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Independent Information Technology Assessment: Prepared for the Town of Middleborough and the Middleborough School Department

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INDEPENDENT INFORMATION TECHNOLOGY ASSESSMENT

Prepared for the Town of Middleborough and the Middleborough
School Department

May 2010



EXECUTIVE SUMMARY

This **Independent Information Technology Assessment** (IT Assessment) arose from long-standing concerns among various elected and appointed officials in the Town of Middleborough about the efficiency and effectiveness of the procurement and deployment of information technology (IT) in both the Town and in the School Department. At Middleborough's direction, the IT Assessment specifically excluded the Police and Fire Departments as well as the Middleborough Gas and Electric Department.

Recognizing the need for a completely independent analysis of these issues, Middleborough contracted with the Edward J. Collins, Jr. Center for Public Management (the Collins Center), located within the McCormack Graduate School of Policy Studies at the University of Massachusetts Boston. The scope of work of the IT Assessment addressed the four tasks Middleborough had identified:

- a. Complete a review of the planning for future technology, security, wireless access, remote access, and expansion; and provide the Town with comments and recommendations that confirm and refine current plans. This review will concentrate on School Department and General Government Three Year Technology Plans.
- b. Assess the current data and network security measures Town-wide and provide the Town with comments on the current status of security measures and enhancements that may be required. Costs for recommended improvements will be identified.

- c. Assess the current Disaster Recovery Plan.
- d. Assess the IT Department in terms of physical security and protection of equipment.

This scope of work also incorporated an evaluation of the efficiency and effectiveness of Middleborough's deployment of hardware resources.

This IT Assessment addresses the scope of work in the context of Middleborough as a \$66 million enterprise and answers the question: how would a \$66 million business need to plan, invest in, manage and deploy IT if it were to survive and thrive in a competitive environment? The IT Assessment was conducted during March and April, 2010.

Key findings and recommendations:

1. Neither the Town nor the School Department has ever had a strategic plan for IT. The Schools have a Technology Plan which covers only educational technology; however, the Schools lack a systematic plan which addresses the other two elements of its use of IT: (1) student information systems and (2) administrative (or business) systems. Absent such a comprehensive, consolidated Town and School strategic plan, Middleborough has no framework for making rational, consistent choices regarding IT.
2. Middleborough has no current, comprehensive capital improvement program (CIP). Absent this kind of well executed CIP, Middleborough has no well informed basis for making sound plans about the procurement and deployment of IT, including expenditures which run well into hundreds of thousands of dollars over a five-year horizon.

3. Middleborough should consolidate its Town and School IT organizations into a single Department of Information Services, headed by a newly hired Director of Information Services. This new, cost-efficient structure--adding only a fraction of the cost of one position—will provide the senior level, business-like leadership which Middleborough needs as a \$66 million enterprise. The Town Manager and the Superintendent of Schools should meet on a regular monthly basis to review the policies, management and operation of this new Department.
4. Neither the Town nor the Schools has ever had a written plan for business continuity/disaster recovery. This leaves Middleborough at extraordinary risk.
5. Failure to use the Affiliated Computer Services (ACS) system to decentralize business functions such as financial management and payroll gives Middleborough the appearance of an organization operating in a 25-year-old, mid-1980's model. This results in gross inefficiencies in these functions throughout the Town and School Department. Before moving in this direction, Middleborough will need to undertake an evaluation of its ACS system in cooperation with ACS to determine whether, in fact, the system can support this kind of secure decentralization throughout the Town and School Department.
6. Middleborough has no excessive deployment of hardware, as has sometimes been rumored. To the contrary, key offices such as the Collector and Town Clerk lack hardware which could bring dramatic enhancements in productivity and customer service.
7. Security of IT facilities has been established by the Town and Schools in a manner appropriate to the risk presented.

8. The Town and Schools report that they each tag all physical property and conduct an annual inventory of these assets. Neither the Town nor the Schools has suffered loss of or damage to these assets.
9. The viability of the ACS system is a critical strategic issue for Middleborough.

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I. BACKGROUND

This **Independent Information Technology Assessment** (IT Assessment) arose from long-standing concerns among various elected and appointed officials in the Town of Middleborough with the efficiency and effectiveness of the procurement and deployment of information technology (IT) in both the Town and School Department. At Middleborough's direction, the IT Assessment specifically excluded the Police and Fire Departments as well as the Middleborough Gas and Electric Department.

Having recognized the need for a completely independent analysis of these issues, Middleborough contracted with the Edward J. Collins, Jr. Center for Public Management (the Collins Center), located within the McCormack Graduate School of Policy Studies at the University of Massachusetts Boston. The scope of work of the IT Assessment addressed the four tasks Middleborough had identified:

- a. Complete a review of the planning for future technology, security, wireless access, remote access, and expansion; and provide the Town with comments and recommendations that confirm and refine current plans. This review will concentrate on the School Department and General Government Three Year Technology Plans.
- b. Assess the current data and network security measures town wide and provide the Town with comments on the current status of security measures and enhancements that may be required. Costs for recommended improvements will be identified.
- c. Assess the current Disaster Recovery Plan.
- d. Assess the IT Department in terms of physical security and protection of equipment.

These four tasks also incorporated an evaluation of the efficiency and effectiveness of Middleborough's deployment of hardware resources.

Scale is also a fundamental consideration in this IT Assessment. As one point of reference, the School Department supports approximately 3,500 K-12 students with 1,100 desktops; on the other hand, the Town has 76 desktops in the agencies included in this scope of work.

This IT Assessment addresses its review in the context of Middleborough as a \$66 million enterprise. The question, then, is: how would a \$66 million business need to plan, invest in, manage and deploy IT if it were to survive and thrive in a competitive environment?

II. METHODOLOGY.

This IT Assessment followed a careful methodology in order to be sure that it responded fully to the scope of work.

1. Review of Background Information

The staff of both the Town and the School Department was very helpful in gathering information which provided important background to the IT Assessment. Documents provided included previous reports, current contracts, budget materials, provisions for IT in current or proposed capital or operating budgets and other similar information.

This background information provided the Collins Center with important knowledge about the current IT situation in the Town and the Schools, significantly informing the interviews and subsequent work.

2. Project Workshop

The very first activity the Collins Center undertook on site was an initial meeting, referred to as the Project Workshop, with key staff of the Town and the School Department as well as the Chair of the Finance Committee. The Project Workshop had two main purposes:

- To ensure that there was a common understanding between Middleborough and the Collins Center about the scope of the IT Assessment and how it was to be conducted.
- To establish a basic conceptual vocabulary and develop a sense of common interest among the various participants in this effort. The Project Workshop set the stage for Middleborough to own and act on the recommendations of the IT Assessment.

3. Functional Assessment

The functional assessment focused on the four tasks identified by the Town and involved several related activities, all of which were necessary for the functional assessment to be complete and provide a sound basis for the IT Assessment.

a. Inventory of Current Systems and Resources

The Collins Center worked closely with the staff of the Town and the School Department to inventory and identify all systems and resources within the scope of the IT Assessment, including application software, hardware, system software, personnel, networking and communications equipment and software, vendor-provided services, owned or leased capital equipment, and annual operating and maintenance expenses.

The inventory helped determine what IT resources Middleborough now has, how they are used and how much they cost. Moreover, the inventory enabled the Collins Center to understand how these valuable resources might be leveraged as Middleborough pursues the best available approach to addressing the four issues in the scope of services. This analysis will help Middleborough maximize the value of its existing IT assets while taking advantage of recent and foreseeable advances in IT technology.

b. Interviews

The Collins Center, as previously agreed, spent two days on site, meeting with the staff of the Town and Schools in detailed interviews. Most of the first day, March 22, 2010, was devoted exclusively to meeting with the staff of the Town IT Department; the second day, March 23, 2010, was devoted almost completely to meetings with various School personnel, focused mainly on the School IT staff.

The interviews were important in providing first-hand views from different town and school personnel regarding strengths and weaknesses in the deployment of IT resources, consistent with the scope of the IT Assessment. Among other things, this process generated ideas from staff about how to enhance IT in Middleborough and what priorities should be set among the various opportunities that exist for strengthening IT.

4. Reviewing the Draft of the IT Assessment

After the draft of the IT Assessment was completed, the Collins Center followed a careful process of review with Middleborough to be sure that the IT Assessment responded fully to Middleborough's expectations. The draft was sent to Middleborough in electronic form in advance of the Collins Center's meeting with key officials on April 16, 2010. This provided Middleborough with time to review the draft thoroughly and prepare for the review meeting.

The review meeting took about a half day. The Collins Center presented key elements of the IT Assessment with emphasis on (1) its major findings and recommendations, (2) alternatives that were considered, and (3) significant issues on which Middleborough needs to focus as it moves toward maximizing the benefits of its IT investments.

After the review meeting, the Collins Center made appropriate changes in the draft of the IT Assessment and prepared it for final presentation to Middleborough.

III. STRATEGIC PLANNING

1. Middleborough needs to put in place and update annually a comprehensive Town-School strategic plan for IT.

Neither the Town nor the School Department has ever had a strategic plan for IT. The Schools do have a *Middleborough Public Schools Long-Range Technology Plan* (the Schools Technology Plan) which covers only educational technology; however, the Schools lack a systematic plan which addresses the other two elements of its use of IT, i.e., (1) student information systems and (2) administrative (or business) systems. The development and presentation of the Schools Technology Plan is determined mainly by State and Federal requirements. Absent such a comprehensive, consolidated Town and School strategic plan, Middleborough has no framework for making rational, consistent choices regarding IT.

Middleborough needs to establish a comprehensive strategic planning process for all Town and School IT, linked closely with the Town's Capital Improvement Program (CIP), which this IT Assessment recommends in the next section.

2. The IT Strategic Plan must be user-driven and developed in close cooperation with the Board of Selectmen, School Committee, Finance Committee and Capital Planning Committee.

Middleborough's users are the people who know best how enhanced deployment of IT can bring benefits in efficiency and economy. While outside expertise can bring a fresh, experienced and broadly informed view, ultimately the staff of the Town and School Department must own the future of IT in Middleborough.

IV. CAPITAL PLANNING

1. Middleborough needs to incorporate its capital needs related to IT as part of an all-inclusive, Town and School Department Capital Improvement Program.

Middleborough has no current, comprehensive capital improvement program (CIP). Absent this kind of well executed CIP, Middleborough has no well informed basis for making sound plans about the procurement and deployment of IT, including expenditures which will run well into hundreds of thousands of dollars over a five-year horizon.

Local governments and school districts have been using CIPs to make fiscally prudent decisions about investment in IT for many decades. The closest thing Middleborough now has to a CIP for IT is the presentation in the Schools Technology Plan of the “3-year Replacement/Enhancement plan.” Again, this covers only educational technology.

The absence of this kind of CIP has very real implications for the Town and Schools. One senior School official noted, for example, that a large number of School desktops still function in a 10-year-old environment, using Microsoft Windows 2000 and Office 2000, thus leaving students ill-equipped to enter the job market or higher education.

2. Middleborough’s Town and School hardware is extremely aged, presenting a situation which must be addressed as soon as possible.

In the absence of a comprehensive CIP, Middleborough now finds itself with an extremely aged inventory of hardware.

As one example, the hardware inventory provided by the Town’s IT Director shows that no hardware has been purchased since 2004--six years ago. Indeed, the overwhelming majority

of PCs and monitors on this inventory averages about eight years old or more. While not as extreme, the School Department faces a similar predicament.

This has very practical ramifications for education and municipal services in Middleborough. Senior School administrators report that some of its desktops cannot run certain educational software. In both the Town and schools, different versions of application software and operating systems installed in various PCs mean that users cannot share information.

Municipalities and schools typically use the CIP to program an annual replacement of 20 percent of their PCs, monitors and printers. This horizon is both realistic and economical. As a corollary, Middleborough may wish to undertake a full evaluation of procurement policies, such as an analysis of lease versus buy, which may prove more beneficial financially, technologically and otherwise.

3. Evaluation of the Schools Technology Plan is beyond this IT Assessment.

The Schools Technology Plan follows a state-mandated format, built around multiple benchmarks including such things as a Vision and Mission Statement (Benchmark 1); Benchmarks for Integration of Technology (Benchmark 2); and Professional Development Strategies (Benchmark 3). This mandated structure means that the only assessment which carries real weight comes from the Commonwealth or (potentially) accrediting agencies.

4. Middleborough should establish a percentage-based policy for capital investment in IT.

The virtue of this approach is that it sets in place a clear policy for the level of effort which Middleborough will extend in investing in capital assets for IT on an annual basis. This policy should be based on a related benchmark. For example, the Town might set capital investment in IT as either 1) a percentage of overall capital expenditures or 2) a percentage of the total Town and School operating budgets.

5. Middleborough should apply the principle of strategic positioning in making capital decisions regarding IT.

The principle of *strategic positioning* may be summarized as making choices in IT now for Middleborough which serve best its longer-term needs. This principle is often characterized as “buying smart, not cheap.”

As one example, the Collins Center has been sharing information regarding new PC technologies with key officials of the School Department. These technologies may bring enhanced functionality, lower requirements for support from the School Department’s IT staff and lower long-term total cost of ownership (TCO).

6. The Town Manager and Peirce Trustees should confer about IT-related funding.

The Peirce Trustees have been very generous in supporting various IT-related requests for funds over the years. While this is important and laudable, Middleborough should be sure that this generosity is consistent with the Town’s capital plans.

V. ORGANIZING FOR INFORMATION TECHNOLOGY

- 1. Middleborough should consolidate its Town and School IT organizations into a single Department of Information Services, headed by a new Director of Information Services.**

This new, cost-efficient structure--adding only a small fraction of the cost of one FTE position—will provide the senior level, business-like leadership which is needed for Middleborough as a \$66 million enterprise.

The School Department now has no dedicated leadership in IT. Its IT Director's position was eliminated several years ago as a result of budgetary pressures which resulted in the elimination of a total of 34 positions from the School Department. While the Assistant Superintendent and Director of Fine Arts have been trying to assume some of the former IT Director's responsibilities, IT is simply too large, complex and critical a part of the School Department for part-time attention.

The Town has an IT Director who expects to be retiring in the not-too-distant future. The present situation in Middleborough presents an excellent opportunity for consolidation of the Town and School IT Departments. This opportunity is also enhanced by the two departments' shared use of administrative applications on the ACS system and the fiber-optic network. Success here will require Middleborough to act with care and consideration in several respects:

- The job description for the Director's position will need to be drafted jointly and carefully by the Town and School Department;
- Competitive compensation for the position needs to be established and maintained;
- Recruitment should be done on a national basis;

- There should be a selection process which evaluates candidates fully and fairly with participation by Town and School personnel; and
- The Town Manager and Superintendent of Schools should have a regular monthly meeting to review ongoing policy-making, management and operation of this new Department.

2. Middleborough should make every possible effort to maintain its current IT staffing in the Town and School Department.

The Town and Schools now have very limited IT staffing, all of whom should be transferred to the new consolidated IT department. *Any further reduction will seriously endanger Middleborough's ability to manage its systems and services in a responsible manner.*

- a. The Town has only two IT positions: the IT Director and the IT Administrator.
- b. With the consolidation into one Town and School IT Department, which this section recommends, the Town's IT Administrator would now assume direct responsibility for supporting the ACS applications throughout the Town and Schools. Implementing the full, secure decentralization of the ACS financial management and payroll/human resources applications which this section recommended earlier will call for the IT Administrator's dedication to this role.
- c. The School Department's Network Manager would assume overall responsibility for Town and School networking in the new, consolidated IT Department.

- d. The support staff position in the newly-consolidated IT Department, now identified as the Secretary in the School IT Department, should be responsible for supporting the Help Desk function (see the discussion later in this section).
- e. The contract secretarial position in the Town IT Department should be eliminated.
- f. All of the other IT staff in the Schools will continue to be needed in the future to meet these joint Town and School responsibilities, especially where this function in the Schools is currently understaffed (see the next paragraph).

3. The School Department's staffing of its Tech Aide positions falls far below accepted benchmarks for this kind of position.

The standard benchmark for this staffing calls for a ratio of one full-time-equivalent (FTE) staff member for every 250 classroom desktops. The Middleborough Schools have about 1,100 desktops; therefore, there should be at least four FTE tech aides. Instead, Middleborough has only 2.7 FTE's for all four of its K-12 schools. This produces a ratio of 1:407, 63 per cent higher than the recommended benchmark.

4. Middleborough must establish compensation for the new, consolidated IT Department which recognizes the role and responsibilities of its staff.

- a. The new IT Director's position should be established at a competitive level somewhere in the range of the high \$90,000's. This represents a very small increase of only about \$10,000 above the Town IT Director's current salary of \$88,158.10.

- b. The Network Manager, IT Administrator and Secretary should each receive additional compensation which recognizes the expansion of their role and responsibility in the newly consolidated IT Department in serving both Town and Schools.

5. Middleborough should implement a Help Desk application.

Neither the Town nor the School IT Department today has any way to document their services in support of end users. This includes such things as:

- the number of calls for support received;
- the Town or School office requesting service;
- the specific nature of the service;
- the elapsed time from call to completion; and
- the Middleborough personnel responding.

In addition, this type of application should include a fully integrated inventory of all hardware, software and networking assets with information such as dates of their procurement, dates of service and cost of service. This would also eliminate the need for the Town and School IT staff to keep this information in stand-alone applications as they do today.

Help Desk packages also enable end-users to submit requests for service electronically, eliminating the need for anyone in the IT Department to answer the phone. Priorities can also be established by type of call.

While it takes some time for the IT Department's staff to complete this information, this is the only practical way that Middleborough can know what services the IT Department and its personnel are providing.

The support-staff position in the newly consolidated IT Department, now identified as the Secretary in the School IT Department, should be responsible for carrying out the Help Desk function.

6. Position specifications will need to be written for all personnel in the newly consolidated IT Department.

This consolidation will bring changes which must be reflected in the specifications for these positions.

7. Middleborough needs to address the issue of critical subordinates in its IT organization.

Because of its relatively small size, Middleborough tends to have only one person in the Town or Schools who has in-depth knowledge of various systems and services. There is no easy solution to this challenge. At the same time, Middleborough needs to do whatever it can to be sure that its IT-based systems and operations could continue in the face of the loss of a key person. Part of the solution to this dilemma may involve enlisting the services of key vendors when necessary.

VI. WIRELESS AND REMOTE COMMUNICATIONS

1. **Middleborough has appropriate facilities for its wide-area communications.**

The current status of these types of communications may be summarized as follows:

- No use is made of wireless communications. The only minor exception to this situation is the use of four wireless carts in classrooms, three at the High School and one at the Burkland School. This is not a shortcoming in any way since there are no applications in the Town or Schools which would benefit specifically from wireless.
- Middleborough has constructed an 11.8-mile fiber-optic network, utilizing and supported by the existing I-Net infrastructure and topology, connecting 18 Town and School buildings. This network serves as Middleborough's primary information network-transport system.
- The Schools have a five-user Virtual Private Network (VPN), used almost exclusively by the School Department's IT staff.

2. **The existing fiber-optic network has no back-up or fail-over provisions and places Middleborough at immediate risk.**

This risk typically comes from physical damage to the pole-distributed fiber-optic cable or failure of the optical electronics. It is of particular concern because the network's distribution topology, determined by the fiber attachment to the existing I-Net, offers no route or cable-sheath redundancy.

Middleborough should undertake a very specific examination of its options for this kind of much needed network backup. This should include, among other things:

- a. Reviewing maintenance and emergency-restoration policies with the I-Net provider.** The categories of risk to the existing network are numerous, including such things as cable cuts, accident-related pole failures, overhead entrance-cable failure, severe weather and vandalism. Any one of these situations represents a major threat to the existing fiber-optic network and the delivery of mission-critical applications for the Town and Schools.
 - b. Considering implementation of a point-to-multipoint network as a backup to the fiber network.** A wireless network, if originating from the water tower at the end of Chestnut Street and behind the Nichols Middle School, could provide wireless connectivity to the majority of all Town and School facilities. This methodology of applying wireless technology to address network redundancy needs would provide a cost-effective, through-the-air platform for the deployment of a shadow wireless broadband network to most, if not all, Town and School buildings. Other supplemental or alternative backup approaches would include cable broadband links and regulated carrier T-1 facilities. This backup network could be deployed on a phased basis, first covering Middleborough's most critical terrestrial network links and paths.
- 3. Middleborough must immediately undertake a complete legal, financial and engineering review of its rights and responsibilities with respect to the I-Net infrastructure and the fiber-optic network.**

This is an exceedingly complex subject which is mission-critical for Middleborough and requires this kind of expedited and full review.

4. The School Department's staff reports that its network becomes slow during peak periods.

The reason for this is not clear but it is reported to occur regularly. The School Department believes that this may be related to the age and diversity of manufacture of its current switches as the next subsection discusses. Middleborough should undertake a specific analysis of this issue with the Network Manager to see how it may be resolved.

5. The School Department needs to address the age and manufacture of its network switches.

These switches come from three different manufacturers and are as much as 12 years old. This is an inherently unsatisfactory situation, the solution for which must be incorporated as soon as possible in Middleborough's CIP. Decision-making about this critical part of Middleborough's IT infrastructure must be fully considered in every respect.

VII. PHYSICAL SECURITY

- 1. Security of facilities has been implemented by the Town and Schools in a manner appropriate to the risk presented.**

The Collins Center visited Town and School IT-related facilities with responsible personnel, viewing and querying security currently implemented for physical facilities. Without disclosing specifics, because of the nature of this IT Assessment as a public record, this report can attest that various measures are in place which appear to provide security appropriate to these facilities.

- 2. Middleborough is tracking the status of its physical assets.**

The Town and Schools report that they each tag all physical assets and do an annual inventory of these assets. Neither the Town nor the Schools has suffered loss of or damage to these assets. In addition, the Town Accountant reports that he has implemented application software which keeps records of all IT assets in conformity with the national standard promulgated by the Governmental Accounting Standards Board and known as GASB 34. This compliance is subject to review by Middleborough's independent auditor as part of its annual audit. Further, all disposition of Town IT assets must be approved by the Board of Selectmen, upon recommendation of the IT Director. The details of each such vote are then forwarded to the Town Accountant.

- 3. Chemical-suppression systems should be installed in all IT facilities.**

The Town Hall's data center currently has only a water sprinkler system for fire suppression. Activation of this system could cause serious damage to or loss of the equipment in the data center. The IT Director, Fire Chief, Building Commissioner and other Town officials

should meet and determine specifically what kind of fire-suppression system ought to be installed in this critical facility. The same recommendation applies to the School Department's data center.

4. Middleborough should review potential risks to its critical IT facilities from adjacent uses.

Middleborough lost \$70,000 of equipment when a pipe burst in the room above the network closet in the Town Hall on December 31, 2008. The IT staff of the Town and Schools should work with the Building Inspector, Fire Inspector and others as appropriate to review any similar risks to other critical IT facilities from adjacent rooms or uses.

VIII. HARDWARE ASSETS

1. **Middleborough has no excessive deployment of hardware.**

The Collins Center visited three of four schools and every Town office except one. The only instances of excessive hardware were found in two places: (1) an old copying machine kept in the Treasurer's Office and (2) duplicate printers maintained in the Selectmen/Town Manger's Office. The Town's IT Director and Town Accountant, as well as the School Department's Network Manager, maintain records of these assets which are available readily for review.

2. **The Collector and Town Clerk should be equipped with countertop cash-drawer workstations and receipting/validating printers at their respective front counters.**

Deployment of this countertop hardware has been common in similar local governments for more than 20 years. Middleborough's IT staff reports that, around 2000, it licensed the application software required for the Collector to implement this service model. It is not clear what ACS applications may already have been licensed for the Clerk's functions. It may also be the case that the Town would owe ACS back charges for (1) not having maintained a support contract for these products over the last 10 years since their licensing around 2000 or (2) needing now to skip to a newer release of these products.

The threshold issue for Middleborough to determine is whether the ACS system supports the functionality and security required for use of these applications at the countertop. Middleborough should pursue this issue cooperatively with ACS and get that firm's response with all associated costs in writing. This recommendation should bring dramatic enhancement in productivity and customer service:

- Almost all business which needs to be transacted, from information queries to

processing of payments from customers, can be done by the Town's staff and the customer at the front counter.

- The walking back and forth from the counter to the back office, which the staff now does to process these transactions would be eliminated completely, saving the staff time and energy.
- The customer has an immediate record of whatever may have transpired in the form of a printed receipt or validated check.

The Collector should be equipped with two of these workstations and printers, and the Town Clerk with one. The specific manufacturer and model of equipment to be procured will be determined by what ACS states in writing it supports and recommends.

3. Middleborough should provide a desktop and printer in the main meeting rooms in the Town Hall and School offices, respectively.

Informed decision-making relies on having the best available information at hand. Both Middleborough's elected and appointed leadership, as well as the staffs of the Town and the School Department, would be more efficient and effective in their work with these assets readily available. These devices can also be secured physically to prevent theft.

4. The ACS server does not need the 24/7 maintenance contract which is now in place.

Because Town Hall and the School offices only use this system for five-day, eight-hour, Monday-through-Friday operations, the current contract represents an unnecessary expenditure for maintenance coverage far beyond what is needed.

5. Middleborough should use the new Help Desk software recommended elsewhere in this IT Assessment to manage its hardware assets.

No systematic means of managing these assets currently exists in the Town or the Schools. One of the key recommendations of this IT assessment, as mentioned in Section V (Organizing for Information Technology) is the need to coordinate all service history for each asset with its procurement record. The use of stand-alone applications for this purpose, such as the Town IT Director and Town Accountant now have, does not provide appropriate support for this critical function.

IX. APPLICATION DEPLOYMENT

1. **Middleborough should decentralize all business functions to the source level throughout the Town and School Department.**

Failure to decentralize business functions such as financial management and payroll/human resources gives Middleborough the appearance of an organization operating in a 25-year-old, mid-1980's model. This results in gross inefficiencies in these functions throughout the Town and School Department, amounting collectively to the loss of several person-days of productivity for departments and central office staff every week.

An enormous number of transactions in the Integrated Financial Management System, especially in purchasing and accounts payable, and in the payroll system are repeated twice or more by the source office and the central office. This is just the nature of the current deployment of the ACS system, not a criticism in any way of Middleborough's diligent, capable and hard-working staff or of ACS.

The School Department's processing of payroll is one good example of this duplication and inefficiency:

- The School Business Office furnishes each school with a weekly payroll time sheet.
- The staff in each school prepares that school's payroll information using either Excel or Word; no consistent format is used.
- Each school calls in their Payroll information for that period to the School Business Office.
- The staff member in the School Business Office inputs this information into the ACS

system only for those individuals who have an exception to their regular pay for that week, such as a day of sick leave.

- The staff person in the School Business Office keeps an entirely separate record of attendance in a FileMaker Pro application.

The processing of the weekly payroll takes two days (Thursday and Friday) to complete. Processing the larger biweekly payroll, takes an additional day (Wednesday).

In a decentralized environment, payroll processing for the School Department's approximately 500 employees should take the central office about half a day, since all input will have been done on a secure basis at each school, thus leaving the central office to just pre-audit the payroll without having to re-do any routine input. Likewise, the FileMaker Pro application should not be necessary since any good payroll/human resources system should provide fully integrated leave accounting in conformity with the Governmental Accounting Standards Board promulgation known as GASB 45.

Purchasing in the Schools works in a similar manner. Each school completes an Excel form and sends it to the School Business Office, which then duplicates all of this effort.

The model for successful decentralization in the Schools is the processing of student attendance which each school has been doing with the MMS system for many years.

Before moving to decentralize these processes, Middleborough will need to undertake an evaluation of its ACS system in cooperation with ACS to see whether in fact it can support this kind of secure decentralization throughout the Town and School Department. This has several aspects to which ACS should be asked to provide very detailed statements in writing regarding this system's capabilities (1) both as implemented currently or (2) as could be implemented.

- **Application Software:** Does the ACS system's application software, as currently installed in Middleborough, support the functionality and security required for this kind of enterprise-wide decentralization? Similarly, would this expanded deployment in the Town and Schools exceed the number of seats which Middleborough currently has licensed for the ACS applications?
- **System Software:** Would this expanded deployment in the Town and Schools exceed the number of seats for which Middleborough currently has licenses for the operating system, database management system or other system software?
- **Hardware:** Would the current server need to be upgraded or replaced in order to support the expanded workload from these additional concurrent users?

2. Decentralization of the Town and School business functions should proceed gradually.

Decentralization should occur one town department or one school at a time. In this way, any issues which may be uncovered in the first step of this decentralization can be resolved successfully before proceeding further.

Assuming a successful launch, only one Town department or school should be added in each subsequent month. Again, no additional location would be added until all outstanding issues have been resolved with the locations decentralized to that date. This approach would ensure that Middleborough would be building on proven success and that almost all town and school locations will be decentralized within approximately one year.

3. Users throughout Town and Schools offices need to be trained in tools such as ad hoc Report Generators in order to increase their self-sufficiency.

Interviewees stated to the Collins Center that various town offices felt unnecessarily limited in their access to the ACS system. The secure decentralization discussed previously in this section may help significantly.

In addition, Middleborough should provide other tools for these departmental end-users. As one example, the current ACS system supports IBM's Query/400 product which enables end-users to obtain information from supported databases on an *ad hoc* basis.

The two essential prerequisites both in decentralization and use of new tools like Query/400 are (1) appropriate security and (2) training. Skimping on either of these will severely undercut the potential value of the system to Middleborough. Again, issues of seats and licensing also may need to be addressed.

4. Middleborough should review the strategic viability of the ACS system.

This IT Assessment was charged specifically with evaluating strategic planning for IT. The ACS system, acquired by the Town in 1989 from the Business Records Corporation, about 10 years before its acquisition by ACS, as implemented betrays its roots in the 1980's. The system is what is generally known in the IT industry as IBM "green screen" technology. While ACS introduced a new generation of product known as New Vision many years ago, Middleborough never implemented this upgrade. Since the ACS system manages all finances for both the Town and the Schools, it is critical that Middleborough have very high confidence in the strategic viability of this system.

The strategic viability of the ACS system is perhaps the most critical strategic issue in IT which Middleborough faces. If a decision is made at some point to replace it, Middleborough may wish to consider a hosted or Internet-accessible “cloud” solution.

5. Procurement of a new Student Information System (SIS) should be anticipated.

Senior staff of the School Department expressed concern with the functional limitations of the current product from MMS, noting that this product was not able to meet the standards of the Massachusetts Department of Education or Schools Interoperability Framework (SIF). One member of the staff expressed interest in exploring a cloud-based solution for this function. Middleborough will need to be sure that it does a thorough job and follows best practices throughout the planning for, procurement and implementation of this new system.

6. Middleborough should be looking at how it can leverage its existing applications.

As one example, the Computer-assisted Mass Appraisal (CAMA) system from Vision Appraisal, which Middleborough has procured and implemented, has significant potential to serve all Town offices which use land records in any way. In addition to the Assessors’ Office, this may range from the Building Inspector and Health to Public Works, Police and Fire Departments.

The main issue here may be the number of seats which are currently licensed for the Vision system and related application or system software and the impact which the cost of licensing additional seats (if needed) may have on both a one-time and an ongoing basis.

7. Middleborough needs to address organizational issues in the deployment of applications.

References were made by different people to the unwillingness of some town offices to

cooperate in implementing more efficient and effective deployment of applications. The Finance Committee, the Board of Selectmen and the Town Manager need to be totally supportive of the Town's staff in these team-based, cooperative efforts both in terms of positive, non-acrimonious, visible leadership as well as financial resources.

X. BUSINESS CONTINUITY AND DISASTER RECOVERY

- 1. Neither the Town nor the Schools has ever had a written plan for business continuity/ disaster recovery.**

This void leaves Middleborough at extraordinary risk. The only document produced by the Town IT Department relative to business continuity/disaster recovery was a single-page narrative focused on steps the Town's IT personnel should follow in the event of a utility or UPS power failure or a failure of the computing hardware and software within the IT Department. Absent from this document was any consideration of additional threats such as fire, water, chemical or biochemical hazard, storm damage or vandalism. The School Department's IT staff also stated that the Schools had no documented procedure in this area.

- 2. Middleborough should take several actions immediately in advance of the development of a formal, written BC/DR plan.**

These actions ought to include, at a minimum, the following:

- a. The most recent copy of the backup should be taken far offsite, outside of downtown Middleborough, in case a natural or man-made disaster occurs which might affect the entire downtown area.
- b. Middleborough should expedite the move, which the Town's IT Department has been investigating, to obtain daily, offsite storage with a commercial firm specializing in this service. Among others, Middleborough may wish to contact: www.vaultusa.com; www.mozy.com, a division of www.emc.com; and www.carbonite.com. These websites are provided by the Collins Center for informational purposes only, with no endorsement intended or implied.

- c. Middleborough should immediately develop a Key Vendor Call List including individual contact data for all parties in case of an emergency. As the key vendor contact data is being developed, Middleborough should invite each key vendor to meet jointly with Town and School IT staff to advise what BC/DR restoration and replacement resources each has available to support Middleborough. The Key Vendor Call List should be maintained on a website, *not* hosted in Middleborough, in order to have it available to Town or School officials in an emergency from wherever they may be.
- d. Middleborough should meet with its current IT providers to see what kinds of BC/DR services they may be able to provide in the short term. These meetings should be considered informational and Middleborough should *not* execute any long-term agreement with any of these firms until the BC/DR plan has been completed and has identified exactly what BC/DR resources may be required.

3. Middleborough needs to develop a formal, written BC/DR plan as soon as possible.

This effort should include:

- a. The formation of a BC/DR development team made up of representatives of each major department within the Town and the Schools, chaired by the Town Manager or his designee. Middleborough's Town and School IT staff should clearly be central players in this effort. In addition, the Police, Fire, Health and Public Works Departments, and perhaps others, need to be involved appropriately.
- b. The utilization of a basic BC/DR template available from any number of sources including www.mass.gov, the Massachusetts Municipal Association (MMA) or other

local governments or school districts in Massachusetts or elsewhere across the United States. This information may also be available from professional associations of which Town and School staff are members, such as the International City/County Management Association (ICMA) or the Association of School Business Officials (ASBO).

- c. Coordination of the development and maintenance of the BC/DR plan, in accordance with Middleborough's plans and actions pursuant to the National Incident Management System (NIMS) or other State or Federal requirements or advisories.

This approach should produce a baseline BC/DR plan for Middleborough, covering both the Town and Schools. As with the Key Vendor Call List, the BC/DR plan should be maintained on a website, *not* hosted in Middleborough.

4. Middleborough needs to undertake several ongoing activities to assure the continuing value of the BC/DR plan.

These activities should include among others:

- a. Quarterly reviews of the plan
- b. Testing the BC/DR plan fully on a monthly or quarterly basis
- c. Updating the BC/DR plan at least annually as Middleborough's operating environment or new technologies change, and tying all of this to the Town's Capital Improvement Plan (CIP).
- d. Assuring that critical, related documents, such as schematics and descriptions of infrastructure, are maintained up-to-date and hosted outside of Middleborough.

XI. DATA AND NETWORK SECURITY AND COSTS

- 1. Middleborough has implemented data and network security which is both appropriate to its operating environment and meets the capabilities of the systems and services implemented.**

The assessment of (1) data security and (2) network security has a few key characteristics:

- It first looks to the particular nature of the operating environment of the Town and Schools in Middleborough.
- It occurs in the framework of best practice for comparable organizations.
- It looks to the capabilities and characteristics of the respective vendors' goods and services.

- a. The operating environment of the Town and Schools can be characterized as follows:**

(1) The ACS system is the only multi-departmental system which the Town uses. Moreover, the only access to the ACS system that Town offices have is read-only access to their own department's accounts. All other systems and applications used in various Town offices, such as the Vision Appraisal system in the Assessors' Office or the BMSI system in Building Inspection, are departmental-only, used solely by that municipal division. Without commenting on the value or appropriateness of this deployment, it greatly simplifies the discussion of data security in the Town.

(2) The School Department's deployment of the ACS system is even more limited than the Town's deployment since no school office outside of the

Central office has any access to this system whatsoever. This deployment does not support long-established principles of school-based management; however, it makes moot the question of data security with respect to the ACS system.

- (3) The School Department uses MMS, a long-established package, as its Student Information System (SIS).

2. Data and network security are not reported to have been issues.

The School Department reports no known security breaches. The Town reports only one claim of a successful intrusion. Immediately upon learning of this claim, the Town's IT Director reported this to the Middleborough Police Department, who then referred him to the Massachusetts State Police. The IT Director reports that the State Police investigated and found no evidence to support this claim.

One key reason why Middleborough may not have seen successful intrusions is the fact that it has what is essentially a closed network with a very small number of points of entry (POE) and has implemented industry-leading products for this purpose.

XII. AFTERWORD

Perhaps the most important afterword which this IT Assessment can offer is that Middleborough needs to be incorporating *all* Town and School offices in addressing IT. The scope of work of this IT Assessment specifically excluded the Gas and Electric, Police and Fire Departments. However, it is impossible to speak about IT in the school-municipal environment and pretend that these three other critical departments don't exist. *Their full integration into everything Middleborough does with IT going forward is critical to assuring taxpayers and ratepayers that Middleborough is maximizing efficiency and effectiveness in every way possible.*

APPENDIX

INTERVIEWEES

Roger Brunelle, Town IT Director

Pam Butler, Accounts Payable and Expenditure Specialist, School Business Office

Theresa Craig, Assistant Superintendent of Schools

Charles Cristello, Town Manager

Mark Mobley, School Network Manager

Tara Pirraglia, Town IT Administrator

Richard Pavadore, Finance Committee Chair

Dr. Robert Sullivan, Superintendent of Schools

Thomas Tatro, School Director of Business and Finance

Debbie Melloul, Coordinator of Payroll and Finance Reporting, School Business Office