on the system, and others do not charge a fee for ongoing system usage. The overall approach is dependent on the existing circumstances within the state.

To summarize, the following approaches are recommended for more robust LMR communications across the state:

Construction of new 700/800 MHz P25 trunked system.

- "Cleanest" approach from a technology perspective, with frequency acquisition and licensing much easier than VHF and UHF
- Consolidated communications across the state on the same platform immediately upon completion
- All channels able to access the full coverage footprint of the system
- Would require more infrastructure than VHF and UHF as well as the replacement of nearly all existing mobile and portable radios in use—therefore will be significantly more expensive than the other two options

Phased approach to attaining statewide P25 conventional simulcast in UHF and VHF, using either ten VSP barracks zones (as RTS is currently planning for the state system) or utilizing the 14 counties as the simulcast zones.

- First phase would construct analog simulcast zones targeted initially at 95% mobile coverage
  - Would allow for the continued use of the existing mobile and portable radios until future phase to migrate to P25
  - Identification and licensing of channels could be challenging, and would require cooperation of existing licensees for any identified channels
  - At a minimum, provision one UHF channel and one VHF channel for dispatch in each zone, with an additional VHF channel for tactical operations monitored by dispatch
    - Additional channels could be added for operational and capacity requirements, but the more channels added the more difficult to identify suitable channels
  - Additional levels of coverage could be added as determined by stakeholder requirements and budgetary constraints
  - State's current backhaul network can be leveraged for network connectivity; additional microwave or fiber can be added to connect additional sites
- Second phase would migrate from analog simulcast to P25 conventional simulcast
  - At this stage, could integrate the other existing P25 systems within the state, including the State system
  - Would require replacing most of the existing mobile and portable radios, so budgetary planning would be necessary
  - Choosing to configure the initial analog simulcast zones to the VSP zones in alignment with the state system approach would make for a more seamless integration with the state system after migrating to P25

Potential Hybrid Wireless Solutions

As the cost estimates are finalized for expanding LMR coverage statewide, if those costs prove too exorbitant, there are vendors that offer hybrid solutions to wireless communications that leverage LMR, commercial cellular, and low earth orbit satellites to provide communications in areas where a single network may not provide adequate coverage. In this case, the State should consider publishing a request for information (RFI) document to explore other potential solutions that may be available to solve some of the wireless coverage challenges for

public safety. MCP recommends the RFI be objectives-based, which would allow for review and thorough vetting of the responses for any viability in providing a reliable and cost effective solution.

Key Decision Points

- Desired level of coverage
  - Public safety standard is 95% coverage over the bounded area, which in this case is statewide.
    - The 95% standard is not required; dependent on fiscal constraints the initial buildout could focus on providing 95% coverage to populated areas and primary highways. System coverage could be expanded in the future as funding allows.
- Spectrum band: VHF/UHF or 700/800 MHz
  - VHF/UHF is probably the more practical choice given the current operating posture of first responders in the state concerning LMR operations; however, the identification and licensing of appropriate channels will require and extensive search and coordination efforts. VHF/UHF will also be considerably less expensive than 700/800 MHz.
  - 700/800 MHz allows for more advanced technological features such as trunking.
- Number of channels needed for system capacity
- Publication of RFI
  - Consideration into the publication of a RFI looking for potential hybrid wireless solutions, which could provide reliable cost effective solutions to current public safety wireless coverage gaps.

Budgetary Estimates

Budgetary estimates for the infrastructure components of the referenced options are under development and will be delivered via addendum.

For purposes of budgetary estimates for replacing existing radios and pagers, the following information was collected, and assumptions are based on this data.

According to the Report to the Vermont Legislature Emergency Medical Services Advisory Committee, dated January 8, 2024, Vermont has 75 ground ambulance services, 1 air ambulance service, and 88 first response services. MCP assumed an average of three vehicles per ground services, and two helicopters for the air service, which would require 227 mobile radios. Additionally, MCP assumed the need for four portable radios per ground service unit and two portable radio for each first response service, for a total of 476 portable radios.

According to the 2016 Full Time Law Enforcement Officers by Agency report from the Vermont Crime Information Center, there are 58 local law enforcement agencies, 14 sheriff's offices, and 6 state law enforcement agencies. The local agencies and sheriff's offices have a total of 799 full time officers/deputies. For the local agencies and sheriff's offices, MCP assumed an average of 15 vehicles per agency, for a total of 1,080 mobile radios. For portable radios, MCP assumed one portable radio per full-time officer, for a total of 800 portable radios. For the state agencies, MCP assumed a total of 500 vehicles, requiring 500 mobile radios, and a total of 450 law enforcement officers, requiring approximately 450 portable radios.

According to the January 2023 National Fire Department Registry Summary, there are 205 fire departments in Vermont. As there was no data available for the number of firefighters, MCP assumed an average of 15

firefighters per department and an average of five apparatus per department. This would require 1,025 mobile radios, 3,075 portable radios, and 3,075 P25 pagers.

MCP made the following assumptions for the purchase of new Unication P25 pagers and mid-range P25 mobiles and portables: $600 per pager, $5,000 per mobile, and $4,500 per portable. Based on these assumptions, the following ROM estimates were formulated for radio and pager replacement:

	Quantity	Extended Cost
Pagers	3,075	$1,845,000
Mobile Radios	2,832	$14,160,000
Portable Radios	4,801	$21,604,500
Total for Radios		$35,764,500
Total Replacement Cost		$37,609,500

VCOMM

The VCOMM system was intended as an interoperability solution to provide shared frequencies leveraging the VHF and UHF national interoperability channels at mountaintop sites throughout Vermont. The system would allow users responding to a given area to interoperate by moving to the shared VCOMM frequency serving that area.

The system has been limited because of several issues including the following:

- Power restrictions for locations north of Line A
  - There are few opportunities for removing the power restrictions on the VHF and UHF national interoperability frequencies. At the time these frequencies were created within the United States, they were not coordinated with Industry Canada and were already heavily incumbered within the portions of the Province of Quebec that border Vermont. This led to the power restrictions currently in place. Continued use of the frequencies will necessitate limiting radiation toward Canada. Further, identifying alternate frequencies was attempted at the time the VCOMM system was licensed, and it is not likely new frequencies without power restrictions could be identified. The only solution to the power restrictions would be to re-evaluate the RF design leveraging more sites and directional antennas to provide targeted improvements in areas where coverage is lacking.
- Complex base station activation procedures that must be initiated from the field
  - The procedure for activating VCOMM base stations requires users to remotely activate the equipment by entering a DTMF number. This can be accomplished via a radio directly, if the radio has the capability of generating a DTMF tone; otherwise, a cell phone could be utilized to generate the tone and broadcast it to the system utilizing a radio. The process is exceedingly cumbersome and requires regular training to ensure users are familiar with the process. The need to follow this procedure is because the UHF VCOMM stations all

operate with duplex repeaters that cannot be left on continuously. The VHF channels are always operational, but they operate in simplex mode and only transmit from the mountain tower sites from dispatch. This too is problematic, as all sites—UHF and VHF—that are situated above Line A (approximately the entire northern half of the state) are limited to 5-watts effective radiated power[56] (ERP); ideally, the minimum ERP would be 50-watts. Currently, however, the DTMF receiver is inoperable; the only way the system can be activated is manually by RTS staff.

  - In other parts of the country, the primary national interoperability frequencies used are in the 800 MHz band, which are paired frequencies leveraging repeaters. With repeaters, the stations can be programmed with the receiver always enabled and the transmitter disabled. When a user in the field requires access to the repeater, they send their request in, and the monitoring dispatcher can remotely enable the transmitter from their console position.
  - When the national interoperability frequencies were first established, the VHF frequencies were selected for simplex (non-repeated) operation, and the UHF frequencies were paired for repeater operation. Since the initial configuration, the National Interoperability Field Operations Guide (NIFOG) has since established procedures for pairing the VHF frequencies to establish repeater pairs. Transitioning VCOMM to repeater operation will allow for the VHF and UHF receivers to always be enabled, and to have transmitters controlled by the monitoring dispatch center when a request for system access is made by a user directly on their radio. The VCOMM frequencies may also be used in the direct (talk-around) mode when users are outside of the VCOMM coverage area.

- Frequency use for non-interoperability communications by some agencies
  - This is a training issue, as the use of the VCOMM channels for anything other than interoperability is prohibited by FCC rules. More consistent use of the VCOMM system will necessitate identifying the offenders and having them use different channels or their cell phones.

VCOMM Recommendations

The VCOMM system was historically needed due to the large number of disparate systems and frequencies used across the state. Given this environment, it is highly likely that users responding outside their jurisdiction might not have shared frequencies programmed in their radios for the users in the area to which they are responding.

In the event the primary system recommendations are implemented to consolidate dispatch frequencies to countywide simulcast cells (or alternate boundaries of similar size), when the number of frequencies needed for interoperable communications is greatly reduced, it is far more reasonable for users to cross-program these frequencies in their radios. This would greatly diminish the need for the VCOMM system. That said, there are still scenarios where shared frequencies might not be available, and the use of national interoperability frequencies would be appropriate.

To improve the effectiveness of the system, MCP provides the following recommendations:

- Replace the existing radio system equipment that has reached end of life, including a refresh of antennas and lines

[56] This is the power at which the base station is permitted to transmit the signal.

- Transition the VHF stations to repeaters, leveraging the repeater configuration in the NIFOG (provided below); this will necessitate re-licensing the VHF frequencies

Non-Federal VHF High Band National Interoperability Channels Tactical Repeater					
CAUTION: Ensure coordination between VTAC simplex and repeater operations. These channels are created by utilizing the frequencies listed for VTAC11-14.					
Assignment	Channel Name	Mobile RX Freq. (MHz)	Mobile RX CTCSS/NAC	Mobile TX Freq. (MHz)	Mobile TX CTCSS/NAC
Tactical Repeater *	VTAC33	159.4725	156.7	151.1375	136.5
Tactical Repeater *	VTAC34	158.7375	156.7	154.4525	136.5
Tactical Repeater	VTAC35	159.4725	156.7	158.7375	136.5
Tactical Repeater *•	VTAC36	151.1375	156.7	159.4725	136.5
Tactical Repeater *•	VTAC37	154.4525	156.7	158.7375	136.5
Tactical Repeater •	VTAC38	158.7375	156.7	159.4725	136.5
- Authorized emission – 11K0F3E (2.5 kHz deviation narrowband Analog FM) – 47 CFR §90.20(d)(80) - Encryption may not be used – 47 CFR §90.20(i) - Limited to 3 watts ERP North of Line A or East of Line C. - VTAC33-38 utilize a 136.5 Hz CTCSS Mobile TX tone which differs from the VTAC11-14 Simplex Channels which utilize a 156.7 Hz CTCSS Mobile TX tone. - VTAC33-35 are the reverse of VTAC36-38 to allow for mitigation of any potential co-site interference. * VTAC33-34, and VTAC36-37 may not be used in Puerto Rico or the US Virgin Islands. •VTAC36-38 are preferred; VTAC33-35 should be used only when necessary due to interference.					

- Transition operation to have receivers remain enabled and have transmitters controlled by the monitoring dispatch center
- Reprogram all user radios with the revised VHF channel configuration and direct mode (repeater talk-around)
- Provide training to users and dispatchers regarding the revised system configuration
- Track down any remaining agencies that leverage these frequencies for non-interoperability purposes

Note: The VCALL10 frequency, 155.7525 MHz, does not fall within the VHF repeater channel plan in the NIFOG. If it were implemented in Vermont, it would need to be maintained in the simplex mode, which means the system would experience the same current issue with one base station transmitter reaching every other fixed site. This is why the requirement to remotely enable transmitters was implemented, which made the system difficult to use. MCP's recommendation is to repurpose one of the repeater pairs for hailing purposes.

Key Decision Points

- To continue operation and maintenance of VCOMM
  - If continued operation is desired, determine how best to configure the system for practical use.

Synergies With Other Projects or Initiatives

The VCBB under the Department of Public Service is responsible for administering the state's participation in the BEAD Program and, as part of that, working with the broadband providers, including commercial cellular providers, to expand broadband coverage. Broadband coverage includes deployment of terrestrial-based broadband infrastructure, such as fiber-optic cable, and increased wireless broadband coverage provided by existing wireless carriers. Cellular wireless coverage presents an opportunity to augment LMR coverage, but the State has almost no control over the commercial cellular providers to expand their coverage. In meeting with

Department of Public Service staff, they stated that they have been engaged in an ongoing effort with the carriers to expand their service, and their thought was that they should be left to continue that effort, and this project should focus primarily on LMR issues. As a corollary between BEAD and this project, the primary objective of the BEAD Program is to expand high-speed broadband service to underserved and unserved areas, which are primarily in rural areas. The preferred method of delivering this service is through the deployment of additional fiber-optic cables. This fiber-optic infrastructure could potentially be utilized to provide additional connectivity, or backhaul, between LMR radio sites. This could potentially provide opportunities for the ECAC, or whatever future governance structure is established, to work with the VCBB to identify opportunities to leverage broadband infrastructure to enhance public safety communications. Through the BEAD Program, it may be possible to identify opportunities for public-private partnerships that will not only benefit the citizens of the state, but also public safety communications.

3.3.5 Cybersecurity

Key Trends and Insights

- There was a general lack of consistency in the implementation of cybersecurity practices and processes from location to location, increasing the risk to individual cybersecurity postures and, to a greater extent, to the state-level posture.
- Understanding and ownership of cybersecurity policies and processes were inconsistent and, in some cases, nonexistent, creating gaps in cybersecurity governance and reducing an organization's ability to enforce uniform security measures.
- Proactive threat and intrusion monitoring is a key capability in securing a network. Consistent implementation across locations would benefit the overall security posture.
- A comprehensive state-level approach to cybersecurity Governance, Risk, and Compliance (GRC) establishes a structured framework for the continuous management and enhancement of cybersecurity postures and network operational maturity.

The cyber assessment was carried out through a self-reporting questionnaire, which concentrated on the agency's cybersecurity profile by utilizing a set of controls provided by MCP. The controls come from the Secure Controls Framework (SCF), an open-source, comprehensive, and unified set of cybersecurity and privacy controls designed to simplify compliance and risk management across various regulatory and industry standards. It provides a structured approach to implementing and managing security measures, ensuring that organizations can meet multiple compliance requirements efficiently. SCF consolidates best practices from numerous frameworks, such as the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF), the International Organization for Standardization (ISO) 27001, and General Data Protection Regulation (GDPR), offering a flexible and scalable solution to protect sensitive information, manage risks, and maintain regulatory compliance in a dynamic threat landscape.

Because the cyber assessment was conducted using agency self-reporting, MCP's recommendation is to conduct a future assessment of the emergency communications ecosystem in collaboration with ADS, Vermont's digital services, and other relevant state agencies.

Every state manages roles differently; however, to align with best practices, the role of state agencies, departments, or boards should be to establish standards, overall governance principles, and training, and ensure appropriate resources are allocated to meet best practice standards and principles. The state agencies

and boards frequently have a role to ensure these practices are maintained over time with planned audits and testing of compliance toward the adopted policies and standards.

The cybersecurity posture of the state's public safety networks is a critical factor in maintaining the integrity, availability, and confidentiality of mission-critical systems. These networks serve as the foundation for emergency response, law enforcement, and public safety communications, making them prime targets for cyber threats that could disrupt operations, delay response efforts, or expose sensitive information. [redacted] Strengthening cybersecurity resilience in these areas is essential to safeguarding public safety infrastructure and ensuring the uninterrupted delivery of emergency services.

The Vermont cybersecurity assessments provide a snapshot of the participating communications centers' self-reported capabilities across various security domains. While some domains, such as data privacy and endpoint security, show relatively higher average scores, others, including network security and continuous monitoring, indicate areas requiring significant improvement. This highlights a need for an enhanced focus on foundational security practices, streamlined monitoring, and robust incident management mechanisms to achieve a more consistent and resilient cybersecurity posture across all participating communications centers.

[redacted]

Additionally, continuous monitoring capabilities are largely reactive, failing to provide the real-time situational awareness needed to detect and respond to threats effectively. Given the increasing reliance on interconnected systems and digital communication networks, the absence of robust monitoring leaves these systems exposed to both targeted attacks and accidental disruptions. Proactive, centralized monitoring solutions are essential to improving situational awareness and response times, minimizing the risk of service outages.

As cyber threats evolve, the role of third-party risk management becomes increasingly important. Public safety systems often depend on external vendors for hardware, software, and cloud-based services, introducing potential vulnerabilities through the supply chain. Strengthening vendor oversight and implementing comprehensive risk management practices will help mitigate these risks and protect the integrity of emergency communications operations.

These findings underscore the critical need for a holistic approach to cybersecurity within the emergency communications ecosystem. By addressing weaknesses in asset management, monitoring, and third-party risk, and by leveraging existing strengths in data privacy and proactive measures, the state can build a more resilient and secure foundation for its emergency response systems. Investments in governance, automation, and integrated cybersecurity practices will play a pivotal role in protecting these essential services and maintaining public trust.

Cybersecurity Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
Improve State's Emergency Communications Cybersecurity Posture	Define and implement a common statewide GRC framework	Implement automated asset management common across agencies	Implement continuous event and intrusion monitoring
	Strengths		
	• Provides a single framework for policies, procedures, tools, and applications regarding GRC management	• Provides automated proactive tracking of assets deployed on the network including software versions and license and support agreement status	• Safeguards all systems with 24/7 cyber event and intrusion monitoring with security operations center (SOC) support and ability to isolate impacted systems
	Challenges		
	• Requires a statewide vision, understanding, and adoption to provide consistency	• Requires organizational structure to identify responsible party for monitoring and managing network assets	• Requires licensing of tools and operational integration for monitoring and external SOC support, which requires budgeting and planning

To strengthen the cybersecurity posture of public safety networks and address identified gaps, implementing a robust GRC program is a critical recommendation. A GRC program provides a structured framework to centralize and formalize the management of cybersecurity policies, risk assessments, and compliance requirements. By integrating these components, a GRC program ensures alignment between cybersecurity practices, operational goals, and regulatory obligations, creating a cohesive strategy to mitigate risks and enhance resilience.

Governance through a GRC program establishes clear roles, responsibilities, and accountability across agencies and stakeholders managing emergency communications networks. This ensures consistent enforcement of policies such as asset management protocols, configuration baselines, and incident response plans. A GRC program would mandate the creation and maintenance of detailed asset inventories, ensuring real-time visibility into all hardware and software components. Automated tools and defined workflows embedded in a GRC framework would help identify unauthorized changes and anomalies, strengthening asset management and reducing operational risks.

On the risk management front, a GRC program enables continuous identification, assessment, and prioritization of threats, ensuring resources are allocated effectively to address high-impact vulnerabilities. By integrating risk assessments into routine operations, agencies can proactively monitor for potential risks in areas such as third-party vendor relationships and network security. This focus on risk-based decision-making minimizes the attack surface and reduces the likelihood of disruptions to emergency communications services.

The compliance component of a GRC program is equally vital, particularly in ensuring adherence to data privacy regulations and industry standards. Regular compliance assessments, facilitated through a GRC platform, would allow agencies to identify and close gaps in privacy protections, continuous monitoring, and proactive security measures. This not only reduces regulatory risk but also bolsters public trust in the security and integrity of emergency communications networks.

By implementing a GRC program, the state can shift from a reactive cybersecurity posture to one that is proactive and adaptive. A GRC framework promotes a culture of continuous improvement, enabling agencies to respond swiftly to emerging threats, enhance operational efficiency, and maintain compliance with evolving regulations. This strategic focus on governance, risk, and compliance will lay the foundation for a secure and resilient emergency communications ecosystem, safeguarding public safety operations now and in the future.

3.4 Physical (Facilities-based) Regionalization (Tier 1)

It is important to remember that true success in a regionalized environment, which involves bringing people together in new organizational and operating structures, can only be achieved when members establish trust, engage in constructive conflict, are committed to the success of the organization, hold each other accountable, and are focused on the results.

The primary goal of physical (facilities-based) regionalization is improving emergency response outcomes. Although there may be capital cost impacts, it is anticipated that the new organizations will become more operationally efficient while also improving fiscal efficiencies in the long term. While maintaining the current operational configuration or collocating would enable the PSAPs and dispatch centers to avoid the challenges associated with merging operations and HR practices with those of another PSAP or dispatch center, neither option inherently results in improved call transfer times or staffing efficiencies. Some would argue that the current regional PSAPs and dispatch centers should continue to control their operations so that any decisions made are in the best interests of the community and field responder agencies the communications center serves. Others would argue that the prior regionalization efforts throughout the state, which have been unsuccessful (e.g., Chittenden County regional emergency dispatch), further complicate future regionalization and may point to these unsuccessful efforts as a reason not to regionalize. However, these arguments are without merit as municipalities having dispatch services provided by an entity other than itself already have proven successful both in the state as well as across the country; the unsuccessful regionalization efforts can be reviewed for lessons learned to prevent unfruitful similar efforts in the future.

A common argument in favor of maintaining the status quo for communications centers is that personnel possess detailed knowledge of their jurisdictions' geography and are familiar with the field responders they support. This familiarity is critical for effective coordination and decision-making during emergencies. Additionally, the proximity of call-takers and dispatchers within localized communications centers facilitates information flow between the public and field responders, contributing to efficient incident management. However, while beneficial, maintaining the current decentralized PSAP and dispatch center configuration presents significant challenges. Transferring emergency calls from PSAPs to one or more dispatch centers introduces delays that can slow dispatching and critically impact incident outcomes (Appendices I and J). Furthermore, decentralized systems can limit interagency communication due to a lack of robust mechanisms for real-time information sharing, resulting in fragmented and uncoordinated responses. This structure also complicates mutual-aid coordination, making interjurisdictional collaboration more difficult and less efficient during critical incidents. Additionally, the decentralized model fosters information silos that restrict the sharing of

vital data across jurisdictions, reducing situational awareness and hindering effective decision-making during emergencies.

Organic regionalization decisions ultimately rest with local authorities and their willingness to look past what they hypothesize they will lose in favor of focusing on what can be gained through regionalization. Where stakeholders tend to focus on their local control, to address the frustrations expressed will require them to think of the larger picture including people that reside outside of their professional area of responsibility. Industry standards and best practices provide essential guidance for determining whether a communications center should consider regionalization.

Additionally, if the decision to fully regionalize is selected as the path forward (see Options 4 and 5 below for details), each PSAP will need to consider the following, which may affect its operational configuration and therefore its staffing:

- How will administrative calls be handled?
- How many personnel/units are on duty for a respective channel/talkgroup for which the dispatch center is responsible (i.e., will the number of personnel create a workload saturation for the PSAP, necessitating another console position)?
- Does any agency use MDTs[57] (which would lighten a dispatcher's workload)?
- Is push-to-talk (PTT) data available to verify the added workload, which would play a role in the workload saturation level?
- Does the dispatch center prefer to maintain a separate workstation position for its agencies (albeit with a cost)?

This is not to say that a communications center that meets these benchmarks should be merged with another communications center as there could be numerous factors, including available opportunities for facility expansion, available funding, and others that could drive such decisions away from what, on the surface, may appear simple.

Regardless of the final structure that physical regionalization may take, the criteria outlined in the following table should serve as a foundation for developing a regionalization roadmap. They can also support collaborative and educational discussions with stakeholders aimed at enhancing service levels and achieving greater operational and fiscal efficiencies (see Appendix B). MCP has broken these down into two categories—if a communications center ***does not provide 24/7 service***, ***has six or more Category One attributes (55%)***, or ***a combination of Category One and Two attributes that exceeds eight (73%).*** In MCP's experience, these centers meet the criteria to strongly recommend exploring physical consolidation and alliance with a neighboring communications center. This is not to say that a communications center that meets this benchmark should be merged with another communications center as there could be numerous factors, including available opportunities for facility expansion, available funding, and others that could drive such decisions away from what, on the surface, may appear simple.

[57] Mobile data terminal

Category One Criteria	Category Two Criteria
• Provides 24/7 operations	• Provides 24/7 operations
• Population served is less than or equal to 30,000	• Population served is less than or equal to 50,000
• Center incident volume is 1% or less than the total statewide incident volume	• Center incident volume is 3% or less than the total statewide incident volume
• The average cost per variable exceeds $40 per call	• The average cost per variable exceeds $30 per call
• The agency has no more than two primary workstations	• The agency has no more than four primary workstations
• The minimum staffing per shift is two or less	• The minimum staffing per shift is four or less
• Agency retention is less than or equal to 75%	• Agency retention is less than or equal to 80%
• Outbound transfers are greater than or equal to 25% of the total call volume	• Outbound transfers are greater than or equal to 25% of the total call volume
• Inbound transfers are greater than or equal to 75% of the total call volume	• Inbound transfers are greater than or equal to 75% of the total call volume
• EFD[58]/EMD/EPD[59] to provide pre-arrival instructions is provided in house	• EFD/EMD/EPD to provide pre-arrival instructions is provided via transfer
• Total administrative call volume is greater than the 911 call volume	• Total administrative call volume is greater than the 911 call volume

The term "regionalization" is sometimes misunderstood due to its association with other regional initiatives at the local level. In the context of physical regionalization, it should be understood as the consolidation of multiple jurisdictions with the primary objectives of creating efficiencies while maintaining or surpassing existing service levels.

In discussing real-world examples with communications centers across the country that have participated in regionalization efforts that included physical consolidation, there are ways to overcome common barriers, if agencies are willing to work together. For example, the importance of including an advisory board comprised of representatives from the agencies served, so the agencies continue to have a voice and appropriate controls over the operation and clear expectations for the level of service based on established performance metrics. The importance of QA post-regionalization is also important to validate there has been no degradation of services. These are only two best practices in a long list of strategies that make regionalization across the country increasingly more successful.

[58] Emergency fire dispatch
[59] Emergency police dispatch

Physical regionalization is a complex process that requires extensive planning, particularly when undertaken as part of a statewide initiative. Success depends on active participation, collaboration, and cooperation from local stakeholders to ensure seamless integration. A successful implementation could ultimately result in a higher level of service for Vermont's communities and citizens. This enhanced service quality may prompt communities currently served by out-of-state dispatch entities to seek a transition to an in-state regionalized center, allowing them to benefit from the improved service standards. When properly coordinated and executed, physical regionalization offers numerous advantages, many of which are highlighted throughout this system design plan.

Key Trends and Insights

- There are 37 communications center ecosystems serving a population of 642,464 people in Vermont.
- Thirteen of the in-state communications centers meet the regionalization benchmark criteria, indicating that they are strongly encouraged to consider regionalizing.
- Using equipment and personnel-based groupings, 48% to 78% of the communications centers are considered either micro centers or small centers (center size defined below).
- Eleven of the communications centers indicated there is a potential for expansion of their current facilities.
- Utilizing a phased approach, many dispatch centers could likely merge with an existing PSAP with little to no change in staffing due to the low call and incident volumes for these agencies.

The number of communications centers serving a population of 642,464 is considerably more than many places in the country that have double the population with only one or two PSAPs and no dispatch centers. While the state of New Hampshire has considerably more dispatch centers, for example, it has double the population of Vermont and manages with only two PSAPs.

Communications Center Size	Communications Centers
Small – 2 to 6 Positions	Barre City, Bennington, Brattleboro, Burlington, Colebrook (NH), Colchester, Dover, Essex/, Grafton County (NH), Hanover (NH), Hartford [PSAP], Lamoille County [PSAP], Ludlow, Mad River Valley Ambulance Service, Manchester, Middlebury, Middlebury Regional EMS, Montpelier, North Adams (MA), Newport, Randolph, Rutland City, Shelburne PD [PSAP], South Burlington, Springfield, St. Albans [PSAP], St. Johnsbury, Saint Michaels College Fire/Rescue, Southwest Fire Mutual Aid (NH), University of Vermont, Wilmington, Windham County, Winooski, Woodstock
Medium – 7 to 20 Positions	VSP Westminster, VSP Williston, Washington County DPS (NY)
Large – 21 to 50 Positions	None

As NASNA notes: *"There is more than one way to regionalize"*[60] and the current Vermont environment lends itself well to this concept.

The following survey respondents reported having some expansion potential in their current or planned facilities.

- Brattleboro
- Hartford
- Lamoille County
- Ludlow
- Middlebury
- Montpelier
- Shelburne
- South Burlington
- Wilmington

Southwest Fire Mutual Aid in New Hampshire also indicated expansion potential.

The ability to expand could provide an opportunity to host one or more other communications centers.

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[60] NASNA - 911 Regionalization - Tools and Information (nasna911.org)

The following presents the four options by which the State can undertake the process of regionalizing the PSAPs and dispatch centers. The options proceed in a manner that builds on the prior option (e.g., Option 2 building on Option 1). In this manner, the State is presented with graduated steps if regionalization in a slow, phased approach is desired. It is also possible to proceed directly to the final options, Options 4 or 5, and still complete the process of regionalization in an organized manner. Maps that depict each option can be found in Appendix F.

Physical Regionalization Options					
Area of Interest	**Option 1**	**Option 2**	**Option 3**	**Option 4**	**Option 5**
Physical Regionalization	**Maintain Existing Six PSAPs (Regionalize 12 Dispatch Centers) Model** Four regional and two managed by the State State PSAPs as separate division of emergency communications (not under VSP) Align intake and dispatch for police, fire, and EMS Regionalize the in-state regional dispatch centers in alignment with the regionalization benchmark criteria findings with the exception of the University of Vermont (8s and 9s listed in Appendix B)	**Two Regional and Four State PSAPs (Limited Dispatch Center) Model** Reopen two previous State PSAPs Two regional PSAPs determined based on benchmark criteria and regional gaps State PSAPs as separate division of emergency communications (not under VSP) Align intake and dispatch for police, fire, and EMS Number of regional dispatch centers only needed to fill wireless communications gaps with the exception of Mad River Valley Ambulance (6s and 7s listed in Appendix B)	**Maintain Existing Six PSAPs (Limited Dispatch Centers) Model** Align intake and dispatch for police, fire, and EMS State PSAPs as a separate division of emergency communications (not under the VSP) Number of regional dispatch centers only needed to fill wireless communications gaps with the exception of Mad River Valley Ambulance (6s and 7s listed in Appendix B)	**Six PSAPs (No Regional Dispatch Centers) Model** State PSAPs as a separate division of emergency communications (not under VSP) Align intake and dispatch for police, fire and EMS No regional PSAPs (e.g., operational state management) or dispatch centers—with the exception of Mad River Valley Ambulance and the University of Vermont—unless self-funded and subject to State policy, operations, and technology requirements	**County PSAPs Model** Eight primary PSAPs Two secondary PSAPs State PSAPs as a separate division of emergency communications to handle VSP dispatching only Align intake and dispatch for police, fire and EMS No regional dispatch centers—with the exception of Mad River Valley Ambulance and the University of Vermont—unless self-funded and subject to State policy, operations, and technology requirements Out-of-state dispatch centers may retain their current dispatch clients

Personnel Cost Impacts Using information from agencies that reported personnel budgets, total potential cost savings on personnel alone through regionalization, Option 4 equals $5,362,137. It can be reasonably envisioned that these cost savings could increase by at least 30% if the remaining dispatch centers provided personnel budget information.					
	Reduction of 11 dispatch centers = 40 FTE and 13 PTE Potential personnel cost savings $2,009,535	Reduction of an additional 6 in-state dispatch centers = 43 FTE and 11 PTE Additional potential personnel cost savings $1,394,421	No change	Reduction of an additional 6 in-state dispatch centers = 39 FTE and 16 PTE Additional potential personnel cost savings $1,958,181	Conversion of 2 dispatch centers to PSAPs and reduction of 19 dispatch centers 102 FTE and 34 PTE Potential personnel cost savings $3,910,116
	Strengths				
	• Provides for the sharing of resources (including policies, procedures, operations, and other support services such as IT, GIS, administration, HR, etc.) • Reduces workforce competition between communications centers • Eliminates occurrences where only one dispatcher is on duty at a time • Improves dispatcher workspace environment	• Reduces duplicate costs (related to administration, operations, technologies, and facilities) • Eliminates call workflows that inherently include two or more 911 and emergency call transfers • Simplifies oversight and governance with fewer regional centers	• Provides for coordinated responses (including joint responses, automatic and mutual aid and/or other shared responses) • Provides a uniform structure across the state, reducing variability in service quality • Simplifies policy enforcement, training, and technology upgrades • Enhances statewide situational awareness	• Provides for greater interoperability (sharing of mission-critical equipment and technologies (e.g., CHE, CAD, radio) • Provides effective and efficient service by reducing 911 and emergency call transfers • Improves service levels • Reduces the complexity of dispatching multiple resources to emergency incidents (as seen in Appendix J)	• Provides for greater interoperability (sharing of mission-critical equipment and technologies (e.g., CHE, CAD, radio) • Provides effective and efficient service by reducing 911 and emergency call transfers • Improves service levels • Reduces the complexity of dispatching multiple resources to emergency incidents (as seen in Appendix J)

	• Leads to operational and capital cost savings • Retains local familiarity with the areas served by each PSAP • Allows the gradual implementation of regionalization by leveraging existing infrastructure • Is an easier transition for staff already accustomed to their current structures	• Reduces duplication of administrative efforts and associated costs • Enhances interoperability by consolidating resources • Provides opportunities for highly sought after state jobs in rural areas of the state	through a centralized system • Enhances continuity of operations (automatic failover) statewide, including regular training/testing • Increases the limited career development opportunities currently provided	• Increases situational awareness • Decreases the number of points of infiltration for cybersecurity risks • Eliminates cost duplication to operate the 31 in-state separate and independent PSAPs and dispatch centers • Provides greater opportunities for interagency response, backup, situational awareness, and data sharing • Ensures consistent service delivery standards • Reduces costs associated with maintaining regional centers • Enhances cybersecurity by limiting the number of entry points • Enhances continuity of operations (automatic failover) statewide, including regular training/testing	• Increases situational awareness • Decreases the number of points of infiltration for cybersecurity risks • Eliminates cost duplication to operate the additional dispatch centers in each county • Provides greater opportunities for interagency response, backup, situational awareness, and data sharing • Ensures consistent service delivery standards • Reduces costs associated with maintaining the 13 remaining regional centers • Enhances cybersecurity by reducing the number of overall entry points • Enhances continuity of operations (automatic failover) statewide, including regular training/testing

				• Increases the limited career development opportunities currently provided	• Increases the limited career development opportunities currently provided
	Challenges				
	• May not provide relief for recruiting, staffing, or flat organizational structure challenges • Gives the perception of loss of control over PSAP and/or dispatch services • May lack clear governance and/or agreements • May maintain inefficiencies inherent in the current structure (e.g., call transfers between PSAPs) • Requires extensive coordination to align procedures and technologies across multiple PSAPs • May perpetuate existing staffing and pay scale challenges if not restructured effectively	• Introduces the potential to increase travel time for staff • Requires the determination of cost-sharing for facility maintenance and recurring costs • May result in turnover and a lack of adequate succession planning • Requires the planning of technical and operational skills specific to the new center • Risks of service gaps in areas not adequately covered by the two regional centers • Introduces the potential for resistance from local agencies losing direct control over PSAP operations	• May be initial costs for furniture and appropriate workspace equipment • Introduces complexity in identifying funding (e.g., service fees or cost-sharing models, if applicable) • May create a disconnect between PSAPs and local emergency services • Introduces the potential for higher initial costs to standardize equipment and procedures across six state centers • Introduces the potential for recruiting and staffing challenges to persist due to the larger scale of operations • May result in a lack of support from existing	• May be disagreements on systems, configurations, and data/information sharing • May be difficult to reaching agreement(s) on merging operations and HR practices • May be perceived by local agencies as a complete loss of autonomy • Could increase response times in rural areas without adequate local dispatch centers • May create inequities between wealthier and less affluent regions • Requires significant restructuring to manage staffing and operational changes • May result in a lack of support from existing	• Increases State technology costs (e.g., 911 CHE) due to the addition of two new PSAPs • Under existing funding model, decreases disbursements to existing PSAPs due to funding now being split with two additional PSAPs (could be rectified with a new state funding model) • May be disagreements on systems, configurations, and data/information sharing • May be difficult to reaching agreement(s) on merging operations and HR practices • May be perceived by local agencies as a complete loss of autonomy

	• May result in a lack of support from existing labor unions and/or employees	• Increases reliance on State oversight, which may slow decision-making processes • May result in a lack of support from existing labor unions and/or employees	labor unions and/or employees	labor unions and/or employees	• Could increase response times in rural areas without adequate local dispatch centers • May create inequities between wealthier and less affluent regions • Requires significant restructuring to manage staffing and operational changes • May result in a lack of support from existing labor unions and/or employees

Based on lessons learned both in the region and nationally, when it comes to the likelihood that physical (facilities-based) regionalization efforts will be viewed as successful or not, MCP encourages stakeholders to consider building consolidation alliance profiles to validate those agencies that may be considered a better fit both operationally and culturally—prior to implementing any recommendations. MCP has provided an outline of an alliance profile (see Appendix H) that considers numerous factors beyond the original Category One and Category Two benchmark criteria noted in Appendix A.

Whether driven by organic growth or structured, mandated efforts, it is essential to ensure that municipalities and first responder agencies impacted by the transition have adequate time to arrange for a new dispatch provider and coordinate with the 911 Board to ensure the transfer of 911 services to an appropriate PSAP. This process is particularly critical when a PSAP or regional dispatch center discontinues services. To mitigate service disruption, this requirement should be codified in state legislation, mandating a notice period typically ranging from 12 to 18 months. This timeframe allows affected entities to account for their unique needs and size while securing new service providers. Additionally, consulting with the 911 Board during this transition ensures that all stakeholders—including local governments, emergency service providers, and regional dispatch centers—are aligned in planning and implementation. A recent analysis of emergency communication centers highlights successful models that can serve as a benchmark for future regionalization efforts. For instance, the VSP Williston PSAP is ranked fifth out of 37 centers in operational performance, while VSP Williston is ranked first (based on the MAPS assessment performed and associated scoring assigned to each in the *Vermont Public Safety Communications System Inventory and Assessment*). The VSP Williston center demonstrates a well-managed operation that should be studied and considered as a best-practice model for future centrally managed PSAPs.

While some stakeholders have advocated for reopening the two previously closed VSP PSAPs, MCP does not recommend this as a first option solution based on the following:

- *Increased number of dispatch centers*: Reopening the closed VSP PSAPs without a concurrent reduction in the number of regional dispatch centers would increase—not decrease—the total number of centers. This contradicts the primary goal of regionalization, which is to streamline services.
- *Service disruption:* Reopening these PSAPs would result in unnecessary service disruption for municipalities currently receiving 911 and dispatch services from the existing six PSAPs. These municipalities would be forced to transition their services again if the goal remains to operate only six state-run centers.
- *Decentralization of dispatch functions:* The reopening of additional PSAPs would further decentralize dispatch functions, creating more centers and reducing the intended efficiencies of a regionalized approach.
- *Equipment costs:* Reequipping the previously closed PSAPs would incur significant costs, including purchasing and installing new technology and infrastructure that had been decommissioned.
- *Recruitment challenges*: Expanding the number of PSAPs would further dilute the pool of qualified personnel, which is already a challenge in the emergency communications sector.
- *Staffing stability:* The existing VSP PSAPs currently have relatively stable staffing levels. Introducing additional centers could negatively impact these stable centers by drawing personnel away, further straining recruitment efforts.

For the following five options, where the features include regionalization of dispatch centers with an existing PSAP, the agencies currently served by the respective dispatch center(s) would receive these services from the regionalized PSAP moving forward.

3.4.1 Option 1: Maintain Existing Six PSAPs (Regionalize 12 Dispatch Centers) Model

This model leverages the six existing PSAPs, which include four regional and two PSAPs managed by an independent authority or new division of the State. Option 1 is represented by the blacked-out centers (13) in Appendix F, which have regionalization benchmark ratings of 8 and 9. This option maintains the existing number of PSAPs and reduces the number of in-state dispatch centers from 25 to 13.

Key Features

- Service Alignment
  - A single point of contact for police, fire, and EMS services leads to quicker handoffs, minimized duplication, and faster decision-making when seconds matter in emergencies.
- Regionalization
  - Restructured regional dispatch centers: The four regional non-VSP PSAPs undergo further alignment to meet established regionalization benchmarks (i.e., merging with those dispatch centers currently rated 8 or 9 in performance and capacity as outlined in Appendix B).
  - Optimized resource allocation: By focusing on the most capable or strategically located communications centers, resources such as updated technology, robust training programs, and advanced interoperability tools can be concentrated in fewer, high-performing facilities.
  - Inter-PSAP cooperation: Incentives for sharing resources (e.g., specialized teams, backup call capacity, or training programs) strengthen inter-PSAP relationships and overall resilience during critical incidents or peak call times.
- Standards Options—Two standards options are proposed under this model to ensure the effective operation of six PSAPs coordinated statewide. Each option presents unique advantages, and stakeholders should consider both approaches when determining the best path forward.
  - Option A: Create a new dedicated State division – In this approach, the two State PSAPs currently operating under the VSP would be transferred to a new, standalone division within State government (e.g., a Division of Emergency Communications under DPS). The organizations operating the remaining regional PSAPs would focus on day-to-day management while taking standards direction regarding call-taking/dispatching policies, performance management, etc. from the new division.

    Key benefits include:

    - Centralized regulation: A single authority responsible for high-level policy-setting, budget allocation, and performance monitoring of PSAP operations based on the state governance body's directives.
    - Uniform standards and training: A consistent set of protocols, training requirements, and performance benchmarks for all personnel within the division.
    - Clear lines of accountability: A well-defined chain of command, ensuring quicker decision-making and enhanced interagency collaboration.

        - Reduced law enforcement perception: By moving the VSP PSAPs to a separate division, stakeholders can mitigate concerns and perceptions that dispatch priorities are skewed toward law enforcement, reinforcing a balanced approach to emergency services across law enforcement, fire, and EMS.

    - Option B: Expand the role of the Vermont Enhanced 911 Board – This option broadens the mandate of the 911 Board—traditionally focused on oversight and management of the statewide 911 call-taking system only (not the entirety of PSAP services)—so that it also becomes the standards-setting body for PSAP and dispatch services. By elevating the 911 Board's responsibilities to include standards oversight of both PSAP and dispatch operations, this strategy would:

        - Consolidate call-take and dispatch standards oversight: Place both critical functions under one oversight and management structure, streamlining workflows and enhancing service delivery.
        - Statewide consistency: Apply unified rules, performance metrics, and standards across all PSAPs and dispatch centers, potentially reducing regional disparities in service levels.
        - Integrated technology and resource sharing: Facilitate the adoption of compatible systems, enabling seamless data exchange, backup capabilities, and cooperative training programs statewide.
        - Reduced law enforcement and government-centric perception: By transitioning standards oversight of the PSAPs to an independent authority, the Board can help counter the notion of dispatch being solely law enforcement-focused or overly controlled by the State, thereby fostering greater first responder and public trust.

- Management Option
    - The management of local PSAPs and dispatch centers could be *optionally* transferred to the state standards authority, enabling greater operational alignment and standardization across the state.
    - The transfer of PSAP and dispatch center management to the state standards authority could take place three to five years *after* the initial regionalization efforts. This timeline allows sufficient opportunity to make measurable progress toward the desired future state, while also fostering stakeholder and public trust in the standards authority.

Key Considerations

- Operational Continuity – Maintaining the existing network of six PSAPs avoids large-scale facility closures that might disrupt local operations. Agencies benefit from familiar processes, and staff remain largely in place, ensuring minimal upheaval and a smoother transition to revised workflows.
- Technology Modernization – Although this approach builds on current facilities, targeted investments will be necessary to continually modernize technology (e.g., NG911 capabilities[61],

[61] While the 911 statewide CHE system was not evaluated as part of this effort, future improvements in NG911 and ESInet technology will require targeted investments by the State to remain technologically current.

shared CAD systems, and enhanced radio networks). Ensuring interoperability among the 13 dispatch centers is critical for seamless communication, data sharing, and redundancy.

- Staffing and Training – Reducing the total number of dispatch centers to 13 will change staffing needs. Existing staff may need to be retrained or reassigned to handle new volumes or different service areas. Coordination of schedules, training, and certification requirements under a unified set of standards will be essential to maintain high performance.
- Financial Implications – Although this model does not build entirely new facilities, capital spending on enhancements to technology infrastructure, facility upgrades, and staff training must be considered.
- Community Relations – Retaining locally known PSAPs can help preserve a sense of local ownership and trust in emergency services. Local governments, stakeholders, and residents may view this model more favorably if it maintains the identity of well-established centers while still seeking operational improvements.

Overall Focus

The overall focus of Option 1 aspires to strike a balance between maintaining local expertise and pursuing operational efficiencies. By preserving the existing six PSAPs while reducing the overall number of dispatch centers, this model provides a path toward more resilient, standardized, and effective emergency communications across the state:

- Strengthens service alignment by co-locating or closely coordinating law enforcement, fire, and EMS call-taking and dispatching services
- Presents viable avenues to oversight of the PSAPs; each option offers unique advantages for statewide coordination, resource optimization, and public confidence—key factors for stakeholders to consider when determining the best path forward
- Refocuses on regionalization by upgrading and standardizing communications centers, ultimately reducing gaps in service quality and improving overall emergency response

In essence, Option 1 balances efficiency (fewer dispatch centers, shared resources, and consolidated management) with stability (preserving well-established PSAPs), setting the stage for more resilient, coordinated, and locally attuned emergency communications throughout the state.

3.4.2 Option 2: Two Regional and Four State PSAPs (Limited Dispatch Center) Model

This model organizes emergency communications services through a combination of two regional and four PSAPs managed by a new State division or expanded Board authority. Option 2 further reduces the number of dispatch centers by another five as represented by the grayed-out centers in Appendix F, adding those with a regionalization benchmark rating of 7. The communications centers identified in this approach may need to be adjusted based on a variety of factors including closing wireless coverage gaps. This option would result in a total of six PSAPs and eight dispatch centers.

Key Features

- Reopening State PSAPs
  - Strategic enhancements: Two previously decommissioned State PSAPs—operated and managed under the new structure—would be re-established to bolster the overall emergency communications infrastructure. By leveraging existing physical facilities,

communication networks, and staffing protocols, the State can quickly scale up operations in areas with high call volumes or critical coverage demands.

  - Improved coordination: Reopening these PSAPs under a unified management structure helps ensure consistent policies, procedures, and training standards.

- Regional PSAPs
  - Data-driven site selection: Two regional PSAPs will be established through the selection of the existing regional PSAPs, based on benchmark performance data and a comprehensive analysis of regional communications gaps. These PSAPs serve as hubs for emergency dispatch within broader geographic areas that share similar risk profiles, call volumes, and geographic challenges.
  - Collaborative coverage: By centralizing call-handling functions, the regional PSAPs can allocate resources more effectively, enhance interoperability with neighboring jurisdictions, and reduce the duplication of services.

- Service Alignment
  - Unified intake and dispatch: All emergency calls—law enforcement, fire, and EMS—are managed through streamlined protocols to optimize coordination and ensure rapid response.
  - Efficiency gains: Enhanced call routing, standardized software systems, and coordinated staff training help reduce response times and eliminate confusion that can arise when multiple agencies and systems operate independently.

- Focused Regional Dispatch
  - Targeted coverage gaps: Existing regional dispatch centers are retained only in areas where wireless or physical communications gaps still exist. These locations have been identified as scoring 7 or 8 on the regionalization benchmark scale.
  - Continuous evaluation: The number and locations of these regional dispatch centers can be recalibrated as technology advances, wireless coverage improves, or local demand shifts.

- Standards Options—The same two standards options proposed under Option 1 are applicable for this option—a dedicated State division or expanded role for the Board.

Key Considerations

- Operational Impacts and Costs
  - Transition planning: Phasing out six dispatch centers requires a robust transition plan, including staff realignment, facility decommissioning, and public communication strategies.
  - Fiscal responsibilities: While there may be cost savings in the long term due to reduced duplication, initial expenses could include technology upgrades, facility renovations, and retraining of personnel for all PSAPs.

- Workforce Implications
  - Staff recruitment and retention: Merging multiple PSAPs into fewer, larger centers could create more specialized roles and advancement opportunities but may also necessitate geographical relocation for some staff.
  - Training standards: Harmonizing the training curriculum is crucial to ensure consistent service delivery across all six centers, including cross-training for emerging communications technologies.
- Technology and Infrastructure
  - Network resilience: Regionalizing into fewer PSAPs requires strong, redundant communications lines and backup power systems. Investing in NG911 technologies becomes even more critical.
  - Interoperability: Ensuring that all PSAPs can seamlessly exchange data (e.g., real-time voice, text, and video) is essential for coordinated multi-agency response.
- Community and Stakeholder Engagement
  - Local perspectives: Stakeholders including local law enforcement, fire, EMS agencies, and the public must be involved in planning to preserve local knowledge and gain buy-in.
  - Transparency: Regularly communicating the benefits, cost implications, and expected improvements in service delivery will help maintain trust and support.
- Flexibility for Future Adjustments
  - Evolving coverage needs: As wireless coverage gaps close due to technological improvements, some regional dispatch centers may no longer be necessary, allowing for further regionalization. Alternatively, unforeseen population growth or new public safety threats might require additional PSAP resources.
  - Performance review: Monitoring response times, incident outcomes, and community satisfaction levels will guide ongoing adjustments to this model.

Overall Focus

The overall focus of Option 2 aspires to strike a balance between statewide management and localized service delivery. It promotes efficient resource utilization, streamlined intake and dispatch processes, and targeted coverage for areas most in need. Although this model necessitates careful planning in terms of workforce alignment, infrastructure modernization, and stakeholder engagement, its overarching goal is to optimize emergency response while ensuring comprehensive, reliable coverage for all communities within the state.

3.4.3 Option 3: Maintain Existing Six PSAPs (Limited Dispatch Centers) Model

In this model, all six PSAPs are provided standards oversight by a newly created division at the State or an independent authority and are managed by their respective organizations. There are no further efforts to reduce the number of dispatch centers. This option maintains six PSAPs and eight dispatch centers.

Key Features

- Service Alignment
  - Unified response protocols: All PSAPs and dispatch centers adhere to a standardized set of policies and procedures, promoting consistent call handling, dispatching, and inter-agency communication. This uniform approach helps reduce confusion among first responders and ensures that the quality of service remains the same regardless of a caller's location.
  - Cross-agency coordination: By consolidating management at the state level, this model facilitates smoother multi-agency coordination. Law enforcement, fire, and EMS dispatches can be more effectively aligned so that resources are deployed rapidly and in sync with one another, especially during large-scale incidents.
- Targeted Regional Dispatch Centers
  - Addressing wireless gaps: If the state moves forward with some type of consolidated statewide public safety LMR system, regional dispatch centers remain active only in areas that still face limited wireless coverage from the statewide system, particularly those with regionalization benchmark ratings of 7 or 8. These communications centers provide critical backup for regions where calls may be difficult to route, thereby minimizing disruptions in emergency response by continuing dispatch services from legacy LMR systems until coverage from the statewide solution is expanded to these regions.
  - Flexible approach: As wireless coverage improves or new technologies emerge, the need for these targeted communications centers can be reassessed. This ensures that resources are concentrated where they have the greatest impact on closing communications gaps, rather than being spread evenly across regions with varied levels of infrastructure.
- Standards Options—The same two standards options proposed under Option 1 are applicable for this option—a dedicated State division or expanded role for the 911 Board.

Key Considerations

- Statewide Consistency versus Local Autonomy – Centralizing all PSAPs under a centralized management structure or independent authority can yield uniform standards and efficiencies, but some local agencies may perceive a loss of autonomy. Developing a governance structure that engages committees made up of local stakeholders that provide recommendations that are used by this management will mitigate this perception. Clear communication around the benefits, such as consistency, better training, and resource sharing, can help mitigate concerns.
- Workforce and Staffing – A centralized standards oversight system (by a State division or independent authority) may streamline recruiting, training, and promotional processes. However, securing and retaining qualified personnel across multiple locations can still be a challenge for individual organizations, particularly for overnight shifts or in areas with a high cost of living. Sufficient funding for competitive wages and benefits will be essential.
- Infrastructure and Technology Investments – Consolidating standards oversight at the state level provides an opportunity to standardize technology platforms (e.g., CAD systems, NG911 solutions). However, initial technology upgrades may be costly and require careful budgeting, grant opportunities, and phased implementation to ensure a seamless transition.

- Operational Redundancy and Resiliency – With six centrally regulated but locally managed PSAPs, the system is robust enough to offer mutual support if one PSAP experiences a technical failure or disaster. Yet, maintaining backup systems, redundant network connectivity, and alternative power sources remains critical to ensuring uninterrupted service.
- Public Perception and Community Engagement – Educating the public about how centralized regulation of PSAPs will still meet local needs is crucial. Ongoing engagement with municipal leaders, first responder agencies, and community organizations can strengthen trust and build collaborative relationships.

Overall Focus

The overall focus of Option 3 is to centralize the regulation of emergency communications at the state level for six dedicated PSAPs, while retaining a network of targeted regional dispatch centers to address persistent wireless coverage challenges. By unifying policy, training, and technology under a single standards framework, this approach promotes consistent service quality across diverse regions. However, success hinges on careful planning for workforce needs, technology integration, and stakeholder engagement. Through strategic statewide governance oversight and adaptive local resource allocation, this model strives to enhance emergency response efficiency, reliability, and equity statewide.

3.4.4 Option 4: Six PSAPs (No Regional Dispatch Centers) Model

In this model, the State continues providing all emergency call-taking and dispatching services standards oversight for the six PSAPs; the 911 Board continues to provide the 911 call-taking equipment and provides call-taking policies to the overall state governance authority. This model eliminates the regional dispatch centers, with the exception of two (Mad River Valley Ambulance and the University of Vermont, due to their unique operations), relying instead on a fully centralized infrastructure. If local municipalities or regions wish to maintain their dispatch or PSAP functions, they must self-fund these operations and adhere to the State's policy, technological, and operational requirements as set forth by the governance body.

By concentrating call-taking and dispatching functions under one standards authority with management by each individual organization (the State in the case of the VSP PSAPs), this model aims to maximize uniformity across the state in terms of service standards, training, and technology, while potentially reducing overhead and redundant facilities.

Key Features

- Service Alignment
  - Streamlined dispatch protocols: With six PSAPs, the intake and dispatch processes for law enforcement, fire, and EMS are governed by a singular set of standards and guidelines, minimizing the risk of communications errors and redundant procedures.
  - Centralized coordination: Calls received at any of the six PSAPs can be seamlessly routed to the appropriate response agency, with unified protocols ensuring the consistent handling of emergency requests.
- No Regional Centers
  - Complete centralization: There are no local/regional dispatch centers maintained or funded by the State. This significantly reduces facility footprints and can help streamline operational costs.

- Local autonomy (if desired): Municipalities or counties that choose to operate their own dispatch centers must self-fund them and comply with State policies and technological standards, ensuring consistency in service quality and interoperability across the entire system.

- Standards Options—The same two standards options proposed under Option 1 are applicable for this option—a dedicated State PSAP Division or expanded role for the 911 Board.

Key Considerations

- Technology and Infrastructure
  - Upfront investments: Transitioning to a fully centralized standards model may require significant expenditures in upgraded technology, such as an improved CAD system and robust communication networks, to handle call volume efficiently.[62]
  - System redundancy: Ensuring uninterrupted operations demands thorough backup systems, redundant network pathways, and reliable emergency power supplies.

- Workforce Implications
  - Recruitment and retention: Centralization can create larger, busier call centers that may appeal to specialized dispatch professionals. However, it can also increase pressure on staff due to higher call volumes, requiring robust employee support and competitive compensation packages.
  - Training and standardization: A centralized model can streamline training, resulting in consistent performance expectations and a uniform standard of care.

- Community Relations and Local Knowledge
  - Maintaining local expertise: Centralization can sometimes raise concerns about the loss of "local knowledge," particularly in rural or unique geographic areas. Comprehensive GIS and continuous liaison with local agencies can help mitigate this. These concerns have been largely proven to be misconceptions nationwide, including the regionalization examples contained herein.
  - Stakeholder engagement: Early and transparent communication with municipal leaders, first responders, and the public helps foster understanding of the model's benefits and addresses any perceived disadvantages.

- Cost Efficiency
  - Reduced overhead: Eliminating multiple dispatch centers could yield long-term cost savings on infrastructure, real estate, and maintenance.
  - Potential financial burden for local centers: Municipal or regional agencies that wish to maintain separate dispatch operations must self-fund them, which may deter smaller communities from opting out of the State managed system.

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[62] Vermont is well along the path of NG911 implementation, having achieved jurisdictional end state in many categories, and transitional state in categories that are dependent on entities outside the Board's control (like OSPs).

Overall Focus

The overall focus of Option 4 represents the most centralized approach among the various regionalization proposals, effectively consolidating all emergency call-taking and dispatching services under direct State standards oversight within six centrally managed PSAPs only (with optional self-funded local dispatch operations that meet all state standards and requirements) while still maintaining management at the local level. MCP acknowledges that not every dispatch center may be interested in regionalization for a variety of reasons. However, if regionalization is not pursued or is not appropriate for a prospective agency, MCP strongly encourages these agencies to consider a CAD-to-CAD interface (for agencies not using Valcour) and/or appropriate fire/EMS-related Valcour improvements with their primary PSAP to eliminate the majority of 911 call transfers, and with their mutual aid partners to reduce the time required for incident notifications.

While this model can lead to greater efficiency, uniform technology adoption, and potential cost savings, it also poses challenges around workforce capacity, local knowledge retention, and community engagement. Nonetheless, by adhering to robust operational standards, investing in advanced technology, and maintaining open lines of communication with local stakeholders, this framework holds the potential to deliver highly consistent, streamlined, and reliable emergency communications service statewide.

3.4.4.1 Option 4 Implementation Variations

The future state for Option 4 is a six PSAPs with no regional dispatch centers model[63]. Given the service alignment and State standards benefits provided by this option, it represents a high level of service that can be provided to the state's citizens, first responders, and visitors.

With this option then comes the decision of how to regionalize the dispatch centers into the existing PSAPs. There are three variations of regionalization for Option 4—by the existing 911 catchment areas (*Regionalization Option 4A*), by geographic proximity to the existing PSAPs (*Regionalization Option 4B*) or by dispatch center choice (*Regionalization Option 4C*) as described below.

In evaluating the methods to regionalize the dispatch centers and PSAPs, several assumptions were made:

- The data provided in the data collection survey by each agency was accurate.
- Each PSAP will continue to dispatch the agencies it dispatches currently.
- For each dispatch center the PSAP regionalizes, the agencies served by that regional dispatch center will transition into the PSAP.
  - For towns where at least one first responder agency is dispatched by a different dispatch center (e.g., the Town of Randolph Police and EMS are dispatched by Westminster VSP, and Fire is dispatched by Barre City PD), all response agencies will regionalize to the same, closest geographic PSAP.
  - MCP acknowledges that some field agencies will not want to move away from their current regional dispatch center and would prefer its dispatch center not regionalize.
- The incident volume for Grafton County Sheriff's Office (NH) and Colebrook Dispatch (NH) does not align with their 911 call volume. It appears the centers may have provided their entire incident volume, not just those for the Vermont agencies which they dispatch. As such, the incident volumes

[63] With the exception of Mad River Valley Ambulance and the University of Vermont

for those two agencies were reduced by 58,000 and 9,000 respectively, bringing them more in line with their respective 911 volumes.

- Due to the unique nature of their operations, the University of Vermont and Mad River Valley EMS remain as standalone dispatch centers.
  - If in the future either agency determines they can no longer fulfill their respective dispatch responsibilities, further study as to the impact of their current dispatch incident volume on the closest geographic PSAP.
- As little information was provided as to the exact nature of the operational configurations, it is assumed that the dispatch centers would be handled within the current configuration of the PSAPs—not on new positions—due to the low volume.
- St. Albans PSAP, in both scenarios, does not regionalize with any existing dispatch centers.

Before outlining the three variations of Option 4, it is important to understand the ability of each existing PSAP to expand their workstation footprint to accommodate additional workload that must be separated onto a different talk group/frequency as determined by management. The following is expansion information as reported in the original data collection questionnaire:

PSAP	Number of Workstations That Can be Added
Hartford	1
Lamoille County	Consoles can be added; the number is not specified, but can expand into the next room
Shelburne	Consoles can be added; the number is not specified
St. Albans	0
Westminster VSP	0
Williston VSP	0

3.4.4.1.1 Implementation Variation 4A

Regionalization Option 4A involves the regionalization of dispatch centers based on the existing PSAP catchment areas. This creates a scenario where a PSAP regionalizes dispatch centers with whom the PSAP has an existing working relationship.

This option would result in no change in existing incident volume for Lamoille County SO, St. Albans, and Shelburne. Hartford would pick up two dispatch centers (including one out-of-state). The Westminster and Williston VSP centers would be impacted the most and would likely need additional personnel, if not workstations. Westminster would pick up 15 dispatch centers that dispatch a total of 88 agencies, and

approximately 90,000 incidents. Williston would pick up 13 dispatch centers that dispatch a total of 128 agencies, and approximately 147,000 incidents.

As neither of the VSP PSAPs has room for additional workstations in the existing center, this option would most likely result in either the need to relocate the PSAP to a portion of the barracks where an addition could be built to accommodate the additional staff and workstation positions. This option would be expensive and possibly financially unfeasible for the State.

3.4.4.1.2 Implementation Variation 4B

Regionalization Option 4B involves the regionalization of dispatch centers geographically based on the closest PSAP. In this manner, the following dispatch center regionalizations would occur:

Dispatch Center	Existing 911 Catchment Area	Proposed PSAP
Hanover, NH	Hartford PD	Hartford
Woodstock	Hartford PD	
Randolph	Westminster VSP	
Rutland City	Westminster VSP	
Grafton County, NH	Williston VSP	
Barre City	Williston VSP	Lamoille County
Colebrook Dispatch, NH	Williston VSP	
Montpelier	Williston VSP	
Newport	Williston VSP	
Saint Johnsbury	Williston VSP	
Middlebury	Westminster VSP	Shelburne
Middlebury Regional EMS	Westminster VSP	
Washington County Dept. of Public Safety, NY	Westminster VSP	
Bennington	Westminster VSP	Westminster VSP
Brattleboro	Westminster VSP	
Dover	Westminster VSP	
Ludlow	Westminster VSP	

Dispatch Center	Existing 911 Catchment Area	Proposed PSAP
Manchester	Westminster VSP	
North Adams, MA	Westminster VSP	
Springfield	Westminster VSP	
SW NH Fire Mutual Aid	Westminster VSP	
Wilmington	Westminster VSP	
Windham County	Westminster VSP	
Burlington City	Williston VSP	Williston VSP
Colchester	Williston VSP	
Essex	Williston VSP	
Saint Michael's Rescue	Williston VSP	
South Burlington PD	Williston VSP	
Winooski	Williston VSP	

The following table shows the number of agencies, 911 calls, and incidents that would be added (or removed) from each PSAP.

Table 2: PSAP Changes through Regionalization (Option 4B)

PSAP	Currently Dispatched Agencies	Additional Agencies	Total Dispatched Agencies	Added 911 Call Volume	Additional 911 Calls Per Hour	Added Incident Volume	Additional Incidents Per Hour
Hartford	19	57	76	4,194	0.48	17,692	2.02
Lamoille Co.	23	74	97	14,416	1.65	56,610	6.46
Saint Albans	25	0	25	0	0.00	0	0.00
Shelburne	38	25	63	4,102	0.47	14,482	1.65
Westminster VSP	52	60	112	-7,766	-0.89	63,970	7.30
Williston VSP	14	22	36	-14,946	-1.71	88,437	10.10

In this model, Burlington City—despite being geographically closer to Shelburne—would regionalize its dispatch operations with Williston VSP, its existing catchment PSAP. This is done to balance the increase to Shelburne's incident volume. This potential increase to Shelburne would be significant and would result in an immediate staffing need that would most likely delay the regionalization effort for many years, if it ever occurred.

Despite the large increase in the number of agencies each PSAP would provide dispatch services for, except for Williston VSP (detailed below), the total hourly increase is not expected to significantly impact an agency. Considering the five regionalization operational configuration questions above, a PSAP may need to reconfigure radio channels/talkgroups to optimize workload and PTTs; however, no PSAP is seen to undertake an insurmountable increase to its incident volume.

Of the five agencies seeing an increase, Williston VSP would have the greatest increase in incident volume—roughly ten an hour on average. However, as the PSAP has five primary dispatch positions, it averages two an hour per position; as it generally staffs three of these positions, the increase is three an hour. The concern is the number of responders and channels for which a dispatcher is responsible. VSP may need to increase its minimum staffing per shift but has open workstation positions. If the operational configuration changes, and staffing an extra workstation 24/7 is required, authorized strength may need to increase. (The general need is six people per workstation staffed).

Based on the six PSAP concept, and that the closest PSAP potentially takes on dispatch responsibilities for the respective dispatch centers (except for Burlington City) and using 911 calls only (no administrative/non-emergency calls), the five PSAPs should be able to handle the average hourly increase in 911 calls and incidents with their recommended staffing from the inventory report (Section 4). In this manner, geographic-specific knowledge of local dispatch centers should be preserved (e.g., the location of a specific landmark, being referred to by name and not typically by address). Administrative calls would largely remain with the respective agencies (mainly law enforcement agencies) in their respective towns. These administrative calls would be requests such as someone wishing to speak to the police chief, obtain a copy of an accident (or other) report, leave a voicemail for an officer, etc. A small percentage of administrative (non-emergency) calls would increase in the respective PSAPs from field responders or agencies with direct questions or other communications regarding an incident. To account for these incoming administrative calls, 10% of the existing dispatch center administrative call volume (where reported) was included in the workload increase calculations.

Personnel Impacts

With the regionalization of dispatch centers, as shown in Options 1 through 4 above, there are reductions in the number of full- and part-time communications center staff statewide. Initially, this may be viewed by some as a negative due to the loss of employment. However, several factors are at play that could reduce or potentially eliminate the total number of jobs lost due to the regionalization efforts.

First, there are a collective total of 14 vacancies in the PSAPs. Staff whose positions are affected by regionalization would present a ready pool of partially trained staff who could fill these positions (dispatch center staff would still be required to complete call-taker and EMD training to become fully operational). Additionally, as stated, a PSAP's authorized strength may need to increase to accommodate the increase in dispatched incident volume if there are operational configuration changes, offering additional positions that would need to be filled (e.g., to accommodate the additional workload if Hartford, Lamoille County, and Shelburne each added a workstation position and Westminster VSP and Williston VSP each added two workstation positions, using a figure of six additional staff positions per workstation position, a collective total of 42 positions would be added within the PSAPs). Vacancies within the dispatch centers would no longer be a staffing factor as these positions would no longer be part of the equation.

Second, given the operational capacities within the six existing PSAPs, which should be standardized statewide (e.g., training, QA, CAD administrators, etc.), existing staff would have promotional opportunities, potentially creating vacancies in the telecommunicator ranks within each PSAP. It is anticipated that this would create at least two positions within each PSAP, creating 12 vacancies.

Finally, the agencies no longer serving as dispatch centers overwhelmingly stated during data collection and stakeholder engagement efforts the need to maintain at least a partial front desk/window/lobby presence for their agencies (e.g., 8:00 a.m. to midnight, five to seven days a week). If each locality decided to maintain such a presence for 16 hours a day for five days a week, it would likely require the reclassification of a minimum of 42 existing dispatch center positions (e.g., one employee each for Dover, Middlebury, Randolph, and Wilmington [currently not 24-hour agencies] and two employees each for the remaining 19 dispatch centers). Employees who do not wish to be employed by a PSAP could fill these positions.

In total, these additional vacancies could total 96 or more following regionalization. Using the calculated personnel impacts shown in Options 1 through 4 above, a total of 122 full-time and 40 part-time positions would be eliminated as part of the regionalization process. It can reasonably be anticipated that the PSAPs would require an increase in the number of full-time positions they have versus their current complement to assist with scheduled and unscheduled leave, potentially transferring the full 40 part-time positions among the PSAPs. If a PSAP must hire additional personnel to manage increased call and incident volumes, appropriate consideration should be given to the number of supervisory roles, in alignment with existing statewide span of control guidelines.

It can also reasonably be anticipated that some PSAPs may decide to hire additional support staff; agencies may elect to have more front desk/window/lobby coverage than anticipated; some staff may elect to leave the public safety communications profession entirely, either through retirement or a change in industry; or some individuals may seek emergency communications employment elsewhere because the distance they would travel to get to work each shift may be greater than is tolerable for their individual situation. In total, the overall net effect on employment may be negligible.

3.4.4.1.3 Implementation Variation 4C

Regionalization Option 4C involves the regionalization of dispatch centers by choice. Each dispatch center would have the autonomy to choose from among the six PSAPs with which to regionalize, allowing them to align with the PSAP that best fits their operational needs and organizational culture. This approach avoids mandating partnerships that could result in unworkable conditions, such as overcrowding, staffing shortages, or lack of regional compatibility.

Additionally, localities currently served by out-of-state dispatch centers would be given the option to either remain with their existing dispatch center or regionalize with a Vermont agency. Compared to Option 4B, this flexibility could lead to a reduction in the total incoming 911 calls and incidents requiring dispatch.

All other applicable elements of Option 4B would still apply under this model.

3.4.5 Option 5: County PSAPs Model

In this model, the State continues providing all emergency call-taking and dispatching services standards oversight for the proposed county PSAPs, VSP PSAPs, and dispatch centers. The 911 Board continues to provide the 911 call-taking equipment and call-taking policies to the overall state governance authority. This model eliminates the regional dispatch centers, with the exception of two—Mad River Valley Ambulance and the University of Vermont, due to their unique operations—relying instead on a fully centralized infrastructure. If local municipalities or regions wish to maintain their dispatch or PSAP functions, they must self-fund these

operations and adhere to the State's policy and technological, and operational requirements as set forth by the governance body.

The existing VSP PSAPs (Westminster and Williston) would function as what is known in the public safety communications industry as a secondary PSAP. A secondary PSAP is "a PSAP to which 9-1-1 calls are transferred from a Primary PSAP."[64] Each county with a PSAP would process 911 calls and dispatch all public safety resources for that specific county. Any request for VSP services would be routed to one of the VSP PSAPs— preferably via a CAD-to-CAD interface to eliminate call transfers. This would allow VSP telecommunicators to focus on radio dispatching efforts for Vermont state troopers and associated state agencies, such as Vermont Department of Motor Vehicles [DMV] and Vermont Fish and Wildlife, thereby improving responder safety.[65]

Additionally, since VSP staff are required to be state certified 911 call-takers under existing state regulations, the VSP PSAPs could function as a default backup PSAP for the counties from which they receive VSP incidents. VSP PSAPs could dispatch troopers based on the following division of services:[66]

[64] National Emergency Number Association. (n.d.). Public Safety Answering Point (PSAP). NENA Knowledge Base. Retrieved March 21, 2025, from https://kb.nena.org/wiki/PSAP_%28Public_Safety_Answering_Point%29

[65] Further study would be required to determine the optimal separation line between the Westminster and Williston service areas.

[66] A thorough evaluation of the VSP incident volumes in each county is recommended to further refine the proposed PSAP assignments before finalization. This will help ensure that each VSP PSAP is staffed appropriately to effectively manage the assigned incident volume.

County	Proposed VSP PSAP
Addison	Westminster
Bennington	
Orange	
Rutland	
Windham	
Windsor	
Caledonia	Williston
Chittenden	
Essex	
Franklin	
Grand Isle	
Lamoille	
Orleans	
Washington	

By concentrating call-taking and dispatching functions under a single standards authority—as with Option 4—this model seeks to enhance statewide consistency in service standards, training, and technology, while also potentially reducing overhead costs and eliminating redundant facilities. Although Option 5 does not reduce the number of PSAPs and dispatch centers to the same extent as Option 4, it offers a more balanced distribution of workload across counties and may provide personnel with comparable or shorter daily commutes.

Key Features

- Service Alignment
  - Streamlined dispatch protocols: With eight primary, two secondary PSAPs, and two dispatch centers, the intake and dispatch processes for law enforcement, fire, and EMS are governed by a singular set of standards and guidelines, minimizing the risk of communications errors and redundant procedures.
  - Centralized coordination: Calls received at any PSAP can be seamlessly routed to the appropriate response agency, with unified protocols ensuring the consistent handling of emergency requests.

- No Regional Centers
  - Complete centralization: There are no regional PSAPs or local/regional dispatch centers maintained or funded by the State. This significantly reduces facility footprints and can help streamline operational costs.
  - Local autonomy (if desired): Municipalities that choose to continue to operate their own dispatch centers must self-fund them and comply with State policies and technological standards, promoting consistency in service quality and interoperability across the entire system.
- Oversight/Management Options—The same two oversight/management options proposed under Option 1 are applicable for this option—a dedicated State PSAP Division or expanded role for the 911 Board.

Key Considerations

- Technology and Infrastructure
  - Upfront investments: Transitioning to a fully centralized model may require significant expenditures for upgraded technology, such as an improved CAD system and robust communication networks, to handle call volume efficiently.[67]
  - System redundancy: Ensuring uninterrupted operations demands thorough backup systems, redundant network pathways, and reliable emergency power supplies.
- Workforce Implications
  - Recruitment and retention: Centralization can create larger, busier call centers that may appeal to specialized dispatch professionals. However, it can also increase pressure on staff due to higher call volumes, requiring robust employee support and competitive compensation packages.
  - Training and standardization: A centralized model can streamline training, resulting in consistent performance expectations and a uniform standard of care.
- Community Relations and Local Knowledge
  - Maintaining local expertise: Centralization can sometimes raise concerns about the loss of "local knowledge," particularly in rural or unique geographic areas. Comprehensive GIS and continuous liaison with local agencies can help mitigate this. These concerns have been largely proven to be misconceptions nationwide, including the regionalization examples contained herein.
  - Stakeholder engagement: Early and transparent communication with municipal leaders, first responders, and the public helps foster understanding of the model's benefits and addresses any perceived disadvantages.

[67] Vermont is well along the path of NG911 implementation, having achieved jurisdictional end state in many categories, and transitional state in categories that are dependent on entities outside the Board's control (like OSPs).

- Cost Efficiency
  - Reduced overhead: Eliminating multiple dispatch centers could yield long-term cost savings on infrastructure, real estate, and maintenance.
  - Potential financial burden for local centers: Municipal or regional agencies that wish to maintain separate dispatch operations must self-fund them, which may deter smaller communities from opting out of the State managed system.
  - State technology costs: Technology costs (e.g., 911 CHE) would increase due to the addition of State-funded technology required for the four new PSAPs.
  - Reduced PSAP funding: Under the existing funding model, disbursements to existing PSAPs will decrease due to the funding now being split among four additional PSAPs. This could, however, be rectified with a new State funding model.

Overall Focus

The overall focus of Option 5 represents a quasi-county-by-county approach[68] among the various regionalization proposals, effectively consolidating all emergency call-taking and dispatching services under direct State standards oversight with local operational management within eight locally managed PSAPs, two State-managed secondary PSAPs (VSP), and two dispatch centers[69]—with optional self-funded local dispatch operations that meet all state standards and requirements.

MCP acknowledges that not every dispatch center may be interested in regionalization for a variety of reasons. However, if regionalization is not pursued or is not appropriate for a prospective agency, MCP strongly encourages these agencies to consider a CAD-to-CAD interface and/or appropriate fire/EMS-related Valcour improvements with their primary PSAP to eliminate the majority of 911 call transfers, and with their mutual aid partners to reduce the time required for incident notifications.

While this model can lead to greater efficiency, uniform technology adoption, and potential cost savings, it also poses challenges around workforce capacity, community engagement, additional costs to the State, and reduced funding disbursements to the PSAPs. Nonetheless, by adhering to robust operational standards, investing in advanced technology, and maintaining open lines of communication with local stakeholders, this framework holds the potential to deliver highly consistent, streamlined, and reliable emergency communications services statewide.

As with Option 4B, it is important to understand each existing PSAP's or dispatch center's capacity to expand its workstation footprint to manage increased workload, especially when operations may need to be split across separate talkgroups or frequencies as determined by management. The following summarizes the reported workstation expansion capabilities, based on responses from the original data collection questionnaire:[70]

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[68] Six of the 14 counties have call and/or incident volumes low enough as to not warrant their own PSAP. In these instances, two or more neighboring counties are consolidated into a single PSAP to most efficiently manage the workload.
[69] The University of Vermont and Mad River Valley Ambulance dispatch centers remain in operation as suggested in previous options.
[70] The following table does not include the University of Vermont or Mad River Valley Ambulance dispatch centers as they are exempt from regionalization. VSP PSAPs are likewise excluded.

County	PSAP or Dispatch Center	Number of Workstations That Can be Added
Addison County	Middlebury PD	Consoles can be added; the number is not specified
	Middlebury Regional EMS	0
Bennington County	Bennington PD	♦
	Manchester PD	♦
Caledonia County	Saint Johnsbury PD	0
Chittendon County	Burlington City PD	0
	Colchester PD	0
	Essex PD/Williston PD	0
	Saint Michael's College Fire/Rescue	0
	Shelburne PSAP	Consoles can be added; the number is not specified
	South Burlington PD	Consoles can be added; the number is not specified
	Winooski PD	♦
Essex County	N/A	N/A
Franklin County	St. Albans PSAP	0
Grand Isle County	N/A	N/A
Lamoille County	Lamoille County Sheriff's Office PSAP	Consoles can be added; the number is not specified, but can expand into the next room
Orange County	Randolph PD	0
Orleans County	Newport PD	0
Rutland County	Rutland City PD	0
Washington County	Barre City PD	0

County	PSAP or Dispatch Center	Number of Workstations That Can be Added
	Montpelier PD	Consoles can be added; the number is not specified
Windham County	Brattleboro PD	Consoles can be added; the number is not specified
	Dover PD	0
	Wilmington PD	Consoles can be added; the number is not specified
	Windham County SO	0
Windsor County	Hartford PSAP	1
	Ludlow PD	Consoles can be added; the number is not specified
	Springfield PD	Consoles can be added; the number is not specified
	Woodstock PD	♦
♦ = Unknown / Data not submitted		

It should be noted that not every dispatch center that reported *no space for added consoles* would require the addition of consoles. For example, if the dispatch centers within a county were to regionalize, and the 911 call and incident volumes could be effectively managed with the existing console positions, no additional console positions would be needed. However, the agency would not be able to expand to meet future growth.

Option 5 Assumptions

Several assumptions were made regarding Option 5 and its viability as a method for determining which counties would be capable of appropriately staffing and operating a future PSAP:

- The data provided in the inventory was accurate.
- All 911 calls would revert to the respective PSAPs (not VSP).
- The agencies currently dispatched by a respective dispatch center would remain with that dispatch center (if it became a PSAP) or would move with that dispatch center to another PSAP.
- The PSAP has the capability to dispatch the first responders from the dispatch centers that regionalize into the PSAP.
- The agencies currently dispatched by VSP Westminster and VSP Williston would be dispatched by the PSAP within the county where the agency resides.

- The University of Vermont and Mad River Valley Ambulance remain as dispatch centers due to their unique operations.
- The two VSP PSAPs would become backup/overflow PSAPs for the primary PSAPs while remaining as dispatch centers for VSP and other state agencies (e.g., Fish and Wildlife, DMV, and Conservation).
- VSP would receive incidents for dispatch via CAD-to-CAD transfers, with the initial call handled by the respective PSAP—unless a call transfer was warranted.

After analysis, either the data or other concerns do not support several counties having a PSAP.

- Grand Isle County does not have a dispatch center within the county. The Grand Isle Fire Department and Grand Isle Rescue currently are dispatched by the Shelburne PSAP, while the Grand Isle County Sheriff's Department is dispatched by VSP Williston. The Grand Isle Sheriff's Department is a Monday through Friday operation, and the fire department and rescue desire to remain with the Shelburne PSAP.
- While Bennington County has two dispatch centers (Bennington and Manchester), Bennington does not have room for expansion; the situation is unknown in Manchester as it did not submit a survey response. Overall, the call and incident volumes for the agencies in the county are low—less than 7,600 and 16,000, respectively—and can be handled by a PSAP in another county.
- While Caledonia County has a dispatch center (St. Johnsbury), it does not have room for expansion. Additionally, the call and incident volumes for the agencies in the county are low—less than 8,500 and 15,000, respectively. St. Johnsbury could likely absorb the Lyndonville Police Department into its dispatch operations without expansion, as it already dispatches the Lyndonville Fire Department. The question is whether this will create a burden on staff who are simultaneously answering calls for service and dispatching first responders.
- Essex County does not have a dispatch center within the county. The Essex County Sheriff's Department is dispatched by VSP Williston, while the Beecher Falls Fire Department is dispatched by Colebrook Police in New Hampshire. The sheriff's department can be dispatched by a PSAP in another county within Vermont.
- While Orange County has a dispatch center (Randolph), it is only operational Monday through Friday from 0800 to 1600. Two fire departments and one EMS agency are dispatched by VSP Westminster, while two police departments are dispatched by VSP Williston. The six responder agencies within the county, including the Randolph Police Department, can be dispatched by a PSAP in another county as the call and incident volumes are low—less than 10,500 and 13,500, respectively.
- While Orleans County has a dispatch center (Newport), it does not have room for expansion. While Newport could absorb Glover Ambulance into its dispatch operations as its incident volume is extremely low—265 incidents annually—the question is whether Newport could transition to a primary PSAP, and potentially handle overflow 911 calls, with its current staff and center without expansion.

The following table shows the number of agencies, 911 calls, and incidents that would be added (or removed) from each PSAP.

Table 3: PSAP Changes through Regionalization (Option 5)[71]

PSAP	Currently Dispatched Agencies	Additional Agencies	Total Dispatched Agencies	Added 911 Call Volume	Additional 911 Calls Per Hour	Added Incident Volume	Additional Incidents Per Hour
Brattleboro *	3	18	21	8,023	0.92	32,812	3.75
Hartford	19	21	40	8,908	1.02	19,695	2.25
Lamoille Co.	23	36	59	16,801	1.92	30,602	3.49
Middlebury *	3	23	26	24,260	2.77	32,667	3.73
Montpelier *	20	14	34	13,436	1.53	30,253	3.45
Rutland *	2	31	33	22,677	2.59	20,940	2.39
Saint Albans	25	1	26	4,803	0.55	5,469	0.62
Shelburne	38	23	61	39,063	4.46	98,792	11.28
Westminster VSP	52	-47	5	-42,151	-4.81	-38,681	-4.42
Williston VSP	14	-10	4	-43,491	-4.96	-49,483	-5.65

Except for the Shelburne PSAP, the increase to incoming call volumes is less than three 911 calls an hour, on average, and the increase to incidents is less than four an hour, on average. That said, there will be peak hours (or surges) when the increase in call and incident volumes exceed these (and conversely, times such as overnight hours where call and incident volume will be less than these averages).

The Shelburne PSAP will see the greatest increase—with an additional five 911 calls an hour, on average, and an additional 12 incidents an hour, on average. Shelburne would be taking on an additional 23 agencies including eight law enforcement agencies. Changes to the operational configuration (from vertical to horizontal operations) may be necessary. Any change to staffed workstation positions would require an increase in authorized telecommunicator positions.

While Lamoille County and Rutland would be taking on the greatest number of agencies, 36 and 31, respectively, the majority are fire departments with low incident volumes.

Before a dispatch center becomes a PSAP or a PSAP takes on a dispatch center (or other agencies), it will need to consider the following, which may affect its operational configuration and, therefore, its staffing:

- How will administrative calls be handled?

[71] New PSAPs marked with a *

- How many personnel and units are on duty for a respective channel or talkgroup for which the dispatch center is responsible (i.e., will the number of personnel create a workload saturation for the PSAP – necessitating another console position)?
- Does any agency use MDTs (which would lighten a dispatcher's workload)?
- Is PTT data available to verify that workload, which would play a role in the workload saturation level?
- Does the dispatch center (or a respective agency) prefer to maintain a separate workstation position for its agencies (albeit with cost)?

Additionally, if the recommended dispatch centers identified under this option are deemed unsuitable to serve as a PSAP—due to space limitations or responses to the considerations outlined above—the State may instead choose to maintain VSP Westminster and Williston as primary PSAPs to manage all call-taking and dispatch responsibilities for the affected counties. This decision would be based on geographic proximity to one of the PSAPs. Alternatively, a neighboring county could be designated as the PSAP for those counties. This approach would reduce the overall number of PSAPs and dispatch centers, while streamlining workloads across the remaining communication entities.

As the complexities of the presented physical regionalization options and their implementation variations are examined, it is important to recognize that there are several approaches to implementing physical regionalization. However, the primary objective of this strategy, particularly in the context of Vermont, are to simplify the operational configure of call-handling—favoring single-stage over two-stage call processing—and to eliminate redundant expenditures. These cost savings can then be redirected to enhance emergency response services.

3.5 Governance

The public safety communications landscape is rapidly evolving. A comprehensive public safety communications system includes NG911, LMR, public safety broadband, CAD, and various other communications applications used by first responders. The public safety communications ecosystem is becoming increasingly complex and interconnected. As this ecosystem grows more complex and interconnected, both the technology and its usage must be aligned to address service disparities and interoperability challenges. Public safety communications rely not only on technology but also on a network of people and processes. Together, these elements form a "system of systems" that is essential for ensuring interoperability and maintaining emergency communication continuity.

Key Trends and Insights

- The inactive ECAC, established by executive order, could be reinstated and expanded into a statewide governance body; however, it would have to be restructured with representation from key state and local stakeholders.
- The 911 Board could be modified to become the statewide governing body. This has been done in a few states. Representation on the Board will need to be modified to include key state and local stakeholders.

- Public safety communications systems supporting multiple jurisdictions require a higher level of stakeholder governance, providing a mechanism to plan for technology changes, allocate funds, prioritize operations, and generally carry out the combined stakeholder's mission and vision.
- Vermont's 911 system is governed under a single statewide system that supports communications centers designated as PSAPs. However, the governance and support only impact the state's six PSAPs and do not extend to the state's 25 dispatch centers or the six out-of-state dispatch centers, which are governed by their respective state.
- The governance and organizational structures of Vermont communications centers vary widely.
- There is a growing desire to establish a more equitable structure that prioritizes the safety of both responders and the communities they serve and reflects a broader movement toward enhancing fairness and inclusivity in emergency response systems.
- There is an absence of standardized organizational frameworks among the communications centers, which presents challenges in establishing consistent operational practices, hinders the ability to adopt statewide best practices effectively, and impedes effective decision-making and strategic planning.
- The disparity in governance and organizational structures in Vermont communications centers highlights the need for ongoing efforts to improve governance models and organizational capacity to ensure the long-term sustainability and effectiveness of communications center operations.
- Addressing disparities in funding, promoting standardization, and enhancing leadership capabilities are critical steps toward building a more effective and equitable emergency response system.

Where technologies are constantly changing and service is paramount, there is a need for consistency in operations that goes beyond the communications centers. It is essential to have interoperability between first responder agencies and SOPs to ensure first responders can communicate across jurisdictional boundaries and access the information they need when they need it to coordinate responses efficiently and make the most effective use of these complex technologies. The public that makes a request for help is also part of this ecosystem and benefits from aligned processes that result in speed and consistent service.

> "You can have all the technology you want but you will not achieve true interoperability if you do not have the cooperation and collaboration that comes with the governance structure that ensure everyone is working together, making joint decisions, spending funds with others in mind."
>
> SAFECOM Committee Chair, Marilyn J. Praisner

A strong governance framework inclusive of all communications systems provides an opportunity to bring the right people together to plan, collaborate, and make decisions that support the use of these technologies for consistent operations. A strong framework allows the entire state to leverage existing technologies where applicable and incorporate new systems into the overall communications landscape.

The benefits of a regional/state governance framework that has oversight over the holistic public safety communications systems are as follows:

- Provides a central coordination point across a broad spectrum of public safety partners and the whole community
- Provides an opportunity to engage users in the decision of what technology is needed, determine best practices on the use of the technology, and engage in lifecycle planning, prioritization, and fiscal decisions.
- Considers the integration of new technology and how it impacts all stakeholders
- Develops a shared approach to dealing with technology challenges and disparity in how these technologies can be used
- Fosters communication and joint decision-making
- Builds partnerships between diverse response organizations at all levels of government

The reality is that building a holistic governance structure is difficult. You are attempting to bring people together with different viewpoints, goals, and concerns to create a common vision and common goals. No one size fits all. There are several key components of effective governance and there are multiple types of governance models. It is important to choose a model that fits the needs of the public safety partners and accomplishes the goals one is trying to achieve.

All stakeholders need to have representation through various committees in the governance framework and must be fully engaged in the governance process. A bottom-up structure empowers public safety officials at all levels to make decisions—strategy and policies are created by the people who use the systems. This develops the buy-in and trust of the user community.

The *Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Officials*, developed by SAFECOM, NCSWIC[72], and the Governance Guide Working Group, identified that there are generally three ways governance bodies are created—legislation, executive order, ad hoc. The figure below defines each one.[73]

[72] National Council of Statewide Interoperability Coordinators
[73] If information is needed regarding the strengths of each structure, please refer directly to the governance guide, which may be found here: Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Officials

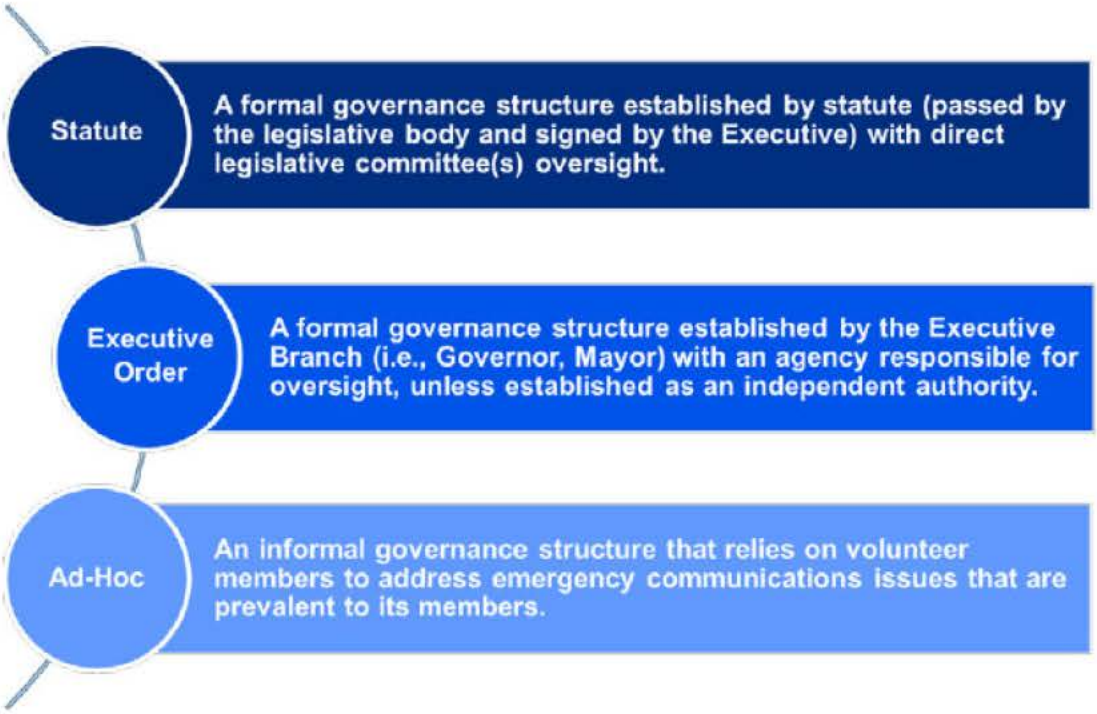


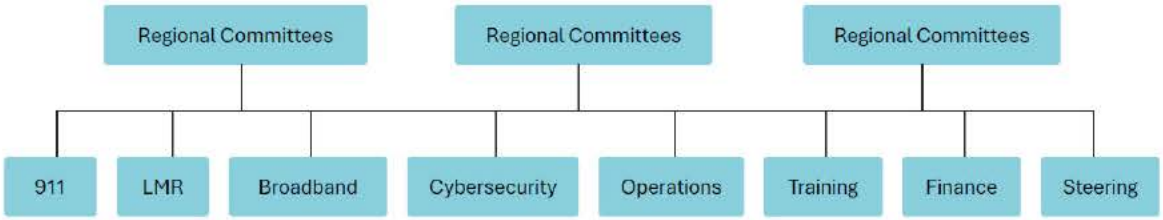
Figure 14: Types of Governance Authority

Key findings on each governance authority type can be found in Appendix G.

The Guide states that there are predominately three main types of governance models employed today.

Model A depicts independent regional committees that focus efforts on regional needs. Each regional committee has sub-committees for each technology (LMR, 911, Broadband, OTT applications, CAD), operations, training, finance and steering. Each region identifies their best practices, challenges and capability gaps. Each region can prioritize their needs and pursue funding as a region. This model provides a central coordination point within the region, but it does not address the need for a central coordination point at a state level.

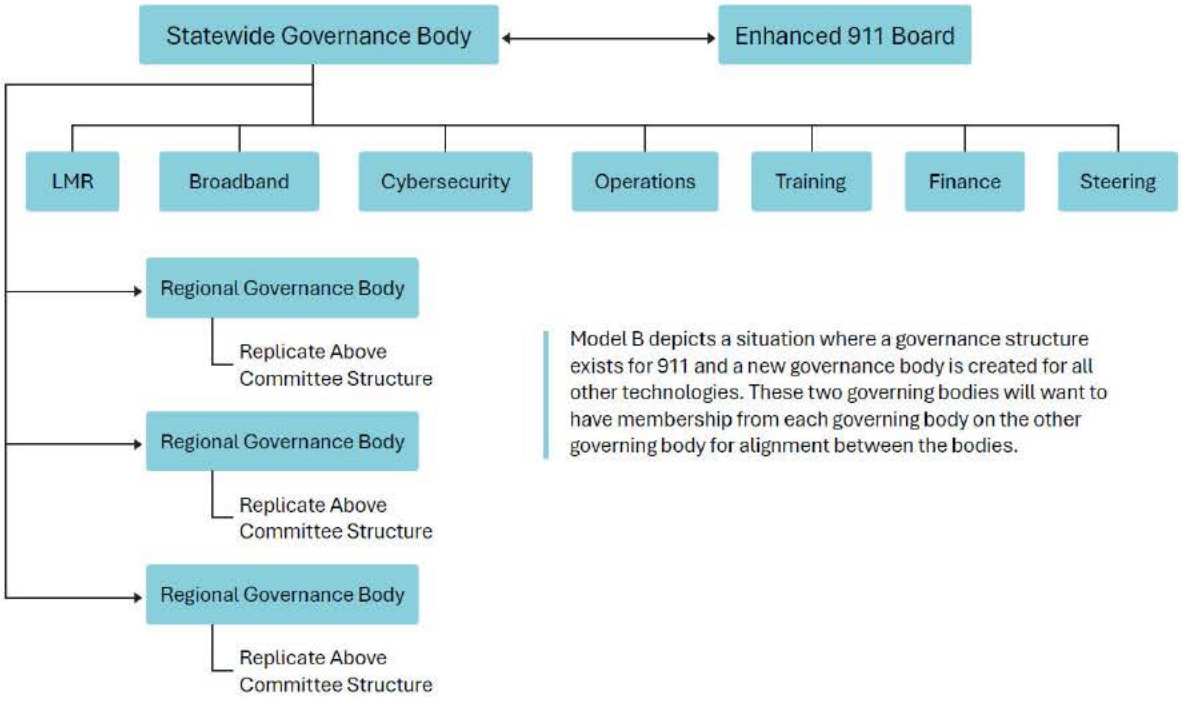
Governance Model A



Model A illustrates independent regional committees that focus efforts on regional needs. Each regional committee has sub-committees for each technology (911, LMR, Broadband), operations, training, finance and steering.

Model B depicts a situation where a governance structure exists for 911 and a new governance body is created that works in concert with the Enhanced 911 Board with a view of the entire public safety communications ecosystem. These two governing bodies must share information as well as coordinate decisions for incident response. This model works when there is overlapping membership between each governing body and alignment is achieved only when communication and coordination are prioritized. The statewide governance body and the 911 Board operate as co-equals, each with oversight of their respective technologies. The 911 Board remains intact as it exists today with the existing subcommittee structure (not shown below). The ECAC could be reinitiated to operate in the role of the statewide governance body. Although this model may be the easiest to deploy without additional statute changes, it requires active participation by the overlapping members to be successful.

Governance Model B

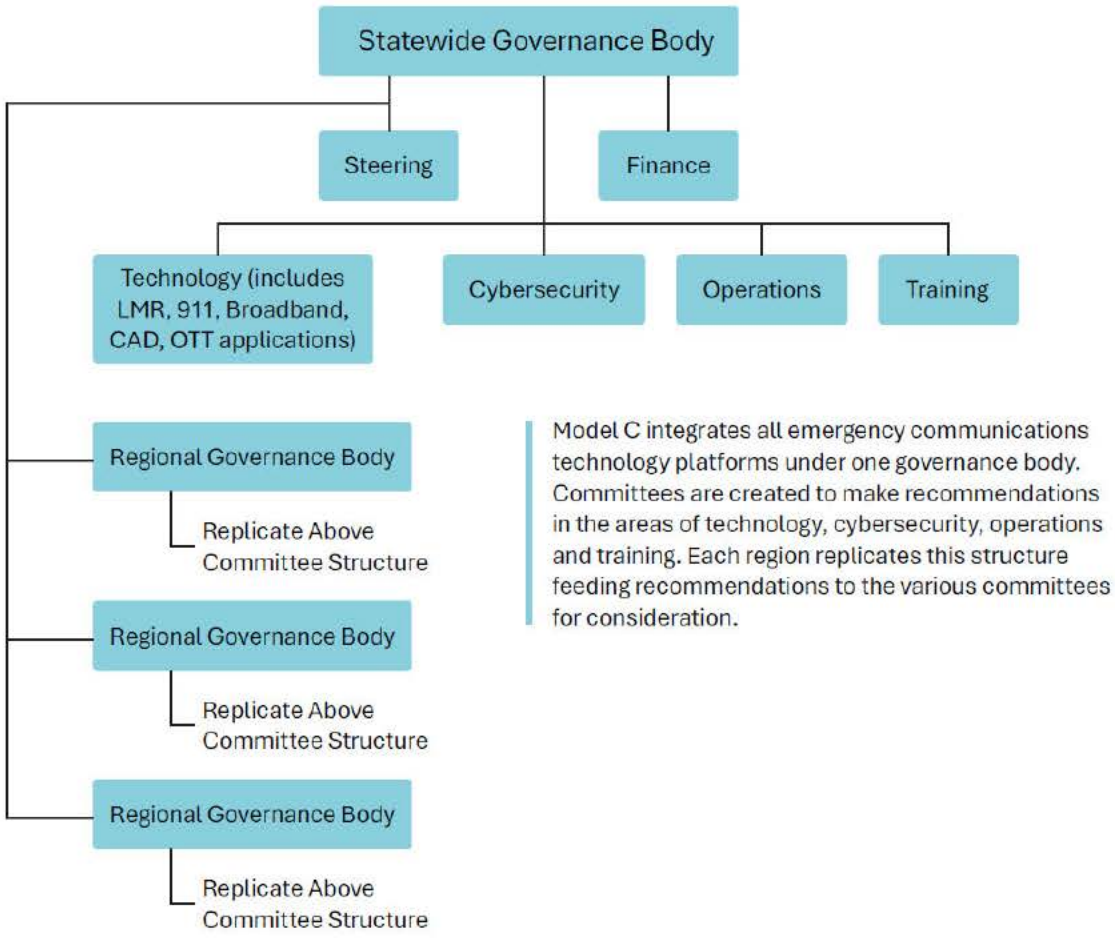


Model C consolidates all emergency communications technology platforms under a single governance body or advisory committee. This centralized decision-making structure strengthens the State's ability to identify interoperability gaps, plan strategic initiatives, and prioritize funding, incorporating input from regional and local stakeholders. Establishing similar governance structures at the regional level would further align local strategies with the state-level strategic initiatives.

A future governance body could be created by the governor based on recommendations from the state legislature or through collaboration with the legislature and local governments. Given the importance of local autonomy, securing buy-in from local authorities is essential for success.

Some states have expanded their 911 boards to oversee all emergency communications—a model worth considering. However, this would require modifying board composition to include both public safety officials and local legislative representatives. An independent board with direct state funding could enhance stakeholder support and operational effectiveness.

Governance Model C



Regardless of the approach, any governance model must comply with state municipal charter and district requirements.

All three models can be effective, but Models A and B require strong communication between their individual entities and lacks a central point of coordination, making it difficult to have a coordinated strategy that all regions and governance bodies work toward. Many states have adopted Model C after recognizing that a central coordination point with a strategic vision helps stakeholders collaborate effectively. This approach ensures NG911 stakeholders are integrated into LMR and broadband planning, fostering interoperability and synergy across all communication platforms. MCP recommends Model C, if possible.

A holistic approach to governance needs to incorporate membership from LMR, broadband, and 911/NG911 functions at all levels of government. Case studies have confirmed that governance models seem to function best with 50% or greater local representation—engaging the users to solve their challenges. The executive committee or overarching board should be comprised of more senior officials. The number of voting members should be between 15 and 20 to achieve optimum efficiency and representation, according to the bodies that were studied in producing the governance guide. The inclusion of the statewide interoperability coordinator

(SWIC) as either a voting or non-voting participant is beneficial. The SWIC's role is to coordinate the interoperable communication activities and initiatives identified by the governing body and "maximize integration and collaboration across the emergency communications landscape."[74] Additionally, inclusion of the state point of contact (SPOC) for broadband planning also would be beneficial. Achieving this level of balance between technology stakeholders and levels of government can best be accomplished through the establishment of different committees and sub-committees. This bottom-up approach to governance through various committees and sub-committees, which report up to the executive committee or overarching board, provides a voice for all levels of government. Typical committees found within public safety governance models are steering, finance, technology, operations, and training; sub-committees are created as needed to study specific issues and make recommendations to the committees to inform the executive or board members of the ultimate decision.

Governance Model Options			
Area of Interest	**Option 1**	**Option 2**	**Option 3**
	Governance Model A: Independent regional committees that focus efforts on regional needs — regions making independent decisions	Governance Model B: Two independent side-by-side state bodies with regional committees that mirror each other to enhance statewide coordination while supporting regional decision-making — multiple decision-making bodies	Governance Model C: One statewide body collaborating with regional governance bodies that mirror the statewide governance to enhance statewide coordination while supporting regional decision-making — a single decision-making body
Oversight	**Strengths**		
	• Has regional stakeholders making decisions as a group and creating alignment within the region • Is easier to create ad-hoc regional committees	• Keeps existing Enhanced 911Board in place while adding a governance body that views public safety communications needs holistically	• Has a single coordination point with a strategic vision that allows for input from committees and regions where consensus is built
	Challenges		
	• Lacks a central point of coordination and guiding vision in the state to assist in setting priorities or on the use of public	• May be difficult to achieve alignment between the two boards, which requires active participation and communication by	

[74] https://www.cisa.gov/ncswic/swic-roles-responsibilities

Governance Model Options			
	safety communication technologies	the overlapping representative; this often comes down to the personality and character strength of the person representing their respective boards	
Cooperation	**Strengths**		
	• Enhances cooperation within the region	• Enhances cooperation statewide as long as there is overlapping membership on both governance bodies and cooperation and communication is prioritized between both bodies	• Enhances statewide cooperation by providing the ability to address tactical, operational and strategic needs of the public safety community across all functions
	Challenges		
	• Requires regional stakeholders to keep the greater good of the region in mind • Does not address cooperation between regions and the State	• May introduce competing strategic initiatives/needs between the 911 Board and statewide governing body	• Requires buy-in from local and regional governance to work • Is time-consuming to reach consensus with multiple meetings • May see a lack of participation occur if too many meetings
Funding Prioritization	**Strengths**		
	• Provides the ability to prioritize funding needs across the region	• Provides the ability to prioritize funding needs within each governance body	• Provides the ability to identify gaps and prioritize funding resources with a holistic view of all public safety communications needs
	Challenges		
	• May introduce competing funding	• May introduce different funding	

Governance Model Options			
	needs between regions and the State if priorities are different	priorities from each governing body if priorities are different	
Interoperability	**Strengths**		
	• Improves interoperability within the region	• Provides the ability to identify and address all technology, operations, training, and interoperability issues across the state and how these technologies interact with 911	• Provides the ability to identify and address all technology, operations, training, and interoperability issues across the state
	Challenges		
	• Does not improve interoperability outside the region	• May be difficult to align interoperability priorities across both governing bodies	
Service Levels	**Strengths**		
	• Provides the ability for the operations and training committees to identify differences in operating procedures across the region and across all public safety communications • Provides the ability to identify best practices, allowing everyone in the region to benefit and provide training opportunities to improve service delivery	• Allows regional input from the operations and training committees of each governing body to identify differences in operating procedures across the state for the technologies for which each board has responsibility • Allows regional input to identify best practices and develop training opportunities to improve service delivery with input from the regions • Assures consistency in SOPs and service	• Allows regional input the operations and training committees to identify differences in operating procedures across the state and across all technologies • Provides the ability to identify best practices and develop training opportunities to improve service delivery with input from the regions • Assures consistency in SOPs and service delivery across the state

Governance Model Options			
		delivery across the state	
	Challenges		
	• Requires similar training for all communications center employees • Requires an open mind to make changes	• Provides the ability for the regions to set SOPs and training requirements higher than the State but not lower than the State's minimum training and SOPs	• The ability for regional participation and common vison and goals helps to overcome the concern that the State is telling them what to do
Interstate Communications	**Strengths**		
	• Improves communications within the individual regions	• Increases communication between stakeholders across the state and between the two boards.	• Increases communication as there is one state-level governance body with committee engagement from stakeholders across the state
	Challenges		
	• Is still a challenge outside of the region with communications	• Depends on overlapping membership and cooperation and communication between those overlapping members • Introduces the possibility that communications will suffer, and priorities or goals will not align	• Is critical that there is consistent participation to ensure a region's voice is heard at the state level

Examples of statewide governance models that invest in a bottom-up approach and incorporate planning, funding and use of holistic public safety communications are listed below. Each of these states has modified the models to fit the unique needs of their state.

Utah Communications Authority

In 1997, the State of Utah created the Utah Communications Agency Network (UCAN) for the purpose of providing statewide public safety two-way LMR coverage paid for by the user agencies.[75] UCAN was created as a "quasi state agency" managed by a board of directors. In 2014, House Bill 155[76] resulted in the creation of the Utah Communications Authority (UCA). The UCA is responsible for governance of the statewide LMR system, FirstNet planning, interoperability, and 911 program administration. The UCA is run by a 27-person board[77] consisting of representatives of the law enforcement (police and sheriff), corrections, fire service, emergency management, public health and 911 sectors from state, local, county, and tribal governments. The UCA has established subcommittees to address 911, statewide interoperability and FirstNet.

The UCA is an example of Model A.

Indiana Integrated Public Safety Commission

The Indiana Integrated Public Safety Commission[78] (IPSC) was enabled through legislation in the form of Indiana Code 5-26[79], and is the governance body responsible for the statewide LMR system, interoperability, and FirstNet planning. The IPSC consists of 12 members from state, federal, local, and county public safety interests. The IPSC created the Statewide Interoperability Executive Committee[80] (SIEC) for the purpose of overseeing the expansion and improvement of regional and local interoperable communications and governance. The SIEC consists of 18 members representing local, state, and PSAP entities.

The Indiana State 911 Board[81] oversees the administration of the 911 system within the state. The 911 Board was created through Indiana Code 36-8-16.7[82] and is administered by a board of 15 persons from state, local, and county governments.

The Indiana model is an example of Model B but also provides a good example of the bottom-up approach, as it established the SIEC with regional representation under the IPSC.

Minnesota Statewide Emergency Communications Board

The most comprehensive governance structure examined was the Minnesota Statewide Emergency Communications Board[83] (SECB). The SECB was created by Minnesota statute 403.36[84] and originally was called the Statewide Radio Board. The SECB has governance responsibility for statewide interoperability, LMR, broadband/FirstNet, 911/NG911, and alerts and warnings. The SECB has established a very robust sub-committee structure to address a thorough list of elements involved in public safety communications.

The SECB consists of 20 members, with one-third from greater Minnesota, one-third from the Twin Cities metropolitan area, and one-third from state agencies that provide public safety services. Members are from all

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[75] Utah Communications Authority webpage located at http://uca911.org/about/history
[76] Utah House Bill 155 of 2014 located at http://le.utah.gov/~2014/bills/static/hb0155.html
[77] Utah Communications Board Members located at http://uca911.org/about/board-members
[78] Indiana Integrated Public Safety Commission website located at http://www.in.gov/ipsc/2412.htm
[79] Indiana Code 5, Article 26 located at http://iga.in.gov/legislative/laws/2015/ic/titles/005/articles/026/
[80] Statewide Interoperability Executive Committee webpage located at https://www.in.gov/ipsc/about-us/advisory-boards/statewide-interoperability-executive-committee-siec/
[81] Indiana State 911 Board homepage located at https://www.in911.net/
[82] Indiana Code 36-8-16.7 located at http://iga.in.gov/static-documents/7/4/7/a/747a8bbc/TITLE36_AR8_ch16.7.pdf
[83] Minnesota Statewide Emergency Communications Board website located at https://dps.mn.gov/entity/secb/governance/Pages/default.aspx
[84] Minnesota statute 403.36 located at https://www.revisor.mn.gov/statutes/?year=2010&id=403.36

areas of the state and all public safety disciplines. The structure also provides a great example of the bottom-up approach given the local and regional representation in the sub-committees.

The following figure illustrates the SECB structure, which is another example of Model A.

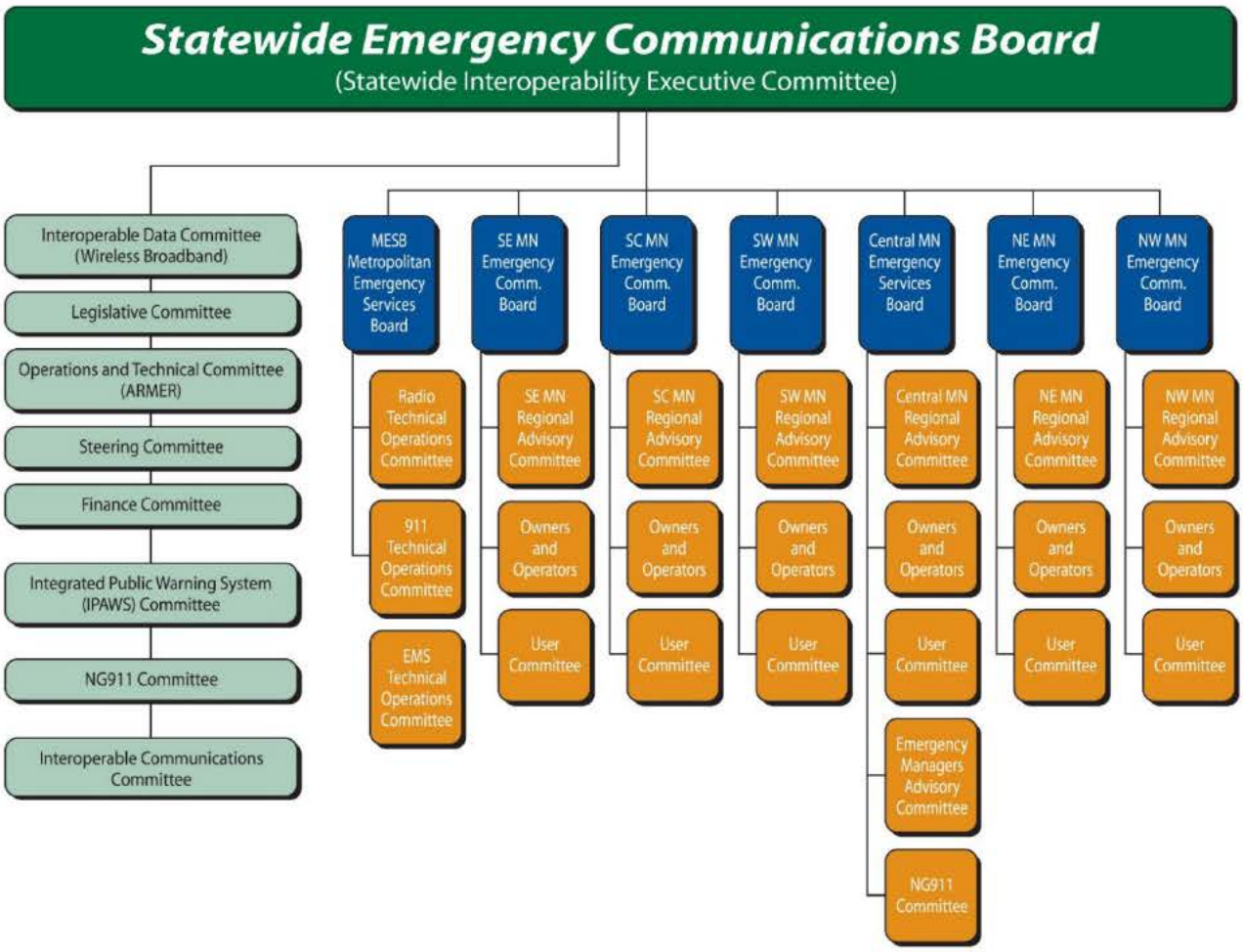

Figure 15: Minnesota Statewide Emergency Communications Board

In addition, each region has a Regional Emergency Services Board (RESB) with LMR, 911, and EMS technical committees with the option to have other committees as identified in their bylaws. SOPs adopted by the region can be more restrictive than state minimum operating procedures but cannot be less restrictive.

3.6 Funding and Cost-sharing

Funding is a key area of concern for communications centers nationwide. Without appropriate funding, communications centers are not able to upgrade technology as required, schedule staffing appropriately, or complete day-to-day operations efficiently. Funding can be identified from multiple sources, but without adequate funding, communications centers become stagnant and the efficiency of the provision of emergency dispatch services suffers.

In many cases, communications centers have been forced to seek alternate sources of funding as local and/or state funding is not adequate to support operations. Communications centers do the best they can considering the funding and resources available. Grant funding, while not as plentiful as in years past, is a viable source of funding, especially for technology projects such as regionalization, system implementation, or radio system replacement. However, once the grant period of performance ends, agencies must be prepared to continue funding operations and maintenance.

Funding can also be in the form of cost savings, particularly from realizing economies of scale. A purchase made by multiple entities to benefit all (cost-sharing) tends to reduce the cost to each individual center versus purchases made separately. Cost savings can also be realized by using existing contract vehicles, where appropriate, to reduce funding needs.

Identifying a funding method for a public safety communications system that, through the sharing of services, creates a secure, reliable and interoperable system that provides a combination of call handling and dispatch services is a complicated task. A key goal from Act 78 is the fair and equitable funding of services—particularly relating to incident dispatch, as some agencies do not pay for this service while other do—across all participating jurisdictions.

Key Trends and Insights

- The reported data indicates a wide range in the average cost per 911 call[85] ($55.39), incidents ($54.71) and population ($35.35- $73.72) with the highest average across all variables being $60.59, $90.58, and $146.47 respectively (Appendix A – Finance).
- The total budget information self-reported by agencies in the questionnaire—with the 25%/75% out-of-state adjustment and no assumptions applied—totals $20,810,384 (PSAPs = $13,542,736 and dispatch centers = $7,267,648). Of this amount, staffing is allocated $19,590,402 for 194 of the 282 full-time positions currently authorized across the state. To align with national staffing standards under the current configuration, an additional $2,914,478 would be necessary to support 66 additional positions.
- Persistent staffing challenges may cause an over-reliance on overtime to maintain minimum staffing levels. This is not a cost-effective or fiscally responsible practice, and pervasive overtime (mandatory or voluntary) can be harmful to employee wellness.
- Even though considered understaffed to meet national standards, the state's current 364 dispatchers are excessive for the call and incident volumes.
- The total estimated cost across the state for dispatch services is between $27,169,576 and $39,688,422, which applies an average budget assumption to accommodate for the 15 agencies that did not provide budget information (See Appendix A – Finance).
- Determining true operating expenses is challenging as most communications centers' budgets are embedded within law enforcement budgets, with personnel costs being the largest expense, and general funds subsidizing workforce expenses.
- Based on the personnel budget information provided by 20 of the 37 communications centers, physical regionalization presents an opportunity to reduce personnel expenses by at least $5,362,137 and could increase by another 30% if the 12 instate dispatch centers

[85] The use of the term 911 call is used to indicate the type of line that a telephone call was received on and is not referencing the "911 system".

that did not provided their personnel budget information did. These funds in part could be redirected to support system design plan recommendations.

- Achieving equitable funding is crucial—moving from a "patchwork" system to a unified statewide model that ensures baseline resources for all agencies and addresses disparities for a sustainable financial foundation.
- While dispatch fee costs were not reported during data collection efforts, it is crucial that in the final system plan these fees are determined and equalized among all agencies.
  - A standard formula can be developed using a combination of factors to determine an equalized and fair method of paying for the services rendered to each agency (e.g., a formula based on percentage of population served, 911 call volume, dispatched incident volume).
- The Board provides two types of disbursements to PSAPs for 911 call handling services.
  - "Regular" refers the reimbursement that is based on the PSAP's call volume in the previous fiscal year and certain performance metrics.
  - "Dedicated CT" refers to a disbursement for dedicated 911 call handling services. This is a separate agreement that is provided to three regional PSAPs—Hartford, Lamoille, and St. Albans.
  - In 2024, Regular quarterly disbursements totaled $897,407.24 and the Dedicated CT disbursements totaled $136,849.96.
- The Vermont Universal Service Fund (VUSF) supports multiple programs, including 911. In 2024, the funding mechanism for the VUSF changed from the 2.4% charge on retail telecommunications charges to a per access line charge of $0.72. This change will become effective in July 2025 and is expected to increase the revenue sufficiently to support all programs through at least 2029.

Cost per variable provides insights into the financial efficiency of operations. Nationally, a cost per variable of $30 or less is generally considered acceptable. Analyzing these costs can help streamline operations, and thus costs, and ensure effective allocation of resources across the communications center network. There is a considerable variance in cost per variable, which can be attributed to several factors including personnel costs. Typically, five to six individuals are needed to cover one position 24/7/365, even when the call volume is low. Compensation and benefits for dispatchers that match the first responder status may also be factors. Additional factors include overtime costs to meet minimum staffing requirements and the use of sworn personnel, who generally receive higher compensation, to fill dispatcher roles. The findings highlight significant cost inefficiencies that must be addressed to meet acceptable standards. By eliminating duplication of effort, system maintenance, and support, resources can be redirected to develop the desired statewide system.

In the State, the 911 call-taking system and dispatch functions are considered separate systems. However, because there is a cost for processing 911 calls at both the PSAP when the call is received and also when the emergency call is transferred to the appropriate dispatch center, the cost per 911 call calculations consider the budgets of the PSAPs and the dispatch centers—resulting in a cost per 911 call calculation that recognizes the duplication of labor. As an indicator of cost duplication, higher than average cost per variable related to two-stage, rather than single-stage dispatch, could be reduced if the number of call transfers and/or dispatch centers were reduced. A reduction in either could open funding that could be redirected and applied to the funding strategy for the statewide system. Neither the statewide call and incident volumes nor the population support the

need for a combined 430 full- and part-time dispatchers[86]. While in the current state this highlights the urgent need for improved staffing to promote the effective dispatch of emergency response, it also demonstrates unnecessary spending that could be redirected and applied to developing the desired statewide system.

Nationwide, it is MCP's experience that many agencies focus on resolving pressing operational challenges, such as staffing shortages or equipment upgrades, rather than developing comprehensive, long-term financial plans. This approach, while necessary to meet immediate demands, can hinder efforts to build sustainable financial models that support future growth and adaptation.

Financial challenges in regionalization efforts necessitate funding sources including cost-sharing strategies to distribute infrastructure and service expenses fairly among agencies. Smaller agencies with limited resources would benefit significantly from this approach, promoting collaboration and resource optimization. There is a need for financial assistance for PSAPs and dispatch centers aiming to regionalize. Neighboring states have successfully implemented funding mechanisms, such as Massachusetts' full funding for implementation and initial budget costs, which could serve as a model for similar efforts in Vermont.

3.6.1 Funding and Cost-Sharing Considerations

At this juncture in the systems design plan, the combination of forward paths created by the options provided above is so great in number and the timeline so uncertain that it is unrealistic to have a detailed determination regarding funding and cost-sharing. Depending on the option(s) chosen, the anticipated costs will vary, and, in some instances, costs associated with one option may or may not directly or indirectly impact costs associated with another option. The timing also impacts the amount needed, what funding sources are available at that point in time, and how long they are available.

As a result of an in-depth review of costs following two funding workshops, multiple stakeholder town halls and listening sessions, public feedback and ongoing interactions with Task Force members, this section contains an in-depth review of costs, funding, and cost-sharing considerations.

3.6.1.1 Costs

While there are many variations of the options, the Task Force and stakeholders can reasonably expect to consider costs associated with key areas that will require a more in-depth review once the combination of options is clearer. At a high level these include:

- ***Policy development*** taking into consideration if the state will subsidize the participation in a policy development workgroup
- ***Training*** based on standardization
- Performance metrics and other associated ***analytics software***
- Additional 66 ***communications center staff*** needed to meet national standards compared to personnel cost savings achievable through physical regionalization
- ***CAD*** – ranging from CAD-to-CAD and ANI/ALI spill interfaces, expanding the feature set of Valcour to engaging in the procurement of a statewide CAD solution[87]

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[86] This number is derived from a combination of the current authorized staffing reported by 31 of the communications centers combined with the staffing recommendations derived from using nationally recognized methodologies for staffing calculations.

[87] More precise costing information would be difficult to determine as part of ROM costing due to multiple system variables. This information would typically be presented by CAD, RMS, and mobile vendors as part of an RFP response.

- ***LMR communications*** build out
- ***Expansion or new construction*** of facilities to support the phased reduction in the number of communications centers
- ***Operations and technology migration*** costs not associated with facility construction including workstations, furniture, equipment, network infrastructure.
- Governance body ***administrative support***
- Staffing for the ***PSAP operations management structure*** (provided by new division at the state, independent authority and/or as part of the governance body responsibilities
  - Management
  - Technical
  - Operational
  - Training
  - Budget/Funding

Estimated System Cost ROM	
CAD/RMS/Mobile	
Based on a browser-based CAD/RMS (approximately 55 seats statewide) and mobile licenses (approximately 2,500 statewide) Note: These numbers are assumptions and not exact figures as the precise number of dispatch consoles is unknown, and would be based on the final configuration of each PSAP, or the number of law enforcement, fire or EMS vehicles statewide that would need MDTs is also unknown.	• Low end: ~$6,900,000 • Mid-range: ~$8,600,000 • High end: ~$11,200,000
LMR	
Non-fixed Assets:	• Fire pagers: ~$1,845,000 • Mobile radios: ~$14,160,000 • Portable radios: ~$35,764,500 Estimated Total for non-fixed assets: $37,609,500
Fixed Assets at 95% statewide coverage (e.g., dispatch consoles, tower sites, etc.):	• VHF: ~$54,000,000 • UHF: ~$268,000,000 • 800-MHz: ~$1,191,000,000
Fixed Assets at 85% statewide coverage (e.g., dispatch consoles, tower sites, etc.):	• VHF: ~$26,000,000 • UHF: ~$79,000,000

Estimated System Cost ROM	
Fixed assets by expanding current state system by adding ten planned VELCO sites, resulting in statewide composite coverage of 82% in UHF and 76% in VHF	• VHF: ~$18,000,000 • UHF: ~$18,000,000
Governance and Policy Development Support	
Salaries & Benefits: • Depending on sector and experience • Per staff member per year	• Executive Director: $80,000 – $200,000+ • Staff (4 members): $40,000 – $100,000 • Benefits (health insurance, retirement, etc.): Typically, 20–35% of salaries Estimated Annual Total: $300,000 – $700,000+
Office & Administrative: • Varies by location	• Office Rent & Utilities: $30,000 – $100,000 • Supplies & Equipment: $5,000 – $20,000 • Technology (software, IT support, website, etc.): $10,000 – $50,000 Estimated Annual Total: $50,000 – $170,000
Board Operations & Governance:	• Board Meetings (travel, meals, materials): $5,000 – $25,000 • Legal & Compliance (filings, audits, insurance): $10,000 – $50,000 Estimated Annual Total: $15,000 – $75,000
Program & Operations:	• Marketing & Communications: $10,000 – $100,000 • Fundraising & Development (if applicable): $20,000 – $150,000 • Professional Services (consultants, training, etc.): $10,000 – $100,000 Estimated Annual Total: $40,000 – $350,000

This type of approach aligns with MCP's experience and represents the kind of structure an independent board would require. If surplus funds remain, grants can be awarded to local units of government—serving as an

incentive that helps sustain engagement among volunteer board members. With a strategic plan in place, annual priorities can be established, and grants can be directed toward initiatives that support those goals. For example, if implementation is carried out in phases, grants could be used to assist municipalities in standardizing a CAD system or in developing a statewide training program supported by the State.

In some cases, there may be an opportunity to offset costs through repurposing equipment such as workstations, monitors, and seating. The elimination of cost inefficiencies that were identified in the inventory assessment can also offset some costs to implement one or more of the proposed options. These cost inefficiencies include excessive staffing, workstation maintenance, network costs, CAD licensing and maintenance.

For those that elect to participate in physical (facilities-based) regionalization, opportunities to refine costs will become available. As this tangible data is entered, a ROM turns into reality. As these opportunities occur, it is anticipated that the Task Force could explore opportunities to use actual savings to offset any increases that have been realized when implementing other desired options. The goal is to become as fiscally efficient as the region is operationally efficient.

3.6.1.2 Funding Sources

There are numerous funding sources available nationwide to support public projects. Of the 57 commonly used sources reviewed by MCP, four were identified as either obsolete or potentially obsolete:

- Interoperability Emergency Communications Grant Program (IECGP)/Law Enforcement Terrorism Prevention Program (LETPP) (under the Homeland Security Grant Program [HSGP])
- Metropolitan Medical Response Grant
- Public Safety Interoperable Communications (PSIC) Grants
- Public Health Emergency Response (PHER) Grant.

The rest are either broadly applicable funding strategies (e.g., taxes, bonds) or tied to programs known to be active in 2025 (e.g., Edward Byrne Memorial Justice Assistance Grant [JAG] Program, Urban Area Security Initiative [UASI], and Federal Emergency Management Agency [FEMA} grants). Some may have evolved or been rebranded since their inception. Others, while not obsolete, were sources that are likely considered irrelevant in Vermont:

- Port Security funds—irrelevant to landlocked Vermont
- Transit Security grants—limited applicability beyond small transit systems (e.g., Burlington)
- UASI funds—Vermont lacks designated UASI areas

MCP's research also indicated the following have been used in Vermont in some capacity with relative success for public safety communications or other initiatives:

- 911 taxes, fees and surcharges
- Vermont Universal Service Fund (Appendix A - Finance)
- Bonds requests (State and Local)
- Cost-sharing
- Department of Homeland Security (DHS) Emergency Operations Center (EOC) grants
- Federal earmarks (Community Project Funding)
- FEMA Preparedness (non-disaster) grants

- Fire Act (Staffing for Adequate Fire and Emergency Response [SAFER] and Assistance to Firefighters [AFG] grants)
- HSGP
- Local budget appropriations
- Public assistance (FEMA)
- State budget appropriations
- State saxes
- Other state revenues (e.g., Hotel tax, Conveyance tax)

While the following funding sources stand out due to their documented use (e.g., FEMA, HSGP) or strong applicability (e.g., bonds, state budgets), the current federal administration may not prioritize or support them to the same extent, raising questions about their near-term viability. Vermont's dependence on federal grants and state funding is reflective of its rural character and vulnerability to natural disasters. Programs like FEMA and HSGP have proven particularly effective following major flooding events in 2023 and 2024. Nonetheless, these sources should not be dismissed, as long-term infrastructure and public safety projects will span multiple federal administrations, and their relevance may increase again in the future.

- Bonds Requests (State, Local)
  - Vermont municipalities and the State have successfully used bond requests to finance long-term capital projects, including public safety communications infrastructure like radio towers and dispatch centers.
  - The Vermont Bond Bank's tax-exempt bonds provide low-cost loans, enabling upgrades to interoperable systems critical for emergency response coordination.
  - This funding source supports large-scale investments, such as the statewide radio network, ensuring reliable communication across rural and urban areas.
- Budget Appropriations (State)
  - State budget appropriations in Vermont have successfully funded public safety communications, with Governor Scott's FY2025 proposal increasing DPS spending by 5.6% to sustain radio and 911 operations.
  - These funds support ongoing costs like maintenance of VSP barracks' communication systems and permanent mental health staff, enhancing emergency response capabilities.
  - By prioritizing public safety within limited revenue growth, Vermont ensures consistent investment in critical infrastructure without new taxes.
- FEMA Preparedness (Non-Disaster) Grants
  - Vermont has successfully utilized FEMA's Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) grants to bolster public safety communications, especially post-2023 and 2024 floods, funding resilient infrastructure like backup dispatch systems.
  - The FY2024 BRIC allocation of $2 million for Vermont supports planning and implementation of interoperable communications, reducing future disaster impacts.

- These grants, administered by Vermont Emergency Management (VEM), have enabled towns to upgrade 911 technology, ensuring continuity during emergencies.

- HSGP
  - Vermont leverages HSGP's State Homeland Security Program (SHSP) funds to successfully enhance statewide interoperable communications, such as the VCOMM radio system used by first responders.
  - Administered through VEM, these grants support equipment purchases and training, aligning with national goals for terrorism and hazard preparedness.
  - The state's rural focus ensures funds improve connectivity across sparse regions, a critical need for effective emergency response.

- Fire Act (SAFER/AFG Grants)
  - Vermont fire departments have successfully used AFG grants to acquire radios and communication gear, improving coordination with 911 PSAPs during emergencies.
  - These funds enhance operational efficiency by equipping responders with standards-compliant technology, which is vital for rural fire services with limited local budgets.
  - Modifications to existing facilities, like adding safety-related communication infrastructure, are supported, ensuring statewide resilience.

As a result of the funding workshop, the following additional funding strategies were identified:

- Phased Funding Strategy: Prioritize short-term goals (e.g., training, standards) with small funding needs, while planning for long-term infrastructure investment.
- Creation of a State-level Fund: Funded through local contributions and state appropriations to support dispatch equity and modernization.
- Regulated Local Control Model: Allowing regional systems to continue operating under State-defined performance and financial standards.

In light of these funding sources, the following sections explore regional cost-sharing models and the concept of a regional dispatch fund, including examples.

3.6.1.3 Additional Funding Considerations

In addition to the primary funding sources evaluated during the Vermont finance workshops and those historically leveraged within the state, a broader national review identified several alternative mechanisms that, while not currently utilized in Vermont, may offer future opportunities, including:

- Certificates of Participation (COPs), which provide a lease-financing alternative to traditional bonds
- Department of Justice (Community Oriented Policing Services [COPS]) and Department of Transportation (DOT) grants, which support emergency communications linked to law enforcement and roadway safety, respectively
- United States Department of Agriculture (USDA) Rural Utility Service (RUS) grants and loans, particularly relevant to rural infrastructure projects

Other options include leveraging forfeiture funds from law enforcement activities, implementing member user fees or talkgroup-based cost recovery models, exploring public–private partnerships (PPPs) for infrastructure deployment, and generating local revenue through right-of-way leasing or vehicle registration fees.

While some sources, such as Transit Security Grants and UASI funds are not applicable to Vermont due to geographic or demographic limitations, their consideration ensures a comprehensive understanding of funding pathways available nationwide for public safety communications systems.

3.6.1.4 Regional Cost-Sharing Model

Nationally, there are several cost-sharing models that are deemed "most common" based on their frequent mention in federal guidance (e.g., SAFECOM, 911.gov), adoption across diverse states, and alignment with major systems like FirstNet and P25. MCP's research and experience reinforce reliance on interoperable standards and federal funding, which these models support.

Per capita and usage-based models dominate due to their simplicity and direct cost-benefit link, while tax/fee and tiered models reflect legislative and structural norms. Hybrid and grant-based approaches address funding gaps, subscriber fees reflect modern network trends, and /in-kind models tackle upfront and operational challenges.

Cost-Sharing Model	Description	Why Its Common
Per Capita Cost-Sharing	Costs are distributed among jurisdictions or agencies based on population size, ensuring larger communities with higher usage contribute more to shared systems like regional PSAPs or radio networks.	Widely used due to its simplicity and fairness, especially in states with centralized 911 systems. It aligns costs with service demand, a key factor in equitable resource allocation.
Usage-based Cost-Sharing	Expenses are apportioned according to system utilization, such as call volume, radio airtime, or data usage, often via subscriber fees or talkgroup charges.	Prevalent in multi-agency radio systems (e.g., P25 networks) where agencies such as police or fire pay based on their operational footprint. It is practical for tracking and billing specific usage, as seen in FirstNet's fee structure.
Proportional Tax or Fee Model	A dedicated tax or sore charge (e.g., 911 fees on phone bills) is collected from residents or subscribers, with proceeds shared across state and local entities to fund systemwide needs.	Nearly universal in 911 funding, with 48 states imposing such fees by 2023 per FCC reports. Its success lies in consistent revenue generation, supporting NG911 transitions nationwide.
Tiered Contribution Model	Higher tier entities (e.g., states) fund core infrastructure (e.g., network backbones), while lower tiers (e.g., counties, cities) cover local costs like equipment or staffing.	Standard in statewide systems like FirstNet or Vermont's VCOMM, where states provide the foundation and localities adapt it. It balances

Cost-Sharing Model	Description	Why Its Common
		centralized investment with localized needs.
Hybrid Funding Model	Combines multiple sources—grants, taxes, fees, and budgets—into a flexible cost-sharing framework, often using negotiated formulas to split expenses.	Ubiquitous due to funding complexity: SAFECOM Guidance (FY2024) highlights its use in blending federal grants (e.g., HSGP) with state/local contributions for interoperability projects.
Grant Matching Model	Federal or state grants (e.g., FEMA, HSBP) cover a portion of costs, requiring local entities to match funds, typically as a percentage (e.g., 25% local, 75% federal).	Common in disaster-prone areas (e.g., Vermont post-2023 floods) and rural regions leveraging USDA RUS grants. Matching ensures local buy-in while stretching federal dollars.
Agency Contribution Model	Participating agencies (e.g., police, fire, EMS) pool resources based on their budget capacity or system dependency, often for shared dispatch or ratio systems.	Frequent in regional consortia (e.g., New Hampshire-Vermont CAD pilot), where agencies directly fund interoperable solutions, reflecting practical collaboration.
Subscriber Fee Model	Users (agencies or individuals) pay recurring fees for access to communication networks, such as FirstNet's broadband or state radio subscriptions.	Gaining traction with FirstNet's nationwide rollout since 2012, offering a scalable, usage-linked revenue stream adopted by thousands of agencies.
Capital Cost Appropriation	Initial capital costs (e.g., building a radio tower) are split among stakeholders based on agreed-upon percentages, while ongoing costs may follow a different model.	Used in large infrastructure projects like NG911 deployments, where states and localities negotiate upfront investment (e.g., FCC-reported state transitions)
In-kind Contribution Model	Non-monetary resources (e.g., staff time, equipment, or facility use) are contributed by participants to offset cash expenditures, supplementing other funding.	Prevalent in budget-constrained rural areas or multi-jurisdictional efforts, enhancing cooperation without additional taxation, as seen in local PSAP support.

Based on MCP's review, a regional cost-sharing model would align best with Option 4C, although it could be adapted to fit any regional model. In a regionalized system where one PSAP supports multiple municipal dispatch centers, the fixed operating costs of the PSAP would be divided among the participating municipalities.

Cost allocation could be based on usage, determined by either of the following metrics:

- The average numbers of incoming calls over the past three years, or

- The average number of CAD incidents over the same period.

Using the number of CAD incidents may provide a more accurate reflection of operational demands, as it directly represents calls that resulted in an actual dispatch of an incident or self-initiated incidents by field responders on their mobile data terminal (MDTs) (e.g., traffic stop by a law enforcement officer). For instance:

PSAP A answers calls for Towns A, B, C and D. The total fixed operating expense is $2,000,000 (after subtracting the State 911 fee contribution). In addition, a capital budget is established to fund future upgrades, such as a regional CAD solution to be implemented in five years. The capital budget is funded at $300,000 per year.

The cost-sharing is distributed as follows, with the allocation percentages based on the respective percentage of CAD incidents:

	Allocation	General Fund	Capital Fund	Total
Town A	32%	$640,000	$96,000	$736,000
Town B	45%	$900,000	$135,000	$1,035,000
Town C	13%	$260,000	$39,000	$299,000
Town D	10%	$200,000	$30,000	$230,000
Total	100%	$2,000,000	$300,000	$2,300,000

3.6.1.5 Regional Dispatch Fund

An idea proposed in the Vermont Public Safety 13 Communications Modernization Act of 2023 was the creation of a regional dispatch fund, designed to be a special fund subject to the provisions of 32 V.S.A. Chapter 7, Subchapter 005.

> *(b) Into the Fund shall be deposited any State or federal funds appropriated to the Fund by the General Assembly, any taxes or fees specifically required by law to be deposited into the Fund, and any grants or gifts received by the State for the benefit of the public safety dispatch system …*
>
> *(d) Disbursements may be made for::*
>
> *(1) nonrecurring costs, including establishing regional dispatch centers; purchasing network equipment and software; developing databases, and providing for initial training and public education;*
>
> *(2) recurring costs, including network access fees and other telephone charges, software, equipment, database management and improvement; public education; ongoing training; and equipment maintenance;*
>
> *(3) expenses of the Board incurred under this chapter that are related to oversight and management of the public safety dispatch system;*

(4) costs solely attributable to regional dispatch center operations; and

(5) costs attributable to demonstration projects designed to enhance the delivery of public safety dispatch services.[88]

The legislation proposed that each municipality pay an annual dispatch assessment to be deposited into the Regional Dispatch Fund. The assessment would be calculated based on the following formula:

$$T = B \times G + R \times C$$

T = total owed to the regional dispatch fund

B = statewide base fee

G = percentage of statewide equalized grand list[89] contained in the municipality

R = remainder of the statewide dispatch budget total owed to the regional dispatch fund

C = statewide percentage of the three-year rolling average of call volume originating from the municipality

The statewide base fee would be approved annually by the General Assembly as part of the budget process prior to the annual collection of the dispatch assessment. A definitive rule would have to be developed on what constitutes "call volume" for purposes of this calculation.

After sufficient time to collect this fee, an annual distribution from the Fund to a regional dispatch center would be calculated with the following formula:

$$F = \Sigma (T \times K) \text{ where:}$$

F = funds distributed to a regional dispatch center

T = total that a member municipality paid into the regional dispatch fund

K = the ratio of a municipality's call volume that was served by the municipality

(A municipality is defined as city, town, incorporated village, unorganized town, or gore.)

3.6.2 Funding Strategy Development

Funding analysis and planning for this initiative, in addition to exploring known funding sources and cost models, will need to involve further research to identify and evaluate funding options for the development of a detailed funding strategy that can provide long-term sustainability of the statewide public safety communications system.

The funding strategy may change over time as various options are implemented across the timeline and funding sources change, new ones become available and others sunset. Part of the funding strategy at least in the short term, may need to include establishing a method for cost-sharing if external funding sources do not cover all identified costs, being conscientious of the current landscape where differences in cost-sharing models exist with some communications centers not charging for services and others are.

While some centers may initially experience increased costs under new regionalization models, the long-term impact is expected to reduce operating expenses across the state. By consolidating staff, equipment, systems,

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[88] Draft Bill Template

[89] Grand list is a list of all real property and taxable personal property in the town and the appraised valuation of that property.

and connectivity, agencies can free up valuable resources for reinvestment. This presents a significant opportunity to achieve sustained cost efficiencies over time. This is where MCP sees the promising long-term opportunity to improve cost efficiencies in the State as a whole.

There are numerous funding models and cost-sharing strategies used nationwide—many of which can be customized or combined depending on which option the State chooses. Funding models can be tailored to the specific model chosen. The ultimate funding strategy should prioritize predictability and equity to build consensus and foster long-term stakeholder support.

Until a path forward is established, all funding plans should be regarded as preliminary estimates. A detailed and finalized budget will be essential once system design decisions are made. MCP encourages the Task Force to pursue a best-in-class approach—one that balances quality with affordability —to ensure the continued delivery of exceptional public safety services.

Additionally, the funding strategy should include provisions for capital reserves to accommodate future system needs and unforeseen expenses.

By taking a thoughtful and collaborative approach to funding, the State can lay the groundwork for a sustainable resilient system that supports every PSAP and dispatch center—benefiting all residents and visitors alike.

3.7 Timeline

Given the information gained and the opinions shared, it is advantageous for the State to consider a tiered, multi-year approach to achieving its mission, which will require integration involving agreement on standardized operating practices, shared services, and regionalized consolidation of communications centers, as shown below.

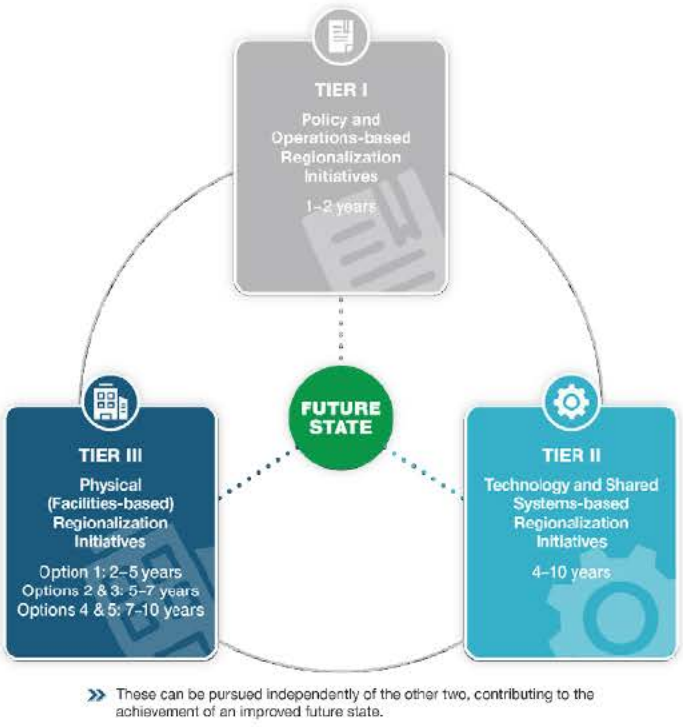


Figure 16: Future State Timeline

Regardless of the path forward, it is important not to rush a timeline. From the time of the agreement to move forward, regardless of which path that may be, management must ensure that impacted staff have the operational support and training to perform and mitigate any lapse in service levels.

Each highlight above can be completed concurrently, providing staff have the resources they need (technologically, physically, and fiscally) and staff and stakeholders collaborate on a continuous but methodical basis (timeframe indicates length of time each will likely take). When the proper time is not taken, many considerations for not only governance but also personnel management can be unintentionally missed.

4 System Design Plan Summary

The information articulated in Section 3 has provided a variety of opportunities, solutions and pathways to continuous improvement through a gradual progress-based approach for the Task Force and legislators to consider. Moving forward, it will be incumbent upon stakeholders, in partnership with the State, to explore these options to support communications centers—many of which have built the best they can with limited resources and budgets. MCP's conclusions contained in the inventory and assessment and the resulting solution options detailed herein are summarized here as a system design plan to resolve identified key areas of concern and positively impact the public safety communications optimization goals previously noted—creating the desired secure, reliable, interoperable statewide public safety communications system. Anticipated improvements in the focus areas (as noted in the inventory assessment report) are reflected in the table below as current state and then future state, if the recommendations are implemented successfully. It is noteworthy that selected options may have cascading effects opening, limiting, or eliminating altogether future options. As such, it is essential to carefully evaluate all presented pathways and establish clear goals, objectives, and performance metrics to affirm that the selected solution is achieving its intended outcomes. Continuous assessment will allow for timely adjustments, if and when necessary.

Current State	Future State
• Lack of a cohesive statewide system	• A cohesive reliable, secure and interoperable statewide public safety communications system
• Operational inefficiencies and lack of strategic inclusion	• Consistent and interoperable operational efficiencies and strategic inclusion
• Staffing shortages and inefficiencies	• Balanced staffing and efficiencies
• Training gaps and concerns for dispatcher health and wellness	• Standardized training and strengthened dispatcher health and wellness
• Lack of failover/backup capabilities	• Reliable failover/backup capabilities providing continuity in the event of a PSAP/dispatch center failure
• Technological limitations and infrastructure issues	• Consistent technological capabilities and reduction in infrastructure

Current State	Future State
• Fragmented public safety wireless environment	• Unified and interoperable public safety wireless environment with a significant reduction in "dead zones"
• Cybersecurity vulnerabilities	• Secure cybersecurity posture

All options should be considered in relation to the others, including a weighted approach based on the consideration of optimization goals. For instance, reducing the number of 911 and emergency call transfers should be given more consideration than minimizing budget competition between field and dispatch personnel. While it is important, cost should not be the primary guiding factor when selecting options. Through interviews and discussions with the various stakeholders, most indicated that cost, although important, could be accepted if there was quality service associated with it.

4.1 Five Point Matrix Strategy

When developing the options presented in Section 3, MCP focused on the following public safety communications system optimization goals. Even the smallest change to any optimization goal will positively impact the state's overall MAPS score, indicating improvements in emergency response.

- Standardize processes to promote community education, trust, and support
- Reduce call for service processing times
- Eliminate occurrences where one dispatcher is on duty at a time
- Eliminate occurrences where unqualified/underqualified personnel are working in the PSAP/dispatch centers (e.g., sworn personnel without adequate training)
- Improve staffing to provide enhanced coverage 24 hours a day, seven days a week (24/7)
- Reduce staffing shortages
- Improve dispatcher workspace environment
- Reduce operational complexity of the combined call-taker/dispatcher position, which can improve training success rates[90]
- Increase intrastate collaboration and communication
- Eliminate some cost duplication to operate the 37 separate and independent PSAPs and dispatch centers assessed
- Provide a shared quality assurance/quality improvement (QA/QI) program
- Assure more consistent and effective service delivery regardless of where residents and visitors reside in the state
- Provide greater opportunities for interagency response, backup, situational awareness, and data sharing
- Provide for improved continuity of operations (COOP) and disaster recovery (DR) plans

[90] Training for a role that combines both call-taking and dispatching responsibilities is more challenging compared to first training as a call-taker, gaining on-the-floor experience, and then training as a dispatcher.

- Minimize budget competition between field and dispatch personnel
- Recognize operational and capital cost savings
- Eliminate duplicative support services
- Decrease wireless communications coverage challenges by decreasing the number of land mobile radio (LMR) coverage "dead zones"
- Provide for fair and equitable funding of services—particularly relating to call dispatch—across all participating jurisdictions
- Improve radio communications and interoperability among responders of all public safety disciplines
- Adhere to training and QA requirements to improve service and reduce mistakes
- Decrease the number of points of infiltration for cybersecurity risks
- Reduce 911 and emergency call transfers[91], [92]
- Eliminate call workflows (two-stage call handling) that inherently include two or more 911 and emergency call transfers in favor of single-stage call handling and direct dispatch[93]

Progress on any optimization goal, which forms the foundation of the five point matrix strategy, will help create a sustainable roadmap for a gradual progress-based approach to continuous improvement and advance the State's initiative to the desired future state. However, there are five critical pathways that MCP encourages the State to adopt, which are anticipated to have exponentially the greatest impact toward the development of a reliable, secure, and interoperable statewide public safety communications system that is equitably and sustainably financed and universally accessible by all people throughout the state.

[91] Transfers cannot be eliminated unless all agencies join in regionalization efforts.
[92] See footnote #2 above
[93] MCP has found that eliminating double transfers is a best practice. This finding is supported by states such as Florida that have such requirements incorporated into their state 911 plan. Florida E-911 Plan, Section 3.2.3(B), says the following about double transfers: "With a transferred call, the caller must never be procedurally required to talk with more than two people: the primary PSAP 911 call taker and the call taker at the remote agency. There shall be no inherent double transfers."

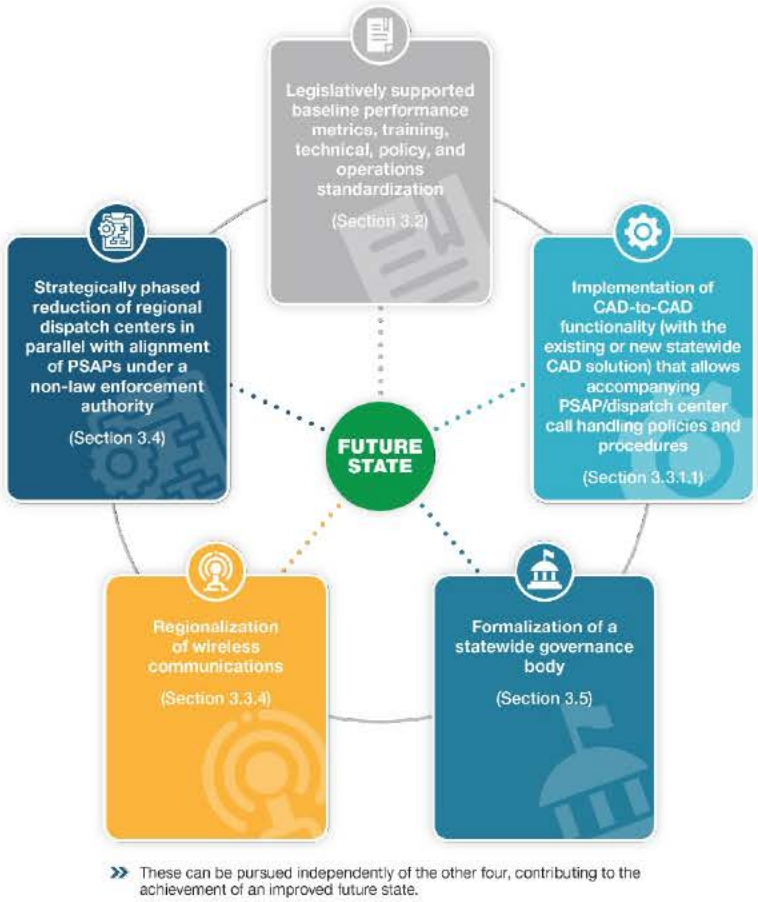


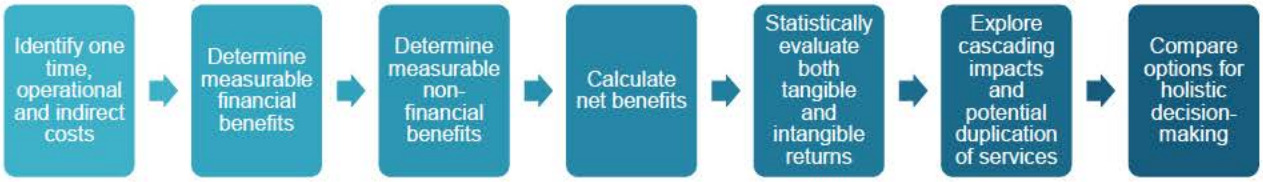
Figure 17: Statewide Optimization Goals

As noted, essentially driven by these top five strategies, the options presented in Section 3 form the matrix solution that was discussed in Section 3.1, Organic and Inorganic Approaches to Regionalization, including the benefits of regionalizing from a combined policy and operations, technology and shared systems, and physical facilities strategy. While it is essential for the State to address all five of these strategies—which can be worked on concurrently, yet independently, whenever possible—if the State begins with those related to Sections 3.2, 3.3.1.1 and 3.4, it is highly likely that there would be significant positive impacts within the short- to mid-term that would support the planning needed for longer-term strategies. These impacts are reflected in the forecast modeling of Vermont's MAPS blueprints provided below.

In addition to the key recommendations that form the foundation of the system design plan, establishing a workflow to guide stakeholders in evaluating potential pathways forward will be helpful. This workflow considers various key criteria to assess the tangible and intangible returns on investment (ROI) associated with each option. The goal is to determine how well each option aligns with and effectively addresses multiple key areas of concern and optimization objectives.

Based on the findings in the inventory and assessment report, as well as this system design plan, stakeholders should consider the following steps. These steps will allow stakeholders to strategically evaluate the options

contained in Section 3 of this plan. This approach will provide a thorough assessment of immediate and additional pathways forward.



There are key questions to consider when assessing—to a measurable degree—the tangible and intangible of the good, better, even better options. These include how each option:

- Enhances situational awareness
- Helps improve decision-making
- Decreases response times
- Improves the ability to save lives
- Improves the ability to save property
- Improves emergency response outcomes

4.2 Pilot Projects

As options are considered, the Task Force may want to explore pilot projects, such as demonstrating communication center resiliency that supports failover, considering geographic diversity, and using proof of concepts to validate the recommended design options.

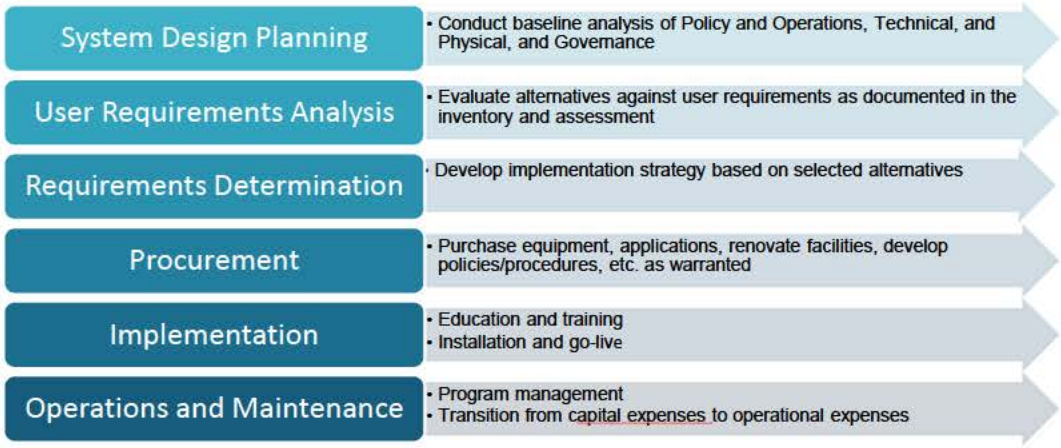
Prior to any pilot projects, proof of concepts should be developed to demonstrate current technologies and determine recommended operational standards, including business continuity requirements that demonstrate alignment with the design plan; federal, state, and local requirements; and applicable national standards and best practices. Each proof of concept should:

- Include descriptions, resources needed, and an explanation of how the project(s) aligns with and furthers the development of a statewide public safety communications system.
- Promote transparency and accountability, particularly concerning the expenditure of State funds pursuant to Act 78.
- Leverage existing inventory and staffing where feasible.
- Include best practices, project management processes, and artifacts such as schedules, pilot costs, scalability, bill of materials, and planning requirements.

The use of pilot projects could position the State positively when implementing transformational change, as is being pursued through this complex initiative. Pilot projects allow the State to not only prove that the desired vision is possible but also practical, and can serve to gain stakeholder buy-in when implementing change on a

larger scale. Pilot projects also enable the standards authority to make iterative improvements and adjust option parameters based on lessons learned during the pilot projects—increasing the odds for long-term success.

Steps for any pilot project should include the following:



The following are suggested pilot projects, based on the five primary recommendations of the five-point matrix strategy, which MCP is confident *will* benefit the state.

Pilot Project	Primary Anticipated Outcome	Anticipated Timeframe	Anticipated Participants
Section 3.2: Leveraging the success of the State developed 911 call-taker standardized training requirements, develop a similar training standard for dispatchers. Training should be supported by legislation and follow existing industry organization standards such as APCO, NENA, or CALEA. Training should include: call-taking and dispatching, CTO training, certification for all dispatchers, and continuing dispatch education. Apply pilot requirements to one PSAP and up to four related dispatch centers.	Formalizes the professionalism of dispatchers. Improves consistency in the level of service to the public and responders for the areas covered by these centers.	One to two years	• PSAP leadership • Dispatch center leadership • Dispatchers • 911 Board • DPS • Regional APCO and NENA representatives (state and national)

Pilot Project	Primary Anticipated Outcome	Anticipated Timeframe	Anticipated Participants
Section 3.3.1.1: Working with CHE vendor and CrossWind staff, build out ANI/ALI spill capability to dispatch centers. Test in one PSAP and up to four related dispatch centers.	Provides location and number information currently only provided verbally during the transfer process. Reduces call processing time and chances of errors. Improves call taking efficiency in two-stage call handling and dispatching field responders to emergency incidents.	Six months to one year	• PSAP leadership • Dispatch center leadership • Call-takers • Dispatchers • 911 Board • State CHE vendor • CrossWind staff
Section 3.3.1.1: Working with CrossWind staff, fully implement data/incident sharing. Develop draft SOP whereby PSAP call-takers intake information and create incidents for dispatch centers. Test in one PSAP and up to four related dispatch centers.	Transitions from two-stage call handling to single-stage. Improves the speed and efficiency when dispatching field responders to emergency incidents that require mutual aid resources to be dispatched from one or more PSAPs/dispatch centers.	Six months to one year	• PSAP leadership • Dispatch center leadership • Call-takers • Dispatchers • 911 Board • CrossWind staff
Section 3.4: Regionalize the dispatch centers that are not 24-hour operations. Coordinate with dispatch centers to transition dispatch services to their geographically closest PSAP. Apply pilot to Wilmington, Dover, Middlebury, and Randolph dispatch centers.	Eliminates complexities and inconsistencies of two-stage call handling depending on the time of day and day of the week. Improves the level of service to the public and responders for the areas covered by these dispatch centers	Three to nine months	• PSAP leadership • Dispatch center leadership • Call-takers • Dispatchers • 911 Board (technology staff) • DPS • Statewide standards entity

Pilot Project	Primary Anticipated Outcome	Anticipated Timeframe	Anticipated Participants
Section 3.3.4: Build out radio infrastructure for all agencies in up to three (out of 14) contiguous VSP districts. Utilize VSP's future 10-zone digital simulcast system.	Improves radio coverage within a region for field response agencies (local and state).	Two to four years	• Dispatch center leadership • PSAP leadership • DPS • Statewide standards entity • VSP LMR manufacturer • VSP LMR local contractor
Section 3.5: In alignment with the Model A option, develop a regional governance committee to support the reduction of a single regional dispatch center.. Focus on operations, training, policy, and funding, and provide oversight.	Improves coordination of public safety communications using a regional governance entity that could be replicated at the state level.	One to two years	• PSAP leadership • Dispatch center leadership • 911 Board • DPS • Vermont legislative body

4.3 Future-State Statewide MAPS Blueprint

Ultimately, the steps outlined in this section can position the State to advance, with consistency and accountability, toward building the desired public safety communications system. Using this plan, stakeholders can focus on implementing strategies designed to help the State achieve the intent of Act 78. The aim is to create a secure, reliable, and interoperable statewide public safety communications system that is equitably and sustainably financed, accessible to all residents and visitors across the state, and which enhances, strengthens, and builds upon previous efforts and initiatives.

While some options are unique, many build upon or reinforce existing activities. The State is poised to improve upon the foundation already in place and not only build—but also strengthen—its public safety communications operations posture.

Implementing the recommended strategies over a reasonable timeline is expected to result in a positive change. Beginning with the implementation of the suggested pilot projects listed above would provide meaningful improvements, indicated by a minor increase from the current score, due to the law of averages statewide. However, the implementation of the first pilot project would result in a measurable improvement to the level of training in all current dispatch centers, resulting in a significant service level increase to the field responders.

A greater initial improvement would be seen if the State commits to the first three of the five-point matrix strategy components—the greatest initial improvement will be from a commitment to implement all five strategies.

The following MAPS graphic shows the improvement that could be achieved by implementing these strategies (minus any dispatch center regionalization) as well as each agency investing in cybersecurity to achieve a minimum rating of 5 out of 10 (50%). Implementing these strategies results in a MAPS rating of [redacted] out of 10[94] (blue line) and is shown below in comparison to the current state score of [redacted] out of 10[95] (yellow line).

No matter which option(s) is chosen, the knowledge outlined in this system design allows the State and each PSAP and dispatch center to enhance governance, cooperation, and relationships among all stakeholders. It will take a high level of commitment and teamwork to establish a secure, reliable, interoperable statewide public safety communications system under a future operational, governance, and funding model. However, the foundation is strong—the common goal of improving emergency response outcomes across the state. It is MCP's sincere hope that as the State embarks upon this initiative, stakeholders will be motivated to see it through and make the difficult decisions necessary for success.

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[94] To avoid incorrectly elevating future state potentials, each MAPS item improved beyond the current state was given a score of 8 out of 10; items that already scored a 10 out of 10 were not modified.
[95] Due to the various regionalization options proposed herein, this MAPS blueprint assumes all current PSAPs and dispatch centers (both in and out of state) remain in operation. Additional MAPS blueprints are outlined in Appendix K for each regionalization option.

To achieve the desired future state will require decisions regarding policy and operations, technology and shared systems, and physical regionalization. Such decisions rest with local authorities and their willingness to look past what they hypothesize they will lose in favor of focusing on what can be gained through the various tiers of regionalization. Stakeholders must consider the larger picture, including individuals who reside outside of their direct professional area of responsibility, rather than just focusing on local control.

Maintaining trust, engaging in constructive conflict, committing to the success of the organization(s), holding each other accountable, and focusing on results will require significant effort. If stakeholders can embrace the recommendations, the emergency response outcomes for public safety communications in Vermont can improve and reach a better state than it is today.

Appendix A: Trends and Insights

As shown below, Vermont's statewide MAPS average assessment score is [redacted] on a 10-point scale.

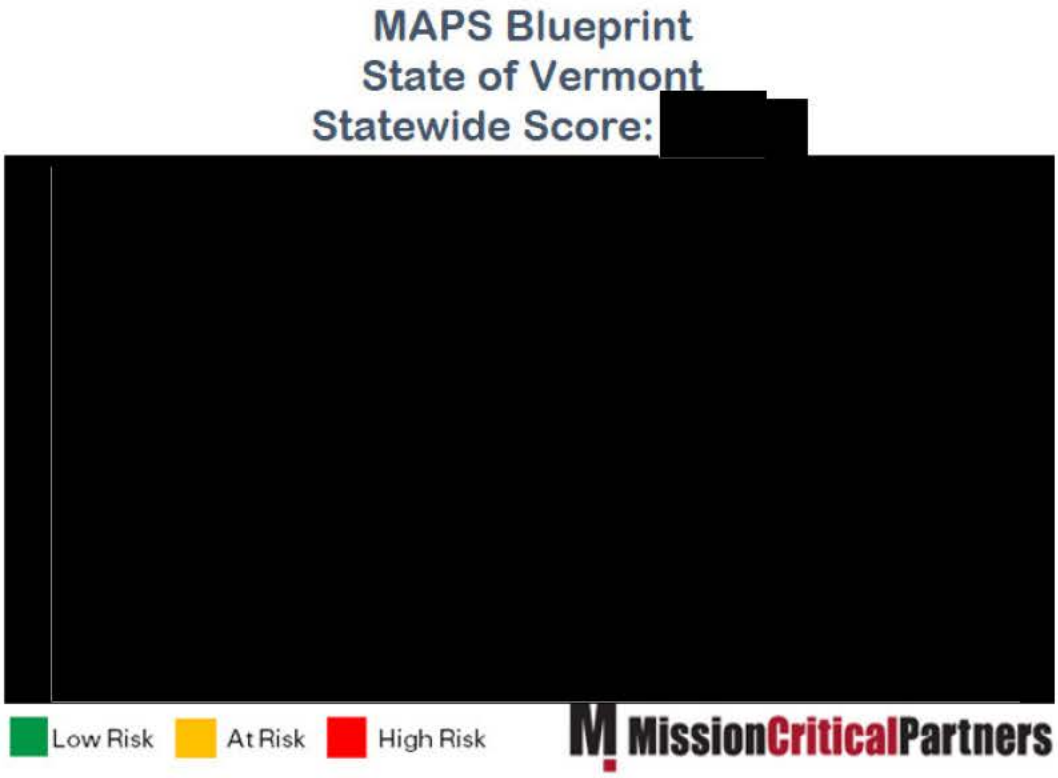

Figure 18: Vermont Statewide MAPS Blueprint

The inventory analysis and, specifically, the trends and insights articulated below establish a baseline for the State and participating PSAPs and dispatch centers to make more informed decisions going into the next phase of this project—planning workshops—with the intent to mitigate risk and minimize costs while maintaining the highest level of service delivery for staff, field responders, and the communities served, including visitors.

Demographics

State Trends and Insights –

The state of Vermont has a total population as reported by the United States (U.S.) Census Bureau of 647,464 in 2023 and covers a total area of 9,616 square miles (69.8 persons per square mile).[96] Of the total estimated population, of the agencies reporting:

- Seven communications centers providing EMS services serve populations over 30,000.
- Twelve communications centers providing fire dispatch services serve populations served between 10,000 – 30,000 and greater than 30,000, which are tied at six each.
- Eight communications centers providing law dispatch services serve populations between 10,000 – 30,000.

Total Population Served	Population Served EMS – Fire – Law			Total Agencies
< 500	1	1	0	0
500 – 1,000	0	0	2	0
1,000 – 2,500	0	0	1	1
2,500 – 5,000	1	1	2	0
5,000 – 10,000	4	3	1	4
10,000 – 30,000	5	6	8	7
>30,000	7	6	5	8
Total Reporting	**18**	**17**	**19**	**20**

- Based on the 26 centers that provided incident information, a total of 503,304 incidents were reported. If the average calls per dispatch center are spread across those centers that did not provide this information (based on their reported population [see assumptions for further]), a total of 584,404 incidents can be assumed. At this number, 10 centers (including two out-of-state dispatch centers) handle less than 1% each of the state's incident volume, another 16 (also including two out-of-state dispatch centers) handle less than 3% each. The three centers that handled the most incidents included an out-of-state dispatch center at 9.84% and both VSP PSAPs with 9.84% and 12.08%.

[96] U.S. Census Bureau. (2023). Quick Facts: Vermont. https://www.census.gov/quickfacts/fact/table/VT/INC110221

Average	911 Call Volume	10-Digit Call Volume	Incident Volume
PSAPs	242,932	85,000[97]	216,469
Dispatch Centers	N/A	400,972[98]	367,935
Total	242,932	485,972	584,404

- Of the 37 communications centers:
  - Four centers (10.8%) do not operate on a 24/7 basis.
  - Eighteen centers (48.6%) have one or two primary workstations with seven (18.9%) having only one.
  - Thirty-three centers (89.2%) have a minimum staffing per shift of less than or equal to the recommended standard of two per shift with 22 (59.5%) having only one per shift.
    - Of the six PSAPs, 50% operate with no more than the minimum standard, with the remaining three (50%) reporting a minimum staffing of two per shift.
    - Of the six out-of-state centers that provide dispatch services, five (83.3%) operate with no more than the minimum standard, with two (33.3%) reporting a minimum staffing of one.
- Retention rates vary significantly across the agencies ranging from 16.7% to 100% with an average of 79% being assumed for those agencies that did not provide information. Ranging from 16.7% to 73.3%, nine centers (24.3%) have a staff retention rate of less than or equal to 75%.
- Based on the 2021 – 2023 average 911 call volume of 242,932 calls annually received by the state's six PSAPs, an average of 78,516 (32.3%) of those calls per year are transferred to dispatch centers.
  - The average percentage of outbound emergency call transfers to dispatch centers for each PSAP is as follows: Hartford (27%), Lamoille (17.5%), St. Albans (15.8%), Shelburne (12%), VSP Westminster (33.3%) and VSP Williston (48.6%).
  - Because the dispatch centers receive their emergency calls via inbound emergency call transfers, it can be assumed they receive over 75% of their emergency calls via inbound transfer.
- Based on the reported 2023 incident volume, the state processed approximately 584,404 law enforcement, fire, and EMS incidents combined.
  - This equates to approximately one law enforcement, fire, or EMS incident per person per year (1.33 per person).

[97] Only one PSAP provided data. Others indicated unable to provide, unknown, or N/A.
[98] Only 9 of the 25 dispatch centers provided data, including one out-of-state dispatch center. Most do not track the data and/or are unable to provide.

  - With the exception of the six PSAPs and one out-of-state center that provide EFD, EMD, and EPD, the remaining 30 (81.1%) do not directly provide these services and would have to contact one of the seven centers should EFD, EMD, or EPD be needed for calls not originating at a PSAP.
  - Not including overflow or training workstations, there are a cumulative 116 primary workstations that are being maintained by the State or local agencies.
  - Ten-digit call volume exceeding the 911 call volume only impacts the PSAPs and is not calculated for the dispatch centers. Only one of the six PSAPs reported its incoming 10-digit call volume, which exceeds the 911 call volume. Based on industry experience, MCP assumed that the remaining five would report the same. This can be updated should the data be provided.
  - Budget information was not provided by 15 communications centers. To accommodate, the total reported budget was averaged across those reporting and equally applied to the 15 that did not report. Total budget rough orders of magnitude (ROMs) range between $22,814,354 and $52,116,284 (see Trends and Insights Finance section for further details).
- Based on those centers reporting information, allowing the calculation of cost per variable, the average cost per 911 call, incident, and population (range) across the state is $58.63, $56.81, and $41.81 to $87.14, respectively. The highest cost per 911 call, incident, and population reported are $90.37, $90.58, and $176.85.
- Across the 31 centers reporting their staffing numbers, a cumulative 282 full-time dispatchers are authorized. Nineteen centers reported being authorized to use part-time, which currently totals 82 dispatchers.
  - Across the 23 centers that provided information, allowing recommended staffing calculations, a total of 66 additional FTEs are recommended to meet national staffing standards.
  - Current vacancies across the reporting centers totals 30 openings (11.7%). When including staffing recommendations, this rises to 96 (27.6%).

Governance and Organizational Structure

National Trends and Insights –

Management, administrative oversight, and governance of public safety communications operations and systems are separate matters. Management involves day-to-day communications center operations, administrative oversight involves policy that establishes and is accountable for overall municipal system performance, while governance involves an even higher level of supervision, generally in a multi-jurisdiction environment.

In a 911 system serving multiple jurisdictions, management, in whatever form it takes, must be able to allocate funds, prioritize operations, and generally carry out the communications center's mission and vision. To provide assurance that this is possible, some form of governance is necessary.

These factors become increasingly important as the nation moves away from analog technology toward a Next Generation 911 (NG911) environment where strategies for virtual regionalization focus on sharing data, services, and advanced capabilities that can lead to cost savings alongside, rather than in exchange for, operational efficiencies.

State Trends and Insights –

The state of Vermont's 911 system is governed under a single statewide system that supports communications centers designated as PSAPs. This support includes requirements for elements such as training and compliance with call-handling protocols, as well as funding for required systems. However, these requirements and support only impact the state's six PSAPs and do not extend to the state's 25 dispatch centers or the six out-of-state dispatch centers that are governed by their respective state (Massachusetts – 1; New Hampshire – 4; New York – 1).

- The governance and organizational structures of Vermont communications centers vary widely—with 14 (48%) of the reporting agencies stating they operate under a formal governance agreement and 13 (45%) reporting they do not.
- A prevailing trend among organizations is the emphasis on local control and autonomy. Many agencies operate under the governance of local municipalities or police departments, with varying levels of oversight from state or regional authorities. However, there is a growing desire to shift away from a police-dominated system, aiming to establish a more equitable structure that prioritizes the safety of both responders and the communities they serve. This reflects a broader movement toward enhancing fairness and inclusivity in emergency response systems.
- A notable trend is the absence of standardized organizational frameworks among communications centers. Agencies exhibit wide variations in reporting structures, leadership roles, and staffing models. This lack of uniformity presents challenges in establishing consistent operational practices and hinders the ability to adopt statewide best practices effectively. Many agencies also face governance-related challenges, including unclear lines of authority, limited

resources, and the absence of formal policies and procedures. These issues can impede effective decision-making, strategic planning, and the overall functionality of communications center operations.

- The governance and organizational structures of Vermont communications centers showcase a mix of strengths and weaknesses. While some agencies benefit from strong leadership and robust strategic planning, others struggle with limited vision and inadequate governance frameworks. This disparity highlights the need for ongoing efforts to improve governance models and organizational capacity to ensure the long-term sustainability and effectiveness of communications center operations.
- The landscape of governance and organizational structures within communications centers is characterized by diverse practices and approaches. Addressing disparities in funding, promoting standardization, and enhancing leadership capabilities are critical steps toward building a more effective and equitable emergency response system. A concerted effort to address these challenges will better position communications centers to meet the evolving needs of their communities and ensure operational excellence.

Finance

National Trends and Insights –

Funding is a key area of concern for communications centers nationwide. Without appropriate funding, communications centers are not able to upgrade technology as required, schedule staffing appropriately, or complete day-to-day operations efficiently. Funding can be identified from multiple sources, but without adequate funding, communications centers become stagnant and the efficiency of the provision of 911 and emergency dispatch services suffers.

In many cases, communications centers have been forced to seek alternate sources of funding as local and/or state funding is not adequate to support operations. Grant funding, while not as plentiful as in years past, is a viable source of funding, especially for technology projects such as regionalization, system implementation, or radio system replacement. However, once the grant period of performance ends, agencies must be prepared to continue funding operations and maintenance.

Funding can also be in the form of cost savings, particularly from realizing economies of scale. A purchase made by multiple entities to benefit all (cost-sharing) tends to reduce the cost to each individual center versus purchases made separately. Cost savings can also be made by using existing contract vehicles, where appropriate, to reduce funding needs.

State Trends and Insights –

Only 22 of the communications centers provided budget information and, in some cases, the information was not entirely complete because of how integrated the budgets are within their respective department budget.

The total budget information self-reported by agencies in the questionnaire totals $22,814,354. Budgets to accommodate various scenarios including the application of contingency costs and averages to accommodate those agencies that did not respond to the questionnaire are provided below.

	Total Self-Reported Budgets	Average Budget Assumption	Total Budgets with Assumptions Applied	Recommended Staffing Costs
Total budgets not including contingency	$22,814,354	$1,037,016	$37,332,579	$2,914,478
Total budget including 25% contingency	$28,934,362	$1,315,198	$47,347,138	
Total budget including 25% contingency and	$31,848,840	$1,447,675	$52,116,284	

staffing recommendation adjustments				

- Since most communications centers operate as a division under a law enforcement agency, their budgets are embedded into the law enforcement budgets, which makes it difficult to determine true operating expenses.
- Most agencies reported little overhead and other costs, with personnel costs totaling the largest portion of their overall operating budget expenses.
- All communications centers reported subsidizing operating budgets with general funds because the 911 funding only pays for the call-handling equipment (CHE) and basic training in PSAPs and does not pay for workforce expenses (dispatcher wages and benefits) and pays nothing for dispatch centers.
- Vermont does not specifically collect 911 surcharges. Rather, there is a Vermont Universal Service Fund (VUSF) that supports multiple programs including 911. Each year there is an appropriation from the VUSF to the Enhanced 911 Special Fund. In the 2023 FCC 15th Annual 911 report, Vermont reported expending $4,587,898.00 in NG911 costs, which was the Enhanced 911 Board's appropriation from the VUSF for that fiscal year. In the last calendar year, the funding mechanism changed from the 2.4% charge on retail telecommunications charges to a $0.72 charge per retail access line in service. This change will be effective in July 2025 and is expected to increase the revenue sufficiently to support all programs through at least 2029.
- The Enhanced 911 Board provides two types or disbursements to PSAPs for 911 call handling services.
  - "Regular" refers the reimbursement that is based on the PSAP's call volume in the previous fiscal year and certain performance metrics.
  - "Dedicated CT" refers to a disbursement for dedicated 911 call handling services. This is a separate agreement that is provided to three regional PSAPs—Hartford, Lamoille, and St. Albans.
  - All figures vary somewhat each year based on call volume and dedicated 911 hours.
  - In 2024, Regular quarterly disbursements were made to Hartford ($95,612.85), Lamoille ($110,280.43), St. Albans ($117,650.10), Shelburne ($92,133.88), VSP Westminster (~$211,961.19) and VSP Williston (~$269,768.78) for a total annual disbursement of $897,407.24.
  - In 2024, Dedicated CT disbursements were made to Hartford ($124,230.14), Lamoille ($804.49), and St. Albans ($11,815.33) for a total annual disbursement of $136,849.96.
- Because of the variations in the way agencies reported their budgets, additional outreach to stakeholders to close gaps may be needed.
- Of the PSAP budget information that was reported, the range was $49.23 per 911 call to $90.37 per 911 call when the operating budget was divided by the number of 911 calls. In MCP's experience, an optimal cost is less than $30 per

911 call. The overall total average cost per variable when divided by the total adjusted operating budget is $61.30.

Variable	Number of Calls/Incidents	Average Cost Per	Average Adjusted Staffing Cost Per
911 calls	242,932	$61.60	$65.69
Incidents	584,404	$56.82	$80.36
Population	647,464	$41.81 – $87.14	$52.54 – $129.76

- The maintenance costs for the Valcour CAD, covered by the State, are as follows:
  - FY22 $850,000
  - FY23 $867,000
  - FY24 $884,340
  - FY25 $902,027
  - FY26 $920,067
- The financial trends across Vermont PSAPs and dispatch centers vary significantly, with some agencies maintaining well-defined budgets specific to communications, while others operate with budgets deeply embedded within overall department finances, often limited to reporting personnel salaries. This disparity highlights the diverse financial management practices among agencies, which can affect their ability to address specific operational needs and plan strategically for the future.
- A common trend is the emphasis on short-term planning and addressing immediate needs. Many agencies focus on resolving pressing operational challenges, such as staffing shortages or equipment upgrades, rather than developing comprehensive, long-term financial plans. This approach, while necessary to meet immediate demands, can hinder efforts to build sustainable financial models that support future growth and adaptation.
- Leadership support and its influence on budgetary decisions also vary widely among agencies. Some communications centers benefit from strong leadership that effectively navigates the political landscape to secure funding for critical initiatives. In contrast, other agencies struggle to influence budgetary decisions, often facing challenges in securing the resources needed to maintain or improve operations. This inconsistency underscores the importance of cultivating skilled leadership to advocate for the financial needs of communications centers.
- Cost-sharing has emerged as a potential solution to address financial challenges, particularly in the context of regionalization. The idea of distributing the cost of infrastructure and services fairly among all agencies within a region is seen as a promising strategy, especially for smaller agencies that may struggle with limited resources. This approach could help reduce financial burdens while promoting collaboration and resource optimization.

  - Onsite interviews revealed that assistance for PSAPs and/or dispatch centers that wish to regionalize is desirable and would be highly beneficial financially. Neighboring states, as well as some states nationwide, have implemented funding mechanisms (including grant programs) to provide a percentage of the funding for these efforts. For example, Massachusetts provides 100% of funding for implementation and 100% of budgetary costs for the first three years.
  - Similar mechanisms could be considered by the state for agency consolidations also.

- Examining fiscal efficiency is another critical focus area, with a particular emphasis on the cost per 911 call. This metric measures the expense of delivering services on a per-call basis, including both 911 and 10-digit line calls (dispatch centers). The same calculation can also be applied on a per-capita basis to provide additional insights into the financial efficiency of operations. Such analyses can inform efforts to streamline costs and ensure that resources are allocated effectively across the communications center network.
- Achieving equitable funding across the state has emerged as a significant focus. The current funding model is often described as a "patchwork" system, where agencies contribute to the state infrastructure without always receiving proportional benefits. There is a clear desire for a unified, statewide funding mechanism that ensures a baseline level of resources for all agencies, with the flexibility to scale up funding based on individual agency needs. This approach aims to address disparities and create a more sustainable financial foundation for communications center operations.

Leadership and Planning

National Trends and Insights –

Leadership training and planning (e.g., strategic planning) are still lacking in many centers throughout the country, especially as it relates to newly promoted supervisors. Both APCO and NENA have developed and offer entry-level supervisory training for staff at the supervisor and center manager levels. APCO also has developed a library of core competencies and minimum training standards for positions within an emergency communications agency, from entry level telecommunicator to supervisor or trainer, to communications director, and positions in between.

Effective leadership of an emergency communications organization involves a combination of proper oversight, governance, strategic planning, and leadership training. Nationally, emergency communications organizations are also starting to move away from management oversight by one of the public safety entities they dispatch for (fire department or law enforcement) and becoming independent agencies or becoming part of third/neutral party agencies such as emergency management; these entities are increasingly being staffed by career 911 professionals versus sworn officers or fire fighters.

State Trends and Insights –

Leadership and planning trends among Vermont communications centers reveal a mix of strengths and challenges. While some leaders excel in executing initiatives and building relationships, others struggle due to limited authority and the absence of formal succession planning. A recurring theme is the difficulty of navigating the political landscape to secure the necessary resources. Budgetary constraints frequently impede efforts to address staffing shortages, upgrade technology, and implement comprehensive training programs, underscoring the pressing need for enhanced leadership support and strategic advocacy.

- Strategic planning practices vary widely across agencies. Some communications centers maintain well-defined plans that are regularly reviewed and updated, providing a roadmap for sustained growth and improvement. Conversely, others adopt a more reactive approach, addressing needs as they arise without a comprehensive long-term strategy. This short-term focus, often driven by immediate operational challenges such as staffing or equipment needs, limits the capacity for proactive development and future readiness.
- The lack of standardized leadership training tailored to public safety communications operations presents a significant challenge. While generic leadership courses and opportunities such as APCO conferences offer some benefits, they do not fully address the unique demands of managing dispatch services. Targeted leadership training programs could significantly enhance leaders' abilities to navigate the complexities of public safety communications and drive operational success.
- Collaborative leadership is highlighted as a key opportunity for addressing these challenges. Fostering communication and coordination between agencies and engaging with the community to build support for initiatives are essential steps

toward creating a more resilient public safety network. However, the varying levels of leadership support and influence on budgetary decisions present obstacles. Some agencies benefit from leaders who effectively advocate for funding, while others struggle to secure the necessary resources, reflecting a need for stronger leadership development across the sector.

- Approaches to change management also vary. While some agencies have formalized policies that provide structured guidance during periods of change, others rely on informal methods, such as email communication or staff meetings. This inconsistency can hinder the effective implementation of new initiatives and adaptations to evolving demands.
- Overall, the leadership and planning landscape in Vermont communications centers reflects significant variability. While some agencies demonstrate strong leadership and strategic planning, others face notable challenges in these areas. Addressing these disparities through targeted training, enhanced collaboration, and more consistent planning practices will be critical to ensuring the long-term sustainability and effectiveness of communications center operations.

Personnel and Workforce

National Trends and Insights –

While headway is slowly being made, the national staffing crisis persists and will continue to do so for the foreseeable future, which is placing a tremendous burden on communications centers and their personnel. Regionalization in the form of shared services, policy, and physical consolidation are contributing to successes. Technology advances in particular are easing the burden, driven by artificial intelligence (AI) and cloud-hosted solutions; however, they are not a panacea for all personnel and workforce challenges.

One of the most important factors in any successful organization is its people and, by association, the allocation of those resources. Many emergency communications centers across the country constantly struggle with staffing shortages. Tenured employees are retiring, while others simply leave for any number of reasons—shift work, the hours, childcare issues, stress, and better pay in the private sector.

More communications centers are regionalizing in some form. They are also increasingly shifting from under law enforcement or fire/EMS oversight for independent divisions of local government or becoming standalone entities, placing career 911 professionals in key roles.

Many organizations are clinging to antiquated recruiting and hiring practices (i.e., the "post and pray" method of recruiting, which has long been the standard). Organizations are getting more creative, modernizing the job application process, and offer enticements, such as remote work opportunities, to address the work-life balance while also improving continuity of operations.

Organizations need to streamline and shorten their hiring processes. It can take as long as six months for a candidate to receive a job offer—that's far too long when competitors in the private sector can get it done in a month or less.

While public safety professionals continue to be passionate about their work, they are increasingly becoming frustrated with their working conditions, which are due primarily to staffing shortages, but secondarily to the fact that 911 and the emergency function take a back seat to additional duties.

Telecommunicators are beginning to be recognized in some states as the first responders that they are, but the acknowledgement often does not come with a commensurate increase in pay, so the gesture feels hollow.

State Trends and Insights –

Vermont's communications centers face significant challenges with staffing shortages and high turnover rates. Vacancies often persist for six months or longer, creating substantial recruitment and retention difficulties. Competition from other agencies and the private sector further exacerbates these issues, as these alternatives frequently offer more attractive salaries, less demanding work schedules, and better work-life balance, making it harder for communications centers to maintain a stable workforce.

- The demanding nature of the job, coupled with the high-stress work environment, contribute to dispatcher burnout and attrition. These factors highlight the urgent need to reevaluate compensation, benefits, and work-life balance to attract and retain qualified personnel. Without addressing these foundational issues, the sustainability and effectiveness of dispatch services remain at risk.
- Efforts to mitigate these staffing challenges are critical to the success of a reliable, secure, and interoperable statewide public safety communications system. Strategies aimed at improving recruitment and retention, while also enhancing employee well-being, are essential for building a resilient workforce capable of delivering efficient and effective dispatch services. Investments in professional development, wellness programs, and competitive compensation packages could play a pivotal role in reversing workforce trends.
- The personnel trends across the communications centers in Vermont are varied. Some agencies, like Colchester, have experienced a period of stability with full staffing for seven months, the longest they have been fully staffed. However, they are still actively interviewing for a sixth position.
- The competition for dispatchers is often from local agencies, which may offer better salaries and/or work-life balance, or federal jobs. Some agencies, like Colchester, have a harder time hiring officers than dispatchers.
- The personnel trends in Vermont communications centers present a mixed picture. While some agencies have achieved stability, others continue to grapple with understaffing and high turnover rates. The competition for qualified dispatchers remains intense, prompting agencies to explore innovative strategies to attract and retain talent. These efforts are essential for ensuring effective and reliable public safety communications.
- Recruitment and hiring practices also vary significantly across Vermont's communications centers. Some agencies have established well-defined programs, while others rely on more informal approaches. A common trend is the use of social media platforms such as Facebook and Indeed to post job openings and reach a broader pool of candidates. This strategy allows agencies to leverage technology to connect with potential hires more effectively.
- Another trend is the emphasis on self-elimination, where agencies provide detailed information about job requirements and expectations upfront. This practice enables candidates to assess their suitability for the role, helping to streamline the hiring process by reducing applications from individuals unlikely to succeed in such demanding positions.
- Despite these innovations, challenges in recruiting and hiring persist. Many agencies struggle with staffing shortages, limited resources, and the absence of formalized policies and procedures. These obstacles hinder their ability to implement consistent and effective hiring practices, further exacerbating workforce instability.

- Overall, the recruiting and hiring trends in Vermont communications centers reflect a mix of progress and ongoing challenges. While some agencies have made strides in developing and implementing effective programs, others are still refining their approaches. Continued improvement in these areas is critical to building a strong, resilient workforce capable of delivering high-quality dispatch services across the state.
- During onsite interviews, staff expressed a desire to be classified as telecommunicators, regardless of employment at a PSAP or dispatch center.
  - This may require a legislative update to reclassify PSAP and dispatch center staff as public safety professionals; the Task Force should consult State legislative representation for clarification.

Operations, Policies and Procedures

National Trends and Insights –

Having an operational state that aligns workload and duty assignments with policies and procedures reduces agency liability. Policies, training, and efficiencies must exist that support the various roles, duties, and focus of the communications center. Routinely assessing the tasks and expectations of each communications center role, analyzing workload to identify the appropriate number of staff, and reducing—if not eliminating—all non-communications center functions (ancillary duties), should be in the forefront to create a favorable workload and avoid inherent risks.

In emergency communications, many communications center supervisors and telecommunicators are often overburdened, especially in centers with only one dispatcher on duty at a time, where they must juggle multiple responsibilities. NFPA 1225 emphasizes the importance of having more than one telecommunicator on duty to ensure effective operations. NFPA 1225 15.3.1 states: *"There shall be a minimum of two qualified telecommunicators on duty and present in the communications center at all times."*[99]

This highlights the need for agencies to maintain sufficient personnel to meet performance objectives, allowing flexibility to adjust staffing based on call volume, community needs, and operational demands. Insufficient staffing can overload already overworked personnel, potentially compromising critical tasks essential for communications center functionality.

Further, in regard to utilizing communications center staff for other nonemergency purposes (e.g., lobby window duties), NFPA Section 15.3.1.2 states: "*Where communications systems, computer systems, staff. or facilities are used for both emergency and nonemergency functions, the nonemergency use shall not degrade or delay emergency use of those resources*."[100]

Larger communications centers can separate call-taker functions from dispatch functions and, in some instances, even separate 911 and administrative-line call-taking and other nonemergent functions—either by creating new positions or engaging AI solutions.

State Trends and Insights –

The operational trends among Vermont communications centers highlight a dynamic landscape of challenges and opportunities. A significant issue across many centers is the lack of well-defined succession plans and standardized training programs, which has led to inconsistencies in operations and leadership transitions.

- Agencies report that outdated technology and the use of the Valcour "CAD" system, continues to hinder efficient dispatching and data analysis, further complicating operational effectiveness.

[99] National Fire Protection Association. (2022). *Standard for Emergency Services Communications*.
[100] Ibid.

- The absence of comprehensive and standardized policies and procedures also affects efficiency and consistency across communications centers. The existence of multiple communication centers for different services has led to inefficiencies and occasional communication breakdowns, underscoring the need for greater integration and coordination within the system.
- Despite these challenges, a key trend is the growing reliance on technology and data-driven decision-making. Agencies are increasingly leveraging tools like ECaTS[101] data for performance assessments and exploring new systems to monitor and enhance operations. This shift reflects a broader effort to modernize operations and utilize data for informed decision-making.
- Efforts to standardize and improve operational processes are also gaining momentum. Initiatives to streamline call transfer procedures (to include the call transfer script on both ends of the call), update policies and procedures (including a standardized statewide dispatch script), and adopt advanced technologies such as simulcast systems demonstrate a commitment to enhancing efficiency and operational quality. These efforts are essential for fostering greater consistency and improving service delivery across the state.
- However, many agencies continue to face significant obstacles, including staffing shortages, resource constraints, and geographic isolation. High turnover rates and limited resources create operational pressures, while geographic challenges complicate communication and coordination efforts, particularly in more remote areas.
- Like communications centers across the country, because of the 24/7 service delivery requirements of the work, it is not uncommon for centers to end up being responsible for roles and responsibilities that are disconnected from the true purpose and mission of 911 and public safety dispatch, which is to provide emergency services to the communities. The following ancillary duties were reported by 29 of the communications centers.

Ancillary Duty Component	Number of Centers Reporting
Administration	29
EAS activation	12
Jail	3
Records	24
Security (active camera and access monitoring)	29

[101] Emergency Call Tracking System

Support municipal services	20
Vehicle release	4
Walk-up window	25
Warrants	25

Other

- Relief from Abuse Orders
- Terminal Agency Coordinator (TAC)
- Fire department radio box maintenance/alarm monitoring
- Parking department
- IT support/troubleshooting prior to going to vendor
- Scheduling
- In-house alarm registration records
- Grants

- Overall, the operational trends in Vermont communications centers reflect a mix of innovation, adaptation, and persistent challenges. Agencies are actively seeking ways to improve efficiency, enhance communication, and address workforce shortages while navigating the complexities of an evolving public safety landscape. These efforts are critical to ensuring that Vermont's public safety communications system remains effective and resilient.
- During onsite interviews, there was a reportable and observable lack of interagency and user communication that will require new processes to improve communications at the agency, interagency, regional, and statewide levels.
  - Bi-monthly user meetings (e.g., dispatchers, supervisors, and managers), held in a regional town hall or similar style, would enhance communication statewide.

Training

National Trends and Insights –

Effective core and leadership training for telecommunicators and supervisors are currently lacking nationwide, creating challenges today and potentially more significant problems in the future. Public safety telecommunicators face extremely demanding responsibilities, and the absence of proper training increases the risk of errors. Proper training significantly reduces these risks, ensuring telecommunicators are well-prepared for their roles.

Adopting training programs aligned with state and/or national standards is a key strategy for addressing this issue. Organizations such as APCO and NENA have established foundational and advanced training programs and core competencies for many emergency communication roles. Implementing standardized training programs, backed by these standards, ensures consistency in skillsets across all telecommunicators, enhancing overall performance and reliability.

Standardization can further be achieved through mandatory training for all personnel within the communications centers, not just PSAPs, creating a unified baseline of knowledge and competencies. Accreditation programs take this a step further by requiring agencies to meet rigorous criteria verified through external assessment, promoting continuous improvement.

Establishing an 80% trainee completion rate as a benchmark prepares new telecommunicators more effectively, instilling confidence and competence while fostering a knowledgeable, highly skilled workforce. Standardized, mandated training is essential for the professionalization of emergency communications and ensuring excellence in public safety services.

State Trends and Insights –

While many communications centers have formalized training programs, there is a lack of mandatory and standardized statewide training and certification for dispatchers in agencies that are not designated as a PSAP.

- The State of Vermont Enhanced 911 Board requires 911 call-takers working in a PSAP to meet the State's training requirements and has mechanisms in place to ensure minimum training requirements are carried out. This includes the requirement for EFD, EMD, and EPD.
  - The State requirement includes a 40-hour basic 911 call-taker certification course provided by the Enhanced 911 Board training and communications staff.
    - The course curriculum is solely based on call-taking and does not address dispatching of incidents.
    - The Vermont Criminal Justice Council offers a training course that teaches how to dispatch incidents but does not address 911 call-taking procedures. This course does not offer a certification/recertification option and is completely voluntary.

        - While dispatchers from dispatch centers may attend the state's training, it may not meet their needs as it primarily focuses on 911-specific topics including EMD certification and the use of APCO protocols.
        - The Enhanced 911 Board does not have purview over dispatch operations and does not provide call-handling protocols to non-PSAPs and does not State-certify non-PSAP personnel in EFD, EMD, or EPD.
    - There is no statewide requirement for dispatcher certification at this point.
        - During onsite interviews, dispatch center staff from multiple centers showed an interest in a State mandate that requires all dispatchers within the state, including dispatch center staff, to obtain a basic statewide training certification that includes 911 call taking and incident dispatching skills and processes.
    - Certified personnel are required to complete 12 hours of continuing education annually and recertify their cardiopulmonary resuscitation (CPR) certification bi-annually.
        - The certification/recertification requirements are specific to 911 call-takers and so do not extend to the dispatch centers; however, three dispatch centers indicated that they voluntarily follow the State requirements.
        - Three additional dispatch centers do not follow the state 911 certification requirements but stated they do certify their training staff through the State's certified training officer (CTO) program.
    - Absent mandated recertification and continuing education requirements for certified 911 call-takers, most agencies—PSAPs and dispatch centers alike—do not include budgetary funds that allow for outside training/career development opportunities.
    - There was a desire articulated during onsite interviews to standardize and formally memorialize all training statewide to ensure a standard/minimum level of service is provided to all citizens and field responders throughout the state.
- Access to professional development opportunities, including leadership training, is often limited by budget constraints and staffing levels.
- Training programs for dispatchers in Vermont vary significantly in terms of standardization, comprehensiveness, and certification. Some dispatch centers adhere to national standards like APCO certification, requiring specific training hours and ongoing professional development.
- There are a variety of training methods throughout the state: 37.9% of centers have a formal training program; 40.5% of centers utilize an internally developed or informal programs[102]; 21.6% of agencies indicated no training program.

[102] Informal programs are often based on adaptations of state-provided training or models like the San Jose model (more commonly referred to as the Field Training Officer [FTO] program).

- This inconsistency results in a lack of uniformity in dispatcher skills, knowledge, and operational delivery across the state.

Formal Training Program	Informal Training Program	No Response
16	14	7

- Mental health training for dispatchers is often limited, with most communications centers providing only basic information during onboarding or through State-sponsored programs. While some dispatch centers incorporate mental health awareness into their training programs or offer access to peer support and employee assistance program (EAP) resources, there is a need for more comprehensive and standardized training in this area.
- The lack of a statewide, standardized training curriculum for dispatchers poses a challenge for ensuring consistent competency and professional development opportunities. Establishing a unified training framework that incorporates national standards, mental health awareness, and specialized skills training would enhance the overall effectiveness of Vermont's dispatch services.

☆☆☆

Quality Assurance and Performance Management

National Trends and Insights –

Performance management, including QA, provides for holistic organizational success and includes everyone in a communications center from telecommunicators to managers and directors. The process is cyclical and is a means to assure that everyone understands their respective roles and responsibilities, has the resources to complete them, be successful, and meets expectations.

Key Performance Indicators (KPIs)—such as abandoned call rate, 911 call wait times, pick up to queue, queue to dispatch, non-emergency call-wait times, and total call processing times—can all be used to measure communications center performance.

QA is another way the performance management cycle can be applied. According to the American Society for Quality (ASQ), QA is "part of quality management focused on providing confidence that quality requirements will be fulfilled." In a communications center, this equates to "all actions taken to ensure that standards and procedures are adhered to and that delivered products or services meet performance requirements."

Other KPIs should be integrated into a QA program to monitor and improve the overall performance of personnel and the communications center. It is important to establish a standardized QA and effective feedback process for telecommunicators. This is a best practice that can identify areas that are consistently meeting agency expectations and those that are falling short. It can often be difficult for smaller centers to proactively perform QA and monitor other performance metrics because of limited support staff.

Where agencies are unable to meet the monitoring of 2% of all calls—due to that number being overly burdensome on staff or not having staff to perform QA—NFPA 1225 Section 5.3.1 also states the "Agency shall ensure a sufficient number of case reviews are conducted for both call-taking and radio dispatch responsibilities of a telecommunicator."[103]

State Trends and Insights –

The QA and performance management trends across Vermont communications centers are varied, with ten agencies reporting they have well-defined programs and 17 did not. However, the site visit interviews established that there may be confusion of what constitutes a structured QA program, relying on informal practices or a complaint workflow rather than QA.

- QA practices in Vermont's communications centers are primarily reactive, often triggered by complaints rather than proactive monitoring: 50% of agencies have reported no QA or performance management program (formal or informal).

[103] National Fire Protection Association. (2022). *NFPA 1225: Standard for emergency services communications systems* (2022 ed.). National Fire Protection Association. https://www.nfpa.org

No QA program	QA for complaints only	Informally review monthly	Formal QA program
17	13	3	2

- This lack of standardized QA programs and policies lead to inconsistencies in how call-handling, dispatching, and other operational aspects are evaluated and feedback provided to staff.
- Many communications centers lack dedicated QA personnel, relying on supervisors or managers to conduct reviews when time permits. This approach often results in limited call review and a focus on addressing immediate issues rather than identifying systemic trends or areas for improvement.
- The absence of comprehensive data analysis further hinders effective QA efforts. While some communications centers utilize basic statistics from their CAD systems, they often lack the tools or expertise to conduct in-depth analysis of call data to identify patterns, trends, or performance indicators.
- This reactive approach to QA and the lack of standardized procedures highlight the need for a more structured and proactive approach to quality management within Vermont's communications centers. Implementing formal QA programs, providing dedicated QA personnel, and leveraging data analysis would contribute to more effective identification and resolution of operational issues, ultimately enhancing the quality of dispatch services.
- A trend is the use of technology to support QA. Four centers reported they are using software like Frontline to conduct real-time QA and track trends.
- There are also challenges in implementing effective QA programs. Some agencies struggle with staffing shortages, limited resources, or a lack of formal policies and procedures.
- Overall, the QA/QI trends in Vermont communications centers reflect a mix of progress and challenges. Some agencies are making strides in implementing effective QA programs, while others are still developing their approaches. There is a need for continued improvement in QA/QI practices to ensure the quality and effectiveness of dispatch services.

Technology and Systems

National Trends and Insights –

Public safety dispatch operations are heavily dependent on IT infrastructure, computer systems, and multiple applications. Mission-critical systems include 911 CHE, CAD systems, radio dispatch consoles, GIS databases and mapping, and data/voice logging recorders. This IT infrastructure is critical to the daily public safety mission and provides interoperability with other communications centers and field responders.

Critical systems and infrastructure, especially when duplicated in the same geographic area, are very costly to acquire and maintain. Increasing technology costs have become a primary issue, often driving funding needs and dispatch regionalization efforts in the U.S.

Officials in many jurisdictions have pursued communications center regionalization to reduce capital expenditures and operating costs. Software maintenance agreements and upgrades increase the total cost of ownership over the life of a system. Reducing the number of communications centers often is intended to eliminate the need to purchase and maintain multiple systems within the same geographic area.

State Trends and Insights –

Technology trends in Vermont communications centers highlight a combination of progress and persistent challenges, particularly in the use of Valcour, which is provided by the State to both PSAPs and dispatch centers. Based on the questionnaire results, Valcour is used in all centers except six agencies that use CAD systems from different vendors including CSI, Spillman (Motorola Flex), Symposium, TriTech (CentralSquare), and Tyler.

- While most agencies rely on Valcour and refer to it as a CAD system, many stakeholders argue it is more accurately described as an RMS marketed as a CAD solution.
- It was clear from the results of the site visits and town hall meetings that this misalignment has led to widespread frustration and dissatisfaction among users, especially fire and EMS agencies because of reports that Valcour is a law enforcement-focused system.
  - However, there is a discrepancy between these findings and the results of the questionnaire's 28 respondents when asked if their CAD system met their operational needs. To that question, 21 responded in the affirmative; six of the seven negative responses are Valcour users.
- One common criticism of Valcour is its lack of essential CAD features. Users report significant difficulties in pulling statistics, generating reports, and creating response plans, which are critical functions for efficient dispatch operations. The system's user interface has also been widely criticized for being ineffective and unfriendly, with issues such as frequent crashes, data loss, and an inability to perform basic tasks like resizing columns or reorganizing information. These shortcomings have forced many users to adopt workarounds, such as using

notepad for CAD notes or external spreadsheets for data analysis, increasing workload and frustration for dispatchers.

- Compounding these issues is the fact that most Vermont communications centers are micro or small operations, typically with fewer than two workstations and responsible for tracking only a few field personnel at a time. For such agencies, a fully functional CAD system might be excessive for their needs. However, even a scaled-down CAD solution with basic functionalities could vastly improve efficiency and reduce dispatcher workload compared to Valcour.
- Beyond the Valcour system, technology trends across Vermont communications centers are characterized by a mix of modernization and setbacks. While some agencies are making strides in updating their equipment and adopting new technologies, others are struggling with outdated tools, limited resources, or a lack of technical expertise. Additionally, a critical gap exists in the inability to transfer automatic number identification (ANI)/automatic location identification (ALI) information from Vermont's 911 CHE (provided to PSAPs only) to secondary systems, which hinders efficient information sharing and disrupts workflows.
- Fourteen agencies report using some level of FSA to dispatch fire/EMS resources, including:
  - Tone/voice paging
  - Active (formerly known as Active911)
  - Bryx Station Alerting
  - U.S. Digital Designs Phoenix G2
  - Zetron paging system
  - RapidSOS
- Overall, while some agencies are modernizing their technology infrastructure, others face significant barriers to keeping pace with advancements. Continued investment in technology tailored to the specific needs of Vermont communications centers is essential to ensure the efficiency, reliability, and effectiveness of dispatch services across the state.
- Agencies, both in- and out-of-state, reported cross-state informational sharing/exchange constraints. This leads to operational difficulties when dispatching agencies in or from neighboring jurisdictions. Technical restraints could be removed or lessened to improve situational awareness with all in- and out-of-state entities.

Facilities

National Trends and Insights –

The public safety communications industry classifies communications center in two ways—the number of equipment positions or the number of operational personnel.

- The National Highway Traffic Safety Administration's (NHTSA) National 911 Program groups communications centers into five sizes based on equipment positions as micro (1 – 2), small (3 – 5), medium (6 – 20), large (21 – 49), mega (50+).
- According to standards established by the Commission on Accreditation for Law Enforcement Agencies, Inc. (CALEA), APCO Project Retains groups communications into three sizes based on personnel – small (1 – 15), medium (16 – 75), and large (76+).

Given the advancement in technologies and infrastructure, the goal in facilities design today is redundancy and resiliency. Purpose-built public-safety facilities are typically heavy users of mission-critical technologies and enterprise-level IT systems and equipment. These critical systems, along with typical facility infrastructure (e.g., heating, ventilation, and air-conditioning [HVAC] systems, generators, and building automation systems [BAS]) are more vulnerable to cyberattacks today. National trends for facility design include not only improvements in physical security for the facility and infrastructure, but also improvements in cybersecurity.

Another trend centers around telecommunicator health and wellness. When designing and constructing communications centers, workforce wellness is a top consideration that, when applied thoughtfully, can improve recruiting and retention. Successful wellness design is multifaceted, including but not limited to the following:

- Architectural design — Ensuring that the operations room has proximity to food preparation, filtered water, and restroom facilities.
- Windows — Natural light from north-facing windows allows the body to adjust to the Circadian rhythms. This affects personnel physically, mentally, and behaviorally following a 24-hour cycle.
- Mechanical systems — High-efficiency particulate air (HEPA) filtration, shut-off ventilation, and touchless fixtures mean less transmission of viruses.
- Healthy areas — Properly equipped stress-reduction, lactation, and workout rooms matter, as do outdoor green spaces.
- Furniture — Reduce the likelihood of a multitude of ailments by filling your new facility with antibacterial surfaces, 24/7 ergonomically designed chairs, sit/stand desks, and more.
- Sight and sound — Reduce eyestrain and stress-triggers by leveraging building design and smart technology choices, and do not neglect natural light and outdoor space.
- Extra mile — Companion animals are proven to reduce stress and elevate mood; hundreds of facilities across the country have incorporated such animals

into their facilities. Good building design can facilitate cohabitation of furry and not-so-furry friends.

State Trends and Insights –

The 37 communications centers serving Vermont can be grouped as follows:

- Equipment positions: 18 micro, 16 small, and 3 medium
- Personnel: 29 small, 8 medium
- Communications centers in Vermont face a range of facility challenges. Many centers operate in outdated buildings with limited space, impacting operational efficiency and employee comfort.
- These outdated facilities often lack adequate backup power solutions, posing risks during power outages. While some centers have backup generators, others rely on smaller UPS systems with limited runtime, potentially disrupting critical communications.
- Security is another concern, with some facilities lacking proper access control measures or secure areas for sensitive equipment. This vulnerability raises concerns about unauthorized access and potential security breaches.
- Of the communications centers, either in the questionnaire or in-person observation, 11 have capacity to expand their facilities and 18 have no capacity—meaning that if regionalization recommendations were adopted, it would likely require merging with one or more other communications centers at a location outside of their municipality.
  - Being chronically understaffed, a majority of centers also have limited capacity to handle overflow or significant call surges for any extended period of time and require additional staffed positions, which, even if approved, would have no ability to be accommodated in the current communications center space.
- Twenty of the agencies responding to the questionnaire indicated they had space in their equipment room to expand and add additional systems and racks and only nine said they could not. Addressing these facility deficiencies is crucial for ensuring the resilience and effectiveness of Vermont's dispatch services. Investing in modern, secure, and well-equipped facilities should be prioritized to provide dispatchers with a safe and efficient work environment.

Facility Room for Expansion	No Facility Room for Expansion	Equipment Room for Expansion	No Equipment Room for Expansion
11	18	20	9

- A small subset of dispatch centers may lie within a registered flood plain. As PSAPs and dispatch centers look toward possible consolidation and/or regionalization efforts, an evaluation of existing facilities must include a threat and hazard identification and risk assessment (THIRA)—or similar process—to identify possible natural, human-made, and technological hazards that may potentially affect a given location. This process would identify if an agency proposed as the host agency for a consolidation or regionalization effort lies within a recognized flood plain and, if so, what efforts would need to be undertaken to protect the facility from future floods. If a consolidation or regionalization effort identifies that a new facility should be constructed to house this future entity, as part of the construction site selection process, sites that are obviously within a flood plain should be eliminated from consideration if possible; this is the best practice across the public safety communications industry.

Response Alternatives

National Trends and Insights –

Alternative response includes mental health, technical, operational, and policy driven approaches that improve operational efficiencies and create workload capacity. Whether the public safety sector, especially the 911 community, embraces AI or continues to be wary of it—and whether they proceed deliberately or rush to adopt it and other alternatives to sending traditional police, fire and EMS personnel to requests for service—it opens incredible possibilities for improving emergency response.

State Trends and Insights –

There is a growing awareness and interest in implementing alternative response methods to address mental health calls and other non-emergency situations. However, the development and implementation of these initiatives are still in the early stages in many areas.

- The increasing use of alternative response methods include crisis hotlines, 211 services, and 988 suicide and crisis lifelines. These resources help alleviate workload on dispatchers and connect individuals with appropriate support.
- Dispatchers are receiving training on alternative response initiatives and new responsibilities associated with these evolving approaches. This training equips them to effectively utilize alternative resources and handle a wider range of situations.
- Collaboration with mental health providers and community responders is growing, with some dispatch centers establishing formal relationships and procedures for coordinating responses. This integrated approach aims to provide more comprehensive and appropriate care for individuals in crisis.
- While some communications centers have implemented online reporting systems for non-emergency situations, their adoption remains limited. Expanding the use of online reporting could further reduce the burden on dispatch centers and allow them to focus on critical incidents.

Wireless Networks

National Trends and Insights –

The widely accepted standard for wireless voice communications systems across the nation is Project 25 (P25) LMR. P25 is a suite of standards designed to improve interoperability and efficiency of communication, while also allowing for more flexibility in purchasing subscriber devices, as any P25-compliant subscriber device should work on any P25-compliant LMR system. P25 systems are digital systems that allow for encryption if desired, especially in law enforcement. Sections 5.13.1 and 5.13.1.1 of the Federal Bureau of Investigation's (FBI) Criminal Justice Information Services (CJIS) Security Policy requires LMR networks be encrypted with encryption keys that are a minimum of 128 bits if certain criminal justice information is to be broadcast across them. As long as dispatchers and end users are thoroughly trained in what information is and is not allowed to be broadcast across LMR, encryption would not be required; however, if certain types of criminal justice information, such as criminal history, is broadcast over an unencrypted LMR network it could violate the CJIS Security Policy.

Public safety use of commercial wireless broadband networks has increased significantly over the past several years. The advent of networks such as AT&T/FirstNet, Verizon, and T-Mobile offering priority service to public safety users has enabled public safety to leverage the data transmission capabilities of these networks to a much greater extent than they could when they had to compete with commercial users for bandwidth and throughput. Wireless broadband networks are excellent networks for data transmission and are complementary networks to LMR for voice communications. Due to the robust mission-critical voice capabilities of LMR as compared to broadband, broadband networks should not be relied upon to provide primary voice communications for first responders due to the limitations in providing all the components necessary for mission-critical voice communications. Examples of this include limitations in talking device to device when off network and point-to-multi-point communications.

To achieve robust public safety wireless communications across all agencies at all levels of government, in addition to utilizing industry standard technology, many states have established a comprehensive governance structure to promote cooperation and collaboration among all public safety stakeholders. At a minimum, a statewide interoperability communications board (SICB) should integrate LMR, wireless broadband, 911/dispatch, and emergency management, including the Integrated Public Alert and Warning System (IPAWS) technologies, through the voices of the various stakeholders at both the state and local level. Minnesota would be one such example of a high functioning SICB that works to achieve more efficient emergency communications across the state. There are other models across the country that also provide for similar collaboration.

The Broadband Equity and Deployment (BEAD) Program, administered under the National Telecommunications and Information Administration, could possibly provide an "outside the box" opportunity for fiber-optic infrastructure in rural areas. The program prioritizes the deployment of fiber-optic infrastructure to support high-speed internet service to currently unserved and underserved areas, which would obviously fall in the rural areas of the state.

State Trends and Insights –

The public safety wireless environment within Vermont is fragmented across technology platforms and frequency bands. Likewise, due to the rural nature of the state and the mountainous topology, commercial cellular coverage is not robust across the state as reported by stakeholders.

- While there are some digital, P25-compliant LMR networks, most systems operating do so in analog mode in either the ultra-high frequency (UHF) band or the very-high frequency (VHF) band, with the vast majority of law enforcement agencies operating in UHF and the vast majority of fire and EMS agencies operating in VHF.
- The state system, which is the system primarily used by the VSP and the Fish and Wildlife Department, currently operates in analog UHF and VHF, but plans are underway to upgrade to a 10-zone digital simulcast system. The state system provides for a very good microwave backhaul system that could be leveraged for future, more robust statewide communications. The State also currently operates the VCOMM system, which is a statewide system established primarily for interoperability utilizing national UHF and VHF interoperability channels. There are challenges with the VCOMM system, which renders its current utility questionable.
- The State currently has a statewide public safety communications governance structure in place—the Emergency Communications Advisory Council—however, it is understood that it is not active at this time. The State currently has a statewide interoperability coordinator (SWIC) assigned to the DPS RTS. The SWIC should be an integral part of the statewide public safety communications governance.
- Additionally, the statutory environment currently creates confusion and complexity as to the process of executing memoranda of understanding (MOU) between state and local government entities to share infrastructure. In speaking with RTS staff, they related the challenge is determining who within state government has the authority to develop and execute an MOU. Apparently, it falls either between the Attorney General or the Governor's Office; it has also been delegated from the Governor's Office to IT, but even finding a contact person for MOU development has proven challenging. The sharing of infrastructure is a key component to establishing a more robust and efficient public safety communications environment.
- The Vermont Community Broadband Board (VCBB) under the Department of Public Service is administering the State's participation in the program. The state is in line to receive approximately $229,000,000 in funding for deployment of infrastructure to support high-speed internet service to unserved and underserved areas. In addition to this fiber-optic infrastructure, Vermont also has existing fiber across the state, some of which could potentially be utilized in support of a future public safety communications system.

Cybersecurity

National Trends and Insights –

The rapid advancement of AI presents both opportunities and challenges in cybersecurity. While AI enhances threat detection and automates incident response, it also introduces new risks. Cybercriminals are leveraging AI to craft sophisticated phishing attacks, automate malware deployment, and evade detection by mimicking legitimate user behavior. Moreover, vulnerabilities in AI models, such as adversarial attacks, can be exploited to manipulate systems reliant on machine learning. Organizations must adopt proactive measures, including securing AI systems and understanding AI-driven threats, to stay ahead in this evolving landscape.

In today's complex threat environment, maintaining a static cybersecurity framework is insufficient. Organizations must adopt a dynamic approach that involves continuous evaluation and adjustment of their overall security posture. This includes implementing real-time monitoring, regular threat assessments, and adaptive strategies to address emerging vulnerabilities. Utilizing frameworks like zero trust, combined with automated response systems, ensures that security measures evolve alongside the threat landscape. A robust cybersecurity posture is no longer a one-time investment but an ongoing commitment to resilience and adaptability. In the recent CJIS updates, a need for regular vulnerability scanning and a risk mitigation program are examples of the focus on an ongoing security process.

With increasing reliance on third-party vendors, managing vendor risks has become critical to protecting sensitive data. Third-party breaches can expose vulnerabilities across interconnected systems, making thorough vetting and continuous monitoring of vendors essential. Simultaneously, the human element remains a significant factor in cybersecurity. Comprehensive end-user training can mitigate risks like phishing and social engineering attacks, empowering employees to recognize and respond to potential threats. Balancing robust vendor management with a well-informed workforce ensures a holistic approach to risk reduction, safeguarding the organization from external and internal threats alike.

State System Trends and Insights –

Assessing the communications centers cybersecurity maturity across different areas shows that the current posture is in the formative to established stages, with average scores between [redacted] and [redacted] on a 5-point scale. This reflects a solid foundation of cybersecurity practices, but it also highlights clear opportunities to strengthen and build a more proactive and resilient security framework.

- Cybersecurity Awareness – Out of the 37 communications centers contacted, 15 responded to the cybersecurity assessment. This revealed a broader challenge: many agencies may lack the cybersecurity awareness or knowledge needed to effectively engage with such assessments. This highlights a critical gap in cybersecurity maturity and underscores the need for greater education and awareness to build a more resilient security culture.

- According to the Cybersecurity Maturity Report 2023, the average cybersecurity maturity score across various industries was 2.4 out of 5. This places Vermont [redacted], presenting an opportunity to refine key areas and aim to meet or exceed industry standards. These national trends are on par with the public safety sector as well.
- Asset Management – [redacted] Without a clear understanding of what hardware and software components are in use, where they are located, and their status, it becomes challenging to ensure security, compliance, and operational efficiency. This gap presents an opportunity to build more comprehensive asset inventories that capture detailed information about all physical and virtual assets. These inventories should include attributes such as asset type, location, ownership, lifecycle status, and configuration. Additionally, implementing automated detection and monitoring systems can provide real-time insights into changes or anomalies in the asset environment.
- Continuous Monitoring – [redacted] By adopting centralized monitoring solutions and refining incident escalation processes, situational awareness and responsiveness can be enhanced.
- Data Privacy – Data privacy shows a relatively stronger foundation, reflecting effective data governance practices. However, staying aligned with evolving privacy regulations through regular updates is crucial to maintaining compliance and security.
- Proactive Security Measures – Agencies are placing greater emphasis on proactive strategies, including continuous monitoring, automated threat detection, and integrating cybersecurity practices into daily operations, to better anticipate and address emerging cyber threats.
- Data Privacy Compliance – With stricter data protection regulations, there is a strong national push for robust data privacy practices, aligning well with the State's relatively higher score in this domain.
- Third-Party Risk Management – As supply chain attacks become more common, there is a growing emphasis on evaluating and mitigating risks tied to third-party vendors. Strengthening this area can help reduce vulnerabilities associated with external partnerships.

[redacted]

Appendix B: Regionalization Benchmark Criteria Roadmap

If a communications center ***does not provide 24/7 service***, ***has six or more Category One attributes (55%)***, or ***a combination of Category One and Two attributes that exceeds eight (73%)***, in MCP's experience, these centers meet the criteria to strongly recommend exploring a physical consolidation and alliance with a neighboring communications center. This is not to say that a communications center that meets this benchmark should be merged with another communications center as there could be numerous factors, including available opportunities for facility expansion, available funding, and others that could drive such decisions away from what, on the surface, may appear simple.

Hashed cells indicate the data was not provided and MCP made assumptions to reasonably determine the data. Cells with a background color indicate that value meets either the Category One or Two criteria and shares the same background color.

PSAP /Dispatch Center Location	24 X 7 Operations	Population	Statewide Incident Volume	Average Cost per Variable	Primary Workstations	Min. Staffing Per Shift	Retention	Outbound Emergency Transfers	Inbound Emergency Transfers	EFD/EMD/ EPD	Admin Call Volume	Total Number of Category One & Two Criteria Met
Category One Criteria	Ø	≤30k	≤1%	≥$40	≤2	≤2	≤75%	≥25%	≥75%	Ø	≥911 Vol.	
Category Two Criteria	Ø	≤50k	≤3%	≥$30	≤4	≤4	≤80%	≥25%	≥75%	xfer.	≥911 Vol.	
Inventory Section Reference		3-5.X.1.1	3-5.X.1.3	3-5.X.2.2	3-5.X.5.1	3-5.X.4	3-5.X.4	3-5.X.1.3		3-5X.5.5		
Wilmington	No	5,000-10,000	0.46%	$49.35	2	1	66.7%	n/a	100%	Xfer	n/a	9
Dover	No	1,000-2,500	0.13%	$47.48	1	1	100%	n/a	100%	Xfer	n/a	8
Middlebury PD	No	5,000-10,000	0.81%	**$55.44**	2	1	88.9%	n/a	100%	Xfer	n/a	8
Randolph	No	1,000-2,500	0.32%	$52.83	1	1	100%	n/a	100%	Xfer	n/a	8
Springfield	Yes	5,000-10,000	1.48%	**$55.44**	2	1	73.3%	n/a	100%	Xfer	n/a	8
Manchester	Yes	2,500-5,000	0.92%	**$55.44**	1	1	**79%**	n/a	100%	Xfer	n/a	8
St. Michael Rescue	Yes	10,000-30,000	0.18%	**$55.44**	1	1	16.7%	n/a	100%	Xfer	n/a	8
Essex	Yes	10,000-30,000	2.29%	$47.19	2	2	62.2%	n/a	100%	Xfer	n/a	8
University of Vermont	Yes	10,000-30,000	1.89%	$61.01	2	1	55.6%	n/a	100%	Xfer	n/a	8
Winooski	Yes	5,000-10,000	1.85%	**$55.44**	2	1	**79%**	n/a	100%	Xfer	n/a	8
Woodstock	Yes	2,500-5,000	1.99%	**$55.44**	2	1	**79%**	n/a	100%	Xfer	n/a	8
Colchester	Yes	10,000-30,000	2.29%	$33.44	3	1	66.7%	n/a	100%	Xfer	n/a	8

PSAP /Dispatch Center Location	24 X 7 Operations	Population	Statewide Incident Volume	Average Cost per Variable	Primary Workstations	Min. Staffing Per Shift	Retention	Outbound Emergency Transfers	Inbound Emergency Transfers	EFD/EMD/ EPD	Admin Call Volume	Total Number of Category One & Two Criteria Met
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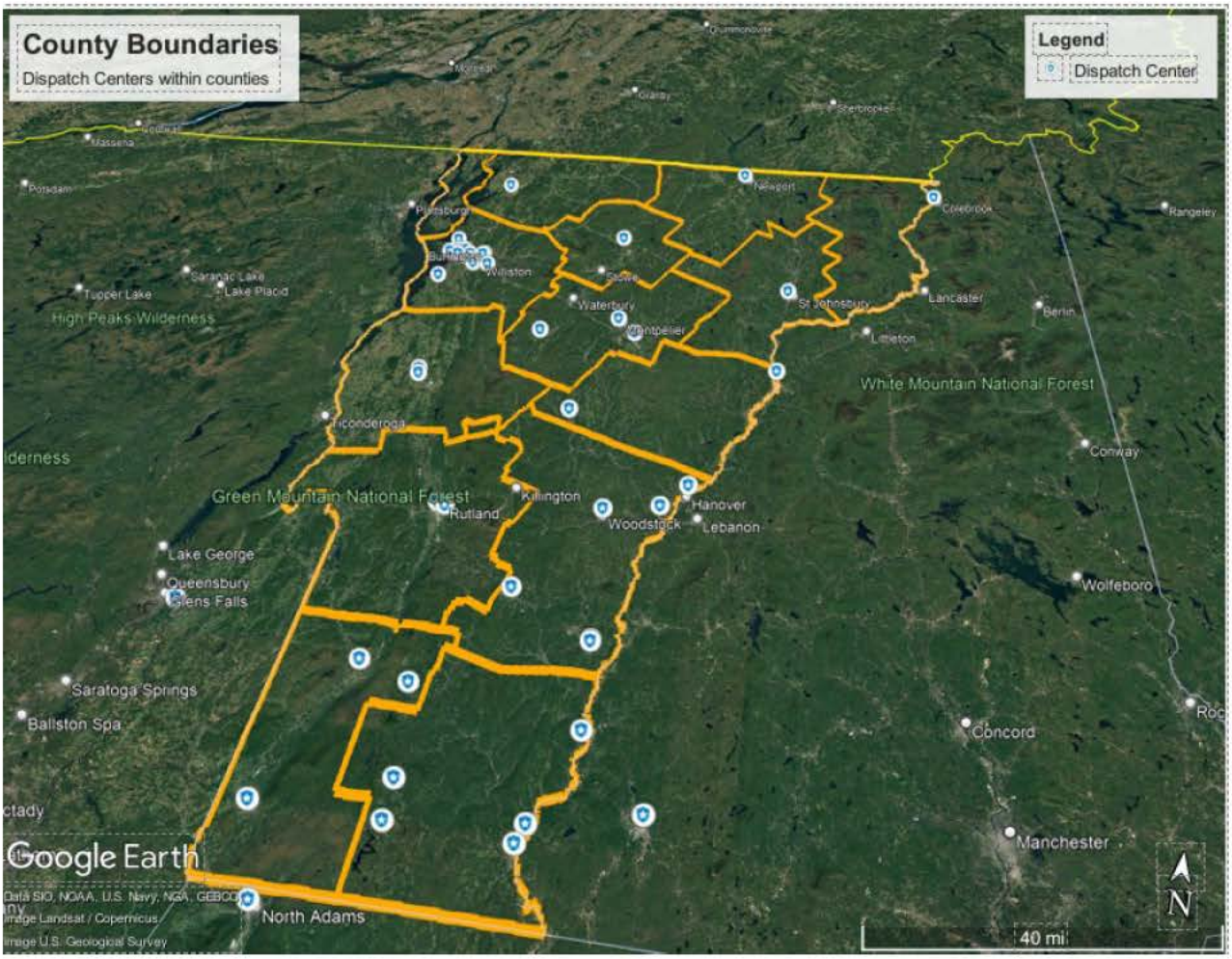
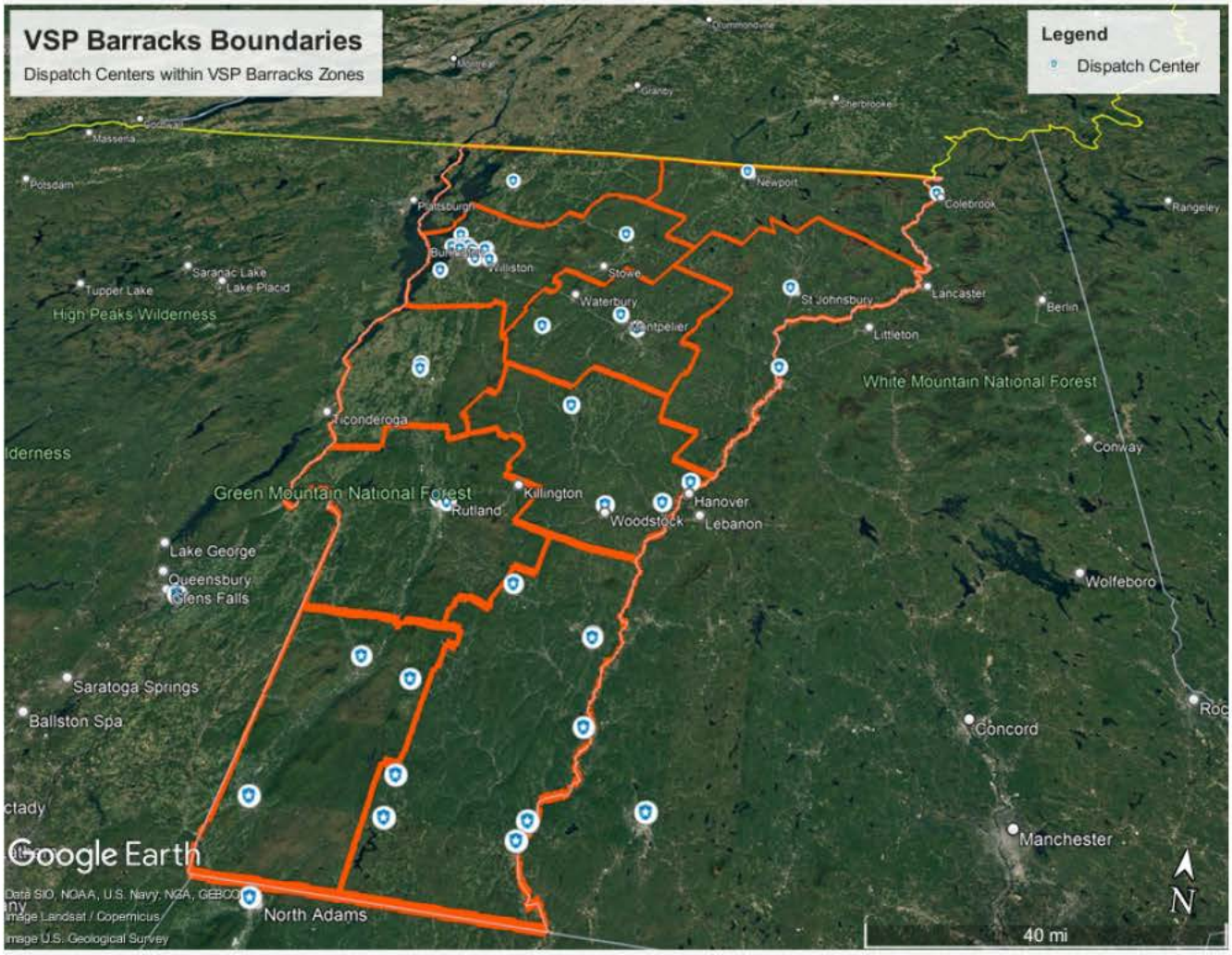
Category Two Criteria	Ø	≤50k	≤3%	≥$30	≤4	≤4	≤80%	≥25%	≥75%	xfer.	≥911 Vol.	
Inventory Section Reference		3-5.X.1.1	3-5.X.1.3	3-5.X.2.2	3-5.X.5.1	3-5.X.4	3-5.X.4	3-5.X.1.3		3-5X.5.5		
Rutland City	Yes	10,000-30,000	1.98%	$44.66	3	1	77.8%	n/a	100%	Xfer	n/a	8
Colebrook, NH	Yes	5,000-10,000	1.60%	**$55.44**	1	1	100%	n/a	100%	Yes	n/a	7
Hanover, NH	Yes	2,500-5,000	0.46%	**$55.44**	4	2	83.8%	n/a	100%	Xfer	n/a	7
Bennington	Yes	10,000-30,000	4.93%	**$55.44**	2	1	**79%**	n/a	100%	Xfer	n/a	7
Ludlow	Yes	10,000-30,000	0.73%	$37.11	1	1	100%	n/a	100%	Xfer	n/a	7
Newport	Yes	10,000-30,000	1.70%	**$55.44**	2	1	89.8%	n/a	100%	Xfer	n/a	7
St. Johnsbury	Yes	10,000-30,000	1.62%	$42.01	2	1	95.8%	n/a	100%	Xfer	n/a	7
Southwest Fire Mutal Aide, NH	Yes	30,000+	0.46%	$30.12	3	1	**79%**	n/a	100%	Xfer	n/a	7
Brattleboro	Yes	10,000-30,000	2.57%	$28.17	3	2	29.2%	n/a	100%	Xfer	n/a	7
South Burlington	Yes	10,000-30,000	3.03%	**$55.44**	4	1	**79%**	n/a	100%	Xfer	n/a	7
North Adams, MA	Yes	10,000-30,000	1.23%	**$55.44**	5	2	**79%**	n/a	100%	Xfer	n/a	7
Mad River Valley Ambulance	Yes	2,500 – 5,000	.10%	$0	1	1	100%	n/a	100%	Xfer	n/a	6
Barre City	Yes	5,000-10,000	3.31%	$91.40	3	2	92.6%	n/a	100%	Xfer	n/a	6
Middlebury Regional EMS	Yes	30,000+	1.49%	$19.74	2	1	73.3%	n/a	100%	Xfer	n/a	6
Hartford (PSAP)	Yes	30,000+	3.16%	$90.37	3	2	**79%**	27%	n/a	Yes	**yes**	6
Windham County	Yes	30,000+	2.38%	**$55.44**	4	1	82.2%	n/a	100%	Xfer	n/a	6

PSAP /Dispatch Center Location	24 X 7 Operations	Population	Statewide Incident Volume	Average Cost per Variable	Primary Workstations	Min. Staffing Per Shift	Retention	Outbound Emergency Transfers	Inbound Emergency Transfers	EFD/EMD/ EPD	Admin Call Volume	Total Number of Category One & Two Criteria Met
Category One Criteria	Ø	≤30k	≤1%	≥$40	≤2	≤2	≤75%	≥25%	≥75%	Ø	≥911 Vol.	
Category Two Criteria	Ø	≤50k	≤3%	≥$30	≤4	≤4	≤80%	≥25%	≥75%	xfer.	≥911 Vol.	
Inventory Section Reference		3-5.X.1.1	3-5.X.1.3	3-5.X.2.2	3-5.X.5.1	3-5.X.4	3-5.X.4	3-5.X.1.3		3-5X.5.5		
Washington County PS, NY	Yes	30,000+	1.85%	**$55.44**	7	4	**79%**	n/a	100%	Xfer	n/a	6
Shelburne (PSAP)	Yes	30,000+	2.37%	$39.61	3	2	**79%**	12%	n/a	Yes	yes	6
Burlington	Yes	30,000+	6.08%	**$55.44**	5	2	65.1%	n/a	100%	Xfer	n/a	5
Montpelier	Yes	30,000+	3.00%	$66.67	3	2	100%	12%	100%	Xfer	n/a	5
VSP – Westminster (PSAP)	Yes	30,000+	7.21%	$92.72	10	4	**79%**	33.3%	n/a	Yes	**yes**	5
Lamoille County (PSAP)	Yes	30,000+	6.10%	$61.86	4	2	**79%**	17.5%	n/a	Yes	**yes**	5
St. Albans (PSAP)	Yes	30,000+	6.13%	$44.53	4	3	**79%**	15.8%	n/a	Yes	**yes**	5
Grafton County, NH	Yes	30,000+	9.84%	$88.85	6	2	86.7%	n/a	100%	Xfer	n/a	4
VSP – Williston (PSAP)	Yes	30,000+	12.08%	$95.02	12	6	**79%**	48.6%	n/a	Yes	**yes**	4

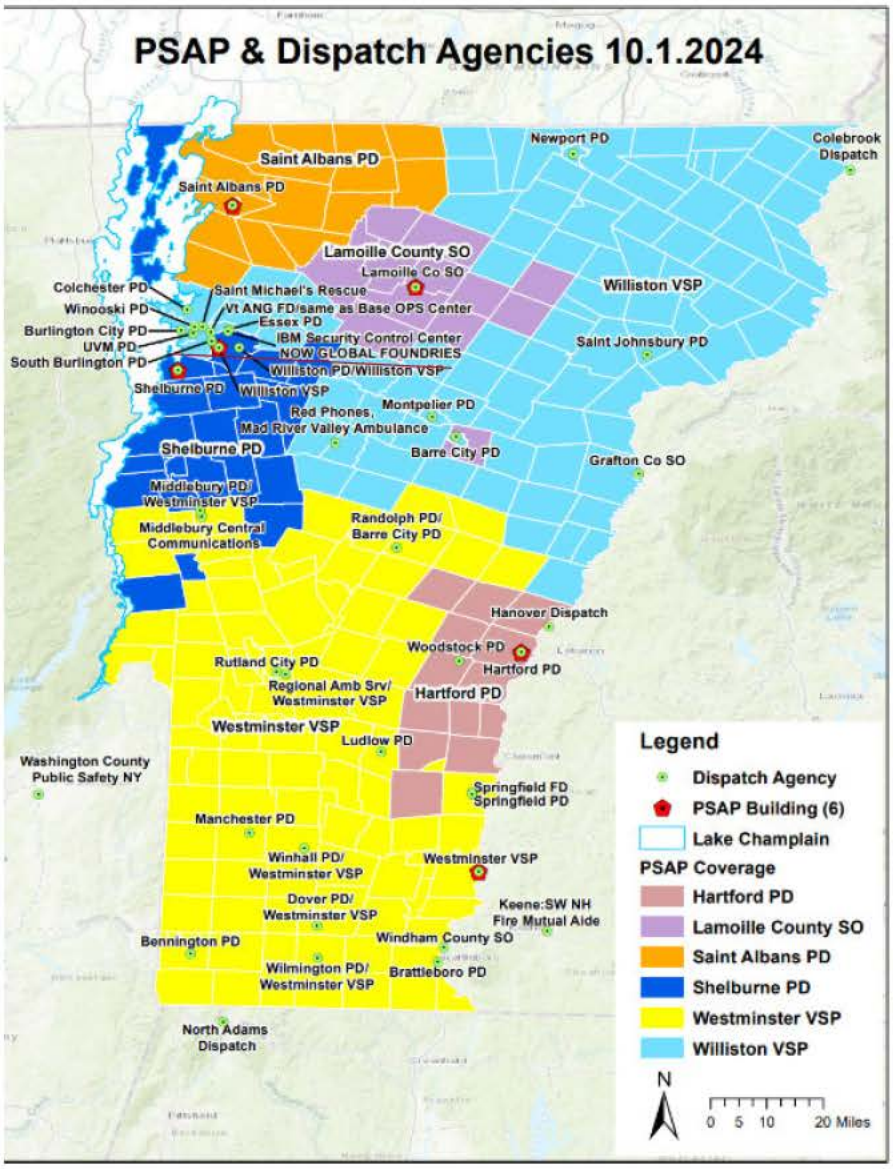
Appendix C: Dispatch Centers with County Boundaries



Appendix D: Dispatch Centers with VSP Borders

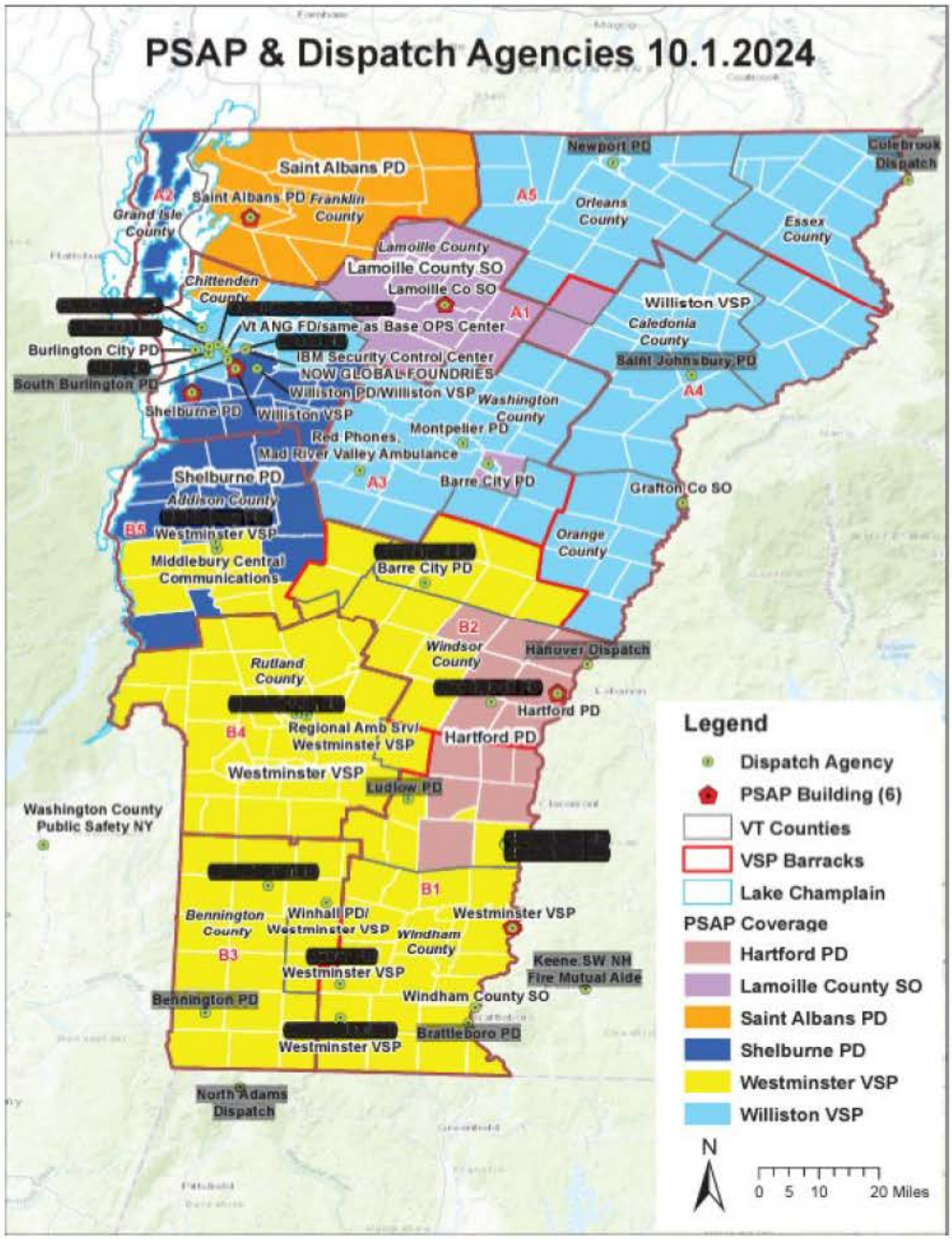


Appendix E: PSAP & Dispatch Center by Primary Catchment Area

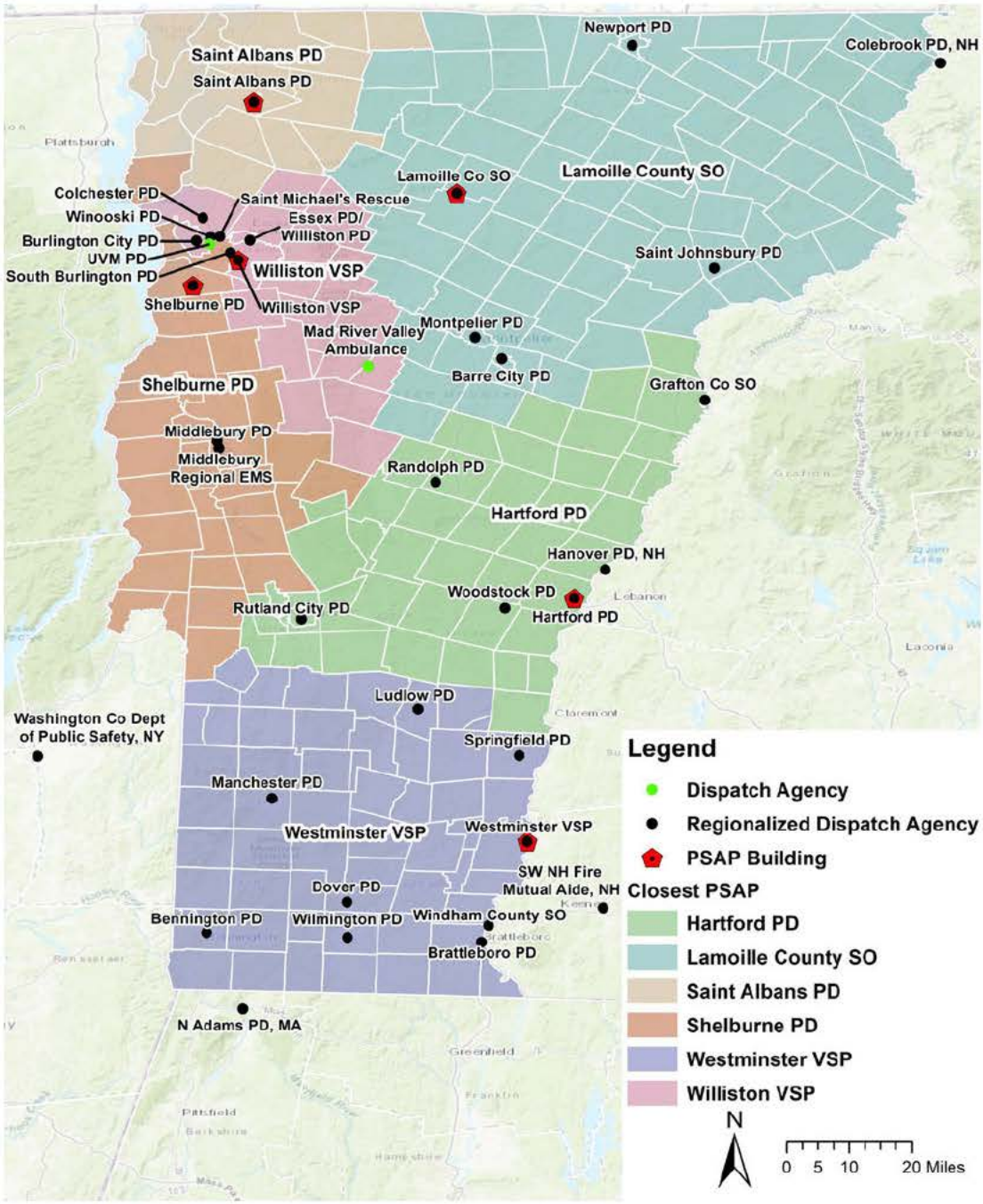


Appendix F: Physical (Facilities-based) Regionalization Option Maps

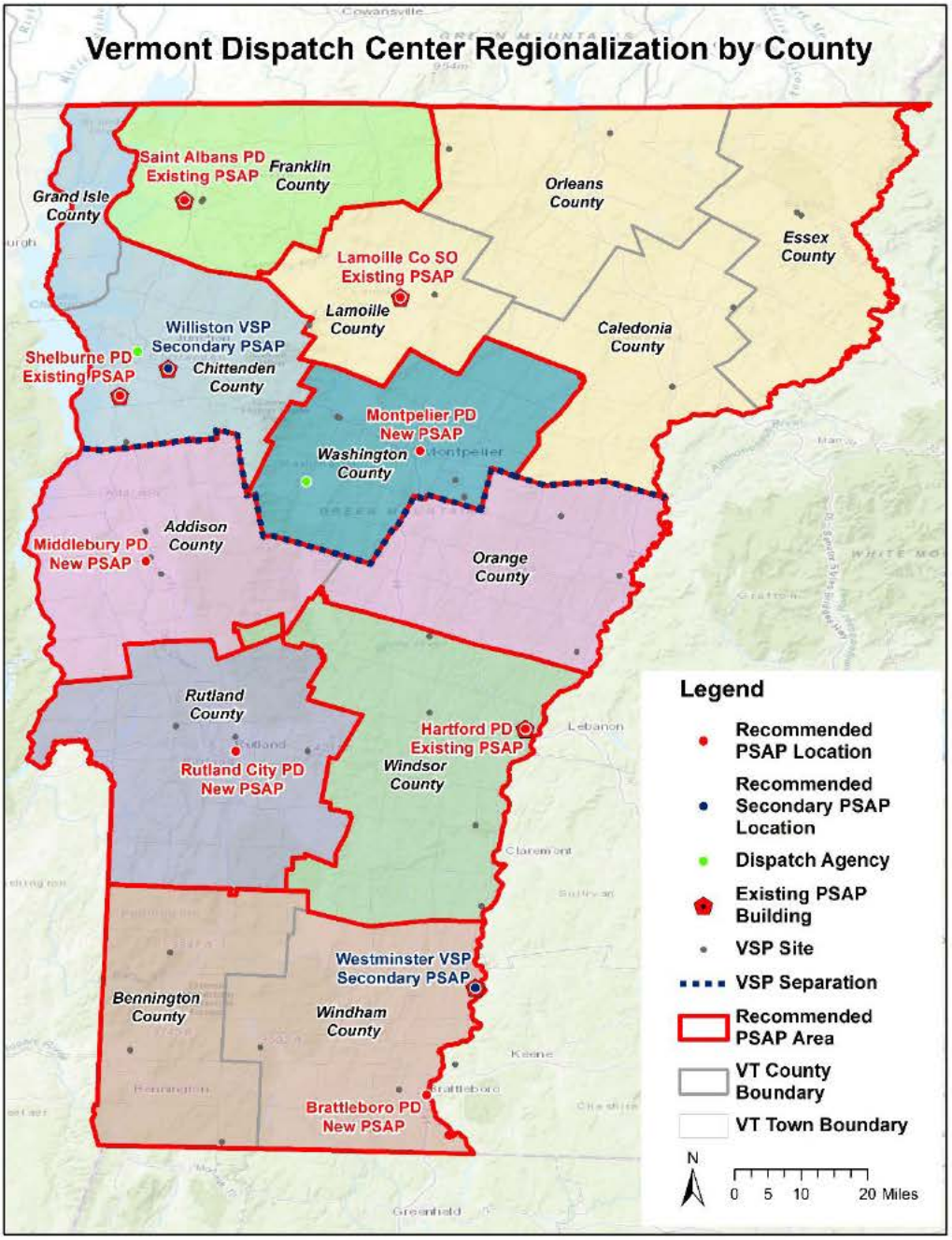
Option 1 in Section 3.4 is represented by the blacked-out centers (13) which have regionalization benchmark ratings of 8 and 9. This option reduces the number of dispatch centers from 25 down to 12. Options 2 and 3 further reduce the number of dispatch centers by another six as represented by the grayed-out centers (6) adding those with a regionalization benchmark rating of 7. The centers identified in this approach may need to be adjusted based on a variety of factors including closing of wireless coverage gaps. Options 3 would result in a total of six PSAPs and six dispatch centers.



Option 4 would result in only six PSAPs.



Option 5 would result in eight primary PSAPs and two secondary PSAPs.



Appendix G: Governance Authority Types Key Findings (SAFECOM and National Council Of Statewide Interoperability Coordinators, 2015)

Key Findings	Ad-Hoc	Executive Order	Statute
Dependent on a Governor that understand and values public safety needs and interoperable communications issues		X	X
Likely to result in the executive staff and the Governor having greater awareness of the role of the governance body		X	X
Increases political and financial backing to advance public safety interoperability needs and priorities		X	X
Minimizes disagreements over the governance body's roles and responsibilities if clearly defined with stakeholder buy-in		X	X
Provides maximum authority with greatest degree of continuity and stability			X
Likely to be the most restrictive approach with any changes requiring the longest amount of time to implement, particularly in a short legislative cycle			X
Critical public safety communications issues subject to greater influence by industry groups and lobbyists in an attempt to influence decision-making		X	X
Expeditious way to legally address challenges caused by the diffusion of responsibilities across multiple governance bodies		X	
Most responsive to change as it allows the governance body to adjust as the operating landscape evolves	X	X	
May experience challenges funding large-scale communications initiatives if the governance body does not represent itself before the legislative body	X	X	
Allows the governance body to publish rules and policies in a responsive way	X	X	X
Avoids delays associated with an often lengthy and politicized legislative review and approval process	X	X	
Potential to change or disband each time there is a new Administration (e.g., Governor, Mayor, City Council)	X	X	
Highly dependent on volunteer members that have a vested interest to advance public safety interoperability	X		
Purview of the governance body may be limited to members' are of expertise with limited enforceability authority	X		
Potential to be the most disruptive form as key members change roles due to the voluntary-nature of membership	X		

Appendix H: Consolidation Alliance Profile

A consolidation alliance profile allows an emergency communications center to identify those agencies that may be a fit both operationally and culturally. The outline that follows considers numerous factors beyond the original Category One and Category Two benchmark criteria listed in Appendix B.

Consolidation Alliance Profile			
Profile Questions (*Consolidation Benchmark Criteria)	**Your Agency** (Identify Must Haves/Nice to Haves)	**Prospect A**	**Prospect B**
History and Demographics			
• Years in operation			
• Population*			
– Projected growth			
• Geography			
– Contiguous borders			
– Mutual aid			
• 9-1-1 call volume*			
• 10-digit call volume*			
• Transfers			
– Outbound*			
– Inbound			
• Minimum staffing per shift*			
• Number of workstations*			
• Other agencies dispatched			
• Cost per call*			
Services Provided			
• Call-taking			
– EMD			

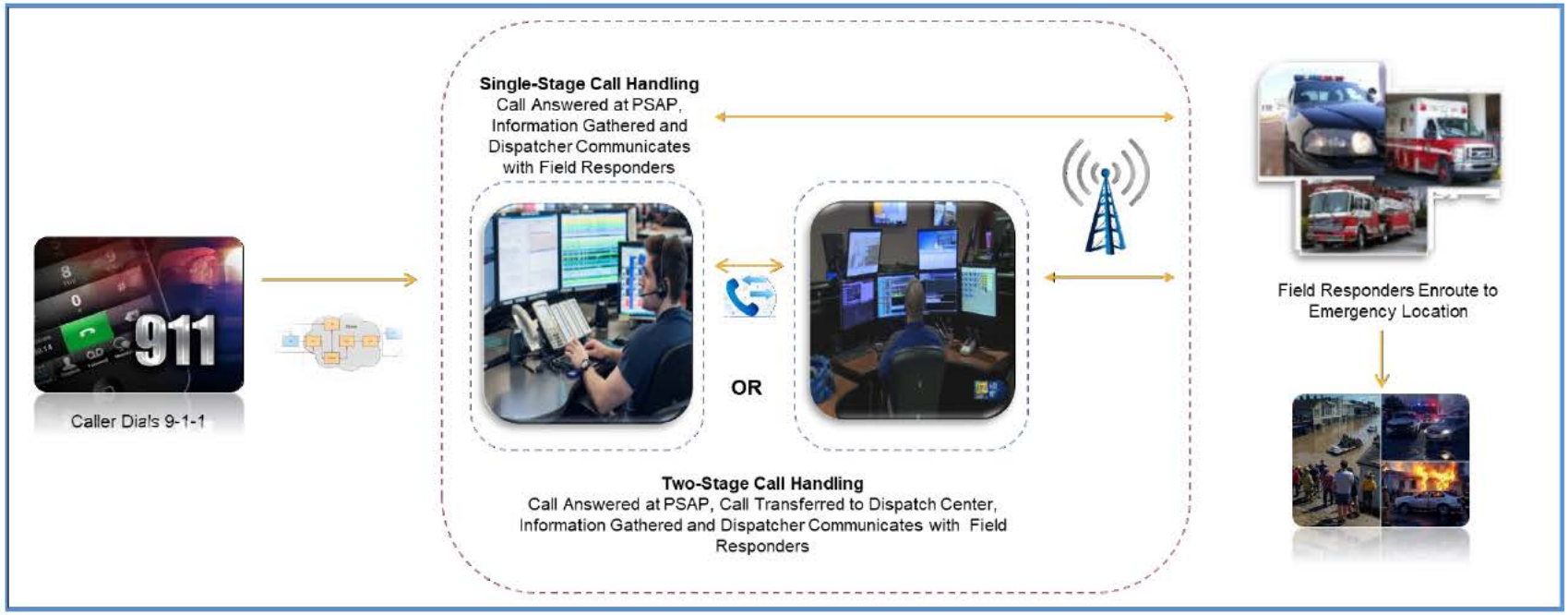
Consolidation Alliance Profile			
Profile Questions (*Consolidation Benchmark Criteria)	**Your Agency** (Identify Must Haves/Nice to Haves)	**Prospect A**	**Prospect B**
– EFD			
– EPD			
– Nurse Navigation			
– ASAP to PSAP			
– Other			
• Dispatching			
– Law enforcement			
– Fire			
– EMS			
• Administrative duties			
• 3-1-1			
• Jail duties			
• Security camera monitoring			
• Access control			
• Support city/county services			
• Walkup window			
• Vehicle releases			
• Early warning system notifications			
• Warrants/Records			
• Public address notifications			
• Billing/Payment receipt			
• Alternative response			

Consolidation Alliance Profile			
Profile Questions (*Consolidation Benchmark Criteria)	**Your Agency** (Identify Must Haves/Nice to Haves)	**Prospect A**	**Prospect B**
Staffing			
• Full-time			
– Telecommunicators			
– Communications training officers			
– Shift supervisors			
– Managers			
– Training coordinator			
– QA coordinator			
– Director			
• Part-time			
• IT			
– In-house			
– Municipal			
– Outsourced			
• Persistent vacancies			
Culture			
• Core values defined			
• Strategic plan			
• Change management policy			
• Employee engagement scores			
• Recognition programs			
• Career advancement			
• Training completion statistics			

Consolidation Alliance Profile			
Profile Questions (*Consolidation Benchmark Criteria)	**Your Agency** (Identify Must Haves/Nice to Haves)	**Prospect A**	**Prospect B**
• Retention rate*			
Finances			
• Budget			
• Revenue sources			
• Projections			
• Capital improvement projects			
Facilities			
• Sufficient space exists			
• Renovations of existing space would be needed and/or are possible			
• A new facility would be required			
Political Environment (stakeholder and constituent support)			
• Elected officials			
• Executive leadership			
• Field personnel			
• PSAP personnel			
• Constituents			
Technology and Systems in Use			
• CAD			

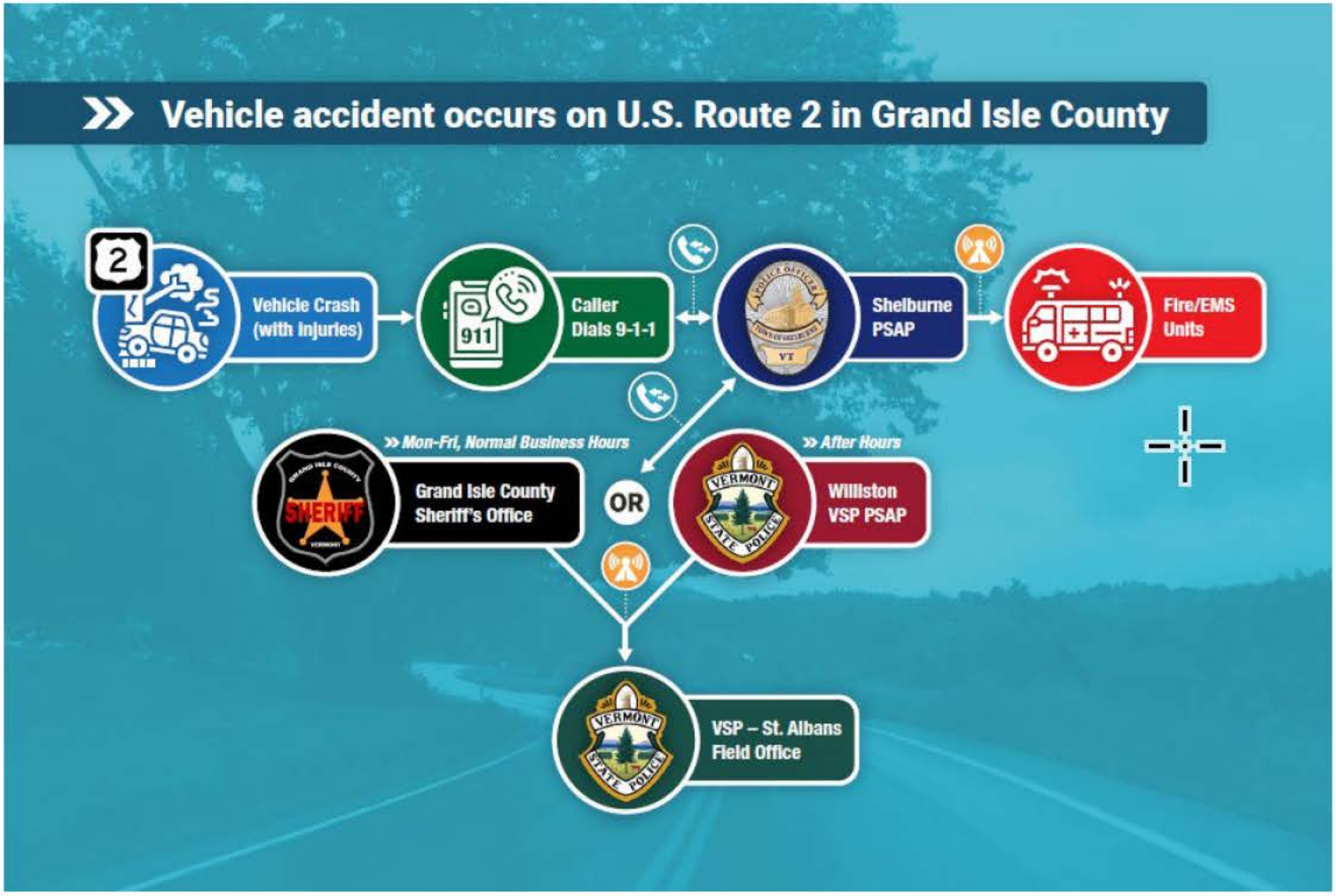
Consolidation Alliance Profile			
Profile Questions (*Consolidation Benchmark Criteria)	**Your Agency** (Identify Must Haves/Nice to Haves)	**Prospect A**	**Prospect B**
• RMS			
• CHE			
– NG9-1-1 or legacy 9-1-1			
• Radio			
– Radio coverage			
• FSA system			
• Logging recorder			
• Cybersecurity policies and practices			
• Applications			
Legal and Media Exposure			
• Threatened/Pending lawsuits			
• Media			
– Negative coverage			
– Positive coverage			
Organizational Structure			
• Management plans			
• Workforce integration			
– Positions			
– Seniority			
– Wages and benefits			

Appendix I: Single-Stage and Two-Stage Call Handling Workflow



Appendix J: Emergency Incident Response Workflow

Figure 19 below depicts an emergency response (law enforcement, fire, and EMS) to a vehicle accident that occurs on Route 2 in Grand Isle County. This workflow shows each step in the process and who is completing the step(s). The precise workflow differs from county to county; however, in large part this image shows the average workflow for an incident of this type throughout the state.



1. Emergency incident occurs
2. Caller places a call to 911
3. A telecommunicator in the Shelburne PSAP processes the initial 911 call
4. Upon completion of the call-taking sequence, the initial telecommunicator transfers the call to the Grand Isle County Sheriff's Office (Monday – Friday, during normal business hours) OR the VSP Williston PSAP (during non-business hours) to initiate a law enforcement response.
5. While the initial caller is being transferred to initiate the law enforcement response, another Shelburne telecommunicator dispatches appropriate fire and EMS responders.

Figure 19: Emergency Incident Response Workflow (initial response)

Throughout Vermont, most of the fire and EMS response agencies are operated as volunteer organizations. As such, there are times when the initial fire and/or EMS entity that is dispatched to an incident such as this is unavailable to respond for a variety of reasons (e.g., staff are otherwise engaged on another emergency response, staff are not in the station at the time of dispatch and are otherwise unavailable, etc.) In these instances, after a period of time following the initial radio dispatch, the next closest fire and/or EMS resources are dispatched. Figure 20 depicts the additional process to obtain said assistance.

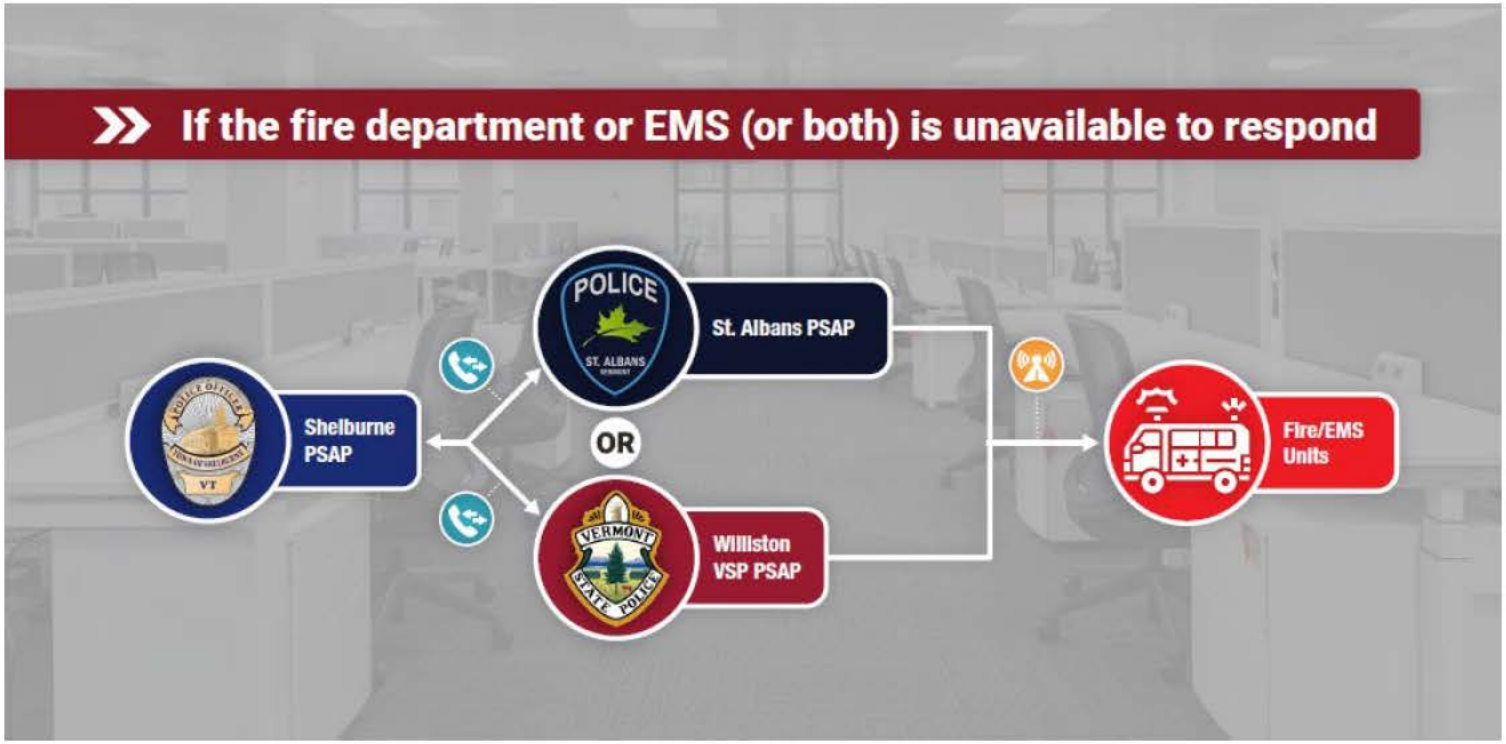


Figure 20: Emergency Incident Response Workflow (secondary response)

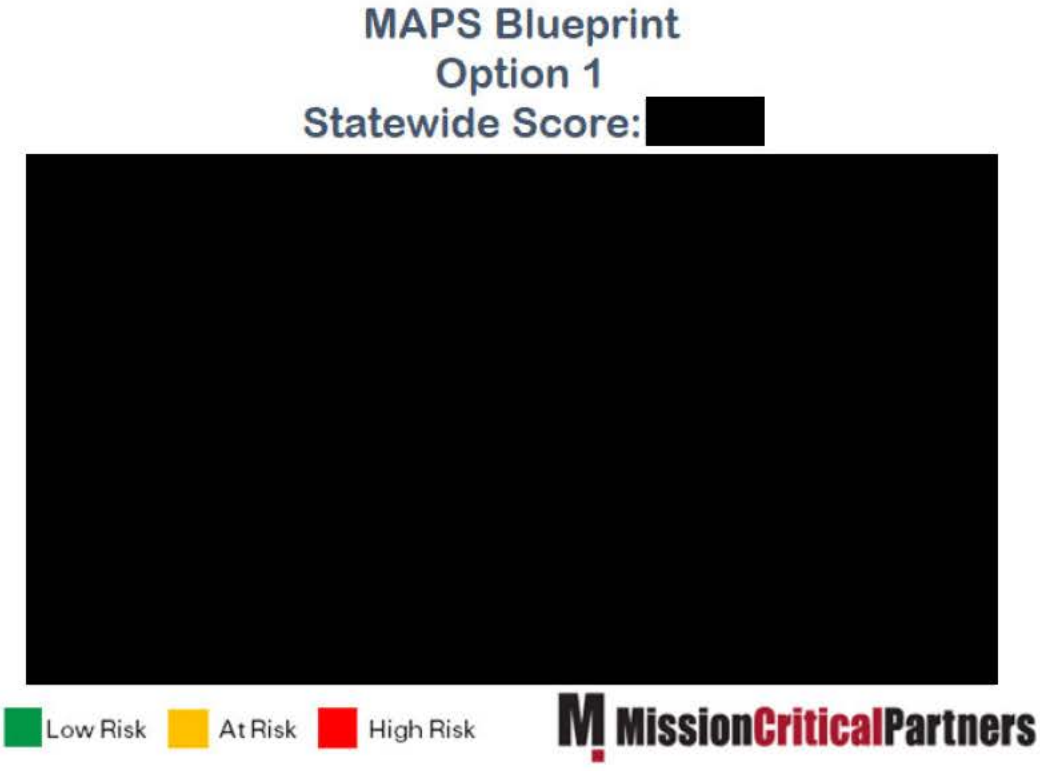
1. A Shelburne PSAP telecommunicator places a call to the St. Albans PSAP and/or the VSP Williston PSAP to request mutual aid resources to respond.
2. The telecommunicator at the St. Albans PSAP and/or the VSP Williston PSAP who answers this phone call creates an entry in their CAD system.
3. A telecommunicator—in many instances the same individual—dispatches the requested fire and/or EMS resources
4. This process starts anew if the requested resources are unavailable to respond for any reason.

Appendix K: Future State MAPS Blueprints

The following MAPS blueprints illustrate the potential improvements beyond those outlined in Section 4.3 for each regionalization option identified in Section 3.4. Each blueprint includes the assumptions used in its development. The original statewide MAPS score—[redacted] out of 10—is represented by the yellow line, while the blue line represents the projected score for each specific option. All five options include out-of-state dispatch centers.

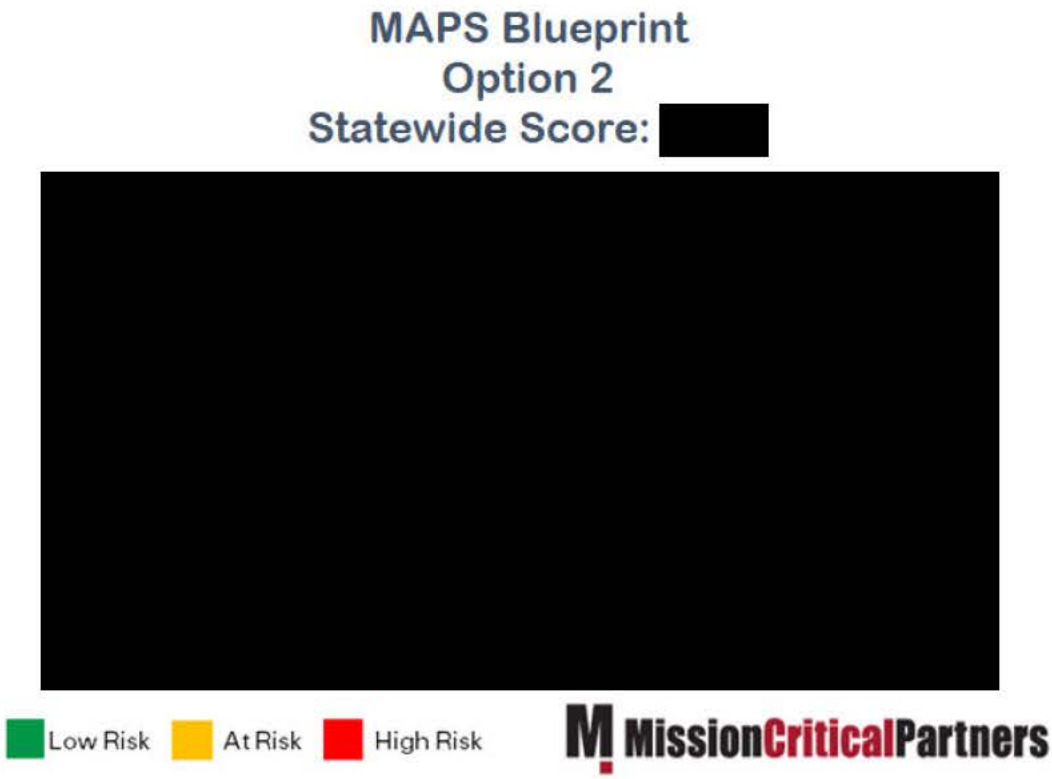
Option 1: Maintain Existing Six PSAPs (Regionalize 12 Dispatch Centers) Model

Option 1 regionalizes the following dispatch centers with another center: Colchester, Dover, Essex, Manchester, Middlebury PD, Randolph, Rutland City, Springfield, Saint Michaels College Fire/Rescue, Wilmington, Winooski, and Woodstock. Option 1 results in a MAPS score of [redacted] out of 10.



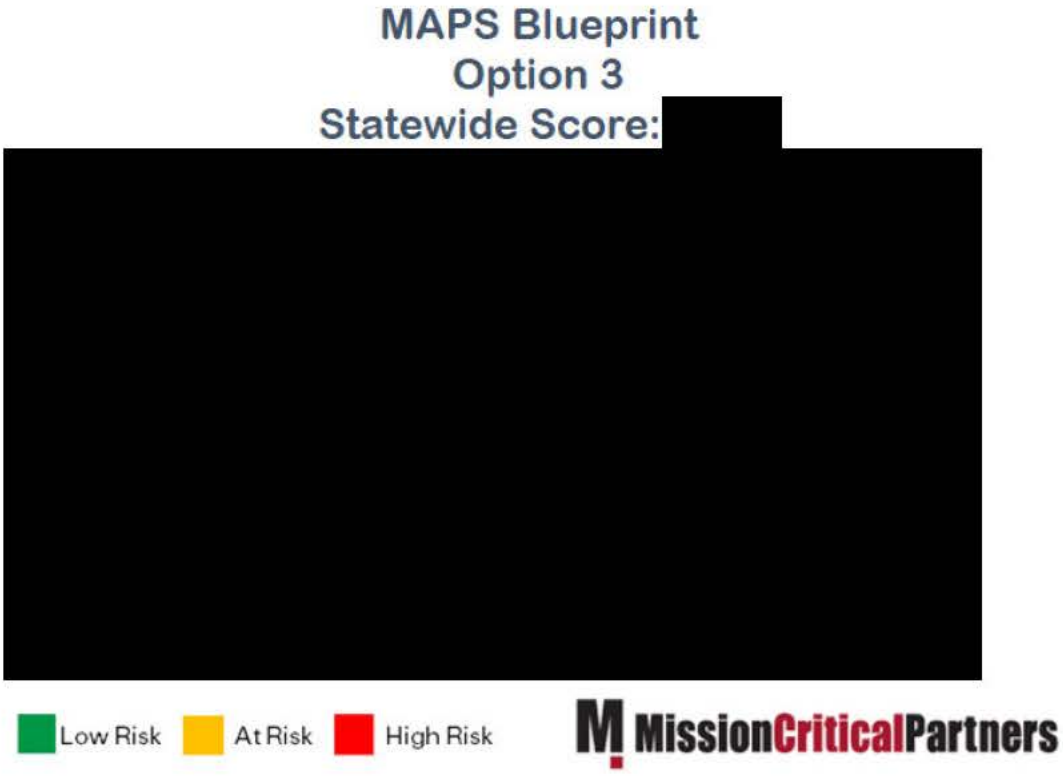
Option 2: Two Regional and Four State PSAPs (Limited Dispatch Center) Model

Option 2 further regionalizes the following dispatch centers with another center: Option 1 centers plus Barre City, Bennington, Brattleboro, Ludlow, Middlebury Regional EMS, Newport, South Burlington, St. Johnsbury, and Windham County. Option 2 results in a MAPS score of [redacted] out of 10.



Option 3: Maintain Existing Six PSAPs (Limited Dispatch Centers) Model

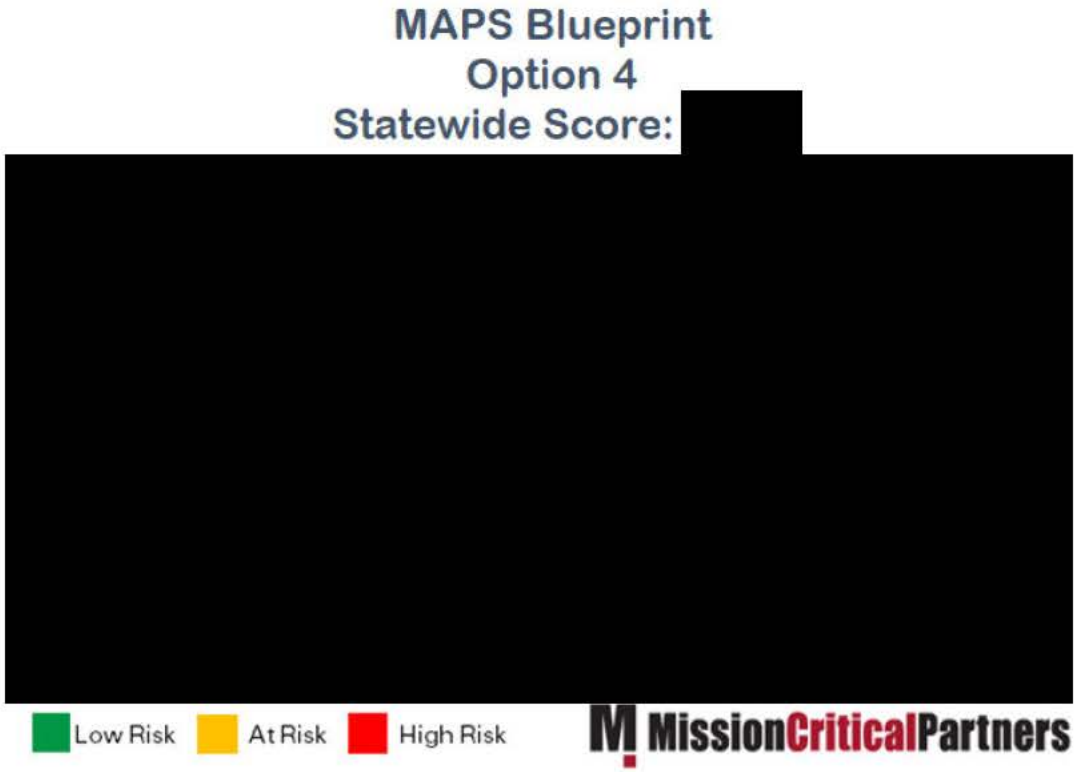
Option 3 maintains the six existing PSAPs and the regional dispatch centers at Mad River Valley Ambulance Service and University of Vermont (due to the unique nature of their operations), and Newport and St. Johnsbury (to fill in LMR coverage gaps).[104] Due to personnel seeking employment from dispatch centers that have been regionalized, the personnel score was increased by two for each agency. Option 3 results in a MAPS score of [redacted] out of 10.



[104] The regional dispatch centers are chosen were approximated based on geographic proximity to a Vermont PSAP and out-of-state dispatch centers. It is difficult to determine the exact centers that may be required to fill in coverage gaps; further LMR coverage studies would need to be conducted, including all appropriate variables (including removal of dispatch centers that are subject to regionalization based on this option).

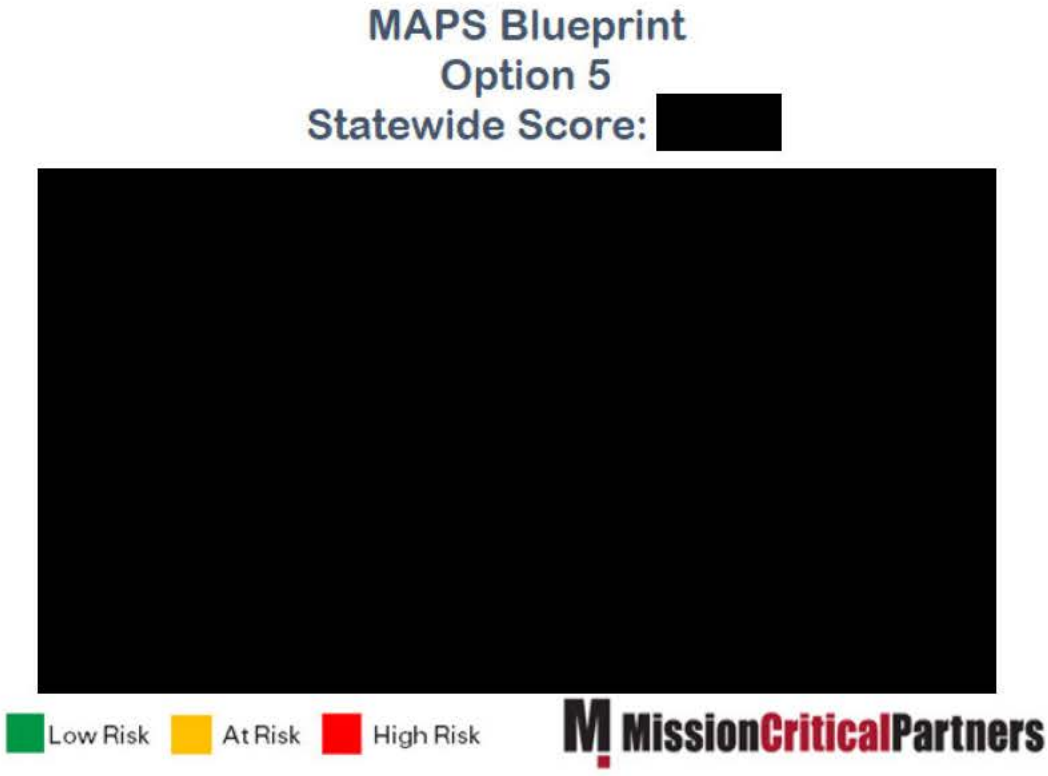
Option 4: Six PSAPs (No Regional Dispatch Centers) Model

Option 4 maintains the six existing PSAPs and the regional dispatch centers at Mad River Valley Ambulance Service and University of Vermont (due to the unique nature of their operations). Due to personnel seeking employment from dispatch centers that have been regionalized, the personnel score was increased by two for each agency. Option 4 results in a MAPS score of [redacted] out of 10.



Option 5: County PSAPs Model

Option 5 maintains four regional PSAPs and the regional dispatch centers at Mad River Valley Ambulance Service and University of Vermont (due to the unique nature of their operations), transforms the regional dispatch centers at Brattleboro, Middlebury, Montpelier and Rutland into PSAPs, and repurposes VSP Westminster and VSP Williston as secondary PSAPs. Due to personnel seeking employment from dispatch centers that have been regionalized, the personnel score was increased by two for each agency. Option 5 results in a MAPS score of [redacted] out of 10.



Appendix L: Glossary

Acronym	Term
AI	Artificial Intelligence
ALI	Automatic Location Identification
ANI	Automatic Number Identification
APCO	Association of Public Safety Communication Officials
CAD	Computer Aided Dispatch
CHE	Call Handling Equipment
COOP	Continuity of Operations Plan
EAS	Early Warning System
ECC	Emergency Communications Center
EFD	Emergency Fire Dispatch
EMA	Emergency Management Agency
EMD	Emergency Medical Dispatch
EMS	Emergency Medical Services
EPD	Emergency Police Dispatch
FCC	Federal Communications Commission
FSA	Fire Station Alerting
LMR	Land Mobile Radio
MDC	Mobile Data Computer
MDT	Mobile Data Terminal
NCIC	National Crime Information Center
NENA	National Emergency Number Association
NFPA	National Fire Protection Association
NG911	Next Generation 911

Acronym	Term
NIets	National Law Enforcement Telecommunications Network
PSAP	Public Safety Answering Point
PTT	Push-to-talk
QA	Quality Assurance
QI	Quality Improvement
RF	Radio Frequency
RMS	Records Management System
SCF	Secure Controls Framework
UHF	Ultra-high Frequency
UPS	Uninterrupted Power Supply
VCOMM	Vermont Communications System
VHF	Very-high Frequency

Appendix M: Emergency Communications Ecosystem