**Background**

Oakland County Information Technology is seeking to undertake an initiative to significantly upgrade the County’s technology infrastructure and communications capabilities through the Universal Communications and Collaboration (UCC) Program. The current technologies for network transport, voice communications and voice mail have all reached their useful end of life necessitating the investment in new technologies. The technology landscape has evolved at a rapid pace providing the opportunity to achieve substantial improvements in performance, administration, security and functionality to improve the way we communicate and collaborate both internally and externally. The investment requested in this Program presents an opportunity to improve the level of service and security provided by IT to all stakeholders. This scope of the UCC Program will be delivered in three phases:

* Phase 1 - Network Equipment Replacement and Program Management
* Phase 2 - Voice Communications
* Phase 3 - Wireless Network and Remote Access

In preparation for this Program, funding designations were requested and approved for $10,250,000 as outlined below:

|  |  |
| --- | --- |
| Building Authority (Bond Funding) |  $ 800,000  |
| Telephone Communications Fund |  $ 2,000,000  |
| General Fund Designation |  $ 7,450,000  |
| Total |  $ 10,250,000  |

Additional funding is available in the Building Authority fund from delayed maintenance that will be included in the Program. The total requested for approval is now projected as $10,727,322 as outlined below:

|  |  |
| --- | --- |
| Building Authority (Bond Funding) |  $ 1,277,322  |
| Telephone Communications Fund |  $ 2,000,000  |
| General Fund Designation |  $ 7,450,000  |
| Total |  $ 10,727,322  |

Phase 1 is expected to consume the building authority fund of $1,277,322 and $4,211,324 from the General Fund.

**Industry Trends**

***Network Equipment Replacement*** *-* Previous trends in networking focused on providing higher bandwidth capacities and low latency performances with network security and system automation as additional layers. These additional layers were often developed independent of the network function and were not well integrated requiring significant operational overhead. The role of network services is rapidly changing from providing connectivity and bandwidth services to one that is adaptable to changing needs, provides integrated security functions, and system automation capabilities to minimize system administration burden. To efficiently provide bandwidth, security and automation services, the network must be integrated with the applications and services that leverage the network.

Intelligent networks in the form of Software Defined Networking (SDN) represent a major shift in how networks are deployed and managed. According to Open Networking Foundation (ONF), SDN is defined as “an emerging architecture that is dynamic, manageable, cost-effective, and adaptable, making it ideal for the high-bandwidth, dynamic nature of today’s applications. This architecture decouples the network control and forwarding functions, enabling the network control to become directly programmable and the underlying infrastructure to be abstracted for applications and network services.”

Software Defined Networks represents the foundation for next generation of IP-based networks. This technology enables automation of management and monitoring tasks for network provisioning, security and analytic insights. Once access and security policies are defined, based on the identity of an end user or a device (printers, devices, computers, etc.), the network system takes on the responsibility of tracking the user and/or device on the network and “self-configures the network” to enforce the defined policies. This intelligence vastly simplifies the network configuration, while enhancing security and visibility into network activities, reducing network staff overhead. All leading indicators point to SDN as the logical choice to provide network services for the County.

There are many technology trends that increase reliance on a high-performance, scalable and adaptable network infrastructure including cloud computing and integration of voice, video and device data.

This integration and consolidation of services on the network will enable Oakland County to further advance the digital transformation process and infuse information technology into daily operations. As systems continue to integrate and interact with one another, the network is the common thread that connects these systems. A strong network is the essential platform for successful deployment and use of these advanced technologies. The first phase of the Program will provide this platform.

***Voice Communications*** – Phone systems have historically been delivered on a legacy copper infrastructure that is aging. The major telecommunication companies are no longer investing to maintain this infrastructure but are investing only in the delivery of services over fiber or cellular media. Most home use has migrated from copper based phone service to phone service provided with internet or cellular delivery. This same trend is replicated in the private and public sectors.

In response, technologies supporting enterprise voice communications have evolved dramatically with the rapid adoption of Voice over Internet Protocol (VoIP) solutions. These solutions have changed the model for voice communications from one in which separate voice networks needed to be implemented and maintained, to a new model where voice communications are carried over data networks. This shift has essentially made voice another data application on existing networks. This consolidation on the data network allows for the integration of telephony services with other related technologies while providing the opportunity to consolidate administration.

VoIP technologies also provide significantly improved functionality for end users as it relates to productivity and accessibility of information including unified communications where all messaging is delivered to a single inbox, and mobility including features that allow an end user to access the enterprise voice system from anywhere. Additionally, modern VoIP systems allow for safety and security enhancements via greater visibility to emergency calls to E911 placed from the system, as well as the facilitation of compliance with increasingly complex E911 regulations. To be compliant with law enforcement regulations, VoIP communications solutions allow for encrypted voice traffic. VoIP technologies will continue to provide enhanced functionality to enterprises into the future with the development of capabilities for integration to enterprise applications including ERP, CRM and call/contact center, as well as capabilities for integration of network enabled devices.

***Wireless Networking & Remote Access*** *–* Wireless technology is currently facing exponential growth in both user expectations and need for bandwidth. Users have a wide-range of devices requiring wireless connectivity and have developed the expectation of high availability, reliability, security and wire-like performance. Mobility has also become an important aspect of attracting and retaining employees.

Similar to trends identified in the Network Equipment Replacement section, wireless technologies are also focused around managing usage, security, increased data traffic and support a diverse mix of applications and services with differing needs. The objective is to provide users a wired-network-like experience for bandwidth intensive and latency sensitive applications. To support the transition of data traffic from the wireless network to the wired network, link aggregation technologies are available to leverage existing cabling infrastructure investments. Centralized management of wireless networks continues to expand in available features and functionality for providing enhanced security and rapid wireless network deployment. To ease the administration burden, these systems also use the SDN capabilities allowing standardizing and automating the access point provisioning process.

Remote access has traditionally been provided through IPSEC or SSL VPN solutions that provide full access as if an employee is on-site. To be secure, remote access has typically been permitted from county provided devices only. Providers of remote access solutions are expanding service offerings to include web-based access from anywhere using any device while maintaining a secure connection to the enterprise environment. Control of security will be provided based on user identity and device compliance using SDN to ensure employees only have access to services required for their job functions.

**Benefits**

The technology upgrades included in this Program will provide many substantial benefits to Oakland County including system performance, management and administration of the solutions. A summary of benefits for each phase is outlined below.

*Network Equipment Replacement* – The recommended Cisco Systems platform will provide a significant upgrade in network performance and a robust backbone for all data traffic within the County. Additionally, this solution will employ a next generation technology in data networks; Software Defined Access (SDA), which is Cisco’s enhancement to the concept of Software Defined Networking (SDN). This technology automates a number of the network management and monitoring tasks in order to mitigate risk and ease administration. Once policies are defined for users or network devices, the software controls access to services. This intelligence simplifies the network configuration, while enhancing security, compliance and visibility while reducing network administration overhead.

The SDA deployment simplifies LAN, WLAN, and WAN administration while increasing network reliability, security and performance. The control and visibility provided increases availability while reducing time to respond to security or performance concerns.

*Voice Communications* – The projected features will provide many significant improvements to functionality. Benefits include mobility and accessibility, providing access to voice communications systems anytime, anywhere. Productivity benefits will result from the use of unified communications technologies that integrate email, voicemail and fax services. Improved functionality will be achieved for call centers throughout the County from simplified administration and increased visibility.

*Wireless Network & Remote Access* – Access to the internet has become a standard expectation for county visitors. Providing robust and secure wireless network access is a necessity to increase employee productivity and visitor satisfaction. The delivery of wireless services through SDA will increase security, performance and coverage. Remote access systems will provide benefits to County staff in the form of secure access to the County’s environment from any remote location.

**Design and Selection Process**

Oakland County Information Technology conducted an extensive design and selection process for

Phase 1 including the UCC Program Management and Network Equipment Replacement activities within the Program.

For UCC Program Management, this process included the development and execution of a Request for Proposal to solicit bids from qualified vendors to provide the expertise, guidance and program management services to support Information Technology in this effort. Oakland County Information Technology conducted a detailed due diligence process on the bids including proposal analysis, reference checks and finalist interviews. This process resulted in the selection of Plante Moran, PLLC to provide these services. Plante Moran is currently validating overall program estimates, providing guidance and recommendations for the Network Equipment Replacement and developing the RPF for Phase 2, Voice Communications. Upon completion of the Phase 2 efforts, they will also develop and execute the RFP for Phase 3, Wireless and Remote Access.

For the Network Equipment Replacement Project, the process included definition of detailed technical and functional requirements for the new switching equipment, as well as warranty, training and implementation services. These requirements were used to develop a Request for Proposal to solicit bids from qualified vendors for the new equipment. Oakland County Information Technology then conducted a detailed due diligence process on the bids including proposal analysis, reference checks and finalist interviews. The result of this process is a recommendation to award the project to Presidio, Inc. for new Cisco networking infrastructure.