

Message from the State CIO

TABLE OF CONTENTS

**California Statewide Telecommunications Strategic Plan
*Pathway to a Connected California***

INTRODUCTION 1

GOALS, OBJECTIVES, AND ACTIONS

GOAL 1 10
GOAL 2 13
GOAL 3 16
GOAL 4 19
GOAL 5 21
GOAL 6 23
GOAL 7 25

CLOSING SUMMARY 28

APPENDICES

A – Telecommunications Strategic Plan Work Group Charter 30
B – Statewide Telecommunications Strategic Plan Summary Charts 36
C – Matrix of Responsibilities and Timelines for Actions 44
D – Glossary 46
E – Members and Contributors 48

INTRODUCTION

Pathway to a Connected California

The management of State telecommunications is at a crossroads in California. A transition is occurring that is transforming the State from a traditional approach that was organizationally and technologically segregated into separate technical fields for voice, data, video, and radio into a merged common discipline. This telecommunications revolution has already been recognized in the private sector and by the youth of the world, but is just beginning to be acknowledged in California State government. It comprises a central theme that permeates the State Telecommunications Strategic Plan: *convergence* – convergence of technology, media, organization, governance, and the work force. Inherent in this theme is the need for *flexibility* to accomplish telecommunications tasks in the best way possible.

In the commercial world, convergence encompasses turning the mobile telephone into an all-in-one personal device that, on demand, sends and receives voice calls, video clips, music, text messages, email, calendar entries, radio transmissions, and the latest motion pictures. It enables public safety agencies to receive data, text messages, satellite video feeds, radio calls, and other emergency communications in their vehicles while responding at the scene of an emergency. From a technology standpoint, convergence is the melding of what had once been separate forms of communication and information processing toward shared standards. This does not mean, for example, that all state communications systems should immediately be transitioned to Internet Protocol (IP) technology. Rather, it means that the State needs to position itself for the future realities of telecommunications and transition individual systems as business needs, security safeguards, and cost considerations warrant.

Because communication is essential to most governmental functions, individual departments needed to develop staff and programs to support their diverse program investments. While this strengthened some departmental telecommunications units by aligning them with program investments, other departments have had limited staff and resources available to take advantage of converging and emerging technologies in a timely manner. The inequities demonstrate the need for the development of a comprehensive statewide approach to robust networks. This Strategic Plan advances an evolution that has already begun in State government, recognizing the need for convergence in numerous facets of information and communications technology and management both as a means of improving services and saving money. The evolutionary advances include building network infrastructure to support voice, data, video, and radio; developing policies regarding such issues as operations, procurement, and security; improving management of the technology workforce; reconciling emergency vs. non-emergency network needs; and establishing technology governance.

Increasingly, the benefits of converging technologies are demanded by State business clients. It has long been recognized that important state functions like public safety, health, social services, education, and corrections have strong mutual dependencies. Barriers to robust information exchange among them are a detriment to their effectiveness. Many of Governor Schwarzenegger's key initiatives – expanded broadband access, e-Government, the new State Portal, and medical information technology – are dependent upon a strong network infrastructure.

Preparation of the Plan

This is the first California Statewide Telecommunications Plan. This Plan is only a starting point. In light of the very dynamic nature of telecommunications technology and industry, it should be revisited annually and expanded or refined as appropriate. In particular, future Plans should devote added attention to

State Telecommunications Strategic Plan

DRAFT

public safety and state/local government communications needs. The Plan was prepared in response to Action 1 of Objective 2 of Goal 4 of the 2006 California State Information Technology Strategic Plan:

“By March 2007, the State CIO and the DTS will establish a business-oriented, statewide telecommunications strategy that will address the full range of telecommunications services used by state agencies, ranging from basic phone service to video conferencing, telecommuting, long-distance learning, call centers and other functions made possible by modern telecommunications technologies. These strategies will complement activities undertaken pursuant to the Governor’s Executive Order, S-21-06 (Oct. 27, 2006), which encourages deployment of ubiquitous broadband throughout the State by increasing adoption rates, promotes accessibility and improve applications to better serve California and its economy.”

The Plan was prepared by the Statewide Telecommunications Strategic Plan Work Group, sponsored by California State Chief Information Officer Clark Kelso and the State Information Technology Council. The 17-member Work Group (acknowledged in Appendix D), assisted by numerous other state and local government telecommunications professionals, met regularly over a period of six months to develop and finalize the plan. Appendix A is the Work Group Charter.

Scope of the Plan

This Plan is not a prescription for the deployment of commercial telecommunications throughout California. It focuses, rather, on advancing the productive use of telecommunications technologies by State government agencies and their local government stakeholders.

For the purposes of this Strategic Plan, it is important to establish a common understanding of what we mean by the term ‘telecommunications’. Historically, telecommunications has been used to mean voice communications or has been used in the strict context of the transmission of signals over

communication links. As such, it has often been contrasted with 'data communications'. However, given the technology convergence taking place wherein a single network can be used to transport voice, data, video, and radio, the terminology distinguishing between telecommunications and data communications networks becomes increasingly meaningless.

For the purposes of this Plan, we define telecommunications to include all hardware, software and service components involved in the secure, efficient and reliable delivery of analog and digital data streams to and/or from government 'end systems'. Examples of the components that comprise a telecommunications system are communications links, routers, switches, multiplexers, transmitters, repeaters, and firewalls. The end systems which are interconnected via a telecommunications system include discrete hardware and software elements that accept analog or digital data streams for storage, processing or conversion to an end user. Examples of end systems are servers, telephones, video displays, and handheld computing devices.

A telecommunications system, as defined here, generally consists of systems, services or components that:

- Do not **create** data except for use by the telecommunications system or systems used to monitor or manage the telecommunications system.
- Do not **store** data except transiently for purposes related to network routing, performance optimization or error recovery.
- Do not **delete** or modify data except for purposes related to the reliability, efficiency and security of the telecommunications service.

This definition of telecommunications is broad enough to allow us to consider, as part of a telecommunications system, technologies that are common across organizations but are focused on not just the mechanics of transporting information but also the content of what is transported. These tend to fall into special classes, such as web or network caching devices; data compression and

WAN optimization devices; anti-malware devices, filters or services; and intrusion detection or prevention devices. The unifying element among these devices or services is their commonality across organizations. For example, while some organizations may use different web technologies, have vastly different web content, use different web browsers, and employ different email systems, these organizations may well use the same anti-spam or anti-spyware services to both improve security and reduce the overhead in transporting this type of undesired intrusion. From a strategic perspective, if there is this level of commonality in use of these services, then we must consider the potential strategic value of providing or contracting for such services centrally to reduce costs, improve reliability, and increase adoption.

Mission, Vision, and Values

As stated in the Work Group Charter:

“The mission of state telecommunications management is to ensure that all state entities can obtain the telecommunications products and services necessary to meet their business needs.”

To focus its efforts on fulfilling this Mission, the Work Group began its assignment by articulating a future vision of telecommunications management and performance in California State government:

“In response to current and emerging business needs, State and local government will have access to cost-effective, capable, flexible, and responsive telecommunications technology and services which include transport and management of network data. A customer-driven governance structure and processes will promote the timely acquisition and provision of these telecommunications services to meet the State’s emergency response, employee productivity, and public service delivery mandates.”

During the development of the Strategic Plan, the Work Group recognized that there are certain key values that should guide policies and actions with

regard to the State's telecommunications agenda. These values hinge, in turn, on two fundamental convictions which the Group holds to be indisputable:

1. **Telecommunications is mission critical.** Protection of public health and safety and many of the State's primary business purposes in today's world rely upon a robust and always available telecommunications system.
2. **Telecommunications is fundamental for government services.** Robust telecommunications will improve worker productivity and enhance delivery of services to all Californians.

The values that are recognized in the Strategic Plan and its specific implementing actions are as follows:

- **Flexibility and responsiveness.** The state should consider technical flexibility, variety, and affordability of service offerings to be paramount for meeting the diverse telecommunications needs of the state and local government entities.
- **Proactive policies.** State policy and procedure should facilitate and encourage the timely adoption of valuable and appropriate telecommunications technology.
- **Buy not build.** The State's preference should be to meet its business needs through the use of competitively available commercial services rather than to construct proprietary infrastructure, thereby reducing support costs and avoiding obsolescence.
- **Nondiscrimination in services.** The state should endeavor to provide telecommunications services to meet the needs of all state entities and business models.
- **Advancement of public infrastructure.** When considering its programmatic business needs, the state should leverage its buying

power to promote the development of infrastructure that will be of benefit to all state residents and businesses.

Strategy for a Connected California

California residents and the state and local government agencies that serve them have an ever increasing need to be connected – to be able to transact business rapidly, effectively, and securely, to find information, and to respond directly to public agencies. The new, easier-to-use California State Portal is one response to this demand. The State's communications policies, practices, and infrastructure must similarly be transformed to meet the demands of the future.

Recognizing this, the Telecommunications Strategic Plan establishes the following seven goals for telecommunications in California state government:

- 1. The State will take an enterprise perspective in the acquisition and strategic management of telecommunications services.*
- 2. The State will secure robust and flexible communications services to support its business objectives.*
- 3. The State will facilitate public safety and emergency preparedness by enhanced access to communications networks and improved survivability.*
- 4. The State will protect its information assets and networks from loss, damage, misuse, and misappropriation.*
- 5. The State will promote the convergence and integration of voice, data, video, and radio services.*
- 6. The State will ensure a more effective telecommunications workforce.*
- 7. The State will establish a customer-driven telecommunications governance structure.*

Each goal is accompanied by defining objectives and specific implementing actions, which are to be accomplished within the next two years. Included

among these actions are some dramatic changes to the way the State has done business in the past with regard to telecommunications management. Listed below are some summarized examples of Action Items representing important changes recommended in the Strategic Plan. The complete text of these and all other recommended Actions may be found following each Goal and Objective. The parenthetical references following each Action below are to the Goal, Objective, and Action number in the Plan.

- Explore alternatives for shared high-speed communications technology to support functions that include general backup, Disaster Recovery, and fault tolerance. (2.1.2)
- Where appropriate, deploy emergency network components (e.g., satellite trucks) for routine remote connectivity needs during non-emergency periods. (2.1.3)
- Implement and manage multimedia and other network-based audio, video, and web-based collaboration services to facilitate public access to government information and services and information exchange between government organizations. (2.4.3)
- Establish statewide network security policies and procedures. (4.1.1 and 2)
- Develop a State converged technologies plan and demonstration project, to include voice, data, and video services. (5.1.1 and 3)
- Evaluate the feasibility of centralizing call center equipment and services through converged technologies. (5.2.1)
- Sponsor a "California Telecommunications Workforce Management Committee" to review the findings regarding telecommunications workforce classification structures and recommend workforce convergence opportunities, risks, issues, and collective bargaining and budget considerations. (6.1.2)

State Telecommunications Strategic Plan

DRAFT

- Establish a governance structure for the development, administration, and implementation of the strategic plan. (7.1.1)
- Establish a position of State Chief Telecommunications Officer. (7.1.2)
- Establish measures of effectiveness of the State's telecommunications infrastructure. (7.4.1)

GOALS, OBJECTIVES, AND ACTIONS

GOAL 1

The State will take an enterprise perspective in the acquisition and strategic management of telecommunications services

To meet the customer-focused government business needs of state agencies and their local government partners, the State will collaboratively acquire, manage, and maintain enterprise-wide telecommunications services to support current and planned government operations. To achieve these purposes, the State will undertake procedural and administrative management reforms.

Objective 1

Promote the planning, architecture, and implementation of telecommunication systems to align with the State's diverse business goals and provide State and local agencies with access to statewide network services that are dynamically scalable to meet changing business needs.

The business needs of state agencies vary widely and, consequently, so do their network needs. The State's strategic approach to meeting telecommunications needs must recognize this and provide for the scalability and services needed by our many diverse state programs or face the inevitability that individual State agencies will seek alternative approaches that will satisfy their programs' needs.

Actions:

1. The Technology Services Board shall establish a mechanism to periodically inventory existing network services and survey agencies to determine their telecommunications business needs. *This Action shall be completed 6 months after adoption of this Plan.*
2. The Information Technology Council shall evaluate existing and available network service offerings for scalability constraints and develop an action plan to address constraints that are found. *This Action shall be completed 6 months after adoption of this Plan.*
3. The Information Technology Council shall establish a strategic team to explore alternatives and develop recommendations for statewide network planning that will lead the state toward effective network deployment,

management, and support. *This Action shall be completed 12 months after adoption of this Plan.*

4. The Department of General Services shall establish a subject matter expert to advise State agencies in State and federal regulatory requirements (i.e., CPUC and FCC) and right-of-way issues pertaining to telecommunications. *This Action shall be completed 3 months after adoption of this Plan.*

Objective 2

Reduce telecommunications bill management complexity.

State agencies currently incur a substantial hidden personnel cost of reconciling, reviewing, and approving overly complex bills from telecommunications service providers. Efficiencies and cost savings could be realized through centralizing and simplifying bill management, where possible.

Actions:

1. The Department of Technology Services shall explore and recommend bill simplification options by CALNET 2 suppliers. *This Action shall be completed 9 months after adoption of this Plan.*
2. The Department of Technology Services shall explore bill simplification options for other DTS telecommunications bills. *This Action shall be completed 9 months after adoption of this Plan.*
3. The Department of General Services shall execute a leveraged procurement document for telecommunications expense management and invoice validation services. *This Action shall be completed 12 months after adoption of this Plan.*

Objective 3

Pursue, on an ongoing basis, additional enterprise-wide procurements that are timely and cost effective, using leveraged contracting vehicles.

Savings could be realized if, in addition to current leveraged procurements, other widely-used telecommunications products and services were purchased centrally or if statewide contracts were available to obtain better pricing and facilitate purchases.

Actions:

1. The State Chief Information Officer shall develop an easy-to-use procurement vehicle for independent network service management

State Telecommunications Strategic Plan

DRAFT

and operational services. *This Action shall be completed 18 months after adoption of this Plan.*

2. The Departments of Technology Services and General Services shall develop an easy-to-use procurement vehicle for streaming video and audio services, to facilitate the implementation of Governor's Executive Order S-23-06. *This Action shall be completed 12 months after adoption of this Plan.*
3. The State Chief Information Officer shall develop an easy-to-use procurement vehicle for enhanced and extended network service offerings and voice services. *This Action shall be completed 18 months after adoption of this Plan.*

GOAL 2

The State will secure robust and flexible communications services to support its business objectives

To support its business objectives, the State will secure robust and flexible telecommunications services, including enhanced Web services and mobile connectivity.

Objective 1

Develop diverse network connectivity options, adopting technologies that provide greater flexibility in how and where government business processes are conducted by government organizations and other service providers.

Providing diversity in connectivity options will allow State agencies greater flexibility to meet a wide array of business needs. In some cases, more options may also result in cost savings.

Actions:

1. The State Chief Information Officer shall develop appropriate Wi-Fi deployment models for use by state agencies, consistent with Executive Order S-23-06 and the State Broadband Initiative. *This Action shall be completed 12 months after adoption of this Plan.*
2. The Department of Technology Services shall explore alternatives for shared high-speed communications services to support functions that include general backup, disaster recovery, and fault tolerance for multiple sites/organizations. *This Action shall be completed 24 months after adoption of this Plan.*
3. The Department of General Services shall identify opportunities for, and remove barriers to, the deployment of emergency network recovery facilities (e.g., satellite trucks) for routine remote connectivity needs, including public safety and other government and educational programs, during non-emergency periods. *This Action shall be completed 15 months after adoption of this Plan.*
4. The Department of General Services, in conjunction with the Department of Technology Services, shall explore the feasibility of using the State's radio network to provide an alternate path for the

State's hard-line network, and vice versa. *This Action shall be completed 24 months after adoption of this Plan.*

Objective 2

Provide multiple alternatives to meet diverse business needs for state agencies through tiered quality and cost options.

Not all State agencies require the most robust telecommunications options for all their services. Savings can be achieved if services, to the greatest extent possible, can be tiered to allow agencies to purchase only the level of service needed for their business requirements.

Actions:

1. The Department of Technology Services shall evaluate tiered service offerings, to the extent this is not covered in CALNET 2 contracts. *This Action shall be completed 3 months after adoption of this Plan.*
2. The Department of Technology Services shall assess customer satisfaction with its enterprise-wide procurements and act to enhance and extend existing or new procurements in response to customer needs. *This Action shall be completed 6 months after adoption of this Plan.*

Objective 3

Re-architect State telecommunications infrastructure to support a wide variety of applications.

State agencies administer many types of applications over their networks, some of which may require considerable network capacity. An infrastructure that can adapt to these varied requirements and establish network priorities will allow greater types of uses and, ultimately, lower overall costs.

Actions:

1. The Department of Technology Services shall evaluate the effectiveness of network caching and content switching at strategic points on the state's networks. If effective, the Department of Technology Services will seek to make such devices available to state agencies through an appropriate contract vehicle. *This Action shall be completed 12 months after adoption of this Plan.*
2. The Department of Technology Services shall ensure that advanced network features, such as Quality of Service (QOS) and multi-casting, are generally available as a service offering from contract vendors. *This Action shall be completed 15 months after adoption of this Plan.*

State Telecommunications Strategic Plan

DRAFT

3. The Department of Technology Services shall implement and manage multimedia and other network-based audio, video, and web-based collaboration services to facilitate public access to government information and services and information exchange between government organizations. *This Action shall be completed 21 months after adoption of this Plan.*
4. The Department of Technology Services shall evaluate use of Wide Area Network (WAN) optimization tools to extend the life of existing circuits. If effective, the Department of Technology Services will seek to make such devices available to state agencies through an appropriate contract vehicle. *This Action shall be completed 15 months after adoption of this Plan.*

GOAL 3

The State will facilitate public safety and emergency preparedness by enhanced access to communications networks and improved survivability

To ensure adequate protection of the public, the State will facilitate State obligations related to public safety and emergency preparedness by enhanced access to telecommunications networks and improved survivability and disaster recovery for the State's information resources.

Objective 1

Assess the readiness, survivability, and flexibility of the State's telecommunications assets in the event of a major regional disaster.

Although every State agency is required to have an Operational Recovery Plan and Business Resumption Plan, the interaction of these plans in the event of a major regional disaster affecting multiple agencies has not been tested for all agencies. An analysis of the telecommunications aspects of all State plans might reveal deficiencies that are not apparent from reviewing the plans individually.

Actions:

1. The State Chief Information Officer and Director of the Office of Emergency Services shall commission a risk assessment of the readiness, survivability and flexibility of the State's telecommunications assets in the event of a major regional disaster affecting Sacramento headquarters facilities and develop proposed action plan for addressing identified deficiencies. *This Action shall be completed 15 months after adoption of this Plan.*
2. The State Chief Information Officer and Director of the Office of Emergency Services shall conduct a feasibility study of alternatives for survivable and rapidly recoverable communications facilities for remote locations and initiate implementation as appropriate. *This Action shall be completed 18 months after adoption of this Plan.*
3. The State Chief Information Officer and Director of the Department of General Services will sponsor an analysis of the California Multi-Agency Radio System (CMARS) to determine whether it is architected appropriately for a broad range of state communications needs as a

transport alternative. *This Action shall be completed 21 months after adoption of this Plan.*

Objective 2

Ensure the ability to recover from a catastrophic outage.

The ability of the State to recover from a catastrophic outage of telecommunications, power, IT resources, or other key infrastructure will depend upon preparations and prioritization schemes developed prior to the outage. Steps need to be taken now to prepare for such an eventuality.

Actions:

1. The Department of Technology Services shall ensure that rapid recoverability and survivability features of new and existing network service offerings are considered and used appropriately. *This Action shall be completed 6 months after adoption of this Plan.*
2. The State Chief Information Officer shall sponsor forums to educate and encourage departments and agencies to implement networking mutual aid agreements and cooperative continuity planning. *This Action shall be completed 21 months after adoption of this Plan.*
3. State Chief Information Officer shall develop policies and guidelines that facilitate prioritized rapid restoration of the state's telecommunications infrastructure and facilities after disruption by any cause. *This Action shall be completed 18 months after adoption of this Plan.*
4. The Department of Technology Services and the Department of General Services Real Estate Division shall develop telecommunications fault tolerance guidelines and standards to be used for new State constructed buildings that address (1) diversity of telecommunication pathways and installations and (2) minimum electrical power requirements required to survive extended interruptions of utility services. *This Action shall be completed 24 months after adoption of this Plan.*
5. The State Chief Information Officer, the Office of Emergency Services, and other state government entities shall engage in outreach to private utility and telecommunications service providers and other governmental entities (including the FBI's Infraguard program) to increase information sharing and partnership on issues such as emergency telecommunications services restoration, infrastructure sharing during disasters, and interoperability. *This Action shall be completed 9 months after adoption of this Plan.*

6. The Office of Emergency Services shall establish a plan that will use current and emerging telecommunications technologies to provide information, directions, and status updates to the public during an emergency. *This Action shall be completed 24 months after adoption of this Plan.*
7. The Office of Emergency Services and the Department of Technology Services shall develop a plan to provide alternate region-wide emergency telecommunications capabilities and business facilities in the Sacramento region to provide for recovery from catastrophic or extended outages. A State plan is necessary because individual departmental Continuity of Operations/Continuity of Government (COOP/COG) plans may not be sufficient in a region-wide disaster and inherently fail to take advantage of shared telecommunications and facilities. *This Action shall be completed 24 months after adoption of this Plan.*

Objective 3

Provide easy-to-use procurement vehicles to obtain services that are not available from the state's public safety network.

State agencies having public safety responsibilities require a speedy procurement vehicle offering a wide range of goods and services to ensure that they can acquire essential services, supplies, and equipment to prepare for disasters.

Actions:

1. The Department of Technology Services shall secure a contract for satellite telephone service to be used for safety and emergency services in remote locations. *This Action shall be completed 9 months after adoption of this Plan.*
2. The Technology Services Board shall encourage public safety agencies to identify new telecommunications offerings that will benefit public safety and, where appropriate, direct the Department of Technology Services to provide easy-to-use procurement vehicles to access the offerings. *This Action shall be completed 9 months after adoption of this Plan.*

GOAL 4

The State will protect its information assets and networks from loss, damage, misuse, and misappropriation

To ensure security of critical information assets, the State will take actions to secure its networks from unauthorized intrusion, malware, and other disruptions to the safe conduct of the state's business. All data stored on state systems and networks shall be regarded as state information assets. State networks will be safeguarded from unnecessary or unauthorized use.

Objective 1

Establish a baseline set of policies and procedures for governing telecommunications security.

Most telecommunications policies and procedures are now developed and implemented by individual state agencies. Because of the importance, interrelatedness, and complexity of telecommunications systems, essential baseline policies covering commonly-used shared services should be available to all state agencies.

Actions:

1. The State Information Security Officer shall coordinate with the Information Technology Council's security committee to ensure development of statewide policies in at least the following areas: appropriate use, internet use, malware protection, expectation of privacy, mobile devices, web-content filtering, remote access, identity management, and authentication. *This Action shall be completed 21 months after adoption of this Plan.*
2. The State Information Security Officer shall coordinate with the Information Technology Council's security committee to establish procedures and policies to manage remote connectivity to the network, including but not limited to: VPN, remote desktop and client applications, telecommuting, access from publicly accessible computers, file sharing, and network access control. *This Action shall be completed 24 months after adoption of this Plan.*
3. The Information Technology Council shall include telecommunications security among the assigned responsibilities of its Security Committee. *This Action shall be completed 3 months after adoption of this Plan.*

Objective 2

Develop and promote tools, services, and standards to enable organizations to comply effectively with security policies and requirements.

Most telecommunications tools, services, and standards are left largely to the discretion of individual state agencies. Because of the importance, interrelatedness, and complexity of telecommunications systems, essential tools, services, and standards should be available to all state agencies.

Actions:

1. The State Information Security Officer, in conjunction with the Department of Technology Services, shall establish a clearinghouse for network security best practices, maintain an inventory of current installed technologies, and provide general information. *This Action shall be completed 3 months after adoption of this Plan.*
2. The State Information Security Officer, in conjunction with the Information Technology Council, shall assess the need for contracts for security products and service offerings, such as web content filtering, intrusion protection systems, firewall implementations, and network vulnerability assessment, and report its recommendations to the Technology Services Board and Department of General Services. *This Action shall be completed 6 months after adoption of this Plan.*
3. The State Information Security Officer, in conjunction with the Information Technology Council, shall develop a security strategy for Wi-Fi deployment, consistent with Executive Order S-23-06 and the State Broadband Initiative. *This Action shall be completed 9 months after adoption of this Plan.*
4. The Department of Technology Services and Department of General Services shall develop procurement vehicles with a minimum of three vendors to provide agency vulnerability assessments and remediation plans. *This Action shall be completed 21 months after adoption of this Plan.*

GOAL 5

The State will promote the convergence and integration of voice, data, and video services

To more effectively serve its constituents, the State should move prudently and deliberately toward convergence of communications where it suits the business needs of the State. Integrated telecommunications services offer the promise of broader capabilities to better serve the public while reducing costs. Networks should be designed with the capability of supporting convergence of voice, data, and video services.

Objective 1

Promote the use of converged technologies to improve access to information and reduce operational cost.

Converged telecommunications technologies, when compared to traditional "silos" of data, voice, and video, offer efficiencies that should be investigated for possible cost savings and service improvements.

Actions:

1. The State Chief Information Officer shall commission the development of a converged technologies plan for state organizations that includes voice, data, and video services. *This Action shall be completed 6 months after adoption of this Plan.*
2. The State Chief Information Officer and the Department of Finance shall develop standards and regulations to ensure consideration of opportunities for convergence in new development or major redevelopment projects. *This Action shall be completed 6 months after adoption of this Plan.*
3. The State Chief Information Officer shall identify opportunities for demonstration projects and provide sponsorship as appropriate. *This Action shall be completed 9 months after adoption of this Plan.*

Objective 2

Promote the use of call center technologies and services to improve service delivery and reduce operational cost.

Many State agencies operate call centers that serve similar purposes and use similar procedures. Emerging call center technologies could allow agencies to combine efforts to improve services and save money.

Actions:

1. The Department of Technology Services shall evaluate the feasibility of centralizing call center equipment and services and use converged technologies to virtualize the processes. *This Action shall be completed 18 months after adoption of this Plan.*
2. The State Chief Information Officer shall identify opportunities for demonstration projects and provide sponsorship as appropriate. *This Action shall be completed 3 months after adoption of this Plan.*
3. The State Chief Information Officer shall sponsor forums to present options and vendor products to reduce costs and increase business capabilities. *This Action shall be completed 9 months after adoption of this Plan.*

Objective 3

Promote the use of converged services for Radio Over IP (ROIP) in support of interoperability, continuity of operations (COOP), and continuity of government (COG) objectives.

Services now available to route radio traffic over Internet networks could provide greater redundancy for emergency uses and possibly lower cost overall.

Actions:

1. The Department of General Services shall explore convergence opportunities to improve the radio infrastructure through leveraging Internet Protocol technologies. *This Action shall be completed 18 months after adoption of this Plan.*
2. The State Chief Information Officer shall sponsor an educational forum on radio options using converged technologies, to present options and vendor products to reduce costs and increase business capabilities. *This Action shall be completed 24 months after adoption of this Plan.*

GOAL 6

The State will ensure a more effective telecommunications workforce

The State will facilitate organizational transformation down to the departmental level by aligning voice, data, video, and radio services workforce, governance structures, recruitment, and training mechanisms. Management and workforce alignment with emerging technological changes are essential to developing a workforce that can implement the vision of a “Connected California.” This vision will be supported and maintained through a robust recruiting and training program.

Objective 1

Merge the voice, data, video, and radio services workforce under common management structures.

Until recently, state agency management structures typically segregated the functions of voice, data, video, and radio services into separate organizational units. As these technologies have converged, this has made effective workforce management and coordination more difficult. These traditional structures should be reexamined.

Actions:

1. The Department of Personnel Administration shall survey agencies and departments and issue a report on the management structures used in the acquisitions, deployment, and management of telecommunications solutions, including data networking, voice, cellular telephone, radio, and video. *This Action shall be completed 6 months after adoption of this Plan.*
2. The State Chief Information Officer shall sponsor a “California Telecommunications Workforce Management Committee” to review the findings regarding telecommunications workforce classification structures and to recommend workforce convergence opportunities; identify risks and issues; and define collective bargaining and budget considerations. *This Action shall be completed 12 months after adoption of this Plan.*

Objective 2

Align voice, data, video, and radio services workforce recruiting and training strategies.

State Telecommunications Strategic Plan

DRAFT

As the State moves toward a more convergent telecommunications architecture, its workforce will need to become more familiar with the new technologies. Ultimately, classification schemes, recruitment, and training programs for telecommunications workers must also recognize that the skill sets have similarly converged.

Actions:

1. The State Chief Information Officer shall sponsor forums, including seminars, conferences, newsletters, special reports, and presentations, to encourage information technology and telecommunications workers to exchange information, experiences, and concepts to their mutual benefit. *This Action shall be completed 6 months after adoption of this Plan.*
2. The Department of Personnel Administration and the State Personnel Board shall work together to ensure that consolidated testing and recruitment vehicles address network skills required of State employees. *This Action shall be completed 12 months after adoption of this Plan.*
3. The Department of Technology Services shall establish a "Network Academy" through a combination of contractors and State department staffs. The Academy curriculum shall include classroom training and practical experience. *This Action shall be completed 12 months after adoption of this Plan.*

GOAL 7

The State will establish a customer-driven telecommunications governance structure

The State will establish a “customer-driven” governance structure and processes to promote the acquisition and provision of cost-effective, capable, flexible, and responsive telecommunications services to identify and meet current and emerging State government business needs. In the past, telecommunications decisions have often been influenced or dictated by vendors or technical units, based upon the available offerings of the vendors or knowledge of the technical staff rather than the needs of the business. As we move forward, a consistent, program-based governance structure, responsive to the program needs of state government customers, is essential.

Objective 1

Establish a telecommunications governance structure.

The Goals, Objectives, and Actions of this Plan cannot be sustained unless an ongoing governance structure is established, recognizing the special challenges of the emerging discipline of telecommunications management.

Actions:

1. The State Chief Information Officer, assisted by the Information Technology Council, shall establish a governance structure for the development, administration, and implementation of the State Telecommunications Strategic Plan. *This Action shall be completed 3 months after adoption of this Plan.*
2. The State Chief Information Officer shall establish a position of State Chief Telecommunications Officer to administer State telecommunications policy by establishing scope, applications, exemptions, and administrative procedures. The Chief Telecommunications Officer shall also ensure: oversight and alignment of telecommunications projects and operations to ensure consistency with the State Telecommunications Strategic Plan; successful and relevant telecommunications strategic planning and decision-making in support of business needs; support for collaboration, flexibility, and change in telecommunications management and workforce; and operational control by those most directly responsible for program performance and delivery. *This Action shall be completed 12 months after adoption of this Plan.*

3. State Chief Information Officer shall establish a telecommunications advisory group, affiliated with the Information Technology Council, to advise the State CIO and the Chief Telecommunications Officer on emerging or changing requirements, new technologies and services, risks, problems, and opportunities. This organization shall also assist in the development, review, and evaluation of telecommunications policy. *This Action shall be completed 6 months after adoption of this Plan.*

Objective 2

Improve alignment of telecommunications governance with State programs.

The telecommunications governance structure must closely align with the current IT governance structure, but must also recognize that state program need is the critical driver of technology implementation.

Actions:

1. The telecommunications advisory group shall identify state and local government information technology and telecommunications working groups and standards organizations, review opportunities for consolidation of such groups, and facilitate liaison between them, as appropriate. *This Action shall be completed 9 months after adoption of this Plan.*
2. The Chief Telecommunications Officer shall engage with the Public Safety Radio Strategic Planning Committee, established pursuant to Government Code Sec. 8592, et seq, to ensure alignment of public safety communications needs and State and local government business communications needs. The term "communications," used in this context should be broadly interpreted to include data as well as voice communications. *This Action shall be completed 15 months after adoption of this Plan.*
3. The Information Technology Council telecommunications advisory group shall monitor and report on emerging consumer technologies – such as cellular telephones, smart phones, unified messaging – that will likely impact the information technology and telecommunications workforce. *This Action shall be completed 15 months after adoption of this Plan.*

Objective 3

Pursue partnership opportunities to improve access to telecommunications technology and services.

Advancement of the State's interest in telecommunications technologies and services will depend upon the ability of state managers to understand the

directions of the industry as a whole and the ways that telecommunications is managed and used by other public and private entities.

Actions:

1. The State Chief Information Officer shall identify a forum to communicate and collaborate with State, local, regional, and federal government partners, tribal nations, schools, universities, and the private sector to identify opportunities for improved access to telecommunications technology and services. *This Action shall be completed 9 months after adoption of this Plan.*

Objective 4

Implement performance measures and benchmarks.

Actions that cannot be measured cannot be achieved. A critical component of the State Telecommunications Strategic Plan must be to define performance expectations and to measure progress against those benchmarks.

Actions:

1. The Chief Telecommunications Officer and the Information Technology Council telecommunications advisory group shall work with the State Chief Information Officer's Performance Measurement Advisory Committee to establish appropriate measures of the effectiveness (cost, accessibility, reliability and performance) of the State's telecommunications infrastructure. *This Action shall be completed 24 months after adoption of this Plan.*
2. The State Chief Information Officer shall establish specific benchmarks to evaluate the results of telecommunications policy initiatives against the policy objectives, and implement processes to ensure that the policies lead to improvements or are eliminated. *This Action shall be completed 24 months after adoption of this Plan.*

CLOSING SUMMARY

This Plan will not resolve all telecommunications issues faced by the State. It will, however, constitute an important first step. To remain relevant, it must be periodically updated. It cannot be allowed to sit untouched on the shelf. The Goals and Objectives of this Plan may change slowly over time, but the Actions are intended to be carried out within two years and to be replaced by new Actions in future updates.

Telecommunications is mission critical and fundamental for government services. As emphasized in this Plan, California State government therefore needs to address its telecommunications and network capabilities as enterprise assets that affect the most basic services provided to California residents. For telecommunications services to be most effectively employed, however, operational management must be delegated to those who best understand the requirements of specific programs.

This first Statewide Telecommunications Strategic Plan is only a beginning. Perhaps its most important element is its Vision and Values, which guide the way to future telecommunications management actions. They will form the basis for building a Connected California, where Californians can easily access government information and transact business with the State. As the Plan evolves, to truly connect California government services additional focus will need to be given to local government, which is a critical strategic partner with the State concerning citizen interactions with government. This may be a major focus of attention in a future update of the Statewide Telecommunications Strategic Plan.

APPENDICES

State Telecommunications Strategic Plan

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Appendix A

Telecommunications Strategic Plan Work Group Charter

Team Name: Statewide Telecommunications Strategic Plan Subcommittee

Executive Sponsor: Clark Kelso, State CIO.

Subcommittee Coordinator/Chair: Gary Arstein-Kerslake, Agency Information Officer, California Environmental Protection Agency.

Mission: As per the approved 2006 Statewide IT Strategic Plan:

“By March 2007, the State CIO and the DTS will establish a business-oriented, statewide telecommunications strategy that will address the full range of telecommunications services used by state agencies, ranging from basic phone service to video conferencing, telecommuting, long-distance learning, call centers and other functions made possible by modern telecommunications technologies.”

1. History and Current State Telecommunications Environment:

Historically, responsibility for statewide oversight and management for telecommunications network services resided in the Department of General Services, Telecommunications Division (DGS-TD). With the passage of Governor's Reorganization Plan #2 (GRP #2) in 2005, the portion of the DGS-TD responsible for that oversight was moved to the new Department of Technology Services (DTS) in July 2005.

Senate Bill 834 was chaptered in 2006, and codified GRP #2, carrying the existing statutory authority for the statewide telecommunications functions forward to Government Code 11541. In addition, a new State Administrative Manual (SAM) Chapter 4600 was assigned to DTS to carry forth the broad State policy and strategy for those functions. Chapter 4600 replaces Chapter 4500 for these functions (Chapter 4500 still provides statewide policy for Public Safety Radio and the 9-1-1 programs), and will update the existing telecommunications strategies and policies. Issuance of the new Chapter 4600 is awaiting development of updated statewide telecommunications policies and strategies before being finalized.

State Management Memorandum 04-08, released in March 2004, outlines the current State telecommunications strategy and policy (pending the SAM updates), including use of the consolidated statewide telecommunications backbone, CALNET. The CALNET contract is a critical component of the State's telecommunications and data services because these services are easily available at very favorable prices through leveraging the collective buying power of state and local government agencies. It provides a comprehensive base of network services from which state telecommunications strategies and policies can be made consistent and updated in conjunction with the State IT Strategic Plan.

The **State Telecommunications Management Manual (STMM)** provides the detailed telecommunications policies and procedures for State Executive Branch agencies and

State Telecommunications Strategic Plan

DRAFT

other state and local government agencies that choose to use telecommunications services that fall under the responsibility of the DTS.

While the DTS has direct responsibilities regarding many statewide telecommunications and network services, there are many other telecommunications technologies and services in use by State organizations in which DTS currently has a limited or very minimal role. Examples of this include telecommuting, local area networks, remote access services, virtual private networks, video conferencing, web conferencing, web casting, long distance learning, Wi-Fi, cellular voice services, etc. Cellular voice services are procured under the California Strategic Sourcing Initiative, for which there are implied or specific policies. However, most of the telecommunications services not managed by the DTS are independently procured and managed with no specific statewide strategy or policy regarding their use. A fundamental objective of the Statewide Telecommunications Strategic Plan Subcommittee will be to consider all areas associated with telecommunications and network services, regardless of whether they have an established contract instrument in place or not, and make recommendations regarding the strategic development, deployment and use of these services.

2. The Need for Development of a 2007 Statewide Telecommunications Strategic Plan:

With the importance of statewide telecommunications network services to support the State's IT Strategic Plan goals and objectives, it is critical to have a comprehensive, well-documented, widely accepted, and State-supported Strategic Telecommunications Plan that is consistent with and supports the goals and objectives of the broader Statewide IT Strategic Plan. The IT Strategic Plan GOALS 1, 4 and 6 outlined below are particularly pertinent.

GOAL 1 of the 2006 State IT Strategic Plan is for the State to **"Make Government Services More Accessible to Citizens and State Clients."** To meet that goal, "The State will complete a technology-enabled transformation in the delivery of services, improving the accessibility, value, and cost-effectiveness of services, benefits and information provided to the public, businesses, other government agencies and State employees. " ... "Modern telecommunications and information technologies are the foundation for this transformation of service delivery."

GOAL 4 of the 2006 State IT Strategic Plan is for the State to **"Lower Costs and Improve the Security, Reliability and Performance of the State's IT Infrastructure."** To meet that goal, it calls for the State to "...develop an IT and telecommunications infrastructure that is secure, reliable and meets high performance standards by standardizing its infrastructure around an Enterprise Architecture and consolidating the management of that infrastructure to support and enable a more customer focused government."

..."Through use of Enterprise Architecture, infrastructure consolidation and enterprise-wide procurements, as well as the adoption of enterprise-wide standards, departments will be able to lower costs, and improve reliability and performance of the IT and telecommunications infrastructure."

GOAL 4, Objective 2: Consolidate Technology Infrastructure and Services

“The state will consolidate its technology infrastructure and services to leverage the economies of scale in the utilization of resources, eliminating unnecessary redundancies and reducing support costs through standardization.” ... “These efforts will align with the development of the enterprise technology architecture and implement the strategic direction for the use and deployment of information technology solutions statewide. Technology consolidation by the departments and the Department of Technology Services, after consulting with its customers, will increase the security, robustness and reliability of the state’s technology infrastructure and improve budget allocation and performance management, cross-agency collaboration, information sharing and e-government solutions.”

GOAL 4, Objective 2, Action 1:

“By March 2007, the State CIO and the DTS will establish a business-oriented, statewide telecommunications strategy that will address the full range of telecommunications services used by state agencies, ranging from basic phone service to video conferencing, telecommuting, long-distance learning, call centers and other functions made possible by modern telecommunications technologies.”

GOAL 6 of the 2006 State IT Strategic Plan calls for the State to “**Better Align Enterprise Business Planning with Technology Governance**” for the purpose of improving the application of technology to support government programs and solve business problems. The general relationship of Goal 6 to the development of a Statewide Telecommunications Strategic Plan is that the three objectives of Goal 6 will be incorporated in the development of the Telecommunications Strategic Plan where appropriate:

Objective 1 – [The State will] establish a Layered Technology Governance Structure ... that clearly assigns authority and responsibility at appropriate levels throughout the life-cycle of information technology projects and systems.

Objective 2 – [The State will] Improve Alignment of Technology Governance with Business Planning ... for enterprise-wide initiatives [through] executive governance structures that ensure critical planning and implementation decisions are brought to the attention of the appropriate State officials for discussion and resolution. It is not enough to have enterprise-wide technology governance and collaboration. Decisions about government operations ultimately belong to executive leaders throughout government. The State needs to develop a better capacity for cross-agency business planning, governance and implementation.

Objective 3 –[The State will] Implement Performance Measures ... and methodologies to assist in managing its technology systems and services. ... Steps will be taken to improve performance review, prepare for more rigorous performance evaluation tools in the future, establish baselines, and encourage better performance from technology systems.

The Statewide Telecommunications Strategic Plan will consider governance structures and decision-making processes that will facilitate:

State Telecommunications Strategic Plan

DRAFT

- Business and program performance and responsiveness,
- Successful and relevant strategic planning and decision-making in support of business goals,
- Oversight and alignment of information technology projects and operations to ensure consistency with strategic plans, and
- Operational implementation by those most directly responsible for program performance.¹

3. Considerations:

The fundamental focus of this Subcommittee is to complete Goal 4, Objective 2, Action #1 above. The Statewide Telecommunications Strategic Plan that is developed will take into consideration and support many other parts of the IT Strategic Plan.

From the perspective of the State's overall business processes and activities, the Subcommittee will identify those areas fundamentally related to and/or dependent upon telecommunications network services. It will propose 'goals' for developing statewide strategic approaches and implementation of services over the next two-to-five years to increase efficiencies or provide enhanced capabilities that are in the best interests of the State as a whole. It is worth noting that the broader and more general issue of making the business case for DTS to develop into a statewide enterprise network service provider, along with the more specific issue of consolidating existing separate wide area networks, is covered under Action #2 of Goal 4, Objective 2 of the 2006 Statewide Information Technology Strategic Plan, not Action #1.

There should be a fundamental focus on the business value of our recommendations. There must be a long-term business benefit to the state. All recommended goals and objectives will take into consideration the impact to and benefits for both State and local government operations and delivery of services.

For the purposes of development of the draft plan, within each of the goals where applicable, develop associated objectives and, within each objective, propose recommendations for actions that can be initiated within 24 months.

4. Subcommittee Goals

1. Define telecommunications network services and related terms which are relevant to the development of the telecommunications strategic plan
2. Outline the perceived State vision for telecommunications based on the IT Strategic Plan, the USC Telecommunications Strategies Report, and other related sources, including current strategies and policies
3. Develop statewide strategic goals and objectives for consolidation of State telecommunications networks where consistent with business goals
4. Develop statewide strategic goals and objectives for convergence of telecommunications services with IT where consistent with business goals

¹ Reference needed to the Final 2006 Statewide IT Strategic Plan – these bulleted items are from the draft plan.

State Telecommunications Strategic Plan

DRAFT

5. Develop strategies that support the objectives of the State's IT Strategic Plan elements (e.g., making government services more accessible, consolidating technology components such as servers and networks where beneficial, etc.).
6. Develop implementation strategies/action items for telecommunications and network-related services
7. Develop recommendations for statewide procurement strategies that will facilitate the implementation of the goals and objectives proposed in the draft Statewide Telecommunications Strategic Plan
8. Complete the draft Statewide Telecommunications Strategic Plan (use format similar to the IT Plan) and submit for review and comments to the State CIO and to the Director of DTS.

5. Project Duration:

Per the approved Statewide IT Strategic Plan, the draft Statewide Telecommunications Strategic Plan is to be prepared by March 2007, and submitted for consideration by the State IT council at their scheduled April 2007 meeting. With the possibility of follow up revisions, it is assumed that the activities of this workgroup would be complete by approximately May 2007.

6. Executive Sponsor Commitments:

- Provide direction and scoping as needed
- Review and comment on initial drafts
- Introduce "final" draft plan to State IT Council for review and adoption

7. Subcommittee Chair commitments:

- Plans and organizes Subcommittee activities
- Lead and facilitate meetings of the Subcommittee (with assistance from John Yonemura).
- Ensures timelines and deliverables are met
- Act as primary editor of the complete draft report
- Briefs the Sponsor on activities of the Subcommittee

8. Subcommittee Members commitments:

- Actively participate in the Subcommittee
- Attend meetings as scheduled or have an alternate attend
- Complete assigned Subcommittee tasks

9. Deliverables:

Draft Statewide Telecommunications Strategic Plan by March 2007:

- Workgroup formation (October 31)
- High-level Goals scoped and drafted (December 8)
- Mid-level Objectives scoped and drafted (January 1)
- Action Items scoped and drafted (February 1)

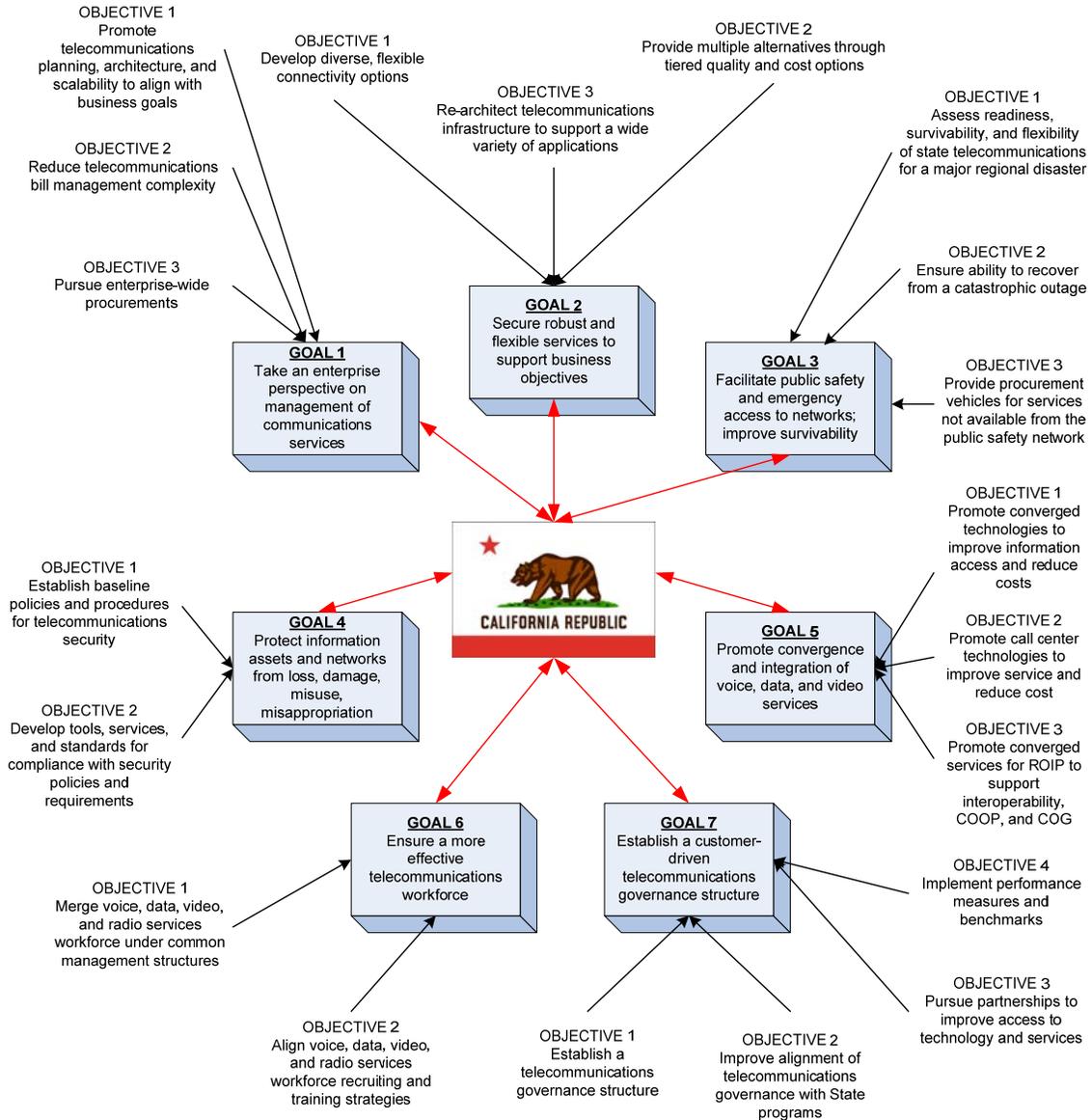
- Draft Report to State CIO (March 1)

10. Reports of progress:

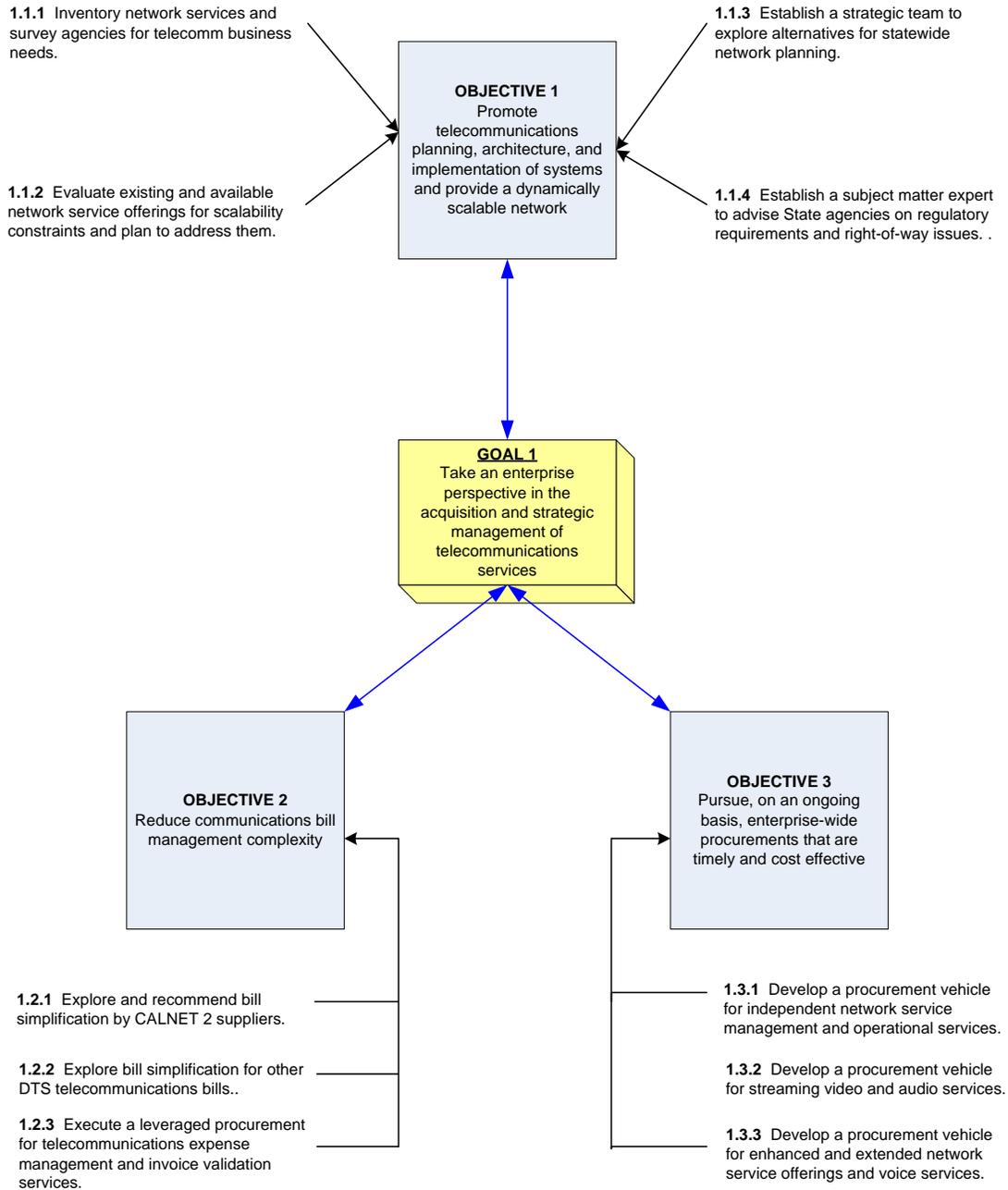
The chair will provide a monthly briefing to the sponsor.

Statewide Telecommunications Strategic Plan Summary Charts

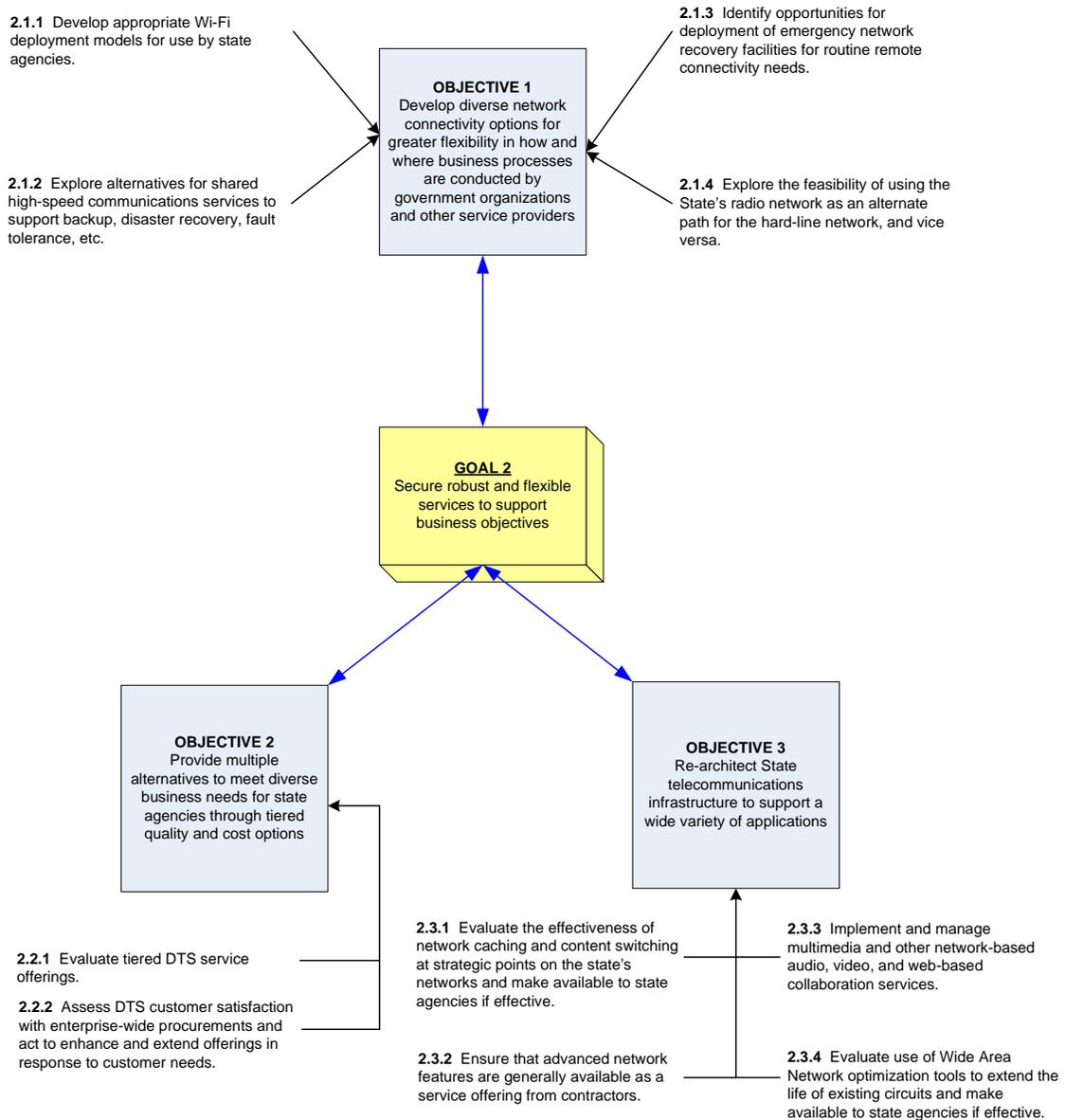
CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN SUMMARY



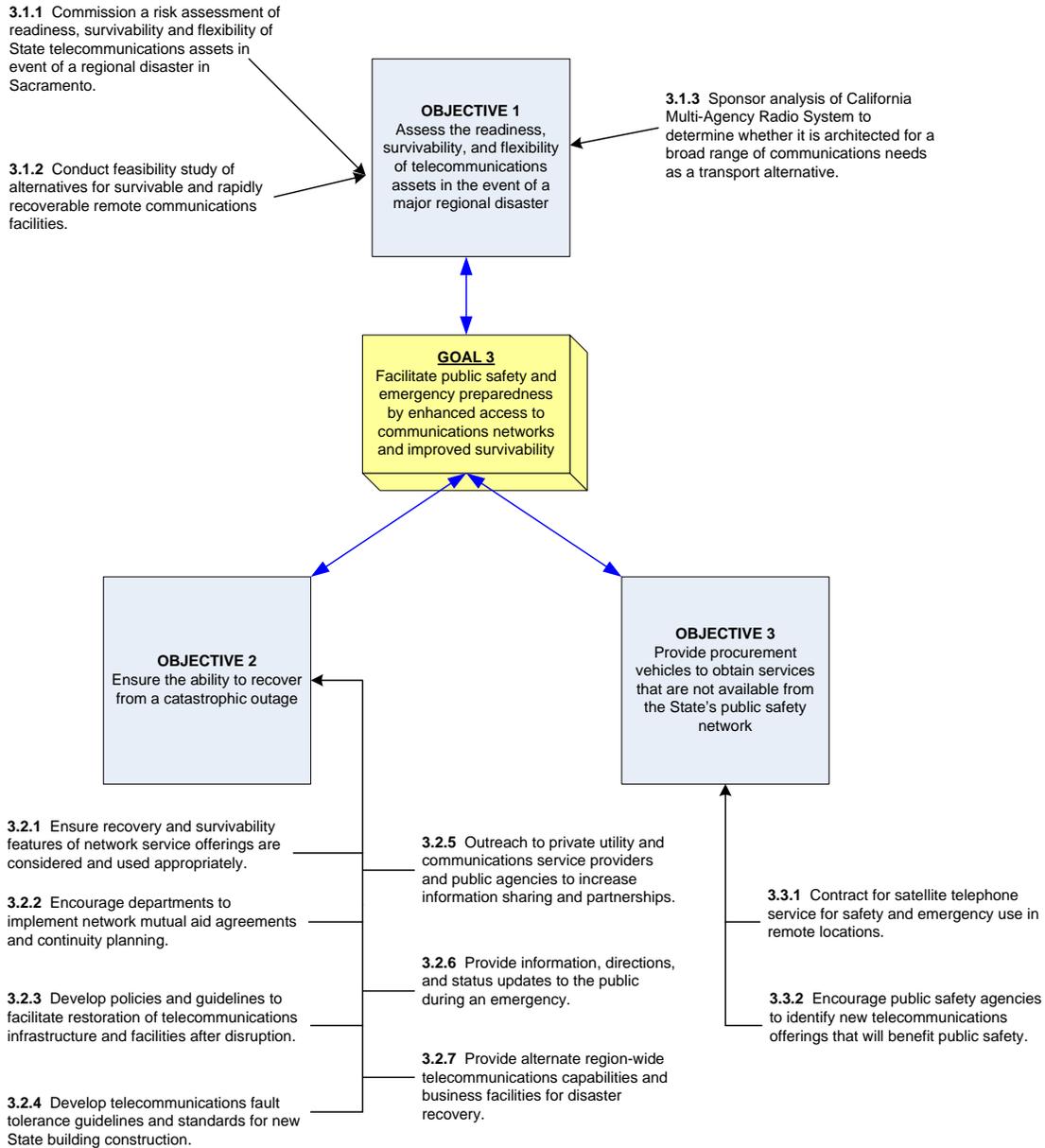
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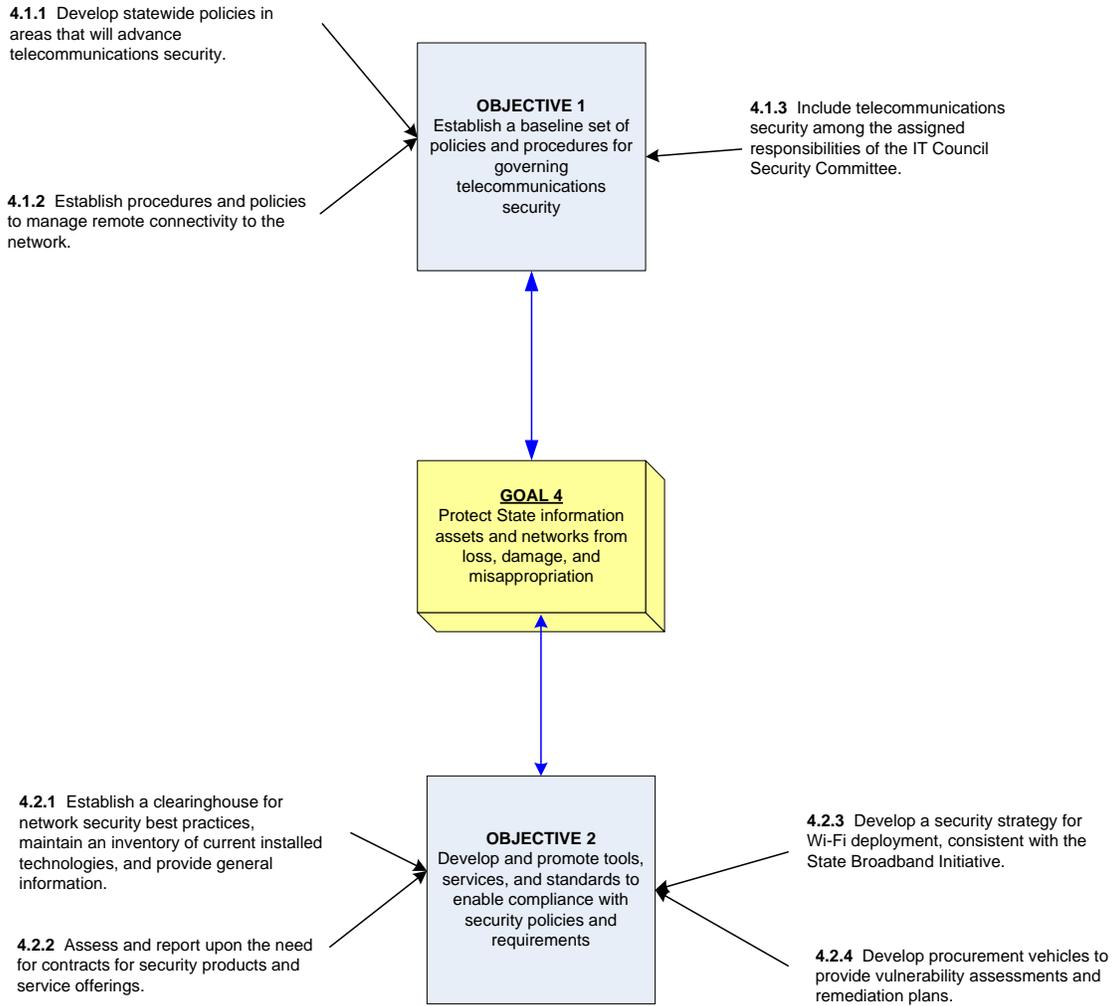
CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 2



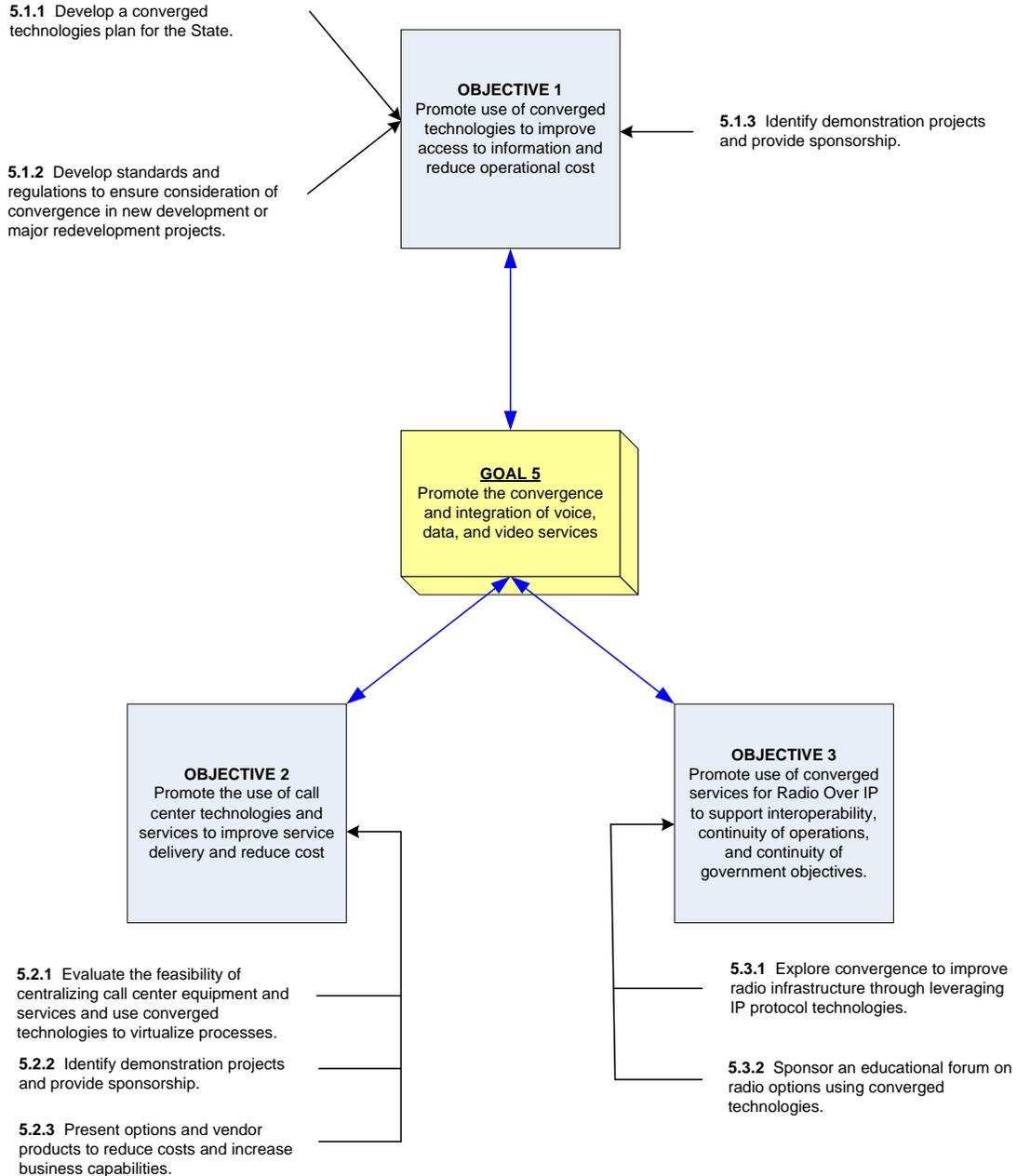
CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 3



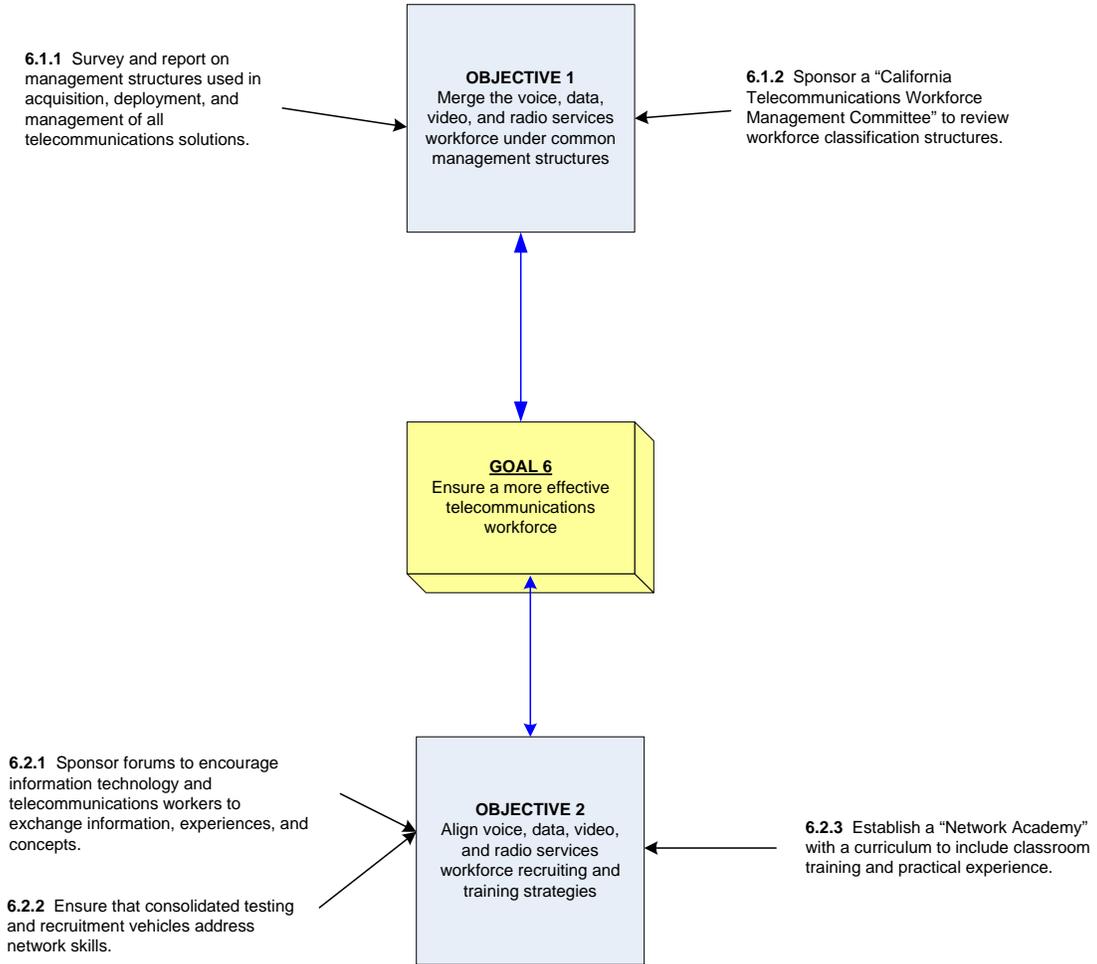
CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 4



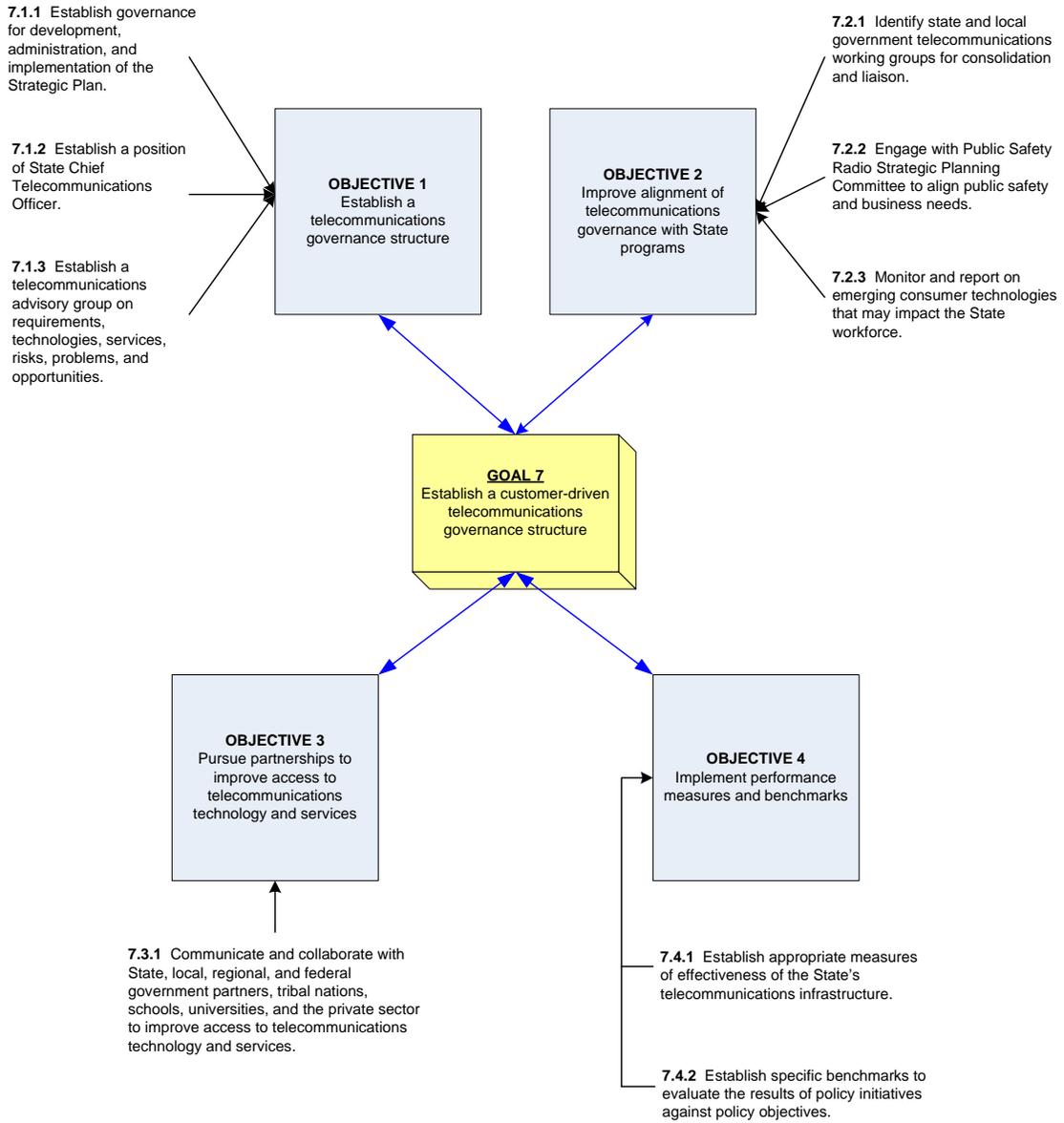
CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 5



CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 6



CALIFORNIA TELECOMMUNICATIONS STRATEGIC PLAN – GOAL 7



Appendix C

Matrix of Responsibilities and Timelines for Actions

**State Telecommunications Strategic Plan
Matrix of Responsibilities and Timelines For Actions**

Party/Due Date	Action Due Date - Number of Months After Adoption of Strategic Plan							
	<u>3</u> Months	<u>6</u> Months	<u>9</u> Months	<u>12</u> Months	<u>15</u> Months	<u>18</u> Months	<u>21</u> Months	<u>24</u> Months
State Chief Information Officer	5.2.2 7.1.1	5.1.1 5.1.2 6.2.1 7.1.3	3.2.5 5.1.3 5.2.3 7.3.1	2.1.1 6.1.2 7.1.2	3.1.1	1.3.1 1.3.3 3.1.2 3.2.3	3.1.3 3.2.2	5.3.2 7.4.2
Technology Services Board		1.1.1	3.3.2					
Information Technology Council	4.1.3 7.1.1	1.1.2 4.2.2	4.2.3 7.2.1	1.1.3	7.2.3		4.1.1	4.1.2 7.4.1
Dept. of Technology Services (see notes)	2.2.1 4.2.1	2.2.2 3.2.1	1.2.1 1.2.2 3.3.1	1.3.2 2.3.1 6.2.3	2.3.2 2.3.4	5.2.1	2.3.3 4.2.4	2.1.2 2.1.4 3.2.4 3.2.7
Dept. of General Services	1.1.4			1.2.3 1.3.2	2.1.3	5.3.1	3.1.3 4.2.4	2.1.4 3.2.4
Dept. of Finance		5.1.2						
Dept. of Personnel Administration		6.1.1		6.2.2				

State Telecommunications Strategic Plan

DRAFT

State Personnel Board			6.2.2		
Office of Emergency Services		3.2.5		3.1.1	3.1.2
					3.2.6 3.2.7
State Information Security Officer	4.2.1	4.2.2	4.2.3		4.1.1
					4.1.2
State Chief Telecommunications Officer (proposed)				7.2.2	7.4.1

Note 1: Abbreviated notation in each cell is Goal #, Objective #, Action # (e.g., 1.1.1 = Goal 1, Objective 1, Action 1)

Note 2: DTS actions are color coded as follows:

- Red** -- Procurement actions by Statewide Telecommunications and Network Division
- Blue** -- Actions by other DTS service divisions

Broadband Any advanced telecommunications capability and services without regard to how such capability or services are provided. Includes wireless, terrestrial, and satellite services and facilities.
CALNET 2 A set of statewide telecommunications contracts awarded by the Department of General Services.
Enterprise The entire organization, to include all individual component parts. For purposes of the Strategic Plan, enterprise generally refers to the entire State of California government.
Infrastructure Generally a set of interconnected elements (herein, the reference is to information technology and telecommunications elements) that provide the framework supporting an entire structure.
Internet Protocol A data-oriented protocol used for communicating data across a packet-switched internetwork .
IP-based network A network based on Internet Protocol.
Local Area Network (LAN) A computer network covering a small geographic area, like a home, office, or group of buildings.
Malware Software designed to infiltrate or damage a computer system without the owner's informed consent . The expression is a general term used by computer professionals to mean a variety of forms of hostile, intrusive, or annoying software or program code, including viruses, spyware, and spam.
Network A network of telecommunications links and nodes arranged so that messages may be passed from one part of the network to another over multiple links and through various nodes.
Quality of Service (QOS) Control mechanisms that can provide different priority to different users or data flows, or guarantee a certain level of performance to a data flow in accordance with requests from the application program. Quality of Service guarantees are important if the network capacity is limited, especially for real-time streaming multimedia applications, such as voice over IP and IP-TV , since these often require fixed bit rate and may be delay sensitive.

<p>Telecommunications</p> <p>The transmission of signals over a distance for the purpose of communication, generally by electro- magnetic waves.</p>
<p>Unified messaging (UM)</p> <p>The integration of different streams of messages (e-mail, Fax, voice, video, etc.) into a single in-box, accessible from a variety of different devices. It differs from simple multimedia email in that UM systems typically try to integrate telephone-based voicemail as well, and to make the UM mailbox accessible from a conventional or cellular phone.</p>
<p>Voice Over Internet Protocol (VOIP)</p> <p>Also called IP Telephony, Internet telephony, Broadband telephony, Broadband Phone and Voice over Broadband, VOIP is the routing of voice conversations over the Internet or through any other IP-based network.</p>
<p>Web or network caching</p> <p>The storing of web documents (e.g., HTML pages, images) in order to reduce bandwidth usage, server load, and perceived "lag". A web cache stores copies of documents passing through it; subsequent requests may be satisfied from the cache if certain conditions are met.</p>
<p>Wide Area Network (WAN)</p> <p>A computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries). Or, less formally, a network that uses routers and public communications links.</p>
<p>Wi-Fi</p> <p>A brand originally licensed by the Wi-Fi Alliance to describe the underlying technology of wireless local area networks (WLAN) based on the IEEE 802.11 specifications. It was developed to be used for mobile computing devices, such as laptop computers, in LANs, but is now increasingly used for more services, including Internet and VoIP phone access, gaming, and basic connectivity.</p>

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State Telecommunications Strategic Plan

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