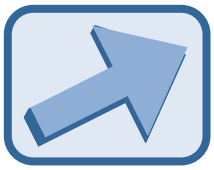
Proposed California NG9-1-1 Roadmap

December 2010


Initiation Phase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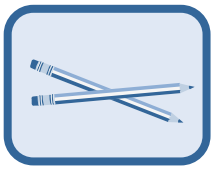
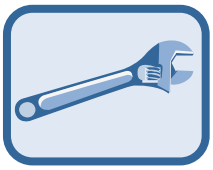

Requirements, Planning & Design Phase


Proof of Concept Phase


Implementation Phase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Arnold Schwarzenegger
Governor

Christy Quinlan
Interim Agency Secretary

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CALIFORNIA TECHNOLOGY AGENCY

Christy Quinlan
Interim Agency Secretary

Dear Fellow Californians:

Relentless advances in technology present ever-growing opportunities for California to define, adopt and implement new and more efficient services that support all Californians. Nowhere is this opportunity greater today than in the delivery of 9-1-1 emergency call services where the need to transform California's legacy 9-1-1 services into the next generation of 9-1-1 is both real and achievable. Today's 9-1-1 platform does not support prevalent technologies like text, video, or photos nor do they offer methodologies to easily adapt and deal with call congestion or workload overflows.

On July 30, 2010, the California 9-1-1 Emergency Communications Office (CA State 9-1-1 Office) published the California 9-1-1 Strategic Plan to emerge as a nationwide leader in the 9-1-1 community. California's commitment to NG9-1-1 continued by working diligently during this past year to create a roadmap that outlines the details necessary to design and build the best Next Generation 9-1-1 (NG 9-1-1) system in the country.

And so it is with great pleasure that I present the Proposed ***CA NG9-1-1 Roadmap***, an action-based, tactical plan that supports the building of a new, cutting-edge NG9-1-1 system in California. This *Roadmap* defines tasks, critical decision points, dependencies, and work products, while pursuing an aggressive timetable.

The planning that has gone into the resulting *Roadmap* is notable, and reflects the hard-work, dedication and collaboration of the CA State 9-1-1 Office staff, and key contributors. The *Roadmap* will be disseminated to the broader 9-1-1 Community for final review and comment. The *Roadmap* will empower California to take a leadership role in NG9-1-1 emergency call handling and underscores California's unwavering commitment to Californians and the 9-1-1 community. It is intended to be a living document that will be revised and updated as necessary.

All Californians will benefit from an NG9-1-1 System and should be excited and pleased that California is committed to taking on this endeavor. I invite you to take a closer look at the attached *Roadmap* and learn how the CA NG9-1-1 system will result in a new level of emergency response for all Californians while providing a robust, sustainable and extensible platform for future advancements.

Sincerely,

/s/

Christy Quinlan

Acting Agency Secretary

Executive Summary

For more than forty years Californians have been served by a capable 9-1-1 system. In 2009, the CA 9-1-1 System handled 24.8 million calls alone. However, while the current 9-1-1 system has functioned efficiently for many decades, the core infrastructure is built on a legacy telephony-based platform unable to support new demands and capabilities.

Widespread adoption of rapidly advancing technologies like text, video, Voice over Internet Protocol (VoIP) and the saturation of high-speed broadband access has raised the expectations of 9-1-1 services for Californians. Improvements are needed to support new requirements and expectations. To that end, California, along with other parts of the country, is migrating to Next Generation 9-1-1 (NG9-1-1).

NG9-1-1 provides the ability to accept multimedia data (e.g. text, video and photo) and improves interoperability, call routing, PSAP call overflow, and location accuracy. NG9-1-1 strengthens system resiliency and reliability, as well as increases opportunities to achieve fiscal and operational efficiency through cost-sharing arrangements.

The federal government recognizes the importance of NG9-1-1. Congress, the Federal Communications Commission (FCC) and the US Department of Transportation (US DOT) have initiated efforts to advance NG9-1-1 at the national level.

At a state level, CA is committed to collaboratively bringing NG9-1-1 to local agencies and the citizens of California. The previously published CA Strategic 9-1-1 Plan identified the migration of CA's legacy 9-1-1 system to NG9-1-1 as a key goal. Furthermore, CA is dedicated to actively advancing the national NG9-1-1 agenda.

This document is the Roadmap that identifies the steps and tasks necessary to assess, plan, design, test, implement and maintain a comprehensive NG9-1-1 System in CA. Industry leader and consulting firm L.R. Kimball was hired to lead the development of the

Roadmap. During the creation of the Roadmap, the CA State 9-1-1 Office hosted a contributor workshop and conducted a statewide survey in which participants discussed their top issues, obstacles and concerns for inclusion in the Roadmap.

The Roadmap utilizes a comprehensive methodology for the implementation of NG9-1-1 in CA:

1. **Initiation phase**
2. **Assessment & analysis phase**
3. **Requirements, design & planning phase**
4. **Proof of concept phase**
5. **Implementation phase**
6. **Maintenance & management phase**

In each phase there are studies, reports, requirements, designs and plans related to the following subject areas:

- **Regulatory, legislative & funding**
- **Governance**
- **Technology**
- **Operations**
- **Security**
- **Related CA projects**
- **CA State 9-1-1 Office**

The Roadmap is designed to be an actionable, sustainable, tactically-focused methodology for a statewide NG9-1-1 implementation.

The Roadmap identifies the **tasks**, **high-level timelines**, **key decision points**, **critical dependencies** and **work products** necessary to implement a NG9-1-1 system in CA.

The CA State 9-1-1 Office, collaborating with key stakeholders, will actively lead the 9-1-1 community through the transformation to NG9-1-1. The outcome will be an improved level of emergency response for all Californians.

Introduction & Overview

The Need for NG9-1-1 in CA

Californians have been served by 9-1-1 since the 1970's. In 2009, 24.8 million emergency 9-1-1 calls were handled in California (CA). Of those calls, 16.8 million were wireless calls, which were an increase of 30 percent from 2008. On any given day in CA approximately 70 thousand calls to 9-1-1 are made. Of those, 45 thousand calls are typically wireless.

The widespread and rapid adoption of wireless phones along with technologies like texting, video, Voice over Internet Protocol (VoIP), coupled with the saturation of high-speed broadband access has raised Californians' expectations of 9-1-1 services.

Currently, 9-1-1 is unable to accept text messages, video feeds, photos or other forms of multimedia, instead relying solely on voice. Yet, many consumers are unaware of this limitation and assume or expect to use these technologies to communicate with 9-1-1.

While the current 9-1-1 system has functioned well for many decades, its core infrastructure is built on an antiquated telephony-based platform that is unable to support these new consumer expectations. With that understanding, CA, along with other parts of the country, is proactively migrating to NG9-1-1.

Today's 9-1-1	Next Generation 9-1-1
Virtually all calls are voice callers via telephones over analog lines.	Voice, text, or video information, from many types of communication devices, sent over IP networks
Most information transferred via voice	Advanced data sharing is automatically performed
Callers routed through legacy selective routers, limited forwarding / backup ability	Physical location of PSAP becomes immaterial, callers routed automatically based on geographic location, enhanced backup abilities
Limited ability to handle overflow situations, callers could receive a busy signal	PSAPs able to control call congestion treatment, including dynamically rerouting callers

United States Department of Transportation NG9-1-1

US DOT: Comparing 9-1-1 to NG9-1-1

NG9-1-1, which is based on Internet Protocol (IP) technology, provides increased accessibility to 9-1-1. By supporting new forms of multimedia, callers can initiate requests for assistance from many devices and in different ways such as texting, video and photo. In addition, NG9-1-1 provides enhanced interoperability, ease of use, resiliency and the potential to spread call workload and costs among parties that share the infrastructure.

The federal government has recognized the importance of NG9-1-1 at various levels:

- **Congress**: Included IP-based 9-1-1 systems (a key NG9-1-1 element) in the New and Emerging Technologies (NET) 911 Act, and is considering new legislation to reauthorize the National 911 Office which provides national coordination on 9-1-1, and specifically on NG9-1-1.
- **Federal Communication Commission (FCC):** The FCC's National Broadband Plan addressed the potential to leverage broadband assets in the migration to NG9-1-1 and recently released a notice of inquiry seeking feedback on NG9-1-1 and texting.
- **U.S. Department of Transportation (US DOT) and U.S. Department of Commerce (US DOC):**

The National 9-1-1 Office was a joint program of the US DOT and DOC and managed a grant program which included NG9-1-1. The DOT conducted a research and development project to prove the concepts behind NG9-1-1, and published numerous documents addressing technological, operational and financial aspects.

The CA State 9-1-1 Office recognizes the value NG9-1-1 will bring to local agencies and the citizens of California. In June 2009, the office released the CA Strategic 9-1-1 Plan, which identified the migration of CA's legacy 9-1-1 system to NG9-1-1 as a key goal. The CA State 9-1-1 Office has begun the process of actively planning for the migration to NG9-1-1. This document, an NG9-1-1 Roadmap for CA, identifies the tasks necessary to plan, design, test, implement and maintain an effective, comprehensive and secure NG9-1-1 system in the CA.

The CA NG9-1-1 System will contain the functions of the legacy 9-1-1 system while allowing for greater accessibility, interoperability, functionality, reliability and better utilization of financial and human resources, in a secure environment.

Elements to Address in Migration to NG9-1-1

Additional benefits of migrating to NG9-1-1 include but are not limited to:

- More accurate location verification
- Improved first response
- Improve access to persons with disabilities
- Increased reliability and disaster recovery of the delivery network
- Ability to route 9-1-1 calls statewide
- Increased capability for Public Safety Answering Points (PSAPs) to exchange/share data, share workloads /call overflow when congested
- Greater opportunities for fiscal and operational efficiencies
- Supports enhanced interoperability

Approach

The CA State 9-1-1 Office hired consulting firm L.R. Kimball[1] to provide subject matter expertise in the creation of a CA-specific NG9-1-1 Roadmap. The process used to create the Roadmap included a detailed analysis of national and state activities, including other state's progress, the results of the U.S. DOT's NG9-1-1 Initiative, and the activities of national organizations like the National Emergency Number Association (NENA) and Association of Public Safety Communications Professionals (APCO).

The Roadmap leveraged previously completed CA work including the CA 9-1-1 Strategic Plan and an NG9-1-1 Statewide Analysis conducted by California Technology Agency.

The process included a contributor workshop held on November 30, 2010, whereby the CA State 9-1-1 Office solicited detailed feedback regarding key concerns and issues to consider in the creation of the Roadmap and beyond. Please see Appendix A for a summary of this meeting.

Additionally, CA conducted a statewide "NG9-1-1 Key Issues and Concerns Survey[2]" to give stakeholders in the broader CA 9-1-1 community an opportunity to express their concerns about NG9-1-1, what they liked/disliked about the current system and what they felt were the most important issues to consider in

1 L.R. Kimball is owned by CDI Corporation, a publicly held company, through its wholly owned subsidiary Management Recruiters, Inc. and is known as CDI-Infrastructure, LLC d/b/a L.R. Kimball.

2 The survey will be published in early 2011

planning for NG9-1-1.

Definitions

Term	Definition
Next Generation 9-1-1 (NG9-1-1)	NG9-1-1 is a robust system of systems that will allow the public to use any device to request help or send information to the appropriate public safety agency. It will: • provide standardized interfaces from call and message services process all types of emergency calls including non-voice (multi-media) messages • acquire and integrate additional data useful to call routing and handling • deliver the calls/messages and data to the appropriate PSAPs and other appropriate emergency entities • support data and communications needs for coordinated incident response and management • provide a secure environment for emergency communications[3]
CA NG9-1-1 Roadmap	An action-based, sustainable, tactically-focused plan for statewide NG9-1-1 implementation. The California NG9-1-1 Roadmap is in line with goals in California State 9-1-1 Strategic Plan, National activities/timeframes, and identifies the tasks, , high-level timelines, critical decision points, obstacles, and dependencies necessary to implement an NG9-1-1 System in CA.
CA NG9-1-1 Initiative	Refers to the overall collection of activities necessary to migrate and transform California's legacy 9-1-1 to a comprehensive, robust, secure, and efficient NG9-1-1 system.
CA NG9-1-1 System	Refers to the overall high-level "enterprise" NG9-1-1 system in California and is comprised of a number of subsystems, people, processes, governance, legislative and regulatory elements, applications and technology that as a *whole* represent NG9-1-1 in California
CA State 9-1-1 Office	Refers to the State of California 9-1-1 Emergency Communications Office, which is housed within the Public Safety Communications Office in the California Technology Agency. The California State 9-1-1 Office enables public safety answering points (PSAPs) to provide expedient telephone access to emergency services for all 9-1-1 callers.
Stakeholder	Refers to a person, group, or organization, which affects or can be affected by 9-1-1/ NG9-1-1 in the State of California.
Public Safety Answering Point (PSAP)	A PSAP is the entity responsible for answering a 9-1-1 call in the State of California.
CA 9-1-1 Community	Refers to the collective grouping of public safety professionals who represent the broader 9-1-1 community in the State of California.
National Emergency Number Association (NENA)	Organization whose mission fosters the technological advancement, availability, and implementation of a universal emergency telephone number system in the United States. NENA promotes research, planning, training and education. NENA first identified the need for NG9-1-1 in 2000, started development actions in 2003, and is nearing full definition and standards for NG9-1-1.
Assessment	The identification and review of what is currently in place
Report	A document that provides the results of an assessment
Analysis	Scientific, or methodology-based study with eye towards recommendations or conclusions (Includes an assessment element)
Study	A document that provides the results of an analysis and may also offer recommendations, comparatives, or conclusions
Governance	A set of processes, policies, laws and institutions affecting the way decisions are made, by what authority and by whom

[3] NENA.org "NG9-1-1 Definition" Document

CA NG9-1-1 Roadmap Overview

The CA NG9-1-1 Roadmap is designed to be an actionable, tactically-focused checklist for a collaborative statewide NG9-1-1 implementation involving the CA 9-1-1 community and any applicable stakeholders.

The CA NG9-1-1 Roadmap identifies the tasks, high-level timelines, critical decision points, and dependencies necessary to implement a NG9-1-1 system in CA and can be used as the basis of a formal NG9-1-1 Project Plan.

The following pages present the CA NG9-1-1 Roadmap. Each section is presented in the following format:

- **Overview**: Provides a high-level overview of the tasks that comprise each phase.
- **Estimated Timeframes**: A high-level approximation of timelines is noted. Timeframes are only potential start/conclusion points for major phases of the project and to provide a sense of scale for each task.
  - *CA seeks to pursue an aggressive timetable for implementation of NG9-1-1 whenever possible.*
  - *Timeframes assume approval of CA NG9-1-1 Roadmap phases and do not account for obstacles or roadblocks.*
- **Tasks**: Provides detailed narratives for each subtask within each phase of the roadmap explaining its importance, work products and any applicable dependencies.
- **Key Decision Points**: Any critical or important decision points (e.g. financial or regulatory or other issues) are explicitly called out.
- **Critical Dependencies**: Where applicable, critical dependencies are identified
- **Work Products**: Items delivered in each phase (e.g. plans, studies, reports, are denoted)

Figure 1, noted on page 6, provides a graphical representation of the CA NG9-1-1 Roadmap timeline. Figure 2 on page 7, offers a graphic depiction of the work products by phase.

While tasks on the CA NG9-1-1 Roadmap extend beyond five years, the CA NG9-1-1 Roadmap has a **5-year shelf** life. CA should review it at least once a year and update it as needed.

The CA NG9-1-1 Roadmap is presented in the order that tasks typically occur. Some phases and tasks may run concurrently. CA has already begun some limited or initial steps identified in the Roadmap and will incorporate current or previous NG9-1-1 related activities.

Next Steps—a Call to Action

While CA establishes itself as a national leader, it must drive the migration to NG9-1-1. Wherever possible, CA will seek to engage in and advance the national discourse and agenda to benefit the 9-1-1 Community and citizens of California.

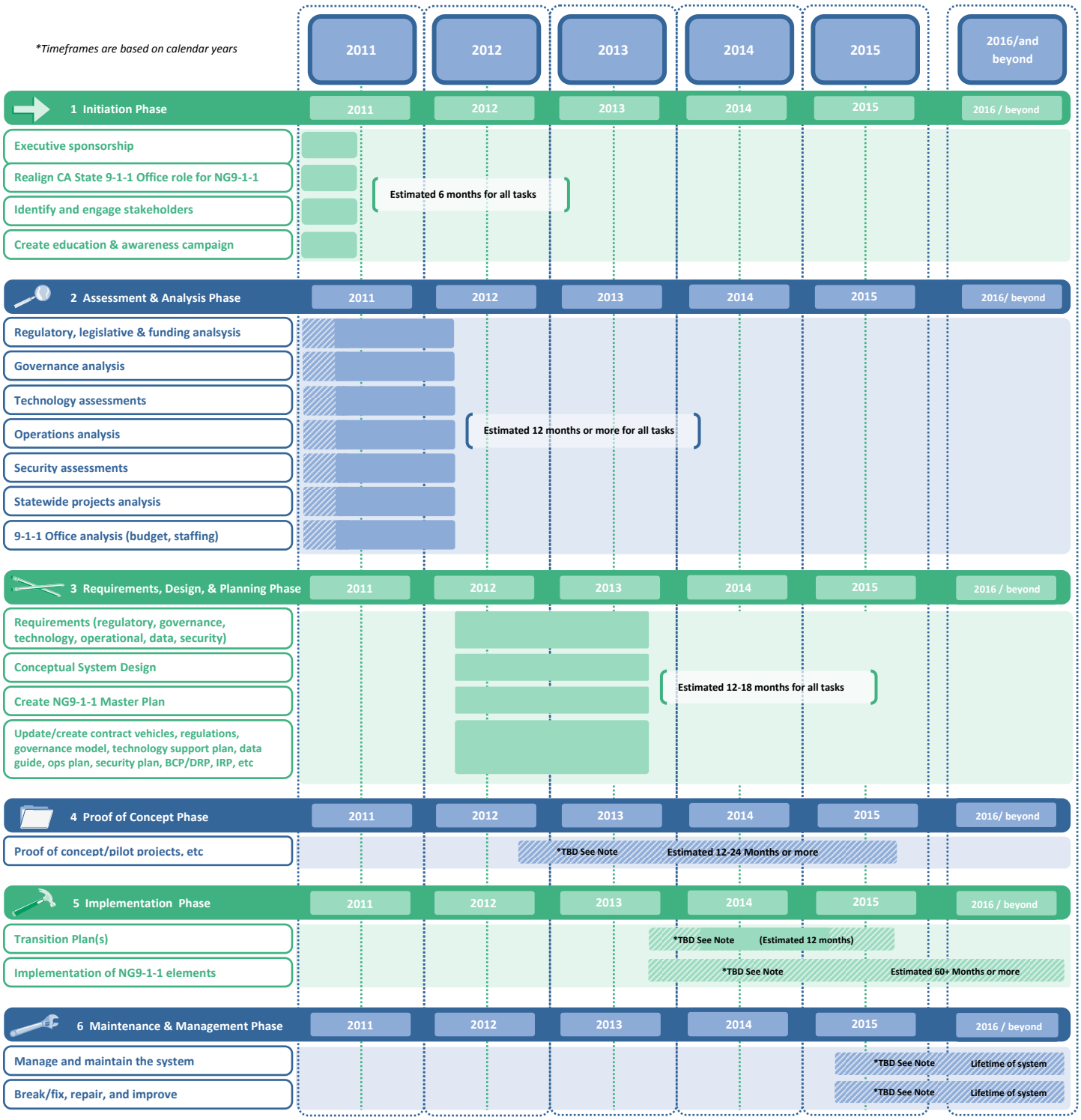
The CA 9-1-1 System must be transformed in order to continue to deliver robust and effective 9-1-1 service into the future. The CA 9-1-1 Office, collaborating with key stakeholders, and using this Roadmap to guide their efforts, will lead the 9-1-1 community through the migration to NG9-1-1.

The outcome will be a new level of emergency response for all Californians and will provide a robust, sustainable and extensible platform for future technology advancements.

CA 9-1-1 Strategic Plan Goals Mapping

Tasks on the CA NG9-1-1 Roadmap are mapped to goals outlined in the CA 9-1-1 Strategic Plan as noted in ***Appendix B****.*

Figure 1—CA NG9-1-1 Roadmap High Level Timeline by Phase

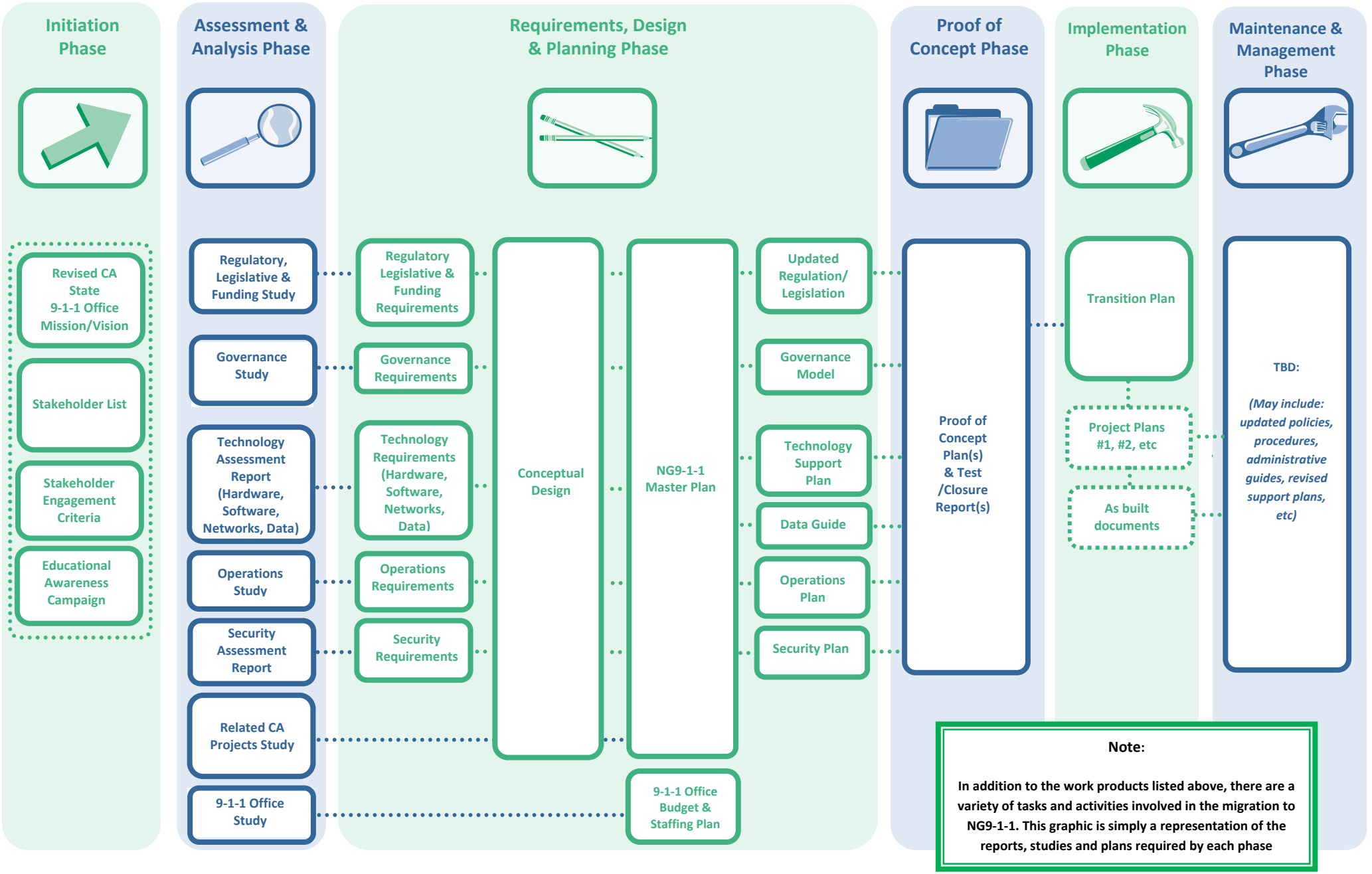


Note:

For all phases of the roadmap, it may be possible to initiate individual subtasks independently and concurrently of other tasks based on executive sponsorship, resource availability, critical dependencies, vendor support, industry standardization, etc.

During the implementation phase, the estimated *start* date refers to the initialization of efforts to deploy individual elements required for NG9-1-1. Implementation of specific elements may vary within the overall timeline for the phase.

Figure 2—CA NG9-1-1 Work Products by Phase



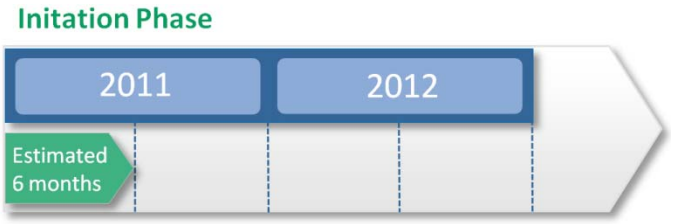
1 Initiation Phase

Overview

The four tasks contained in the Initiation Phase of the project are provided below, many of which are already in progress:

- Executive sponsorship
- Align role of CA State 9-1-1 Office with responsibilities and requirements unique to NG9-1-1
- Identify and engage stakeholder community
- Create an education and awareness campaign

Estimated Timeframes



Tasks

The following tasks are identified with detailed narratives explaining why each subtask is important, outcomes and any applicable dependencies outcomes.

1. Executive sponsorship

The CA State 9-1-1 Office has received executive sponsorship from the Interim Agency Secretary of the California Technology Agency, a Cabinet level position within the Executive branch.

The CA NG9-1-1 Initiative seeks to collaboratively transform CA's 9-1-1 system into a robust NG9-1-1 system that is capable of effectively supporting the growing needs of CA residents and visitors. Such an effort involves the coordination and cooperation of multiple entities and stakeholders. Furthermore, the complexities involved in a project of this magnitude require active and sustained executive support. The CA State NG9-1-1 Office has received executive sponsorship from the Interim Agency Secretary of the California Technology Agency, a Cabinet level position within the Executive branch. It is critical to ensure this sponsorship is maintained throughout the lifetime of the initiative.

2. Continue to align role of CA State 9-1-1 Office with responsibilities and requirements unique to NG9-1-1

The CA State 9-1-1 Office should continue its ongoing efforts to reassess its current role and responsibility in the context of the responsibilities and requirements necessary for state 9-1-1 offices in NG9-1-1.

The CA State 9-1-1 Office should reevaluate its role during and after the transition to NG9-1-1. Goal One of the CA Strategic 9-1-1 Plan states:

"Empower the OCIO/PSCD 9-1-1 Office to lead CA into the Next Generation of 9-1-1 services.

Objective: PSCD 9-1-1 Office as Gatekeeper - The PSCD will be responsible for establishing the system-wide standards, decisions and business rules by which communication services interact with the statewide NG9-1-1 network and by which 9-1-1 requests are distributed."

[4]The Wireless Communications and Public Safety Act of 1999 encouraged states to implement seamless, end-to-end emergency communications services. In making that policy statement, the Act notes that this "requires statewide coordination of efforts of local public safety, fire service and law enforcement officials, emergency dispatch providers, and transportation officials; the establishment of sources of adequate funding for carrier and public safety, fire service, and law enforcement agency technology development and deployment; the coordination and integration of emergency communications with traffic control and management systems…" The ENHANCE 911 Act of 2004 as amended further reinforced and expanded on the concept of state-level leadership by making it a requirement for receiving grant funding.

While staffing of PSAPs and handling of 9-1-1 calls will remain local functions, aspects of NG9-1-1 will require state-level planning and coordination. In addition, state-level leadership is essential in developing critical policies and the ability or mechanisms to promulgate those rules and policies.

NG9-1-1 requires the California Technology Agency to have adequate authority to plan and coordinate the implementation of NG9-1-1 statewide.[5]

The complexities involved in designing, deploying and maintaining a statewide NG9-1-1 system require an active, committed, engaged, and empowered CA State 9-1-1 office. The CA State 9-1-1 Office, under the authority and direction of the California Technology Agency, should continue its ongoing efforts evaluate its current vision, mission, role and responsibility in the context of where it must be in order to successfully and collaboratively (in conjunction with stakeholders) design, deploy and maintain NG9-1-1 in CA.

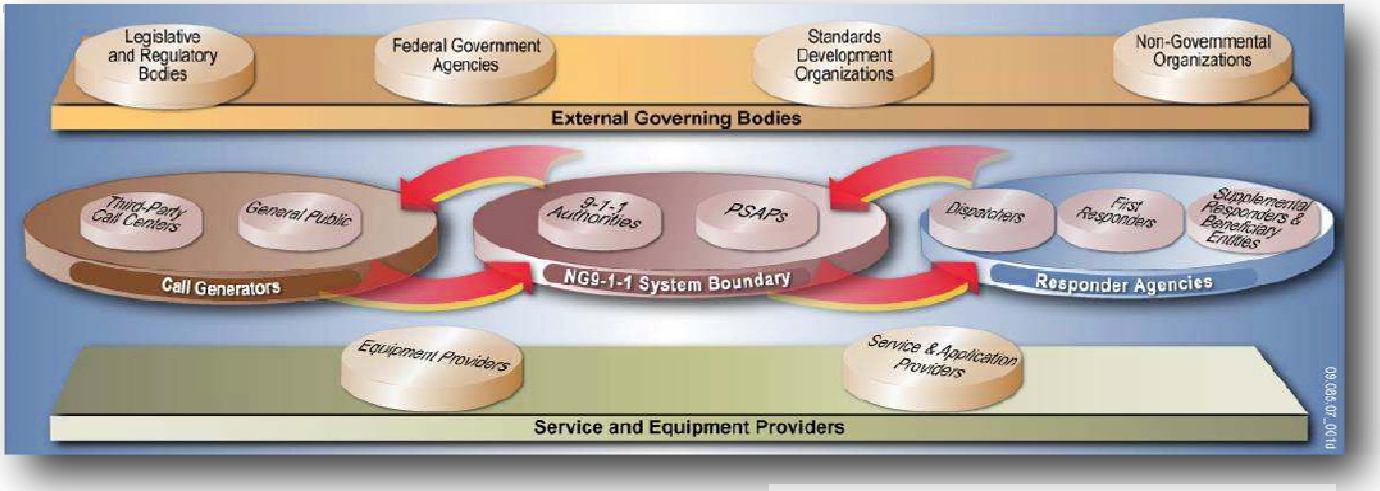


Figure 3: US Department of Transportation's Definition of Stakeholder Relationships

3. Define and engage the Stakeholder community

Identify the primary, secondary and tertiary stakeholders, as well as how they will be engaged throughout the CA NG9-1-1 Initiative. Use focus groups to assist in accomplishing this goal.

[4] US Department of Transportation's NG9-1-1 Transition Plan, Appendix A

[5] See the National Emergency Number Association Next Generation Partner Program *Next Generation 9-1-1 Transition Policy Implementation Handbook, A Guide for Indentifying and Implementing Policies to Enable NG9-1-1 (*March 2010)*, page 7* for a complete description of desired characteristics of a state level 9-1-1 authority.

Successful deployment of the CA NG9-1-1 System requires interaction and partnership with a wide ranging community of stakeholders. These include local 9-1-1 and government authorities, State 9-1-1 Advisory Board, legislators, vendors, telecommunications companies, special interest groups, and others. An example of potential stakeholders and their relationships is noted by the US DOT in Figure 3. Identifying *who* the primary, secondary and tertiary stakeholders are, and *how* they will be engaged during the process is important.

Stakeholders must actively represent their constituency throughout the process. At the same time, each stakeholder must come to the table prepared to understand the needs of the other stakeholders and to achieve mutually agreeable compromises. To identify the stakeholders and determine engagement criteria the CA State 9-1-1 Office should actively engage any currently defined or known stakeholders to aid in the definition of a more comprehensive list. Focus groups are a useful tool in accomplishing this task.

4. Create an Education and Awareness Campaign

Create a robust education and awareness campaign targeted towards stakeholders in the 9-1-1 Community

Transforming the CA 9-1-1 system into a robust and effective NG9-1-1 system affects stakeholder communities at many levels. To increase the effectiveness of the CA NG9-1-1 Initiative as well as gain and sustain momentum, CA should initiate a comprehensive education and awareness campaign. It should define the audience (based on stakeholders) and include: targeted messaging, conference appearances, speeches, talking points, branding, media policies, and other similar activities. An educational campaign will greatly assist in garnering support in the 9-1-1 community, the executive branch of government, and the legislative branch. The educational initiative will be implemented concurrently throughout the CA NG9-1-1 Initiative.

Key Decision Points

The following key decision points are related to the Initiation Phase of the CA NG9-1-1 Initiative:

1) **Decision**: Determine whether to further align the CA State 9-1-1 Office's mission, vision and authority to support the *unique* needs of the CA NG9-1-1 System
2) **Decision**: Identify the key stakeholders in the CA 9-1-1 Community
3) **Decision**: Determine how and to what extent the CA stakeholder community will be engaged in a meaningful and sustained fashion over the course of the CA NG9-1-1 Initiative
4) **Decision**: Determine scope and scale of educational awareness campaign.

Critical Dependencies

Applicable dependencies, by task, are identified below.

- **Executive sponsorship**
  a. None
- **Continue to align role of CA State 9-1-1 Office with responsibilities and requirements unique to NG9-1-1**
  a. None
- **Identify and engage stakeholder community**
  a. None
- **Create an education and awareness campaign**
  a. Dependent on effective identification of stakeholder community, funding, and resources to support educational awareness campaign

Work Products

The following work products are required in this phase:

- ☐ Revised CA State 9-1-1 Office Vision/Mission Statement
- ☐ Stakeholder List
- ☐ Stakeholder Engagement Criteria
- ☐ Educational Awareness Campaign

2

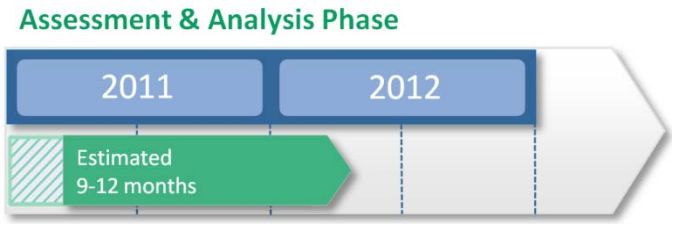
Assessment & Analysis Phase

Overview

The CA State 9-1-1 Office must fully understand the elements comprising today's CA 9-1-1 system to effectively plan the transition to NG9-1-1. The following sections provide a detailed description of the elements to assess and analyze as well as why they are important:

- Regulatory, legislative and funding
- Governance
- Technology (hardware, software, network and data)
- Operations
- Security
- Potential related statewide projects
- 9-1-1 Program Office (staffing, budget, funding)

Estimated Timeframes



Tasks

The following tasks are identified with detailed narratives explaining why each subtask is important, expected outcomes and any applicable dependencies.

1. Regulatory, Legislative and Funding Analysis

Assess and analyze current laws, regulations and tariffs that impact 9-1-1 service in CA to determine whether changes are necessary to support NG9-1-1.

From a regulatory perspective, NG9-1-1 presents a new set of challenges and decisions. NG9-1-1 systems are typically much larger in scope and provide service to multiple jurisdictions and wide ranging, diverse agencies. Given this environment, changes in policy will be a critical part of establishing seamless, end-to-end NG9-1-1 systems. CA's assessment and analysis should include the following areas:

- Regulation, legislation and tariffs
- Funding
- Establishing statewide Emergency Services IP Networks (ESInets)
- Confidentiality
- Liability

The following sections discuss each of the aforementioned topics:

Regulation, Legislation & Tariffs

Current CA 9-1-1 laws, regulations and tariffs were written for E9-1-1; NG9-1-1 did not exist. Thus, CA's laws, regulations and tariffs make specific references to older technologies that are not necessarily compatible with NG9-1-1 and *may* present a roadblock to implementing NG9-1-1. In order to provide a seamless

and efficient transition from E9-1-1 to NG9-1-1, it is essential that CA reviews all current laws and regulations to keep pace with advancements in telecommunications.

A few examples of legislative/regulatory matters that should be assessed include:

- Provisions regarding the eligible use of 9-1-1 funds.
- Provisions that reference or require specific legacy technology components of E9-1-1 service; technology neutral provisions are preferable.
- Language (including provisions in tariff) that prohibit the sharing of 9-1-1 system components and data (with appropriate safeguards for security and confidentiality).
- Existing 9-1-1 service arrangements and tariffs that inhibit new entrants from making similar competitive services available to state or local authorities responsible for procuring 9-1-1 services.[6]

Funding

When planning for NG9-1-1, it is imperative to ensure that sufficient funding is available both from a state and local perspective. Current CA 9-1-1 systems are funded through special-purpose dedicated 9-1-1 surcharges/fees and general fund revenues. Section 41136.1 of the CA Revenue and Taxation Code specifies that the State collect a surcharge on every wireline, wireless and VoIP phone line in the state for use of intrastate telephone communication service. The amount of the charge is determined by the CA State 9-1-1 Office annually and cannot exceed ¾ of one percent or be less than ½ of one percent. Money collected from the fund is deposited into the State Emergency Telephone Number Account (SETNA).

To begin the process of maximizing funding and ensuring sufficient resources are made available to implement and operate the NG9-1-1 system, CA should review all current funding provisions. This review should focus on making sure there will be adequate revenues to fund services throughout the transition and beyond[7]. Additionally, eligible uses of funding need to be reviewed to ensure unique NG9-1-1 system components are covered.

Establishing Emergency Services IP Networks (ESInets)

ESInets are the IP-enabled backbone networks over which NG9-1-1 services are delivered. They host numerous application layer services that support interoperability among diverse regional/local networks and agency applications.

CA will need to determine whether it currently has the authority to establish or fund an ESInet(s) and manage the interconnections between multiple regional ESInets. Furthermore, CA will need to assess whether it has an adequate mechanism to effectively coordinate the activities of local 9-1-1 authorities and other public safety or government stakeholders who may share the ESInet backbone (including interconnections with ESInets in neighboring states, or federal entities). The ability and authority to establish and fund ESInets, coordinate the public safety agencies that will use them, and manage the interconnections between multiple regional ESInets are essential state-level functions in a NG9-1-1 environment.

Confidentiality

Like the rest of the nation, CA's 9-1-1 systems are dedicated, closed, single purpose systems. They exist solely for transmitting 9-1-1 calls and minimal data (e.g. caller phone number or address) and nothing else. 9-1-1 call recordings and data in CA are typically stored at the PSAP that received and dispatched the call. Preserving the confidentiality of this information and retaining appropriate records as required by local or state law is a fairly straightforward process. As California transitions to NG9-1-1, today's 9-1-1 voice and data will be aggregated, shared, transferred, and perhaps stored in more than one location (including remote, off site locations). A recent NENA publication accurately observed that "[m]aintaining confidentiality

[6] National Emergency Number Association Next Generation Partner Program *Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010, page 14*

[7] Typically costs are higher during the transition phase

under those circumstances is not something envisioned by current local, state, and federal confidentiality, retention and disclosure laws."[8] Thus, CA will encounter a new challenge: ensuring that information delivered over NG9-1-1 systems is delivered to the appropriate PSAP and can be appropriately shared with federal, state and local emergency response organizations *while* conforming to applicable federal, state, and/or local confidentiality, disclosure and information retention statutes and rules. CA should assess all confidentiality regulations and statutes at a federal, state and local level to determine potential application to NG9-1-1.

Liability

Another significant challenge related to regulation and policy for NG9-1-1 is liability. Lack of legal clarity on the issue of liability can lead to significant issues, including delays in provisioning critical NG9-1-1 services.

The New and Emerging Technologies 911 Improvement Act of 2008 (Net 911 Act) expands state liability protections to PSAPs, services providers and their vendors, so it is imperative that CA assess liability issues in its respective statutes and rules as well. In particular, it will be necessary to ensure that liability protection is broad enough to apply to new 9-1-1 capable services and technologies that are introduced in the future.

2. Governance Analysis

Conduct an assessment and analysis of the existing governance models employed in CA today.

By its nature as a "system of systems,", and as noted on the US DOT Community Model diagram in Figure 4, NG9-1-1 incorporates numerous stakeholders, many of which were not considered or involved in legacy 9-1-1. In NG9-1-1, the complexities involved in managing the interconnections between state, regional and local systems requires a defined governance model that clearly identifies the roles, responsibilities, and authority by which decisions are made.

A comprehensive governance model is necessary to assure adequate stakeholder input in the decision making process.

The governance model for a shared system defines decision making processes and policies (such as change management) that will be responsive to PSAP needs and allow local participation.

A tiered system of governance *may* consist of boards [9]or councils that use standing committees with specific responsibilities such as a Technology Committee, an Operational Committee and a Training Committee. The Technology Committee may be made up of technical staff from both state and local entities with responsibilities for reviewing new applications, keeping up with security standards, and providing technical recommendations for the governance leadership.

Creating a governance model is a formal step in the Requirements, Design & Planning Phase of the CA NG9-1-1 Roadmap. However, to begin the process of creating a governance model it is necessary to conduct a thorough analysis of the governance frameworks that exist in CA today. Such an analysis of state, county and local decision making and authority will shed light on how decisions are made with regard to 9-1-1 in CA. Wherever possible conduct workshops to collaboratively engage the stakeholder community in the process.

3. Technology Assessments

Conduct a thorough and detailed assessment of the technological components and infrastructure comprising the 9-1-1 system in CA today. This list includes hardware, software, networks and data).

A detailed assessment of current technology systems and providers is needed to properly identify the technology requirements and steps needed to migrate from the current 9-1-1 system to a NG9-1-1 system. This assessment will identify technology and systems that may need to be replaced or upgraded.

[8] Ibid, page 18

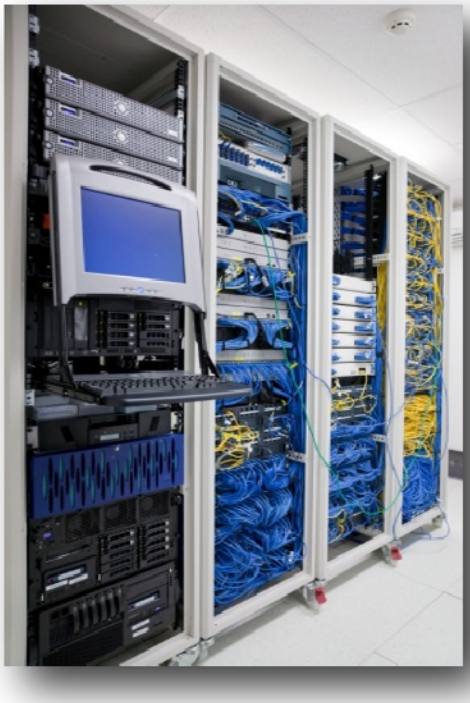
[9] Today, CA has a State 9-1-1 Advisory Board which is designed to promote the communication between PSAPs and the CA State 9-1-1 Office and advise on matters pertaining to policies, standards, training, budget/funding and projects.

This assessment will enable the state to:

- Identify technical functions that are important to the current systems
- Identify current infrastructure components that can be used with the NG9-1-1 system
- Assist in determining the conceptual design of the system

The following technologies and systems should be assessed:

- General
  - PSAP Locations
  - Call Volumes
  - Call Flow
  - Locations of serving offices / selective routers
  - ALI provider information
  - Current bandwidth capacity
  - Current redundancy levels
  - Geographic coverage area
  - Facility locations
  - Current plans for interoperability
  - Operational infrastructure
  - Regional connectivity options
- Hardware
  - Customer Premise Equipment (CPE) Hardware (e.g. PBXs, switches, servers, workstations, trunks)
- Software
  - CPE Software (e.g. call taking applications, CAD systems, Emergency Notification Systems, Management Information Systems (MIS) Databases)
- Data
  - Analytics
  - Geographic Information Systems (GIS)
    - See next section for more details on unique importance of GIS in NG9-1-1

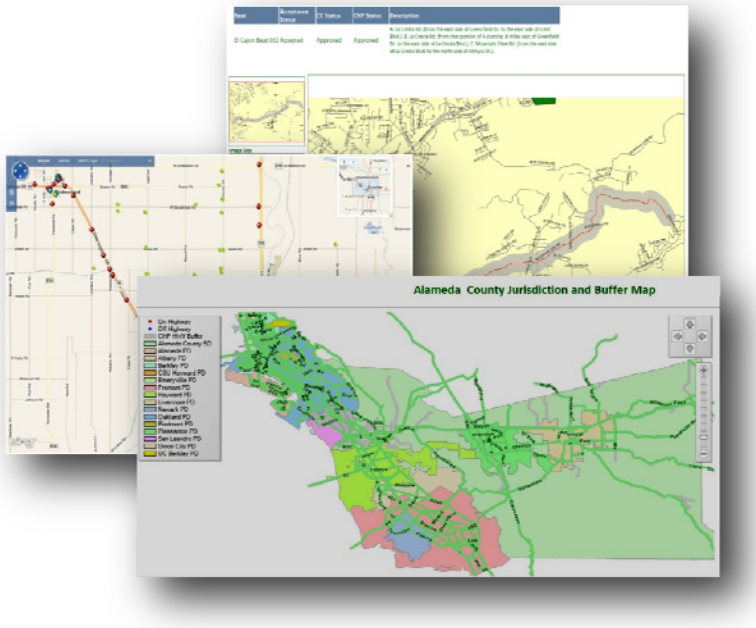


GIS Assessment

GIS will play a far more critical role within the NG9-1-1 environment. Today, GIS is primarily used within the mapping modules of Computer Aided Dispatch (CAD) systems or other like-systems, but not routing. However, within NG9-1-1, all 9-1-1 calls will be routed based on location using GIS datasets.

The change to GIS-enabled call routing re-emphasizes the priorities for the way public safety departments manage and store location data. The first step the CA State 9-1-1 Office should take to prepare its data for NG9-1-1 is to assess the GIS datasets across the state in preparation for a more comprehensive NG9-1-1 data readiness assessment. A data readiness assessment should include the following:

- Applicable CA Geospatial Information Officer (GIO) statewide policies and standards.
- Display existing GIS data layers used by each PSAP.
- Provide a baseline assessment between GIS data and Master Street Address Guide (MSAG) to determine current accuracy level.[10]
- Determine if PSAPs have taken steps to regionalize datasets with neighboring PSAPs and reconcile any edge-matching issues with neighboring roads and/or boundaries.
- Determine if a data maintenance plan is in place and the frequency of GIS data updates
- Determine what data standards and policies exist
- Review any existing addressing policies and inter-governmental data sharing agreements to ensure long term sustainability of GIS data accuracy, maintenance and standards
- Identify, assess and determine implementation of a statewide and/or regional enterprise GIS database repository(ies)



[10] If PSAPs have access to their ALI data or can get an extract from the Local Exchange Carriers (LEC), a baseline accuracy assessment can be performed between the ALI and MSAG tables and the ALI database and the GIS databases.

4. Operations Analysis

Conduct an assessment of the operational management, staffing, training, and policies of typical CA PSAPs. Assessments may include surveys.

PSAPs are the operational hub of public safety communications. Within a PSAP, technology and people come together to deliver emergency communication services. An effectively run PSAP consists of excellent staff, effective policies, a clear governance model, and a comprehensive training program. In the transition to NG9-1-1, call-takers and dispatchers (including their management structure) may be faced with a changing job role. New forms of media will become available that expand traditional functions within the PSAP.

The U.S. Department of Transportation's "A National Plan for Migrating to IP-enabled Systems" notes:

> *"The increased quantity of available multimedia data will enhance and expand existing call-taking functions. It may also extend the time it takes to process 9-1-1 calls, increase the workload of the call taker, and significantly change the call taker's experience (e.g., seeing the incident versus hearing the incident)."*[11]

New and changing technology in the PSAP will require commensurate changes to the roles and responsibilities of the PSAP staff. For example, processing a 9-1-1 call accompanied by data in the form of a recorded video of an incident may require the call taker or dispatcher to function differently. Additionally, call takers or dispatchers may now be exposed to graphic images or video and require additional training to deal with emotional stress factors.

Furthermore, the NG9-1-1 environment will enable (although not mandate) resources and workloads to be distributed or shared across a number of PSAPs. This will substantially increase the ability to effectively respond to emergencies. However, the operational impacts, training, and staffing concerns must be assessed, addressed, and where applicable, standards and policies created or updated to address the new operational models, and achieve fiscal and workflow efficiencies.

Achieving these goals necessitates an analysis of the existing operational models in CA. And operational analysis considers the following:

- Operational management
- Policies & standards
- Staffing
- Training

Operational Management

NG9-1-1 allows (although does not mandate) interoperability across many jurisdictions. Accordingly, it is important to establish a management model that defines mechanisms for change, adoption of rules, installation of new applications, standards for interconnection, and many additional operational factors that need to be considered in a NG9-1-1 environment. Having a management model in place will aid in the determination of how to handle different types of data in particular situations.

The starting point is to analyze CA's PSAPs to determine what management mechanisms exist in the PSAPs and whether these mechanisms will be able to handle operational challenges detailed above. This analysis will be conducted with benchmarks based on known factors and identified risks. This will allow the PSAPs to make the adjustments in advance to better prepare for technological changes now and into the future.

Policies and Standards

NG9-1-1 may necessitate changes in existing operational policies and standards. Several national standards development organizations (e.g. NENA) are working on standards for the technologies and systems that relate to NG9-1-1. CA will need to collaborate with key stakeholders (using the governance model) to implement operational policies and standards that foster coordination, promote resource sharing, and address confidentiality issues.

[11] National E9-1-1 Implementation Coordination Office: A National Plan for Migrating to IP-Enabled 9-1-1 Systems, September 2009. Page 1-4

CA should consider adopting a minimum set of operational policies, procedures and standards for NG9-1-1. To accomplish this, CA will need to assess what is in place today, determine whether existing provisions are still applicable to the NG9-1-1 environment and how they can be adjusted to assure a smooth transition.

Staffing

Staffing of the 9-1-1 center has been and will remain a local issue. In NG9-1-1 current staffing models *may* not be appropriate for tomorrow's PSAP.

Staff positions will need to be analyzed to determine the appropriate staff to fill those positions. Job descriptions and job requirements may change during the migration in order to appropriately staff a PSAP. Staff expertise will be a major factor in the success of NG9-1-1. Day to day tasks may become more intricate and may require more specialized skill sets. Whether the job is call taking, dispatching, managing equipment in the PSAP, or managing the personnel, there will be a demand for a higher level of staff expertise. Staff turnover will continue to be a challenge in the NG9-1-1 environment particularly with changing and increased demands and increased training requirements.

Based on the staffing analysis together with stakeholder input, a staffing plan (described in a later phase) should be part of an operations plan prepared for the NG9-1-1 environment.

Training

As it is today, training will be required to prepare call takers and dispatchers to use new technology, new types of data, new policies and procedures, and new standards. In order to successfully utilize and maintain staff, there must be minimum, consistent training standards in place across the system. CA should begin by analyzing the training requirements and modalities that exist in the PSAPs currently. From there, it will be possible to develop new or additional training standards to meet NG9-1-1 requirements as noted in a later phase.

5. Security Assessments

Conduct Security Assessments (NG-SEC, NIST, etc) of a statistical sampling of CA PSAPs to determine current readiness and risk levels for NG9-1-1.

Traditionally 9-1-1 has been a closed system thereby minimizing the risk and effectiveness of cyber attacks. However, the IP-enabled, interconnected nature of NG9-1-1 radically alters the attack surface of the local PSAP and the overall NG9-1-1 system. This exponential increase in attack vectors is magnified by the attractiveness 9-1-1 systems offer cyber attackers. Accordingly, it is critically important to ensure that cyber security controls are planned for and built into the system from the outset and over the course of the project. Cyber security should be architected into the "DNA" of the CA NG9-1-1 System.

NENA released the NG9-1-1 Security Standards (NG-SEC) in early 2010. These standards provide detailed requirements on how to secure NG9-1-1 systems. Presently, several states, cities, and counties have adopted, or are considering adopting NG-SEC standard as the core foundation of their security program. The vendor community appears to have expressed some support for the standard. NG-SEC, when coupled with any additional customization of security controls necessary for a state like CA can become a useful framework to build an effective security program. In addition to considering the use of NENA standards, the State may be required or choose to comply with federal and/or state security requirements.

CA's current 9-1-1 system comprises a wide-ranging set of telecommunications companies, CPE vendors, implementations, and local policy, constraints. This broad spectrum of systems has likely created a wide ranging approach to mitigating security risks across the state. In order to gauge current risk levels an assessment is necessary. In order to integrate cyber security into the CA NG9-1-1 System it is necessary to establish a security baseline of the current system. As an alternative to assessing each individual

PSAP (a task that would be both cost and time prohibitive), a statistical sampling that is representative of CA PSAPs should be used (e.g. large/small, small, vendor A, vendor B, etc). The security assessment should be based on the NG-SEC standards and any other applicable frameworks CA is required to comply with or it intends to leverage in the CA NG9-1-1 System.

6. Potential Related Statewide Projects Assessment

Identify and assess related or tertiary projects in CA that may affect project or be useful in planning phase (e.g. BTOP grants, etc).

CA should identify and analyze any existing projects that may have a useful relationship to this project.

For example, the CA statewide microwave network should be examined for its suitability as a primary or redundant path for NG9-1-1 information.

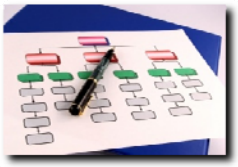
Other potential examples include:

- Currently underway Northeast CA Grant Project, which was funded by the ENHANCE 911 Act, will route wireless calls by exact location (lat/long) to the appropriate PSAP.
- $50 million Bay Area Wireless Enhanced Broadband Project (BayWEB) Broadband Technology Opportunities Program (BTOP) Grant aims to deploy a 700 MHz interoperable wireless public safety broadband network. This project may have a tangential relationship to public safety that could prove beneficial during the migration to NG9-1-1.
- CA Public Utilities Commission received a 7.9 million dollar grant to execute recommendations of the CA Broadband Task Force through the new CA Broadband Council, a state-led body that includes the State executive and legislative branches, and the CA Emerging Technology Fund.

Any similar projects should be assessed for potential use in the NG9-1-1 Project. Opportunities for synergy and/or cost savings may arise through the cooperation and sharing of information.

7. CA State 9-1-1 Office Analysis (staffing, budget, etc)

Assess the CA State 9-1-1 Office to determine if adequate budget, staffing, and training levels are in place and what changes are necessary to support migration to CA NG9-1-1 System and beyond.



It will be necessary to assess current staffing levels, organization structure, functions, and other budgetary concerns necessary for the CA State 9-1-1 Program Office to adequately and effectively fulfill its obligations in a NG9-1-1 environment. While an analysis must still be performed it is likely the role, responsibilities, and workload of the CA State 9-1-1 Office will *increase* and as such, staffing levels, training, and budget should be assessed to determine their appropriateness.

Key Decision Points

The following key decision points are related to the Implementation Phase of the CA NG9-1-1 Initiative:

1. **Decision**: Define the scope of the assessments
2. **Decision**: Identify who will conduct the assessments
3. **Decision**: Determine how to increase effectiveness and expertise of the CA State 9-1-1 Office

Critical Dependencies

Applicable dependencies, by task, are identified below:

- **Regulatory, legislation, tariffs and funding analysis**
  - Resources available to conduct assessment
- **Governance analysis**
  - Resources available to conduct assessment
- **Technology assessments (hardware, software, network and data)**
  - Resources available to conduct assessment
  - Access to PSAP sites across state
- **Operations analysis**
  - Dependent on resources available to conduct assessment
  - Access to PSAP sites across state
- **Security assessments**
  - Resources available to conduct assessment
  - Access to PSAP sites across state
  - Identification of an applicable security framework to measure PSAPs with (e.g. NG9-1-1 Security, or NG-SEC)
- **Potential related statewide projects assessment**
  - Resources available to conduct assessment
  - Successful identification of said projects
  - Cooperation of agencies representing said projects
- **9-1-1 Office analysis (staffing, budget, funding, etc)**
  - Resources available to conduct assessment

Work Products

The following work products are required in this phase:

- ☐ Regulatory, Legislative & Funding Study
- ☐ Governance Study
- ☐ Technology Assessment Report (Hardware, Software, Data)
- ☐ Operations Study
- ☐ Security Assessment Report
- ☐ Potential Related CA Projects Study
- ☐ CA 9-1-1 Office Study

3

Requirements Design & Planning Phase

Overview

After assessing and analyzing the current state of the CA 9-1-1 system, the CA State 9-1-1 Office can begin to define requirements, design select deployment options, and create plans that will govern the NG9-1-1 system, its deployment and lifecycle.

The major tasks comprising this phase include:

- **Define requirements**
  - Define regulatory, legislative and funding requirements
  - Define governance requirements
  - Define technology requirements
  - Define operational requirements
  - Define data requirements
  - Define security requirements
- **Create conceptual system design**
- **Create NG9-1-1 Master Plan**
- **Create Detailed Plans**
  - Begin to update regulatory, legislative and funding Model(s)
  - Update procurement vehicles / contracts
  - Create governance model
  - Create technology support plan
  - Create data guide
  - Create operations plan (includes staffing, training, policies, etc)
  - Create security plan
  - BCP/DRP/IRP

Estimated Timeframes

Tasks

The following tasks are identified with detailed narratives explaining why each subtask is important, outcomes and any applicable dependencies.

1. Define Requirements

Using the information learned during the assessment process begin to define the requirements necessary to implement the CA NG9-1-1 System

Creating detailed requirements will assist the CA State 9-1-1 Office in implementing an NG9-1-1 system that will meet the needs of the stakeholders. These requirements provide the basis for system design and would be used in testing the implemented system. The requirements:

- Form the backbone of procurement vehicles and efforts to ensure that systems procured adhere to the CA vision for NG9-1-1
- Serve as a guidepost for future decisions, including political, funding, technical, operational or otherwise

Requirements are separated into the following categories:

- Legislative, regulatory, tariffs & funding
- Governance
- Technology
- Operations
- Data
- Security

Define Legislative, Regulatory & Funding Requirements

Create Legislative, Regulatory and Funding Requirements for CA NG9-1-1 System

As noted earlier, legislative, regulatory and funding includes the following areas:

- Regulation, legislation and tariffs
- Funding
- Establishing statewide emergency services IP networks (ESInets)
- Confidentiality
- Liability

The following sections identify potential requirements that should be considered for adoption in the CA NG9-1-1 System. Any future legislative changes must be comprehensive in scope and fully representative of all necessary changes. Individual legislation that is not all-inclusive or representative should be avoided. Furthermore, it is imperative that legislative changes have been vetted and approved by the entire governance model before changes are adopted.

I. Regulation, Legislation and Tariffs

Ensuring that regulatory, legislative and tariff requirements are appropriately defined is critical. For example, the NG9-1-1 environment is inherently competitive. Therefore, it is important that the CA regulatory environment provide competitive 9-1-1 System Service Providers (SSPs) with the same reasonable and nondiscriminatory treatment as incumbent 9-1-1 SSPs. All such requirements should be functional and performance based and, most importantly, neutral with regard to technologies, manufacturers or providers.

II. Funding and NG9-1-1

As noted previously, it is imperative to ensure that sufficient funding will be available to cover the increased costs will be incurred during the transition from the current E9-1-1 system to the NG9-1-1 system. With the information gleaned from the assessment and analysis phase, CA should take steps to address each item so as to maximize funding and ensure sufficient resources will be available to implement and operate the NG9-1-1 system:

- Assess reasonable and equitable fees on all end user communication technologies or services capable of accessing 9-1-1-.[12]
- Assess prepaid fees.
- Clearly define the eligible uses of 9-1-1 funds and establish penalties to deter misuse of funds
- Provide the California Technology Agency with the ability to adjust the 9-1-1 surcharge rate.
- Ensure statutes, regulations and tariffs enable system components to be shared among the agencies and entities that use it and that there is a mechanism for these agencies and entities to share the costs[13]

III. Establishing statewide emergency services IP networks (ESInets)

In order for CA to establish an ESInet, the state should develop requirements that consider legislating and funding state-wide ESInets (or regional, interconnected ESInets) and the NG9-1-1 services hosted on, or accessed by them. .[14]

Emergency service agencies should consider the sharing of infrastructure with other governmental entities as a matter of affordability.

[12] CA should view this as a relatively short-term step. At some point in the future, an entirely different funding model may be more appropriate. See the NENA publication entitled, "Funding 9-1-1 Into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration" dated March 2007.

[13] National Emergency Number Association Next Generation Partner Program *Next Generation 9-1-1 Transition Policy Implementation Handbook, March 2010,* pages 9-10

[14] Ibid, pages 16-17

IV. Confidentiality

With regard to confidentiality, CA should develop requirements that adequately cover the types of 9-1-1 calls and call content that will exist in a NG9-1-1 environment, and make any necessary modifications.

V. Liability

Concerning liability, CA should develop requirements, based on assessments that ensure that all entities involved in emergency response in the NG9-1-1 environment are protected.

Define Governance Requirements

CA should leverage the results of the governance assessment to identify any requirements necessary to support a collaborative vision of NG9-1-1 in CA. These requirements should be comprehensive and representative of the stakeholder community and applicable regulations and/or statutes.

Define Technology Requirements

Develop a detailed set of technical and functional requirements for the NG9-1-1 system that encompass hardware, software and networks.

The CA State 9-1-1 Office should create detailed technical and functional requirements based on the results of the technology assessment and analysis phase, the unique factors present in CA, the needs of the stakeholder community, and lessons learned from other states migrating to NG9-1-1.

Technical requirements should address the domains noted in table 1, below:

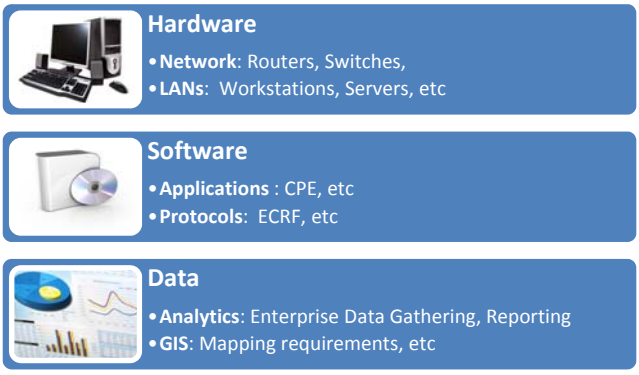


Table 1: Technical Requirements

Requirements should also address key issues of redundancy, availability, and incident response or disaster recovery as applicable.

The CA State 9-1-1 Office should use stakeholder focus groups to gather information that will be used to develop the requirements. Information acquired should include known standards, best practices, and technical solutions available on the market. Once the State defines the requirements it can prioritize them

Define Operational Requirements

The information found during the assessment process along with the involvement of key stakeholders will enable CA to identify the operational requirements necessary to implement NG9-1-1. This task will lead to an understanding of what is important to the stakeholder community and what needs to be in place to successfully operate the system. Operational requirements include, but are not limited to:

- Operations management
  - Change management
  - Rule adoption for new applications
  - Interconnection standards
  - Access management
    - New users
    - New technologies
- Policies and standards
  - Statewide coordination
  - Resource sharing
  - Determine how “calls” will be handled
  - Determine how new technologies and increased access will be handled
  - Managing an influx of data into the PSAP
  - New types of data for telecommunicators
- Training
  - Determine the training that is necessary to support the changing system environment
  - Training for changing job descriptions
  - Training for new job requirements and expectations
  - New skill sets in the PSAP
  - There will be an increase in data and types of data
  - New training standards and training assessments

- Staffing
  - Determine the staff needed to implement policies
  - Analyze the need for additional positions and increased staff in the PSAP
  - Determine what types of staff expertise is needed to operate the new system
  - Work with Peace Officer Standards and Training (POST) for hiring standards and training requirements of staff

The process of defining operational requirements will lead to an understanding of what CA and its stakeholders will need to collaboratively implement in order to make NG9-1-1 a success. Consensus-based best practices will help assure the success of the system.

Define Data Requirements

I. Analytics

The activities and tasks involved in making a request for emergency assistance provide a rich and powerful data stream that if warehoused and mined appropriately may provide significant insight into trending (both real time and historical). The CA State 9-1-1 Office and local PSAPs already capture and aggregate call record data; however in an NG9-1-1 environment the ability to aggregate and measure more data points is a notable opportunity that CA should take advantage of. This data may provide real time or historical decision making capabilities that dramatically alter emergency response effectiveness or crime prevention.

In this task, define the aggregation, usage, reporting and retention of appropriate data points.

II. GIS

Using the results of the GIS data readiness assessment, define the necessary GIS requirements specific to the CA NG9-1-1 environment. The data requirements will include input from state and local stakeholders involved in the data assessment process, industry and specific NG9-1-1 standards, and the CA GIO infrastructure, workflows, policies and standards, where applicable.

The data requirements will include, at a minimum:

- GIS accuracy requirements—based on specific industry and NG9-1-1 standards. The need for accurate and effective call routing will drive the data accuracy standards.
- GIS maintenance requirements—defining expectations for the interval of updates and workflow metrics.
- GIS and system standards—a data schema and system architecture designed for the CA NG9-1-1 System that includes a data standard to facilitate the integration of local 9-1-1 GIS datasets into seamless regional and/or statewide enterprise GIS datasets. The requirements for a regional or statewide architecture will include data quality control standards and data replication standards, including metrics, between the local 9-1-1 authorities and the enterprise GIS database and between the enterprise GIS database and the ECRF GIS data store. These requirements will take into consideration existing CA GIS data standards and system infrastructures.
- Policy—Requirements focused on the metrics and workflows developed for GIS accuracy and maintenance.

Define Security Requirements

During this phase, the CA State 9-1-1 Office, with involvement of key stakeholders, will begin to define its security requirements. The definition process may incorporate the following activities or items:

- Security industry best practices
- Stakeholder surveys / focus groups
- Goals from the CA Strategic 9-1-1 Plan
- Consensus based standards
- Vendor specifications
- NG9-1-1 standards (e.g. NG-SEC)
- CA preference
- Interconnectivity constraints
- Security controls and safeguards.
- Frameworks, standards, regulations, compliance issues such as NG-SEC, National Institute for Standards and technology (NIST), Health Insurance Portability and Accountability Act (HIPAA), CA-specific, etc)

2. Create Conceptual System Design

Develop a conceptual system design and conduct an order of magnitude cost analysis based on the functional, security, data, technical and operational requirements.

The conceptual design is a model based on the existing environment and what is required to meet the State's objectives. During this design phase it is important to fully consider the current status of national standards (for example, at the time of this NG-1-1 Roadmap's creation, NG9-1-1 standards were not fully developed).

The conceptual design is important to define the system in a manner that is easily understood. This design will meet the requirements and be consistent with the regulatory and operational environment.

The conceptual design should encompass the following:

- Investigate models of ESInets (hierarchical ESInet versus one large ESInet)
- Availability of current IP transport modes
- Network transport methodologies (e.g. MPLS, Microwave, etc)
- Location based routing functions
- NG9-1-1 elements
    - Session Initiation Protocol (SIP)
    - Real Time Protocol (RTP)
    - Presence Information Data Format Location Object (PIDF-LO)
    - Emergency Service Routing Proxy (ESRP)
    - Policy Routing Function (PRF)
    - Emergency Call Routing Function (ECRF)
    - Location Validation Function (LVF)
    - Border Control Function (BCF)
    - Legacy Network Gateway (LNG)
- Principles and best practices for security, continuity, incident response, and disaster recovery
- Data components (GIS, applicable analytics)

The outcome of this effort is the definition of a technical architecture that will provide the most feasible, flexible, robust, and redundant platform to support NG9-1-1.

Conduct Order of Magnitude Cost Analysis

Based on the conceptual design, the State can conduct an order of magnitude cost analysis of the estimated costs directly attributable to the deployment of NG9-1-1. The analysis should define, at a minimum, the following elements:

- Non-recurring
    - Capital expenditures
    - Expenditures based on construction and implementation schedule
- Recurring
    - Annual operations and maintenance costs
- Return on Investment (ROI) analysis
    - Annualized costs based on construction and implementation schedule

3. Create CA NG9-1-1 Master Plan

Prepare a CA NG9-1-1 Master Plan which will communicate the CA vision for NG9-1-1, offer a CA perspective of the system's functionality, management, operations and governance (high-level), and provide a high-level construct for transitioning to NG9-1-1.

The CA NG9-1-1 Master Plan will become the formal planning document for CA. It documents the envisioned shape of NG9-1-1 throughout CA and communicates the CA vision for NG9-1-1 to the stakeholder community.

Components of the plan should address (at a high level) the following:

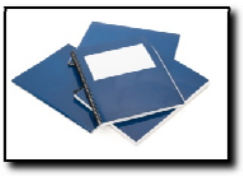
- Current state of 9-1-1
- Future state of NG9-1-1
- Goals & objectives
- Risks/mitigation
- Public awareness and education
- Security
- High level transition overview

- Levels of authority
- Roles and responsibilities
- Legislative and regulatory status and changes
- Operational management of the system
- Operational impact to Stakeholders
- Training of users and technical staff
- Necessary detailed plans

The CA NG9-1-1 Master Plan will become the formal design describing the CA NG9-1-1 System. It will be a living document and require regular updating to keep it current. For example, after the pilot phases, it may be necessary to update the plan based on lessons learned. A robust master plan provides the various stakeholders guidance and a means to measure progress

4. Detailed Planning

Prepare detailed plans such as technology support plan, governance model, technology support plan, GIS guide, and more.



Once the NG9-1-1 Master Plan is complete it will be necessary to perform the following activities, or create the following detailed plans:

- Update legislative, regulatory and funding Model(s)
- Update procurement vehicles / contracts
- Create governance model
- Create technology support plan
- Create an operations plan
- Create a GIS guide
- Create a security plan

The following sections identify these components in more detail.

Update Legislative, Regulatory and Funding Model(s)

Depending on the results of the regulatory, legislative and funding assessments, as well as the outcome of the requirements and design phases, begin making necessary changes to laws, regulations, and tariffs to support NG9-1-1 in CA.

In order for CA to move forward with adopting a comprehensive, end-to-end NG9-1-1 system, the State should:

- Determine whether the changes identified in the assessment require statutory treatment, or would be better addressed through regulations or tariffs.
- Identify all of the stakeholders that will be affected by the changes and establish a mechanism that will help ensure their input.
- Determine whether statutory and regulatory changes can be made through 9-1-1 and public safety leadership or if outside experts will be needed.
- Develop educational materials for the State legislature, other agencies and regulatory bodies.
- Determine whether to draft a single, omnibus bill that addresses all of the issues or to tackle one issue at a time.
- Adopt an appropriate media strategy to build support.[15]

Update Procurement vehicles/contracts

Based on the plans and requirements identified in previous phases, the State should update its procurement vehicles and contracts to reflect the requirements for NG9-1-1.

Create Governance Model

The CA NG9-1-1 governance model will be based on the outcome of the requirements definition phase and will be the framework for the implementation management of the NG9-1-1 system.

In order to create a consensus-based governance model that can be implemented statewide, CA must identify stakeholders from across the state and prepare them to contribute in an effective way to the development of the governance plan. These stakeholders should have expertise in their field and an understanding of what is involved and expected of them in creating a governance

[15] Ibid, Page 25, for a more complete discussion of how to develop a strategy to implement these changes.

model. It is important to train these stakeholders in NG9-1-1 to ensure they have a unified understanding of what NG9-1-1 is and how it presents a need for effective governance. Once these stakeholders gain an understanding of the task they will be able to provide input and gain ownership of the governance model. Their ownership will promote an atmosphere of acceptance of the model throughout the state.

The CA State 9-1-1 Office together with its stakeholders will create a framework that describes the governance model in clear terms. It will set forth policies and procedures and explain why they are in place. The governance framework will address but is not limited to:

- Scope
- Authority
- Roles and responsibilities
- Membership
- Stakeholder representation
- Components
- Agreements
- Interlocal agreements
- Interstate agreements
- Plans that need to be developed and maintained
- Reporting procedures

Create Technology Support Plan

Support for the NG9-1-1 system after deployment will be critical. The CA State 9-1-1 Office and its stakeholders must create a comprehensive and holistic support plan that addresses fault management, maintenance, and monitoring. It should address desired service levels, KPIs and other performance criteria. It should clearly identify who is responsible for each aspect of support, and provide detailed escalation paths. It should also synchronize with change management policies across the enterprise.

Create an Operations Plan

The CA NG9-1-1 Operations Plan will draw from stakeholder input and be developed as a result of the operations assessment conducted and the operational requirements defined by stakeholders early in the process. This plan will enable CA to most effectively and successfully transition to NG9-1-1, as well as maintain effective operations through the transition and once the transition is complete. This plan will be consensus-based with mechanisms built in for updates and changes as the 9-1-1 environment inevitably progresses in the future.

The operations plan should address but is not limited to the following areas:

- Operations management
- Policies and standards necessary for implementing and successfully maintaining NG9-1-1 in CA (including technical, and security)
- Training policies and procedures and updates
- A staffing plan
- Procedures regarding not only the transition to NG9-1-1 but any future transitions that are clearly identified
- Metrics and tasks to aid in successful transitions and the successful daily operations of a PSAP
- Process to maintain and amend the plan

Create a Data Guide

I. Analytics

An Analytics guide will describe the tasks and components necessary to implement and sustain a long-term analytics program and will support the analytics requirements previously defined.

II. GIS

The GIS guide will be a plan for state and local stakeholders to implement and sustain long-term effective GIS data management necessary for the NG9-1-1 framework.

It will build upon the information compiled during the NG9-1-1 data readiness assessment phase, and incorporate industry standards and approaches used by other state programs.

The GIS guide will provide an overall plan for:

- Educating and community outreach regarding

the requirements for GIS within a NG9-1-1 environment
- Leveraging existing data and system infrastructure, developing and implementing the necessary data remediation steps to improving data accuracy and maintenance, where applicable
- Developing an effective enterprise GIS infrastructure to integrate GIS data from each local 9-1-1 authority into seamless datasets that will be provisioned to the ECRF/LVF
- Developing and implementing necessary policy and governance
- Developing necessary addressing guidelines to maintain standards and data currency
- Providing staff training for data and system workflows, addressing guidelines and overall NG9-1-1 data requirements
- Determining costs associated with GIS remediation, system infrastructure, staffing, and long term sustainability

Create a Security Plan

A security plan formally documents the CA State 9-1-1 Office's goals and objectives regarding the security of the CA NG9-1-1 System. Typically, a security plan accomplishes the following:

- Documents the State's goals, objectives and intentions regarding cyber security within the CA NG9-1-1 System
- Exercises due care by managing the risk of security exposure or compromise within the CA NG9-1-1 System
- Promotes and increases awareness of security across the CA NG9-1-1 System
- Identifies the standards and frameworks applicable by legislative, regulatory, policy, or choice that the CA NG9-1-1 System shall comply with (e.g. NG9-1-1 Security [NG-SEC], NIST, CJIS, etc)
- Identifies the security policies necessary to implement and enforce the CA 9-1-1 Office objectives
- Clarifies the security aspects of management governance structure, as it applies to the CA NG9-1-1 System
- Identifies order of magnitude estimates for implementation of security across the CA NG9-1-1 System

A security plan provides the overarching strategy and vision for securing the CA NG9-1-1 system and is the foundation of an effective security program. Ideally, it should come before an organization starts to select or implement security technology, managed services vendors, etc. It may be advisable for PSAPs to create their own security plans as well.

Create a Business Continuity / Disaster Recovery / Incident Response Plans

Business Continuity Planning (BCP), as well as Disaster Recovery Planning (DRP) and Incident Response Planning (IRP) are critical to system uptime and outage resolution. The purpose of each of these plans is to maximize NG9-1-1 service by identifying an organization's exposure and applying risk management techniques to mitigate it. Furthermore, architectural principals such as redundancy and survivability can be architected into the requirements phase. While the State should create these plans it may be necessary for local PSAPs to create their own BCP/DRP/IRPs.

Key Decision Points

The following key decision points are related to the Requirements, Design & Planning Phase of the CA NG9-1-1 Initiative:

1. **Decision**: Determine requirements for the CA NG9-1-1 System
2. **Decision**: Define standards or frameworks (federal, state, local, or industry) the CA NG9-1-1 System adhere to or adopt
3. **Decision**: Decide what existing CA infrastructure will be used in CA NG9-1-1 System
4. **Decision**: Determine the technical architecture of the ESInet(s) (e.g. regional vs. statewide)
5. **Decision**: Decide what types of elements (and to what extent) are included in the CA NG9-1-1 System (e.g. calls, texts, video, telematics, sensors, etc)
6. **Decision**: Determine what network transport methodologies will be used (e.g. ATM vs. MPLS, Microwave, etc)

Critical Dependencies

Applicable dependencies, by task, are identified below:

- **Requirements**
  - Completion of Phases 1-2
- **Conceptual System Design**
  - Completion of requirements definition
- **Create NG9-1-1 Master Plan**
  - Completion of requirements and Conceptual design tasks
- **Create Detailed Plans**
  - Begin to update regulatory, legislative and funding Model(s)
    - Limits of current authority
    - Existence of appropriate regulatory instrument
    - Dependent on legislative cycle
    - Legislative sponsorship
  - Update procurement vehicles / contracts
    - Dependent on available funding and procurement lifecycles
  - Create governance model
    - Dependent on completion of NG9-1-1 Master Plan
  - Create technology support plan
    - Dependent on completion of NG9-1-1 Master Plan
  - Create data guide
    - Dependent on completion of NG9-1-1 Master Plan
  - Create operations plan (includes staffing, training, policies, etc)
    - Dependent on completion of NG9-1-1 Master Plan
  - Create security plan
    - Dependent on completion of NG9-1-1 Master Plan
  - BCP/DRP/IRP
    - Dependent on completion of NG9-1-1 Master Plan

Work Products

The following work products are required in this phase:

- ☐ **Requirements**
  - Regulatory, legislative & funding requirements
  - Governance requirements document
  - Technology requirements document (hardware, software, data)
  - Operations requirements
  - Security requirements
- ☐ **Conceptual System Design**
  - Conceptual design document
- ☐ **NG9-1-1 Master Plan**
- ☐ **Detailed Planning**
  - CA State 9-1-1 Office Budget / Staffing Plan
  - Updated regulation / legislation
  - Governance model
  - Technology support plan
  - Data guide
  - Operations plan
  - Security plan

4

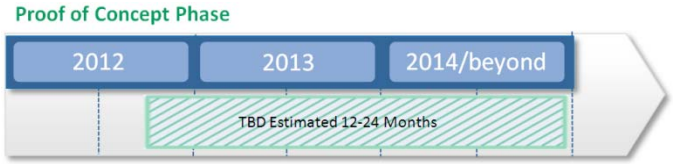
Proof of Concept Phase

Overview

An overview of the task comprising the Proof of Concept Phase of the project is provided below:

- Proof of Concept Project(s), Pilot Project(s)

Estimated Timelines



The proof of concept phase is estimated between 12-24 months. However, this is dependent upon the proofs of concept that will be selected. These are unknown at this time.

Tasks

The following task is identified with detailed narratives explaining why it is important, outcomes and any applicable dependencies.

1. Proof of Concept Project (s), Pilot Project(s)

Identify and execute pilot project(s) to test and validate the NG9-1-1 design concept in CA.

Depending on the conceptual design and the selected deployment model(s) proof of concept/pilot projects can begin to be rolled out. Proof of concept/pilot projects are used to validate the NG9-1-1 Master Plan and to test the chosen solution. The proof of concept/pilot projects should involve a group of PSAPs that are representative of several PSAP types and different PSAP equipment. This sampling should reflect the various systems currently deployed or expected to be used in the NG9-1-1 system.

Each proof of concept/pilot project should use the requirements defined in the master plan. This effort can be used to validate selected portions or all of the requirements. The CA State 9-1-1 Office, in conjunction with the pilot PSAPs and involved vendors should develop detailed project plans for each proof of concept/pilot project to include the equipment or process being validated, expected results, and testing processes. Detailed lessons learned should be documented for each proof of concept / pilot project for use in updating the master plan and developing a final system design.

> ***Note:***
>
> The exit criteria for this phase involves a review of the lessons learned from each project and if applicable, re-enter the Requirements, Design and Planning Phase, as well as update the CA NG9-1-1 Master Plan, and any other detailed plans.
>
> Furthermore, the Northeast CA NG9-1-1 Grant Project was already underway when this Roadmap was created.

Key Decision Points

The following key decision points are related to the Proof of Concept Phase of the CA NG9-1-1 Initiative:

1. **Decision**: Define critical success factors for concept / pilot projects
2. **Decision**: Determine go/no go for further implementation of design based on lessons learned from proof of concept / pilot projects or revert to Requirements, Design & Planning Phase

Critical Dependencies

Applicable dependencies, by task, are identified below:

- Proof of Concept Project(s), Pilot Project(s), etc
  - Dependant on successful adoption of NG9-1-1 Master Plan and other sub plans
  - Dependent on funding to support proof of concept / pilot projects
  - Dependent on technology and standards that support desired conceptual design(s)

Work Products

The following work products are required in this phase:

- ☐ Proof of Concept Project Plans
- ☐ Proof of Concept Closure/Test Reports

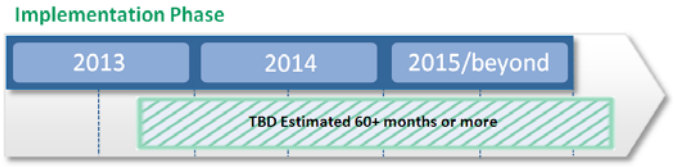
5 Implementation Phase

Overview

An overview of the tasks comprising the Implementation Phase of the project is provided below:

- Create transition plan
- Implement NG9-1-1 elements

Estimated Timeframes



Tasks

The following tasks are identified with detailed narratives explaining why each subtask is important, outcomes and any applicable dependencies.

1. Create Transition Plan

Create a high level transition plan that will chart the course of NG9-1-1 development, testing, implementation and other initiatives and activities on this extensive, multi-year effort.

A transition plan will identify and outline the specific steps needed to execute the NG9-1-1 Master Plan and sub plans, and deploy/transition CA's PSAPs and systems to the NG9-1-1 system. The CA State 9-1-1 Office and its stakeholders will develop the transition plan from the NG9-1-1 Master Plan, Operations Plan, Security Plan, and the lessons learned from proof of concept/pilot projects. The transition plan must account for statewide and regional deployments. Each PSAP and provider should be listed and tracked. The plan should detail the order that the transition will take place and should leverage or align with current procurement cycles wherever possible. The transition plan should include:

- People
  - Roles, responsibilities, and authority of all stakeholders
- Process/Policy
  - Detailed procedures and checklists
  - Back out plans
  - Change control plan
  - Testing procedures and checklists
  - Acceptance criteria
  - Communications plan
- Technology
  - Availability of vendor software / hardware to support CA NG9-1-1 requirements
  - End of life for current/proposed hardware/software
- Schedule
  - Timelines
  - Current procurement cycles
- Financial factors
  - Availability of funding
  - Return on investment modeling
  - Cost-benefit analysis

A transition plan assists in deploying NG9-1-1 across the state. This helps to deploy in a similar manner throughout the state, and allows lesson learned to be used to better the process and avoid making the same mistakes.

2. Implement NG9-1-1 Elements

Deploy NG9-1-1 components and systems throughout CA, consistent with the Transition plan.

During this phase the CA NG9-1-1 System will be deployed in a phased manner per the transition plan. This will include the specific processes associated with procuring, installing and testing the equipment and services and interconnecting each PSAP and call origination network to the NG9-1-1 system. At completion of the deployment, detailed as-built documentation of equipment and configurations should be created for each site and the complete system. These as-built documents should be maintained on an on-going basis to reflect the actual system architecture.

This phase also refers to the implementation of processes, policies and procedures, as well as any remaining legislation, regulation, etc, that must be updated to migrate to NG9-1-1. The implementation phase is representative of the entire set of steps necessary to implement NG9-1-1 in CA.

Key Decision Points

The following key decision points are related to the Implementation Phase of the CA NG9-1-1 Initiative:

1. **Decision**: Define transition methodology (e.g. north, south, vendor type, etc)
2. **Decision**: Determine procurement methodologies
3. **Decision**: Determine deployment schedule(s)

Critical Dependencies

Applicable dependencies, by task, are identified below:

- Create transition plan
  - Dependent upon successful completion of the proof of concept / pilot projects phase
- Deploy NG9-1-1
  - Dependent upon available funding
  - Dependent on necessary changes to the regulatory environment being made

Work Products

The following work products are required in this phase:

- ☐ Transition plan
- ☐ Project plan(s)
- ☐ As-built documentation

6

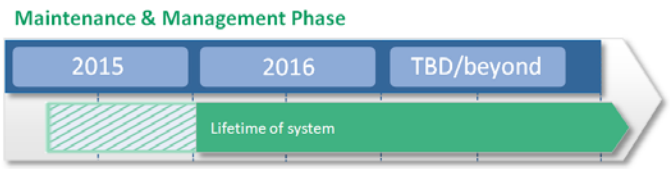
Maintenance & Management Phase

Overview

An overview of the tasks comprising the Maintenance and Management Phase of the project is provided below:

- System management (Monitoring, Fault Management, Configuration Management, Change Management, Incident Response/Management, etc)

Estimated Timeframes



Tasks

The following tasks are identified with detailed narratives explaining why each subtask is important, outcomes and any applicable dependencies.

1. System Management

Conduct the systems management activities necessary to support the NG9-1-1 system throughout CA over its lifecycle.

With a fully deployed NG9-1-1 System, traditional lifecycle management activities of the system can commence. For example, this may entail:

- Fault management (technical support, break/fix, etc)
- System maintenance
- Configuration management (changes, Upgrades, Improvements, etc)
- Key Performance Indicators (KPIs) / performance management
- Managed services (monitoring, etc)
- Security management
- Reporting / analytics
- Incident response/management
- Dashboards/portals

> ***Note:***
>
> Full implementation of NG9-1-1 is dependent upon many factors, including project delays, national activities or inability to accomplish tasks on this Roadmap. The dates are only a **high-level estimated timeframe** of when maintenance and management of some deployed NG9-1-1 elements may commence and should **not** be construed as a firm date for statewide NG9-1-1 deployment.

Key Decision Points

The following key decision point is related to the Maintenance & Management Phase of the CA NG9-1-1 Initiative:

1. **Decision**: Determine whether or how new forms of technologies/data/information will be allowed to use the CA NG9-1-1 System

Critical Dependencies

The applicable dependency, by task, is identified below:

- System management (Monitoring, Fault Management, Configuration Management, Change Management, Incident Response/Management, etc)

Work Products

- ☐ **TBD** (may include: updated policies/procedures, administrative guides, revised support plans, etc)

Appendices

- Appendix A: Contributor Workshop Summary
- Appendix B: 9-1-1 Strategic Plan Goal Mapping
- Appendix C: References

Appendix A: Contributor Workshop Summary

CA NG9-1-1 Roadmap Contributor Workshop Summary
11/30/2010

Meeting Purpose:
The focus of this meeting was to: engage contributors in CA NG9-1-1 Roadmap development, solicit specific input from contributors (e.g. top issues, concerns, obstacles in planning for NG9-1-1, and major projects or initiatives in CA area that might benefit from or be useful to the roadmap), and to communicate the purpose and intent for the CA NG9-1-1 Roadmap.

Attendees:

- CA State 9-1-1 Office: Karen Wong, Ryan Dulin, Andy Nielsen, Chereise Bartlett
- State 9-1-1 Advisory Board Long Range Planning Committee: Chris Hinshaw
- California Highway Patrol: Michelle Bland
- California Fire: Brenda Seabert
- County Coordinators Task Force: Lori Sowder, Shasta Area Safety Communications Agency (SHASCOM), Ella Sotelo, LA County
- California Technology Agency: Jon Dickinson
- L.R. Kimball: Joel McCamley, Jeremy Smith, Roxann Brown, Gordon Vanauken, Wendy Day, Mike Kennedy

Summary:
After introductions and an explanation of the CA NG9-1-1 Roadmap project from the CA State 9-1-1 Office, consulting firm L.R. Kimball conducted an educational session on NG9-1-1 and provided a nationwide update on progress across the country. L.R. Kimball facilitated a guided discussion about key issues, obstacles, and major initiatives in CA that should be considered in the roadmap. A summary of issues is outlined below:

Key Issues to consider in Roadmap:

- Governance –Governance (including how stakeholders are formally involved) was discussed as a top issue to be considered during the migration to NG9-1-1.
- Security –Security is a key issue to be considered in NG9-1-1. In traditional 9-1-1, security was typically not a concern. In the interconnected model of NG9-1-1 it will become paramount.
- Operations / Staffing / Training –NG9-1-1 brings new forms of data which will require a new look at operations, staffing and training issues.

Obstacles to success:

- Funding – Insufficient funding for staff and training, both from a local and state perspective. Adequate funding levels to support NG9-1-1.
- Fear of Change – Some in the CA 9-1-1 Community may suffer from a fear of change. Ensuring that change is managed as best as possible during the transition will be important.
- Geography – The geography of CA presents obstacles that are specifically unique to CA. This means that while lessons from other states are useful, CA will require a customized approach.

General Comments:

- Additional focus groups or workshops involving the stakeholder community will greatly benefit the process. The process should be as transparent as possible.
- An education campaign to help build support/consensus around the NG9-1-1 initiative was noted as extremely valuable. The message needs to be tuned to each audience type.
- Identifying local “ambassadors” (or people in the CA 9-1-1 Community who can help communicate the value of NG9-1-1 and broaden the reach of the CA State 9-1-1 Office) was noted as critical.
- The existing CA Microwave Network should be examined for its suitability in NG9-1-1.

Appendix B: 9-1-1 Strategic Plan Goal Mapping

CA NG9-1-1 Roadmap			CA 9-1-1 Strategic Plan	
	Task	Work Products	Goals	Objectives
Initiation Phase	Executive Sponsorship	N/A	1	All
	Continue to align role of CA State 9-1-1 Office with responsibilities and requirements unique to NG9-1-1	Revised CA State 9-1-1 Office Mission/Vision	1	All
	Identify and engage stakeholder community	Stakeholder List and engagement criteria	1 5 6 7 8 9	1.2 All All All 8.1, 8.4, 8.5 9.4
	Create an education and awareness campaign	Education awareness campaign	8; 9	8.3, 8.4; 9.3, 9.4
Assessment & Analysis Phase	Regulatory, legislative and funding analysis	Regulatory, legislative and funding study	4	All
	Governance analysis	Governance study	1,6,7,8	All
	Technology Assessment (hardware, software, networks and data)	Technology assessments reports	3	All
	Operations analysis	Operations study	6	2
	Security assessment	Security assessment report	3	3.3
	Potentially related statewide projects assessment	Potentially Related statewide projects report	3	All
	9-1-1 Office analysis (staffing, budget, funding, etc)	9-1-1 Office study	1	All
Requirements, Design & Planning Phase	Requirements definition (regulatory, governance, tech, data, security, ops)	Define regulatory, legislative and funding requirements Define governance requirements Define technology requirements Define operational requirements Define data requirements Define security requirements	3 4 5	All All All
	Conceptual system design	Conceptual System Design	3	All
	Create NG9-1-1 Master Plan and sub plans (e.g. governance model, Ops plans, Security plan, GIS, BCP, DRP, Tech support, and begin to update, legislative, regulatory and funding models, etc)	Begin to update regulatory, legislative and funding Model(s) Update procurement vehicles / contracts Create technology support plan Create data guide Create operations plan (includes staffing, training, policies, etc) Create security plan BCP/DRP/IRP	3 4	3.1 – 3.8 4.1 – 4.4
Proof of Concept Phase	Proof of Concept Project(s), Pilot Project(s), etc	Proof of Concept Test Plans, Reports	3	3.7
Implementation Phase	Create transition plan	Transition plan	5	5.4
	NG9-1-1 deployments	Project plan(s) & as-built documentation	3	All
Maintenance & Management Phase	System management (Monitoring, Fault Management, Configuration Management, Change Management, Incident Response/Management, etc)	TBD (may include: updated policies/procedures, administrative guides, revised support plans, etc)	9	All

Appendix B, continued (Glossary for CA 9-1-1 Strategic Plan)

1. ***GOAL 1:*** **EMPOWER THE OCIO/PSCD 9-1-1 OFFICE TO LEAD CALIFORNIA INTO THE NEXT GENERATION OF 9-1-1 SERVICES**.
   1.1. **PSCD 9-1-1 Office as Gatekeeper**. The PSCD 9-1-1 Office will provide the leadership necessary to act as the gatekeeper throughout the planning, development, and implementation of the NG9-1-1 environment. In this role the PSCD will be responsible for establishing the system-wide standards, decisions and business rules by which communication services interact with the statewide NG9-1-1 network and by which 9-1-1 requests are distributed.
   1.2. **Facilitate solutions through collaboration**. Utilize the broad talent base within the PSCD's 9-1-1 Office and leverage the vast knowledge base available throughout the emergency communications community (including, the Advisory Board, County Coordinators, PSAP staff, professional organizations and vendors) to identify and address strategic and tactical Next Generation plans, projects and issues. Establish a NG9-1-1 governance structure to facilitate solutions through collaboration. Individual participation should remain flexible, and vendor participation in policy development should be minimized. A few examples of this type of work include investigating alternative communication modalities for emergency communications, creative solutions for network architecture, shared resource deployments, and business rules for day-to-day operations versus crises management.
   1.3. **Ensure that the 9-1-1 Office has sufficient knowledgeable staff appropriate to the transition and ongoing support of NG9-1-1 in California**. Maintain adequate levels of staff with the knowledge and capability needed to be able to interpret, understand, and adapt to emergent technologies, organizational challenges, change management, vendor relationship management, and other complexities that will be part of the planning and transition to the Next Generation of 9-1-1 in California.
   1.4. **Develop new tools to enhance staff effectiveness, and that will facilitate planning and problem solution analysis and outreach**. For NG9-1-1, the PSCD will refresh or replace the tools necessary to increase staff effectiveness. In response to the continuing dramatic shift from landline to wireless calling, continue the 9-1-1 Office's Routing on Empirical Data (RED) and Emergency Call Tracking System (ECaTS) projects to ensure the timely delivery of 9-1-1 wireless calls to the appropriate PSAPs, establishing a baseline for NG9-1-1. More 9-1-1 Office staff will be involved in problem and solution analysis, in outreach and education of the public, County Coordinators and PSAPs, and in general program leadership.
2. ***GOAL*** **2: EXPAND 9-1-1 TO INCLUDE COMMON AND USEFUL MODES OF COMMUNICATION**
   Objectives: **Determine the criteria for including or excluding various communications technologies into California's NG9-1-1 solution**. The PSCD and the 9-1-1 community will need to establish criteria to use in considering which communication technologies should be brought into California's next generation of 9-1-1 services. For example, criteria may include (but should not necessarily be limited to):
   - Prevalence or popularity of the modality for communication, as well as its purpose.
   - Whether or not the modality is capable of providing real-time communication between the requestor and the PSAP.
   - The degree that certain disadvantaged parties are reliant upon the communication modality (e.g., deaf, speech disabled, blind, etc).
   - The extent that the modality might be considered by the public or others to be a useful or normal form of communication to request emergency help.
   - The extent that the modality may offer unique functional advantages to the responding PSAP.

   2.2. **Determine a process for indentifying the appropriate data to include in the NG9-1-1 solution**. In conjunction with the identification and inclusion of the NG9-1-1 communications technologies, the PSCD and the 9-1-1 community will need to assess the available types and sources of data that can be utilized to compliment the effectiveness of the emergency response effort. Establish standards for data format, accuracy, security, delivery, and other parameters. As with the analysis of communications technologies, this will be an ongoing process as new communications technologies and new data sources become available.
   2.3. **Determine which communications technologies should be supported by California's NG9-1-1 solution**. Using the criteria developed in response to objective 1.1/ assess and determine which communications technologies should be included within California/s NG9-1-1 solution. This can also be an ongoing process as new communication methodologies are developed and adopted. Also consider whether the inclusion of each modality should be mandatory or optional on the part of the service provider, and mandatory or optional on the part of the user.
3. ***GOAL*** **3: DEFINE THE NEXT GENERATION 9-1-1 ARCHITECTURE.**
   Objectives:
   3.1. **IP based and open standards technology**. Create an architecture that will support the broadest possible types of communication modalities and systems, based on an open standards IP network. Adherence to open standards will ensure the greatest possible flexibility and interoperability for California/s NG9-1-1 system, facilitating participation by all communication providers and modalities, as well as interfaces to adjunct 9-1-1 systems such as GIS and CAD.
   3.2. **Security Requirements**. Developing a NG9-1-1 public safety system on IP-based technology will require information technology security considerations similar to other IP networks that are vulnerable to cyber-threats (such as viruses,

hackers, and cyber-criminals). Stringent security requirements must be defined and included in the initial system design and development, and kept up to date on an ongoing basis. These requirements will need to encompass all aspects of the NG9-1-1 security design technologies, as well as operational program, policies and procedures.

3.3. **Deliver requests to PSAPs over the IP network without requiring specialized hardware and software at the PSAP**. Connect 9-1-1 requests and associated information to the PSAPs via web applications operating as a cloud/hosted environment (software as a service), ensuring universal client access via open standards interfaces. Web based services will allow connectivity from variable locations, supporting traditional, consolidated, virtual and incident based PSAPs.

3.4. **All 9-1-1 communication modality vendors to provide all information necessary to identify and route the request**. As a condition of providing 9-1-1 access to their customers, all communication providers of the modalities selected in Goal #1, shall provide their 9-1-1 related valid customer information to the NG9-1-1 system at no charge as a requirement of doing business in California. Such information might include but is not limited to, ten digit phone number, IP address, physical address, longitude and latitude (X/V address), name of customer, identity and call back number of the communications provider, modality of the request.

3.5. **Establish a common statewide knowledge system to route requests based on business rules**. Route calls based on flexible business rules rather than an inflexible network or statute. Business rules could include factors such as X/V and street address routing, communication modality, type of emergency, PSAP jurisdictional boundaries, availability of the PSAP, predictive emergency events, load balancing, and so forth.

3.6. **Supports complete flexibility of PSAP jurisdictions and operations**. The system should provide complete flexibility in supporting all types of PSAPs, including existing PSAPs, consolidated PSAPs, temporary or permanent virtualization of PSAPs, mobile and temporary incident PSAPs. PSAPs shall continue to be owned and managed by the responsible government jurisdiction.

3.7. **Robust services and delivery mechanisms, including leveraging existing or planned State infrastructure as appropriate**. The system must be fail safe and offer multiple delivery pathways, including leveraging other State IP and data networks, and emergency communication systems, with active management reporting, while ensuring appropriate security standards.

3.8. **Ensure that the NG9-1-1 system is publicly owned and non-proprietary**. California's vision is to create our NG9-1-1 environment as an open source, open standards-based public asset, licensed via the General Public License (GPL). Public agencies under the leadership of the PSCD will oversee NG9-1-1, while private companies may be contracted for systems development and administration. This public solution will provide California with a NG9-1-1 system which is interoperable, extensible, shareable, and cost sustainable

4. ***GOAL 4:*** **MODERNIZE THE FUNDING MECHANISM TO ALIGN WITH THE NEXT GENERATION SOLUTION.**

Objectives*:*

4.1. **Keep the SETNA special fund and ensure that its use is protected**. Retain the special purpose fund account in the State Treasury, and ensure by statute, policy and procedure that it can only used for approved 9-1-1 purposes, and cannot be borrowed against for other purposes.

4.2. **Ensure a minimum available fund value at all times**. The amount in the fund should be sufficient to continuously provide authorized 9-1-1 program services, and should have sufficient excess reserve to accommodate unforeseen emergency requirements and multi-year planning. The funds should approved State budget

4.3. **Identify the most appropriate funding source for NG9-1-1 program services**. The current telephone user fee based funding of 9-1-1 will be neither sufficient nor equitable to support the wide variety of Next Generation services. A new funding model will need to be collaboratively identified and developed that is appropriate to the communication services and responsive to the fiscal needs of the program. Request federal grant funds as available.

4.4. **Repurpose the fund's allowed expenditures**. The current Revenue and Taxation Code for 9-1-1 does not sufficiently define the variety of costs and expenditures associated with the full range of 9-1-1 program elements, nor for all of the types of costs that will be necessary for the Next Generation of services. Clarifying and repurposing the expenditures should include items such as:

- Fund the 9-1-1 Office
- Pay for the NG9-1-1 architecture including IP network, databases, SAAS, and reporting systems
- PSAP 9-1-1 call taking customer premise equipment (CPE) and related items (e.g., furniture, etc.)
- Special projects and pilots
- 9-1-1 Office training and travel
- Advisory board support
- County Coordinators
- PSAP call taker recruitment
- PSAP education and training
- Public education and outreach
- Other program related costs

4.5. **Continued review and evaluation**. The PSCD 9-1-1 Office will provide ongoing review of the impact that NG9-1-1 deployments are having on the PSAPs and their associated SETNA funding considerations.

5. ***GOALS:*** **CREATE AN OPEN MARKETPLACE FOR NG9-1-1 SOLUTIONS.**

Objectives*:*

5.1. **Promote market outreach and enrichment**. Educate vendors of broader technology industries about the opportunity to participation in California NG9-1-1. Attracting the interest of technology companies from outside the traditional 9-1-1 telecommunications industry is a constructive way to infuse new ideas, energy, and innovation.

5.2. **Procure open source NG9-1-1 systems and services**. Engage commercial companies to help design and develop new open source systems, components and features for the NG9-1-1 environment. These new open-source systems will facilitate multiple new compatible projects in response to specific needs of PSAPs and communications services providers. These individual projects have the potential to be smaller, less complex, and faster to develop than traditional stand-alone proprietary systems, and therefore less expensive overall. A significant benefit can result from lessening the distance between a good idea and its implementation. This creative, agile approach enables the rapid pace of evolution and enhancement of the NG9-1-1 environment.

5.3. **Preserve open access to the market**. A key role of the PSCD, in collaboration with other stakeholders such as the 9-1-1 Advisory Board, is to preserve the continual opportunity for diversity and participation by new vendors in the California NG9-1-1 market through lessons learned, preventing the insertion of proprietary components into the NG9-1-1 environment, ensuring product and service contracts are correctly written, and encouraging a healthy understanding and appreciation among industry organizations such as NENA and CalNENA

5.4. **Publish/distribute shared solutions**. California and other participants benefit from the continuing evolution, expansion and enrichment of the open source NG9-1-1 environment brought about by the sharing of solutions. It is critical that California provide a leadership role in charting, understanding and obtaining new solutions developed by other state, local and federal agencies, as well as distributing information about our new system enhancements. Sustained collaboration is the cornerstone of an ever-evolving NG9-1-1 experience.

6. ***GOAL 6:*** **EMPOWER COUNTY COORDINATORS IN THE NEW PARADIGM.**

Objectives*:*

6.1. **Expand the role and responsibilities of the County Coordinators to support NG9-1-1**. Expand and clarify the role and responsibilities of the County Coordinators to support the PSAPs as NG9-1-1 services are implemented. Consider multiple ways that an expanded role of County Coordinators may contribute to the success of 9-1-1, such as public outreach and education, PSAP compliance and problem assistance, conveying PSAP needs to the 9-1-1 Office, and so on. A manual created by a joint effort of the State 9-1-1 Office, County Coordinators and PSAP managers, can facilitate the development and understanding of this new role.

6.2. **Establish a standardized training program and monitor effectiveness**. Develop a formal 9-1-1 Office training program for County Coordinators, covering a variety of topics germane to their responsibilities. Conduct both initial and ongoing training, and include regional County Coordinator meetings to ensure peer discussion, education, mentoring program, and feedback to the 9-1-1 Office.

6.3. **Research the best ways to employ County Coordinator services to ensure stability and succession planning in support of their expanded NG9-1-1 role**. Considering the anticipated expanded roles and responsibilities of the County Coordinators in transitioning to and supporting the NG9-1-1 environment, a best practice for employing and retaining County Coordinator services will need to be collaboratively developed. This may result in refinements to the existing methods of employing County Coordinator services through various counties and cities, or may consider other approaches, all with the purpose of identifying the best practice and best value solutions.

7. ***GOAL 7:*** **EMPOWER THE 9-1-1 ADVISORY BOARD TO PROVIDE LEADERSHIP IN THE NEW PARADIGM.**

Objectives*:*

7.1. **Provide the Board with ongoing and current information related to the policy and program challenges of transitioning to the NG9-1-1 environment**. The Advisory Board should be informed of 9-1-1 program challenges, information and opportunities in order to empower it to provide advice and guidance to the 9-1-1 Office. The PSCD should gather and/or develop pertinent project and other information with the purpose of sharing that information with the Board members, especially as it relates to transitioning to the Next Generation environment.

7.2. **Involve the Board in collaborative policy development**. The Board members represent unique experience and perspectives within the 9-1-1 community that may not reside within the State 9-1-1 Office. The PSCD recognizes the significant contribution that the Board may add to the development of program policies and practices, and therefore, the 9-1-1 Office and the Board should collaborate in the early stages of policy development, as well as in ongoing program improvements.

7.3. **Enhance the Board's communication and procedural methodology**. Communication and sharing of information needs to be enhanced among the Board Members, and between the Board, the County Coordinators and the State 9-1-1 Office to improve the free flow of ideas and information, while ensuring the public transparency of the Bagley-Keene Act.

7.4. **Encourage the Board to provide leadership and outreach to the 9-1-1 Community in support of transitioning to the new NG9-1-1 environment**. The PSAPs and other members of California's 9-1-1 community will benefit from knowing the Advisory Board's recommendations and consensus with the State's 9-1-1 plans and policies. The transition to NG9-1-1 will require significant collaboration and partnership with all jurisdictions, and the Advisory Board is in a unique position to corroborate NG9-1-1 statewide program direction and policies.

8. ***GOAL 8:*** **ENSURE THE PUBLIC IS INFORMED OF THE NEXT GENERATION CHANGES AND THE PROPER USE OF 9-1-1.**

Objectives*:*

8.1. **Confirm policies affecting the public's use of 9-1-1**. Review and confirm those policies that will impact the public's ability to use 9-1-1 effectively in the Next Generation environment. For example, the use of ten-digit emergency numbers, which types of communication modalities are to be incorporated into NG9-1-1 and how to use them when placing a request for emergency service, any actions that users may need to perform to register or enable their NG9-1-1 services, and so forth.

8.2. **Determine the percentages of call types among 9-1-1 calls**. Perform a statistically valid sampling of calls received at various PSAPs to find out the nature of the calls. Assess why people are calling 9-1-1 and determine the percentage of calls that are for various emergencies, and those that are not emergencies. Also determine what groups are not using 9-1-1.

8.3. **Study the cost and benefit of a public education campaign**. Contract with a marketing and outreach analysis firm to determine: 1) what kinds of public education may significantly lower 9-1-1 call volumes, and 2) what is the best way to inform the variety of users of non-legacy communication technologies on how to use 9-1-1. Include consideration of material that can be used by a variety of community groups, such as community based organizations and agencies that serve people with communications disabilities, instructors of English as a Second Language, police and fire departments, primary and secondary grade teachers, university police, etcetera. Consider material for a variety of media such as TV, radio, websites, and corporate distribution (i.e., material that should be provided by the communication providers to their potential and existing customers). Also investigate co-sponsorship and gratis participation of statewide or regional companies, such as public service announcements, supermarket chains that may put information on their bags, and others. Assess potential costs and benefits to develop and manage the campaigns, including in different languages, and what campaigns may be State sponsored and which may best be achieved at the local level.

8.4. **Conduct focused public education campaigns as warranted**. Depending upon the results of the studies, develop and initiate public outreach and education efforts to reach the targeted audiences, including people with communication disabilities, with the most effective messages.

8.5. **Establish standard messages for PSAPs to include on their websites**. A survey of over 300 California PSAPs' websites indicated that almost 40% did not list a "non-emergency" telephone number.Without a non-emergency number listed, citizens may conclude that the appropriate way to contact the police or fire department is by dialing 9-1-1 for all situations. Provide updated messages for PSAP use with new information as NG9-1-1 services are implemented.

9. ***GOAL 9:*** **MONITOR SYSTEM HEALTH FOR THE PUBLIC GOOD.**

Objectives*:*

9.1. **Define NG9-1-1 key performance indicators and business rules**. NG9-1-1 creates the possibility for all PSAPS (including small distributed locations, centralized large call centers, and individual PSAP team members participating outside a PSAP or in a mobile fashion) to perform as a collaborative community. New business rules and practices can help ensure consistency and capability across the entire spectrum of PSAPs. Legacy wireline voice answer times and other performance standards can serve as a starting point, but will need to evolve to become applicable to NG9-1-1. The 9-1-1 Office will provide leadership in working with other stakeholders such as the Advisory Board and County Coordinators to determine new NG9-1-1 business rules.

9.2. **Create the NG9-1-1 performance dashboard**. Create a NG9-1-1 portal environment which includes a "dashboard" view of overall system health. This type of *status-at-a-glance* feature allows all stakeholders to easily understand and rapidly and appropriately respond to conditions such as network trouble spots, PSAPs in event distress with potentially slow response times, missing request information, training requirements, and many other potential key indicators of NG9-1-1 performance. A strength of this online dashboard is the ability for all parties to view the same information, thus encouraging collaborative problem solving between different jurisdictional agencies.

9.3. **Create the NG9-1-1 Community Portal**. In conjunction with the performance dashboard, the creation of a portal environment enables the creation of a statewide knowledge repository. All participants in California 9-1-1 will be able to contribute content such as lessons learned, stories of individual achievement, resolutions to challenging problems, development of new solutions, and questions to be answered by other PSAPs or the 9-1-1 Office. There is enormous potential for idea sharing, cross training, and enhancing a sense of collaboration throughout the state. Such a NG9-1-1 Community Portal may quickly become the glue that creates a new, stronger and more flexible bond between all 9-1-1 contributors.

9.4. **Communicate up, communicate out**. The 9-1-1 Office will be responsible for making system health status viewable *upward* to the benefit of state management and elected officials, as well as *outward* to help inform the public of how well 9-1-1 serves -and of potential challenges faced. Connecting the public to the heartbeat of the 9-1-1 system via web sites or other

information distribution methods is one for the strongest accelerators for creating a greater sense of community between public services and the public served as long as appropriate security requirements are maintained.

Appendix C: References

The following references were used in the creation of this document:

- 9-1-1 Industry Alliance (9IA). *2008 Study on the Health of the US 9-1-1 System* (March 2008. http://www.911alliance.org/publications/download_report.cfm.
- National Emergency Number Association (NENA). Next Generation Partner Program: Next Generation 9-1-1 Transition Policy Implementation Handbook*: A Guide for Indentifying and Implementing Policies to Enable NG9-1-1 (*March 2010). http://www.nena.org/government-affairs/stories/ngpp-transition-policy-implementation-handbook.
- Department of Transportation's *"A National Plan for Migrating to IP-enabled Systems"*
- Department of Transportation's *"NG9-1-1 System Initiative Transition Plan"*