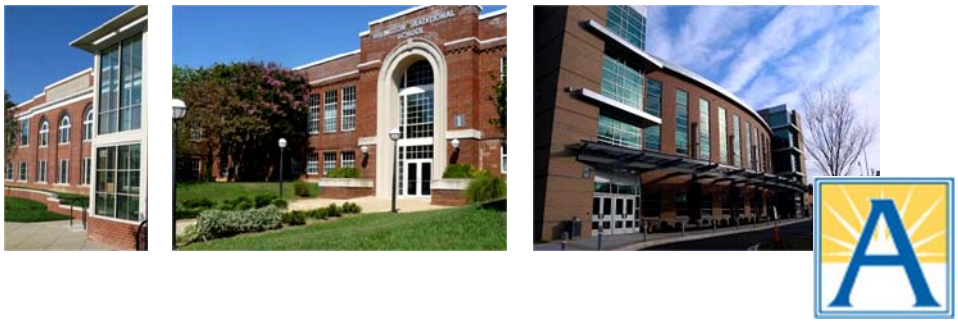
Arlington Public Schools



Consulting Services for Information Services Review and Recommendations

IS Review – Recommendations Report

Final Version
April 2011

Prepared for:
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Arlington Public Schools

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IS Review – Recommendations Report

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Version	Delivered Date	Update Reason
Draft 1	March 24, 2011	Working Draft 1 Submitted to APS for Review
Final	April 14, 2011	Final Version Submitted to APS

Table 01: Version History of the Report

Acknowledgements

Berry, Dunn, McNeil & Parker would like to thank the employees of Arlington Public Schools (APS) for collaboratively working with us to complete this Information Services (IS) Review for the Information Services Department. Special thanks go to the Project Team members whose time and commitment were essential to the development of this report.

We would also like to thank the IS and other APS staff who participated in the development of the report. Not only did department representatives participate in the information gathering process, but each department valued the opportunity to participate and provide input to this project. We truly appreciate the level of cooperation, support, and feedback we received from the employees of APS.

The key ingredient for future success of implementing the recommendations in this report is the commitment level of necessary staff and managerial resources. We also believe that the citizens of Arlington should be proud of the manner in which the dedicated employees of the Information Services Department provide services to the Arlington Public Schools.

Executive Summary

This section contains an executive summary of the recommendations report.

In November 2010, Arlington Public Schools (APS) retained Berry, Dunn, McNeil & Parker (BDMP) to conduct an assessment of the technology infrastructure and processes of the IS Department and review the Concept Plan (Platform Plan) developed by IS staff for the upgrading and replacing of its infrastructure. The evaluation and assessment also encompassed the review of technology tools, equipment, and materials used by the IS Department to support the goals of APS. As part of the project, BDMP also reviewed the current student information system, eSchoolPlus from SunGard, and evaluated and reviewed the use of APS's financial system, Oracle E-Business Suite, known internally to APS as Strategic Transformation of Administrative Resource Systems (STARS).

As part of this project BDMP developed and delivered an initial report, the IS Review Current Environment Report in February, 2011. This report contained findings and issues related to eleven focus areas APS requested be reviewed as part of the scope of the project as well as additional information describing the current IS environment. The Current Environment Report formed the basis for the recommendations contained in this report.

In early March 2011, BDMP facilitated a work session to review the information contained in the Current Environment Report and collect feedback from the IS Leadership group and other APS stakeholder departments including Instruction, Finance, and Personnel. The work session and review process helped build consensus related to the issues and challenges identified in the current IS environment at APS. The complete list of project participants is included in Appendix D.

In addition to the work session with APS staff to review the Current Environment Report, BDMP also conducted additional meetings with the APS IS Assistant Superintendent to discuss specific findings and brainstorm potential recommendations related to the current and planned IS department organizational structure, as well as the planned activities related to the IS Platform Plan.

In addition to identifying findings and issues related to the current environment and developing recommendations, APS is interested in leveraging industry best practices to assist the IS department with improving overall efficiencies and leveraging technology. In order to develop the recommendations contained in this report BDMP conducted benchmarking research with similar organizations and has also aligned the recommendations with several industry standard best-practices including the Information Technology Infrastructure Library (ITIL), Project Management Institute (PMI) the American Productivity and Quality Center (APQC) as well as standards published by the State of Virginia Department of Education.

On March 31, 2011, BDMP facilitated a work session with APS to present the recommendations developed and contained in this Report. Participants in the work session totaled 20 and included representation from all areas of Information Services. Additional feedback was collected as each recommendation was presented and discussed. This feedback was used to update the IS Review – Recommendations Report to this final version.

Because this project is an evaluation and assessment of the current environment, the comments and feedback presented in this report are critical by nature, this report does not detail many of the strengths noted by BDMP during the fact-finding meetings. The recommendations developed in this

report are based on the challenges in the current environment and builds on the strengths identified and leverages internal resources as APS plans for the future.

It is important for readers of this report to understand that APS hired a new Assistant Superintendent for the IS Department in August 2010. Due to current challenges within APS, some projects were initiated during the course of this assessment that impacted the scope of our planned work. It was understood that it was important for APS to move ahead quickly to address some issues. We worked closely with APS to communicate interim findings and recommendations during our work; however the findings and recommendations in this report reflect our analysis as of the issue of this report.

One of the largest changes implemented recently is a revised organizational structure for the IS Department that aligns the department with the IS service delivery goals, leverages the internal strengths of IS staff, streamlines the internal reporting process, and creates greater opportunity for collaboration between divisions within IS. The revised organizational structure has an impact on several of the recommendations in this report. Where applicable the impact has been described for the appropriate recommendations.

Fifteen high level recommendations are identified in this report that addresses the findings documented in the Current Environment Report. Each of the high level recommendations contains numerous sub-recommendations and guidance about how to implement them. The recommendations presented in the report have not been formally prioritized by APS or BDMP. However, there are several recommendations that BDMP view as “high” priority recommendations that if addressed, will assist APS as they implement the other recommendations identified. These recommendations include Recommendations C - Redesign Organization Structure and Update Job Descriptions, E – Centralize and Standardize Project Management Processes and Tools, O- Complete the Implementation of the Platform Plan.

Many of the findings identified in the current environment report, as well as the recommendations developed in this report have similar focus areas. These focus areas include, improving project management practices, documenting functional and technical requirements for projects and systems, improving communications, both within the IS Department and to external IS customers. APS should consider these focus areas when implementing the recommendations described in this report since they will impact many of the findings and recommendations. A failure to consider these focus areas when undertaking an initiative such as planning for a new system, redesigning a business process, conducting a needs assessment or developing a new policy or procedure can lead to challenges in achieving the desired result of the initiative.

Implementing the recommendations in this report will in some cases greatly impact current APS and IS department business processes and will require a high level of project management related work. Planning, selecting, deploying, and managing for improved systems, new technology and revised policies and procedures will require strong leadership, and comprehensive planning. As new technologies, and revised policies and procedures are implemented, APS will need to actively communicate the services and benefits to both internal and external stakeholders.

The IS Department should consider the following requirements that implementing the recommendations in this report necessitate:

1. Active management involvement and sponsorship will be critical to the successful adoption and continued support of the recommendations.

2. Allocating resources will become critical; establishing clear commitments from all internal IS resources and external IS customers will become increasingly important.
3. In the instances where a recommendation will need to be implemented as part of a project or initiative, it will be important that project goals and objectives are communicated to stakeholders and progress proactively monitored.
4. Business processes should be evaluated, and where necessary, redesigned to leverage new technologies (such as the new platform) in order to meet the IS Department's desired objectives.
5. Management should be proactive in their change management roles as not all changes will be technical in nature. Adopting the recommendations may create shifts in responsibilities, process changes, and policy adjustments. Effective change management for IS and APS staff will be a critical success factor in ensuring that the recommendations are implemented effectively and achieve desired results.

The final step of this assessment project is to prioritize the recommendations and assign the necessary activities to implement them based on priority. BDMP and APS plan to work collaboratively to complete this final step to update and complete the report to reflect these additional project activities.

1.0 Introduction

This section of the report describes the background of the project leading up to the report, the format of the report, the work performed in the development of the report and common terms and abbreviations.

1.1 Project Background

Arlington Public Schools (APS) is comprised of 31 schools that serve a Pre-K-12 enrollment population of approximately 21,500 students. APS is in the process of completing the last year of its current Strategic Plan and is currently finalizing a new Strategic Technology Plan that will go into effect for the 2011-2012 school year. In conjunction with developing the Strategic Technology Plan, there was a need recognized for an evaluation and assessment of APS' infrastructure and processes of the Information Services (IS) Department.

In November 2010, Arlington Public Schools (APS) retained Berry, Dunn, McNeil & Parker (BDMP) to conduct an assessment of the technology infrastructure and processes of the IS Department and review the Concept Plan (Platform Plan) developed by IS staff for the upgrading and replacing of its infrastructure. The evaluation and assessment also encompassed the review of technology tools, equipment, and materials used by the IS Department to support the goals of APS. As part of the project, BDMP also reviewed the current student information system, eSchoolPlus from SunGard, and evaluated and reviewed the use of APS's financial system, Oracle E-Business Suite, known internally to APS as Strategic Transformation of Administrative Resource Systems (STARS).

BDMP developed and delivered the IS Review Current Environment Report in February, 2011. This report contained findings and issues related to eleven focus areas APS requested be reviewed as part of the scope of the project as well as additional information describing the current IS environment. The Current Environment Report formed the basis for the recommendations contained in this report.

In August 2010, APS hired a new Assistant Superintendent for the IS Department. The recommendations made as a result of this project will be used by the Assistant Superintendent to guide some of the changes that will be implemented in the IS Department.

1.2 Report Format

This report is comprised of seven sections and an executive summary, as described below:

1. **Introduction.** This section of the report describes the background of the project, the format of the report, and the work performed in the development of the report.

2. **Current Environment Summary.** This section summarizes the Current Environment Report including the three areas of the IS Review as well as the findings and issues that were identified in the report

3. **Benchmarking and Best Practice Research.** This section describes the approach and results of the benchmarking and best practice research conducted as part of the IS Review.

4. **Information Services Recommendations.** This section contains the recommendations related to the Information Services area of the IS Review including the Concept Plan, uses of best management practices, staffing for the STARS application, processes and procedures in place and IT communication.

5. **Applications Recommendations.** This section contains the recommendations related to the Applications area of the IS Review including APS' student information system, STARS application and other technologies and applications.

6. **Technology Recommendations.** This section contains the recommendations related to the Technology area of the IS Review including APS' use of technology tools, technology concepts and other technologies and applications.

7. **Next Steps in the Project.** This section outlines the next steps that APS may take to implement the recommendations contained in the report.

1.3 Work Performed

As part of this project, BDMP developed and delivered and initial report, the IS Review Current Environment Report in February 2011. Members of IS Leadership, including the project team and additional stakeholders, met internally to review the report and provide feedback. In early March 2011, BDMP facilitated a work session to review the information contained in the Current Environment Report and collect feedback from the IS Leadership group, and other APS stakeholder departments including Instruction, Finance, and Personnel. The work session and review process helped build consensus with regards to the issues and challenges in the current environment at APS. The complete list of project participants is included in Appendix D.

The focus of the work sessions was to confirm the Current Environment Report and the findings and issues identified. During the work session, many of the APS staff provided updates and information on current and planned initiatives which were collected by BDMP and incorporated into the recommendations developed in this report.

In addition to the work session with APS staff to review the Current Environment Report, BDMP also conducted additional meetings with the APS IS Assistant Superintendent to discuss specific findings and brainstorm potential recommendations related to the current and planned IS department organizational structure, as well as the planned activities related to the IS Platform Plan.

In addition to identifying findings and issues related to the current environment and developing recommendations, APS is interested in leveraging industry best practices to assist the IS department with improving overall efficiencies and leveraging technology. In order to develop the recommendations contained in this report BDMP conducted benchmarking research with similar organizations and has aligned the recommendations with several industry standard best-practices including the Information Technology Infrastructure Library (ITIL), Project Management Institute (PMI) the American Productivity and Quality Center (APQC) as well as standards published by the State of Virginia Department of Education.

On March 31, 2011, BDMP facilitated a work session with APS to present the recommendations developed and contained in this Report. Participants in the work session totaled 20 and included representation from all areas of Information Services. Additional feedback was collected as each

recommendation was presented and discussed. This feedback was used to update the IS Review – Recommendations Report to this final version.

Because this project is an evaluation and assessment of the current environment, the comments and feedback presented in this report are critical by nature, this report does not detail many of the strengths noted by BDMP during the fact-finding meetings. The recommendations developed in this report are based on the challenges in the current environment and builds on the strengths identified and leverages internal resources as APS plans for the future.

2.0 Current Environment Summary

This section of the report summarizes the Current Environment Report including the three areas of the IS Review as well as the Findings and Issues that were identified.

The IS Review Current Environment Report provided information on eleven assessment areas requested by APS to be reviewed. These areas were grouped into three categories in planning the approach to conduct the IS Review: Information Services, Applications and Technology. This section of the report provides a summary of the information that was presented in the Current Environment Report.

2.1 Information Services Review

The following table outlines each sub-section below with the assessment tasks APS requested be analyzed as part of the scope of work for this project.

Information Services Review Areas		
Section No.	**Section Title**	**APS RFP Section/Task No.**
2.2.1	Concept Plan for Infrastructure Replacement - Implementation	2.1
2.2.2	Outsourced Services	2.7
2.2.3	Best Management Practices	2.8
2.2.4	IS Staffing and Organization	2.9
2.2.5	IS Communication Methods	2.11

Table 02: Information Services Review Areas

2.1.1. Concept Plan for Infrastructure Replacement – Implementation

APS is currently undertaking a large-scale infrastructure replacement project. The project is described in a Concept Plan developed by multiple stakeholders at APS which contains 20 sub-projects divided into three phases. The project originated from the need to replace numerous outdated technologies and it was soon realized that due to many interdependencies in the technology environment, other additional technologies would also need to be replaced or upgraded. Many of the projects now contained in the Concept Plan are critical in allowing IS to continue to advance technologically and provide services to APS based on recent technological advances. As a result, IS recognizes the need to expedite many of the projects in the plan and upgrade the aging platform as soon as possible. This issue has created an approach for replacing the platform where overall project management best practices including detailed planning and scheduling cannot be fully leveraged or utilized. It was acknowledged by many IS staff they are operating essentially in an “emergency mode” to complete the implementation of the new platform and that detailed project planning could have been improved.

Concept Plan: Implementation - Findings and Issues	
No.	**Finding or Issue**
M7	**The implementation of the new "platform" at APS is not adequately planned for and does not leverage best practices of project management.** The IS Department has developed a "Concept Plan" for the platform and is currently moving forward with the project. To implement needed improvements quickly, the IS Department has put this project on a fast track. A formal implementation project plan that includes key considerations such as the project timeline, project team, necessary business process changes, a training plan, and a communication plan does not exist. Technology implications such as how applications will operate on the updated platform have not been fully explored and tested. User input has also not been widely gathered to ensure that new platform meets their needs and that the implementation has "buy-in" from users.

Table 03: Concept Plan: Implementation – Findings and Issues

2.1.2. Outsourced Services

APS has historically not relied on a large amount of outsourced services. The majority of regular business functions of the IS Department have been managed in-house. One exception is the outside hosting of the STARS Enterprise Resource Planning (ERP) system used at APS provided by Oracle. Additional outsourced services have been leveraged in the past where it has presented a beneficial opportunity to utilize a subject matter expert, alleviate strain on internal resources, or to streamline a particular project, for example.

As APS plans for the coming years and its goals with implementing new technologies, additional outsourced services are planned to be used, specifically related to the implementation of the Concept Plan to replace the platform. The opportunity to utilize subject matter experts beyond APS will be leveraged. It was also reported that in some cases, short-term contracted resources will be used to fill vacancies created by departing staff. Using external resources for parts of the platform replacement project will assist in improving the ability to upgrade a wide array of systems in an aggressive timeline without placing additional strain on internal IS resources.

No findings or issues were identified related to outsourced services.

2.1.3. Best Management Practices

A majority of the APS management staff have completed the foundational level of the Information Technology Information Library (ITIL) training. ITIL is a widely accepted approach to IT service management. APS' desire to have the IS staff trained in the ITIL concepts demonstrates a commitment to maintaining and improving the service delivery of IT services at APS. However, it was reported that training and professional development opportunities have been reduced during the previous year due to training budgets being cut district wide.

The IS Department has made advances in the past two to three years to align with IT management best practices, including alignment with ITIL concepts. However, several IS staff reported, and BDMP observed that additional improvements can be made. For example, a documented change management policy that tracks changes to systems and user requests for modifications does not exist. In addition, a comprehensive disaster recovery plan that encompasses all APS systems and not

just individual systems does not exist. It was also reported by IS staff that not all general IT policies and procedures such as backup procedures and change management policies are documented.

Several IS Department re-organizations over the past three to four years under previous administrations have impacted the IS Department's ability to effectively plan for new systems and technologies and have forced them to operate in what IS staff have referred to as "emergency mode." This situation has meant that best management practices related to project management, project selection, and project prioritization have not been adhered to strictly. In the current environment in the IS Department an appropriate set of information technology project management tools or an agreed-upon methodology to track the status of IT projects does not exist. To increase the likelihood of project success, it is important that projects are tracked and reported on to measure progress against key project milestones or metrics. Failure to track, plan, and report on projects increases the likelihood that projects will not achieve desired results and will ultimately lead to failed projects. A standard set of Project Management tools to track projects, assist in planning for resource needs, and facilitate the overall prioritization process is not documented in the current environment. Many organizations struggle with tracking projects which often leads to initiating more projects than can be supported. With a standard set of project management tools for project tracking, resource planning, and reporting, IS will be able to better plan and manage projects.

In addition to tracking and prioritizing projects, it is critical that the project reporting processes monitor the appropriate metrics. The IS Department does not have a formal documented methodology for reporting project status. At a minimum, reporting should be done on project scope, schedule, and budget (known as the triple constraints) along with staffing on larger projects. The inability to effectively track projects makes reporting against these metrics increasingly difficult. The inability to monitor key project metrics and report on the overall "health" of a project increases the likelihood that there will be cost, scope, or schedule variances that will adversely impact the project.

IS currently has numerous IT projects in progress, including the implementation of the Concept Plan to replace the platform. The IS Department is responsible for managing, overseeing, and ensuring success of all IT projects. In the current environment, a system for selecting and prioritizing projects is not documented. It will be important for the IS Department to mitigate situations where departments will begin an IT project without the involvement of IS and subsequently request assistance as the project progresses. This process can place a great deal of strain on existing IS resources and make project planning and prioritization difficult. In addition, a methodology for selecting and prioritizing projects is not documented. The lack of a project prioritization process can force the IS Department to operate in a reactive mode, responding to project issues and addressing immediate needs as opposed to strategically planning, selecting, and prioritizing projects.

In many organizations today, a Project Management Office (PMO) has been established to manage all projects across the organization and/or for a specific department. A PMO provides a consistent project management framework, methodology and tools to be used to manage projects. It's important that overall project management needs be fully assessed prior to implementing a PMO for APS. Establishing a PMO is a significant commitment that requires careful planning to help ensure it provides benefits and serves the needs of APS.

Best Management Practices - Findings and Issues	
No.	**Finding or Issue**
M2	**The Career Ladder and related job descriptions within the IS Department are not adequately documented, current or consistent with the current marketplace.** The job descriptions that are documented at APS are approaching as much as ten years old. The lack of current job descriptions has resulted in confusion of responsibility, and thus accountability. Corresponding pay scales to job descriptions have not been updated and some individuals are being paid less, or in some cases more, than what the position would typically pay today.
M6	**Professional development opportunities for IS staff have been impacted due to budget constraints.** For example, in the past some mid-level management in the IS Department received training in ITIL best practices. However, the training budgets at APS were significantly reduced last fiscal year which has decreased the availability of training opportunities for IS staff.
M12	**The IS Department does not have established and well documented change management procedures.** Change management procedures are lacking for application upgrades, application configuration, system implementation or other technology changes. As a result, users are not aware of all changes and their benefits. In addition, IS staff are often not aware of the changes in order for them to effectively support the systems they impact and train users of new functionality.
M14	**The process for selecting new technologies to implement is not documented.** Many IS Department staff reported challenges in implementing and supporting technologies because they were not involved in the selection process for these technologies. In addition, the "true-cost" is often not analyzed to understand the resource levels that will be needed to support various technologies.
M15	**A comprehensive disaster recovery/business continuity plan that describes how all information systems will be restored does not exist.** APS does not have a business continuity and disaster recovery plan to ensure it will still be able to serve its users following a catastrophic incident.
M16	**A documented process for identifying, prioritizing, and managing IT projects does not exist.** A process or system and related set of policies and procedures for selecting, managing, prioritizing, collaborating and implementing IT projects does not exist which can make project management and support difficult.
M17	**General IT Management Policies and Procedures are not fully documented.** It was reported that not all general IT policies and procedures are fully documented. Examples include back-up procedures, change management, updated support call handling and acceptable use polices.

Table 04: Best Management Practices – Findings and Issues

2.1.4. IS Staffing and Organization

APS has an IS Department that is divided into three divisions with multiple groups in each division. Currently, the IS Department has 63 staff. All of the groups fall under the direction of the Assistant Superintendent. Descriptions of the three divisions are provided below.

Planning and Evaluation

The Planning and Evaluation Division is comprised of 10 staff and is responsible for administering, supervising, and/or coordinating the testing program, accreditation process, attendance reporting, evaluations and developing and providing data for numerous state and local reports. Information is collected, analyzed and disseminated to the public, APS staff, and the Virginia Department of Education. Planning and Evaluation relies heavily on the data stored in eSchoolPLUS, APSNet, and other MS Access databases for their reporting needs. Planning and Evaluation reported that they are often challenged to collect data across various systems for reporting purposes and that data stored across multiple systems creates challenges in validating data. It was also reported that a system for tracking report requests that come into Planning and Evaluation would assist with prioritizing requests and in some cases identifying duplicate requests does not exist.

Technology Services

The Technology Services Division is the largest within the IS Department and contains several different groups. The group that is most similar to a “help-desk” is the Service Support Center (SSC). The SSC staff is tasked with taking support calls, triage, and dispatching tickets to other groups. The SSC staff is also responsible for communicating with the end-users and making sure assigned support calls are completed. There is an expectation that the SSC staff will collect and document information from the customer and enter this information into the HEAT ticket tracking system and even resolve some issues before dispatching the problem to another department. There are currently three resources in the SSC.

The User Support Group (USG) is charged with creating technology training materials and hosting training classes for APS employees. The USG employees are often contacted to work in a desktop support role and provide onsite workstation support. Other duties include testing new applications and helping collect data from disparate information silos. USG tracks tickets with an in-house developed application and does not use the HEAT tracking system. USG staff enter tickets for Enterprise Solutions and the Network Infrastructure Services groups to resolve into the HEAT system on behalf of end-users.

The Network Infrastructure Services (NIS) group is divided into three areas. The first is the Infrastructure group which is the group that performs the technology engineering functions for APS. The group is made up of Network Analysts that perform the duties of Systems and Network Administrators. Although staff within the Infrastructure group are the Administrators and Engineers for APS, at times they are called upon to assist with routine desktop support issues.

The second group within NIS is known as the Integration group. This group is made up of Network Analysts that perform PC hardware and software support services including creating workstation operating system images, application deployments and support of both operating system and applications. This group takes calls directly from end-users, gets support tickets from the SSC, and works alone or in conjunction with other groups to address end-user issues. This group works from

their desk and also travels to administrative offices and school locations to perform support tasks. Integration is also called upon to support other aspects of technology services.

The third group within NIS is the Telecom group. This group is in charge of maintaining and supporting the school's Mitel phone systems and setting up Blackberry smart phones and managing Blackberry contracts.

The Engineering and Technical Services group within Technology Services contains three groups: Video, Mail and Hardware. The Video group supports CCTV technology, cameras and televisions for distance learning and audio-visual equipment in classrooms. The Mail group is responsible for all postal and internal mail services. The Hardware group is made up of technicians that have assigned responsibility for all of the schools within the APS system. The technicians are primary points of contact for school employees and provide onsite support for the schools. Hardware technicians receive calls directly from the HEAT system, directly from end-users and often when traveling to and from other support tasks. Multiple individuals within the Hardware group have knowledge in the support of Macs; however, multiple official Macintosh support roles are not defined. The Hardware group is also involved in setup and delivery of new equipment and imaging and installation of software.

Enterprise Solutions

The Enterprise Solutions Group is responsible for the planning, design, integration, and support of Arlington Public Schools' data and business systems. This unit has responsibility for ensuring that the APS staff and community have access to accurate data in order to support Instructional and business decisions. Their work involves supporting school systems and working with county government, software vendors and consultants. The two largest systems maintained by the Enterprise Solutions group are the Enterprise Resource Planning (ERP) system, Oracle's E-Business Suite (commonly referred to as STARS); and the Student Information System (SIS), which is currently SunGard's eSchoolPLUS.

Currently, the Enterprise Solutions office is supported by a staff of six analysts, two database administrators, and three developers in addition to a Director and Project Manager. Some analysts reside within the functional offices they support, including HR and Finance. Over 40 registrars (one at each APS location) input data into the SIS and are responsible for updating student records. Many of these personnel were with APS prior to the migration to web-based enterprise systems and have developed their current skills on the job.

In addition to the three divisions under IS, a small number of individuals have specialized roles within IS. These include the Technology Architect and the Special Projects Coordinator. Both of these positions report directly to the Assistant Superintendent. The Technology Architect is responsible for providing the guidance and management level support for APS network. The Special Projects Coordinator is primarily responsible for managing projects that span the entire IS Department as well as acting as a liaison between other APS departments and the IS Department for enterprise-wide projects.

IS Staffing and Organization - Findings and Issues	
No.	**Finding or Issue**
M1	**The current IS organizational structure is not optimized to assist APS in meeting the overall needs of the organization.** Several IS and APS staff reported challenges associated with the current organizational structure in the IS Department. Prior to the current IS Assistant Superintendent joining APS, multiple reorganizations occurred in the prior five to six years resulting in some individuals receiving promotions and others demotions in that time period. The current structure is creating challenges in how IS works to assist in meeting the needs of APS.
M2	**The Career Ladder and related job descriptions within the IS Department are not adequately documented, current or consistent with the current marketplace.** The job descriptions that are documented at APS are approaching as much as ten years old. The lack of current job descriptions has resulted in confusion of responsibility, and thus accountability. Corresponding pay scales to job descriptions have not been updated and some individuals are being paid less, or in some cases more, than what the position would typically pay today.
M3	**Consistent Service Level Agreements that cover all services offered by IS are not in place at APS.** It was reported that a Service Level Agreement (SLA) was implemented at one point at APS but it is currently not followed by all departments or groups within IS. As a result, documented standards for the level of service users should expect do not exist. This has lead to ambiguity in how to resolve issues as well as who is responsible and accountable for supporting particular groups of users.
M5	**A single system and related policies and procedures for tracking and managing support requests for all areas of Information Services does not exist.** The Service Support Center uses the technology tool *HEAT* (FrontRange Solutions) while the Enterprise Support Group uses *Bugzilla* to track support requests. An additional tracking mechanism is the Access database used by User Support Group (or TSS) to track training activities. While the nature of the requests largely dictates which system is used and ultimately which APS resources address the issues, overlap exists which has lead to confusion and lack of accountability in the resolution as well as the assigned priority of some support requests. In addition, the benefit of sharing resolution strategies among the organization is not realized.
M9	**IS Department resources are being used to support regular business functions involving particular applications.** It was reported that members of IS are responsible for performing particular business functions, such as semi-monthly payroll processing, quarterly processing and reporting and generation of assignment notices and teacher contracts. This impacts the ability of the IS staff to perform their other responsibilities and also creates silos of knowledge within APS.

IS Staffing and Organization - Findings and Issues	
No.	**Finding or Issue**
M10	**Procedures for support beyond standard business hours are not established.** Support for APS users is generally available from 7:00 AM to 5:00 PM on weekdays. Due to the multiple groups of IS Department resources providing support, the hours vary depending on the type of support requested. Some support procedures are not consistently followed and/or are not adequately documented.
M11	**The roles and responsibilities of Instructional Technology Coordinators (ITCs) vary from school to school.** This issue has lead to some ITCs being used at locations for roles not related to supporting technology education. The original intention of these resources was to improve the effectiveness of technology in aiding instruction.
M13	**It appears that some groups within IS such as the Network group do not have an appropriate number of resources in comparison to their expected workload.** Published best practice staffing levels are not in place in some divisions of the IS Department. One such group is the functional area that is performing typical network administration work as it appears to have fewer staff than an organization similar in size to APS may have. Other groups in IS appear to have more staff than a similarly sized organization typically may have. In addition, the responsibilities for a particular role are not necessarily represented by that role's title.
T5	**Users reported a perception that the IS Department has limited individuals with the ability to support Macintosh computers.** Currently, there are approximately 250 Macintosh computers throughout APS and a large number of Apple iPads are being deployed at APS. While individuals within the IS Department have expertise related to Mac support, users reported that they are not aware of dedicated resources. A documented support policy for Macs or iOS devices does not exist.
T9	**A process to manage requests for information from the Planning and Evaluation Division does not exist.** Requests for report information from the Planning and Evaluation Division do not follow a documented process. Staff from this division will often work independently to fulfill requests which may result in duplicate efforts.

Table 05: IS Staffing and Organization – Findings and Issues

2.1.5. IS Communication Methods

The IS Department currently utilizes a combination of communication methods to facilitate the distribution of information within the IS Department. Communication methods include meetings, email communications, information shared on an internal intranet site, as well as the use of internal web portal sites (dashboards). Regular meetings within the IS Department include a bi-weekly meeting with the IS leadership group (department directors) and another meeting every other week where staff involved with IS projects are invited. Topics at these meetings include discussions related to the status of current projects, upcoming activities and outstanding support issues. A newsletter known as

the “Friday Letter” is distributed weekly to the school board. This newsletter is not published by IS, but IS does contribute updates on certain IS initiatives and projects that have a large impact on the organization. It was reported that readership of the newsletter is sometimes low. Two other newsletters are utilized within APS. One is called “NewsCheck” and goes to all staff every other week and the second is “LeaderNews” which is sent weekly to APS Leadership.

It was reported by several IS and APS staff that challenges exist in communicating information related to new or modified application functionality to end-users both within the IS Department and users external to IS. For example, the Service Support Center routinely provides communications to the schools for dissemination to the Instructional Technology Coordinators (ITCs). However, it was reported that often these communications do not always reach the ITCs. Despite the varied communication methods used within IS, it was reported that information is at times not communicated in a timely manner which has lead to end-users being unfamiliar with new or modified application functionality. In addition, it was reported that there have been times when new applications were deployed at the schools and IS staff responsible for training on the new application had limited time to prepare for the training.

Due to several factors in the IS Department (multiple reorganizations during previous administrations, an aging and in some cases outdated infrastructure) the need to expedite projects and initiatives exists. In some cases, such as the platform replacement project, IS has determined that it is in the best interest of the organization to involve external resources to conduct some of the planning and design work for the implementation of parts of the platform project. This situation has created the perception with some IS staff that information related to the platform project is not being communicated effectively and that IS staff are not being involved in the design process. The reality is that much of the design and planning work is being performed by resources outside of IS. An internal platform site has been established by IS leadership to report on and monitor the status of the projects related to the platform.

Despite the recurring management and project team meetings, several non-management IS staff expressed an interest in holding regularly scheduled meetings to share information and improve communication and collaboration between divisions within IS. Some IS staff reported that similar meetings had been scheduled in the past, however, it was reported that the meetings lacked the appropriate focus to be productive and meet the overall objective of the meetings. This led to frustration among IS staff and attendance suffered and the meetings were eventually cancelled.

As a result of the fact-finding meetings with IS and APS staff as well as the review of the SWOT responses completed by project participants, three findings and issues were identified that directly relate to the IS Communication Methods at APS. While there are other findings described in this report that impact the communication channels (M1 Current Organizational Structure, M14 Selecting New Technology, and M16 Prioritizing and Managing IT Projects), the findings summarized in the table below could be categorized as having the greatest impact on the communication challenges reported by IS and APS staff. Recommendations to address the findings will be presented as part of the Recommendations Report.

IS Communication Methods - Findings and Issues	
No.	**Finding or Issue**
A8	**Updates of APS applications resulting in new or modified functionality are not adequately communicated to users.** As IS upgrades or modifies the configuration of applications used at APS, the implications to end-users are not always communicated. The result is that users are faced with unfamiliar interfaces that reduce productivity and users do not fully leverage new or updated functionality.
M4	**It was reported by many IS staff that the current communication methods within the IS Department could be improved to ensure that all appropriate staff are aware of current and planned projects.** It was reported by many individuals that there is a need for an improved communication mechanism so that planned IT projects and new systems being deployed are communicated to appropriate staff. While management does meet on a bi-weekly basis, non-management staff reported times when communication is not always "pushed down."
T11	**Technology training for technology users at APS is sometimes limited due to instances of a lack of communication within IS.** A training group exists within IS, consisting of seven resources tasked with training activities for all employees. There are times when the training group is not engaged in the implementation of new technologies throughout APS which presents challenges in ensuring users are adequately trained to use systems in place. Ongoing "refresher" training efforts are sometimes shared with the Instructional Technology Coordinators (ITCs) in the schools. It was reported that the ITCs are not always involved in the implementation of new technologies in order to satisfy end-users' requests for training.

Table 06: IS Communication Methods – Findings and Issues

2.2 Applications Review

The following tables outlines each sub-section below with the assessment tasks APS requested analyzed as part of the scope of work for this project.

Applications Review Areas		
Section No.	**Section Title**	**APS RFP Section/Task No.**
2.2.1	Student Information System	2.2
2.2.2	Oracle E-Business Suite	2.3
2.2.3	Application Support Staffing and Organization	2.9

Table 07: Applications Review Areas

2.2.1. Student Information System

In 2006, APS selected eSchoolPLUS (ES+) as its student information system (SIS). ES+ was developed by SunGard Pentamation and is a web-based system that is designed to manage student and program information and utilizes an integrated reporting system. The SIS is APS's first step in consolidating its student data and creating a system of record from which it will be managing a comprehensive database. ES+ is capable of combining data sets, including attendance tracking, student and staff scheduling, grade book, report cards, student discipline, progress notes, school transcripts, student achievement data, verified credits, and graduation information. APS seeks this consolidation to improve data access and navigation for its users.

In 2010, APS purchased Cognos Reporting to supplement eSchoolPLUS. APS also has the need to interface with other student databases. These include: The State of Virginia's EIMS, IEP Online, APSnet (an APS web-based, in-house developed student tracking system), and programmatic databases in various parts of the school division. It was reported that some functionality in eS+ is replicated in APSnet in order to provide an improved user interface.

The following table contains the technical specifications of the version of eSchoolPLUS in place.

eSchoolPLUS Technical Specifications	
Version of Software	V2.3
Server Hardware	VMWare Cluser – 3 servers Dell PowerEdge R900 hosting Production and Development environments
Server Database	SQL Server 2000
Server Operating System	Windows Server 2003

Table 08: eSchoolPLUS Technical Specifications

Most of the challenges APS has with the SIS are related to data management and reporting. It was reported by several APS staff that critical functionality needed for storing and reporting on data in ES+ is not available. Therefore, it was reported that continued use of APSnet by some users is needed because ES+ does not provide necessary functionality. Users of ES+ reported many instances of manual workarounds and the use of MS Excel and Access to develop necessary reports. In many cases, the information desired cannot be obtained from the system in an efficient manner, and sometimes not at all. Since data is stored in several locations, producing reports from ES+ is time consuming and often times requires users to validate reports and data against other databases to ensure data accuracy. APS has requested numerous system enhancements from SunGard to improve end-user functionality. It was reported that many of these requests require custom software development from SunGard along with additional costs, rather than being provided in standard system upgrades as part of annual software maintenance charges.

In addition, some APS users reported that other systems exist that could provide benefit to the organization by being integrated with ES+. These systems include IEPonline-Special Education and 504 plan. It was also reported that in some cases additional data fields in ES+ or a separate system to track work being by done by staff such as psychologists, social workers, and counselors who work directly with students would be beneficial.

Users reported challenges related to the limitations of EasyGradePro, which is a student grade book system. The IS Department is currently in the process of implementing the grade book functionality

within ES+ which will allow remote access and enhanced functionality. Successful implementation and proper training for end-users should help address many reported needs associated with grade book information system capabilities.

Student Information System - Findings and Issues	
No.	**Finding or Issue**
A3	**APSnet is used to store critical data due to limited functionality in eSchoolPLUS.** It was reported that eSchoolPLUS does not accommodate storing certain critical data and as a result APSnet is being used to do so. This results in similar, or the same data residing in different systems and increases the time required for report generation.
A4	**APSnet and eSchoolPLUS are not integrated in a manner that supports efficient sharing of data.** It was reported that the lack of effective integration between APSnet and eSchoolPLUS creates redundant data entry and inefficiencies in sharing data between the two applications.
A5	**The current eSchoolPLUS configuration does not allow the system to easily produce all State reports.** It was reported that APS cannot easily generate State reports from eSchoolPLUS that are required by the State of Virginia. This leads to additional manual processes and lost productivity. In addition, this information is stored in another system separate from eSchoolPLUS.
A6	**Data quality and data standards are a concern for application users at APS.** It was reported by users of the SIS, Enterprise Resource Planning system (ERP - STARS) and other applications that an effort was made to assign “data ownership” for specific functional areas, but that this has not succeeded. In addition, data pockets exist beyond the applications in place in APS, and prescribed data audit procedures are not widely used. The lack of confidence in current data quality impacts APS employees’ willingness to use Enterprise Applications and encourages siloed data repositories.
A7	**Some applications in use in APS do not accommodate complete remote access functionality.** The IS Department supports remote access to the APS network; however, some applications or components of applications are not accessible remotely. An example most referenced by users is EasyGradePro. Currently, the IS Department is considering replacing EasyGradePro with grade book functionality within eSchoolPLUS which will provide remote access functionality.
A9	**Report generation from eSchoolPLUS and other APS applications require significant manual configuration, data manipulation, and data clean-up.** Reports are generated from multiple applications in use at APS for multiple purposes including assessment and planning and evaluation. With most applications, particularly with eSchoolPLUS, the reports that are generated are not complete and require a significant amount of time of IS Department resources for data manipulation and clean-up.

Student Information System - Findings and Issues	
No.	**Finding or Issue**
A12	**A lack of integration of APS applications necessitates the use of manual workarounds.** Paper-based processes as well as the use of disparate MS Excel spreadsheets and MS Access databases are common in APS when data needs to be analyzed and reported among applications. The use of these tools occupies a large amount of time from IS and APS resources.
A13	**The configuration of eSchoolPLUS is not optimized for the business needs of APS.** It was reported that multiple instances of the system being incorrectly or incompletely configured result in many inefficiencies and manual processes. For example, areas where "drop-down" menus do not contain relevant data necessitate manual entry and may create data errors.

Table 09: Student Information System – Findings and Issues

2.2.2. Enterprise Resource Planning System

In November 2005, APS selected a consulting firm to implement a district-wide ERP System based on Oracle applications software and related technologies. This multi-year engagement encompassed financial, procurement, materials management, payroll and human resource functions and sought to implement a comprehensive range of modern web-based capabilities as the foundation of the district's administrative processes. Oracle was also in use in the County at the time that APS considered it and a separate procurement process was used at the schools. It was considered at that time that the hosting option offered by Oracle was attractive, and using a similar system as the County may present opportunities of more efficient exchanges of data, ideas and best practices. APS has invested significant effort to configure this system to meet the needs of Finance and Personnel. According to APS, the Strategic Transformation of Administrative Resource Systems (STARS), the name of the system and project to implement the Oracle software, represents a major departure from the mainframe based systems used by APS staff for many years. The STARS initiative remains a multiyear effort to migrate all current IBM mainframe-based financial and personnel systems to Oracle Corporation's Enterprise software.

The following table contains the technical specifications of the version of STARS in place at APS.

STARS Technical Specifications	
Version of Software	11.5.10.2
Server Hardware	Linux Servers (Hosted by Oracle On Demand) host five instances: dacpsi, dacp1i, tacpsi, tacp1i, and pacpsi
Middleware	Oracle Application Server 1.0.2.2.2
Server Database	Oracle 10.2 (10g)
Server Operating System	Linux 2.6.9 Middleware – x86 – 15 servers – Version 2.6.9 Database Server – x86-64 – 3 servers – Version 2.6.9 Enterprise Linux AS4 – 1 server – Version 2.6.9

Table 10: STARS Technical Specifications

The Findings and Issues that were identified related to the ERP system largely are based on aspects of the system configuration, how data is managed in and outside of the system, and the need for manual processes utilizing spreadsheets or other stand-alone databases. Issues related to configuration of STARS include the desire to use workflow functionality more effectively and the ineffectiveness of the Grants module, necessitating the use of MS Excel for APS business processes. It was reported that the system has some ability to support both, but the functionality available and current configuration of the system do not satisfy the needs of APS users.

Several Findings and Issues are based on the challenge of software fit and functionality which is closely related to the use of outside systems and processes. For example, MS Access is used during the budgeting process. Grants are currently tracked at a summary level within the general leader of STARS and in detail using MS Excel spreadsheets. Several APS staff in several meetings expressed concern about whether the capabilities and functionality provided by the Oracle software is the right fit for APS.

Six Findings and Issues were identified related to the Enterprise Resource Planning System. They are contained in the following table.

Enterprise Resource Planning System - Findings and Issues	
No.	**Finding or Issue**
A1	**There is a desire at APS for greater use of workflow functionality within the ERP system (STARS).** It was reported that the STARS application supports workflow functionality, such as routing approvals for purchases which is currently being used by the Finance Department for purchasing business processes. However, Finance reported a desire to configure workflow approvals based on categories of purchases and other business processes within APS could benefit from implementing workflow functionality.
A2	**The manner in which the STARS Budgeting module is being used by APS has made Position Control problematic.** It was reported that APS staff are exporting budgeting information from STARS into an MS Access database to calculate and run reports. Since some of the budgeting analysis is taking place in MS Access the ability to leverage the payroll and human resources information for position control is difficult.
A6	**Data quality and data standards are a concern for application users at APS.** It was reported by users of the SIS, Enterprise Resource Planning system (ERP - STARS) and other applications that an effort was made to assign “data ownership” for specific functional areas, but that this has not succeeded. In addition, data pockets exist beyond the applications in place in APS, and prescribed data audit practices are not widely used. The lack of confidence in current data quality impacts APS employees’ willingness to use Enterprise Applications and encourages siloed data repositories.
A10	**There is not a clear responsibility for who owns the management of project costing in the STARS ERP system.** Based on interviews with both Personnel and Finance Departments, it is not clear how APS currently tracks labor costs and cost allocations in the STARS system. It was reported that documented policies and procedures do not exist.

Enterprise Resource Planning System - Findings and Issues	
No.	**Finding or Issue**
A11	**Grants and Projects are manually tracked in an Excel spreadsheet.** It was reported that APS implemented Oracle's Grants/Project module, but the functionality available is not being utilized by APS staff. Currently, grants are managed by downloading data from the General Ledger and importing to an Excel spreadsheet. This results in disparate data repositories.
A14	**APS is currently using a third-party vendor for Applicant Tracking (Winocular).** The STARS application does have an applicant tracking product (Oracle - iRecruitment) but APS has not implemented this functionality based on a decision by the Personnel Department. Currently, the Winocular application does not interface with STARS.
A15	**Challenges exist with tracking and reporting teacher certification and professional development information.** It was reported by APS users that certification data is maintained within STARS and professional development data in the ERO system. This presents challenges with reporting these two areas of information together, which currently relies on manual processes utilizing MS Excel. In addition, some certification information is used in eS+, but information is not easily transferred due to a lack of integration of applications.

Table 11: Enterprise Resource Planning System – Findings and Issues

2.2.3. Application Support Staffing and Organization

Support of the SIS and ERP system at APS is addressed by dedicated resources that are part of the Enterprise Solutions (ES) group within the IS Department. The current organizational structure contains eleven resources for the support of the SIS and ERP system. Of these eleven, six have the title "analyst," two "database administrators," and three "developers." Three of the six analyst positions are focused on the ERP system and are currently or will soon be vacant.

Support resources in the Enterprise Solutions group have a high level of technical expertise and also perform other functions in addition to their focus on the SIS and ERP system. A small number of individuals within ES have a detailed knowledge of the business functions of some departments and so are often involved in these regular job functions. It was reported that this is the result of many department resources not having a high level of knowledge of key systems used in these departments.

Support requests related to the SIS and ERP system typically originate in the Service Support Center. When the call is received it is attempted to be triaged by SSC and is then routed to Enterprise Solutions. Bugzilla is the tracking application used to manage support requests related to the SIS and ERP system.

The Findings and Issues that were identified related to the support of applications in use at APS were similar to those Findings and Issues related to the IS Organization Structure and Staffing (sub-section 2.4). Due to the current organizational structure in the IS Department, there is sometimes confusion in which resources are responsible for support of specific applications. Similarly, as some resources are highly specialized, efforts to triage support requests in the "first-line" support groups are not made, and instead the support calls are quickly escalated to specialized resources.

Application Support Staffing and Organization - Findings and Issues	
No.	**Finding or Issue**
M1	**The current IS organizational structure is not optimized to assist APS in meeting the overall needs of the organization.** Several IS and APS staff reported challenges associated with the current organizational structure in the IS Department. Prior to the current IS Assistant Superintendent joining APS, multiple reorganizations occurred in the prior five to six years resulting in some individuals receiving promotions and others demotions in that time period. The current structure is creating challenges in how IS works to assist in meeting the needs of APS.
M9	**IS Department resources are being used to support regular business functions involving particular applications.** It was reported that members of IS are responsible for performing particular business functions, such as semi-monthly payroll processing, quarterly processing, and reporting and generation of assignment notices and teacher contracts. This impacts the ability of the IS staff to perform their other responsibilities and also creates silos of knowledge within APS.

Table 12: Application Support Staffing and Organization – Findings and Issues

2.3 Technology Assessment

The following table outlines each sub-section below with the assessment tasks APS requested be analyzed as part of the scope of work for this project.

Technology Assessment Areas		
Section No.	**Section Title**	**APS RFP Section/Task No.**
4.1	Concept Plan for Infrastructure Replacement - Technical	2.1
4.2	Technology Tools	2.4
4.3	Technology Concepts	2.5

Table 13: Technology Assessment Areas

2.3.1. Concept Plan for Infrastructure Replacement – Technical

It was reported that the Concept Plan for Infrastructure Replacement proposes a design based on simplicity, mobility and collaboration. Aspects of the plan related to the project management of its implementation are described previously in sub-section 2.1 of this Current Environment Report. Aspects of the technical components of the plan are described in this sub-section. The Concept Plan consists of three phases with 20 linked sub-projects. The projects related to each phase of the concept plan are summarized in the table on the following page.

Concept Plan Phases and Sub-Projects	
No.	**Sub-Project**
Phase 1	
1	eMail Archiving
2	Critical Infrastructure Upgrade
3	Unique Identity System
4	Active Directory
5	Automated Account Provisioning
6	Unified Network Services Gateway
7	Wireless Capacity and Technology Expansion
8	Workstation Deployment and Management
Phase 2	
1	Local Storage and Backup
2	Legacy and Exceptional Applications
3	Cloud Productivity
4	eMail Platform Change
5	Network Intrusion Detection
Phase 3	
1	Windows 7 – Admin
2	Windows 7 – Instruction
3	Cloud Storage
4	PSX Support
5	iOS Support
6	Office 2010
7	Novell Infrastructure Retirement

Table 14: Concept Plan Phase and Sub-Projects

Currently, some sub-projects have already been initiated as part of Phase 1 of the Concept Plan. The goal of the Concept Plan is to upgrade the core system environment to better enable Information Services to be responsive to the changing technology needs of APS. Based on the current state of the core systems environment and the list of sub-projects developed to improve it, the technical perspective the Concept Plan represents an effective plan to greatly improve the core information systems environment. If implemented properly, APS will benefit from increased functionality and improved efficiency achieved through the use of more modern, reliable and capable technologies. The Concept Plan is very ambitious and includes rapid changes to the current computer infrastructure. If these changes are made in rapid succession without adequate testing, training and tuning the stability of the new system could be impacted.

Implementing new technologies will bring challenges that are not always recognized early on in an implementation. When implementing a large-scale systems environment upgrade, care must be given to understand how the new technologies will interact with each other and the user community. For example, the Concept Plan contemplates that external systems (outsourced) will need to be synchronized with APS' logical access methods and controls. This implies an on-going level of support both from the external system vendor and from APS.

Although it is suggested in the Concept Plan that new systems will require less specialized support, the model proposed will not guarantee a reduction in specialized support. Workstations, servers, databases and network devices will remain in need of specialized support. Core applications, such as the baseline applications proposed will still need to be supported and updated for the user community. Furthermore, virtual systems also require specialized support skills.

The applications proposed in the Concept Plan also have larger implications on the IS Department. The use of virtual desktop systems and web-applications have many positive aspects, among them cost savings and increased application security. Because web browsers are a focus of malware, caution should be used in selecting and developing browser-based applications. Use of cloud resources for applications and storage is often an area that requires detailed research due to the maturity level of this technology.

The Concept Plan addresses many of the modern technologies available that will help improve the core system environment at APS. In general, it represents a plan to replace older technologies and IS management techniques with more current and proven technologies. As the Plan is initiated, it is likely new technologies will continue to be introduced, tested and become viable alternatives; therefore, on-going changes or adjustments will likely be required as the Plan is executed.

Concept Plan for Infrastructure Replacement - Technical - Findings and Issues	
No.	**Finding or Issue**
T13	**The standard technology platform in use throughout APS is outdated.** The platform includes many aspects of technology including workstation configuration, network tools and hardware. Users throughout APS and IS Department staff reported that components of the platform are outdated and are largely impacting productivity as well as creating support challenges and security threats. For example, the instance of MS Office 2003 and Internet Explorer version 6 prohibit some documents and web-pages to be shared or opened among or by APS employees.

Table 15: Concept Plan for Infrastructure Replacement – Technical – Findings and Issues

2.3.2. Technology Tools

In our review of the current technology environment of the IS Department, it was important to understand the current technology tools in place as well as the upcoming changes that are being driven by the Concept Plan. This is especially important in light of the large-scale changes that are underway with the Concept Plan for infrastructure replacement. For example, weaknesses related to the email system in use at APS will be addressed as the new infrastructure is implemented. Of the ten findings and issues identified related to technology tools, five will largely be addressed by the completion of the Concept Plan project: findings T6, T10, T12, T13, T15, and T16. In addition, T1 will

be improved with the rollout of Postini email archiving, and T12 will also likely be improved with modern components in the new infrastructure.

The IS Department is currently leveraging many effective technology tools that greatly improve services to the end-users. These currently include the HEAT and Bugzilla support ticket tracking system and will soon include the KACE imaging system. Optimization of these tools depends on documenting policies and procedures to determine how they will be used within the organization. Findings and Issues that were identified that will not be addressed with the changes in the Concept Plan in some cases are a result of either a lack of documented policies and procedures, or a situation where the policies and procedures are not uniformly followed.

Many of the Findings and Issues identified relate to the network infrastructure in place at APS and how users are able to use it. The Concept Plan for infrastructure replacement will address findings and issues related to the outdated network design, wireless connectivity, remote access, network hardware and workstations. Each of these areas will be addressed in either Phase 1 or Phase 2 of the Concept Plan. Key sub-projects such as the Active Directory and the Unified Network Services Gateway will improve the way users access the network. Wireless connectivity will be improved through the implementation of 802.11n technology. Security will be improved through the implementation of Network Intrusion Detection and overall use of more modern technologies.

The finding related to the outdated email system will largely be addressed upon the successful implementation of the Concept Plan. The plan calls for replacing Novell GroupWise with Microsoft Exchange. This will greatly improve the reliability of APS' email system while also allowing features of modern email systems to be utilized. For example, email archiving will be much easier using a modern, more current email system.

Some Findings and Issues related to Technology Tools are not planned to be addressed by the Concept Plan. These include the lack of an enterprise-wide Document Management System and the lack of a Voice Over Internet Protocol (VoIP) phone system. These are examples of tools that are becoming more and more commonplace in education environments as they offer benefits that APS could leverage in the future.

The IS Review – Recommendations Report will provide recommendations on addressing the Findings and Issues related to Technology Tools.

Technology Tools - Findings and Issues	
No.	**Finding or Issue**
T1	**APS does not have a single enterprise-wide document/records management system.** APS users reported that a large amount of time is spent finding and tracking paper records. In addition, there are instances of large amounts of paper storage in various locations at APS.
T4	**User accounts are not appropriately configured to support the roles of particular individuals within the IS Department.** Although IS has made improvements in this area recently, it was reported that due to a lack of standard user configuration procedures and a lack of consistent job descriptions, the access privileges of various user accounts are not appropriately configured. In some cases, users do not have enough access to perform their job functions and in others some users have more privileges than a resource in their position should typically have. As

Technology Tools - Findings and Issues	
No.	**Finding or Issue**
	a result, some instances of sharing user logins have occurred. Without a consistent, documented policy for access levels security control is diminished.
T6	**The wireless network at APS has multiple areas where performance is inconsistent.** It was reported that wireless network performance throughout APS is not consistent. In certain buildings there are areas where the wireless signal is weak or non-existent. As some computer labs are being converted to "mobile labs," the demand for wireless capability will be increasing throughout APS.
T7	**IS maintains two separate networks throughout APS.** When the demand for network access grew in prior years, it was determined that separate networks would exist for administration and instruction to ensure that sensitive data would be protected within each network. With increases in security technology capabilities, maintaining separate networks is not required. Transitioning to a single network with appropriate controls will require an initial investment, but significant infrastructure support time and costs could be saved by utilizing a single network.
T8	**APS does not use Voice Over Internet Protocol (VoIP) technology for telecommunications.** Currently, APS uses a Mitel phone system and has made significant infrastructure upgrades towards supporting VoIP technology. A documented plan to upgrade the remaining infrastructure does not exist and a budget has not been secured to complete the transition. While costly to implement initially, VoIP phone systems offer significantly improved performance, additional functionality and can reduce support costs.
T10	**Remote access to some APS applications is cumbersome and not user–friendly.** APS users reported they are able to access APS applications remotely; however, the process to do so is cumbersome and the resulting network performance is sometimes too slow to perform desired tasks. Reported examples were primarily related to functionality within STARS, including the lack of availability of verification tables while working remotely.
T12	**While implementation of a new platform is underway, the current APS network has areas of potential security weaknesses.** The design of the network is not optimal and security tools are not in place to best mitigate potential threats. The IS Department currently employs McAfee anti-virus software. It was reported that McAfee is not meeting the needs of IS to adequately mitigate the risk of malware threats. There is currently a plan to implement enhanced anti-virus software or an intrusion detection system (IDS). While costly to mitigate, it was also reported that there is at least one instance of a single point of failure which is the 6513 switch. Another security weakness is the limited number of backup resources at APS with a high degree of knowledge of the network.
T15	**Critical network hardware in place in APS is outdated.** Outdated network hardware in place in APS includes an EMC CX400 storage area network (SAN) that is eight years old; a Novell 6.5 file server that is prohibiting the adoption of best of breed technologies; and additional file servers that are more than five years old.

Technology Tools - Findings and Issues	
No.	**Finding or Issue**
T16	**The APS email system is outdated.** The IS Department currently employs Novell GroupWise for approximately 5,000 mailboxes. One dedicated IS resource supports the email system. Some email archiving is currently performed using Google Postini.
T17	**End-users expressed dissatisfaction with either the functionality or the appearance of the APS website.** End-users reported the current APS website lacked both aesthetics and appropriate content management capabilities. The School and Community Relations group manages and updates the website and so the IS Department is not directly responsible for it. However, IS staff reported they often hear complaints about the website as users have the perception it is managed by IS.

Table 16: Technology Tools – Findings and Issues

2.3.3. Technology Concepts

APS currently employs many modern technology concepts including the hosting of applications, a centralized workstation imaging process, and professional development training from the Information Technology Infrastructure Library (ITIL). Realizing the benefits of modern technology concepts typically involves technology tools, resources, and managed processes. At APS, there are many instances where all three components are in place and the IS Department benefits from modern concepts. An example of this would be the effectiveness of hosting the Oracle ERP system. This process leverages appropriate modern technology, utilizes resources with the necessary expertise at APS, and employs modern business processes of managing the hosting vendor relationship.

In other situations at APS, the benefits of modern technology concepts cannot be fully realized because one of the three components is not adequate. One example is in the area of network security. A secure network requires certain technology tools as well as appropriate resources and processes for regular testing, management and ensuring documentation is current. While APS has historically maintained a secure network, due to a lack of documentation in some areas it cannot be ensured that the network security will quickly be restored in the event of a security event.

Another example is in the area of workstation imaging. APS utilizes a centralized imaging process as new workstations are put in place throughout the schools. The resources in IS that are involved in the process demonstrate the appropriate level of knowledge for workstation imaging, but due to a few shortcomings in the process to develop an appropriate image for the various locations throughout APS, the end-users are not always satisfied with the new workstations. On occasion, the image deployed at a particular location will not have a specific application in use at that school. When this occurs, it is typically because that school is the only one using the application and the IS Department was not aware that it should be added to the image. The result is that the workstation will need to be reimaged or software must be installed separately. It would be very difficult for IS to develop an image that encompasses all software applications that need to be installed to satisfy the needs of all school locations.

As a result of the fact-finding meetings with IS and APS staff as well as the review of the SWOT responses completed by project participants, two findings and issues were identified that directly relate to Technology Concepts in place at APS. The findings relate to the concepts currently in place

and the Recommendation Report will contain information related to additional modern technology concepts that APS could benefit from.

Technology Concepts - Findings and Issues	
No.	**Finding or Issue**
T2	**Best practices related to security and risk management are not fully implemented within the IS Department to protect APS.** Several best practices are not utilized within the IS Department to reduce security threats to APS. Some of these include the lack of role-based security and a dedicated resource within IS to focus on security. In addition, firewalls are logged, but not monitored and patch management tools (such as MS WSUS/Patchlink) are not utilized resulting in patches only being applied once per year. Patching of servers is done on an *ad hoc* basis.
T14	**The workstation management/application delivery system is overly complex and inefficient.** IS staff use a mix of applications, scripts and manual processes to image workstations. While the actual time to complete the imaging process is time consuming, the actual staff time needed to monitor the process is minimal. Many sites expect customizations or utilize numerous, site specific instructional tools which results in significant staff time preparing supporting workstations.

Table 17: Technology Concepts – Findings and Issues

3.0 Benchmarking and Best Practice Research

This section of the report contains the results of the benchmarking and best practice research conducted with APS' peer public schools. These results include descriptions of how the peer schools have addressed challenges similar to those APS currently faces.

Arlington Public Schools requested that benchmarking and best practice research be conducted as part of the Information Services Review Project. Specifically, APS was interested in collecting information related to three specific areas:

1. *What school systems in the nation are models for effectively using technology in its systems?*
2. *Are there services we should consider outsourcing or bringing back in house? Do we outsource more or less than industry standards?*
3. *Are our business strategies, service level objectives and work practices in line with industry standards and customer expectations?*

The research conducted as part of this project was not limited to the three issues above but included research questions designed to understand how peer school systems have addressed challenges similar to those faced by APS. In addition, BDMP made use of their knowledge of IT best practices though their work with similar education, public and private sector clients. The approach used for the research as well as the results are contained in the following sub-sections of this report.

The results of the research were incorporated into the recommendations (contained in Section 4.0).

3.1 Benchmarking Research Approach

A list of APS' peer schools was developed by BDMP and confirmed by the APS Project Team. The list was developed from schools identified by participants of the fact-finding meetings, those used previously by APS for research and from BDMP's knowledge of similar schools. In addition, BDMP contacted the vendors of the ERP and Student Information systems to request a contact at a similar school using each system.

BDMP developed research outlines that were reviewed with the APS Project Manager. A general outline was developed as well as specific outlines for the schools chosen due to their use of a SunGard Student Information System or Oracle ERP System. The outlines are included in Appendix C.

BDMP initially contacted the benchmarking schools, sent the interview outlines and conducted follow-up teleconferences to review the completed outlines. Two of the schools contacted completed the outline; however other organizations preferred to provide verbal responses as opposed to providing a written response. Additional details related to ERP and SIS systems in use by other school districts and local governments in Virginia can be found in Appendix D.

Responses to the benchmarking research are contained below.

I. School District Metrics

1. How many students are in your school district?
   Cambridge: Approximately 6,000
   Virginia Beach: Approximately 69,000
2. How many school locations are in your school district?
   Cambridge: 13
   Virginia Beach: 85 schools and centers

II. IT Organizational Structure and Staffing

1. How many computer workstations (laptops and desktops) are supported?
   Cambridge: 3,300
   Virginia Beach: Approximately 50,000
2. How many staff are in the Information Services/Information Technology Department?
   Cambridge: 12
   Virginia Beach: 74
3. What is the internal structure of the IS/IT Department?
   Cambridge: CTO, Project Manager, Senior Database Administrator, Systems Administrator, Web Administrator, Data Administrator, Help-Desk and 5 Computer Technicians
   Virginia Beach: CIO, Security Specialist, Administrative/Intranet Coordinators, Administrative Assistance, Instructional Technology, Information Services Project Manager, Database Administrator, Telecommunications, Systems Engineer, Customer Support, and Help Desk.
4. Please describe the communication mechanisms in place internal to the IS/IT Department.
   Cambridge: Email and Weekly Meetings
   Virginia Beach: We use Sharepoint, and reports from Service Desk.
5. What is the total annual level of IT spending in your school district?
   Cambridge: $1.1M
   Virginia Beach: $46.8M

III. Student Information System (SIS)

1. What Student Information System is your school district currently using and how long has it been in place?
   Cambridge: Century Star Student was implemented ten years ago
   Virginia Beach: Edupoint's GENESIS was implemented in the Fall of 2010
2. Please describe the process in which the SIS was selected over other products and who was involved in the selection process.
   Cambridge: Not available
   Virginia Beach: Requirements were gathered and agreed to. An RFP for a new SIS was issued. RFP committee with representatives from the Elementary schools, Middle schools, High schools, Department of School Administration, Department of Curriculum & Instruction, Guidance Services, Student Leadership, Department of Research, Evaluation & Assessment and Department of Technology was developed. Committee members scored the vendors products. Based on the committee's scores, three vendors were selected to be short listed. Vendor presentations were given by the three short listed vendors. The committee member scored the vendors. Two vendors were selected to continue. Site visits for selected committee members were scheduled with School division that used the vendor's product. The committee scored the final two vendors. GENESIS, by Edupoint, was select by the committee.

3. How many staff from the school district were dedicated to the implementation of the SIS?
   Cambridge: Not available
   Virginia Beach: Six
4. Please describe the process in which decisions of configuration and design were made during the implementation of the SIS.
   Cambridge: Not available
   Virginia Beach: Key decisions are being made by the Student Data Steering Committee, which has representatives from the Department of School Administration, Department of Curriculum and Instruction, Guidance Services, Student Leadership, Department of Research, Evaluation and Assessment and Department of Technology.
5. How was the SIS configured to be able to produce necessary State reports?
   Cambridge: Not available
   Virginia Beach: Edupoint is still working on the configuration of State reports
6. How long did the implementation of the SIS take?
   Cambridge: Not available
   Virginia Beach: 1 Year and 1 Month, some aspects ongoing

IV. Enterprise Resource Planning (ERP) System

1. What ERP System is your school district currently using and how long has it been in place?
   Cambridge: We currently do not have an ERP system. We use the City's system, Peoplesoft.
   Virginia Beach: Insite was implemented 12 years ago for financials. Lawson was implemented ten years ago for human resources and payroll functionality.
2. Please describe the process in which the ERP System was selected over other products and who was involved in the selection process.
   Cambridge: N/A
   Virginia Beach: The City selected Insite. Lawson was selected using an RFP process.
3. How many staff from the school district were dedicated to the implementation of the ERP System?
   Cambridge: N/A
   Virginia Beach: Six
4. Please describe the process in which decisions of configuration and design were made during the implementation of the ERP System.
   Cambridge: N/A
   Virginia Beach: A Steering Committee was established with representatives from the Departments of Budget and Finance, Human Resources and Technology.
5. How was the ERP System configured to be able to produce necessary State reports?
   Cambridge: State reports are developed with the assistance of City resources.
   Virginia Beach: An in-house reporting team configured reports using Crystal Reports.
6. How long did the implementation of the ERP System take?
   Cambridge: N/A
   Virginia Beach: 1.5 Years

V. Management and Support of SIS and ERP System

1. How many staff are currently assigned to the management and support of the SIS and ERP System?
   Cambridge: Shared among three staff.
   Virginia Beach: 13
2. Are outside consultants used for the management and support of the SIS or ERP System?
   Cambridge: No
   Virginia Beach: We used outside consultants during the system implementation, but they are no longer used.
3. What is the level of vendor support you typically receive for the SIS or ERP System?
   Cambridge: Immediate within an hour.
   Virginia Beach: We have vendor maintenance contracts with Edupoint and Lawson.
4. How are support requests from users related to the SIS or ERP System currently tracked and resolved?
   Cambridge: Through the internal help desk structure and system. Currently, we are using FirstClass email to track support requests.
   Virginia Beach: We use Service Desk from CA Technology.
5. Please describe the process of deploying patches, updates or upgrades to the SIS or ERP System.
   Cambridge: IT managers select and schedule patch updates as needed.
   Virginia Beach: We first apply them on a test system and after successful testing we plan an outage and apply to production.
6. Are there instances where additional systems or processes have been developed due to limitations of the SIS or ERP System? (e.g., disparate databases, manual workarounds, etc.)
   Cambridge: Yes, many.
   Virginia Beach: Yes, for the HR-Payroll system we are trying to eliminate.

VI. Technology Systems and Services in your School District

1. Are you deploying hosted services in your school district? If so, which ones?
   Cambridge: Yes, YARDS, EDline Blackboard Connect and a few others.
   Virginia Beach: Yes. SchoolNet (curriculum management, parent portal, student assessment and data management and reporting), Application Tracking and Asset Management. All of these are hosted by the vendors.
2. Are Macintosh computers supported in your school district? If so, approximately how many are in use and how many IT staff support them?
   Cambridge: Approximately 2,000 workstations are Macs.
   Virginia Beach: Macs are not supported.
3. Does your IS/IT Department support remote access to key applications and systems?
   Cambridge: Only for a limited few.
   Virginia Beach: Yes
4. Does your IT/IT Department utilize centralized deployment of updates and patches?
   Cambridge: Yes, for some.
   Virginia Beach: Yes
5. Does your IT/IT Department maintain the following documented policies?
   a. Disaster Recovery Plan
      Cambridge: No
      Virginia Beach: Yes

b. Security Policy including the process for managing and testing security
   Cambridge: No
   Virginia Beach: Yes
c. Comprehensive Compliance Standards
   Cambridge: No
   Virginia Beach: Yes
d. Change Management Process
   Cambridge: No
   Virginia Beach: Yes

VII. Technology Project Management in your School District

1. What process does your school district use to select and prioritize IT projects?
   Cambridge: The process is not clearly defined.
   Virginia Beach: The Leadership team, using SharePoint and MS Project.
2. Is the process to select and prioritize IT projects documented?
   Cambridge: No
   Virginia Beach: Yes
3. Who oversees the selection and prioritization of IT projects?
   Cambridge: Currently the Chief Technology Officer
   Virginia Beach: The Chief Information Officer
4. What process does your school district use to define deliverables, milestones, activities and resources for IT projects?
   Cambridge: The process is not clearly defined.
   Virginia Beach: We have a project management office that is responsible for developing and managing project plans.
5. How are users trained to use new technologies implemented in your school district?
   Cambridge: Educational Technology staff are utilized to conduct workshops.
   Virginia Beach: Using training sessions using the "train the trainer" model. Sometimes we use Microsoft Live Meeting or just issue user guidelines for simple changes.
6. What major IT projects do you have underway or planned for the next 1-3 years?
   Cambridge: YARDS, online applications with Google, "1 to 1" initiative and managed wireless infrastructure upgrade in all schools.
   Virginia Beach: Finalizing the implementation of the SIS; Switching gradebook; Switching Special Education system; Upgrading employee email system; Adding second ISP connection; Upgrading security; Upgrade to our HR/Payroll system; Upgrade Sharepoint to 2010; Upgrades to security environment including network access control; and Event and Log management.

3.2 Best Practice Research Approach

BDMP's approach to best-practice research focused on the areas related to the Findings and Issues identified in the Current Environment Report. The recommendations developed as part of this report were based on industry best practices as well as BDMP experience conducting similar projects for other public sector organizations. While there are several IT related best practice organizations that provide standards and guidelines related to the service management of IT, since some APS staff have received training from specific organizations, the recommendations developed aligned with the concepts APS has become familiar. The four organizations BDMP references in the recommendations

are the State of Virginia Department of Education (DOE), the Information Technology Infrastructure Library (ITIL), the Project Management Institute (PMI) and the American Productivity and Quality Center (APQC).

- **State of Virginia Department of Education (DOE):** The Virginia DOE strives to increase student learning and academic achievement in support of the mission of Virginia's public education system. The DOE is comprised of the Superintendent of Public Instruction and the Virginia Board of Education which is the governing and policy-making body for the Virginia system of public education.

- **Information Technology Infrastructure Library (ITIL):** ITIL is a widely adopted approach for IT Service Management that provides a framework for delivering IT services to an organization. There are five core processes within ITIL that are documented in Version 3, published in 2007.

- **Project Management Institute (PMI):** PMI is a leading not-for-profit membership association for the project management profession. These concepts and framework provided by PMI are the basis of greater recognition and acceptance of project management's successful role in governments, organizations, academia and industries.

- **American Productivity and Quality Center (APQC):** APQC publishes best practice information for a variety of industries. Specific to education, APQC has developed a Process Classification Framework "PCF" that covers many topics, including Information Technology. APQC was formed in 1977 and has become one of the most referenced resources for research worldwide.

References to specific documents from these organizations are included throughout the recommendations contained in Section 4.

4.0 Recommendations

This section of the report contains recommendations developed to address the findings and issues identified during the course of the project.

As described previously, the recommendations developed in this report are based on BDMP's experience conducting similar assessments for public sector organizations, industry best practices according to ITIL, PMI, VA DOE and APQC, feedback from APS and IS staff and benchmarking research with other peer school districts. While many of the recommendations are interrelated, they are organized in a manner that allows them to be addressed and implemented as standalone projects or initiatives.

It is important for readers of this report to understand that APS hired a new Assistant Superintendent for the IS Department in August 2010. Due to current challenges within APS, some projects were initiated during the course of this assessment that impacted the scope of our planned work. It was understood that it was important for APS to move ahead quickly to address some issues. We worked closely with APS to communicate interim findings and recommendations during our work; however, the findings and recommendations in this report reflect our analysis as of the issue date of this report.

APS has made progress against several of the findings and issues identified by BDMP. One of the largest changes implemented recently is a revised organizational structure for the IS Department that aligns the organization with the IS service delivery goals, leverages the internal strengths of IS staff, streamlines the internal reporting process and creates greater opportunity for collaboration between divisions within IS. The revised organizational structure has an impact on several of the recommendations in this report. Where applicable, the impact has been described for the relevant recommendations.

Fifteen high level recommendations are identified in this report that address the findings documented in the Current Environment Report. Each of the high level recommendations contain numerous sub-recommendations and guidance about how the implement them. The recommendations presented in the report have not yet been prioritized by APS or BDMP. However, there are several recommendations that BDMP view as "high" priority recommendations that if addressed, will assist APS as they implement the other recommendations identified. These recommendations include Recommendation C- Redesign IS Organization Structure and Update Job Descriptions, E – Centralize and Standardize Project Management Processes and Tools, O- Complete the Implementation of the Platform. Additional information related to prioritizing the recommendations in contained in Section 5.0, Next Steps.

The following table traces each finding or issue contained in the Current Environment Report to a recommendation.

Findings and Issues Traceability Matrix			
ID	**Finding or Issue**	**ID**	**Associated Recommendation**
A1	There is a desire at APS for greater use of workflow functionality within the ERP system (STARS).	**I**	Conduct an ERP Business Process and Needs Assessment Analysis

Findings and Issues Traceability Matrix			
ID	**Finding or Issue**	**ID**	**Associated Recommendation**
A2	The manner in which the STARS Budgeting module is being used by APS has made Position Control problematic.	**I**	Conduct an ERP Business Process and Needs Assessment Analysis
A3	APSnet is used to store critical data due to limited functionality in eSchoolPLUS.	**J**	Develop policies and procedures to improve data quality in applications
A4	APSnet and eSchoolPLUS are not integrated in a manner that supports efficient sharing of data.	**K**	Conduct an SIS Business Process and Needs Assessment Analysis
A5	The current eSchoolPLUS configuration does not allow the system to easily produce all State reports.	**K**	Conduct an SIS Business Process and Needs Assessment Analysis
A6	Data quality and data standards are a concern for application users at APS.	**J**	Develop policies and procedures to improve data quality in applications
A7	Some applications in use in APS do not accommodate complete remote-access functionality.	**A**	Develop written policies and procedures related to remote access
A8	Updates of APS applications resulting in new or modified functionality are not adequately communicated to users.	**B**	Develop enterprise-wide change management policies and procedures
A9	Report generation from eSchoolPLUS and other APS applications require significant manual configuration, data manipulation and data clean-up.	**K**	Conduct an SIS Business Process and Needs Assessment Analysis
A10	There is not a clear responsibility for who owns the management of project costing in the STARS ERP system.	**I**	Conduct an ERP Business Process and Needs Assessment Analysis
A11	Grants and Projects are manually tracked in an Excel spreadsheet.	**I**	Conduct an ERP Business Process and Needs Assessment Analysis
A12	A lack of integration of APS applications necessitates the use of manual workarounds.	**I**	Conduct an ERP Business Process and Needs Assessment Analysis
A13	The configuration of eSchoolPLUS is not optimized for the business needs of APS.	**K**	Conduct an SIS Business Process and Needs Assessment Analysis

Findings and Issues Traceability Matrix			
ID	**Finding or Issue**	**ID**	**Associated Recommendation**
A14	APS is currently using a third-party vendor for Applicant Tracking (Winocular).	**I**	Conduct an ERP Business Process and Needs Assessment Analysis
A15	Challenges exist with tracking and reporting teacher certification and professional development information.	**J**	Develop policies and procedures to improve data quality in applications
M1	The current IS organizational structure is not optimized to assist APS in meeting the overall needs of the organization.	**C**	Redesign IS Organization Structure and update job descriptions
M2	The Career Ladder and related job descriptions within the IS Department are not adequately documented, current or consistent with the current marketplace.	**C**	Redesign IS Organization Structure and update job descriptions
M3	Consistent Service Level Agreements that cover all services offered by IS are not in place at APS.	**D**	Update existing and develop new Service Level Agreements (SLAs)
M4	It was reported by many IS staff that the current communication methods within the IS Department could be improved to ensure that all appropriate staff are aware of current and planned projects.	**E**	Centralize and standardize project management methodologies and tools
M5	A single system and related policies and procedures for tracking and managing support requests for all areas of Information Services does not exist.	**F**	Develop policies and procedures for managing enterprise-wide support.
M6	Professional development opportunities for IS staff have been impacted due to budget constraints.	**G**	Develop policies and procedures for professional development and training
M7	The implementation of the new “platform” at APS is not adequately planned for and does not leverage best practices of project management.	**E**	Centralize and standardize project management methodologies and tools
M9	IS Department resources are being used to support regular business functions involving particular applications.	**C**	Redesign IS Organization Structure and update job descriptions
M10	Procedures for support beyond standard business hours are not established.	**D**	Update existing and develop new Service Level Agreements (SLAs)

Findings and Issues Traceability Matrix			
ID	**Finding or Issue**	**ID**	**Associated Recommendation**
M11	The roles and responsibilities of Instructional Technology Coordinators (ITCs) vary from school to school.	**C**	Redesign IS Organization Structure and update job descriptions
M12	The IS Department does not have established and well documented change management procedures.	**B**	Develop enterprise-wide change management policies and procedures
M13	It appears that some groups within IS such as the Network group do not have an appropriate number of resources in comparison to their expected workload.	**C**	Redesign IS Organization Structure and update job descriptions
M14	The process for selecting new technologies to implement is not documented.	**E**	Centralize and standardize project management methodologies and tools.
M15	A comprehensive disaster recovery/business continuity plan that describes how all information systems will be restored does not exist.	**H**	Develop Disaster Recovery and Business Continuity Plan
M16	A documented process for identifying, prioritizing, and managing IT projects does not exist.	**E**	Centralize and standardize project management methodologies and tools.
M17	General IT Management Policies and Procedures are not fully documented.	**E**	Centralize and standardize project management methodologies and tools.
T1	APS does not have a single enterprise-wide document/records management system.	**L**	Conduct a Needs Assessment for a Document Management System
T2	Best practices related to security and risk management are not fully implemented within the IS Department to protect APS.	**M**	Conduct a Network Analysis
T4	User accounts are not appropriately configured to support the roles of particular individuals within the IS Department.	**C**	Redesign IS Organization Structure and update job descriptions
T5	Users reported a perception that the IS Department has limited individuals with the ability to support Macintosh computers.	**D**	Update existing and develop new Service Level Agreements (SLAs)
T6	The wireless network at APS has multiple areas where performance is inconsistent.	**M**	Conduct a Network Analysis

Findings and Issues Traceability Matrix			
ID	**Finding or Issue**	**ID**	**Associated Recommendation**
T7	IS maintains two separate networks throughout APS.	**M**	Conduct a Network Analysis
T8	APS does not use Voice Over Internet Protocol (VoIP) technology for telecommunications.	**N**	Analyze and consider implementing VoIP technology
T9	A process to manage requests for information from the Planning and Evaluation Division does not exist.	**F**	Develop policies and procedures for managing enterprise-wide support.
T10	Remote access to some APS applications is cumbersome and not user–friendly.	**A**	Develop written policies and procedures related to remote access
T11	Technology training for technology users at APS is sometimes limited due to instances of a lack of communication within IS.	**B**	Develop enterprise-wide change management policies and procedures
T12	While implementation of a new platform is underway, the current APS network has areas of potential security weaknesses.	**M**	Conduct a Network Analysis
T13	The standard technology platform in use throughout APS is outdated.	**O**	Complete the Platform Infrastructure Replacement Project
T14	The workstation management/application delivery system is overly complex and inefficient.	**O**	Complete the Platform Infrastructure Replacement Project
T15	Critical network hardware in place in APS is outdated.	**M**	Conduct a Network Analysis
T16	The APS email system is outdated.	**O**	Complete the Platform Infrastructure Replacement Project
T17	End-users expressed dissatisfaction with either the functionality or the appearance of the APS website.	**F**	Develop policies and procedures for managing enterprise-wide support.

Table 18: Findings and Issues Traceability Matrix

Many of the findings identified in the current environment report, as well as the recommendations developed in this report have similar focus areas. These focus areas include, improving project management practices, documenting functional and technical requirements for projects and systems, and improving communications, both within the IS Department and to external IS customers. APS should consider these focus areas when implementing the recommendations described in this report since they will impact many of the findings and recommendations. A failure to consider these focus areas when undertaking an initiative such as planning for a new system, redesigning a business process, conducting a needs assessment or developing a new policy or procedure can lead to challenges in achieving the desired result of the initiative.

All recommendations were developed utilizing a standard format. The template of this format is described below. It identifies any assumptions to develop the recommendations.

Arlington Public Schools – Recommendation Template			
This section of the template contains the recommendation number and name.			
Recommendation Description			
This section of the template contains a description of the recommendation.			
Recommendation Source Information			
Functional Area:	Application Issues, IT Management and Best Practice Issues, and Technology Issues		
Related Finding(s) and Issues(s)			
#	Listing of the Finding(s) and Issue(s) that this recommendation addresses.		
Benchmarking and Best Practice Information			
This section of the template includes relevant findings from benchmarking and best practice research.			
Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	X months/years	**Estimated Required Effort**	# of Hours
Description	This section of the template contains a high-level description of the duration and required effort for the recommendation, including the methodology used to determine the estimates. The estimate for Required Effort assumes the task(s) is performed by an individual(s) that has previously successfully conducted this activity, or a similar activity, before.		
Action Items to Implement Recommendation			
This section of the template contains a checklist of the action items that are needed to implement the recommendation.			
Anticipated Benefits			
This section of the template contains a checklist of the anticipated benefits that are expected from the recommendation.			

Table 19: Recommendations Template

4.1 Information Services Recommendations

A - Develop written policies and procedures related to remote access	
Recommendation Description	
With the increases in mobile computer technologies, there is an increased expectation from APS users to be able to work from any location, at any time using any device. Providing remote access capabilities in a setting such as APS requires written policies and procedures to ensure data security. BDMP recommends that APS determine which applications should provide remote access capability, and implement the appropriate technology tools. Those applications used most frequently should be considered for inclusion in remote access, such as eS+ and STARS. As APS considers additional applications, consideration should be given to how that application will work when accessed remotely, and how it may require support from IS. APS currently has remote access capability to limited applications using Juniper SSL VPN technology. BDMP recommends that APS consider and evaluate other technologies available for providing remote connectivity before it expands which applications will be offered remotely. Citrix or RDP are technologies that are commonly used and should be considered by APS. These technologies may be used in conjunction with existing SSL remote access technology to deliver non-Web enabled applications. As the technology used for providing remote access, as well as the applications that will be offered remotely are selected, IS should document related procedures for appropriate use of remote access. Service Level Agreements will require significant attention as applications become available beyond standard business hours. The plan for how they will be supported at these times will need to be determined. Appropriate change management of remote access should also be a focus. Training the end-users of the new capabilities will both reduce the demand on support resources but also improve end-user satisfaction.	
Recommendation Source Information	
Functional Area:	Application Issues and Technology Issues
Related Finding(s) and Issues(s)	
A7	Some applications in use in APS do not accommodate complete remote-access functionality.
T10	Remote access to some APS applications is cumbersome and not user–friendly.
Benchmarking and Best Practice Information	
Respondents to the benchmarking research are also undergoing the process of expanding remote access capabilities. These schools reported that caution should be given to select the applications in highest demand first and gradually roll out new remote access connectivity to additional applications. It was also reported that time spent to train users during implementation resulted in a significant time savings once implementation was complete.	

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	1-2 Months	**Estimated Required Effort**	80 hours
Description	BDMP recommends that an individual with technical policy/procedure writing experience conduct this activity.		

Action Items to Implement Recommendation

- ☑ Determine which applications IS will provide remote access
- ☑ Complete the implementation of the new platform
- ☑ Determine the technology that will be used to deliver remote access capabilities
- ☑ Document policies and procedures related to remote access
- ☑ Update existing documentation based on new remote-access capabilities
- ☑ Manage the change and train users to the new functionality

Anticipated Benefits

- ☑ Improved efficiency by allowing employees to work from multiple locations
- ☑ Increased data security with leveraging modern remote access tools
- ☑ Improved user satisfaction with remote access capability

B - Develop enterprise-wide change management policies and procedures

Recommendation Description

Change management is as fundamental to an organization as it is widespread through nearly every aspect of that organization's composition. Every aspect of an organization will undergo change, and effectively managing this change is crucial. APS has historically maintained a focus on change management, but with the recent initiation of many widespread initiatives and projects this focus has not been consistently maintained.

Many institutions that study best-practices have published information related to change management. One such organization is the American Productivity and Quality Center (APQC). On the subject, APQC recommends[1] that "organizations that excel at realizing change embrace the following objectives:

- Involve all levels of the organization in the change process;
- Communicate the change process continuously via multiple channels;
- Identify and train change agents;
- Provide the work force with information, tools, and other resources to ease transition;
- Use rewards and recognition to facilitate the change process among employees;
- Plan ahead regarding how resistance to change will be handled; and
- Monitor and manage change fatigue."

Similarly, the Information Technology Infrastructure Library (ITIL) has published information related to change management[2]. This information outlines the process steps from initiating the request for change all the way through to implementing and measuring the effect of the change. BDMP recommends that APS adopts change management practices in line with ITIL as further described below:

1. **Establish a Change Advisory Board.** APS should establish a Change Advisory Board (CAB) that will review requests for change, classify the request and determine if and when it should be implemented. The CAB should be comprised of representatives from all areas within IS as well as representatives from business units. On occasion, additional external parties may need to be consulted based on the subject matter of the requested change. Since the board will have a high level of knowledge from a variety of viewpoints, the board will also provide guidance to the resources responsible for implementing the change. A recommendation of this report is to establish a Project Management Office (PMO) and centralize project management functions related to IT projects. It is likely there will be some overlap between the CAB and the PMO. At a minimum, the CAB and PMO should regularly communicate in order to best plan for the demands on resources within IS as well as the larger organization at APS.

2. **Develop and document a process for requesting changes.** Requests for change typically originate from a variety of user-levels and will vary greatly in their scope. It is important that a consistent process is used to collect requests for change so that all users have a chance to request them, and so that even the smallest change is appropriately managed. A single support tracking system is recommended as part of this report in the recommendation to "Develop policies and procedures for tracking support enterprise-wide." Modern help desk support tracking systems

[1] APQC. *Realizing Change: Knowing When and How to Successfully change*. 2005
[2] Information Technology Infrastructure Library, Version 3. 2007

typically have the ability to track change requests as well. This type of system should be leveraged to ensure users have the ability to request a change, assign an initial classification/priority, associate any issues or "tickets" with it, and attach any relevant documentation, such as error reports or screen captures.

3. **Develop and document a process for reviewing requested changes.** The process of reviewing requested changes should involve several activities. First, the CAB should thoroughly review the request to make sure all of the necessary information is available and understood by the board. Further investigation may often be needed, depending on the specialization of functionality. The second step is for the CAB to either approve or deny the request for change. Third, the CAB should classify the request. The classification should be based on a standardized set of request levels. ITIL provides guidance on the definition of each level, and APS should consider modeling their own levels based on these. Finally, the CAB should prioritize and schedule the implementation of the request for change based on its assigned classification relative to the other approved change requests, and the availability of resources to implement the change.

4. **Develop and document a process for implementing approved changes.** The implementation of approved changes should be treated just as the implementation of any new technology or service. This process should utilize best practices in project management. These are further described in the recommendation "Centralize and standardized project management methodologies and tools." Implementing changes require following documented procedures for testing, training, and approving the changes, and also includes updating business process documentation and providing effective communication related to the change throughout its implementation.

5. **Develop and document a process for measuring the effectiveness of implemented changes.** The CAB that APS establishes should plan to review implemented changes in order to ensure they are effectively achieving the objectives that formed the basis of justification for the initial request for change. In some cases, the CAB will be actively involved in providing guidance during the implementation of a change and therefore this step may not require significant effort. In other cases, changes will be implemented without a lot of input from the CAB and the board should take the effort to meet with stakeholders to understand the effect of the change.

Adoption of the preceding steps to change management will allow APS to more effectively and efficiently respond to requests for change. As these processes are implemented they should be documented.

Recommendation Source Information	
Functional Area:	Application Issues, IT Management and Best Practice Issues, and Technology Issues
Related Finding(s) and Issues(s)	
A8	Updates of APS applications resulting in new or modified functionality are not adequately communicated to users.
M12	The IS Department does not have established and well documented change management procedures.
T11	Technology training for technology users at APS is sometimes limited due to instances of a lack of communication within IS.

Benchmarking and Best Practice Information			
As referenced in the description of this recommendation, the APQC and ITIL have published best practice information related to change management. This information was considered in the development of the recommendation. In addition, benchmarking schools all reported the challenges of effective change management.			
Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	2-3 Months	**Estimated Resource Effort**	640 Hours
Description	One individual should lead this effort but be supported by others at APS. It may be beneficial for some of the additional resources to be those that will ultimately serve on the CAB.		
Action Items to Implement Recommendation			
☑ Assign resources to develop the change management practices ☑ Establish a Change Advisory Board ☑ Develop and document a process for requesting changes ☑ Develop and document a process for reviewing requested changes ☑ Develop and document a process for implementing approved changes ☑ Develop and document a process for measuring the effectiveness of implemented changes			
Anticipated Benefits			
☑ Increased ability for users at multiple levels to request changes ☑ Increased ability for organization to be responsive to requests for changes ☑ Increased ability for organizational-wide input of the priority of change requests ☑ Increased likelihood of changes being effective and meeting desired results			

C - Redesign IS Organization Structure and update job descriptions

Recommendation Description

The IS Assistant Superintendent has taken steps recently to update the IS Department organization structure. The redesigned organizational chart allows the IS Department to better align the strengths of the staff in the department with the needs of other APS departments. The new organizational chart also increases the opportunity for collaboration between divisions within IS.

As part of implementing the new organization structure, it is important that the IS Department update and develop job descriptions to align with new and revised work responsibilities. The IS Department is currently working with the Personnel Department to revise existing job descriptions and create new job descriptions as a result of the new organization structure. It will be important that IS take an active role in the development of the job descriptions to ensure technical requirements and all IS Department work responsibilities are adequately described. When draft job descriptions are completed, we recommend that IS and Personnel work together to review them to ensure that all IS Department work responsibilities are reflected in the job descriptions.

Since many of the existing job descriptions have not been updated for several years the IS Department should consider adding technical certifications required for appropriate jobs. Certifications related to project management, security, database administration and network administration should be considered.

In addition to updating job descriptions and titles, it will be important for IS to align passwords and user accounts for IS systems based on job descriptions to ensure that IS staff have access to the appropriate systems. The new IS organization should include positions and documented job descriptions for appropriate security administration for APS.

As part of the process of updating the job descriptions it will be important for APS to examine the current career ladder in the existing job descriptions and determine if the career ladder currently associated with the current job descriptions aligns with the revised roles and responsibilities documented as part of the new job descriptions. As a result of the implementation of the new organization structure, some IS staff have taken on new roles and responsibilities. It will be important that the career ladder for all IS staff allows for growth and is aligned with industry best practices as well as the current public sector marketplace for similar jobs.

Recommendation Source Information

Functional Area:	Management and Best Practice Issues and Technology Issues

Related Finding(s) and Issues(s)

M1	The current IS organizational structure is not optimized to assist APS in meeting the overall needs of the organization.
M2	The Career Ladder and related job descriptions within the IS Department are not adequately documented, current or consistent with the current marketplace.
M9	IS Department resources are being used to support regular business functions involving particular applications.
M11	The roles and responsibilities of Instructional Technology Coordinators (ITCs) vary from school to school.

M13	It appears that some groups within IS such as the Network group do not have an appropriate number of resources in comparison to their expected workload.
T4	User accounts are not appropriately configured to support the roles of particular individuals within the IS Department.

Benchmarking and Best Practice Information

Job descriptions that align service delivery goals as described by ITIL will be important to assist the IS Department in achieving the benefits of the revised organizational chart.

Estimated Duration and Budget/Staffing Recommendation

Estimated Duration	2-3 months	**Estimated Resource Effort**	320 Hours
Description	Implementing this recommendation will require IS staff time to develop job descriptions with Personnel and review job descriptions with IS Leadership.		

Action Items to Implement Recommendation

- ☑ Determine titles and responsibilities for jobs based on new organizational structure
- ☑ Work with Personnel to finalize job descriptions
- ☑ Publish job descriptions in IS
- ☑ Consider adding appropriate certifications to job descriptions

Anticipated Benefits

- ☑ Increased IS Department staff knowledge by requiring appropriate certifications
- ☑ Improved service delivery
- ☑ Increased collaboration between divisions within IS
- ☑ Increased IS staff satisfaction based on clear roles and responsibilities

D – Update existing and develop new Service Level Agreements (SLA)

Recommendation Description

APS as an organization is a customer in the SLAs it maintains with vendors, the users at APS are also customers to the IS Department for the services it provides. As customers, APS users have certain levels of desired service. And as a provider of service, the IS Department has certain obligations of the levels of service it will provide. Defining and documenting these service levels is critical in ensuring the business objectives of APS are met. This recommendation is to update the existing SLA to cover all services provided by IS to the other APS departments.

One of the fundamental reasons for developing Service Level Agreements in an organization is limited IT resources. In order to allocate the efforts of IS's support resources most effectively, enterprise-wide SLAs will help ensure that those services most critical to APS' business objectives are not interrupted.

The Service Support Center currently has an established SLA that does not extend to all services provided or resources within IS. A best practice is to develop enterprise-wide SLAs that include all areas of technology. BDMP recommends that APS develop Service Level Agreements for the services offered by the Information Services Department.

The SLAs that IS develops should include the following components:

- Definitions of four types of events: service request, incident, problem and change request;
- Guaranteed response times and durations to each type of event;
- Definitions of service levels for various users: platinum, gold, silver, etc.;
- Guaranteed response times and durations to each service level;
- Available hours that support will be provided;
- Processes for working with vendors of commercial applications and outside services;
- A listing of the technologies that will be supported; and
- How changes to the SLA will be managed.

The development of SLAs should involve multiple resources from different levels in the organization. It is equally important to understand the needs of the end-user as it is to understand the capabilities of the support resources. Based on how these align the need for additional training either for the end-user or for the support resources may be needed. Initially, APS should plan for three to four resources tasked with the development of the SLA. Additional individuals should be consulted during the development in order to gather a wide variety of perspectives. The ultimate decisions as to the allocation of resources should be made by an IS Leadership group.

The ITIL process known as Service Level Management includes "defining, building and negotiating Service Level Agreements."[3] Additional activities within this process include the monitoring and management of SLAs, along with other process documentation. An important point is that all SLAs need to be regularly reviewed and updated. Best practices suggest this should be done on an annual basis and involve both IS support staff and customers of IS. The SLA should also be updated as new technologies are implemented at APS.

Recommendation Source Information

Functional Area:	IT Management and Best Practice Issues and Technology Issues

[3] Information Technology Infrastructure Library, Version 3. 2007.

Related Finding(s) and Issues(s)	
M3	Consistent Service Level Agreements that cover all services offered by IS are not in place at APS.
M10	Procedures for support beyond standard business hours are not established.
T5	Users reported a perception that the IS Department has limited individuals with the ability to support Macintosh computers.

Benchmarking and Best Practice Information

There are many sources of best practice information related with the development, implementation and management of Service Level Agreements. BDMP has drawn upon the publications from APQC and ITIL to develop this recommendation and APS should also consider these resources as they conduct the work recommended. In addition, APS should consider contacting peer organizations who have developed SLAs to understand challenges and lessons learned.

Estimated Duration and Budget/Staffing Recommendation

Estimated Duration	3-4 Months	**Estimated Resource Effort**	960 Hours
Description	The estimated duration and staffing of this recommendation is based on a primary team of two to three individuals leading the development of the SLA's. The duration is based on internal review and update processes.		

Action Items to Implement Recommendation

- ☑ Identify two to three individuals to be responsible for developing the SLA
- ☑ Collect all existing IS and vendor SLAs
- ☑ Create an inventory of all service capabilities IS offers
- ☑ Create a listing of all service needs that the organization has
- ☑ Define service response times and durations based on type of event
- ☑ Define service response times and durations based on service level
- ☑ Regularly update SLA

Anticipated Benefits

- ☑ Increased assurance that mission critical technologies will be given priority of support
- ☑ Improved efficiency with responsiveness to support requests
- ☑ Increased resolution rate of support requests
- ☑ Improved user satisfaction

E - Centralize and standardize project management methodologies and tools

Recommendation Description

APS is currently undertaking numerous IT projects in an effort to modernize its overall IT infrastructure. In this current environment, the IS Department would benefit from an improved set of information technology Project Management tools and processes to track the status of IT projects. To increase the likelihood of project success, it is important that projects are tracked and reported on to measure progress against key project milestones or metrics. Failure to plan, track, and report on projects increases the likelihood that projects will not achieve desired results which may ultimately lead to failed projects.

BDMP recommends that the IS Department develop a standard set of Project Management tools to track projects, assist in planning for resource needs and facilitate the overall prioritization process. Many organizations struggle with tracking projects which often leads to initiating more projects than can be supported. With a standard set of project management tools for project tracking, resource planning, and reporting, the IS Department will be able to better plan and manage projects. Many organizations have moved towards using a centrally managed Project Management and Tracking tool such as MS Project and MS SharePoint to track the status, risks and issues and overall progress made on projects. Web based project management applications have also been developed recently that can operate on Smart Phones and allow project team members access to project documents, track status and communicate with the team. As the IS Department begins the planning process for the recommendations identified in this report, it will be important to implement the recommendations identified here to increase the likelihood of success for IS Department projects.

The IS Department should at a minimum consider documenting project dependencies, identifying a project schedule and documenting the critical path activities as well as the identification of potential risks and issues that could impact the project. BDMP recommends that the IS Department develop a policy of always collecting functional and technical requirements prior to starting any project. The collection of requirements should involve both IS resources as well as APS departmental stakeholders.

In addition to tracking and prioritizing projects, it is critical that the project reporting processes monitor the appropriate metrics. The IS Department does not have a formal methodology for reporting project status. At a minimum, reporting should be done on project scope, schedule, and budget (known as the triple constraints) along with staffing on larger projects. The inability to effectively track projects makes reporting against these metrics increasingly difficult. The inability to monitor key project metrics and report on the overall “health” of a project increases the likelihood that there will be cost, scope, or schedule variances that will adversely impact the project.

We recommend that the IS Department develop a formal reporting structure for all projects. The reporting process should include a standard status report template, identification of standard metrics that will be reported on, reporting frequency, and the audience (in addition to the IS Department) that will receive the report.

The IS Department currently has numerous projects in progress as a result of the platform project implementation. The IS Department is responsible for managing, overseeing, and ensuring success of all of IT related projects. In the current environment, a business process and system for selecting and prioritizing projects does not exist. This issue has placed a great deal of strain on existing IS resources and made project planning and prioritization difficult. In addition, a methodology for

selecting and prioritizing projects does not exist. The lack of a project prioritization process has forced the IS Department to operate in a reactive mode, responding to project issues and addressing immediate needs as opposed to strategically planning, selecting, and prioritizing projects.

In many government organizations today, a Project Management Office (PMO) has been established within the information systems organization to manage all IT projects across the organization and/or for a specific department. A PMO provides a consistent project management framework, methodology and tools to be used to manage projects. Due to the amount and frequency of conducting IT projects, APS could benefit from a PMO model; however, a formal process that provides guidance and assists in selecting and prioritizing projects needs to be put in place. We recommend that policies and written procedures be developed to provide guidance related to identifying and prioritizing IT projects. Finally, we recommend that training be provided, and the overall project management needs be fully assessed prior to implementing a PMO for the APS. Establishing a PMO is a significant commitment that requires careful planning to help ensure it provides benefits and will indefinitely serve the needs of APS.

Recommendation Source Information	
Functional Area:	IT Management and Best Practice Issues

Related Finding(s) and Issues(s)	
M4	It was reported by many IS staff that the current communication methods within the IS Department could be improved to ensure that all appropriate staff are aware of current and planned projects.
M7	The implementation of the new “platform” at APS is not adequately planned for and does not leverage best practices of project management.
M14	The process for selecting new technologies to implement is not documented.
M16	A documented process for identifying, prioritizing and managing IT projects does not exist.
M17	General IT Management Policies and Procedures are not fully documented.

Benchmarking and Best Practice Information
PMI, AQPC and ITIL all stress the importance of appropriate project management, project tracking and reporting as well as the development of organizational wide standards and tools for project management.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	3-6 Months	**Estimated Resource Effort**	480 Hours (Phase 1 only) Develop Standards
Description	The budget for this recommendation is based on the costs for the IS Department to implement project management tools such as MS SharePoint. APS could also use part of this budget to obtain outside assistance from a company with experience establishing project management functions in government organizations.		

Action Items to Implement Recommendation
☑ Develop internal project management function

☑ Document policies and procedures for selecting, prioritizing, and managing IT projects ☑ Communicate and train IS staff on policies related to IT Project Management
Anticipated Benefits
☑ Documenting project requirements will help ensure projects meet business expectations ☑ Increased planning, prioritization and selection of IT related projects will increase the likelihood of appropriate level of IS support for projects. ☑ Increased likelihood of project success. ☑ Greater project forecasting related to budgeting and IS resources for upcoming projects

F - Develop policies and procedures for managing enterprise wide support

Recommendation Description

BDMP recommends that IS develops enterprise-wide policies and procedures for managing support requests. These would include determining which tools will be leveraged for this effort as well as the role that the various individuals within IS will play in supporting the business objective of APS.

Currently APS is using a combination of multiple commercial applications and MS Access databases to manage and track support requests. The way that each system is used, as well as who uses each varies greatly as they are generally used for separate purposes. Overlap does exist, however, and in those instances as well as others, there is confusion and inefficiencies with the way support is provided to APS users.

As with other recommendations in this report, this particular recommendation is dependent on other recommendations that have been proposed. One example is the recommendation related to developing Service Level Agreements. As these SLAs are established, the policies and procedures for managing support requests should be designed to help achieve them. As the SLAs establish the prescribed levels of service that IS will provide to APS users, the process for managing support will be the operating side of how the agreements will be met.

This recommendation contains a few key activities, all of which should be appropriately documented:

1. **Determine which application will be used to track support.** BDMP recommends that APS implement a single support tracking application. APS should develop and document business and technical requirements for a support request tracking system. Currently, the IS Department uses the *Heat* application from Front Range Solutions; however they are several releases behind. It was reported that the current version of Heat offers the functionality that additional systems in place currently offer, such as change request functionality. Consolidating to a single system would improve the ability to route and track support requests. In addition, the ability to develop a single knowledge base will improve with a single system. BDMP recommends that the IS department select a specialized system for tracking Freedom of Information Act requests. The sensitive nature and priority of these requests often necessitates a specialized system.

2. **Allocate support resources based on Service Level Agreements.** The current organizational structure of IS has a Service Support Center (SSC) that serves as the first point of contact for support requests.. It was reported that the SSC is not always the first point of contact, creating complications in tracking all support requests. With changes being recommended for the SLAs in place and as the organizational structure evolves, the support resources and should be further defined into Tier 1, 2 and 3. ITIL provides guidance on the definition of each tier[4]:

    a. Tier 1 (Service Desk): Register, classify and log incidents and provide immediate response. If a resolution cannot be achieved within a prescribed time period, Tier 1 resources should transfer the incident to Tier 2.
    b. Tier 2: Comprised of multiple specialized groups, Tier 2 support will further investigate the issue, prioritize it within their queue of support requests and spend a greater

[4] Information Technology Infrastructure Library, Version 3. 2007.

amount of time to satisfy the request.

c. Tier 3: External support groups.

3. **Review and monitor support metrics and reports.** A benefit of using a single support tracking system is the ability to draw metrics and reports from the application. BDMP recommends that an IS Leadership group regularly review these reports. The Virginia Department of Education supports the recommendation that the metrics and reports from the tracking system should be reviewed: "Technology administrators should have a trouble-ticket or incident-tracking system that measures and assess the past and current performance of network-related equipment…understanding the past performances of a network and its related equipment can help determine future performance expectations."[5]

4. **Leverage support metrics and reports for training and projects.** Support metrics and reports will show where IS resources are spending their time. If a particular technology is requiring a large amount of time from support resources, it may require additional user training. Similarly, if there is a large demand for support resources in an outdated technology, it may require a project to update to a newer version, or different technology.

The implementation of this recommendation will be accomplished by internal resources of IS, largely from Leadership.

Recommendation Source Information	
Functional Area:	IT Management and Best Practice Issues and Technology Issues
Related Finding(s) and Issues(s)	
M5	A single system and related policies and procedures for tracking and managing support requests for all areas of Information Services does not exist.
T9	A process to manage requests for information from the Planning and Evaluation Division does not exist.
T17	End-users expressed dissatisfaction with either the functionality or the appearance of the APS website.

Benchmarking and Best Practice Information
The development of this recommendation drew upon information from ITIL, APQC and the Virginia Department of Education. The schools contacted during the benchmarking resources further stressed the need for a documented support process. Most schools had a single ticket tracking system and reviewed the reports from it to determine where training needs exist, and where particular technologies may not be effective.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	3-6 Months	**Estimated Resource Effort**	240 Hours
Description	It is estimated that implementing this recommendation will take approximately three to six months.		

[5] Virginia Department of Education, Division of Technology and Career Technology: Educational Technology Guidelines. May 2008.

Action Items to Implement Recommendation
☑ Document requirements for a support request tracking system ☑ Select and implement a single support tracking system ☑ Define and document support roles within IS ☑ Regularly review and monitor metrics and reports from support tracking system ☑ Leverage reports and metrics to identify training needs and ineffective technologies
Anticipated Benefits
☑ Ability to view “dashboard” of all outstanding and resolved support requests ☑ Ability to develop a more effective knowledge base of support resolution strategies ☑ Increased responsiveness to support requests ☑ Increased efficiency to resolving support requests ☑ Improved ability to respond to needs for training or replacements for ineffective technologies ☑ A single system for all support requests

G - Develop policies and procedures for professional development and training

Recommendation Description

Ongoing professional development and training of resources within IS will allow the group to be more effective at providing services to APS users since resources will become more qualified in the existing services offered as well in their ability to leverage new technologies. To best manage the capabilities of resources, it is important that policies and procedures are developed to meet the overall strategy of IS related to professional development and training.

BDMP recommends that APS consider the following during the development of the policies and procedures:

- **Overall strategy for training and professional development.** ITIL has historically been a focus of technology training at APS. IS should consider setting a strategy which will determine if this will continue to be the primary focus.
- **Establish minimum training levels for individual job descriptions.** This aspect is related to another recommendation contained in this report which will ensure that each job description contains information related to the minimum training requirements. These documented requirements will be fundamental in ensuring consistent ongoing training and professional development within IS.
- **Develop Individual Development Programs.** Many organizations utilize a form of Individual Development Program (IDP) to align training and professional development with an individual's particular job description, continuing education requirements, and the training strategy of the organization. Such a program empowers individuals to set goals based on long-term planning of how they will develop within the organization.
- **Allocate budgets for training.** Based on the overall strategy, minimum training requirements and IDP goals for professional development, budgets may be allocated for training.
- **Develop process for requesting training opportunities.** A consistent process which resources within IS will use to request training opportunities should be developed. Such a process would ensure that resources are leveraging training that is consistent with the group's strategy, the requirements of their job description, and the resource's IDP.

There is little question as to the value of training and professional development. However, in order to best realize this value, a coordinated effort to develop the team's collective capabilities is necessary. Developing and utilizing policies and procedures related to professional development and training will help ensure these benefits are realized.

Recommendation Source Information

Functional Area:	Management and Best Practice Issues

Related Finding(s) and Issues(s)	
M6	Professional development opportunities for IS staff have been impacted due to budget constraints.

Benchmarking and Best Practice Information			
Peer schools contacted as part of the benchmarking research reported challenges with managing training and professional development of their IT staff. Situations were reported where some individuals are very ambitious towards seeking out training and while other staff were reluctant to participate in additional training. This challenge was often resolved or reduced with setting clear expectations for training based on the role of each individual. This information was fundamental in the development of this recommendation.			
Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	12 Months	**Estimated Resource Effort**	320 Hours
Description	It is estimated to take approximately 12 months as all staff within IS will develop respective IDPs on their anniversary dates. Estimated staffing hours is based upon IS Leadership's efforts towards this recommendation and does not include those from each employee within IS.		
Action Items to Implement Recommendation			
☑ Determine training and professional development strategy ☑ Establish minimum training levels for respective job descriptions ☑ Develop Individual Development Programs ☑ Allocate budgets for training ☑ Develop process for requesting training opportunities			
Anticipated Benefits			
☑ Increased consistency of training among IS resources ☑ Improved staff retention through effective, ongoing training programs ☑ Improved productivity with existing IT tools ☑ Improved ability to leverage emerging technologies ☑ Increased ability to serve APS users			

H - Develop Disaster Recovery and Business Continuity Plan

Recommendation Description

APS currently does not have a formalized Disaster Recovery and Business Continuity Plan that covers all services enterprise-wide. This plan is critical for APS to effectively react and to quickly resume operations in the event of a disaster. Furthermore, APS has an obligation to its user base to provide assurance that in the event of a disaster APS will be capable of delivering services.

BDMP recommends that APS undertake the development of a Disaster Recovery and Business Continuity Plan largely utilizing existing resources. This recommendation is based upon the fact that application-specific and process-specific plans do exist within functional areas of APS. Instead of undertaking this effort "from scratch," APS will instead need to consider all of the individual procedures documented and combine them to develop the enterprise-wide plan. APS should consider utilizing outsourced consultants for specific aspects of the Plan development, as further described below.

APS should first identify a Project Team that will be responsible for the development of the Plan. The team should be comprised of individuals from a variety of functional areas within IS that also have knowledge areas from various perspectives including technical, managerial and those from the user-level. The team will not require representation from every component that will ultimately be addressed in that Plan, but instead should include individuals who are able to gather information from those outside the team.

Once a Project Team has been established, APS should follow a four-phased approach to the development of the Plan:

Phase 1: Risk Assessment – BDMP recommends that APS consider engaging outside consultants to conduct a Risk Assessment. This assessment should determine which services will need to be provided in the event of a disaster, the priority of these services and how quickly they need to be resumed following the event. Based upon this list, these services should then be assessed as to how valuable they are in the event of a disaster. Utilizing outside consultants will typically result in an objective analysis of APS' current areas of risk. If APS decides to conduct the Risk Assessment internally, the activities of the Assessment should be modeled after ITIL best practices and those conducting the Assessment should familiarize themselves with these practices.

Phase 2: Document Business Processes – Those business processes that are critical to the services that have been identified in Phase 1 as to be provided in the event of a disaster need to be documented. BDMP expects this effort will be completed by internal APS resources.

Phase 3: Develop Plan – Based on the results of the Risk Assessment and the accompanying business process documentation, the Plan can be developed involving both internal resources and the consulting firm, if desired. BDMP recommends that APS utilize the consulting firm for best-practice information, (if consultants are used for Phase 1) but largely develop the Plan using internal resources. The Plan should be detailed indicating the timing and individuals who will carry out the various aspects of the Plan.

Phase 4: Regularly Test and Update Plan – In order to be best prepared for a disaster, APS needs to regularly test the procedures in its Disaster Recovery and Business Continuity Plan. This can involve simple to complex drills, but effort should be made to test each aspect of the Plan at least

once a year. In addition, the process to update the Plan should take place annually. If APS decides to use outside consultants in the development of the Plan, it may not be necessary for them to be engaged each year the Plan is updated. Instead, APS should consider the services of outside consultants to update the plan every five years, or based on another time interval.

Recommendation Source Information	
Functional Area:	IT Management and Best Practice Issues

Related Finding(s) and Issues(s)	
M15	A comprehensive disaster recovery/business continuity plan that describes how all information systems will be restored does not exist.

Benchmarking and Best Practice Information

ITIL refers to the subject matter of this recommendation as Contingency Planning. ITIL stresses the importance of proactive measures to reduce the risk of a disaster from occurring, in addition to how an organization will respond to a disaster. While this recommendation does focus on being responsive, considerations were made to best leverage "lessons learned" to be proactive, should an incident occur.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	3-5 Months	**Estimated Resource Effort**	960 Hours
Description	The estimated budget and staffing is based on the use of resources spending approximately 960 hours over three to five months.		

Action Items to Implement Recommendation

- ☑ Identify Project Team to develop Disaster Recovery and Business Continuity Plan
- ☑ Engage a consultant to conduct a Risk Assessment
- ☑ Document current business processes
- ☑ Develop Disaster Recovery and Business Continuity Plan
- ☑ Continually update and test the Plan

Anticipated Benefits

- ☑ Increased risk mitigation
- ☑ Improved business continuity
- ☑ Decreased downtime
- ☑ Preservation of critical data

4.2 Applications Recommendations

I - Conduct an ERP Business Process and Needs Assessment Analysis

Recommendation Description

It was reported by APS departmental staff as well as IS staff that some challenges exist in the current environment with business processes related to STARS and that there is a desire among APS staff for greater use of existing functionality such as workflow. It was also reported that functionality available in traditional Enterprise Resource Planning (ERP) systems is not currently used at APS either due to the choice of APS staff or due to a lack of functionality in the STARS system.

BDMP recommends that APS consider three tasks to begin addressing the findings related to this issue.

Task 1 Conduct an Enterprise wide Business Process Analysis. This analysis could be conducted by internal APS staff or by outside consultants. APS currently has one to two vacant positions in the Enterprise Services group. One of these positions could be filled by a business analyst that could work with APS departments and the IS staff that support STARS to document the current business processes and how STARS is used to perform the business processes. The analysis should focus on all business processes that currently involve STARS. Business process diagrams should be completed to indicate processes that are manual and those that are automated by STARS. This analysis will assist APS in understanding where processes could be modified to include STARS and also identify those processes that are currently manual. The business process analysis will serve as a basis for an organizational wide needs assessment.

Task 2 Conduct an ERP Needs Assessment. BDMP recommends that APS conduct an enterprise wide ERP needs assessment. Using the business process analysis as a starting point, APS should identify both the business and technical needs of APS that are not currently being met by STARS. The information can be collected through focus group meetings, user surveys and demonstrations of the existing STARS functionality. Once the needs of APS have been documented, the next step would be to conduct a gap analysis to identify those needs that are being met by STARS and those that require additional functionality.

Task 3 Develop ERP Functional and Technical Requirements. Using the information collected as part of the business process diagramming and needs assessment process, APS should develop a detailed list of business and technical requirements for STARS. APS should share this list with Oracle and develop a strategy for meeting the requirements. APS should also consider involvement in Oracle user groups that would allow them to understand how similar organizations are using the E-Business Suite to meet similar requirements.

The information collected during this process can assist APS in determining if replacing STARS should be a long term strategy. APS, based on the results and outcome of Task 3, would then be in a position to decide whether to issue the requirements list and other developed documentation to ERP vendors through either a Request for Proposal (RFP) or a Request for Information (RFI) process to better understand the functionality and options available in other systems.

As an additional option to this recommendation, we believe APS could first develop and issue a high level RFI to ERP vendors that provides APS with information about initial and on-going costs, software modules offered, and similarity of ERP vendor client base in comparison to APS. This

preliminary RFI process would help APS refine the focus of the tasks described above and compare costs of ERP software alternatives.

STARS Staffing

Staffing related to STARS was one of the issues that BDMP reviewed as part of this project. While the staff level related to supporting STARS from a development standpoint in Enterprise Solutions appears to be appropriate to meet the needs of APS, additional staff are needed to serve as business analysts between APS departments and the Enterprise Solutions group. APS should consider that one of the vacant positions in Enterprise Solutions be filled by a business analyst. This position would be responsible for understanding the functionality offered in STARS, the business processes in APS departments that require the use STARS, how STARS is used to complete business processes, the impact of new releases and the functionality offered in subsequent releases of the Oracle E-Business Suite.

Recommendation Source Information	
Functional Area:	Application Issues

Related Finding(s) and Issues(s)	
A1	There is a desire at APS for greater use of workflow functionality within the ERP system (STARS).
A2	The manner in which the STARS Budgeting module is being used by APS has made Position Control problematic.
A10	There is not a clear responsibility for who owns the management of project costing in the STARS ERP system.
A11	Grants and Projects are manually tracked in an Excel spreadsheet.
A12	A lack of integration of APS applications necessitates the use of manual workarounds.
A14	APS is currently using a third-party vendor for Applicant Tracking (Winocular).

Benchmarking and Best Practice Information

As part of the planning for new systems, organizations typically conduct needs assessments, business process analysis and requirements gathering projects to assist in identifying the goals and objectives for new systems. These processes assist in defining an implementation and system configuration strategy.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	12 months	**Estimated Resource Effort**	1,200 Hours
Description	This recommendation could take up to 12 months for all three tasks.		

Action Items to Implement Recommendation

- ☑ Determine if internal APS resources will be used to develop business processes analysis, needs assessment and requirements documentation
- ☑ Document and diagram business processes
- ☑ Conduct a gap analysis to understand needs of APS that are being met by APS and those processes that are being performed manually
- ☑ Based on the business processes analysis and needs assessment process, develop a list of

functional and technical requirements
- ☑ Become involved in vendor (Oracle) user groups to understand how other similar organizations are meeting similar requirements as APS
- ☑ Discuss unmet requirements with Oracle to understand options for meeting requirements
- ☑ Hire a business analyst for Enterprise Services group
- ☑ Issue an RFI to the vendor community to understand functionality available in other systems and potential maintenance costs

Anticipated Benefits

- ☑ Documented business processes
- ☑ Gap analysis of current requirements
- ☑ Requirements documentation to assist in future STARS configuration decisions
- ☑ Greater understanding of STARS functionality
- ☑ Increased collaboration between APS departments and Enterprise Solutions
- ☑ Documentation developed can assist APS in the decision making process related to the long term viability of STARS

J - Develop policies and procedures to improve data quality in applications

Recommendation Description

As part of the fact finding interviews, many APS staff reported a need to track data outside of existing enterprise wide systems such as eSchoolPlus and STARS. There were several reasons provided including a lack of data fields to store data, unfamiliarity with the functionality in existing systems, reported lack of functionality to meet reporting needs, and a lack of understanding in how reports are developed based on existing data fields. When compared with other similar school districts contacted during the benchmarking process, APS has taken steps to address enterprise wide needs by already having an Enterprise Resource Planning (ERP) and Student Information System (SIS) implemented and in use. Some districts have either an ERP or SIS, while others are in the process of selecting systems.

BDMP recommends that APS implement the steps in this recommendation to address the data quality and tracking issues identified by APS staff. This recommendation should be addressed in conjunction with recommendation I (Business Process Analysis and Needs Assessment for STARS) and recommendation K (Business Process Analysis and Needs Assessment for eSchoolPlus). The information collected and the approach developed as part of recommendations I and K will directly impact the decisions made related to this recommendation.

BDMP recommends the following steps to begin to address the findings related to this recommendation:

1. **Update the existing data dictionary.** It was reported that at one time a data dictionary had been developed that contained definitions for data in eSchoolPlus and STARS. BDMP recommends that the data dictionary be updated to reflect the current environment at APS. Publishing an updated data dictionary that describes the fields available in both systems and their purpose will allow APS to educate all users of the systems and work towards reducing data entry errors resulting from data being entered into incorrect fields.
2. **Create business rules for validating data.** APS should consider developing business rules for the validation of data. In some cases, the business rules can be configured in STARS or eSchoolPlus that will limit or restrict the type of data entered into a field. Where automation is not available, APS should develop business rules that guide the data entry standards.
3. **Identify a single source for managing student data.** APS should consider identifying a single resource (such as registrar) for managing all student data. This will assist in reducing the amount of data entry errors and work towards building consistency within student data.
4. **Work with SunGard to potentially retire APSNet.** As part of the requirements and needs developed as part of recommendation K (Business Process Analysis and Needs Assessment for eSchoolPlus), BDMP recommends that APS work with SunGard to incorporate the data storage and reporting needs within eSchoolPlus so that the APSNet application can potentially be retired.
5. **Reduce number of "data pockets".** APS should identify the data that is currently being stored in MS Access and Excel and eliminate those systems by bringing the data into STARS and eSchoolPlus whenever possible.
6. **Conduct regularly scheduled data audits.** BDMP recommends that data audits be conducted on a regularly scheduled basis for STARS and eSchoolPlus to identify data conditions that need to be corrected.

Recommendation Source Information			
Functional Area:	Application Issues		
Related Finding(s) and Issues(s)			
A3	APSnet is used to store critical data due to limited functionality in eSchoolPlus.		
A6	Data quality and data standards are a concern for application users at APS.		
A15	Challenges exist with tracking and reporting teacher certification and professional development information.		
Benchmarking and Best Practice Information			
When compared with other similar school districts contacted during the benchmarking process, APS has taken steps to address enterprise wide needs by already having an Enterprise Resource Planning (ERP) and Student Information System (SIS) implemented an in use. Some districts have either an ERP or SIS, while others are in the process of selecting systems. It is important that APS take "the next step" and work to standardize the way data is handled, where it is stored and how reporting is handled.			
Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	6 months	**Estimated Resource Effort**	960 Hours
Description	It is estimated that this recommendation would take 960 hours to complete the tasks described.		
Action Items to Implement Recommendation			
☑ Address in conjunction with recommendations I and K. ☑ Update existing data dictionary ☑ Develop business rules for validating data ☑ Eliminate disparate systems used for tracking data that can be stored in eSchoolPlus and STARS ☑ Work with SunGard to potentially retire APSNet by having the capability to move data stored in APSNet into eSchoolPlus ☑ Conduct scheduled data audits ☑ Identify owners of data responsible for ensuring data integrity ☑ Implement reporting tool that can go across multiple systems ☑ Synchronize teacher certification data between eSchoolPlus and STARS			
Anticipated Benefits			
☑ Reduction or elimination of standalone systems (MS Access, Excel) ☑ Ability to satisfy ad hoc report requests with less manual intervention ☑ Ability to provide state and federal reports with less manual intervention ☑ Increased end user confidence in reports and data ☑ Greater access to student data in a single source ☑ Reduction in the time needed to produce reports			

K - Conduct an SIS Business Process and Needs Assessment Analysis

Recommendation Description

It was reported by APS departmental staff as well as IS staff that challenges exist in the current environment related to using eSchoolPlus to track student related data, produce reports and assist in overall planning. When compared with the challenges faced by APS related to STARS, IS leadership expressed concern that there is a greater need to examine and improve capabilities and functionality related to eSchoolPlus, and associated business processes.

BDMP recommends that APS consider three tasks to begin addressing the findings related to this issue.

Task 1 Conduct an Enterprise wide Business Process Analysis. This analysis could be conducted by internal APS staff or by outside consultants. APS currently has one to two vacant positions in the Enterprise Services group. One of these positions could be filled by a business analyst that could work with APS departments and the IS staff that support eSchoolPlus to document the current business processes and how eSchoolPlus is used to perform the business processes. The analysis should focus on all business processes that currently involve eSchoolPlus. Business process diagrams should be completed to indicate processes that are manual and those that are automated by eSchoolPlus. This analysis will assist APS in understanding where processes could be modified to include eSchoolPlus and also identify those processes that are currently manual. The business process analysis will serve as a basis for an organizational wide needs assessment.

Task 2 Conduct an SIS Needs Assessment. BDMP recommends that APS conduct an enterprise wide SIS needs assessment. Using the business process analysis as a starting point, APS should identify the needs of APS that are not currently being met by eSchoolPlus. The information can be collected through focus group meetings, user surveys and demonstrations of the existing eSchoolPlus functionality. Once the needs of APS have been documented, the next step would be to conduct a gap analysis to identify those needs that are being met by eSchoolPlus and those that require additional functionality. APS is currently participating in demonstrations from other SIS vendors to understand functionality available in the market place today. APS should leverage the information collected through this process to further identify additional needs.

Task 3 Develop SIS Functional and Technical Requirements. Using the information collected as part of the business process diagramming and needs assessment process, APS should develop a detailed list of business and technical requirements for eSchoolPlus. APS should share this list with SunGard and develop a strategy for meeting the requirements. APS should also consider involvement in SunGard user groups that would allow them to understand how similar organizations are using eSchoolPlus to meet similar requirements.

The information collected during this process can assist APS in determining if replacing eSchoolPlus should be a long term strategy. APS, based on the results and outcome of Task 3, would then be in a position to decide whether to issue the requirements list and other developed documentation to ERP vendors through either a Request for Proposal (RFP) or a Request for Information (RFI) process to better understand the functionality and options available in other systems.

Should APS decide that continuing to use eSchoolPlus is in the best interest of the school district, it will be important to adequately plan for the activities that will need to take place to address the needs identified as part of conducting the SIS Needs Assessment. The analysis and activities needed to

mitigate some of the challenges with the current eSchoolPlus configuration will be similar to the activities that would take place for an implementation of a new SIS. For example, APS will need to plan for and adequately staff activities including:

- Design and configuration sessions
- Conference Room Pilots (CRP) sessions to validate the configuration settings
- User Acceptance Testing
- End user training
- Pilot
- Go-live
- Post go-live support activities

It will be important for APS to design a project schedule in collaboration with the current SIS vendor to ensure appropriate activities are planned for and completed as part of a "re-implementation" of the current SIS if that is the approach APS chooses.

SIS Staffing

Staffing related to eSchoolPlus was one of the issues that BDMP examined as part of this project. While the staff level related to supporting eSchoolPlus from a development standpoint in Enterprise Solutions appears to be appropriate to meet the needs of APS, additional staff are needed to serve as business analysts between APS departments and the Enterprise Solutions group. APS should consider that one of the vacant positions in Enterprise Solutions be filled by a business analyst. This position would be responsible for understanding the functionality offered in eSchoolPlus, the business processes in APS departments that require the use eSchoolPlus, how eSchoolPlus is used to complete business processes, the impact of new releases and the functionality offered in subsequent releases of eSchoolPlus.

Recommendation Source Information	
Functional Area:	Application Issues
Related Finding(s) and Issues(s)	
A4	APSnet and eSchoolPlus are not integrated in a manner that supports efficient sharing of data.
A5	The current eSchoolPlus configuration does not allow the system to easily produce all State reports.
A9	Report generation from eSchoolPlus and other APS applications require significant manual configuration, data manipulation and data clean-up.
A13	The configuration of eSchoolPlus is not optimized for the business needs of APS.

Benchmarking and Best Practice Information

During the benchmarking and research it was determined that while several similar school districts are using eSchoolPlus, other districts have conducted evaluation processes and selected SIS other than eSchoolPlus. For example, Virginia Beach school district reported performing an evaluation and procurement process and selected a different system than eSchoolPlus.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	12 – 14 months	**Estimated Resource Effort**	1,200- 1,400 Hours
Description	This recommendation could take up to 12 months for all three tasks. When compared with the STARS initiative, this recommendation involves a larger stakeholder group and could take additional time to ensure that all appropriate stakeholders are involved.		

Action Items to Implement Recommendation

- ☑ Determine if internal APS resources will be used to develop business processes analysis, needs assessment and requirements documentation
- ☑ Document and diagram business processes
- ☑ Conduct a gap analysis to understand needs of APS that are being met by APS and those processes that are being performed manually
- ☑ Based on the business processes analysis and needs assessment process, develop a list of functional and technical requirements
- ☑ Become involved in vendor (SunGard) user groups to understand how other similar organizations are meeting similar requirements as APS
- ☑ Discuss unmet requirements with SunGard to understand options for meeting requirements
- ☑ Hire a business analyst for Enterprise Services group
- ☑ Issue an RFI to the vendor community to understand functionality available in other systems and potential maintenance costs

Anticipated Benefits

- ☑ Documented business processes
- ☑ Gap analysis of current requirements
- ☑ Requirements documentation to assist in future eSchoolPlus configuration decisions
- ☑ Greater understanding of eSchoolPlus functionality
- ☑ Increased collaboration between APS departments and Enterprise Solutions
- ☑ Documentation developed can assist APS in the decision making process related to the long term viability of eSchoolPlus
- ☑ Greater understanding of data needs
- ☑ Assist in developing a strategy for where student related data needs to be stored
- ☑ Serve as a foundation for improving data quality

4.3 Technology Recommendations

L - Conduct a Needs Assessment for a Document Management System

Recommendation Description

Many functional areas within APS have recognized the need for a document management system (DMS), and many more could gain efficiencies from this type of system. Currently, documents are stored mostly in paper form. While APS is scanning and storing some documents, it is not leveraging a true DMS and the capabilities these systems offer.

A DMS can significantly streamline workflow within departments at APS. Additionally, reducing the reliance on retaining paper documents will free physical space within the buildings at APS. While some documents will still need to be retained in paper form, infrequent access and storage in environmentally controlled locations outside of APS' buildings will maintain integrity of documents.

APS faces significant legal issues, State laws and guidance on records management, web content management, file name conventions, the State's records retention schedules and other recommended retention policies at the State and Federal level. To date, there have been instances where APS has had to devote considerable effort to satisfy particular requests for information. APS must maintain a strong understanding of these guidelines, and look for updates when rules are changed.

BDMP recommends that APS conduct a Needs Assessment for a document management system based on the increased functionality that will be offered through the completion of current and planned projects as well as the recommendations contained in this report. This assessment should consist of three activities:

Activity 1: Develop list of document management requirements – APS should first develop a complete understanding of all of the requirements related to document management. Documentation should be developed of the regular reporting requirements that must be satisfied as well as the types of information that may be requested which APS would need to provide. An effective way to manage the development of this documentation may be to assign a single resource as the central point of contact responsible for this effort. This individual should then involve resources in the functional areas to understand their needs related to document retention.

Activity 2: Assess ability to satisfy requirements – Based on APS' understanding of the requirements related to document management, APS should assess how their current systems and processes satisfy these requirements. This could be accomplished by test scenarios which ask particular functional areas to produce historical documentation. The results of the scenarios will show both the actual ability of departments to produce requested documents, but also the time and number of resources the requests took to satisfy.

Activity 3: Develop Action Plan – Following the assessment of APS' ability to satisfy the requirements related to document management, APS should develop an action plan to improve the current capabilities. Possible solutions will likely range from leveraging functionality in existing APS applications to implementing a document management system for a particular functional area within APS to implementing a full enterprise-wide document management system.

This recommendation considers how APS should proceed to reach the point that it will need to decide how to improve its current capabilities related to document management. Based upon the action plan

that APS decides to follow, best-practices related to system procurement and change management should be followed.	
Recommendation Source Information	
Functional Area:	Technology Issues
Related Finding(s) and Issues(s)	
T1	APS does not have a single enterprise-wide document/records management system.
Benchmarking and Best Practice Information	
With increased regulations related to how documents are managed, many of the schools contacted as part of the best practice research are currently engaged in projects to implement document management capability. Most schools have only completed preliminary steps to implement a document management system and have expressed lessons learned related to conducting a thorough assessment of the organization's needs. Given the large impact of such a system, it was recommended that this first step is given a large emphasis.	

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	6 Months	**Estimated Resource Effort**	480 Hours
Description	The hours estimate is based on a resource spending approximately 480 hours over a six month timeframe to complete the recommendation.		

Action Items to Implement Recommendation

- ☑ Identify primary resources to collect document management requirements/standards
- ☑ Consult functional area resources to develop a list of all document management requirements/standards
- ☑ Assess APS' ability to satisfy document management requirements/standards
- ☑ Develop an action plan to improve APS' ability to satisfy document management requirements/standards

Anticipated Benefits

- ☑ A reduction in the abundance of paper-based and disparate systems throughout APS coupled with the use of electronic media will create efficiencies for every functionality area within APS
- ☑ Increased efficiency with computerized access to files
- ☑ Increased document security
- ☑ Improved compliance with State and Federal regulations

M - Conduct a Network Analysis

Recommendation Description

As APS implements many new technologies as part of the Platform Replacement Project, it is important that the network is able to support the new systems and technologies. The performance of new technologies, whether it be speed or reliability is important in the user adoption process. BDMP recommends that APS conduct a Network Analysis to better understand where improvements could be made to ensure reliable performance of the network.

BDMP recommends that APS consider utilizing external resources for all or part of this recommendation. The value of external resources for this type of effort is that they can provide a new perspective based on current technologies available in the marketplace and other organizations. Given that the network at APS is largely designed and managed by only a few resources, this approach may be especially valuable.

Several areas should be considered part of this analysis:

- **Security Assessment.** BDMP recommends that APS retain the services of external resources to conduct a Security Assessment. Such an assessment will consist of the review of documentation, current network configuration, current hardware in place, and will include testing of network components. Such an assessment should be based on modern standards as documented by organizations such as the Information Systems Audit and Control Association (ISACA).

- **Wireless connectivity.** Some users reported inconsistent performance of the wireless networks in certain locations. BDMP recommends that IS resources test some of these reported locations to find areas of inconsistent wireless performance. As IS implements 802.11n standard wireless technology as part of the Platform Project, many areas of inconsistent performance may be addressed. The Virginia Department of Education cautions organizations as to the security implications of wireless connectivity: "Since the network range may extend beyond the walls of the building, it can be accessed from outside…consider the equipment's security features to ensure that only valid users have access to the network and that data is protected."[6] Currently APS plans to implement the most modern security equipment with the wireless upgrade and this should continue to be a major consideration.

- **Network configuration.** APS has long maintained two separate networks, one for administration and one for instruction. Historically, there was a need for two networks due to a lack of appropriate security tools to limit information sharing between these two areas. BDMP recommends that APS consider the effectiveness of modern tools to allow for only a single network.

- **Network hardware.** APS currently has some pieces of network hardware that are in need of replacement. IS should ensure that the projects within the Platform upgrade will address these instances of outdated hardware. If not, additional steps should be taken to modernize these components.

[6] Virginia Department of Education, Division of Technology and Career Technology: Educational Technology Guidelines. May 2008.

The Network Analysis will result in the need for additional projects and initiatives. As these are identified, it will be important that IS prioritizes them in order to best utilize the limited time and resources available.

Recommendation Source Information	
Functional Area:	Technology Issues

Related Finding(s) and Issues(s)	
T2	Best practices related to security and risk management are not fully implemented within the IS Department to protect APS.
T6	The wireless network at APS has multiple areas where performance is inconsistent.
T7	IS maintains two separate networks throughout APS.
T12	While the implementation of a new platform is underway, the current APS network has areas of potential security weaknesses.
T15	Critical network hardware in place in APS is outdated.

Benchmarking and Best Practice Information

The Arlington Department of Education provides guidance on network security that was considered as part of the development of this recommendation. In addition, schools contacted during benchmarking research cautioned that wireless expansion can create a large level of increased support demands from end users.

Estimated Duration and Budget/Staffing Recommendation

Estimated Duration	3-6 Months	**Estimated Resource Effort**	200-300 Hours for Network Analysis and 150-200 for Security Assessment
Description	The estimated hours is based on a resource needed for 200-300 hours to conduct a network analysis and 150-200 hours to conduct a security assessment.		

Action Items to Implement Recommendation

- ☑ Identify resources to conduct a Security Assessment
- ☑ Analyze primary areas of the network
- ☑ Develop projects and initiatives to address the findings of the network analysis

Anticipated Benefits

- ☑ Improved security of the network
- ☑ Increased performance of the network, including speed and availability
- ☑ Ability to leverage newer network technologies
- ☑ Improved end user satisfaction with network performance

N - Analyze and consider implementing VoIP technology

Recommendation Description

Currently APS uses a Mitel phone system and has made significant infrastructure upgrades towards supporting VoIP technology. A documented plan to upgrade the remaining infrastructure does not exist and a budget has not been secured to complete the transition. While costly to implement initially, VoIP phone systems offer significantly improved performance, additional functionality and can reduce support costs.

BDMP recommends that APS re-evaluate the long term viability of the existing telephone system by developing a request for information (RFI) and issuing it to the vendor community. This will allow APS the opportunity to compare the implementation costs as well as the total cost of ownership and potential return on investment for a VoIP system over a 5 to 10 year period.

Recommendation Source Information

Functional Area:	Technology Issues

Related Finding(s) and Issues(s)

T8	APS does not use Voice Over Internet Protocol (VoIP) technology for telecommunications.

Benchmarking and Best Practice Information

Two of the organizations contacted during the benchmarking research currently use VoIP technology. VoIP is becoming the industry standard for enterprise wide phone systems.

Estimated Duration and Budget/Staffing Recommendation

Estimated Duration	1 month	**Estimated Resource Effort**	240 hours
Description	The duration and estimated staffing are based on time to develop an RFI and issue it to vendors, followed by time to analyze responses and estimates total cost of ownership for VoIP over a 5 and 10 year period.		

Action Items to Implement Recommendation

- ☑ Re-evaluate the viability of the current Mitel system
- ☑ Develop a non-binding Request for Information (RFI) and issue it to the vendor community to understand the current market offerings and their potential costs
- ☑ Analyze the total cost of ownership over a 5 and 10 year time period

Anticipated Benefits

The anticipated benefits of a VoIP system can include:

- ☑ Current, more reliable technology.
- ☑ Better availability of support and replacement parts.
- ☑ Opportunities to introduce and leverage new features such as PC integration for faxing to the desktop.

O - Complete the Platform Infrastructure Replacement Project

Recommendation Description

APS is currently undertaking a large-scale infrastructure replacement project. The project is described in a Concept Plan developed by multiple stakeholders at APS which contains approximately 20 sub-projects divided into three phases. The project originated from the need to replace numerous outdated technologies and it was soon realized that due to many interdependencies in the technology environment, other additional technologies would also need to be replaced or upgraded. Many of the projects now contained in the Concept Plan are critical in allowing IS to continue to advance technologically and provide services to APS based on recent technological advances. As a result, IS recognizes the need to expedite many of the projects in the plan and upgrade the aging platform as soon as possible. This issue has created an approach for replacing the platform where overall project management best practices including detailed planning and scheduling cannot be fully leveraged or utilized. It was stated by IS that they are operating essentially in an "emergency mode" to complete the implementation of the new platform, and therefore detailed project planning could have been improved if urgency was not required to address current organization risks.

It was reported that the Concept Plan for Infrastructure Replacement proposes a design based on simplicity, mobility and collaboration. The Concept Plan consists of three phases with 20 linked sub-projects. The projects related to each phase of the concept plan are summarized in the table below.

Concept Plan Phases and Sub-Projects	
No.	**Sub-Project**
Phase 1	
1	eMail Archiving
2	Critical Infrastructure Upgrade
3	Unique Identity System
4	Active Directory
5	Automated Account Provisioning
6	Unified Network Services Gateway
7	Wireless Capacity and Technology Expansion
8	Workstation Deployment and Management
Phase 2	
1	Local Storage and Backup
2	Legacy and Exceptional Applications
3	Cloud Productivity
4	eMail Platform Change
5	Network Intrusion Detection

Phase 3	
1	Windows 7 – Admin
2	Windows 7 – Instruction
3	Cloud Storage
4	PSX Support
5	iOS Support
6	Office 2010
7	Novell Infrastructure Retirement

Currently, some sub-projects have already been initiated as part of Phase 1 of the Concept Plan. The goal of the Concept Plan is to upgrade the core system environment to better enable Information Services to be responsive to the changing technology needs of APS. Based on the current state of the core systems environment and the list of sub-projects developed to improve it, the technical perspective the Concept Plan represents is an effective plan to greatly improve the core information systems environment. If implemented properly, APS will benefit from increased functionality and improved efficiency achieved through the use of more modern, reliable and capable technologies. The Concept Plan is very ambitious and includes rapid changes to the current computer infrastructure. If these changes are made in rapid succession without adequate testing, training and tuning the stability and desired capabilities of the new system could be impacted.

Implementing new technologies will bring challenges that are not always recognized early on in an implementation. When implementing a large-scale systems environment upgrade, care must be given to understand how the new technologies will interact with each other and the user community.

Although it is suggested in the Concept Plan that new systems will require less specialized support, the model proposed will not guarantee a reduction in specialized support. Workstations, servers, databases and network devices will remain in need of specialized support. Core applications, such as the baseline applications proposed will still need to be supported and updated for the user community. Furthermore, virtual systems also require specialized support skills.

The applications proposed in the Concept Plan also have larger implications on the IS Department. The use of virtual desktop systems and web-applications have many positive aspects, among them cost savings and increased application security. The Concept Plan addresses many of the modern technologies available that will help improve the core system environment at APS. In general, it represents a plan to replace older technologies and IS management techniques with more current and proven technologies. As the Plan is initiated, it is likely new technologies will continue to be introduced, tested and become viable alternatives; therefore, on-going changes or adjustments will likely be required as the Plan is executed.

Since this recommendation is already in the process of being implemented, BDMP recommends that the IS department continue with the implementation of the plan, however it is strongly recommended that the recommendations in this report related to project management standards, requirements documentation and the development of Service Level Agreements (SLA) be implemented in conjunction with the platform plan. In addition, BDMP recommends that a formal end user group be created to review and approve the business requirements for the platform plan.

Implementing the concept plan will require a high level of focused project management to ensure that goals and objectives of the plan are met and that projects in the plan remain on schedule and within budget. The IS Department is constrained by the need to have the technologies in the plan ready for end user training by August 2011. Due to this, we recommend that APS identify and develop contingency plans should some of the key planned capabilities of the infrastructure replacement need to be delayed in order to meet the planned project deadlines.

Recommendation Source Information	
Functional Area:	Technology Issues

Related Finding(s) and Issues(s)	
T13	The standard technology platform in use throughout APS is outdated.
T14	The workstation management/application delivery system is overly complex and inefficient.
T16	The APS email system is outdated.

Benchmarking and Best Practice Information

BDMP recommends that the IS Department leverage project management processes advocated by PMI as well as best practices related to the implementation of new systems and technologies as described by ITIL.

Estimated Duration and Budget/Staffing Recommendation			
Estimated Duration	The implementation of the platform needs to be completed and transitioned to IS support by September 2011.	**Estimated Resource Effort**	See Description Below
Description	APS currently has several outside consultants assisting in the development of the technical design for components of the platform plan. The budget, staffing and duration to implement the technologies in the plan are still being finalized.		

Action Items to Implement Recommendation

- ☑ Develop a detailed project schedule and plan for each of the projects in the platform plan
- ☑ Incorporate the designs provided by the outside consultants into the plan
- ☑ Where possible, document business and technical requirements for projects in the platform to ensure goals and objectives of the new platform are met
- ☑ Create a formal end user group to review and approve the business requirements for the platform plan
- ☑ Test the new platform technologies prior to training
- ☑ Train end users on new platform technologies
- ☑ Transition support of new platform technologies to IS support group
- ☑ Incorporate project management best practices throughout the implementation of the plan including monitoring and reporting project risks and issues, creating a decision log to track important decisions made, monitor progress against requirements and report project status on a regular basis

Anticipated Benefits
☑ Increased network security ☑ Improved remote access capability for APS staff ☑ Ability to leverage functionality in latest version of productivity tools including MS Office, Windows 7 and Outlook ☑ Streamlined user account management processes through the use of Active Directory and Front Line Identity Manager ☑ Email archiving and backup ☑ Increased data storage capability ☑ Workstation deployment process efficiencies ☑ Ability to leverage newer technology to meet APS goal of “access anytime, from anywhere with any device”

5.0 Next Steps

This section of the report outlines the next steps that APS may take to implement the recommendations contained in the report.

The findings and issues identified during the course of any IT assessment project are critical by nature. Many organizations do not take the opportunity to undertake a project of this scope to analyze and improve existing processes and systems. Implementing the recommendations identified in this report is a first step towards continuing to build upon the good work and quality services provided by the IS Department.

Implementing the recommendations in this report will in some cases greatly impact current APS and IS department business processes and will require a high level of project management related work. Planning, selecting, deploying, and managing for improved systems, new technology and revised policies and procedures will require strong leadership, and comprehensive planning. As new technologies, and revised policies and procedures are implemented, APS will need to actively communicate the services and benefits to both internal and external stakeholders. The IS Department should consider the following requirements that implementing the recommendations in this report necessitate:

1. Active management involvement and sponsorship will be critical to the successful adoption and continued support of the recommendations.

2. Allocating resources will become critical; establishing clear commitments from all internal IS resources and external IS customers will become increasingly important.

3. In the instances where a recommendation will need to be implemented as part of a project or initiative, it will be important that project goals and objectives are communicated to stakeholders and progress proactively monitored.

4. Business processes should be evaluated, and where necessary, redesigned to leverage new technologies (such as the new platform) in order to meet the IS Department's desired objectives.

5. Management should be proactive in their change management roles as not all changes will be technical in nature. Adopting the recommendations may create shifts in responsibilities, process changes, and policy adjustments. Effective change management for IS and APS staff will be a critical success factor in ensuring that the recommendations are implemented effectively and achieve desired results.

The final step of this assessment project is to prioritize the recommendations and assign the necessary activities to implement them based on priority. The IS Department plans to prioritize the recommendations in this report working collaboratively with other APS departments. BDMP recommends that APS consider the following steps as they prioritize the recommendations in this report:

1. **Identify Prioritization Project Team.** Similar to the approach to developing the Project Team for the IS Review Project, the team that will prioritize the recommendations should include

representative members of each functional area, both within IS and from additional user groups. This approach can provide multiple perspectives on the prioritization of the recommendations.

2. **Determine and Assign Priority Levels.** In order to prioritize the recommendations, a common understanding of the priorities that will be used to rank the recommendations must be reached. BDMP recommends APS consider three priority levels for prioritizing the recommendations. The recommended priority levels are summarized in the following table.

Recommendation Priority Levels	
Priority Level	**Description**
High	High priority recommendations should be addressed in the next six months.
Medium	Medium priority recommendations should be addressed in six to 12 months.
Low	Low priority recommendations should be addressed in 12-18 months.

Table 20: Recommendation Priority Levels

Once the priority levels have been determined, the Project Team should assign a priority to each recommendation based on the number of issues the recommendation addresses, the availability of staff resources and its overall impact on APS using a group scoring process. The scoring process should be done by each member of the Project Team. Since there are 15 total recommendations, it is recommended that five recommendations be categorized as High, five as Medium, and five as Low priority recommendations. This will ensure an even distribution of scores. Once the averages from all team members are calculated, the final priority level can be assigned to each recommendation.

3. **Understand Resource and Budget Constraints.** The Project Team should understand the level of available resources and available budget to assist with determining the number of projects that can be performed in each of the next two years. Where possible, available resources should be named along with the amount of time they may devote to projects.

4. **Map Projects and Initiatives Over Two Years.** Once priorities assigned to each recommendation and an understanding of resources and budget constraints, the Project Team can then plan the implementation of the recommendations over a two-year period.

5. **Assign Resources and Budgets.** Once the recommendations have been planned over a two year period, the Project Team can begin to assign resources and budgets for each recommendation. This final step will likely involve additional resources beyond the Project Team as department leads and other members of IS Leadership will need to be involved.

The following table is a sample that depicts a hypothetical scoring outcome based on a scoring Project Team of ten people.

Sample Prioritized Recommendations Table			
ID	**Recommendation**	**Score**	**Priority**
A	Recommendation A	30	High
B	Recommendation B	29	High
C	Recommendation C	29	High
D	Recommendation D	28	High
E	Recommendation E	27	High
F	Recommendation F	23	Medium
G	Recommendation G	22	Medium
H	Recommendation H	20	Medium
I	Recommendation I	17	Medium
J	Recommendation J	16	Medium
K	Recommendation K	14	Low
L	Recommendation L	14	Low
M	Recommendation M	11	Low
N	Recommendation N	10	Low
O	Recommendation O	10	Low

Table 21: Sample Prioritized Recommendations Table

Appendix A: Information Services Checklist

This appendix contains the completed Information Services Checklist. The checklist was developed based on standards prescribed in the Information Technology Infrastructure Library (ITIL) Version 3. BDMP completed the checklist based on the information gathered during the IS Review Project.

IS Function/Process	Response Summary
Service Design	
Does a disaster recovery plan exist?	It was reported that APS does not have a current disaster recovery plan for enterprise-wide information systems. Particular components of the system environment do have disaster recovery plans; however, a master plan to restore business continuity in the event of a disaster does not exist.
Security Management	
Describe the process for testing security mechanisms.	It was reported that APS does not have a documented process for testing security mechanisms. Regular monitoring of security mechanisms does occur, however performance statistics or "checklists" do not exist to document the operation of these components.
Describe the process for managing security incidents.	It was reported that APS does not have a documented process for managing security incidents. Historically, security incidents at APS have been few and with little impact. In the event of an incident, resources in the appropriate departments are quickly assigned to a resolution strategy.
Describe how and how often security control processes are reviewed.	It was reported that security control processes are not reviewed on a prescribed basis. Instead, processes are typically reviewed upon the implementation of a new technology in the APS system environment.
Compliance Management	
Does the IS department keep a register of all compliance standards that must be met?	It was reported that the IS Department does not maintain a central register of all of the compliance standards that must be met. Although BDMP did not perform a complete audit of compliance, it was observed that APS largely maintains compliance with respective standards. As some technologies in place at APS fall further behind industry standards it will be an increasing challenge to maintain compliance, however.
Does the IS department maintain documented policies and procedures?	The IS department maintains documented policies and procedures for several areas of IS operations. However, policies do not exist for many processes including several of significance including areas of security and user access privileges.

IS Function/Process	Response Summary
Does a blueprint for future development of the technological infrastructure exist?	APS has developed the Concept Plan for Infrastructure Replacement which lays out a three-phased process to upgrade the infrastructure at APS enterprise-wide.
Service Transition	
Does the IS department have a documented change management process?	It was reported that APS does not have a documented change management process. Generally-followed guidelines are in place, however. These include the use of some change tracking tools, such as the case with Enterprise Services.
Does the IS department log all change requests?	The IS Department lost most change requests. This is done using multiple tools and separate processes. A single enterprise-process does not exist.
Does the IS department have a separate process for handling emergency change requests?	The IS Department does not have an official process for handling emergency change requests outside of the process for all requests. Typically, the nature of these requests will bring them to the attention of IS Leadership which results in them receiving a higher priority for resolution.
Does the IS department have a process for authorizing or rejecting change requests?	The IS does not have a documented process for authorizing or rejecting change requests. When requests for change are made, they are typically made by members of IS Leadership. This does not always involve a group of more than one or two individuals, however.
Project Management	
Does the IS department follow a documented project initiation phase of defining stakeholders, responsibilities and resources?	The IS Department does not maintain documented project management processes. The IS Department has many resources who are certified or who have received training of ITIL best practices. Although these practices have been implemented in some aspects of project management at APS, these processes are not documented.
Does the IS department follow a documented project planning process of defining deliverables, milestones, activities and resources?	The IS Department does not maintain documented project management processes. The IS Department has many resources who are certified or who have received training of ITIL best practices. Although these practices have been implemented in some aspects of project management at APS, these processes are not documented.
Does the IS department follow a documented project control process of monitoring progress and resource consumption?	The IS Department does not maintain documented project management processes. The IS Department has many resources who are certified or who have received training of ITIL best practices. Although these practices have been implemented in some aspects of project management at APS, these processes are not documented.

IS Function/Process	Response Summary
Release and Deployment Management	
Does the IS department have a documented process of issuing and supporting major release deployment?	It was reported that a documented process for issuing and supporting major release deployments does not exist. APS typically assigns particular resources to work with application vendors to manage the deployment of major releases.
Does the IS department have a documented process of issuing and supporting minor release deployment?	It was reported that a documented process for issuing and supporting minor release deployments does not exist. APS typically assigns particular resources to work with application vendors to manage the deployment of minor releases.
Does the IS department have a documented process of how the release is tested and quality-assured?	It was reported that a documented process for how releases are testing and quality assured does not exist.
Service Operation	
Does the IS department have a dedicated process for dealing with service requests?	Service requests are generally handled based on the nature of their requests. Multiple groups within IS are tasks with responding to requests. A single, documented process with an initial point of contact for all requests does not exist.
Does the IS department regularly review user access levels to ensure they are consistent with job descriptions?	It was reported that IS does not regularly review user access levels to ensure they are consistent with job descriptions. It was also reported that there currently are instances where users do not have the appropriate access levels to perform their job.
Does the IS department have documentation for the process of modifying user access levels?	IS does not have documentation for the process of modifying user access levels. It was reported that there have been instances in the past where requests for access changes have take multiple months to respond to.
Does the IS department have a documented process to verify all conditions are met for a new service to be activated?	It was reported that the IS Department does not have a documented process to verify all conditions are met for a new service to activated.
Operations Management	
Does the IS department have a documented process of communicating the status of systems to other departments?	It was reported that the IS department does not have a documented process of communicating the status of systems to other departments. Communications of system outages or down-time are typically communicated via mass-email. It was also reported that communications related to technology projects are communicated to the rest of APS through the “Friday letter.” Users reported varying levels of effectiveness of this communication method.
Does the IS department monitor and control process	IS infrastructure is located in secure areas in close

IS Function/Process	Response Summary
routines such as backup and restore activities, output management, and routine maintenance?	proximity to where IS staff work on a daily basis. There are limited times when staff are not present near the primary infrastructure locations. APS has implemented alarms and additional monitoring devices to critical components.
Does the IS department monitor the physical environment where the IS infrastructure is located to ensure the security of equipment and data?	The IS Department did not report any policies or procedures for monitoring the physical environment where the IS infrastructure is located, either documented or otherwise.
Service Evaluation	
Does the IS department issue regular satisfaction surveys to users?	The IS Department does not issue regular satisfaction surveys; however, as new technologies are selected and implemented, the IS Department typically consults the users through documented survey processes.

Appendix B: List of Findings and Issues

This appendix contains the complete listing of Findings and Issues that were identified. This list has been updated based on feedback from APS and additional meetings facilitated by BDMP.

No.	Finding or Issue
	Application Findings and Issues
A1	**There is a desire at APS for greater use of workflow functionality within the ERP system (STARS).** It was reported that the STARS application supports workflow functionality, such as routing approvals for purchases which is currently being used by the Finance Department for purchasing business processes. However, Finance reported a desire to configure workflow approvals based on categories of purchases and other business processes within APS could benefit from implementing workflow functionality.
A2	**The manner in which the STARS Budgeting module is being used by APS has made Position Control problematic.** It was reported that APS staff are exporting budgeting information from STARS into an MS Access database to calculate and run reports. Since some of the budgeting analysis is taking place in MS Access the ability to leverage the payroll and human resources information for position control is difficult.
A3	**APSnet is used to store critical data due to limited functionality in eSchoolPLUS.** It was reported that eSchoolPLUS does not accommodate storing certain critical data and as a result APSnet is being used to do so. This results in similar, or the same data residing in different systems and increases the time required for report generation.
A4	**APSnet and eSchoolPLUS are not integrated in a manner that supports efficient sharing of data.** It was reported that the lack of effective integration between APSnet and eSchoolPLUS creates redundant data entry and inefficiencies in sharing data between the two applications.
A5	**The current eSchoolPLUS configuration does not allow the system to easily produce all State reports.** It was reported that APS cannot easily generate State reports from eSchoolPLUS that are required by the State of Virginia. This leads to additional manual processes and lost productivity. In addition, this information is stored in another system separate from eSchoolPLUS.
A6	**Data quality and data standards are a concern for application users at APS.** It was reported by users of the SIS, Enterprise Resource Planning system (ERP - STARS) and other applications that an effort was made to assign “data ownership” for specific functional areas, but that this has not succeeded. In addition, data pockets exist beyond the applications in place in APS, and prescribed data audit practices are not widely used. The lack of confidence in current data quality impacts APS employees’ willingness to use Enterprise Applications and encourages siloed data repositories.

No.	Finding or Issue
A7	**Some applications in use in APS do not accommodate complete remote-access functionality.** The IS Department supports remote access to the APS network; however, some applications or components of applications are not accessible remotely. An example most referenced by users is EasyGradePro. Currently, the IS Department is considering replacing EasyGradePro with grade book functionality within eSchoolPLUS which will provide remote access functionality.
A8	**Updates of APS applications resulting in new or modified functionality are not adequately communicated to users.** As IS upgrades or modifies the configuration of applications used at APS, the implications to end-users are not always communicated. The result is that users are faced with unfamiliar interfaces that reduce productivity and users do not fully leverage new or updated functionality.
A9	**Report generation from eSchoolPLUS and other APS applications require significant manual configuration, data manipulation and data clean-up.** Reports are generated from multiple applications in use at APS for multiple purposes including assessment and planning and evaluation. With most applications, particularly with eSchoolPLUS, the reports that are generated are not complete and require a significant amount of time of IS Department resources for data manipulation and clean-up.
A10	**There is not a clear responsibility for who owns the management of project costing in the STARS ERP system.** Based on interviews with both Personnel and Finance Departments, it is not clear how APS currently tracks labor costs and cost allocations in the STARS system. It was reported that documented policies and procedures do not exist.
A11	**Grants and Projects are manually tracked in an Excel spreadsheet.** It was reported that APS implemented Oracle's Grants/Project module, but the functionality available is not being utilized by APS staff. Currently, grants are managed by downloading data from the General Ledger and importing to an Excel spreadsheet. This results in disparate data repositories.
A12	**A lack of integration of APS applications necessitates the use of manual workarounds.** Paper-based processes as well as the use of disparate MS Excel spreadsheets and MS Access databases are common in APS when data needs to be analyzed and reported among applications. The use of these tools occupies a large amount of time from IS and APS resources.
A13	**The configuration of eSchoolPLUS is not optimized for the business needs of APS.** It was reported that multiple instances of the system being incorrectly or incompletely configured result in many inefficiencies and manual process. For example, areas where "drop-down" menus do not contain relevant data necessitate manual entry and may create data errors.
A14	**APS is currently using a third-party vendor for Applicant Tracking (Winocular).** The STARS application does have an applicant tracking product (Oracle - iRecruitment) but APS has not implemented this functionality based on a decision by the Personnel Department. Currently, the Winocular application does not interface with STARS.

No.	Finding or Issue
A15	**Challenges exist with tracking and reporting teacher certification and professional development information.** It was reported by APS users that certification data is maintained within STARS and professional development data in the ERO system. This presents challenges with reporting these two areas information together, which currently relies on manual processes utilizing MS Excel. In addition, some certification information is used in eS+, but information is not easily transferred due to a lack of integration of applications.
	IT Management Findings and Issues
M1	**The current IS organizational structure is not optimized to assist APS in meeting the overall needs of the organization.** Several IS and APS staff reported challenges associated with the current organizational structure in the IS Department. Prior to the current IS Assistant Superintendent joining APS, multiple reorganizations occurred in the prior five to six years resulting in some individuals receiving promotions and others demotions in that time period. The current structure is creating challenges in how IS works to assist in meeting the needs of APS.
M2	**The Career Ladder and related job descriptions within the IS Department are not adequately documented, current or consistent with the current marketplace.** The job descriptions that are documented at APS are approaching as much as ten years old. The lack of current job descriptions has resulted in confusion of responsibility, and thus accountability. Corresponding pay scales to job descriptions have not been updated and some individuals are being paid less, or in some cases more, than what the position would typically pay today.
M3	**Consistent Service Level Agreements that cover all services offered by IS are not in place at APS.** It was reported that a Service Level Agreement (SLA) was implemented at one point at APS but it is currently not followed by all departments or groups within IS. As a result, documented standards for the level of service users should expect do not exist. This has lead to ambiguity in how to resolve issues as well as who is responsible and accountable for supporting particular groups of users.
M4	**It was reported by many IS staff that the current communication methods within the IS Department could be improved to ensure that all appropriate staff are aware of current and planned projects.** It was reported by many individuals that there is a need for improved communication mechanism so that Planned IT projects and new systems being deployed are communicated to appropriate staff. While management does meet on a bi-weekly basis, non-management staff reported times when communication is not always “pushed down”.
M5	**A single system and related policies and procedures for tracking and managing support requests for all areas of Information Services does not exist.** The Service Support Center uses the technology tool *HEAT* (FrontRange Solutions) while the Enterprise Support Group uses *Bugzilla* to track support requests. An additional tracking mechanism is the Access database used by User Support Group (or TSS) to track training activities. While the nature of the requests largely dictates which system is used and ultimately which APS resources address the issues, overlap exists which has lead to confusion and lack of accountability in the resolution as well as the assigned priority of some support requests. In addition, the benefit of sharing resolution strategies among the organization is not realized.

No.	Finding or Issue
M6	**Professional development opportunities for IS staff have been impacted due to budget constraints.** For example, in the past some mid-level management in the IS Department received training in ITIL best practices. However the training budgets at APS were significantly reduced last fiscal year which has decreased the availability of training opportunities for IS staff.
M7	**The implementation of the new "platform" at APS is not adequately planned for and does not leverage best practices of project management.** The IS Department has developed a "Concept Plan" for the platform and is currently moving forward with the project. To implement needed improvements quickly, the IS Department has put this project on a fast track. A formal implementation project plan that includes key considerations such as the project timeline, project team, necessary business process changes, a training plan, and a communication plan does not exist. Technology implications such as how applications will operate on the updated platform have not been fully explored and tested. User input has also not been widely gathered to ensure that new platform meets their needs and that the implementation has "buy-in" from users.
M9	**IS Department resources are being used to support regular business functions involving particular applications.** It was reported that members of IS are responsible for performing particular business functions, such as semi-monthly payroll processing, quarterly processing and reporting and generation of assignment notices and teacher contracts. This impacts the ability of the IS staff to perform their other responsibilities and also creates silos of knowledge within APS.
M10	**Procedures for support beyond standard business hours are not established.** Support for APS users is generally available from 7:00 AM to 5:00 PM on weekdays. Due to the multiple groups of IS Department resources providing support, the hours vary depending on the type of support requested. Some support procedures are not consistently followed and/or are not adequately documented.
M11	**The roles and responsibilities of Instructional Technology Coordinators (ITCs) vary from school to school.** This issue has lead to some ITCs being used at locations for roles not related to supporting technology education. The original intention of these resources was to improve the effectiveness of technology in aiding instruction.
M12	**The IS Department does not have established and well documented change management procedures.** Change management procedures are lacking for application upgrades, application configuration, system implementation or other technology changes. As a result, users are not aware of all changes and their benefits. In addition IS staff are often not aware of the changes in order for them to effectively support the systems they impact and train users of new functionality.
M13	**It appears that some groups within IS such as the Network group do not have an appropriate number of resources in comparison to their expected workload.** Published best practice staffing levels are not in place in some divisions of the IS Department. One such group is the functional area that is performing typical network administration work as it appears to have fewer staff than an organization similar in size to APS may have. Other groups in IS appear to have more staff than a similarly sized organization typically may have.

No.	Finding or Issue
	In addition, the responsibilities for a particular role are not necessarily represented by that role's title.
M14	**The process for selecting new technologies to implement is not documented.** Many IS Department staff reported challenges in implementing and supporting technologies because they were not involved in the selection process for these technologies. In addition the "true-cost" is often not analyzed to understand the resource levels that will be needed to support various technologies.
M15	**A comprehensive disaster recovery/business continuity plan that describes how all information systems will be restored does not exist.** APS does not have a business continuity and disaster recovery plan to ensure it will still be able to serve its users following a catastrophic incident.
M16	**A documented process for identifying, prioritizing, and managing IT projects does not exist.** A process or system and related set of policies and procedures for selecting, managing, prioritizing, collaborating and implementing IT projects does not exist which can make project management and support difficult.
M17	**General IT Management Policies and Procedures are not fully documented.** It was reported that not all general IT policies and procedures are fully documented. Examples include back up procedures, change management, updated support call handling and acceptable use polices.
Technology Findings and Issues	
T1	**APS does not have a single enterprise-wide document/records management system.** APS users reported that a large amount of time is spent finding and tracking paper records. In addition, there are instances of large amounts of paper storage in various locations at APS.
T2	**Best practices related to security and risk management are not fully implemented within the IS Department to protect APS.** Several best practices are not utilized within the IS Department to reduce security threats to APS. Some of these include the lack of role-based security and a dedicated resource within IS to focus on security. In addition, firewalls are logged, but not monitored and patch management tools (such as MS WSUS/Patchlink) are not utilized resulting in patches only being applied once per year. Patching of servers is done on an *ad hoc* basis.
T4	**User accounts are not appropriately configured to support the roles of particular individuals within the IS Department.** Although IS has made improvements in this area recently, it was reported that due to a lack of standard user configuration procedures and a lack of consistent job descriptions, the access privileges of various user accounts are not appropriately configured. In some cases, users do not have enough access to perform their job functions and in others some users have more privileges than a resource in their position should typically have. As a result, some instances of sharing user logins have occurred. Without a consistent, documented policy for access levels security control is diminished.

No.	Finding or Issue
T5	**Users reported a perception that the IS Department has limited individuals with the ability to support Macintosh computers.** Currently there are approximately 250 Macintosh computers throughout APS and a large number of Apple iPads are being deployed at APS. While individuals within the IS Department have expertise related to Mac support, users reported that they are not aware of dedicated resources. A documented support policy for Macs or iOS devices does not exist.
T6	**The wireless network at APS has multiple areas where performance is inconsistent.** It was reported that wireless network performance throughout APS is not consistent. In certain buildings there are areas where the wireless signal is weak or non-existent. As some computer labs are being converted to "mobile labs," the demand for wireless capability will be increasing throughout APS.
T7	**IS maintains two separate networks throughout APS.** When the demand for network access grew in prior years, it was determined that separate networks would exist for administration and instruction to ensure that sensitive data would be protected within each network. With increases in security technology capabilities, maintaining separate networks is not required. Transitioning to a single network with appropriate controls will require an initial investment, but significant infrastructure support time and costs could be saved by utilizing a single network.
T8	**APS does not use Voice Over Internet Protocol (VoIP) technology for telecommunications.** Currently APS uses a Mitel phone system and has made significant infrastructure upgrades towards supporting VoIP technology. A documented plan to upgrade the remaining infrastructure does not exist and a budget has not been secured to complete the transition. While costly to implement initially, VoIP phone systems offer significantly improved performance, additional functionality and can reduce support costs.
T9	**A process to manage requests for information from the Planning and Evaluation Division does not exist.** Requests for report information from the Planning and Evaluation Division do not follow a documented process. Staff from this division will often work independently to fulfill requests which may result in duplicate efforts.
T10	**Remote access to some APS applications is cumbersome and not user–friendly.** APS users reported that they are able to access APS applications remotely; however the process to do so is cumbersome and the resulting network performance is sometimes too slow to perform desired tasks. Reported examples were primarily related to functionality within STARS, including the lack of availability of verification tables while working remotely.
T11	**Technology training for technology users at APS is sometimes limited due to instances of a lack of communication within IS.** A training group exists within IS, consisting of seven resources tasked with training activities for all employees. There are times when the training group is not engaged in the implementation of new technologies throughout APS which presents challenges in ensuring users are adequately trained to use systems in place. Ongoing "refresher" training efforts are sometimes shared with the Instructional Technology Coordinators (ITCs) in the schools. It was reported that the ITCs are not always involved in the implementation of new technologies in order to satisfy end-users'

No.	Finding or Issue
	requests for training.
T12	**While implementation of a new platform is underway, the current APS network has areas of potential security weaknesses.** The design of the network is not optimal and security tools are not in place to best mitigate potential threats. The IS Department currently employs McAfee anti-virus software. It was reported that McAfee is not meeting the needs of IS to adequately mitigate the risk of malware threats. There is currently a plan to implement enhanced anti-virus software or an intrusion detection system (IDS). While costly to mitigate, it was also reported that there is at least one instance of a single point of failure which is the 6513 switch. Another security weakness is the limited number of backup resources at APS with a high degree of knowledge of the network.
T13	**The standard technology platform in use throughout APS is outdated.** The platform includes many aspects of technology including workstation configuration, network tools and hardware. Users throughout APS and IS Department staff reported that components of the platform are outdated and are largely impacting productivity as well as creating support challenges and security threats. For example, the instance of MS Office 2003 and Internet Explorer version 6 prohibit some documents and web-pages to be shared or opened among or by APS employees.
T14	**The workstation management/application delivery system is overly complex and inefficient.** IS staff use a mix of applications, scripts and manual process to image workstations. While the actual time to complete the imaging process is time consuming, the actual staff time needed to monitor the process is minimal. Many sites expect customizations or utilize numerous, site specific instructional tools which results in significant staff time preparing supporting workstations.
T15	**Critical network hardware in place in APS is outdated.** Outdated network hardware in place in APS includes an EMC CX400 storage area network (SAN) that is eight years old; a Novell 6.5 file server that is prohibiting the adoption of best of breed technologies; and additional file servers that are more than five years old.
T16	**The APS email system is outdated.** The IS Department currently employs Novell GroupWise for approximately 5,000 mailboxes. One dedicated IS resource supports the email system. Some email archiving is currently performed utilizing Google Postini.
T17	**End-users expressed dissatisfaction with either the functionality or the appearance of the APS website.** End-users reported the current APS website lacked both aesthetics and appropriate content management capabilities. The School and Community Relations group manages and updates the website and so the IS Department is not directly responsible for it. However, IS staff reported they often hear complaints about the website as users have the perception it is managed by IS.

Appendix C: Benchmarking Interview Outlines

This appendix contains the three interview outlines that were used during the benchmarking process. One outline was developed specifically for schools using eS+, another for schools using Oracle, and the third was a general outline.

General Information Technology Research Outline

I. School District Metrics

1. How many students are in your school district?
2. How many school locations are in your school district?

II. IT Organizational Structure and Staffing

1. How many computer workstations (laptops and desktops) are supported?
2. How many staff are in the Information Services/Information Technology Department?
3. What is the internal structure of the IS/IT Department?
4. Please describe the communication mechanisms in place internal to the IS/IT Department.
5. What is the total annual level of IT spending in your school district?

III. Student Information System (SIS)

1. What Student Information System is your school district currently using and how long has it been in place?
2. Please describe the process in which the SIS was selected over other products and who was involved in the selection process.
3. How many staff from the school district were dedicated to the implementation of the SIS?
4. Please describe the process in which decisions of configuration and design were made during the implementation of the SIS.
5. How was the SIS configured to be able to produce necessary State reports?
6. How long did the implementation of the SIS take?
7. Please provide key experiences and lessons learned during the implementation of the SIS.

IV. Enterprise Resource Planning (ERP) System

1. What ERP System is your school district currently using and how long has it been in place?
2. Please describe the process in which the ERP System was selected over other products and who was involved in the selection process.
3. How many staff from the school district were dedicated to the implementation of the ERP System?
4. Please describe the process in which decisions of configuration and design were made during the implementation of the ERP System.
5. How was the ERP System configured to be able to produce necessary State reports?
6. How long did the implementation of the ERP System take?
7. Please provide key experiences and lessons learned during the implementation of the ERP System.

V. Management and Support of SIS and ERP System

1. How many staff are currently assigned to the management and support of the SIS and ERP System?
2. Are outside consultants used for the management and support of the SIS or ERP System?
3. What is the level of vendor support you typically receive for the SIS or ERP System?
4. How are support requests from users related to the SIS or ERP System currently tracked and resolved?
5. Please describe the process of deploying patches, updates or upgrades to the SIS or ERP System.
6. Are there instances where additional systems or processes have been developed due to limitations of the SIS or ERP System? (e.g., disparate databases, manual workarounds, etc.)

VI. Technology Systems and Services in your School District

1. Are you deploying hosted services in your school district? If so, which ones?
2. Are Macintosh computers supported in your school district? If so, approximately how many are in use and how many IT staff support them?
3. Does your IS/IT Department support remote access to key applications and systems?
4. Does your IT/IT Department utilize centralized deployment of updates and patches?
5. Does your IT/IT Department maintain the following documented policies?
    a. Disaster Recovery Plan
    b. Security Policy including the process for managing and testing security
    c. Comprehensive Compliance Standards
    d. Change Management Process

VII. Technology Project Management in your School District

1. What process does your school district use to select and prioritize IT projects?
2. Is the process to select and prioritize IT projects documented?
3. Who oversees the selection and prioritization of IT projects?
4. What process does your school district use to define deliverables, milestones, activities and resources for IT projects?
5. How are users trained to use new technologies implemented in your school district?
6. What major IT projects do you have underway or planned for the next 1-3 years?

Appendix D: Systems in Other Virginia Schools and Governments

This appendix contains a sample of the ERP and SIS systems that are in place in other Virginia school districts, counties and cities.

Systems in Other Virginia Schools and Governments			
No.	**Organization**	**Budget**	**ERP System in Use**
1	Fairfax County Public Schools	$1,000M	Tier FAMIS
2	Prince William County	$998M	AMS Advantage
3	Virginia Beach City Public Schools	$780M	Insite/Lawson
4	City of Hampton	$435M	New World
5	Chesapeake Public Schools	$397M	Oracle Peoplesoft
6	Stafford County Public Schools	$220M	SunGard HTE
7	Alexandria City Public Schools	$197M	Mitchell Humphrey
8	Hanover County Public Schools	$183M	Brite
No.	**Organization**	**No. of Students**	**SIS System in Use**
1	Fairfax County Public Schools	165,000	EduPoint
2	Virginia Beach City Public Schools	76,000	EduPoint
3	Henrico County Public Schools	45,000	Century Consultants
4	Roanoke County Public Schools	14,000	SunGard
5	Suffolk City Public Schools	13,000	SunGard
6	Albermarle County Public Schools	13,000	SASI
7	Rockingham County Public Schools	11,000	PowerSchool
8	Alexandria City Public Schools	11,000	Star Student

Appendix E: Project Participant List

This appendix contains the list of participants in the project.

Project Participant List		
No.	**Name**	**Department**
1	Jorge Adrian	NIS - Integration
2	Raj Adusumilli	Enterprise Solutions
3	Abhay Agarwal	Enterprise Solutions
4	Marcella Ahern	Arlington Traditional School
5	Singh Ajrawat	NIS – Telecommunications
6	Everton Anderson	Engineering and Technical Services
7	Tiffany Anderson	Service Support Center
8	Bruce Bailey	Engineering and Technical Services
9	Sonny Balmores	Engineering and Technical Services
10	Joe Baumann	Personnel
11	Ahmed Bensalem	NIS - Infrastructure
12	David Blorstad	Finance
13	Chris Brown	Technology Architecture
14	Mary Beth Chambers	Finance
15	Pitter Chi	NIS - Integration
16	Kathleen Clark	Facilities - Maintenance
17	Kathy Clingenpeel	Planning and Evaluation
18	Cate Coburn	Instruction
19	Diane Coggins	Instructional Information Technology
20	Nora Cuellar	User Support Group
21	Sara Daniel	School and Community Relations
22	Billie Deel	Personnel
23	Ashley Deljo	Student Services
24	Hung Do	Enterprise Solutions - Development
25	Bridget Doles	User Support Group
26	Teri Doxsee	Instructional Information Technology
27	Noel English	User Support Group

Project Participant List		
No.	**Name**	**Department**
28	Francis Fuller	Engineering and Technical Services
29	Diane Gale	Enterprise Solutions
30	Robin Gardner	Instructional Information Technology
31	Amy Graham	Planning and Evaluation
32	Bryan Graitge	Engineering and Technical Services
33	Weber Grandish	NIS - Infrastructure
34	Renee Harber	Swanson School
35	Helene Hartman	Planning and Evaluation
36	Charles Harvey	Instructional Information Technology
37	Diane Hellmuth	Network and Infrastructure Services
38	Beatriz Hernandez	User Support Group
39	Bill Herring	Facilities – Design and Construction
40	Tanya Hileman	Enterprise Solutions
41	Kevin Holcombe	NIS - Infrastructure
42	Nghia Huynh	Enterprise Solutions – Database Administration
43	David Jackson	Engineering and Technical Services
44	Kathy Jaffke	Finance
45	Mark Johnston	Instruction
46	Amy Jones	Facilities – Design and Construction
47	Chris Jorss	NIS - Integration
48	Bobby Kaplow	Finance
49	Ellen Kennedy	Personnel
50	Salah Khelfaoui	Information Services – Asst. Superintendent
51	Eric Knott	NIS - Infrastructure
52	Steve Larson	Facilities – Risk Management
53	Lap Le	Engineering and Technical Services
54	Cathy Lin	Facilities - Maintenance
55	Duane Lomis	Engineering and Technical Services
56	Helena Machado	Facilities - Aquatics
57	Amy Maclosky	Finance
58	Erica McCoy	Ashlawn School

Project Participant List		
No.	**Name**	**Department**
59	Sara Melendez	User Support Group
60	Andrea Myers	Jefferson School
61	Sri Nallamala	Enterprise Solutions - Development
62	Leslie Peterson	Finance
63	Jeff Politzer	Kenmore School
64	Tyrone Powell	Engineering and Technical Services
65	Terrance Proctor	Service Support Center
66	Suzanne Raber	Planning and Evaluation
67	Girish Rajput	Enterprise Solutions – Development
68	Amy Ramirez	Planning and Evaluation
69	Dan Redding	Carlin Springs School
70	Jeannine Richardson	Instructional Information Technology
71	Miriam Ruiz	Facilities - Maintenance
72	Sue Sarver	Professional Development Office (Instruction)
73	Betty Schwoebel-Mills	Planning and Evaluation
74	Larry Seals	Instructional Information Technology
75	Kris Seldomridge	Finance
76	Dana Smith	User Support Group
77	Matt Smith	Information Services – Special Projects
78	Valerie Smolinski	Professional Development Office (Instruction)
79	Hae-Lee Solomon	Instructional Information Technology
80	Lisa Stengle	Planning and Evaluation
81	Kerry Sterns	Service Support Center
82	Judy Strachan	Personnel
83	Claudia Stucki	Planning and Evaluation
84	Faith Tabatabai	Instruction
85	Natalie Taylor	Student Services
86	Rochelle Taylor	User Support Group
87	Pat Teske	Instructional Information Technology
88	Patrick Tien	Personnel
89	Jim Totty	Purchasing

Project Participant List		
No.	**Name**	**Department**
90	Kerm Towler	Facilities – Plant Operations
91	Regina Van Horne	Planning and Evaluation
92	Paul Velit	Enterprise Solutions
93	Peter Weilenmann	Planning and Evaluation
94	Tricia Wells	Enterprise Solutions
95	David Welsh	Career Center
96	Kenny White	NIS - Integration
97	Alvera Wilson	Finance
98	Tom Windsor	Instructional Information Technology
99	Sara Witherow	NIS - Integration
100	Eva Wood	Instructional Information Technology
101	Ruijuan Xia	Enterprise Solutions – Database Administration
102	Alicia Zekan	Wakefield School