# Telephone Replacement Project
# Getting to VoIP

## Overview

The County's current telephone system is a capital investment of $3.5 million. It is eight years old and is running on technologies that are obsolete. NEC, the County's current telephone system provider has announced that the Private Branch Exchange (PBX) used by the County of Santa Barbara is at the end of life. Continuing to operate an end-of-life system poses a number of risks to the County. Replacement parts will no longer be manufactured, out of date software will not be supported, and support calls will be billable. The Telephone Replacement Project is in the Capital Improvement Plan (CIP) and at the end of FY 12/13 will be fully funded (see attached project description from the CIP). Over the years, rates charged to departments for system depreciation have accumulated in the Communication Internal Service Fund (ISF) for the replacement of the system.

End of life signifies that NEC will only offer "best effort" service, and the County will be charged for all time and material support for the product. While a low risk, if a processor card failed in the PBX, the entire phone system or several hundred phones within a building could be out of service. Since NEC no longer produces the processor, the County would need to search for reconditioned parts using third party distributors, or build a store of replacement parts.

Voice Over Internet Protocol (VoIP) is the preferred voice communication system industry wide. VoIP is voice transmitted over a data network instead of over the traditional analog Public Switched Telephone Network (PSTN). Skype is an example of VoIP in the personal telecommunications/phone market. Skype allows users to make voice and video calls over the internet.

The telecommunication industry has transitioned to VoIP deployments as the standard because the technology provides measureable cost savings over legacy telephone systems, simplifies the delivery and management of communications, and facilitates network convergence for more flexible business operations.

Without transitioning to a new VoIP system, the County's Telephone Services Division will have limitations in providing:

- Equipment repair.
- New site expansion or consolidation, the necessary equipment may not be available.
    - The County historically has expanded at a rate of one to three sites per year and with recent service level reductions and department consolidations may actually see a reduction in the number of sites.
- Call Center Functionality - departments have requested call center functionality that spans across campuses. Current systems can only control call centers located in one campus or geographic location.

The Telephone Services Division's maintenance plan establishes upgrade points during the service life of a system to ensure continued supportability throughout the lifecycle. These changes are in the form of hardware and software upgrades, component substitution, replacement, and evaluation

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of alternative hosting platforms. Executing this technology refresh plan ensures the telephone system is technically capable, reliable, and cost effective.

From a Telephone System only point of view, delaying this project by one or two years would involve calculated risks, however, the County's Telephone Services division can take steps to mitigate the risks of an end of life system. However, that delay impacts a closely related project in the CIP, "Data Network Modernization and Refresh" (see attached project description from CIP). Findings from the planned Telecommunications Technical consultant engagement will directly inform the approach taken to reengineer the data network. To develop a *comprehensive plan,* a decision on VoIP is required.

## Need for a consultant

While VoIP is an industry standard, both the technologies that leverage VoIP and the providers of the equipment are rapidly evolving. The County seeks the assistance of a consultant to develop a strategic plan for the replacement of the phone system and the selection and implementation of modern communication technologies. The Telephone Services Division staff is comprised of 1.5 FTE. Telephone system maintenance is outsourced to NEC. Achieving recognizable savings requires preparation and investment in the existing data network. To attain the maximum costs savings from VoIP, the County must first converge voice and data networks into a single corporate network optimized for voice. How quickly the cost benefits are realized will depend upon the condition of the data network. Voice does not require large amounts of bandwidth; however it is extremely sensitive to network congestion, and unless the data network is properly configured, the quality of voice calls can quickly decline when faced with a spike in data traffic.

General Services put out a Request for Proposal (RFP) for a County Telecommunications Technical Plan 2011 - 2015. Gartner Inc. a leading information technology research and advisory company, was the lowest bidder and had the most experience of the responders. Gartner will assist the County with these fundamental decisions:

1) Where to locate PBXs and who will manage them? Options include:

- **Premise-based IP PBX -** In the traditional customer premise based approach, the enterprise owns and manages an IP PBX.

- **Managed IP PBX -** The enterprise owns or leases the equipment but outsources the day-to-day operation, monitoring, and management of the IP PBX and the underlying corporate IP network. The County's current telephone installation uses a managed PBX service model on the voice network and is supported by three NEC technicians.

- **Hosted IP -** Hosted voice services are an alternative to premise-based business telephone systems. Hosted IP voice services deliver all business-class telephony features. Service is delivered on a simple "per-seat, per-month" cost basis, and up-front costs are a fraction of those for traditional PBX equipment.

2) How to upgrade/replace the existing NEC PBXs? Options include:

- **Upgrade in place** - Gradually replacing the existing NEC PBXs with NEC VoIP PBXs as the data networks are made capable of supporting VoIP. The upgrade in place option represents a gradual introduction and gradual investment in VoIP. For instance, when older equipment fails, a VoIP solution would be installed. All features and capabilities of the current PBX systems will be transitioned to VoIP.

- **Fork Lift Approach** –Replacing all PBXs, one site at a time. This approach allows for the selection of the optimal solution. Training of County staff on the new system is delivered in an efficient and compressed timeframe.

The primary reasons for hiring a Telecommunications consultant include:

- Limited availability of County staff to manage the project, and meet with vendors and stakeholders to define our business needs.

- Consultant expertise. This is a large complex investment. Experience in VoIP and data network systems is critical to selecting the most effective, cost efficient solution.

- A need for impartial recommendations. Vendors may be unable to make an unbiased recommendation when the interests of their company come into conflict with the interests of the County.

Gartner will help the County analyze our readiness for VoIP and then recommend and design an efficient, least cost, network scheme.

## Project Scope

### Consultant Deliverables:

- Detailed analysis of the current County of Santa Barbara telephony environment including an IP telephony assessment that identifies specific problems and makes recommendations for resolution. These services enable businesses to avoid costly post-deployment problems by identifying potential bottlenecks and throughput issues before implementation.

- Design of an efficient PBX network scheme that is geographically redundant incorporating meshed networking technologies that support telephone system and disaster recovery solutions.

- VoIP/Unified Communication strategy and executive presentation.


### Telephone Services Division Deliverables:

- Implementation of an efficient PBX network scheme that is geographically redundant, incorporating meshed networking technologies that support telephone system and disaster recovery solutions.

- Update current processes and procedures for moves, adds and changes as well as service request.

- Update maintenance and operations procedures.

- Update methodology for E911 tracking and reporting. (E911 automatically associates a physical address with the calling party's telephone number, and routes

the call to the most appropriate Public Safety Answering Point (PSAP) for that address.)

- Update the Telephone Services Division Service Level Agreements and performance metrics. The Service Level Agreement documents:
    - The technology services ITD provides to the organization.
    - The general levels of response, availability, and maintenance associated with these services.
    - The responsibilities of ITD as a provider of these services and of clients receiving services.
    - Processes for requesting services.
    - Sample metrics include:
        - Resolve telephone service repair calls within one business day.
        - Complete telephone move, add and change requests by the agreed upon due date.

The scope of the project *does not* include:

- Creation of Network Infrastructure in support of VoIP
    - Infrastructure that goes beyond the network device that provides data connectivity to the workstation.
- Renovation/modification of departmental data equipment closets.

## Cost Reductions: Savings through Investments in Technology

While future savings are difficult to predict at this point, the International Data Corporation, a leading provider of market intelligence and advisory services, estimates that a VoIP system can reduce telephony-related expenses by 30%[1]. The current costs for maintaining the Countywide telephone network is approximately $1.1 million annually. This includes PBX system maintenance, labor and digital voice network connections (both private and Verizon leased lines). Preliminary Telephone Services Division estimates target an annual savings of approximately $100,000 through the elimination of redundant voice connections.

### Infrastructure Savings

- The cost savings realized from operating a single converged network can be significant and in many cases these savings alone have justified the deployment of enterprise VoIP.

- Consolidate the existing 16 PBX systems into just four to five servers. Traditional phone systems manage phones for a specific geographic region. VoIP eliminates the location based restriction. The phones and the phone system can be managed from any internet connected computer.

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[1] White Paper, VoIP: Delivering the Competitive Advantage, IDC, William Stofega, May 2006.

- Converging voice and data networks could result in savings of approximately $100,000 per year, by eliminating the redundant digital voice connections. Voice and data share the same connections. Cost to provide both voice and data infrastructure to remote and local locations is currently as much as 50% more than necessary.

- Savings related to moves, adds and changes to the existing PBX system are another target for reducing costs. The cost to move an existing phone and extension is $62 and typically takes three days to submit and complete. In a VoIP PBX environment, moves, adds and changes can occur in real time. If the phone jack is live, moving a phone is as simple as unplugging it, carrying it to your new office space, and plugging it in.

- However, the most significant potential for savings are the features that VoIP provides that allow employees to perform their duties more efficiently. These are summarized below.

## Unified Communication Features

The technology behind VoIP has proven that it can deliver more than just voice. A VoIP enabled infrastructure provides the foundation upon which emerging devices and applications can be supported. Features include:

- **Visual voicemail** - Visual voicemail is a popular feature. This application allows users to listen to voice messages through a browser or email, as well as through a telephone. This allows voicemail to be handled like email, in that voice messages can be viewed and listened to in priority order according to caller ID or a date/time stamp. Voice messages can be forwarded to any email box. Voicemail messages can be forwarded as email attachments or stored for reference. Of course, end users can still access their voice messages in the traditional manner by picking up their desktop handset or dialing in from a remote phone. The displayed messages are not only voicemail but also email, thus enabling an employee to see all of his or her messages in one view. This creates a unified mailbox of voicemail, email, and faxes and enables a centralized directory with click-to-call and click-to-conference functions. The ability to view an entire message store from any device becomes an extremely powerful tool to employees with busy schedules.

- **Automatic Call Distribution (ACD)** - Functionality distributes incoming calls evenly among agents and provides initial and repeating announcements that encourage callers to remain on the line. Callers can leave a message if they choose to receive a callback from an agent. Calls can also be routed based on business rules. Typically, this determines the best available employee or employees to respond to a given incoming call based on the callers answers to a set of questions.

- **Web Based Call Management** – Users can select their own calling features from a web portal via any internet connection. The portal contains a list of dialed, received and missed calls and provides the ability to click to call from the log.

- **Soft phones** (PC based telephony, network connection, headset, and a microphone.) Make and receive calls on your PC.

- **Find Me/Follow Me** – Using a web portal, users can instruct the service to forward their call to any combination of numbers (home phone, cell phone, office phone, or friend's or colleague's phone). This ensures the reception of important calls and avoids the distraction of low-priority calls. Calls can be directed sequentially (e.g., ring office, then mobile, then home) or simultaneously.

- **Presence** - Applications such as presence, which are similar to "find me" and "follow me" applications, allow employees to discern the availability of other employees to engage in a communications session. At the most basic level, Instant Message (IM) clients on personal computers (PCs) exemplify the power of presence, whereby IM users can see who is online and available to chat. Workers are able to advertise their availability to communication, whether it be wire line/wireless, voice, IM, video, or conference call.

- **Remote user** - Calls for specific employees or all employees can quickly be rerouted to satellite offices or home offices, as if they were still receiving and making calls on their normal office extension. This means employees can work from anywhere (e.g., remote offices, home, hotels, executive suites) in a transparent manner. The remote user function is an effective disaster recovery solution in the event that power failure or other events knock out the office location. Float staff and employees who typically work at different locations can move between different points on the network without having to alter their telephone extension while retaining full access to their configuration profile. They can do this by moving their phone from one location to another, and they can also log in at a remote location on another telephone set.

- **Caller ID** - Caller ID can display a name associated with the calling telephone number.

- **Disaster response** - The ability to reroute communications during a natural disaster. The flexibility built into IP-based voice simplifies the rerouting of calls to alternative locations and allows the County to be "open for business" soon after a disastrous event.

- **Conferencing** – Conduct and manage audio conferencing, video conferencing, web conferencing and video streaming distribution.

## Recommendation

VoIP is the industry standard because the technology provides long term cost savings, provides flexibility in the delivery and management of communications, and facilitates network convergence for a more flexible business operation. Contracting with Gartner will provide the Telephone Services Division adequate time to:
- Involve County departments in defining business needs.
- Identify and start implementing steps necessary to enhance the data network in anticipation of VoIP.
- Develop a strategic plan for replacement of the existing telephone system with a VoIP network that is prepared to support Unified Communications.