

Chapter 5. Data Analysis and Reporting

5.1 Comparison and Complexity

Market conditions and complexity are realities for postsecondary institutions that are under pressures to focus on improvement, to find their market niche, and to be competitive. Competition for potential students may require institutions to make greater investments in faculty, in student financial aid, and in physical plant improvements. Consequently, they must monitor and measure their current internal conditions so that they can make needed operational changes and allocate resources to programmatic priorities, as well as have a clear understanding of their relative market and qualitative position compared with competitors.

Demands for greater accountability and for more consumer information mean that more external reporting is also a reality for postsecondary institutions. States make decisions on the fair and equitable allocation of resources for operations and for capital improvements among public colleges and universities. Having comparable information on facilities, finance, faculty, and students for institutions within a state as well as for peer institutions is extraordinarily important to states' policy and decision-making processes.

Many states collect facilities inventories for public institutions. These data may be used for a multiplicity of purposes, including determining the allocation of maintenance and operations funds among colleges and completing space utilization studies that may be used to determine the need for, and relative priority of, new facilities. In addition, a number of states conduct facilities audits to support capital budget requests for renovation and renewal of facilities. Thus, postsecondary institutions are involved in collecting and analyzing information for themselves and for others as well. This information helps colleges and universities communicate more effectively, build credibility, and develop the case for additional financial support from donors and government agencies.

In summary, facilities data collections are used internally for management purposes, to establish strategic directions, and to build support for additional resources. States use facilities data for accountability reporting, for informing consumers, and in the budgetary process.

5.2 Required Data Elements

As referenced in chapter 2, this manual outlines two broad categories of facilities inventory data: *required data elements* and *optional data elements*.

If an institution is assembling a facilities inventory database for the first time or re-inventing and overhauling one that has become obsolete, please refer to chapter 1 for practical tips on how to begin this process. This manual recommends first collecting at least the four required data elements. It also recommends that if a room is divided into several spaces for either assignment or architectural use purposes, data for each space should be provided.

Table 5-1 presents the four types of required data. They are the minimum necessary to provide unique identification to a given room or space. Together, they serve as the foundation upon which other data may be added to suit the needs of each institution.

Table 5-1. Required data elements

| | |
|--|--|
| Unique Space or Room Identifier | A code assigned by the institution to identify every specific room or space, whether assignable or nonassignable. This code should incorporate a unique building, floor, and room number for each space. |
| Organizational Unit | An institutionally determined name or code to identify the organizational unit(s) to which the space is assigned at the time of inventory (e.g., school, department, division). |
| Area | The floor area of every specific room or space, measured in square feet or meters, whether assignable or nonassignable. For a specific space, it is the area assigned to or available for assignment to an occupant or specific use. If the space is prorated, the area should be proportionately allocated. Floor areas are defined in chapter 3. |
| Space Use Category | Code indicating the classification of every specific room or space based on primary use or activity that occurs in the space at the time of the inventory. It may be a space use name, a numerical code, or both. The standard classifications of space use are defined in detail in chapter 4. |

5.3 Optional Data Elements

Optional data elements contribute to greater effectiveness by providing additional data that increase the overall value of the database for intrainstitutional analysis and organize the data for external (interinstitutional) reporting. (Appendix A contains a basic framework for external sharing or reporting

of summary data drawn from building inventory and room inventory data sets maintained by institutions or system- or state-level offices.)

In this section, several additional data elements commonly used in facilities inventory systems are explained. The need for and the mix of optional data elements vary and are specific to each institution. As a general rule, the need for a specific type of optional data will be driven by two factors: first, what the institution needs to analyze its inventory and make decisions about its facilities; second, what types of reporting and accountability are required of the institution.

5.4 Optional Building and Space Data Elements

Table 5-2 lists the optional building and space data elements, and tables 5-3 and 5-4 briefly describe them. These tables are intended to indicate and provide guidance on which data elements are generally viewed as most important and useful for institutional management or external reporting. None of these data elements should be viewed as prescriptive, and institutions typically vary as to which data elements are included in their facilities inventory.

Table 5-2. Optional building and space data elements

| | |
|---------------------------------|---|
| Building Information | |
| Institutional Identifier | Location or Street Address |
| Site Identifier | Local Name |
| Building Identifier | Number of Floors |
| Ownership Status | Type of Construction |
| Estimated Replacement Cost | Landmark Status |
| Original Building Cost | Gross Area |
| Cost of Latest Major Renovation | Assignable Area |
| Year of Construction | Fixed Equipment |
| Year of Beneficial Occupancy | Building Service Area |
| Year of Latest Major Renovation | Circulation Area |
| Disabled Access to Building | Mechanical Area |
| Building Condition | Structural Area |
| Space Information | |
| Institutional Identifier | Local Space Name |
| Building Identifier | Suitability |
| Academic Discipline | Space Architectural Features |
| Functional Use | Space Fixed Equipment |
| Number of Stations | Space Moveable Equipment |
| Disabled Access to Space | Functional Categories (NACUBO and A-21) |
| Space Condition | Academic Discipline Codes (CIP) |

Table 5-3. Optional building data element descriptions

| | |
|--|---|
| Institutional Identifier | A code (such as the IPEDS Unit ID) that identifies the institution; may be used for reporting as part of a multi-institutional (comparative, state, or national) reporting effort. |
| Site Identifier | A code assigned by the institution to identify the unique physical description of the site where the building is located (e.g., “Main” or “West” campus). |
| Building Identifier | A unique identifier assigned by the institution to the specific building (a unique building name or a code consisting of numbers or letters). |
| Ownership Status | The agency with which the ownership of the building resides (also may include data on the conditions of ownership, terms of a lease, etc.). Suggested codes are provided in section 5.5.1. |
| Estimated Replacement Cost | Estimated building replacement cost (construction only) at time of inventory. |
| Original Building Cost | The total original project cost of the building to the institution. |
| Cost of Latest Major Renovation | The dollar value of the latest renovation that cost in excess of 25 percent of the estimated replacement cost of the structure and that significantly extended its useful life. |
| Year of Construction | The year the construction of the building was completed. |
| Year of Beneficial Occupancy | The year the institution occupied the building. |
| Year of Latest Major Renovation | The year of the most recent renovation that cost 25 percent or more of the estimated replacement cost of the building and that significantly extended its useful life. |
| Disabled Access to Building | Indication that there are no exterior site or architectural barriers to access to the building by a mobility-impaired person. Access to Building means the ability to physically approach and enter the building without assistance; floor accessibility is noted by the room accessibility data element. Compliance should be measured using the Uniform Federal Accessibility Standards or the ADA Accessibility Standards, developed by the Architectural and Transportation Barriers Compliance Board. A summary of these standards is provided later in this chapter (section 5.5.3). ¹ |
| Building Condition | The physical status of the building at the time of the inventory or audit, based on the best judgment of those persons familiar with the physical characteristics and condition of the campus. |

See notes at end of table.

Table 5-3. Optional building data element descriptions—Continued

| | |
|-----------------------------------|---|
| Location or Street Address | The specific location at which the building can be found. |
| Local Name | The name commonly given to the building. |
| Number of Floors | The number of floors in the building, including basements, attics, and rooftop structures that have assignable area. |
| Type of Construction | A code assigned by the institution to indicate the type of construction used in the building. |
| Landmark Status | Indication that the building is listed on the National Register of Historic Buildings or on some other official listing that limits the character of changes that can be made in the building's use or appearance. |
| Gross Area | The total floor area of the building within the outside faces of the exterior walls. This is also referred to as Gross Square Feet (GSF). |
| Assignable Area | The sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant or use, excluding nonassignable spaces defined as building service, circulation, mechanical, and structural areas. This is also referred to as Net Assignable Square Feet (NASF). |
| Fixed Equipment | Information assigned by the institution to indicate the presence of special fixed equipment such as chillers or elevators. |
| Building Service Area | The sum of all areas on all floors of a building used for custodial supplies, sink rooms, janitorial areas, and public rest rooms. |
| Circulation Area | The sum of all areas required for physical access to some subdivision of space within the building, whether directly bounded by partitions or not. |
| Mechanical Area | The portion of the gross area of a building designed to house mechanical equipment, utility services, and shaft areas. |
| Structural Area | The sum of all areas on all floors of a building that cannot be occupied or put to use because of structural building features. This is a nonmeasured area calculated as the difference between gross area and the sum of assignable and nonassignable space. |

¹ See also the definitions for Disabled Access to Room provided in table 5-4 and the comprehensive regulations and definitions under the 1990 Americans with Disabilities Act (ADA). For example, see S.R. Colter, *Removing the Barriers: Accessibility Guidelines and Specifications* (Alexandria, VA: Association of Higher Education Facilities Officers, 1991).

Table 5-4. Optional space data element descriptions

| | |
|-------------------------------------|---|
| Institutional Identifier | A code or other means to indicate the campus or site of the building where the space is located. For use when institutional space data are reported as part of a larger multicampus system or statewide reporting effort. |
| Building Identifier | The unique identifier determined by the institution for the building where the space is located. May be a unique name, number, letter, or combination of these. |
| Academic Discipline | Identifies the academic field, discipline, or program area to which the space is assigned for instruction, research, and academic support. |
| Functional Use | Identifies the assignment of space to academic and support functions. (See appendix B for codes.) |
| Number of Stations | Identifies the capacity of the space for selected space use categories where information about capacity (number of workstations, seats, or beds, for example) is useful in assigning or scheduling the space. The space use codes for which this information is useful include Classroom, Class Laboratory, Open Laboratory, Research/Nonclass Laboratory, Conference Room, Study Room, Open-Stack Study Room, Athletic Facility Spectator Seating, Assembly, Food Facility, Meeting Room, Patient Bedroom, Staff On-Call Facility, and Sleep/Study. (See chapter 4.) |
| Disabled Access to Room | Indicates whether the room is barrier-free for its assigned use, normally through a simple notation for accessibility. This indicates that the room can be approached, entered, and used, without assistance, by a mobility-impaired person. Floor accessibility is, therefore, indicated by this notation at the room level. If the site and the building are not accessible, no notations of disabled access to rooms in that building should be made. |
| Space Condition | Identifies the need for a room to be repaired, upgraded, or renovated based solely on its physical condition. |
| Local Space Name | The name commonly given to the room, such as the “Anderson Hydraulic Laboratory,” or the “Multi-discipline Teaching Laboratory.” This is the locally used name for the room rather than the name of the room use category. |
| Suitability | Evaluation of the suitability or functionality of the room for its assigned use and function at the time of the inventory, based on the design, configuration, and fixed equipment in the room. The evaluation of room suitability may change as its use, function, or assigned organizational unit is changed. Detailed definitions for coding room suitability are presented in this chapter (section 5.5.5). |
| Space Architectural Features | Identifies the physical characteristics of the room that are built into its architectural design and that affect the assignment or use of the room. These include structural features, such as high bay space or a sloped floor, and the type and amount of utility service provided. The coding of architectural features would not change, regardless of room use or function, unless the room was remodeled. |
| Space Fixed Equipment | Identifies special fixed equipment that allows the room to be used for specific purposes, such as a fume hood. |
| Space Movable Equipment | Identifies movable equipment assigned to a room. It is suggested that current practices set forth in OMB Circular A-21, A-110, and the like, be considered as guidelines here. |

5.5 Building and Space Optional Data Element Discussion

This section includes a discussion of specific optional data elements that need further explanation, including building ownership status, estimated replacement cost, disabled access to buildings, building condition, space suitability, space condition, space architectural features, functional categories, and coding for organizational unit, academic discipline, or academic program.

5.5.1 Building Ownership Status

- A. **Definition.** The type of ownership and relation of title holder to institution.
- B. **Description.** The following categories illustrate types of ownership status; they may also be used as descriptors of codes for ownership status in the facilities inventory database.
 - i. Owned in fee simple.
 - ii. Title vested in the institution and being paid for on an amortization schedule (regardless of whether the building is shared with another institution or organization).
 - iii. Title vested in a holding company or building corporation to which payments are being made by the institution; title will ultimately pass to the institution (includes lease-purchase arrangements).
 - iv. Not owned by the institution:
 - a. Leased or rented to the institution at a typical local rate.
 - b. Available to the institution either at no cost or at a nominal rate.
 - c. Shared with an educational organization that is not a postsecondary institution.
 - d. Shared with another postsecondary education institution.
 - e. Owner may or may not be university affiliated, but building is used exclusively for institutional services (e.g., housing, bookstore, food service, warehouse). Facility is located on institutional property.
 - f. Shared with a noneducational institution.

Note: For some institutional purposes and external sharing of data, it may be appropriate to collapse categories iv (a) through (f) into a single category of “Other, not owned by the institution, including facilities shared with other entities.”

5.5.2 Estimated Replacement Cost

- A. **Definition.** The estimated cost to replace the building at the time of inventory.
- B. **Basis for Calculation.** The cost to replace the building's gross floor area at current construction costs in accordance with current building and public safety codes, and standard construction methods. *The Engineering News Record*, R.S. Means,⁶ or Whitestone Research,⁷ or replacement value shown on the building's insurance policy are examples of frequently used sources of information for determining construction cost indices. The selected source of information should be locally determined. The replacement cost of *fixed equipment* in the building should be included.

5.5.3 Disabled Access to Buildings

A. Section 504 Program Accessibility Standards

The Department of Education's Section 504 regulation applies to preschool, elementary, secondary, postsecondary, vocational, and adult education programs and activities, as well as other programs and activities that receive federal financial assistance. In accordance with Subpart C of the Section 504 regulation, no qualified individual with a disability shall be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity because a recipient's facilities are inaccessible to, or unusable by, persons with disabilities.

The Section 504 regulation contains two distinctly different standards to be used in determining whether a recipient's program and activities are accessible to individuals with disabilities. One standard applies to existing facilities; the other applies to new construction.

The term "*existing facility*" refers to any facility in existence or in the process of construction on or before June 3, 1977, the effective date of the regulation. The term "new construction" means groundbreaking that took place after the effective date of the regulation. "Facility," as defined in the Section 504 regulation, includes all or any portion of buildings, structures, equipment, roads, walks, parking lots, laboratories, and other real or personal property or interest in such property.

⁶ R.S. Means Company, Inc., Construction Consultants and Publishers, publishes an historical cost index. In addition, the Commercial/Industrial/Institutional section of one of the Means manuals contains base building costs per square foot or floor area for 70 model buildings.

⁷ The Whitestone Research organization specializes in applied economic research and software development for both public sector and corporate clients. Whitestone also publishes focused technical reports and software products.

For an existing facility, the regulation requires that the recipient's program or activity, **when viewed in its entirety**, be readily accessible to persons with disabilities. This standard does not require that every facility or part be accessible, as long as individuals with disabilities have access to the programs and services contained in those facilities. Thus, recipients need not make structural changes to existing facilities where other alternatives are effective in making programs and activities accessible.

Examples of alternative methods include redesign or relocation of equipment, reassignment of classes and services, and provision or assignment of aids (e.g., use of "reach extenders" to access controls on elevators or light switches, assistance in retrieving library materials.)

Priority consideration, however, must be given to offering the programs or activities in the most integrated setting appropriate. In meeting the objective of program accessibility, an institution must use precaution not to isolate or concentrate individuals in settings away from other participants. For example, the Section 504 regulation would not permit making only one facility or part of a facility accessible if this resulted in segregating students with disabilities. It should be noted that if no effective alternatives can be provided to achieve program accessibility, a recipient is required to make necessary structural changes. These changes are to be consistent with the requirements for new construction.

For new construction, the regulation requires that a facility or part of a facility constructed by, on behalf of, or for the use of a recipient of federal financial assistance must be designed and constructed in such manner that the facility or part of the facility is readily accessible to and usable by persons with disabilities. Likewise, all alterations that could affect the usability of a facility are required, to the maximum extent feasible, to be readily accessible to and usable by persons with disabilities, where the alteration was initiated after June 3, 1977.

When the Section 504 regulation became effective on June 3, 1977, design, construction, or alteration of buildings in conformance with the American National Standards Institute (ANSI) Standards A117.1-1961 (R 1971) was sufficient to satisfy the requirement for new construction. However, on January 18, 1991, an amendment to the Section 504 regulation replaced the accessibility guidelines included in the ANSI 1971 document with the Uniform Federal Accessibility Standards (commonly referred to as UFAS) (Appendix A to 41 C.F.R. subpart 101-19.6) for all new construction or alterations initiated from that date forward by a recipient of federal financial assistance. The Section 504 regulation permits departures from particular technical and scoping requirements of UFAS by the use of other methods where substantially equivalent or greater access to and usability of the building is provided.

B. Accessibility Standards under the Americans with Disabilities Act

The American with Disabilities Act of 1990 (ADA), which provides comprehensive civil rights protection to individuals with disabilities in the areas of employment, public accommodations, state and local government services, and telecommunications, was enacted on July 26, 1990. On July 26, 1991, the Department of Justice issued final regulations implementing subtitle A of Title II of the ADA, which prohibits discrimination on the basis of disability by public entities. The U.S. Department of Education, Office for Civil Rights (OCR) is responsible for enforcing the Title II regulation in public elementary and secondary education systems and institutions, public postsecondary institutions and vocational education institutions (other than schools of medicine, dentistry, nursing, and other health-related schools), and public libraries. The regulations implementing Title II became effective on January 26, 1992.

The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) is the applicable accessibility standard under the Title II regulation for new construction and alterations that were initiated after January 26, 1992, by, for, or on behalf of public entities. Because the regulation implementing Section 504 continues to apply to entities that receive federal financial assistance, public entities have a choice of following UFAS or ADAAG. However, public entities must follow the same standard throughout an entire building. They may not, for example, follow ADAAG on one floor of a new building and UFAS on the next floor.

It is important to note that although the ADAAG is modeled on UFAS, the ADAAG established different requirements in some areas. For example, requirements differ concerning elevators, signage, and telecommunication display devices or telecommunication devices for the deaf for individuals who cannot use voice telephones. In addition, the Title II regulation specifically disallows the elevator exemption contained in ADAAG for small buildings. The Title II regulation permits departures from particular requirements of either standard by the use of other methods when it is clearly evident that equivalent access to the facility or part of the facility is thereby provided.

5.5.4 Building Condition

- A. **Definition.** The physical status of the building at the time of the inventory or audit, based on the best judgment of those persons familiar with the physical characteristics and condition of the campus.
- B. **Derivation.** The most useful facilities management information is produced when the inventory or audit rates each subsystem of a building. This approach documents the building's overall composite rating and provides information about needed repairs or

replacements. A facilities audit should tie subsystem and overall composite ratings to the estimated building replacement value to provide a rough estimate of the cost of rehabilitating or renovating the facility.

C. **Description.** Building condition has the following categories based on the extent of renovation or restoration required:

- i. Minimal Renovation (Good). Suitable for continued use with normal maintenance. The approximate renovation cost is less than 5 percent of building replacement cost.
- ii. Limited Renovation (Satisfactory). Requires restoration to present acceptable conditions. The approximate cost of restoration is 5–15 percent of building replacement cost.
- iii. Moderate Renovation (Fair). Requires updating or restoration. The approximate restoration cost is 16–30 percent of building replacement cost. The physical conditions may have an affect upon building operations.
- iv. Significant Renovations (Poor). Requires significant updating or restoration. The approximate restoration cost is 31–45 percent of building replacement cost. The physical conditions adversely affect building operations.
- v. Major Renovations (Unsatisfactory). Requires major restoration with possible need to overhaul building subsystems. The approximate restoration cost is 46–60 percent of building replacement cost. Consideration of actual restoration requirements may lead to classifying the facility as being in need of replacement.
- vi. Replace/Demolition. Should be demolished or abandoned because the building is unsafe and/or structurally unsound, irrespective of the need for the space or the availability of funds for a replacement. Additionally, this category takes precedence over categories i-v. If a building is scheduled for demolition, its condition is reported in this category, regardless of condition.
- vii. Termination. Planned termination or relinquishment of occupancy of the building for reasons other than unsafeness or structural unsoundness, such as abandonment of temporary units or vacating of leased space. Additionally, this category takes precedence over categories i-vi. If a building is scheduled for termination, its condition is reported in this category, regardless of its condition.

5.5.5 Space Suitability

The coding of space suitability is intended to reflect a judgment about how well the design of a space supports the function of the space and the organizational unit to which the space is assigned. This evaluation of *space suitability* for its assigned use focuses on a different dimension than the coding of *building condition*, which generally assesses the useful life of a building through the evaluation of

structural and building systems. Suitability coding is also different from the coding of *space condition*, which may assess the need for the space to be repaired, upgraded, or renovated based solely on the physical condition of the space. Assessment of space suitability is not required for the initial task of performing a space inventory.

It is entirely possible that the evaluation of space suitability may reflect an evaluation that seems to conflict with the evaluation of building condition. For example, a space such as a geography class laboratory (see Class Laboratory-210) could be evaluated as satisfactorily suited for its existing use, even though the building in which the space is located could be rated as requiring major remodeling due to the age and condition of utility or structural systems. Conversely, a similar laboratory, being used as an office, located in a building that is in excellent condition, may be rated as having an unsuitable use.

- A. **Definition.** The suitability or functionality of the space for its assigned use at the time of the inventory or audit.
- B. **Basis for Classification.** The evaluation of a space for functional suitability should be based on the judgment of a departmental representative (rather than the individual user assigned to the space) and the institution’s facility planning or physical plant personnel. Only permanent architectural features and fixed equipment should be considered in rating the space’s suitability; the configuration, age, condition, or amount of movable furniture and equipment should not affect the rating. The rating of space suitability can change significantly from one inventory or audit date to the next if, in the intervening period, the space has been reassigned to a different function or organizational unit, even though no physical alterations have been undertaken.
- C. **Coding.** The following categories may be used to designate space suitability.

| | |
|----------------------------------|--|
| Highly Suited, Excellent A | Highly suited or optimally matched to the original design intent and configuration of the space. The architectural features of the space support the use/activity. Appropriate building infrastructure and services are easily and readily available to support the use. |
| Satisfactory B | Suitable for continued use and provides adequate support for program delivery. Although the space is not optimal for the use, minor modification may be desired to improve the suitability. |
| Conditional C | Requires limited renovation to support the use on a continued basis. The cost of renovation to optimize program delivery would not exceed 25 percent of the replacement cost of the space. |
| Development Required D | Requires significant renovation to support the assigned use on a continuing basis. The space significantly inhibits program delivery. The cost of renovations to optimize the fit between the assigned use and the space would range |

| | |
|---------------------|--|
| | between 25 percent and 50 percent of the replacement cost of the space. |
| Unsatisfactory F | Is unsatisfactory for the assigned use. Renovating the space to fit the use would not be cost-effective. Renovation costs would exceed 50 percent of the replacement value of the space. |
| Inappropriate I | Not appropriate for current use but may be appropriate for other uses. It may be appropriate to relocate the activity to another location and use this space for more suitable activity. |

5.5.6 Room or Space Condition

Room condition coding must be distinguished from the coding of *room suitability*. *Room condition* coding provides a structure for assessing the need for a room to be repaired, upgraded, or renovated based solely on the physical condition of the room. A room can be in poor condition but still be highly suitable for its use.

The condition of a room may be considered independent of the condition of its building. Room condition pertains to specific conditions in the room itself, such as interior finishes, rather than conditions of **base** building systems, such as heating and air conditioning or exterior walls, which affect the building as a whole.

- A. **Definition.** The physical status of the room at the time of the inventory or audit, based on the best judgment of those persons familiar with the physical characteristics and condition of the room.
- B. **Derivation.** The most useful facilities management information is produced when the inventory or audit rates each space or space within a building. This approach documents the rating of each space, as well as the overall composite rating of all spaces in a building, and provides information about needed repairs or replacements. A facilities audit should tie subsystem and overall composite ratings to the estimated cost of rehabilitating or renovating the space(s).
- C. **Description.** Space condition has the following categories based on the extent of renovation or restoration required:
 - i. Minimal Renovation (Good). Suitable for continued use with normal maintenance.
 - ii. Limited Renovation (Satisfactory). Requires restoration to present acceptable conditions.

- iii. Moderate Renovation (Fair). Requires updating or restoration. The physical conditions may have an effect upon space use.
- iv. Significant Renovations (Poor). Requires significant updating or restoration. The physical conditions adversely affect space use.
- v. Major Renovations (Unsatisfactory). Warrants major restoration with possible need to overhaul interfaces of equipment in the space with building subsystems.
- vi. Replace/Demolition. Barred from use because it is unsafe or hazardous, irrespective of the need for the space or the availability of funds for a replacement. This category takes precedence over all other categories.
- vii. Termination. Planned termination or relinquishment of occupancy of the space for reasons other than unsafeness or hazardous conditions, such as abandonment of temporary units or vacating of leased space. Additionally, this category takes precedence over category vi. If a space is scheduled for intentional vacancy, its condition is reported in this category, regardless of its condition.

5.5.7 Room or Space Architectural Features

The design of a space in terms of architectural features often dictates the assignment of a space to specific uses or limits flexibility in reassigning some spaces to other uses or academic disciplines. The assignment of codes for architectural features can assist an institution in managing its space resources. This activity is not required for the initial task of performing a space inventory.

- A. **Definition.** The architectural features of a space, including structural design and utility services, that are relevant to the use of the space.
- B. **Basis for Classification.** The information needed to code spaces according to architectural features should be obtained by visual inspection of each space, but may also be obtained from as-built drawings. These space characteristics will change only when the space is remodeled. This coding should be done by those familiar with the physical characteristics of campus buildings and in consultation with the occupants of the space.
- C. **Structural Features Coding.** The following categories may be used to indicate structural features:
 - 1. Flat floor, low bay, no special characteristics.
 - 2. Flat floor, low bay, one or more special characteristics.
 - 3. Flat floor, high bay, no special characteristics.
 - 4. Flat floor, high bay, one or more special characteristics.
 - 5. Sloped or stepped floor.
 - 6. Other structural configurations not classifiable into one of the above.

Low bay ceiling heights (measured floor to underside of floor above) are 13 feet or less. High bay ceiling heights are over 13 feet.

Special characteristics of the space may include such architectural features as wall or door arrangements to eliminate light, projection booths or rear-view projection, sound deadening, electromagnetic screening, x-ray blocking, vibration damping, special insulation in cold or hot rooms, and heavy security doors and walls in vaults.

D. **Utility Services Coding.** The following categories may be used to indicate the availability of identified utility services:

- (C) Communication. Special cabling for telecommunications, data distribution, video sources, or media projection.
- (E) Electrical Service. Special electrical services such as 200v, 440v, or filtered electrical supply.
- (G) Gas Service. Gas piping installed to provide compressed air, lab gases (flammable or inert), and vacuum services.
- (S) Special Plumbing Service. Special plumbing services such as acid drains, glassed pipes, distilled water, or ionized water provisions.
- (T) Temperature Control Service. Special temperature and humidity control services, typically for cold or hot rooms.
- (V) Ventilating Service. Special ventilating services such as fume hoods, clean rooms, or special air circulation systems for animal rooms.
- (W) Water Service. Access to water drainage for drinking, washing, or sanitary functions.

E. **Architectural Features Coding.** Examples are indicated in figure 5-1.

Figure 5-1. Room or space coding for architectural features

| | Struct. | Utilities | | | | | | |
|--|---------|-----------|---|---|---|---|---|---|
| | | C | E | G | S | T | V | W |
| A space in a low bay section of a building (used for an office) with no architectural barriers | 1 | | | | | | | |
| A space in a low bay section of a building (used for a classroom) with no architectural barriers but wired for video projection | 1 | X | | | | | | |
| A space in a high bay section of a building with 220v electrical service (could be used for a shop where large objects are handled, even if now being used as a classroom) | 3 | | X | | | | | |
| A space in a low bay section that has water access and power (could be used for a kitchenette) | 1 | | X | | | | | X |
| A space in a high bay section of a building that has 220v electrical service, acid drains, lab gases, and fume hoods | 3 | | X | X | X | | X | |
| A space in a high bay section with a stepped floor that has 220v electrical service | 4 | | X | | | | | |
| A space in a low bay section with special insulation and with 220v electrical service and special temperature controls | 2 | | X | | | X | | |

5.5.8 Functional Categories

In addition to *space use* categories and organizational unit assignment, facilities inventory systems commonly contain a set of categories or codes to allocate space across functional categories (e.g., instruction, research, public service, academic support). This is used primarily to link space allocations to financial data or to institutional missions (e.g., the proportion of space used for public service) or to analyze and compare space allocations across institutions according to commonly used functional categories.

The functional categories recommended for this purpose, outlined in appendix B, are adapted from standard financial reporting categories, including the definitions for these categories as adapted from standard financial reporting guidelines. Coding for function requires identification of the primary (or prorated) functional use of each space.

The categories outlined in appendix B are adapted from the *Financial Accounting and Reporting Manual for Higher Education*, Release 02-6, by the National Association of College and University Business Officers (NACUBO) and OMB Circular A-21, *Principles for Determining Costs Applicable to Grants, Contracts, and Other Agreements with Educational Institutions*. See these two documents for detailed information. While the functional categories are designed for financial reporting, they can be readily adapted to facilities reporting through limited modifications. For most functional categories, there is a direct crosswalk between NACUBO and Circular A-21. A crosswalk for each major category is provided in appendix B. It is highly recommended that functional activities be identified at the major category level and not at subcategory levels, which will preclude getting involved in detail that may add only marginal value to the identification of an institution's primary functional activities. Appendix B represents a brief synopsis of the adaptation of these functional categories. For those institutions that are seeking a Facilities and Administrative (F and A) Rate for the recovery of indirect costs associated with sponsored grants and contracts, it is highly recommended that the A-21 functional categories be adopted.

5.5.9 Coding for Organizational Unit, Academic Discipline, or Academic Program

Information and coding schemes to identify the organizational unit, academic discipline, or academic program to which a space (or room) is assigned are institution specific; that is, they are based on the institutionally determined names or conventions to identify the organizational unit (school, department, division, etc.) to which the space is assigned at the time of the inventory. Since these

organizational structures and names vary across institutions, these data are not useful for interinstitutional comparisons or reporting. For that purpose, users have adopted the National Center for Education Statistics (NCES) Classification of Instructional Programs (CIP) or some local or state adaptation of these coding structures for academic fields or programs.

For external reporting and interinstitutional use of facilities inventory data, this updated manual recommends that the academic discipline coding scheme adopted by an institution be consistent with or capable of being presented in a crosswalk to the categories defined by the NCES CIP, as used for standard federal academic program reporting. The current CIP at the two-digit level can be found in appendix C. This crosswalk to standard instructional programs is applicable only for space assigned to appropriate academic functions (e.g., instruction, research, academic support) and not for nonacademic functional categories (e.g., student services, institutional support).

5.6 Data Analysis and Reporting

The array of building, room/space, function, and academic discipline data elements described previously enable an institution to generate and analyze a wide variety of information for analysis, reporting, planning, and decisionmaking. Following are examples of the types of internal (intra-institutional) reports that can be generated from these types of data, and the types of questions to which such reports can provide answers.

1. Reports by building:
 - A. Detailed space-by-space listings for each building. This report will answer questions such as:
 - i. What is the use of each space?
 - ii. What is each space's floor area and number of stations?
 - iii. To what institutional organizational unit is it assigned?
 - B. Summaries for each building by space use category, by functional category, and by organizational unit. These summaries can answer such questions as:
 - i. How many spaces are there in the building by each space use category? How many square feet of space are there in each space use category for that building?
 - ii. How many spaces are assigned to each organizational unit in the building by each space use category?

- iii. How many spaces are assigned to each academic discipline or functional category in the building by each space use category?
- iv. How many square feet does each organizational unit have in the building?
- v. What is the ratio of net assignable area to gross area in that building?

Figure 5-2 illustrates a report of a campus summary by space use category, formatted in the same manner as figure 3-1, Conceptual framework for analyzing building space, in chapter 3.

- 2. Reports by organizational unit (and/or by academic discipline and functional use):
 - A. Detailed list of each space by the organizational unit to which it is assigned. This report can address such questions as:
 - i. What spaces are assigned to this organizational unit, by space use category?
 - ii. In what buildings are those spaces located?
 - B. Summaries by space use category and by building. These summaries can answer questions such as:
 - i. What is the total area assigned to each organizational unit, by space use category?
 - ii. What is the total assignable area assigned to that unit and the percentage of each building that it occupies?
 - iii. What is the total area assigned to each organizational unit in all buildings?
- 3. Reports by space use category:
 - A. Detailed list of all spaces by space use category. This report can answer such questions as:
 - i. How many classrooms (or laboratories, or offices, etc.) does the institution have?
 - ii. What is the area and number of stations in each?
 - B. Summaries by space use category. This report can answer a question such as:
 - i. What is the area of each space use category within the institution?

Figure 5-2. Sample campus summary, by space use category

| | | | | | | | | | | | | | | | | |
|-----------------------------------|----------------------------------|-------------------------------------|--------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------------|------------------------------------|---------------------------------|-----------------------------------|---|---|--------|
| GROSS SQUARE FEET (GSF) | | | | | | | | | | | | | 100 % | 9,827,017 sf | | |
| NET USABLE SQUARE FEET (NUSF) | | | | | | | | | | | | | 89.4 % | 100 % 8,784,483 sf 30,820 spaces | 10.6 % | |
| NET ASSIGNABLE SQUARE FEET (NASF) | | | | | | | | | | | | | 65.8 % | 73.6 % 6,468,705 sf 21,044 spaces | NON- 23.6 % ASSIGN SQ. FT. 2,315,778 sf 9,776 spaces | 26.4 % |
| 2.1% 2.4% | 4.7% 5.3% | 13.1% 14.6% | 18.0% 20.0% | 10.5% 11.7% | 0.3% 0.3% | 2.7% 3.0% | 2.0% 2.2% | 11.6% 13.0% | 1.0% 1.1% | 1.9% 2.1% | 14.5% 16.3% | 7.1% 8.0% | | | | |
| 644 sf average | 360 sf average | 429 sf average | 191 sf average | 260 sf average | 124 sf average | 819 sf average | 758 sf average | 542 sf average | 297 sf average | 101 sf average | 307 sf average | 213 sf average | | | | |
| 324 spaces | 1282 spaces | 2998 spaces | 9245 spaces | 3954 spaces | 242 spaces | 320 spaces | 258 spaces | 2099 spaces | 322 spaces | 1844 spaces | 4646 spaces | 3286 spaces | | | | |
| CLASSROOMS 208,578 sf | GENERAL USE 461,925 sf | LABORATORIES 1,284,931 sf | OFFICES 1,764,765 sf | RESIDENTIAL 1,027,989 sf | RSCH HLTH CARE 29,934 sf | SPECIAL USE 262,120 sf | STUDY 195,628 sf | SUPPORT 1,137,334 sf | UNCLASSIFIED 95,501 sf | BLDG SERVICES 186,694 sf | CIRCULATION 1,427,579 sf | MECHANICAL 701,505 sf | STRUCTURAL 1,042,534 sf | | | |

Scope - Physical: Academic Owned and Leased; 157 Buildings; 786 Floor Plans; 143 Departments
Financial: \$XXXM in FY'05 F&A cost recovery via INSITE™ + \$YYM from other INSITE™ area-prorated cost pools totaling \$70.9M in the university's overhead recovery supported by INSITE™ space and asset data.

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NOTE: All percentages are rounded to nearest tenth; **Bolded %** are based on Gross Square Feet; Unbolded % are based on Net Usable Square Feet; "Classrooms" are all teaching spaces, centrally scheduled or not.

SOURCE: "ABC" University's INSITE™ System; "ABC" University Office of Cost Analysis; Space Use definitions: 2006 Facilities Inventory Classification Manual, National Center for Education Statistics.

4. Comparisons of the capacity of the facilities with their actual utilization. Note: These reports depend on being able to link the facilities files with current utilization records. These reports can answer such questions as:
 - A. For each type or size of classroom or laboratory, what percentages of each type of spaces are in use at each hour of the day? How many hours per week are certain spaces in use, and for what purposes? Are there “valleys” in the utilization pattern that could be better scheduled?
 - B. For classrooms or laboratories with different numbers of stations, what percentages of the stations are used at each hour? Where could more students be accommodated?
 - C. Based on standards or criteria the institution or system wishes to use, how many students (or weekly student contact hours) can be accommodated in the existing physical plant? Does the institution have enough space? Too much? What categories of space are needed to accommodate additional students or program changes?

5. Uses of the facilities inventory database for space management and facility management decisions, to answer such questions as:
 - A. What are the options for finding space for Professor X?
 - B. With the shift in enrollment patterns, can some of the space assigned to Department Z be made available to Department Y?
 - C. If I plan to repaint all classrooms every 8 years but complete whole buildings one at a time, how can I best schedule all the buildings, knowing the number of classrooms and approximate square footage and stations available?

5.7 Data Element Questions and Answers

1. **Question:** **How does the coding structure account for such spaces as offices in auxiliary enterprise or hospital facilities? How are office assignments among academic departments differentiated?**

Answer: All offices are coded Office (310). While some institutions have expanded this code to include faculty office, administrative office, clerical office, etc., this practice is discouraged as it mixes two distinct data types—space use and occupant rank. Greater flexibility for planning and utilization studies is achieved by storing the space occupant’s rank in a separate field of data associated with the space’s use. The ability to report on all office space is easy; and the ability to study space utilization of faculty offices, for example, is also easily done by reporting on only spaces coded Office (310) **and** housing an occupant of the rank “Faculty.” Similarly, the space use categories have been kept free from activity connotations. The use of the functional category structure allows offices used by auxiliary enterprises to be differentiated from offices assigned to instruction. An

office within the functional category of instruction **could** be further classified by academic discipline.

2. **Question:** **Classrooms may be scheduled by a central campus office such as the registrar or may be assigned to a specific department, which then schedules the classes. How does the coding scheme allow me to differentiate among these rooms in order to compare the utilization of classrooms scheduled by the registrar with the utilization of classrooms scheduled by specific departments?**

Answer: Under this manual's classification system, all classrooms are coded 110. By using the organizational assignment of each Classroom, a required field of space data in all cases, institutions can easily differentiate among classrooms assigned by a registrar and those assigned by a specific college or department. The organizational assignment for a space scheduled by a central campus office might be "Registrar." The assignment for a space scheduled by a specific department or college would be that department or college.

3. **Question:** **How should laboratories used for "departmental research" be coded?**

Answer: If the primary use of the space is as a research/nonclass laboratory, the space use code is Research/Nonclass Laboratory (250).

According to the conventions and definitions in NACUBO's *Management Reporting and Accounting for College* and OMB Circular A-21, departmental research and public service that are not separately budgeted should be included as instruction. The functional category in this case should be instruction. Research/Nonclass Laboratories (250) can have a function code of either instruction or research, depending upon whether the laboratory is used for departmental or separately budgeted research. (See appendix B for definitions of functional categories.)

4. **Question:** **How are "departmental libraries" coded?**

Answer: The use of the term "departmental libraries" is highly discouraged. It creates significant conflict with official (formal) central and branch libraries. Most of the spaces will have the use code Study Room (410).

These libraries, if they contain catalogued materials, can be optionally classified as a library function within the functional category of academic support. (See appendix B for definitions of functional categories.)

5. **Question:** **How are fraternity and sorority houses classified?**

Answer: Fraternity and sorority houses and rooms that are part of university facilities and not separately organized and controlled are classified as house (970), with the appropriate organizational unit assignment, and can have an optional classification as an auxiliary enterprise. However, if the fraternities or sororities are not owned or controlled by the university, they should not be included in the inventory.

6. **Question:** **How should chapels be coded?**

Answer: A chapel meets the definition of a devotional facility and should be coded as Assembly (610) along with other devotional facilities. If the chapel is not under university control, it should not be inventoried.

A chapel can be optionally classified as social and cultural development function within the functional category of student services if under university control. A chapel in a hospital would be optionally classified under the NACUBO function of hospital. See appendix B for definitions of functional categories.

7. **Question:** **How should day care centers be coded?**

Answer: Day care centers may be coded as Demonstration (550) or Day Care (640). Day care rooms used to **practice**, within an instructional program, the principles of child care or development, or teaching are classified as Demonstration (550). Day Care (640) serves as a central service center for faculty, staff, and students. Demonstration day care centers have a functional classification of instruction, while those facilities coded 640 could have a functional classification of either institutional support or auxiliary enterprise depending upon how the activity is organized and funded.