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Finally after 6 additional revisions the report has been cleared with many changes.

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Report to Congress

ANC's Automation Project Total Cemetery Management System (TCMS)

I. Executive Summary

A. Overall Plan for Automation

For most of its 140-year history, Arlington National Cemetery – the nation's premier military cemetery and shrine honoring those men and women who served in the Armed Forces – has conducted its critical mission entirely manually. The burial records, gravesite records, and maps associated with burial locations are still archived and accessed manually. The large majority of ANC's 300,000-plus burial records are still maintained on paper and microfiche and, until recently, scheduling funeral ceremonies was also performed manually.

For the last several years, ANC has been working to find an automated solution to improve these processes. As ANC works to bring its business processes into the 21st century, ANC is guided by several key pieces of legislation. Congressional calls for reducing paperwork figure prominently in our plans. For instance, although ANC does not currently bear a specific Government Paperwork Elimination Act (GPEA) requirement, ANC is working to comply with the spirit of GPEA and the Paperwork Reduction Act (PRA) by incorporating GPEA requirements into its modernization blueprint. This ANC modernization blueprint is serving as the catalyst and compliance mechanism, as ANC works to modernize its current information processing, sharing, and storage mechanisms. In addition to GPEA and PRA, ANC is striving to embrace the spirit and letter of the e-Gov Act. By using new technologies and collaborating with the federal e-Gov initiatives, ANC can completely transform the way it provides services to citizens. Finally, throughout this undertaking, ANC intends to manage the project in accordance with the Clinger-Cohen Act. This will ensure that our Information Technology investments produce a significant and positive impact on improving the effectiveness of the program, as well as ensuring that the program is managed prudently, achieving all planned cost, schedule, and performance goals.

1) Challenges and Goals, History to Date

Starting in 2000, ANC conducted several Business Process Review studies to analyze requirements and solicit industry input for recommendations on how best to fill the performance gaps related to ANC's critical scheduling, burial, and records management functions. In 2001, a Visitor Study / Customer Survey was completed to provide a customer satisfaction baseline against which to track. In 2002, a Burial Records Automation Project was undertaken to define functional requirements, data collection processes for gravesite inventory and burial records data entry, and process flows for locating requests. Also in 2002, an Automation Assessment was conducted to provide analysis and recommendations on burial operations, scheduling, records management, and technology infrastructure enhancements and training.

Based on its initial research, ANC had anticipated that the Department of Veterans Affairs Burial Operations Support System (BOSS) application, developed by and used throughout the VA, would be a practical alternative to its current manual process. However, after a comprehensive study, Army & ANC officials decided that BOSS was not a viable alternative. After researching a variety of other alternative solutions, ANC developed the Interment Scheduling System (ISS), as a first step in automating all key ANC business processes.

While ISS does provide a number of critical services not supported by BOSS, ANC still has a number of key business requirements that are not being addressed. Some of the ongoing challenges facing the ANC are:

- **Lack of Automated Schedule Coordination.** ANC must coordinate all funeral resources, including its own resources (gravesites and chapels) and military resources (chaplains, honor teams) for an average of 24 burials each day. In addition, over 3,000 special, non-funeral ceremonies are conducted each year. The current funeral scheduling system does not

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provide any automated scheduling support and all funeral resources are managed manually, both within ANC and across the four military departments.

- **Lack of Gravesite Location Information.** ANC receives approximately 4 million visitors annually, many of whom come to visit individual gravesites. ANC also receives thousands of visits from florists, particularly on Memorial Day and Veterans Day. Currently, all visitors seeking gravesite location information must wait in line at the Visitors Center, and then only receive partial information. Current records provide only the section number and general location; no automated map or directions to the gravesite are provided. More significantly, location information is limited to the gravesite's section and approximate location; some sections are larger than an acre in size. On some holidays, florists and other visitors may have significant wait time to get gravesite location information.
- **Lack of Summary Archival Data.** ANC receives numerous requests from the Administration, Congress, and the public concerning the demographics of people interred at ANC. Limited information on interment/inurnments conducted since 1999 is maintained in electronic format in the VA's BOSS and ISS; however, this information is not completely accessible to people or organizations conducting research or seeking summary data. To easily summarize and keep the integrity of this data, all burial records must be converted to electronic format and existing paper files must be archived.
- **Lack of Capacity Planning Information.** ANC must maintain an accurate account of gravesite resources for current funeral scheduling as well as estimating remaining cemetery capacity. Capacity estimates affect military and Congressional policy on eligibility for interment at ANC, as well as planning for expansion. ANC has no current, verified cross-reference of burial information against the physical plant. Performing a manual verification/cross-reference is not feasible due to the sheer number and age of the records. ANC requires a physical inventory of all gravesites, headstones, and burial records, validated against the physical plant.

2) Major Components

After analyzing the results of these studies and reviewing data on various alternatives, ANC developed a modernization plan centered on the ANC Total Cemetery Management System (TCMS). ANC's vision for TCMS calls for a collaborative, component-based approach described as follows:

- **Interment Scheduling System (ISS)** – This component will provide an automated mechanism to schedule burials and honors ceremonies.
- **Geographic Information System (GIS)** – This component will provide the capability to locate gravesites, buildings and other facilities, utilities, and even natural objects on the current 624 acres of the cemetery and any other future land accessions.
- **TCMS Data Repository (TDR)** – This component will provide an electronic repository and retrieval mechanism for information on persons interred/inurned at ANC (e.g., personal and location information), making this information available to administrative personnel as well as families and tourists, through desktop workstations, kiosks and the ANC web site.
- **ANC Automated Headstone Ordering System (AHOS)** – Currently, all headstones for federal cemeteries must be ordered through the VA's Automated Management Application System (AMAS), even though all requested information is already in the ISS record. The AHOS is intended to eliminate the current duplication of effort between ISS and the AMAS.

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Many of these components will introduce new processes to the ANC staff. Upon implementation, a comprehensive training effort will be undertaken to ensure a smooth deployment without delays or breaks in service to ANC's customers. Following an initial pilot implementation scheduled for completion next year, specific cost and schedule information pertaining to user training will be available. These user training costs are not included in the dollar estimates presented in this report, and were not included in the President's 2006 Budget for "Cemeterial Expenses, Army" in the Budget Appendix (page 958).

Figure 1 below shows a component-level view of the TCMS. Components in the top (yellow) row represent the various applications that will be used to access the system. Components in the middle row (green) represent the database management systems that will manage the data, and components across the bottom (blue) represent the actual data storage. The additional green and yellow markings provide a general indication on funding priorities. A more detailed view of the plan is provided in the following sections of this report.

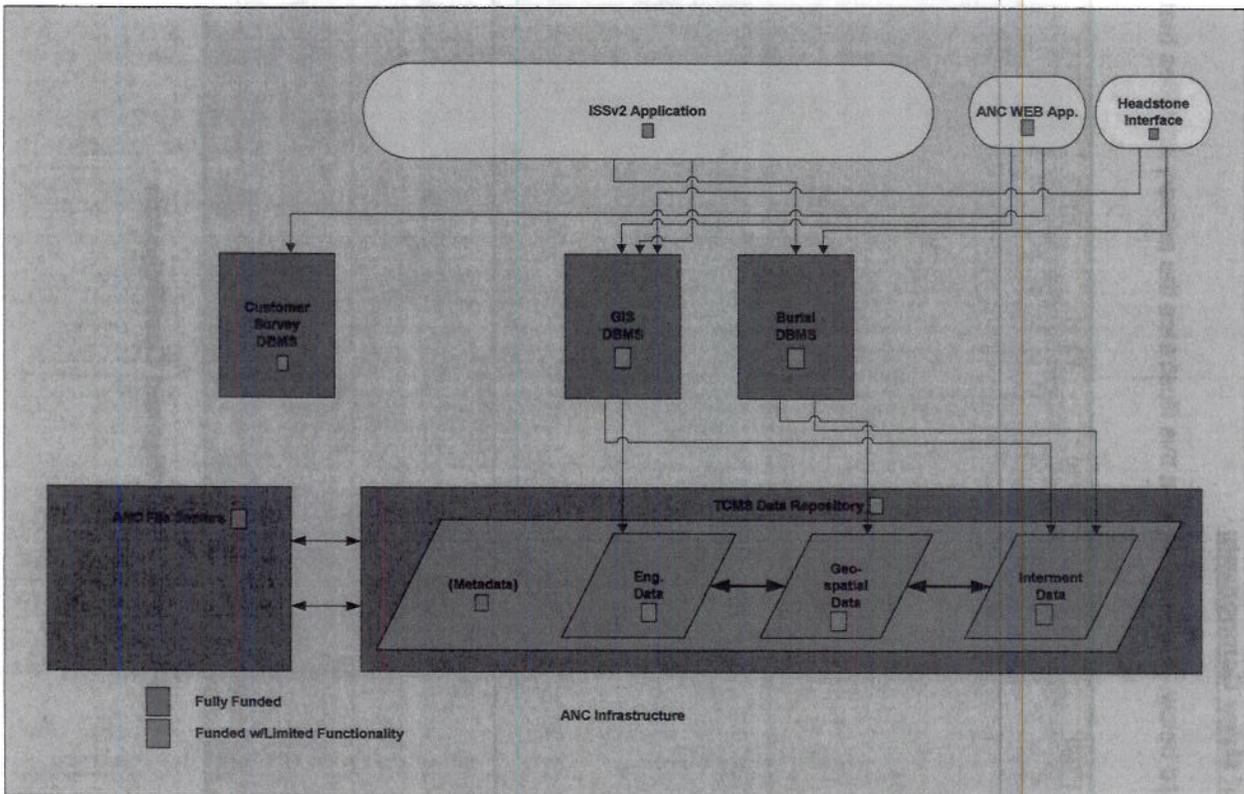


Figure 1. Component-Level View of TCMS

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B. Overall Planned Cost and Schedule of Major Components

ANC's overall plan for automation is reflected below. Please note that this illustrates the primary activities that planned based on currently anticipated funding.

TCMS Development Plan	FY05		FY06		FY07		FY08		FY09		FY10		FY11		FY12		FY13		FY14		FY15		FY16	
	Q1	Q2	Q3	Q4																				
TCMS Planning and Security																								
\$26k																								
Automated Headstone Ordering System (AHOS)																								
\$120k																								
Grave Card Data Entry																								
\$63.375k																								
\$50k																								
\$0																								
TCMS Data Repository Development & Maintenance																								
\$396.47k																								
Gravesite Integration and Validation																								
\$131.6k																								
Grave Card Capture																								
\$312.36k																								
Headstone Capture																								
\$485k																								
\$600.76k																								
\$0																								
GIS Database Development & Maintenance																								
\$390.897k O&M																								
\$0																								
ISS Enhancements, Integration to GIS, and Maintenance																								
\$460.235k																								
\$224.6k																								
\$0																								
Total Infrastructure Costs																								
\$4,602.48K																								
Website Enhancements & Maintenance																								
\$306k																								
\$559k																								
\$596k																								
\$628k																								
\$615k																								
Customer Survey																								
\$214.4k																								
\$2,174,967k																								
\$350k																								
\$546k																								
\$500k																								
\$516k																								
\$583k																								
\$583k																								
\$583k																								
\$20k																								

Figure 2. TCMS Planned Cost/Schedule

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II. Cost and Schedule Breakdown of Major Components:

The following table provides detailed information on cost and schedule, based on currently anticipated funding.

ANC Information Technology Component Costs (By fiscal year in thousands of dollars)

	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10-16	Total
TCMS Planning and Security	\$ 185	\$ -	\$ 75	\$ -	\$ 209	\$ 25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 494
Automated Headstone Ordering System (AHOS)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 120	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 120
Grave Card Data Entry	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 63	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 63
Customer Survey	\$ -	\$ -	\$ -	\$ -	\$ 51	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 214	\$ 265
TCMS Data Repository Development & Maint	\$ -	\$ -	\$ -	\$ -	\$ 565	\$ 50	\$ -	\$ 37	\$ 38	\$ 40	\$ 281	\$ 1,011
Gravesite Integration and Validation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 132	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 132
Grave Card Capture	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 312	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 312
Headstone Capture	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 485	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 485
GIS Database Development & Maintenance	\$ -	\$ -	\$ -	\$ -	\$ 299	\$ 501	\$ -	\$ 90	\$ 45	\$ 40	\$ 256	\$ 1,231
ISSV2 Enhancements & Maintenance	\$ -	\$ -	\$ -	\$ -	\$ 82	\$ 48	\$ -	\$ 50	\$ 45	\$ 46	\$ 297	\$ 568
ISSV2 Integration to GIS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 160	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 160
ISS Box 2 (Backup Box)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 17	\$ -	\$ -	\$ -	\$ -	\$ 45	\$ 62
Total Infrastructure Costs	\$ 10	\$ -	\$ 226	\$ 397	\$ 1,317	\$ 262	\$ 350	\$ 369	\$ 371	\$ 390	\$ 2,860	\$ 6,552
Website Enhancements & Maintenance	\$ 5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 306	\$ 311
Total *	\$ 200	\$ 0	\$ 301	\$ 397	\$ 2,523	\$ 2,175	\$ 350	\$ 546	\$ 500	\$ 516	\$ 4,259	\$ 11,767
Carry Forward, FY04						\$ 674	FY 04 carry forward of \$674 is included in the FY 05 amount of \$2,175.					

* These estimates are the Automation/Visitor Survey Category amounts in Object Class 25.0 Other Services. Other automation activities may have been funded from Object Classes: 11.9 Personnel Compensation; 23.2 Communications; and 31.0 Equipment; or the Defense Emergency Response Fund that are not separately identified and quantified as IT Component Costs.

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III. Current Status

ANC is now working against its TCMS management plan, and is on schedule to deliver significantly improved services in FY05. Current status of each major component is discussed below.

TCMS Planning and Security

- **Security Assessment** – In early 2004, ANC conducted an initial security review and privacy impact assessment. ANC is currently pursuing Certification and Accreditation of its systems and applications.
- **Enterprise Architecture** – In FY2004, ANC began implementing the initial stages of EA, including definition of its current and target architectures.

Interment Scheduling System

- **ISS Review** – To ensure clean interoperability, ANC began reviewing the ISS program code to better understand if the application can be modified to allow for ease of integration with TCMS. After the review of the current ISS application, from two independent sources, it has been determined that the code will have to be modified considerably to allow integration with the other components of TCMS. In addition, the current application must be re-engineered so that ANC can have a working backup should the current application or its hosting environment fail.

Geospatial Information System

- **GIS Pilot** – Building on a 2002 study, this pilot was conducted in December 2004 and January 2005. This effort has now proven that the GIS application can be developed to enhance ease of interoperability with other TCMS components. This pilot, which focused on the 300 gravesites in a single section of ANC, was completed with great success.

TCMS Data Repository

- **TCMS Data Repository (TDR)** – The foundation for TCMS has been a central repository to maintain data (e.g. burial records, scanned images, VA information, source data, etc.). Requirements of this repository have been assessed based upon lifecycle capacity requirements, hosting platform, system interoperability and scalability, as well as other technical requirements. Through the use of Component Based Architecture and Model Driven Architecture, the TDR will be completely functional, interoperable, and modular. This approach will create the greatest ease of use through out the software development life cycle, as well as implementation and evolution of TCMS.
- **Records Scanning and Validation** – ANC has successfully completed the scanning of over 297,000 burial records, and has begun the process of data entry of key fields from each record. This process includes a double validation of the data before it is accepted and made a part of the data repository. The data entry is anticipated to be completed by June 2005.

ANC Automated Headstone Ordering System (AHOS)

- ANC is currently working with the Veterans Administration to develop an application interface allowing this process to function as an interoperable component of TCMS. ANC has been making exceptional headway, and it is anticipated that this approach will lead to the development of an application that will further automate processes, and create greater efficiency, between ANC and other government agencies.

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TCMS Infrastructure

- **Video Matrix** – This portion of TCMS (which is currently being developed and tested) will provide streaming video from multiple locations across the cemetery to various locations in the Administration Building and the Visitor's Center. As part of the TCMS pilot which was conducted in January 2005, currently installed components of the Video Matrix demonstrated complete functionality and seamless integration with the TCMS system.
- **Fiber runs across campus** – To provide greater efficiency in band-width for the video and data requirements of ANC, Fiber Optic cabling has been laid throughout various locations at the cemetery. These Fiber runs have proven very successful for distributing high volumes of data across the ANC Campus with little to no degradation.
- **Integration Environment** – ANC is currently developing an environment which will logically mirror its production platform. This Integration Environment (IE) will host application development, and provide a means for testing system modifications and upgrades prior to incorporation into production. This greatly reduces the risk of system error, and provides for enhanced Change Management.
- **Network Infrastructure** – The current infrastructure, which is the platform for ANC's production environment, has been assessed and modifications are being made to ready the network and its related components for hosting the TCMS, as a fully structured, interconnected environment. This environment will bring together office automation, business applications, video imaging, and source data.
- **Interactive Website** – ANC plans to redesign its current static website to an interactive information portal that will tie into the TCMS. This redesign will allow individuals to look up persons buried at the cemetery and print out a map of the precise burial location. This will enable ready, real-time access to information, and reduce the time visitors have to wait in line to go through the current, manual location process. The improved website will include a grave location that provides walking and driving directions to each gravesite. In addition, photographs of each headstone will be available. The website will also broadcast live data feeds of special occasions occurring at ANC.

In addition to the TCMS components described above, ANC is looking to develop an application to directly and immediately assess its impact on its customers through the use of a Customer Survey DBMS. These surveys will be available to any visitor via the ANC website, and also to families and tourists who visit the cemetery, and to families who attend funerals and ceremonies at ANC. These surveys gauge key metrics that ANC will use to improve customer satisfaction and internal excellence. They will also be useful in assessing the overall progress and development as TCMS matures.

Driven by the overarching strategic plan and target enterprise architecture, the TCMS investment is now on track to provide a robust, interoperable, and secure means of managing all cemetery functions.