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DEPARTMENT OF AUDITOR-CONTROLLER

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September 22, 2006

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TO: Mayor Michael D. Antonovich
Supervisor Gloria Molina
Supervisor Yvonne B. Burke
Supervisor Zev Yaroslavsky
Supervisor Don Knabe

FROM: J. Tyler McCauley
Auditor-Controller

SUBJECT: **SELECTION AND IMPLEMENTATION OF A VOIP STANDARD, AND RELATED PLAN MODIFICATIONS AT THE LAC/USC REPLACEMENT FACILITY – AUGUST 22, 2006 BOARD AGENDA ITEM #19**

On August 22, 2006, the Board of Supervisors directed the Auditor-Controller (A-C), Chief Administrative Office (CAO) and County Counsel to investigate the Department of Health Services' (DHS) Los Angeles County/University of Southern California (LAC/USC) Voice Over Internet Protocol (VoIP) standard at their replacement facility. Specifically, the Board asked: (1) whether appropriate County policy was followed, and, if not; (2) recommend appropriate corrective actions; (3) provide any necessary changes to County policy to ensure the Board is involved in approving critical technology and procurement decisions; (4) report on when the decision was made and the basis and authority upon which the decision was made to change the proposed telephone system for the Replacement Facility at the LAC/USC medical center from a Private Branch Exchange (PBX) to a system based on VoIP technology; and (5) report on the CIO/Internal Services Department (ISD) directive to Department Heads regarding VoIP, and the associated Request For Information (RFI) process by which Cisco Systems' VoIP architecture was made a standard in the County's Telecommunications Equipment and Services Master Agreement (TESMA).

To address these questions, staff from the A-C's Office of County Investigations (OCI) analyzed evidentiary documents concerning the establishment of VoIP as an enterprise technology standard, including the RFI, vendor proposals and evaluation instruments, and reviewed specific items of correspondence related to Replacement Facility construction. OCI Investigators also interviewed managers and staff from the CIO, ISD, and DHS responsible for implementing VoIP systems. The following report summarizes our findings and conclusions. A more detailed explanation of our investigation is also included as Attachment I.

Summary and Conclusions

Compliance with County Policy

County Code Section 2.119.030(C) states that the CIO shall "...adopt standards for countywide information technology, which shall be subject to approval by the Board of Supervisors." County Counsel has indicated that, under this section, the CIO does not have the authority to unilaterally adopt Countywide information technology standards without specific, direct Board action. Although the CIO and ISD did notify the Board, via memo (Attachment II), VoIP was adopted as the County's standard telecommunications protocol, and Cisco was selected as the Countywide standard VoIP architecture, neither of these decisions was submitted to the Board for specific approval. This violates County policy.

While adequate statutory requirements/control mechanisms do exist to provide for Board oversight, review and approval of strategic changes to technology standards, we recommend that the CIO and ISD issue enhanced protocols for Board approval that clarify desired controls.

Decision to Change the Telephone System to VoIP

Our investigation indicates that DHS relied on direction from the CIO and ISD, as well as their own strategic plan for implementing VoIP systems, in choosing such a telephone system for the Replacement Facility. Specifically, on July 20, 2004, the CIO and Director of ISD jointly sent a letter to each Department Head titled "New Telephony Systems", advising that the County had adopted Cisco's VoIP architecture as the standard telecommunications protocol, and requiring that new and replacement telephone systems use VoIP technology. In addition, on February 17, 2006 the CIO sent an email (Attachment III) to various County executives in which he stated that the County has adopted VoIP as a standard for all new/leased facilities.

Ultimately, the decision to change the telephone system to VoIP was consistent with direction provided by the CIO, ISD, and DHS' own strategic plan, and in line with the implementation of similar projects at other County facilities. At the date of this report, no VoIP telephone equipment has been purchased or installed at the Replacement Facility.

VoIP Evaluation/Selection Process

ISD stated no formal process exists to evaluate/select enterprise technology standards. Consequently, the CIO and ISD chose to use the RFI process to evaluate competing VoIP architectures, resulting in the selection of Cisco as the County's standard. We found that the RFI evaluation process was technically comprehensive, reviewed by an independent consultant, and appeared objectively and fairly scored.

While the overall RFI process that resulted in the selection of Cisco's VoIP architecture as the County's standard was generally objective and reasonable, we did note the following issues:

- In several cases, RFI score sheets could not be reconciled with underlying scoring instruments. In one case, this had the effect or overstating Cisco's final score, although it did not change the final rankings. Neither ISD nor CIO staff could explain the discrepancies.

- Several sets of "final" scoring instruments were provided to investigators that did not agree with one another and could not be reconciled back to individual rating documents completed by members of the evaluation committee. Investigators could not duplicate the calculations in the final scoring instrument that resulted in the selection of Cisco as the VoIP standard.

- Cost, while considered on a theoretical basis in the RFI, was weighted only 10% of the overall score. Considering the relative final rankings of each proposer, and the fact that the proposer ultimately selected as the County standard was also the most expensive, changes in the weighting of various evaluation components to give more consideration to cost could have materially impacted the final rankings.

To address these issues, we have recommended that the CIO and ISD resolve scoring discrepancies and issue a revised final scoring instrument. We also recommend that the CIO and ISD submit their selection of Cisco's VoIP architecture to the Board for formal approval. In addition, to address the more global issue of a standard selection process, we recommend that the CIO and ISD develop and codify for Board approval a formal process for evaluating and selecting "standards" for the implementation of strategic/enterprise information technology. Finally, we recommend that in future solicitations cost be weighted more heavily to ensure a competitive selection process.

We reviewed our report with representatives from County Counsel, the CAO and CIO. We thank the managers and staff responsible for this RFI for their cooperation and assistance in completing our review.

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R-2006-1320-E.doc

Attachments

c: David E. Janssen, Chief Administrative Officer
Sachi Hamai, Executive Officer, Board of Supervisors
Dave Lambertson, Director, Internal Services Department
Jon Fullinwider, Chief Information Officer
Jonathan Fielding, MD, Director of Public Health and Health Officer
Audit Committee
Public Information Office

ATTACHMENT I

Investigation of the VoIP-Standard Selection Process and Related Changes to Building Specifications at the LAC/USC Replacement Facility

Background

On February 9, 2004, the Chief Information Office (CIO) and Director of the Internal Services Department (ISD) issued a Request For Information (RFI) to identify what Internet Protocol (IP) telephony platform(s) should be adopted for use by the County of Los Angeles. According to the RFI, the County's stated intention was to "...standardize on a single manufacturer's platform that will satisfy the County's requirements." The RFI sought proposals from IP telephony equipment manufacturers, and included various implementation scenarios for the analysis of theoretical cost structures, as well as equipment interoperability, reliability, features and functionality. The RFI was reviewed and vetted by Gartner Group, a contract consulting firm, before being issued. Six IP telephone equipment manufacturers submitted responsive proposals, which were evaluated by a panel of 20 County managers, including representatives from the Sheriff, CIO, ISD, and the Departments of Health Services (DHS) and Public Social Services (DPSS). The RFI evaluation process was completed on June 3, 2004. The Cisco VoIP architecture received the highest composite score and was subsequently appended to the County's Telecommunications Equipment and Services Master Agreement (TESMA).

On June 30, 2004, the CIO and ISD jointly sent an informational memorandum to the Board of Supervisors titled "Modern Telephone Systems," (Attachment II) advising of strategic changes in County technology standards for the purchase of telecommunications equipment. Specifically, they advised that technology and industry trends favored network-based Voice Over Internet Protocol (VoIP) telephone systems, and stated that except in extraordinary circumstances, future telecommunications system purchases or refurbishments must utilize this technology. This memorandum also stated that Cisco Systems was selected to provide VoIP equipment to the County, based on a competitive RFI process. On July 20, 2004, the CIO and ISD jointly sent a letter to each Department Head titled "New Telephony Systems", (Attachment III) similarly advising that the County had adopted VoIP as the standard telecommunications protocol, based on the Cisco VoIP architecture, and requiring that new and replacement telephone systems be based on VoIP technology.

On March 3, 2005, the Department of Health Services (DHS) issued a Strategic VoIP Implementation Plan to the CIO, detailing specific strategies and criteria for integrating voice, data and video communications into the Department's IP network, in line with CIO/ISD guidelines. The Implementation Plan identified three "driving factors" that would require the purchase/implementation of a new VoIP system: (1) a new facility that needs to be equipped with phone services; (2) an existing facility with an old Private Branch Exchange (PBX) system that has reached the end of it's life cycle and recurring issues related to reliability, functionality, or operational support had become unacceptable to the Department; and (3) an existing facility where the legacy PBX or Centrex system could not meet new demands for capacity or applications, and the cost to upgrade the existing platform or to expand the existing services was not an appropriate option for the Department.

In line with this strategy, on August 15, 2006, DHS, the Department of Public Works (DPW) and the CAO submitted a joint letter to the Board requesting approval and funding for construction modifications at the Los Angeles County/University of Southern California (LAC/USC) Medical Center Replacement Facility (Replacement Facility), including for design changes required to implement a VoIP rather than PBX telephone system. As of the date of this report, no VoIP telephone equipment has been purchased or installed at the Replacement Facility.

Scope

Staff from the A-C's Office of County Investigations (OCI) investigated two specific issues: (1) the decision to change the proposed telephone system for the Replacement Facility at the LAC/USC Medical Center from a PBX to a system based on VoIP technology - specifically, who made the decision, when the decision was made, and the basis and authority upon which the decision was made; and (2) the CIO/ISD directive to Department Heads regarding VoIP, and the associated RFI process by which Cisco Systems' VoIP architecture was selected as a technology "standard" in the TESMA. In addition, we were requested to determine whether appropriate County policy was followed, and recommend corrective actions or necessary changes in County policy, as appropriate, to ensure the Board is involved in approving critical technology and procurement decisions.

OCI did not evaluate the comparative technological merits of VoIP, PBX or Centrex technologies, nor did we review or evaluate the veracity or feasibility of technical information or theoretical implementations included in the RFI proposals, since these areas are outside the expertise of OCI staff and are being reviewed separately by ISD and the CIO. We also did not examine the merits or strategic implications of standardizing information and telecommunications systems around one proprietary architecture or manufacturer.

To investigate the decision to change telephone systems at the Replacement Facility, OCI investigators reviewed evidentiary documents obtained from the CIO and ISD concerning the establishment of VoIP as a technology standard, and specific items of correspondence related to DHS and Replacement Facility construction. To determine whether the RFI and evaluation process were consistent with County policy and provided an objective basis for selection of a technology standard, OCI investigators reviewed the RFI, vendor proposals, County rating instruments, and associated criteria used for scoring. We also recalculated the scores awarded by the evaluation team for a sample of individual bids to determine their accuracy, and reconciled those summary scores with original, signed rating instruments. Finally, OCI investigators interviewed CIO, ISD and DHS managers responsible for the RFI and the August 15, 2006 Board request concerning modifications to the Replacement Facility, and surveyed other Southern California municipalities to determine their progress, if any, in implementing VoIP systems.

Findings and Conclusions

Compliance with County Policy

The CIO stated that he followed what he believed to be appropriate protocol when he sent a memo to the Board advising that Cisco was selected as the standard VoIP architecture for the County. The CIO told OCI investigators that the Cisco architecture was selected after a comprehensive evaluation of competing technology proposals, solicited through the RFI process, and that this decision represented the best solution, in terms of technology and reliability, for the County. The CIO also told Investigators that he believed the joint CIO/ISD memo to the Board (Attachment II) constituted notice that a new standard had been established. However, both the CIO and the Director of ISD acknowledge that specific Board approval was not obtained before promulgating VoIP or the Cisco architecture as County standards. The Director of ISD also agreed that, in the future, it would be advisable to seek Board approval in cases where a specific vendor or proprietary technology was being selected.

County Code Section 2.119.030(C) provides that the office of the CIO shall "Adopt standards for countywide information technology, which shall be subject to approval by the Board of Supervisors. County departments and County information technology bodies shall adhere to such standards." County Counsel has indicated that, under this section, the CIO does not have the authority to unilaterally adopt Countywide information technology standards without specific, direct Board action. Although the CIO and ISD did notify the Board, via memo, that VoIP was adopted as the County's standard telecommunications protocol, and that Cisco was selected as the Countywide standard VoIP architecture, neither of these decisions was submitted for the Board's specific approval. This violates County policy.

OCI identified a similar issue in a November 15, 2001 Board-requested investigation regarding the selection of Cisco Systems as the sole-provider of network equipment for the County. In that case, County Counsel similarly concluded that the CIO did not follow appropriate approval protocol before declaring a technology standard. At the time, the CIO stated that setting standards is within his authority as County CIO, but told Investigators that he would obtain the Board's specific approval in the future. However, that does not appear to have happened in this case. This may indicate a lack of understanding of the process for adopting and seeking approval of changes in technology standards.

While adequate statutory requirements/control mechanisms do exist to provide for Board oversight, review and approval of strategic changes to technology standards, we recommend that the CIO and ISD issue enhanced protocols for Board approval that clarify desired controls.

Recommendation

1. **The Chief Information Office and ISD issue enhanced protocols for Board approval that clarify desired controls.**

Decision to Change the Replacement Facility Telephone System to VoIP

DHS relied upon several factors, including direction from ISD and the CIO (the July 2004 memorandum to Departments), and their own subsequently developed Implementation Plan for IP-based telephone systems, as the basis/authority for the decision to implement a VoIP telephone system at the Replacement Facility. It appears that DHS was also acting in response to a February 17, 2006 email message from the CIO, which states that the County has adopted VoIP as a standard for all new/leased facilities, and that he "strongly objects" to the implementation of a system based on other-than VoIP technology. The full text of that message is cited below.

From: Fullinwider, Jon [JFullinwider@laccio.org]
Sent: Friday, February 17,2006 9:47 AM
To: Janssen, David; Wolfe, Don; Dave Lambertson; Shelley, Dennis; bchernof@ladhs.org; jcochran@ladhs.org; Pdelgado@lacusc.org
Cc: oautelli@lacusc.org; sharper@cao.co.la.ca.us
Subject: Voice-Over-Internet-Protocol at the New Med Center

The County adopted the strategy of implementing VoIP for all replacements of PBX technology and as a standard for all new/leased facilities. The strategy/standard was adopted over two years ago and has resulted in well over 20 successful implementations with 30+ planned for the future. VoIP is the (new) standard for voice communication in the telecommunications industry. I have been advised that for some reason, that is not clear to me, a decision was made not to install VoIP at the new Med Center. I don't know who made this decision, however, it was not discussed and represents a clear lack of understanding on where communications technology is today and the opportunities that VoIP will present in the future. Implementing 80+ year old technology (PBX technology) in a new state-of-the-art facility represents a poor decision given that VoIP is a superior solution, less costly to operate, more robust in functionality, directly compatible with the DHS planned implementation of VoIP at it other major facilities (several are already planned), is in concert with the County's strategic enterprise direction to telecommunications and lastly, represents the worst expenditure of project dollars for a critical component of communications technology that is essential to the operation of the new Med Center. There is no reason to be in the position we are in! During early conversations with the project staff, it was agreed that the decision on the type of communication technology would be discussed at the point that the decision had to be made. All departments including their technology and communications staffs were formally advised of the decision to adopt VoIP as the County direction. In fact, there is no disagreement to this direction. As the County CIO, I must strongly object to the decision to implement a technology other than VoIP. We need to take immediate action to curtail the current direction and adopt a VoIP implementation at the Med Center. I would suggest a meeting be held to discuss actions required to redirect this initiative.

According to Dennis Shelley, the Associate CIO responsible for the VoIP RFI process, the original contract drawings for the Replacement Facility specified infrastructure that would accommodate a PBX phone system, to be provided by DHS. However, since the Replacement Facility was originally designed, telephone system technology has developed around VoIP systems. In acknowledgement of this trend, the CIO informed the Board in their June 30, 2004 letter that only IP phone systems will be implemented when new or upgraded telephone systems are needed in County facilities. Mr. Shelley stated that the change from PBX to VoIP systems was not a "new standard". Instead, the telephone equipment industry had set their own standard and made the decision for

the County by moving away from PBX systems. Mr. Shelley also stated that the selection of Cisco was through a competitive solicitation in accordance with purchasing guidelines, using the same process under which divergent PBX and Centrex systems were standardized.

VoIP Evaluation/Selection Process

ISD stated no formal process exists within the County to evaluate/select enterprise technology standards. Consequently, the CIO and ISD chose to use an RFI to evaluate the competing VoIP architectures. Section 2.5.4 of the ISD Services Contracting Manual (Manual) specifies that an RFI generally is used when the vendor community must be canvassed prior to developing a solicitation document. However, the Manual also expressly states that the RFI is not a source selection tool. The Manual details the following circumstances where use of an RFI is appropriate:

- Solicit data and/or interest level from potential contractors.
- Gather information from the vendor community regarding new developments/technology in their field of products, services, etc.
- Conduct a market survey.
- Pre-qualify firms.
- Determine estimated project price range (for budgeting purposes only).

The Manual also specifies that an RFI must include, at a minimum, an introduction and background, instructions to vendors, and a questionnaire.

While an RFI was not the optimal selection tool, the document prepared by ISD and the CIO nevertheless contained an appropriate level of detail concerning the scope of services/technology required, and disclosed both the detailed selection process and evaluation criteria to prospective proposers. In addition, the evaluation process and rating criteria appear to have been designed to objectively measure each proposal's compliance with the rating criteria. We also noted that the RFI was independently evaluated by Gartner Group, a contract consulting firm and County Master Agreement vendor, and found to be technically comprehensive and fair.

The evaluation process for this RFI was based on scores derived from seven proposal categories, weighted by percentage as indicated below:

RATING CRITERIA	%
Manufacturer Vision and Capability	25%
Telephone System Architecture	25%
Voice Mail and Unified Messaging	10%
Call Center	5%
Maintenance and Support	20%
Cost Models	10%
References	5%
TOTAL	100%

Within each category, the RFI specified numerous sub-criteria that were used to evaluate and score the merits of each proposal. These included hypothetical implementation scenarios designed to elicit meaningful cost comparisons, specific questions concerning system features, architecture, interoperability and reliability, and requests for detailed specifications and capabilities of commonly sought telephone systems features and functions.

The RFI process was consistent with other proposal processes that have been used throughout the County, albeit necessarily more technically complicated and detailed with respect to specific questions of operability, functionality and implementation. The committee responsible for creating this RFI appropriately obtained input from stakeholders during the development process, including from various VoIP equipment manufacturers and several County Departments where VoIP systems had already been implemented on a limited basis. The evaluation committees also were staffed with individuals who by virtue of their positions appeared to have sufficient technical knowledge to make a meaningful analysis of each proposal.

The resulting technical requirements, specifications, and rating criteria were also reasonable, and the process used to evaluate the proposals was generally consistent with that used by ISD in evaluating services contracts. The evaluation criteria were specific, generally relevant, reasonable, and applied in an unbiased and consistent manner to all proposals. The evaluation criteria were also appropriately disclosed to the proposers, and the RFI included a detailed breakdown of rating factors to be considered by the evaluation committee.

Ideally, when an emerging technology or product reaches a point in the lifecycle process where it should appropriately be considered for adoption as a "standard", the CIO would submit a request to the Board to approve a new standard. If approved, and particularly in cases where selection of a proprietary protocol or a specific vendor would result, the CIO and/or ISD should then conduct a competitive process to vet competing products/architectures, and submit the winning proposal to the Board for adoption. Technology integrators and vendors could then be added to the TESMA pursuant to Board action adopting a standard.

Since similar situations necessitating the evaluation and selection of a technical standard will undoubtedly arise in the future, we recommend that the CIO and ISD collaborate on establishing a formal process for standardizing technology, particularly for strategic/enterprise implementations. Such a process should include detailed procedural guidelines, similar to those promulgated by ISD for the issuance and evaluation of Requests for Proposals (RFP's), and should be similarly comprehensive. We also recommend that the CIO and ISD formally submit the proposed change in telephone system standard (to VoIP), and the separate decision to select Cisco as the County's VoIP architecture, to the Board for review and approval.

Recommendations

The Chief Information Office and Internal Services Department should:

2. **Collaborate on establishing a formal process for evaluating and selecting "standards" for the implementation of strategic/enterprise information technology. Such a process should include detailed procedural guidelines, similar to those promulgated by ISD for the issuance and evaluation of Requests for Proposals (RFP's), and should be similarly comprehensive.**

3. **Formally submit the proposed change in telephone system standard (to VoIP), and the separate decision to select Cisco as the County's VoIP architecture, to the Board of Supervisors for review and approval.**

While the overall RFI process that resulted in the selection of Cisco's VoIP architecture as the County's standard was generally objective and reasonable, OCI investigators did note various scoring irregularities and other issues, detailed below.

Scoring Irregularities

OCI investigators attempted to reconcile individual scoring documents completed by evaluation committee members with a summary score sheet provided by a Telecommunications Planning Manager at ISD who was head of the RFI evaluation committee. This summary score sheet was used to select the winning proposal (Cisco). OCI attempted to recalculate the individual category scores, and to reconcile totals from select proposals to the summary sheet.

In several cases, OCI investigators could not reconcile the score sheets provided by ISD. Additionally, the variances did not appear to be the result of simple computational errors, and neither ISD nor CIO management could provide an explanation for the discrepancies. For example, each of the six evaluators who rated the "cost" component of Cisco's proposal awarded Cisco 250 out of a possible 1,000 points (the lowest score of any proposer). However, on the summary score sheet, Cisco was awarded 375 points for cost. Using either consensus scoring or score averaging, the only possible outcome would have been a summary score of 250 points. This error had the effect or overstating Cisco's final score by 125 points, although it did not effect the overall outcome. No one could explain the cause of this variance.

In another example, we found that each of the six raters who evaluated the cost component of Avaya's proposal awarded them 700 points or less. However, Avaya received an overall cost score of 742 points. Assuming that the overall scores for each category were computed by taking the average of individual scores, as was represented by ISD, this outcome is mathematically impossible.

Investigators also noted instances where the spreadsheet used to aggregate and summarize individual scores contained mathematical errors in the formulae used to compute the summary averages. For example, in one case the sum of six individual

scores was divided by eight, rather than six, to calculate an average. Overstating the denominator in an averaging calculation has the effect of lowering the result, and consequently lowered the score awarded to the affected vendor.

OCI investigators also identified administrative/record keeping deficiencies with respect to supporting documentation underlying the RFI evaluation process. Specifically, investigators found multiple sets of "final" scoring instruments, none of which agreed with one another and which could not be reconciled back to individual rating documents completed by members of the evaluation committee. The absence of any marking to identify the rating instruments and summary forms as either "draft" or "final" work product substantially impaired investigators' ability to locate authoritative documents, or to timely complete an accurate reconciliation. As a result, OCI investigators could not duplicate the calculations in the final scoring instrument that resulted in the selection of Cisco as the VoIP standard. Additionally, mathematical errors had the effect of reducing the point margin between Cisco and the first runner-up. The following table details the scoring for each proposer.

SUMMARY OF OVERALL SCORES, BY RATING CRITERIA AND PROPOSER

RATING CRITERIA	CISCO	AVAYA	NEC	ALCATEL	MITEL	NORTEL
VISION AND CAPABILITY	2,409	2,074	2,226	1,612	1,881	1,036
TELEPHONE SYSTEM ARCHITECTURE	2,296	2,087	1,998	2,001	1,831	1,785
VOICE MAIL AND UNIFIED MESSAGING	907	838	929	676	860	901
CALL CENTER	450	467	462	444	460	459
MAINTENANCE AND SUPPORT	1,977	1,830	1,259	1,477	1,343	1,458
COST MODELS	250	692	647	987	564	413
REFERENCES	457	319	336	351	352	150
OVERALL SCORES (TOTAL)	8,746	8,307	7,857	7,548	7,291	6,202

While the scoring errors we identified did not change the final ranking of proposers, we recommend that the CIO work with ISD to resolve all scoring discrepancies and publish a revised final score sheet for this RFI.

Recommendation

4. **The Chief Information Office and Internal Services Department should work together to resolve all scoring discrepancies and publish a revised final score sheet for this RFI.**

Weighting of the Cost Component

While ISD's Contracting Manual does not specify a minimum weighting or magnitude that must be assigned when considering the cost of proposals submitted in conjunction with an RFI, implementation cost is an important factor and should figure prominently somewhere in the evaluation process. In this case, each of the equipment manufacturers that submitted a proposal appeared capable of providing a functional VoIP product, and most share a common set of core features and functionality expected of a modern telephone system.

We noted that cost constituted only 10% of the final score, which appears low given that the various proposers represented to be at least minimally capable of meeting the County's telecommunications needs.

SUMMARY OF COST MODEL SCORES*

PROPOSER	A	B	C	COMPLETENESS	TOTAL
MAXIMUM POSSIBLE SCORE	250	300	250	200	1,000
Cisco	42	92	42	74	**250**
Avaya	208	133	208	143	**692**
NEC	167	217	83	180	**647**
Alcatel	250	300	242	195	**987**
Mitel	100	175	150	139	**564**
Nortel	125	50	125	113	**413**

*Cost models were scored based on the following possible point structure: Model A – 250, Model B – 300, Model C – 250. All values in this table were taken from summary scoring instruments provided to us by ISD. The higher the score, the lower the total cost of each proposed implementation.

Considering the distribution of final scores, the relative rankings of each proposer, and the fact that the proposer ultimately selected by the CIO as the County standard was also the most expensive, it is conceivable that changes in the weighting of various evaluation components to give more consideration to cost as a scoring factor could materially change the final rankings. We recommend that future solicitations give more weight to cost as a scoring factor to ensure a competitive selection process.

Recommendation

5. **The Chief Information Office and Internal Services Department should ensure that future solicitations give more weight to cost as a scoring factor to foster a competitive selection process.**

Comparison of other Municipal VoIP Implementations

OCI investigators contacted telecommunications managers from five other Southern California municipal governments to determine whether they had begun to implement VoIP technology, and if so, the rationale for their decisions. We also obtained information on the respective processes used to select a technology standard, and the vendor ultimately selected by each municipality. All of the governments we contacted are transitioning from PBX and/or Centrex based systems to a VoIP architecture. In every case, the staff we spoke with cited the declining availability and support environment for PBX/Centrex systems, and the growing market share and technical/functional advantages of VoIP systems as primary reasons for the change. This is consistent with the direction and rationale cited by the County. The table below summarizes the results of our survey.

MUNICIPALITY	SOLICITATION PROCESS	PROVIDER SELECTED
CITY OF LOS ANGELES	INVITATION FOR BID	COMCAST/TIME WARNER
SANTA BARBARA COUNTY	REQUEST FOR QUOTATION	NEC
RIVERSIDE COUNTY	REQUEST FOR PROPOSAL	CORNET
SAN BERNARDINO COUNTY	DIRECT BID	ACS
ORANGE COUNTY	REQUEST FOR PROPOSAL	AVAYA

ATTACHMENT II

COUNTY OF LOS ANGELES
CHIEF INFORMATION OFFICE
500 West Temple Street
493 Kenneth Hahn of Administration
Los Angeles, CA 90012

JON W. FULLINWIDER
CHIEF INFORMATION OFFICER

Telephone: (213) 974-2008
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June 30, 2004

To: Supervisor Don Knabe, Chairman
Supervisor Gloria Molina, Chair Pro Tem
Supervisor Yvonne B. Burke
Supervisor Zev Yaroslavsky
Supervisor Michael D. Antonovich

From: Jon W. Fullinwider
Chief Information Officer

Dave Lambertson, Interim Director
Internal Services Department

Subject: **MODERN TELEPHONE SYSTEMS**

This memorandum is to provide your Board with an update on activities related to the implementation of modern telephone systems in the County.

Historically, telephone systems and data systems have used separate building networks and separate wide area networks. The newest telephone systems make use of the Internet Protocol (IP) to transmit telephone calls over the same building network and wide area network infrastructure that is currently used for our data systems. This approach is most commonly referred to as Voice over IP (VoIP). VoIP systems overcome some of the limitations of traditional telephone systems, including:

- Additional costs by using separate building wiring for data and voice transmission.
- Lack of integration of voice mail and e-mail on desktop computers.
- Significant costs associated with telephone instrument relocation.
- Lack of full phone number portability (i.e., the same phone number can be transferred from one physical location to another location).

Market analysts predict that by 2007 the majority of telephone systems sold in the country will be IP based. All major manufacturers have begun phasing out their conventional PBX products. Therefore, it is critical that the County prepares for this change.

The Internal Services Department (ISD), Community Development Commission, and the Sheriff's Department (Sheriff) have implemented new VoIP telephone systems at some of their facilities and other departments are interested in doing the same. However, currently there are no industry interoperability standards for these systems. Each manufacturer has implemented their own proprietary systems and, therefore, no two manufacturers' systems will directly interoperate (i.e., communicate seamlessly) with each other. Without industry-wide interoperability standards, the County needs to standardize on a single manufacturer's platform as we move into IP telephone systems. To do otherwise would result in multiple realms of voice communication and needless gateways and transition points, increasing the cost and complexity of voice communications in the County.

An interdepartmental committee developed a Request for Information (RFI) which was issued by ISD. The RFI was used to solicit information from the industry to determine which IP telephone system(s) would provide the County with the best functionality and integration with the existing voice and data networks. Responses were received from Alcatel, Avaya, Cisco, Mitel, MCI, NEC, and Nortel. An evaluation committee of representatives from ISD, Chief Information Office (CIO), Sheriff, Department of Health Services (DHS), Information Systems Advisory Body (ISAB), and the Department of Public Social Services (DPSS) formally reviewed and scored the responses. The response from Cisco received the highest score and was determined to be the best IP telephone system for use in the County at this time.

The Cisco IP telephone system will be added to the existing Telecommunications Equipment and Services Master Agreement (TESMA) in a new category. ISD will issue a solicitation for system integrators and distributors to be added to TESMA to support this new category. These TESMA qualified system integrators and distributors will have the opportunity to provide the County competitive bids on the Cisco IP telephone systems if, and when, new telephone systems are required at County facilities. When the industry adopts interoperability standards for IP telephone systems, compatible systems from other manufacturers will be added to TESMA.

The implementation of IP telephone systems is part of our overall converged networks strategy. Unless there is extenuating business or technical requirements that have been reviewed and approved by the CIO, only IP telephone systems will be implemented when new or upgraded telephone systems are needed in County facilities. CIO and ISD staff will be working with departments on an enterprise-wide architecture and the implementation and operational support services for IP telephone systems.

For additional information, please contact Dennis Shelley, of the CIO, at 562.940.3935 or David Mayer, of ISD, at 562.940.2907.

JWF:DL:DS:ygd

c. Chief Administrative Officer
Executive Officer, Board of Supervisors
Chair, ISC

ATTACHMENT III

COUNTY OF LOS ANGELES
CHIEF INFORMATION OFFICE
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CHIEF INFORMATION OFFICER

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July 20, 2004

To: Department Heads

From: Jon W. Fullinwider
Chief Information Officer

Dave Lambertson, Interim Director
Internal Services Department

Subject: **NEW TELEPHONE SYSTEMS**

A new type of telephone system makes use of the Internet Protocol (IP) to transmit telephone calls over the same building network and wide area network infrastructure that is currently used for our data systems. This approach is most commonly referred to as Voice over IP (VoIP). Market analysts predict that by 2007 the majority of telephone systems sold in the country will be IP based. All major manufacturers have begun phasing out their conventional PBX products. Therefore, it is critical that the County prepares for this change.

An interdepartmental team of staff has completed the formal evaluation of responses to a Request for Information (RFI) for this new type of telephone system. Out of the major manufacturers that submitted responses, Cisco was scored the highest and has been selected as our standard VoIP platform until interoperability standards and compatible products from other manufacturers are available. (See attached).

In the future, the telephone system will run over your local area network (LAN). Both your telephone and information technology staff, organizationally separated in some departments, need to understand VoIP telephone systems and how to cooperatively design, implement, and support them. As there are a number of obsolete PBXs at various facilities that need replacement, we will be moving forward with the implementation of VoIP systems at those locations. To facilitate the implementations:

- ISD is adding the Cisco VoIP systems to the existing Telecommunications Equipment and Services Master Agreement (TESMA) in a new category. ISD will issue a solicitation for system integrators and distributors to be added to TESMA to support this new category. This process will take a few months to complete.

- We will be meeting with Cisco's Professional Services staff and consultants to develop an enterprise-wide VoIP architecture and best practices for security, operations and implementation. This will provide for seamless integration of the VoIP systems as they are implemented in various facilities, will provide for common enterprise platforms for conferencing and voice mail, and will provide the diversity and redundancies to ensure reliable telephone services. The results will be documented and shared with all departments. Your technical staff is invited to participate in this process.

- Seminars and training provided by Cisco will be available for your staff to become familiar with this new technology.

- ISD will be training its staff and also providing third party support for ongoing management, maintenance, monitoring and repair of the VoIP systems.

Unless there are extenuating business or technical requirements that have been reviewed and approved by the CIO, only IP telephone systems will be implemented when new or upgraded telephone systems, including call centers, are needed in County facilities. The implementation of IP telephone systems is part of our overall converged networks (voice, data, video) strategy. VoIP implementation and operation is different from traditional telephone systems and will require a redefinition of roles and responsibilities of ISD, departmental I/T and telephone services staff, and third party providers. We ask for your assistance in this evolution.

We will be supplying additional information to your telephone and information technology staff in the coming weeks. For any questions please have your staff contact Dennis Shelley, of the CIO, at (562) 940-3935 or David Mayer, of ISD, at (562) 940-2907.

JW:DS:sjc

Attachment

c: Chair, Information Systems Commission