

# Standard on Facilities, Computers, Equipment, and Supplies

Approved September 2003

## **International Association of Assessing Officers**

The assessment standards set forth herein represent a consensus in the assessing profession and have been adopted by the Executive Board of the International Association of Assessing Officers. The objective of these standards is to provide a systematic means by which concerned assessing officers can improve and standardize the operation of their offices. The standards presented here are advisory in nature and the use of, or compliance with, such standards is purely voluntary. If any portion of these standards is found to be in conflict with the *Uniform Standards of Professional Appraisal Practice (USPAP)* or state laws, *USPAP* and state laws shall govern.

## **Acknowledgments**

At the time of the completion of this standard, the Technical Standards Subcommittee was composed of Nancy C. Tomberlin, chair; Sheldon Bluestein; Pamela M. Dubov, CAE; James L. Pence; Jan Vann; and Ed Crane, associate member.

Published by  
International Association of Assessing Officers  
130 East Randolph  
Suite 850  
Chicago, IL 60601-6217

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fax: 312/819-6149  
<http://www.iaao.org>

ISBN 0-88329-173-8  
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Printed in the United States of America.

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# Standard on Facilities, Computers, Equipment, and Supplies

## 1. Scope

This standard provides general recommendations on facilities, computers, equipment, and supplies needed in assessment administration. Detailed recommendations are not made, because technology changes rapidly and because the specific needs of an assessment office cannot be determined without reference to the functions and workload of that office.

## 2. Introduction

Assessment offices must have the facilities, tools, and other resources needed for cost-effective performance of the assessment function. Historically, governments have allocated inadequate resources for assessment administration. Moreover, agencies sometimes receive or acquire superfluous resources or resources poorly matched to their needs. Assessment offices may also undertake comprehensive reappraisal projects that can significantly increase the size of staff and support facilities for several years. The purpose of this standard, therefore, is to enumerate the basic facilities, including computers, equipment, and supplies, needed in assessment administration. Assessment offices may not need all of the resources mentioned here, and some jurisdictions may have needs not covered by this standard.

## 3. Office Facilities and Furniture

### 3.1 Office Space

Adequate office facilities should be provided. They should be clean, attractive, and sufficiently spacious to provide comfortable workspace for each full- and part-time employee; to serve the public; to house computers and other office equipment; and to store records, maps, forms, and supplies. The arrangement of space should encourage teamwork, promote self-esteem, minimize distracting sights and sounds, and help each employee work efficiently. Offices should be designed to accommodate persons with disabilities. Facilities should comply with local ordinances and national laws (such as the Americans with Disabilities Act [ADA] and Canada's Human Rights Act) enacted to make the workplace more accessible to staff and customers.

The following minimum space standards are suggested for managerial, supervisory, and support staff:

*Assessor (chief assessing officer, director, and so on)*—a private office, enclosed by walls or windows extending to the ceiling, of 200 square feet (18 to 19 square meters),

or about 14 feet by 14 feet

*Management position (chief deputy assessor, head of a division in a large jurisdiction, and so on)*—a private office, enclosed by walls or windows extending to the ceiling, of 170 square feet (15 to 16 square meters), or about 12 feet by 14 feet

*Supervisory position (head of a section, unit, or team of appraisers, mappers, analysts, technicians, or clerks)*—a private office or partitioned space of 150 square feet (14 square meters), or about 12 feet by 12 feet

*Appraisers and technical staff*—private offices or at least partitioned, quiet work areas of 50 to 100 square feet (5 to 10 square meters), not including aisle and file space, with a desk and chair

*Support staff*—adequate workspace, open or partitioned, to promote intended work functions and access

In addition, there should be adequate aisle space, room for file storage and access, and room for training and library facilities. As paper records give way to electronic records, less file space will be needed. The following guide is offered to aid the layout process:

*Aisle space*—Aisles should conform to local codes and the Americans with Disabilities Act (ADA) or other such standards for space.

*File and storage space*—A space of 1.5 feet by 5.0 feet (0.5 by 1.5 meters), not including aisle requirements, should be provided for each standard three-drawer letter- or legal-size file cabinet. Sufficient space for storage of supplies should be provided in a convenient unobtrusive location.

*Training and meeting space*—Adequate space should be provided for training, meetings, and a library.

*Mapping and drafting space*—Adequate space should be provided for large-format scanners, plotters, copiers, and printers and for storage of large-format map documents.

*Public service space*—Such space should be sufficient to serve public needs and allow for access to and review of records utilizing public access computer terminals. There should also be provisions for counters, waiting areas, private conferences, and the like. Wall space should be available for posting such items as public notices, tax rates, jurisdiction maps, and the IAAO Code of Ethics and Standards of Professional Conduct. The public space

should reflect the size of the jurisdiction and be based on a study of actual requirements. Additional space may be necessary during reappraisals.

*Network servers and telecommunications hub*—A secure place should be provided to house network servers and telecommunications equipment.

*Printers/photocopiers*—This equipment should be placed in convenient locations throughout the office. Machines that generate excessive heat, noise, or fumes should be located in a separate enclosed area with adequate ventilation.

In designing an office layout or considering space needs, the services of an architect, interior designer, or person skilled in office design may be needed.

### 3.2 Furniture

An assessment office should have furniture of adequate quality, quantity, design, and size to meet the needs of current office technology. Such furniture should include, but not be limited to, desks, chairs, worktables, counters, storage cabinets, coat racks, bookshelves, and filing cabinets. The arrangement should be attractive, secure, and promote efficient use. Some technical functions may require specialized furniture. Data entry and computer workstation furniture should incorporate design features to reduce stress on eyes, wrists, and lower back.

### 3.3 Lighting

Halls and common areas should have a minimum of 10–15 foot-candles (100–160 lumens/square meter) of illumination. Work surfaces should be provided with at least 50 foot-candles (540 lumens/square meter) of illumination. Visually difficult work can require 80–120 foot-candles (850–1,300 lumens/square meter) of illumination. Lighting should be placed to minimize glare and reflection on computer monitor screens and terminals.

### 3.4 Ventilation and Air Quality

The office environment should eliminate exposure to tobacco smoke and minimize airborne chemical pollutants. Heat-dissipating electronic equipment in the automated office places additional demands on cooling and ventilation systems. Some computer systems may require temperature- and humidity-controlled environments to function properly.

### 3.5 Electrical Power

Adequate electrical power and sufficient outlets must be provided. As assessment operations grow more dependent upon electronic document storage and information processing, precautions must be taken to minimize the disruption of services or loss of work products due to electrical power problems. Considerations can range from surge-suppression devices to dedicated circuits, voltage regulators/filters/conditioners, and standby/uninterruptible

power systems for computer equipment. Backup generator support may be a worthwhile investment if power interruptions are frequent and lengthy.

## 3.6 Safety and Security

The facility should be designed to maintain orderly control of the operation and reduce the vulnerability of the staff or facility to acts of abuse and violence. Customer access should be restricted to specified areas and separated from staff work areas. Emergency exits should be adequate and clearly marked, evacuation diagrams should be prominently displayed throughout the facility, and evacuation drills should be performed periodically. Identification badges, key/magnetic entry cards, and/or metal detectors should be considered for large offices with heavy customer traffic.

Exterior lighting of the building and grounds should be designed to deter theft and provide security for customers and staff who may use the facility after dark.

Automated assessment offices house many valuable pieces of equipment, such as cameras, video recorders, and computers. The value of data stored on such equipment often exceeds the cost of replacing it. The facility should be designed to incorporate security measures and systems to guard against losses from theft, vandalism, terrorism, fire, and natural disaster.

## 4. Office Equipment

### 4.1 Office Machines

An assessment office should have office machines in quantities and with capabilities sufficient to meet the needs of the office. In addition to computers (which are discussed in section 5), such equipment would include, but not be limited to, the following:

*Photocopy machines*—Useful features include speed, auto-feed, collation, reduction and enlargement, automatic stapling, and two-sided copy capabilities.

*Scanning and micrographic equipment*—By storing images of documents and records on microfilm or magnetic or optical media, it is possible to make better use of office space, speed the retrieval of stored information, and enhance security. Consult state or provincial law for relevant standards on imaging and to determine if images are accepted as an archival medium.

*Mailing machine*—In addition to speeding mailing operations, postage meters help control postage expenses.

*Typewriters and dictating equipment*—This category of equipment has become less prominent in assessment offices because most of the functions can now be performed on basic computer systems. However, typewriters are still useful for completing short forms, preparing labels, or addressing envelopes.

*Calculators*—These instruments must be provided for appraisers and other staff who frequently perform mathematical calculations. Several types of calculators may be needed to handle specialized tasks such as income analysis or statistical studies.

*Facsimile (fax) machines*—Useful features include automatic answering, automatic redial, gray-scale scanning, delayed transmission, data compression, automatic image reduction, activity journal, adjustable resolution, broadcast capability, and memory-to-memory transmission.

*Printers*—Most computerized offices should have a variety of printers available. Some tasks require speed, whereas others call for high-quality text or specialized output, such as color images or large-scale maps. The assessment office should also have access to printing and binding facilities for high-volume jobs. For larger jurisdictions, it may be cost-effective to maintain such facilities in house.

*Multifunction machines*—Machines exist to perform photocopying, scanning, faxing, printing, inserting, and mailing functions.

## 4.2 Field Inspection Equipment

An assessment office should possess the following kinds of equipment for collecting data:

*Accurately prepared and maintained parcel identification maps*—These maps should be designed to help the field staff locate property. (See *Standard on Cadastral Maps and Parcel Identifiers* [IAAO 1988; undergoing revision].)

*Measuring instrument(s)*—Tapes of various materials, lengths, and units of measure are used to measure buildings and other improvements. Electronic/optical/sonic instruments and mechanical instruments can be useful for some measurements but may not meet accuracy requirements. Various scales are helpful in preparing more accurate and legible sketches.

*Calculators*—Inexpensive, hand-held units can be practical for fieldwork because such units have a short life span when subjected to rough handling and harsh environmental conditions outdoors.

*Motor vehicles*—An alternative to providing vehicles is to reimburse personnel for the use of privately owned vehicles. Jurisdictions with large expanses of open or rugged country should have access to utility, all-terrain, or special-purpose vehicles for fieldwork. Vehicles should bear proper identification.

*Official identification cards*—Identification must be provided to staff that participate in field work. Such identification should include at a minimum a laminated, clip-on, photo identification badge. Business cards should also be available to appraisers and staff.

*Specialized Equipment*—Some field assignments may require a laptop, notebook, pen-based computer, or personal digital assistant (PDA). Various cameras (still, instant, video, or digital) may be employed to capture a pictorial image of the property. Global positioning system (GPS) location devices can be useful for field staff that work in large rural jurisdictions. Microcassette recorders are useful for taking notes during property inspections.

*Miscellaneous field equipment*—Such equipment includes road maps, communication equipment such as cellular telephones and pagers, flashlights, clipboards, first-aid kits, personal security devices, dog repellent, hard hats, earplugs, safety glasses and shoes, and luggage carts for transporting files and equipment to and from the field.

## 4.3 Mapping Equipment

It is essential that an assessment office have a complete and continuously updated set of cadastral maps. The need for mapping equipment in an assessment office will vary from jurisdiction to jurisdiction, depending on whether mapping is done in house or by another agency. For information on equipment to prepare and maintain cadastral maps, see *Standard on Cadastral Maps and Parcel Identifiers* (IAAO 1988; undergoing revision).

Many jurisdictions make effective use of computer-assisted drafting (CAD), automated mapping, or geographic information systems (GIS), which involve specialized equipment such as plotters, digitizers, and customized computer workstations.

## 4.4 Telephones and Communication Lines

The office should have an adequate number of lines to ensure that an open line is available for both incoming and outgoing calls. Each employee should have ready access to a phone. Speakerphones and conference calling features are recommended. Reappraisal projects, heightened public awareness of issues, or seasonal variations in workload may require phone banks with queuing and messaging capabilities. The linkage of computers with telecommunication systems has made electronic mail (email) and voice mail practical for even the small office. Computerized call routing can also be helpful, but messages and menu selections should be kept as short as possible. The data flow and information exchange activity in a computerized assessment office can place additional demands on the telecommunications system. Frequent use of fax machines, downloading of data from the field, access to online information services, and employment of telecommuting options can significantly increase the need for more and higher quality lines. Several options often are available when faster and more reliable data transmission is required.

## 5. Computers

Computers are a critical part of the assessment function. Assessment offices must recognize that computer technology is changing rapidly. They should, therefore, frequently evaluate the adequacy of their systems and attempt to maintain systems at the current state of the art.

### 5.1 Importance of Computers

Every assessment office requires adequate computer support. Computers greatly reduce the time required for such routine operations as production of the assessment roll, time and production reporting, and valuation calculations. Computers expand analytical capabilities, make possible the use of advanced mass appraisal techniques, and generally improve the accuracy and equity of valuations. Hence, computers increase both the effectiveness and efficiency of the assessment office. The reasonable costs, technical advances, and improvements in ease of use make computers a necessity in the modern assessment office.

There are two basic aspects to any computer system: hardware and software. A fundamental understanding of hardware and software will help the assessor appreciate the role of computers in the assessment process and make informed decisions about their acquisition and use. The office should choose the software first. Choosing hardware first may limit the kinds of application software that can be used. The operating system and the application software should be reviewed frequently—at least annually—for compatibility and expectation of future support. Both the operating system and application software upgrades should be backed up when installed and after any upgrades. Appropriate measures for system security should be taken (see section 5.4.9).

### 5.2 Hardware

Computer hardware consists of the central processing unit (CPU) and the various peripheral units, including mass storage devices, keyboards, monitors, printers, and plotters.

#### 5.2.1 Categories of Computer Hardware

There are three general categories of computer hardware: mainframe computers, minicomputers, and microcomputers. Larger jurisdictions often require either a mainframe or minicomputer system to satisfy their storage and processing needs. The microcomputer will typically play an important role in every office, regardless of size.

##### 5.2.1.1 Computer Trends

The newer generations of computers with powerful processing capabilities are now assuming a much larger role in the assessment office. In general, professional staff involved in research, analysis, model building, or valuation review should have desktop access to computers. Microcomputers are relatively inexpensive and offer

much more flexibility and independence to the user than larger computers. Most smaller jurisdictions can satisfy their data processing needs using microcomputers. Many larger offices are now augmenting or replacing their mainframe and minicomputer systems by linking microcomputers together to form a local area network (LAN) or a wide area network (WAN). Microcomputers are becoming the primary platform for running assessment-related programs, whereas the mainframe or minicomputer has begun to assume the role of a file server, often using the desktop or portable microcomputers as “clients” in a “client–server” network configuration.

##### 5.2.1.2 Computer Configurations

Many software manufacturers will offer one version of their program to operate, for example, with a Windows-based operating system and another to operate on the Apple Macintosh (Mac). Although new microprocessor chip designs allow for more cross-platform compatibility, the additional translation steps needed to permit software developed for one operating system to operate on another can slow down processing and give rise to other unexpected problems.

### 5.2.2 Computer Peripherals

Devices that attach to the computer and perform functions to send, receive, display, and store data are referred to as peripherals. The assessment office should have enough computer peripherals to provide adequate data entry, storage, retrieval, and backup capabilities; printer support; and graphics. The system should provide direct or online access to files, allowing the user to retrieve data almost instantly.

### 5.3 Software

Computer software consists of the programs that interact with the user. These programs help manage the database, aid in the valuation process, prepare assessment notices, generate reports, produce maps, and provide other output. Software should also be acquired that allows the use of the Internet and worldwide web for use in researching web resources and for communicating with taxpayers, other officials, and peers. There are three basic categories of computer software: operating system software, utility software, and application software. The operating system is generally supplied with the computer and manages overall operation of the system, including file maintenance and communications between the processor and peripherals. Several types of operating systems have become standard in the industry, and care should be taken to choose one that will support the desired application software.

Operating system software performs such routine functions as sorting, copying, and merging files and managing the simultaneous operation of multiple peripheral devices. Utility software performs hardware and software

diagnostics and searches for destructive viruses. Utility software may be provided by the computer system vendor or purchased separately.

Application software performs the actual functions required by the user. Mass appraisal work, which includes assessment administration, database management, valuation modeling, and reporting functions, is often performed by a specialized set of application programs referred to as computer-assisted mass appraisal (CAMA) systems. Mapping support has also become automated through computer-assisted drafting (CAD) and geographic information system (GIS) software. At the highest level of sophistication, attribute data from the CAMA application can be brought together with spatial data from the GIS to perform complex analytical tasks.

The assessment office should have a variety of application software packages available to perform such routine functions as word processing, spreadsheet analysis, statistical testing, database queries, graphics presentations, and project planning. Word processing and desktop publishing software should be used to maintain manuals, prepare reports and form letters, and produce routine correspondence. Spreadsheet software can be used to develop and test simple models and assist with financial and economic analysis. Although spreadsheet programs can perform many statistical functions, stand-alone statistical packages typically offer more powerful evaluation tools and better graphic capabilities. Database applications can be employed to develop small or temporary files for analysis or valuation modeling performed outside of the CAMA system. Graphics software can produce specialized plots, graphs, and charts. Project planning software can be helpful in scheduling field work, monitoring reappraisal programs, tracking implementation of new procedures, and the like. Application software to produce correspondence (triggered by events or deadlines) that incorporates data merged from various files may also be highly productive.

Two basic kinds of application software are available, custom and generic (general purpose).

### 5.3.1 Custom Software

Custom software is designed to perform specific tasks, identified by the jurisdiction, and can be specifically tailored to the user's requirements. Most CAMA software packages fall in this category. The data screens and processing logic can often be customized to reflect actual or desired practices, and the prompts and help information can be tailored to reflect local terminology and convention.

After completing the purchase or license requirements, the jurisdiction should retain access to the program "source code," which is the program as written in a programming language, and before conversion to machine

code. This means that other programmers conversant in that programming language may be able to modify the program to reflect changing requirements. Once the program is compiled to machine code (the code in which programs are executed), program modifications are virtually impossible.

The major disadvantages of custom software are the time and expense of writing and testing the programs. Particular attention must be paid to ensuring that user requirements are clearly conveyed to programmers and reflected in the end product, which should not be accepted until proper testing has been completed. Future modifications to programs, even those of a minor nature, can involve system administrator approval and can be a time-consuming, costly, and rigorous job. (See *Standard on Contracting for Assessment Services* [IAAO 2002].)

### 5.3.2 Generic Software

An alternative to custom software is generic software, of which there are two major types: vertical software, which is written for a specific industry, and horizontal software, which is written for particular applications regardless of industry. Examples of the latter include database, spreadsheet, word processing, and statistical software. Although the actual instruction code within these programs cannot be modified, they typically permit the user to create a variety of customized templates, files, and documents that can be processed. These are often referred to as commercial off-the-shelf software (COTS) packages.

Vertical generic software provides a system for assessment administration that can be placed in operation quickly. Usually this type of software will require modification to fit a jurisdiction's specific needs. Such software is available through independent software houses, mass-appraisal services companies, and mass appraisal software companies. Some companies may be persuaded to add customized features to their packages. In considering such a system, the assessor should evaluate the extent to which the software meets the agency's needs, how modifications will be accomplished (if available), the vendor's commitment to continued support of the software, whether the source code can be obtained, and a number of other issues (see section 5.4). In general, the assessment office should prepare a report that includes a discussion of the existing system, a system requirements definition (SRD), a request for information (RFI) document, or request for proposals (RFP) that details the agency's requirements and concerns, and a system implementation timetable (if possible). (See *Standard on Contracting for Assessment Services* [IAAO 2002].)

Horizontal generic software is more flexible, permitting the user to define file structures, relational table layout, input and output procedures, including form or format, and reports. Assessment offices with expertise in such

software (which does not imply a knowledge of programming) can adapt it for

- property (data) file maintenance
- market research and analysis
- valuation modeling and processing
- many other aspects of assessment operations

Horizontal generic software's major advantages are that it is inexpensive and flexible. However, it requires considerable customization to local procedures and requirements, including the development of system documentation. A minimum of two persons should understand the system, at least from the user's perspective, so that backup resources are available if necessary.

### 5.4 Selecting a Computer System

Before considering the purchase of a computer system, an assessment office should conduct an in-depth analysis of the current business processes (inputs, work-flows, and outputs). A detailed description of the office's needs and requirements to improve the process can then be prepared by comparing the existing processes to the desired processes using the automated system. A jurisdiction that does not have the in-house expertise required to conduct such an evaluation should obtain outside assistance. The development of performance specifications embodied in an RFP is recommended. (See *Standard on Contracting for Assessment Services* [IAAO 2002].) The evaluation should be concerned with the extent to which available software meets the jurisdiction's required functions and procedures. Special emphasis may be placed on system integration if desired by the jurisdiction. System integration means having several functions related to assessment incorporated into the overall system design. A few of the related functions that may be integrated are

- Land records
- Mapping
- GIS
- Tax collection
- Funding disbursements

The point of contact between these potentially related functions and the assessment process is often referred to as an "interface." An additional and helpful consideration is to compare the data elements recorded on the existing field card or data-collection card to the data requirements of the desired (CAMA) system. The data collected has to match the system requirements or the system has to be designed or modified to use the desired data elements. When selecting a computer system a decision should be made either (1) to change the existing process to meet the requirements of the automated system or (2) to design the system to automate existing practices. In reality, the outcome is usually somewhere in between. Some addi-

tional key issues, related to hardware and other concerns, are outlined below.

#### 5.4.1 Memory and Storage

Computer systems record information using two basic media: operating (or system) memory and auxiliary (or peripheral) storage. System memory takes the form of very fast electronic chips (referred to as random access memory [RAM]) that reside within the computer. Valuation, mapping, and graphics-based programs can demand many millions of bytes of memory to perform efficiently on a computer. The computer should be configured with memory sufficient to meet recommended requirements of the most demanding software application loaded on the system. Secondary storage may be internal or external to the computer and takes the form of magnetic tapes, floppy disks, hard disk drives (or an array of disks), and magneto-optical and CD-ROM drives. If the computer is intended for a CAMA application, careful planning is required to ensure adequate space will be available to hold the property characteristics data for all parcels, particularly digitized documents and photographic images. Automated mapping and GIS applications can demand significantly more disk space. Enough secondary storage is needed to support the current data files and software applications and allow for future expansion.

#### 5.4.2 Processing Speed

The computer system should be able to perform calculations and input/output processing at speeds that do not hinder research, development, and timely data retrieval. Growth should be planned for so that added terminals and other peripherals do not make the system slow and unresponsive. In general, computer users should obtain the most current system architecture (generation of memory chip and data bus design) and fastest processing speed (measured in megahertz) that can be afforded. This recommendation is particularly important if the computer will be used for applications involving valuation modeling, imaging, CAD, or GIS. For routine data entry and file maintenance applications, the recommended response time between an operator pressing a key to signify that a transaction is complete and the system signaling its readiness to accept the next transaction should be nearly imperceptible.

#### 5.4.3 Computer Monitors and Graphics Display Cards

Computers are taking on more expanded roles in the area of mapping, GIS, and imaging. The selection of monitors and graphics cards has consequently become an important consideration. Monitors with large screens and with fast, high-resolution graphics cards are essential. Dual monitor configurations that allow dedicating one screen to maps, images, and graphics, and a second screen to data are desirable. Other considerations in monitor selection include compliance with the MPR-II (Swedish) standard

that places limits on electromagnetic radiation. Electrical energy conservation standards must be met to earn the EPA Energy Star (USA) rating. The TCO (Swedish) standard is the most stringent and comprehensive. It demands more restrictive limits on electromagnetic radiation and also addresses energy conservation, ergonomics, electrical and fire safety, environmentally responsible manufacturing processes, and recycling requirements.

#### **5.4.4 Expandability**

It should be easy to upgrade the computer system with additional memory data storage capacity and peripherals to support future enhancements. Leasing rather than purchasing the hardware can provide greater flexibility in this regard. In any case, it is important that the software be convertible to new hardware without major disruptions. In the rapidly changing computer environment, it may not be prudent to upgrade a machine that is more than two or three years old. When designing a LAN or WAN, future growth of the office and/or users should be considered in the design. There are limits to the number of workstations a system can support.

#### **5.4.5 Selecting a Computer System**

The computer industry has been evolving rapidly. Processor designs now undergo several upgrades every year. New and more powerful peripherals are introduced every week. It is not within the scope of this standard to present a minimum configuration. Although a premium price is often attached to new processor designs, assessors should consider purchasing the most advanced technology available. A number of computer publications closely track changes in the industry. These periodicals often provide a balanced set of system recommendations and equipment reviews for demanding business applications.

#### **5.4.6 Transferability**

The computer system should be capable of exchanging data and programs with other computer systems with minimal difficulty. For example, it may be important for an assessor's system to be able to communicate directly with the state's or province's computer system and, possibly, with the computer systems of other assessment jurisdictions and government agencies. In mainframe and minicomputer systems, the ability to download or upload data to and from microcomputers makes research and analysis much easier. This function can be an integral part of LANs and WANs. (See section 5.4.9 for security required.)

#### **5.4.7 Compatibility**

When acquiring a new system, select the software first and then the hardware. Hardware and software must be compatible—the hardware must be capable of running the software. Be careful to choose software that will not limit the hardware selection to a single manufacturer, because this will limit purchase options and future upgrades. (See

section 5.4.) It is also essential to select computers and peripherals that are compatible.

#### **5.4.8 System Documentation and Support**

The computer system, particularly the application programs, must be well documented and supported. When purchasing application software, make certain complete documentation is provided. Provisions should be made for user training, maintenance, incorporation of any new software releases, and program modifications required by changes in user needs. Computer documentation varies in quality, and potential users should seek information on the completeness and quality of documentation. Product reviews published in trade publications are often helpful in evaluating support and service for both hardware and software. A manufacturer's warranty provisions and service record and the availability of online help are of utmost importance. Assistance with using application programs can often be obtained from user groups and computer clubs or on-line discussion groups accessed through electronic bulletin board services.

#### **5.4.9 Security and Backup**

The system must provide for security to prevent unauthorized or unintentional damage or loss of data and programs. This will include password protection, write protection (in which designated users have "inquiry only" access to the system), and regular backup of files and programs. Computer viruses, which can corrupt system functions or destroy an entire database, should be a high-priority concern. Protection measures should be in place to scan for viruses before any file or program is loaded on the system. Additional levels of security and backup control are required on systems that allow users to perform data uploads from other computers. If systems are connected by telecommunications to outside networks, a firewall is necessary. Backup options include a variety of compact tape formats, high-capacity diskettes, optical disks, and other devices. Additional backup options may be available in a network environment. Backups should include the operating system (and subsequent upgrades) and all application software, as well as data files. One copy of the backup should remain in house and another be taken off site.

#### **5.4.10 File Structure and Database Design**

A file structure in which all commonly used data items appear to be in a single logical file improves research and analysis, as well as program modifications, and results in more efficient processing. This is the relational database concept; its implementation hides from the user the complexity of what are probably multiple physical files linked by common data elements. This technique is used to ensure that any given fact is recorded only once in the database, which reduces the risk of inconsistencies arising. Programmer productivity is increased because files can be redefined and augmented as necessary. This makes it possible to add new capabilities, such as includ-

ing digitized documents and photographic images (often referred to as objects), to a system without modifying existing programs. New database designs that incorporate object/relational features are rapidly evolving to handle the additional demands of managing electronic images and documents.

#### **5.4.11 Query and Report Writing**

The system should provide query and report-writing capabilities, in which the user can easily select a given subset of the records and generate customized reports. Such capabilities are, in turn, improved by a database file structure.

#### **5.4.12 Modular Design and Ease of Use**

It is important that the software be well designed and easy to use. A modular design structure, in which the programming is divided into logical subsets, is helpful in this regard, as is good documentation. Software can be menu driven, command driven, or both. Menu-driven software is easier to learn, but experienced users often find command-driven software quicker and more convenient. The system should have “help” keys, or their equivalent, which provide online help in interpreting error messages and in choosing among menu options.

#### **5.4.13 User Involvement**

It is important that users understand the system’s objectives, become involved in the decision-making process, contribute to the design, and be committed to the system. Employees who will use the system should be involved in the review and acquisition process. They should be assured at the outset that the computer is their tool and can increase their productivity and professionalism. Learning and creativity should be encouraged. The office environment may influence the placement of computer equipment.

#### **5.4.14 Training and Documentation**

An ongoing training plan is essential. Computer software and hardware are of little benefit if users lack the skills for using them efficiently. Training and documentation, critical to success and productivity, are resource intensive and require ongoing investments.

### **6. Reference Materials**

Reference materials are needed in an assessment office to promote compliance with laws and regulations, uniformity in operations and procedures, and adherence to generally accepted assessment principles and practices. The following kinds of materials should be kept current and readily available.

#### **6.1 Standards of Practice**

Written standards of practice should be prepared in such areas as personal conduct, collection of property data,

coding of information for data processing, and completion of any form that is not self-explanatory. The amount of detail will vary with the nature of the operation and the size of the office. The standards of practice may incorporate or be contained in laws, regulations (such as the *Uniform Standards of Professional Appraisal Practice* [Appraisal Foundation 2002; updated annually]), policy memoranda, procedural manuals, appraisal manuals and schedules, standard treatises on property appraisal and taxation (see section 6.2), and forms (see section 8).

### **6.2 Professional Library**

Every assessment office should have a comprehensive professional library that contains the information employees need to perform their duties and to keep abreast of developments. The library should contain applicable property tax laws and regulations; a complete set of IAAO standards; current treatises, monographs, periodicals, and reports; and other publications, manuals, and schedules dealing with assessment and appraisal principles and practices, real property market developments, real estate finance, building construction, management, supervision, urban planning, architecture, mapping, GIS, statistics, data processing, and general property appraisal. The library should also be the repository for equipment manuals and software documentation. Space should be provided to house and use these materials. An individual should be responsible for cataloging all material in the library and for keeping accurate records of loans.

## **7. Supplies**

Every assessment office should have enough general office supplies on hand. One person should be responsible for inventory and ordering of supplies, and a systematic program of ordering should be developed.

## **8. Forms**

An assessment office should always have standard forms available on demand. Computerized offices can store many of these documents electronically and produce them for customers as needed. One individual should be responsible for inventory, ordering, and distribution if special forms are needed. Examples of such forms include, but would not be limited to, the following:

*Data collection forms*—These are designed to be used in the field for recording or verifying property characteristics data and then to become the primary data entry (system input) document.

*Assessment roll forms*—These provide for such basic data as property ownership, legal description, and assessed value.

*Property appraisal forms*—These are used as the primary paper record for all appraisals and should provide for

recording pertinent information on the identification, description, and valuation of a property.

*Assessment notices*—These are used to inform the property owner of the assessed value and may include estimates of taxes and other information required by statute.

*Exemption applications*—These are used to gather data necessary for establishing the taxable status of property and/or taxpayer.

*Appeal, tax relief, and abatement applications*—These are used by property owners who wish to appeal their assessments, have their assessments reviewed, or have their taxes reduced or abated.

*Other preferential assessment applications*—These are used to gather data necessary in establishing eligibility for current use assessment or land-productivity value and for other legal forms of preferential assessment.

*Personal property reporting forms*—These are used by businesses and individuals who own taxable personal property to render situs, taxable status, cost, and other information about assets located in the assessment jurisdiction on the lien date.

*Operating property and utility property reporting forms*—These are used by operating property or utility property companies to furnish the assessment office with the information needed to identify and value such property.

*Sale, cost, income and expense, and property characteristics questionnaires*—These are used to collect or verify information from property owners.

As needs and requirements change, forms should be evaluated and, when necessary, modified.

## References

The Appraisal Foundation. 2002 (updated annually). *Uniform standards of professional appraisal practice*. Washington, DC: The Appraisal Foundation.

International Association of Assessing Officers (IAAO). 1988 (undergoing revision). *Standard on cadastral maps and parcel identifiers*. Chicago: IAAO.

International Association of Assessing Officers (IAAO). 2002. *Standard on contracting for assessment services*. Chicago: IAAO.

## Assessment Standards of the International Association of Assessing Officers

FEBRUARY 1990  
Guide to Assessment Administration Standards

JULY 2003  
Standard on Administration of Monitoring and Compliance Responsibilities

JULY 2001  
Standard on Assessment Appeal

SEPTEMBER 2003  
Standard on Automated Valuation Models

FEBRUARY 2002  
Standard on Contracting for Assessment Services

JULY 2003  
Standard on Digital Cadastral Maps and Parcel Identifiers

SEPTEMBER 2003  
Standard on Facilities, Computers, Equipment, and Supplies

FEBRUARY 2002  
Standard on Mass Appraisal of Real Property

OCTOBER 2000  
Standard on Professional Development

AUGUST 1997  
Standard on Property Tax Policy

JULY 2001  
Standard on Public Relations

JULY 1999  
Standard on Ratio Studies

JULY 2001  
Standard on Valuation of Property Affected by Environmental Contamination

FEBRUARY 1996  
Standard on Valuation of Personal Property



To order any standards listed above or to check current availability and pricing, go to:

<http://www.iaao.org/publications/standards.html>