

CAPITAL PLANNING, DESIGN AND CONSTRUCTION
SECTION V - MEASUREMENT DEVICES FOR CAMPUS PHYSICAL PLANNING
SECTIONS 9045 – 9050

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9045 MEASUREMENT DEVICES FOR PHYSICAL PLANNING

This section defines and explains the use of measurement devices used in the development and evaluation of campus capital outlay programs: enrollment, capacity, and utilization. This section also includes information regarding the Space and Facilities Database (SFDB) and the ASF per FTE Model.

9046 ENROLLMENT

Enrollment may be expressed in terms of total student enrollment, full-time student enrollment, part-time student enrollment, or annual full-time equivalent student enrollment (FTE).

• Lecture -	1 contact hour (hour in class)	=	1 credit hour	= 1 unit
• Activity -	2 contact hours	=	1 credit hour	= 1 unit
• Laboratory -	3 contact hours	=	1 credit hour	= 1 unit
1 Full Time Equivalent Student (FTE)		=	15 credit hours	= 15 units

Annual FTE is a measurement of full-time equivalent students, which is equal to 30 semester units for a semester system campus or 45-quarter units for a quarter system campus. Term FTE is a measurement of full-time equivalent students, which is equivalent to 15 semester or quarter units per term.

Annual FTE (Semester System)	=	30 units
Annual FTE (Quarter System)	=	45 units

Total enrollment is defined as the headcount of all students, measured yearly on the census date, which is the third week of classes for campuses on a quarter system and the fourth week for semester campuses.

The Academic Planning Database (APDB) is the source for enrollment data. It contains information on each class section that is offered and the resources used to teach these courses each term. Annual studies of facilities utilization are supported by data from the APDB. The Course Section Report (CSR) is one of the reports produced from the APDB. Further definitions and information can be found in the Data Element Dictionary (DED) regarding: space types, course classification numbers, weighted teaching units (wtu), etc. The DED website address is <http://www.calstate.edu/cim/data-elem-dic/data.shtml>.

9046.01 ANNUAL ACADEMIC YEAR (AY) FULL-TIME EQUIVALENT STUDENT ENROLLMENT

The annual academic year (AY) begins with the fall term and ends with the spring term. Summer sessions are not included in the academic year.

AY FTE enrollment is used for capital outlay purposes in determining campus instructional needs. The final long-range allocation of FTE used for capital outlay purposes are issued annually by the Analytic Studies division of the Academic Affairs department of the Chancellor's Office.

The Board of Trustees approved Master Plan FTE ceiling applies to the physical seat count capacity of lecture and laboratory spaces at a given campus; it does not include "other earned" FTE. This definition is supported by the 1972 document entitled "Enrollment Ceilings," prepared by the Chancellor's Office Division of Institutional Research, and approved by the Board of Trustees.

9046.02 ANNUAL COLLEGE YEAR (CY) FULL-TIME EQUIVALENT STUDENT ENROLLMENT

The annual college year (CY) comprises summer through spring sessions for semester system campuses and summer, fall, winter and spring sessions for quarter system campuses. Summer session begins the college year. Multiyear CY FTE enrollment projections of the main campus and off campus centers are provided annually to CPDC by the Analytic Studies division of the Academic Affairs department of the Chancellor's Office.

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CY FTE enrollment includes all lecture FTE, lab FTE and FTE generated in a category known as "other earned." "Other Earned" FTE, taught in non-traditional instructional space, e.g., indoor and outdoor P.E., independent instruction, etc. The "other earned" FTE is recognized as on-campus FTE above the physical seat count capacity defined as lecture and lab FTE.

Annual CY FTE for the college year is a factor used in support budget funding.

9047 CAPACITY

Capacity of facilities is usually expressed in terms of student stations, annual FTE student capacity, or office stations. Capacity is calculated using the appropriate utilization measures and space standards approved by the state.

The total campus FTE capacity is determined for a particular year by calculating the total FTE capacity of all lecture/seminar classrooms and teaching laboratory space expected to be available for use by that year. This includes permanent facilities only. Capacity space in leased space and temporary facilities are tracked, but are not included. Temporary facilities include trailers, old houses, apartments, barracks, and other facilities of temporary construction.

9047.01 SPACE FACILITIES DATABASE

The Space and Facilities Database (SFDB) is the centralized system for maintaining capacity space, providing information about facilities and space at each of the twenty-three campuses. This data is maintained in CPDC and serves as the official central record of campus facilities and space. Custodial space and farm acreage data are also maintained on the SFDB, which directly affects the campus support budget. Annually CPDC issues a call letter for custodial and farm acreage space. Policy information and call letter can be found at:

http://www.calstate.edu/CPDC/Facilities_Planning/Space_Mgmt/index.shtml

SPACE FILE

A space is defined as a single room that houses an administrative, instructional, or support function on the campus. The space of a facility is defined as Assignable Square Footage (ASF), and consists of a room-by-room listing of the activity taking place in a particular facility. Space or ASF data of a facility include the measurements of the room, the type of activity taking place in the room (administrative, instructional or support), and the number of student seats accommodated in that room (referred to as student station count).

The annual call letter for updating the SFDB is issued each summer. Space for new facilities should be submitted to CPDC upon completion of construction. The space for new facilities must be submitted to CPDC prior to requesting custodial maintenance funding for the facility (preferably electronically using the Facility Information Sheet (CPDC 4-2, Appendix B). The space data for new, existing or remodeled facilities should also be submitted electronically to CPDC during the update window using the Space and Facilities Database Worksheet (CPDC 4-3, Appendix B). Campuses can access and download the space worksheet, and e-mail it to CPDC upon completion. Changes to space and SFDB are accepted, processed and analyzed during the reporting window in preparation of the next capital outlay planning process.

FACILITY FILE

The facility file consists of a physical inventory of all state and non-state funded facilities on campus. It contains detailed information about each facility, such as the category, condition, construction type, ownership, gross square feet, master plan status, budgeted cost, number of floors, and the date of the Notice of Completion. Although usually updated during the SFDB reporting window cycle, requests to place new facilities on the database are received year round by CPDC.

A Facility Information Sheet (CPDC 4-2) must be submitted for a new facility, to update an existing facility, or to delete a permanent or temporary facility from the database. The data requested on a new facility includes the category of the facility, the construction and master plan status, and ownership information. The Facility Information Sheet (CPDC 4-2,

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Appendix B) can be submitted to Space Management in CPDC via e-mail. The facility file data is vital to the capital outlay program, and impacts various other reports, including the Custodial Maintenance Budget, the annual Facility Inventory Report to OREDS, and the annual Statistical Abstract Report.

9047.02 CONVERSION FROM STUDENT STATION CAPACITY TO FTE CAPACITY

To convert from student station capacity to FTE capacity, the number of student stations (SS) is multiplied by the appropriate conversion factor described in the following formula, in which WSCH/FTE refers to weekly student contact hours per full-time equivalent student. Weekly room hours/room (WRH/RM) and station occupancy (STN OCC) identify components of space and utilization standards. These are discussed in Section VI 9048.01.

Conversion Factor Formula for Conversion from Student Stations to FTE:

$$\text{Full-Time Equivalent Student} = \frac{\text{Weekly Room Hours per Room} \times \text{Station Occupancy \%} \times \text{Student Stations}}{\text{Weekly Student Contact Hours per FTE}}$$

$$FTE = \frac{WRH/RM \times STN OCC \% \times SS}{WSCH/FTE}$$

Conversion Factors:

Lecture

$$\text{Lecture} = \frac{53 \text{ WRH/RM} \times 66\%}{15 \text{ WSCH/FTE}} = 2.33$$

Lecture example = A room with 200 student stations equals how many FTE?
FTE = lecture conversion factor x student stations
FTE = 2.33 x 200 student stations
FTE = 466

Laboratory

$$\begin{aligned} \text{Lower Division Lab} &= \frac{27.5 \text{ WRH/RM} \times 85\%}{45 \text{ WSCH/FTE}} = 0.52 \\ \text{Upper Division Lab} &= \frac{22.0 \text{ WRH/RM} \times 80\%}{45 \text{ WSCH/FTE}} = 0.39 \end{aligned}$$

9047.03 OTHER EARNED CAPACITY

Other earned capacity is a factor directly related to enrollment. "Other" includes Independent Study, Outdoor P.E., etc. It is identified by those classes with a course classification number of C11, C17, through C21, those classified S12, S25, S36, S48, and---unless it requires capacity space---C77 and C78. (The Course Classification System chart appears in SUAM Appendix B.) The total student credit hours derived from the classes with these classifications, whether on or off campus, are compared with the total student credit hours to determine the percent of "Other Earned" capacity.

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The following formula, in which SCH refers to student credit hour, may be used to determine the percentage of "Other" capacity:

$$\frac{\textit{"Other" SCH}}{\textit{Total SCH}} \times 100 = \textit{Percent "Other" Capacity}$$

Using the appropriate enrollment allocations in the formula below uses the percentage factor to determine the earned FTE capacity for any particular year:

$$\text{Annual FTE} \times \text{Percent Other Capacity} = \text{Other FTE Capacity}$$

The factor is provided to the campuses each year and is based upon the most recent fall term enrollment data from the Academic Planning Database Course Section Report.

9047.04 ANALYSIS OF CAPACITY NEEDS

Traditionally the analysis of capacity needs has been based on station count as explained in Section 9047.04.01. Beginning with fiscal year 2005/06 capacity needs will be determined using an ASF per FTE Model that is currently being used in parallel to the station count capacity analysis. See Section 9047.04.02 for further explanation of this model.

9047.04.01 BASED ON STATION COUNT

FTE capacity need is based on the comparison of AY FTE enrollment to the campus FTE capacity at a given point in time (refer to the current campus Summary of Campus Capacity Form CPDC 1-2 and the Laboratory Enrollment FTES vs. Laboratory Capacity FTES report). These comparisons can be made on a campuswide basis for lecture, laboratory, faculty offices, etc. Comparisons to determine instructional capacity for a specific project are made at the target year, which is two years beyond occupancy of the project. For planning purposes, a streamlined project funded for PWC is expected to be occupied three years after the initial budget year (a total of four years). The total campus FTE capacity five years after the initial budget year is target year (a total of six years) and is the total of the following:

- The current station count FTE capacities from the Space and Facilities Database (SFDB)
- The FTE capacity of projects funded for construction or alteration not included in the SFDB
- Any FTE capacity proposed for construction and occupancy within five years after the initial budget year

The difference between the projected enrollment, excluding other earned FTE, and the total campus permanent FTE capacity indicates the extent of need for capacity projects. Care must be exercised when enrollment and capacity figures are compared to ensure that comparable values are used.

A more detailed analysis of capacity needs can be made by comparing the FTE enrollment allocations in each discipline---excluding the other earned FTE---with the campus FTE capacity in each respective discipline.

9047.04.02 ASF PER FTE MODEL

The ASF per FTE Model uses the concept of "assignable square feet per full-time equivalent" (ASF/FTE) to evaluate space needs and project future space requirements. "Restructuring Campus Capacities, a report from the Task Force on Facilities Planning and Utilization," June 1998, is a report that discusses the background, development and uses of the ASF per FTE Model. See SUAM Appendix B for the report.

The following is an excerpt from Task Force report:

"Current measurements of campus capacity, i.e., utilization standards that convert lecture and laboratory station counts to FTE are no longer appropriate due to the alternative uses of space and non-traditional methods of educational delivery."

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“An important part of the solution is to measure campus FTE capacity on an ASF/FTE basis which recognizes that both traditional instructional space and instructional support space can be used to provide or originate instruction.

Campus capacity based upon ASF/FTE will change annually when the model is run with new SFDB and enrollment data. A campuswide projection of space needs is developed by applying the most recently reported campus mix of disciplines, levels, and types of instruction to the main campus academic year FTE enrollment projections. The space planning standards are applied to these detailed projections of FTE to project required discipline specific space needs that are aggregated to campus space needs. The space requirements are compared to the space inventory to determine deficits or surpluses of space over the projection period. Deficits provide an indication of a need for a new space project.

Campus space deficits and surpluses are identified based upon FTE projected for future years and the assumption of a constant mix of disciplines, levels and types of instruction (the latest reported mix from the APDB Course Section Report). While such an assumption is warranted to identify space deficit problems at the campus level, it is not necessarily the only assumption to be used in planning specific projects (for either new space or for the replacement of existing space).”

The focus of the model is on campus space needs. It is recognized that mediated instruction and distributed learning supported by electronic technology may fundamentally change these on-campus space needs during the next decade. The model will continue to evolve as the effects of these developing technologies upon capital needs (space and equipment) are more fully understood and utilized.

9048 UTILIZATION

Utilization of capacity space is a measurement of capacity space efficiency. Capacity space in the CSU is categorized as lecture, seminar, or teaching laboratory. It is based on the hours per week a space is scheduled and the student station occupancy per class session. It is the product of the weekly room hours per room (WRH/RM) and the station occupancy (STN OCC).

9048.01 UTILIZATION STANDARDS

Instructional space needs are calculated in conformity with Space and Utilization Standards approved in September 1966 by the Coordinating Council for Higher Education (now titled California Postsecondary Education Commission) as modified by the Legislature in March 1971 and June 1973. Below are the currently established standards.

Standard =	WRH/RM		STN OCC%		WSH/SS
Lecture Utilization Standard	53.0 hours/week	x	66%	=	35 hours/week
Laboratory Utilization Standards					
Lower Division=	27.5 hours/week	x	85%	=	23.4 hours/week
Upper Division=	22.0 hours/week	x	80%	=	17.6 hours/week

WRH = weekly room hours= the number of hours a room is expected to be in use each week
STN OCC % = station occupancy % = the percent of available seats occupied while the room is in use
WSH = weekly station hours = the number of hours each seat is in use in each room each week

9048.02 DEVELOPMENT OF COMPUTER LABORATORY STANDARDS

The space and utilization standards for self-instructional, general, and advanced Computer Assisted Design (CAD) computer laboratories are based on the following:

- On-site surveys of computer laboratories on campuses and in private industries.
- Analyses of the user requirements.
- Input from faculty and staff.
- Data provided by the campuses.
- Development of model floor plans.

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9048.03 COMPUTER LABORATORY UTILIZATION STANDARDS

The components of space and utilization standards are as follows:

- Room utilization = Number of hours per week a computer laboratory can be expected to be in use.
- Station occupancy = Percentage of expected student station occupancy when rooms are used.
- Station utilization = Number of hours per week a student station on the average can be expected to be in use.

	WRH/RM		STN OCC%		WSH/SS
General Computer Laboratory	80 hours/week	x	66%	=	53 hours/week
Computer Assisted Design (CAD) Laboratory	53 hours/week	x	66%	=	35 hours/week

9049 GROSS SQUARE FOOTAGE AND ASSIGNABLE SQUARE FOOTAGE

9049.01 DEFINITION OF GROSS SQUARE FOOTAGE

Gross square footage (GSF) is the outside measurement of a facility or structure, and is usually expressed in square feet. The inclusions and exclusions for GSF are as follows:

- Outside gross area is computed by floor level, outside to outside of exterior walls, excluding fins, pilasters, and similar projections beyond face of wall.
- Mezzanines, stacks, and interior balconies are included in the total, but only for the floor area they represent.
- Penthouses of headroom height are included.
- Stair, elevator, utility core, and similar shafts are considered as floor area at each level.
- A room extending through more than one floor is counted only once at the level on which its floor occurs.
- Exterior covered areas attached and related to the building are counted at one-half value.
- Full height unfinished area (i.e., excavated basement areas not developed, or unfinished floors) is counted at one-half value.
- Exterior terraces and stairways, loading docks, courts, light-ways, areaways, roof decks, and covered walks between buildings are not included.
- Unexcavated areas in basements and undeveloped attic space are not included.
- Exception cases with areas involved will be footnoted.

9049.02 DEFINITION OF ASSIGNABLE SQUARE FOOTAGE

The assignable square footage (ASF) of a facility is the floor area within any building or structure. It is the ceiling to floor usable portion of the inside of a space or room (except separate parking structures) and should also be:

- Covered by a ceiling 7 feet, 0 inches or higher.
- Enclosed on all sides by walls, partitions, doors, or a functional equivalent.
- Measured between the principal surfaces of the enclosing walls, partitions, or doors at or near floor level.
- Expressed in square feet to the nearest whole number.
- Inclusive of:
 - Build-in or free-standing furniture and equipment; and
 - Alcoves and similarly recessed areas.

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- Exclusive of:
 - Public corridors, lobbies, stairways, elevators, and other general-circulation facilities;
 - Janitor's closets and other specialized custodial facilities usable only for building maintenance;
 - Heating, ventilating, air conditioning, electrical, and other utility facilities required for building operation; and
 - Public toilets.

9049.03 GUIDE IN CLASSIFICATION OF ASSIGNABLE SQUARE FOOTAGE

The general definition of assignable area, given above, is clarified and supplemented by the following classification guide. A copy of this guide is listed in Appendix B.

	Counted as Assignable Area	Not Counted as Assignable Area
1. Construction and Mechanical		
a. Wall and partitions – columns or similar structural obstructions		X
b. Ducts, flues, vents, tunnels		X
c. Electrical closets		X
d. Telephone closets		X
e. Heating and ventilating equipment rooms:		
(1) Within building requiring services		X
(2) Within structurally isolated heating plants		X
f. Transformer, switchgear, generator rooms:		
(1) Within building requiring services		X
(2) Within structurally isolated sub-stations		
or generating plants	X	
g. Separate mechanical areas serving		
special laboratories only	X	
2. Custodial and Building-Service Areas		
a. Janitor's closets		X
b. Custodial offices	X	
c. Custodial locker rooms	X	
d. Interior loading and receiving docks	X	
e. Custodial and storage areas and shops	X	
f. Interior incinerator rooms		X
3. Circulation Areas		
a. Building corridors, stairways, elevators, escalators		X
b. Lobbies that are internal corridors		
serving operational functions, such as		
reception and waiting	X	
c. Lobbies for general circulation		X
d. Reception and waiting rooms	X	
e. Corridors within departmental suites	X	
f. Library stack areas, including aisles	X	
g. Library reading rooms, including aisles	X	
h. Stairways and elevators within book stacks		X
i. Book elevators and conveyors	X	
j. Display facilities and lockers in corridors	X	

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	Counted as Assignable Area	Not Counted as Assignable Area
4. Personal Facilities		
a. Toilets for:		
(1) Public.....		X
(2) Residence hall and apartment occupants.....	X	
(3) Clinic out-patients	X	
(4) Hospital in-patients.....	X	
(5) Executive suites.....	X	
(6) Instructional and research activities, controlled as in environment laboratories and gymnasiums	X	
b. Dressing rooms, locker rooms, washrooms, and showers for academic activities or performers		X
c. Theater green rooms	X	
d. Social rooms in residence halls	X	
e. Laundry rooms in residence halls and apartments.....		X
f. Lunchrooms.....	X	
5. Other		
a. Greenhouses and head houses	X	
b. Lath houses.....		X
c. Screen houses	X	
d. Institutional garage and automotive and vehicular service and storage areas.....	X	
e. Parking areas in non-parking-structure buildings.....		to be considered on a project-by-project basis

9050 BUILDING EFFICIENCY

Building efficiency is the ratio of assignable square footage to the ratio of gross square footage of a facility. Depending on the type of facility, the ratio should be no less than 60%. Building Efficiency ratios can be found in the annual CSU Cost Guide in Appendix B.