

APPENDIX 3 | SPACE NEEDS ANALYSIS



Space Needs Analysis

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Project Scope

Comprehensive Facilities Planning, Inc. (CFP) in association with WTW Architects was retained by Shippensburg University to conduct a space needs analysis of its academic programs. The project involved the collection and analysis of data on a departmental level for all of the academic schools and divisions. The tasks and process involved included the following:

- Review the existing space inventory database
- Provide base data to inform short and long term decision making, to be specifically used as part of a new campus master plan.
- Collect data and evaluate the University's current space and needs using national space guidelines modified to fit the campus culture, as well as, a comparative calculation applying the PASSHE space guidelines.
- Model future space needs based on three projected across-the board undergraduate enrollment scenarios.
- Recommend space strategies for optimizing the campus space and accommodating the space shortfalls.

This study is a critical step in developing the current space requirements (departmental space deficiencies or surpluses) and establishing planning priorities. General planning assumptions applied in the analysis are included in the report along with room type definitions and formulas. Summaries of the calculated space needs based on CFP space guidelines modified to model the academic programs at Shippensburg University are presented in the following sections of this report.

Space Included in Study

The space utilization study was limited to the main campus of Shippensburg University located in Shippensburg, Pennsylvania. Administrative offices, student services, residential, food service, athletic performance venues, and building support facilities (e.g. mechanical rooms, etc.) were not included in the scope of the study.

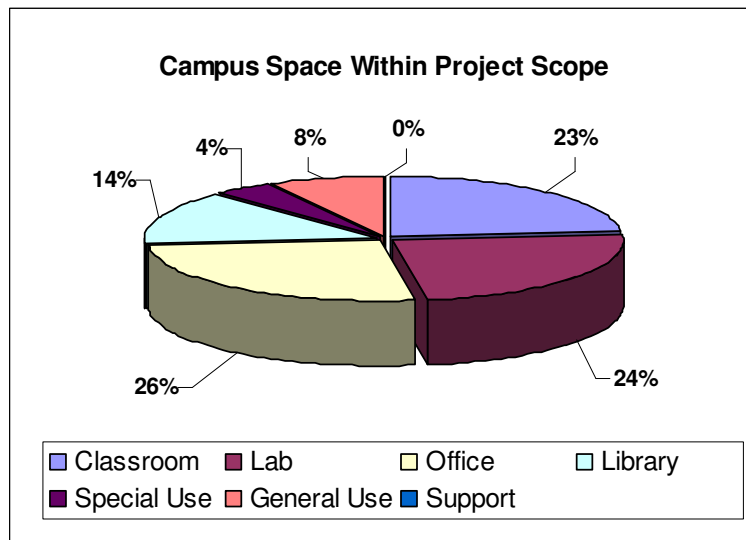
The basic data used in this study provided by the university included: (1) the current space inventory; (2) the Fall 2007 personnel by department; (3) the Fall 2007 class file; and (4) the 2007 credit hour data. These files were merged into an aggregate relational database and appropriately mapped or linked to generate the formula-based space needs calculations.

Space Inventory: The space inventory was obtained from the University's MAXIMO space management system. Key data elements for this analysis included campus, building and room locations, square feet, room capacity for classrooms and instructional labs, room type or use and departmental assignment. The inventory uses the PASSHE room use codes to classify space usage. Departments were requested to review this data to insure accuracy. In addition the consultants recommended some changes during the detailed review and walk through of the classrooms. The Fall 2007 assignable square feet (ASF) of space for the academic units included in the study totals 373,789. The chart and table below graphically display the assignable space by room type for the areas analyzed in the scope of this study.

Table 1: Campus Space within Project Scope

Room Type	ASF	% of Total
Classroom	84,970	23%
Laboratory	87,959	24%
Office (includes vacant space)	95,855	26%
Library	51,682	14%
Special Use	14,393	4%
General Use	29,557	8%
Support	182	0%
Total	364,598	

Chart 1: Campus Space within the Project Scope



Personnel Data: A basic personnel database was provided through the University's Human Resources department. This data was supplemented with other positions not typically reported to Human Resources including authorized, open positions; non-university personnel; student employees; and graduate assistants. Each department reviewed and verified the data for accuracy. The verified data was then mapped to relate to the appropriate space department. Based on position title each position was also categorized to relate to an appropriate office module size. Although most position titles and responsibilities are uniform across the University, there are some that are not similar although they carry the same title. These positions required manipulation within the database to correctly map the position type with the appropriate office module type.

Projected personnel were generated using an enrollment based process depending on whether a particular department's staffing may be sensitive to enrollment changes. Therefore, based on the projected enrollments a department's staffing was increased proportionately. This process may have resulted in calculated personnel that included fractional numbers. In addition, staff increases in the administrative offices were based on information provided by the VP/Dean of each area.

Table 2: Summary of Current and Projected Personnel

Category	Current FTE	Projected FTE (7.5%)	Projected FTE (20%)	Projected FTE (35%)
FTEN Admin	74.0	75.6	77.8	80.8
FTEN Clerical	36.0	38.6	41.6	45.9
FTEF Faculty	381.1	408.4	454.1	508.7
Graduate Assistants (HC)	91.0	97.2	106.6	118.3
Total	582.1	619.8	680.1	753.7

Schedule of Classes: In addition to the Fall 2007 class schedule, provided by the University, independent collection of data not reported for certain instructional rooms was also necessary. For the rooms that had scheduled use that were not reported and later added, course enrollments were estimated applying the average weekly room hours of 37.5 and a station occupancy factor of 67%. This data was used to generate the current room utilization profile.

Student Credit Hours: This data file was provided through the Registrar's Office. Although this office maintains accurate current credit hour data for the academic units, the data was modified to include only courses taught on

the Shippensburg campus. These data were used to calculate the instructional laboratory space needs as well as the classrooms needs by department. The following table summarizes the current and projected credit hours for the academic units.

Table 3: Summary of Current and Projected Students and Credit Hours

Student Category	2007 Credit Hours	Student FTE	Projection Factor	Projected Credit Hours	Projected Student FTE
Undergraduate Lower	67,032	4,469	7.5%	72,059	4,804
Undergraduate Upper	25,572	1,705	7.5%	27,490	1,833
Graduate	4,393	366	7.5%	4,722	394
Total	96,997	6,540		104,271	7,031

Student Category	2007 Credit Hours	Student FTE	Projection Factor	Projected Credit Hours	Projected Student FTE
Undergraduate Lower	67,032	4,469	20.0%	80,438	5,363
Undergraduate Upper	25,572	1,705	20.0%	30,686	2,046
Graduate	4,393	366	20.0%	5,272	439
Total	96,997	6,540		116,396	7,848

Student Category	2007 Credit Hours	Student FTE	Projection Factor	Projected Credit Hours	Projected Student FTE
Undergraduate Lower	67,032	4,469	35.0%	90,493	6,033
Undergraduate Upper	25,572	1,705	35.0%	34,522	2,302
Graduate	4,393	366	35.0%	5,931	494
Total	96,997	6,540		130,946	8,829

Process Methodology

The methodology used included measuring the quantitative space needs that may impact the delivery of services. This quantitative process calculates space needs based on a series of interactive work steps. Data and programmatic information from various user groups were gathered, analyzed, and documented. The data and assumptions developed from these initial steps were verified and adjusted to customize the space needs model for each department, including space criteria (modules) for the type of space being analyzed.

The space need requirements, including the square footage amounts of each room type were determined by the discipline, equipment used in the area, utilization rates (e.g. station area, station occupancy ratios, and room utilization rates), number of persons occupying the space, etc. The results derived from the space needs calculations were then compared to the current assigned space to determine surpluses or deficiencies of space. The CFP space needs calculation methodology differs from the Pennsylvania State System of Higher Education (PASSHE) process in that CFP calculates the space need at the department level and rolls the result to the College or Division level and finally to the Campus level. The PASSHE calculations provide a campus wide “allocation” of space by space type (classrooms, instructional labs, offices, etc.) using campus wide personnel and enrollment data multiplied by an appropriate “space factor”. While this provides useful data at the campus level for capital planning, it does not provide detail as to which units have space surpluses or deficits.

While the CFP method in some cases uses the same “space factors” as the PASSHE model, the input data, personnel, enrollment etc. is at the department level and is based on the current or proposed operation practices. This provides space surpluses or deficits by space type at the department level. In addition, it is important to note that the scope of work for the space study was to evaluate the academic needs, rather than a campus-wide assessment of space needs.

General Planning Assumptions

The following general planning assumptions were developed from direction provided by Shippensburg University. These planning assumptions provide guiding principles, which are critical in the formulation of the results of this study.

The basic data used in this study were provided by Facilities Management (space inventory), Human Resources (personnel), class schedule and credit hour data (Registrar). Fall 2007 was used as the baseline data.

This study is limited to space assigned to the academic units located on the Shippensburg Campus. Building support facilities (e.g. mechanical rooms, corridors, etc.) administrative units, student services, residence halls, food services, athletic and recreation facilities, and non-university operations are not part of the scope of this study.

The primary focus of this analysis is on the quantity of space by type and its use. However, a physical survey of the instructional spaces on campus was conducted to evaluate the condition and function of these spaces relative to their designed use. Although only noted, as it may impact the space needs, physical condition and functional quality issues for other space types were not been assessed as part of the analysis.

The space needs calculations are based on two planning models: The Pennsylvania State System of Higher Education (PASSHE) Volume VI-B dated November 2007 and national space planning guidelines modified to fit the culture and operations of each department and using the applied experience of the CFP consultants.

The following assumptions were used to model the space needs based on the CFP guidelines developed for the Shippensburg campus. The PASSHE guidelines/formulas are identified in a separate document.

1. Full time faculty, instructors and visiting faculty have each been provided with a uniform office module size of 115 square feet (ASF). Adjunct faculty have been allocated an office module of 60 ASF; and graduate assistants 40 ASF. No office space has been allocated for emeriti faculty.
2. Laboratory-based research space needs are based on the number of personnel engaged in research including: faculty, research staff, graduate research assistants, and post-doctoral students. For planning purposes it is assumed that 100% of the faculty, graduate research assistants and post-doctoral students in lab-based research departments are engaged in research activities. When identified as part of a department's curriculum requirements, undergraduate researchers have been included in the calculation for research laboratory space. The undergraduate research space allocation is one-third of the typical space module for the particular discipline. It is assumed that 5% of the undergraduate students are conducting research at any one time.
3. Certain laboratory space has been classified as "special use" labs that may not be assigned to a specific faculty or researcher and likely are shared spaces that are functionally unique usually because of specialized equipment. Unless noted these existing spaces have been assumed to be sufficient.
4. The space needs calculations for all departments include an allocation for conference room and office lounge space. Although these calculated needs may not generate sufficient space for a functional room, the generated need is recognized as a space allocation, and it is assumed that in practice shared conference space or lounges would be provided to serve two or more departments in order to create a functional room.
5. Typically a factor of 10% of the calculated office need has been applied to determine office service space for academic departments and 15% for most administrative departments unless otherwise noted. Supplemental office support space requirements have been recognized above the normal office service allocation for departments requiring waiting rooms, processing areas and longer-term storage needs. Typically these departments include operations dealing with the public and students such as senior administrative and student service offices.

6. For space planning purposes full time equivalent student counts have been determined using a conversion factor of 15 credit hours per undergraduate student and 12 credit hours per graduate student. These FTE totals are used in calculating certain space needs such as classrooms and student lounges.
7. Classroom space needs have been analyzed by applying a uniform set of utilization goals across all departments within each college. The following utilization goals have been used in developing the classroom space needs: 37.5 Weekly Room Hours for scheduled use; 67% station occupancy in scheduled rooms; and 22 assignable square feet per student station (20 ASF per station x 1.1. service space multiplier). These factors are modeling averages that may vary as related to existing usage patterns and conditions.
8. Instructional laboratory needs have been identified by individual academic program within each department. Lab calculation criteria have been modified to reflect current instructional requirements per program area. Programs that do not generate sufficient student credit hours to calculate a functional lab facility are provided with a minimum lab need as it is assumed delivery of the instructional program requires the provision of a functional lab space.
9. Three across the board enrollment growth scenario increments have been used. Future space needs scenarios are based on incremental enrollment increases of 500 FTE (7.5%), 1,500 FTE (20%) and 2,500 FTE (35%).
10. Faculty and staffing personnel projections included in the study are based upon the projected enrollments. Projected personnel counts were reviewed by the Provost, Deans and other senior administrators. Projected staffing for all academic departments generating student credit hours are assumed to increase proportionately to projected enrollments for the respective department. Staffing needs for other departments have been reviewed on a case-by-case basis. These projections are assumed to be realistic expectations for future staffing levels.
11. A space allocation for student lounge space is provided for each academic department.
12. Current space allocations for certain types of space needs are assumed to be sufficient and must be reviewed on a case by case basis. Typically these types of space will include: departmental libraries; student lounges assigned to administrative units; training rooms; testing rooms and interview rooms.

Space Needs Summary Findings

The space needs are calculated at the department level by space type and compared to the current existing space assigned to the department. Columns in the following charts are:

Current ASF: Current square feet of space assigned to the department or unit

Calculated ASF Current Need: The calculated square feet of space needed to accommodate the current personnel and/or current enrollments based on the appropriate space factor.

Growth ASF Need: The calculated square feet of space needed to accommodate the projected personnel and/or projected enrollments based on the appropriate space factor.

Difference from Current: This is the Current ASF minus the Calculated Need. This determines space surpluses (+) or deficits (-).

The calculated current need is based on current personnel and enrollment using space planning guidelines for offices, instructional labs, research space and classroom space as described in the Assumptions section. The space was calculated based on discipline specific factors developed by CFP and modified by the actual methods of instruction of the department.

The projected need assumes an increase in students using enrollment growth rates of 500 (7.5%), 1,500 (20%) and 2,500 (35%) additional students for the College of Arts and Sciences, College of Education and Human Services,

John L. Grove College of Business, and School of Academic Programs and Services. Based on these increments, an estimation of relative growth in staffing needs was developed and factored into the calculations. This process produced projected increases in total personnel identifying a potential total increase of 70-172 positions.

Space Needs by Space Type

Table 4 summarizes the current and projected space needs by space type category using the PASSHE guidelines.

Table 4: PASSHE Current and Projected Needs by Type of Space

Room Type Grouping	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff From Current ASF	20% FTE Growth ASF Need	Diff From Current ASF	35% FTE Growth ASF Need	Diff From Current ASF
Classrooms	84,970	69,503	15,467	74,715	10,255	83,405	1,565	93,830	-8,860
Class Labs	75,348	106,785	-31,437	114,802	-39,454	128,142	-52,794	114,160	-38,812
Research Labs	12,611	14,108	-1,497	15,164	-2,553	17,324	-4,713	19,024	-6,413
Offices	94,858	102,795	-7,937	109,904	-15,046	120,172	-25,314	131,553	-36,695
Library	51,682	90,114	-38,432	92,966	-41,284	97,715	-46,033	103,417	-51,735
Special Use	14,420	22,495	-8,075	22,943	-8,523	22,943	-8,523	22,943	-8,523
Assembly*	18,624	18,624	0	18,624	0	18,624	0	18,624	0
Exhibition*	2,776	2,776	0	2,776	0	2,776	0	2,776	0
Food Facilities*	988	988	0	988	0	988	0	988	0
Lounge	3,554	7,031	-3,477	7,552	-3,998	8,417	-4,863	9,456	-5,902
Meeting Rms*	3,615	3,615	0	3,615	0	3,615	0	3,615	0
Support*	182	182	0	182	0	182	0	182	0
Vacant (Offices)*	1,746	1,746	0	1,746	0	1,746	0	1,746	0
Total All Space	365,374	440,762	-75,388	465,977	100,603	506,049	-140,675	522,314	-156,940

* PASSHE guidelines provide a campus wide allocation for this space type. Because the current space is only a part of the total campus inventory.

No comparative calculation has been completed.

Table 5 summarizes the current and projected space needs using the national space planning guidelines modified to fit the culture and operations of each department and using the applied experience of the CFP consultants.

Table 5: Current and Projected Space Needs by Type of Space

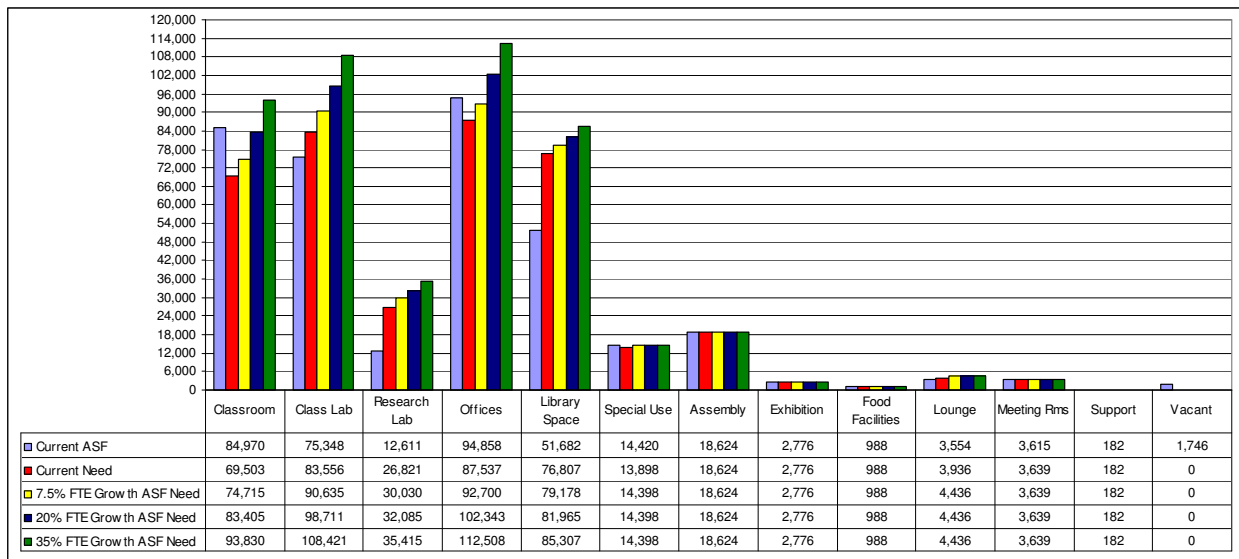
Room Type Grouping	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
Classrooms	84,970	69,503	15,467	74,715	10,255	83,405	1,565	93,830	-8,860
Class Labs	75,348	83,556	-8,208	90,635	-15,287	98,711	-23,363	108,421	-33,073
Research Labs	12,611	26,821	-14,210	30,030	-17,419	32,085	-19,474	35,415	-22,804
Offices	94,858	87,537	7,321	92,700	2,158	102,343	-7,485	112,508	-17,650
Library Space	51,682	76,807	-25,125	79,178	-27,496	81,965	-30,283	85,307	-33,625
Special Use	14,420	13,898	522	14,398	22	14,398	22	14,398	22
Assembly	18,624	18,624	0	18,624	0	18,624	0	18,624	0
Exhibition	2,776	2,776	0	2,776	0	2,776	0	2,776	0
Food Facilities	988	988	0	988	0	988	0	988	0
Lounge Space	3,554	3,936	-382	4,436	-882	4,436	-882	4,436	-882
Meeting Rms.	3,615	3,639	-24	3,639	-24	3,639	-24	3,639	-24
Support	182	182	0	182	0	182	0	182	0
Vacant (Offices)	1,746	0	1,746	0	1,746	0	1,746	0	1,746
Total All Space	365,374	388,267	-22,893	412,300	-46,927	443,552	-78,178	480,524	-115,150

The Calculated Need in Table 5 shows a space deficit of about 22,893 assignable square feet (6% of the total space) which grows to a projected deficit of about 115,150 square feet (31.5% of total space). The Calculated Need based on the PASSHE model in Table 4 shows a space deficit of 75,388 assignable square feet which is considerable higher than the Campus model developed by CFP. This is primarily due to the Class Lab and Library space deficits. The PASSHE model projected deficit grows to 156,940 assignable square feet in the 35% enrollment growth model, which is 41,790 assignable square feet greater than the deficit identified in the CFP model.

The following space categories account for the space deficit: library space; research space and instructional lab space. The university has a significant surplus of office and office support space currently due to the 1,629 assignable square feet of vacant space in Wright Hall and 19,811 assignable square feet of swing space in the Faculty Office Building, Horton Hall, Stewart Hall, Gilbert Hall, Wright Hall and Memorial Auditorium.

A detailed analysis of the classroom needs is documented in a separate report. The classroom space includes 102 classrooms and 36 rooms of classroom service space identified in the inventory. Of this total only 72 rooms are currently scheduled. Thirty rooms are inactive or under renovation. A more refined analysis of the general purpose classroom is provided in a separate report. The classroom square footage need identified in Table 4 does not include a 6% contingency factor. The calculated ASF need for classrooms is based on PASSHE criteria (utilization, station size, etc.).

Chart 2: Current and Projected Space Needs by Type of Space



Instructional Labs: Instructional laboratory space includes scheduled teaching labs (room type 210); open labs (room type 220); computer labs (room types 213 and 223); and teleconference labs (room type 214). Space needs are determined by a formula using criteria including weekly student contact hours (WSCH), weekly room hour utilization goal (WRH), station occupancy goal and a station square feet module. These criteria are specific for each academic discipline (CIP) and are used in conjunction with the reported student credit hour data.

At most universities the WSCHs for laboratories are underreported for numerous reasons. Therefore, a conversion factor is applied to the student credit hours generated by each discipline to calculate the WSCHs for the instructional laboratory need. The conversion factor can range from 0.0 (no class lab use) for courses such as Business, Economics & Philosophy to 1.5 for Art. Those disciplines with a "0" class lab need may use computer labs or project rooms instead. Computer lab needs are calculated similar to teaching labs, but normally use a longer room use period (WRH). The formula also takes into account the unscheduled use of these rooms. A portion of the WSCHs generated from the credit hours is typically allotted to computer lab use, but will also vary by

discipline. The formula is: (student credit hrs x WSCH conversion factor) x 1/WRH use factor x 1/station occupancy rate x station module size = Instructional Lab ASF.

Since the PASSHE method for calculating instructional laboratory space is not discipline specific it does not provide sufficient detail to identify laboratory space shortages or surpluses at the department level. Therefore, instructional laboratory space is calculated based on the weekly student contact hours and discipline specific factors developed by CFP and modified by the actual methods of instruction of the department. The Departments in the following table account for the instructional lab deficits. While some departments have space surpluses generally they are unsuitable to offset the deficits since instructional labs are department specific.

Table 6: Departments with the Greatest Instructional Lab Space Deficit

Department	Current Lab ASF	Calculated Lab ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Lab Need	Diff from Current ASF	20% FTE Growth ASF Lab Need	Diff from Current ASF	35% FTE Growth ASF Lab Need	Diff from Current ASF
MUS	5,266	9,043	-3,777	9,722	-4,456	10,846	-5,580	12,208	-6,942
BIO	12,651	12,480	171	13,418	-767	14,975	-2,324	16,850	-4,199
GEO	3,204	4,602	-1,398	4,948	-1,744	5,524	-2,320	6,213	-3,009
TCH	1,778	3,196	-1,418	3,435	-1,657	3,835	-2,057	4,314	-2,536
ART	9,622	9,120	502	10,950	-1,328	10,950	-1,328	10,950	-1,328
COM	1,562	2,397	-835	2,579	-1,017	2,878	-1,316	3,235	-1,673
MAT	1,638	2,364	-726	2,542	-904	2,837	-1,199	3,191	-1,553
SOC	0	929	-929	998	-998	1,114	-1,114	1,253	-1,253
CSC	3,764	3,982	-218	4,283	-519	4,781	-1,017	5,379	-1,615
ENG	0	839	-839	902	-902	1,007	-1,007	1,133	-1,133
ESC	1,417	1,818	-401	1,955	-538	2,182	-765	2,454	-1,037
MBA	649	1,192	-543	1,281	-632	1,432	-783	1,614	-965
MGT	0	632	-632	679	-679	758	-758	853	-853
HIS	0	595	-595	640	-640	714	-714	803	-803
PLS	0	530	-530	570	-570	636	-636	715	-715
HCS	0	445	-445	478	-478	534	-534	601	-601
PSY	963	1,373	-410	1,409	-446	1,468	-505	1,539	-576

Research Laboratories: Currently the University has 12,611 assignable square feet of research space, excluding special use labs. Since the PASSHE guidelines do not calculate research space at the departmental level, CFP applied research factors based on the discipline and the number of personnel engaged in research including: faculty, research staff, graduate research assistants, and post-doctoral students. These factors added about 20,175 assignable square feet to the 35% projected growth scenario.

The method for calculating research lab space is based on the percent of master and doctoral students, the percent of technicians, the percent of faculty, and number of research scientists conducting research at a given time by a research lab module for each discipline. For modeling purposes it is assumed that 100% of those positions engaged in lab-based research should contribute to the calculated need.

The research lab module is the amount of space allocated for each researcher. A research lab normally houses a number of researchers. For example, a faculty member doing research may have a post doc and two graduate students conducting research in the lab. Therefore on average the core lab size would be 1,200 ASF (4 times the 300 ASF module). A faculty member with several large grants could have several research labs depending on the number of researchers involved.

For selective disciplines part of the research lab calculation may also include an allocation for special use space. Special use labs are usually spaces that are not assigned to a specific faculty or researcher and are likely shared space. These areas are functionally unique usually because of specialized equipment. Examples of these types of

spaces include wind tunnels, wave tanks, electron microscopy rooms, NMR rooms, etc. A supplemental space module is allocated for special use space, typically 20% of a full research lab module. This module is then multiplied to the number of researchers conducting lab-based research to generate the special use allocation.

Included in this category are project rooms. These rooms have become an important part of the educational delivery system for several disciplines including economics, engineering, finance, history, management, marketing, public administration, & sociology. These rooms may also be used as shared space for conducting research projects. A typical module of 250 ASF is allotted for faculty and students to work on projects relating to their academic discipline, but may vary.

PASSHE has recently (November 2007) revised the formula for calculating research space to allocate 40 square feet per faculty FTE. Using the 381 FTE faculty reported, generates a current need of about 15,240 square feet of research space is generated. This compares to the calculated need of 26,821 ASF that ranges to a future need of 35,400 ASF. Table 6 displays all departments that generate research space needs.

Table 7: Departments with Research Lab Needs

Department	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
ACC	0	250	-250	250	-250	250	-250	250	-250
ART	0	1,600	-1,600	1,800	-1,800	2,000	-2,000	2,200	-2,200
BIO	5,696	8,355	-2,659	9,325	-3,629	9,975	-4,279	10,950	-5,254
CHE	2,731	4,600	-1,869	4,845	-2,114	5,170	-2,439	6,145	-3,414
CSC	0	400	-400	400	-400	500	-500	500	-500
ECO	0	250	-250	250	-250	250	-250	250	-250
ESC	0	600	-600	600	-600	600	-600	800	-800
FIN	0	250	-250	250	-250	250	-250	250	-250
GEO	350	2,251	-1,901	2,890	-2,540	2,890	-2,540	3,090	-2,740
MBA	0	250	-250	250	-250	250	-250	250	-250
MGT	0	250	-250	250	-250	250	-250	250	-250
PHY	1,315	2,697	-1,382	2,847	-1,532	3,147	-1,832	3,447	-2,132
PSY	2,170	3,988	-1,818	4,633	-2,463	4,933	-2,763	5,233	-3,063
SOC	349	1,080	-731	1,440	-1,091	1,620	-1,271	1,800	-1,451
Total	12,611	26,821	-14,210	30,030	-17,419	32,085	-19,474	35,415	-22,804

Offices: Currently the University has about 95,855 assignable square feet of office and office service space within the academic units on campus. The office space needs consist of two parts: 1) office space and 2) office support, lounge space, conferencing space and service space. The office space need is determined by multiplying the number of FTE personnel by position by a module (office size in square feet) appropriate for that position, which recognizes different levels of responsibilities and therefore larger office requirements of senior administrators.

Typical office service space needs (areas for files, non-staffed waiting areas, copy machines, supply storage, etc.) are based on a percent of the total calculated office space required for a department, college or unit. For most academic departments and administrative units 10% is used whereas for some larger administrative units such as colleges or senior administrative offices 20% is used. For other administrative departments, 15% should be used.

Using these guidelines, the University has sufficient office space to house the current personnel. However, the 20% and 35% enrollment growth will require additional office space to accommodate the anticipated personnel.

The PASSHE formulas for calculating office space is determined by using the total FTE numbers for faculty and staff times a office module of 150 ASF plus an additional office service module of 40 ASF. Graduate and undergraduate students requiring office space are provided a 120 ASF and 70 ASF modules respectively, with no additional space for office service.

Library: Currently the University has about 51,700 assignable square feet of library space within the academic departments on campus. Of this total, 47,370 assignable square feet houses the University library collection (468,594 volumes).

Table 8: Current Library Space Summary

Building Name	Assignment	ASF	Room Type	Room Type Description
Franklin Science Center	Biology	676	410	Study Room
Franklin Science Center	Chemistry	301	410	Study Room
Rowland Hall	Communications/Journalism	126	410	Study Room
Shearer Hall	Geography/Earth Sciences	278	410	Study Room
Rowland Hall	Modern Languages	306	410	Study Room
Ezra Lehman Library	Learning Center	1,231	450	Study Service
Ezra Lehman Library	Library	818	410	Study Room
Ezra Lehman Library	Library	39,071	430	Open Stack-Study Room
Ezra Lehman Library	Library	7,055	440	Processing Room
Ezra Lehman Library	Library	426	450	Study Service
Math & Comp Tech Bldg	Mathematics	297	410	Study Room
Franklin Science Center	Physics	767	410	Study Room
Shippen Hall	Social Work/Gerontology	330	410	Study Room
Total All Space		51,682		

Library space includes study rooms, stacks, open-stack study rooms, and processing areas as well as service areas. Individual offices are coded as office facilities. Reading/study space includes tables, carrels, or chairs where students and faculty can work. Service space includes binding, cataloging, re-shelving, reserves, and circulation space.

The calculation of library space is addressed differently than the other campus-wide calculation categories. This space type is more specialized and a significant part of the basic data needed to conduct this calculation is solicited separately from the institution. The space needs for library space includes all non-exempt space classified under the 400 room type series for library assigned to the institution's main library unit. Space assigned to other departments is not calculated in the model and is assumed to be sufficient, or should be assessed independently on a case-by-case basis.

Stack space needs are based on the reported collections that are converted to bound volume equivalents and then allocated space based on the following factors: .10 ASF / volume for first 150,000 volumes; .09 ASF / second 150,000 volumes; .08 ASF / next 300,000 volumes; .07 ASF / all volumes over 600,000. Compact shelving, if applicable, is .03 ASF / volume.

10% of FTE students and 5% of FTE faculty require seating at any one time. The station size varies depending on the type of station: casual seats (20 ASF), computer station (30 SF), reserved (40 ASF), etc. For simplification, a composite student reading space module of 26.75 ASF and a faculty reading space module of 29.5 ASF have been used. Two (2) ASF per user is applied to the total calculated number of library users determined for the reading space (FTE students and faculty) to allow for lounge facilities where food and drink such as cyber cafes are permitted.

An allocation of 15% of the calculated need for reading/study and stack space is added to the total need for technical services. Office space needs for the main library are calculated under the office needs formula.

The library space needs calculation shows a deficit of 25,125 ASF that increases to 33,600 ASF for the 35% enrollment growth scenario.

The PASSHE model for calculating library spaces is similar to the CFP calculation with three variations: 1) Reading/study space is based on 15% of the FTE students and faculty using a 30 ASF module. 2) Additional stack space is provided under the open-stack study space category using 15% of the calculated stack space need. 3) Supplemental study service space allocation is provided using 10% of the calculated study space. Using this model, the PASSHE formula would add 19,000 ASF of additional space to the calculated need.

Media: The space needs for Media space includes all non-exempt space classified under room types 530-media and 535-media service. For departments requiring this type of space a minimum of 150 ASF plus a space factor of 0.1 ASF / student credit hour is used. This space is usually assigned to communication, radio/TV, and visual arts departments. For administrative units such as printing services that are assigned Media space a need is not calculated, and the space assigned is assumed to be sufficient. The PASSHE formula uses an Allocation (ASF) = 1.0 ASF per FTES (Fall term); with a minimum of 5,000 ASF

Demonstration: The space needs for demonstration space includes all non-exempt space classified under room types: 550-demonstration and 555-demonstration service. For departments requiring this type of space such as education, consumer sciences, and culinary programs, a minimum core of 2,500 ASF plus a factor of 0.1 ASF / student credit hour is used. For administrative units that are assigned demonstration space a need is not calculated, and the space assigned is assumed to be sufficient but may be modified on a case-by-case basis. The PASSHE model uses the criteria for the function for which the room is used, i.e., classroom (100), day care (640), laboratory (200), open lab (220), research/non class laboratory (250), or clinical space (540).

Greenhouses: The space needs for greenhouse space includes all non-exempt space classified under room types 580-greenhouse and 585-greenhouse service. For departments requiring this type of space such as biological sciences, a factor of 5 ASF / student credit hour is used. For administrative units that are assigned greenhouse space a need is not calculated, and the space assigned is assumed to be sufficient but may be modified on a case-by-case basis. The PASSHE model uses an allocation (ASF) = 0.5 ASF per FTES (fall term).

Lounge: The campus wide space needs for student Lounge space includes all non-exempt space classified under room types 650-lounge and 655-lounge service. The calculation for Lounges is 2 ASF / Student FTE. Lounge space for faculty and staff is calculated under the office category (300). The PASSHE model uses an allocation (ASF) = 1 ASF x (FTES + FTEF + FTEN (administrative and clerical employee) + 4 ASF per FTEN (all other employees, except doctoral, graduate, and student workers).

Meeting rooms: The campus wide space needs for meeting room space includes all non-exempt space classified under room types 680-meeting rooms and 685-meeting room service. The calculation for meeting room is 1.5 ASF / FTE student, faculty, and staff. The PASSHE model uses an allocation (ASF) = Core 5,000 SF + 1 ASF for each FTES over 5,000.

Assembly, Exhibition, and Support Facilities: The space needs for assembly space, exhibition space, and support facilities are typically calculated using a campus wide ASF/FTE allocation. Since this study was limited to the academic units, the space classified under these categories, were assumed to be sufficient.

Division and College Space Needs Summary

Table 9 summarize the calculated ASF needs based on current personnel and enrollment using the space planning guidelines for offices, instructional labs, research space and classroom space as described in the Assumptions section. The projected needs are based on the enrollment growth scenarios of 7.5%, 20%, and 35%.

Table 9: Current and Projected Space Needs – Division Summary

Division	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
VP Information Technologies and Services	59,754	81,142	-21,388	83,078	-23,324	86,306	-26,552	90,177	-30,423
Provost and VP for Academic Affairs	53,894	26,029	27,865	26,529	27,365	26,529	27,365	26,529	27,365
College of Arts and Sciences	179,900	203,882	-23,982	220,702	-40,802	241,165	-61,265	265,981	-86,081
John L. Grove College of Business	24,493	26,537	-2,044	28,042	-3,549	30,828	-6,335	33,847	-9,354
College of Education and Human Services	36,754	40,216	-3,462	42,817	-6,063	47,100	-10,346	52,103	-15,349
School of Academic Programs & Services	10,579	10,459	120	11,133	-554	11,622	-1,043	11,886	-1,307
Total All Space	365,374	388,267	-22,893	412,300	-46,926	443,552	-78,178	480,525	-115,151

- The College of Arts and Sciences has the largest calculated deficit of almost 24,000 ASF, primarily in office and lab space. In Information Technologies and Services, the Libraries has the largest current deficit of about 21,450 assignable square feet, primarily in stack, study space and processing space.
- The 7.5% projected enrollment growth scenario will more than double the projected space need to almost 47,000 ASF. The deficits for the three academic colleges will increase by an average of almost 75% each. The deficit for Information Technologies and Services will grow marginally.
- The 20% projected enrollment growth total space deficit is about 78,200 assignable square feet. The College of Arts and Sciences will have the greatest shortfall of about 61,300 ASF or 34% of the current ASF.
- The 35% projected enrollment scenario will produce a deficit is about 115,150 ASF (about 31% of current space). Arts and Sciences will continue to have the greatest space need exceeding 86,000 ASF. All colleges show a projected space shortfall primarily a result of the increase in office and laboratory space need.
- The School of Academic Programs and Services has sufficient space currently, but will need about 1,300 ASF in the 35% enrollment scenario, primarily in the Learning Center.
- Surplus space in all enrollment scenarios for The Provost/VP for Academic Affairs is due to a total of 21,440 assignable square feet of swing space/vacant space assigned to this area.

Academic Department Space Needs Summaries

The following charts and tables summarize the current and calculated space needs by college and for the academic departments. The projected need assumes an increase in students using enrollment growth rates of 500 (7.5%), 1,500 (20%) and 2,500 (35%) additional students for the College of Arts and Sciences, College of Education and Human Services, John L. Grove College of Business, and School of Academic Programs and Services. Classroom space is analyzed in a separate report.

College of Arts and Sciences

The College of Arts and Sciences, the largest within the university, has three primary areas of emphasis: educating undergraduates, offering high quality graduate programs, and providing general education courses to all undergraduate students. Currently the College has about 179,900 assignable square feet of space in 21 academic departments and the Dean's office housed in several buildings on campus. As identified in Chart 3,, the largest percentage of calculated need is in research labs, followed by instructional labs, classrooms, and offices.

Chart 3: College of Arts and Sciences by Space Type

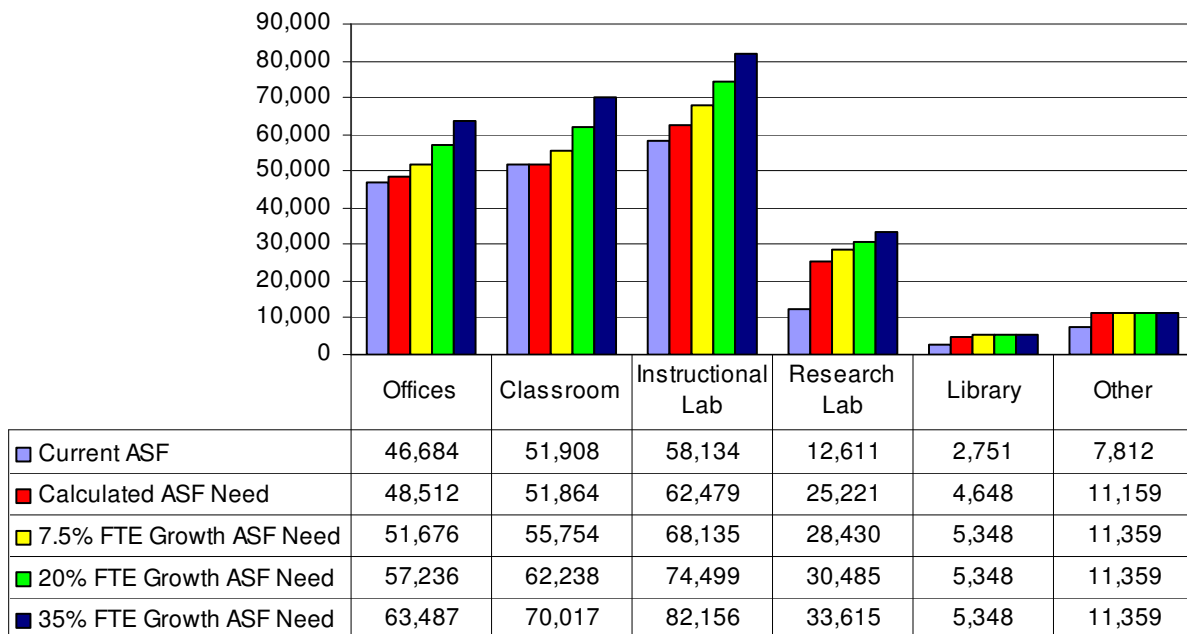


Table 10 summarizes the current and calculated need for the departments in the College. The Biology, History/Philosophy, Mathematics, Music/Theatre, Psychology, and Sociology/Anthropology departments have the greatest need in the projected enrollment scenarios.

Table 10: College of Arts and Sciences Department Summary

Division	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
ART	15,821	15,712	109	17,993	-2,172	18,612	-2,791	19,314	-3,493
BIO	29,809	32,883	-3,074	35,410	-5,601	38,481	-8,672	42,370	-12,561
CHM	18,950	15,989	2,961	17,144	1,806	18,830	120	21,434	-2,484
COM	6,755	7,166	-411	7,626	-871	8,304	-1,549	9,114	-2,359
CSC	5,556	6,096	-540	6,550	-994	7,320	-1,764	8,124	-2,568
ASC	4,086	2,749	1,337	2,800	1,286	3,175	911	3,202	884
ECO	2,810	4,398	-1,588	4,679	-1,869	5,149	-2,339	5,714	-2,904
ENG	13,334	11,845	1,489	12,719	615	14,175	-841	15,924	-2,590
ETH	167	245	-78	250	-83	257	-90	265	-98
GEO	13,673	15,985	-2,312	17,579	-3,906	19,170	-5,497	21,275	-7,602
HIS	6,924	12,539	-5,615	13,479	-6,555	15,046	-8,122	16,927	-10,003
HONOR	339	1,279	-940	1,538	-1,199	1,637	-1,298	1,754	-1,415
HCS	4,782	4,495	287	4,819	-37	5,357	-575	6,003	-1,221
INT	174	315	-141	324	-150	340	-166	358	-184
MAT	7,577	10,112	-2,535	10,927	-3,350	12,118	-4,541	13,544	-5,967
LANG	3,912	4,485	-573	4,772	-860	5,252	-1,340	5,831	-1,919
MUS	7,446	12,773	-5,327	13,724	-6,278	15,301	-7,855	17,209	-9,763
PHY	13,923	11,019	2,904	11,653	2,270	12,592	1,331	13,667	256
PLS	4,258	6,224	-1,966	6,667	-2,409	7,404	-3,146	8,289	-4,031
PSY	11,748	16,501	-4,753	18,017	-6,269	19,436	-7,688	21,078	-9,330
SOC	5,505	9,077	-3,572	10,014	-4,509	11,156	-5,651	12,490	-6,985
WST	2,349	1,995	354	2,016	333	2,053	296	2,096	253
Sub Total	179,900	203,882	-23,982	220,702	-40,802	241,165	-61,265	265,981	-86,081

John L. Grove College of Business

As one of the three academic units of the university, the College of Business provides students with a comprehensive and rigorous program oriented toward developing their intellectual capacities, their analytical abilities, and their written and oral communication skills. Currently the College has 24,500 assignable square feet of space housed primarily in Grove Hall. The College has a space shortage of just over 2,000 ASF and will need up to 9,354 ASF of additional space to accommodate the 35% enrollment growth scenario. As identified in the chart below the largest deficit is in classrooms, followed by instructional labs and offices.

Chart 4: John L. Grove College of Business by Space Type

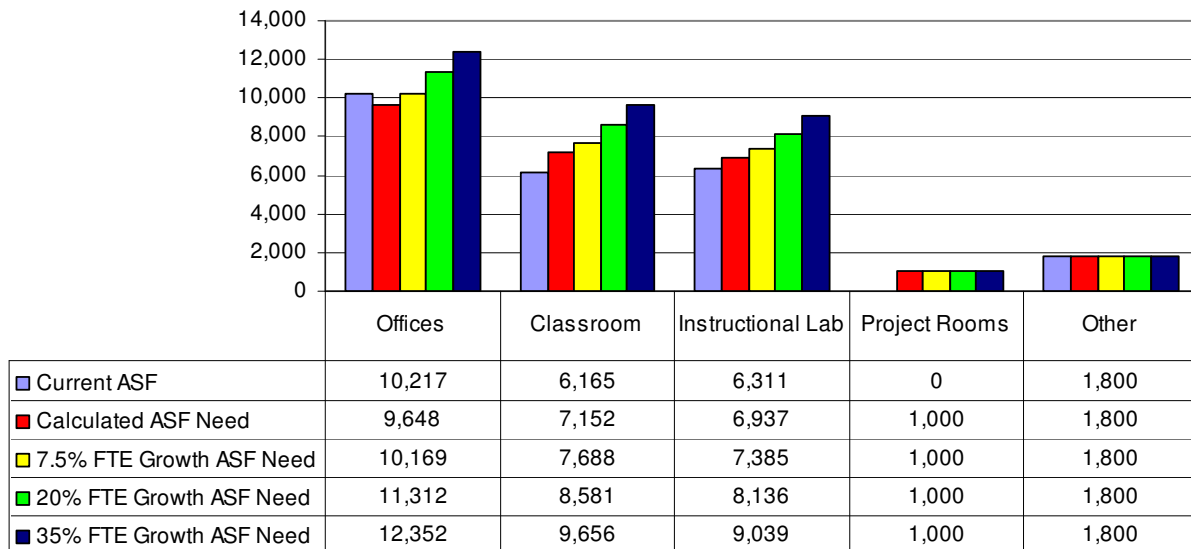


Table 11 identifies the calculated space needs by department. All four departments have space deficits with Management having the greatest space shortage in all enrollment scenarios.

Table 11: John L. Grove College of Business Department Summary

Division	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
ACC	6,693	7,192	-499	7,698	-1,005	8,541	-1,848	9,557	-2,864
DEAN	6,869	4,881	1,988	4,881	1,988	5,157	1,712	5,157	1,712
FIN	3,768	4,745	-977	5,067	-1,299	5,607	-1,839	6,252	-2,484
MGT	6,272	8,081	-1,809	8,669	-2,397	9,646	-3,374	10,822	-4,550
MBA	891	1,638	-747	1,727	-836	1,878	-987	2,060	-1,169
Sub Total	24,493	26,537	-2,044	28,042	-3,549	30,828	-6,336	33,847	-9,354

College of Education and Human Services

The departments of Counseling, Criminal Justice, Educational Leadership and Special Education, Social Work, and Teacher Education comprise the College of Education and Human Services. This College is charged with upholding a learning environment in which faculty, administration, staff, and students work together to develop a lifetime commitment to being of service to others. Currently the College has about 36,754 assignable square feet of space housed primarily in Shippen Hall. The calculated space need identifies a current deficit of 3,462 ASF that increases to 15,349 in the 35% enrollment scenario. As identified in the chart below, the greatest deficit for the College is in offices and instructional labs.

Chart 5: College of Education and Human Services by Space Type

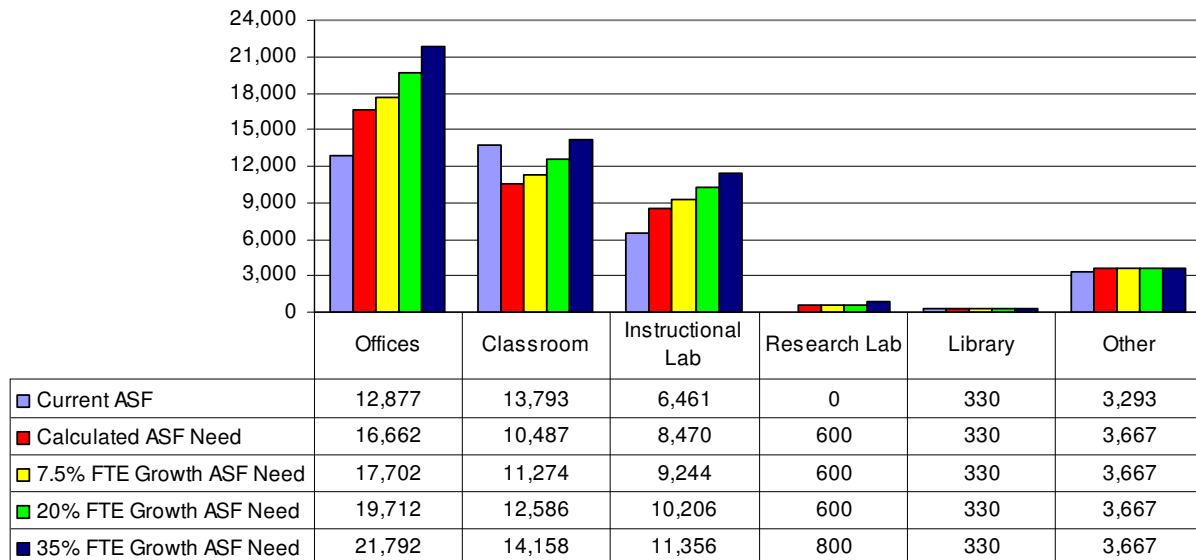


Table 12 summarizes the calculated space needs by department. The departments of Education and Counseling have the greatest deficits, while Social Work shows a small surplus. Under the 35% enrollment scenario, all departments will need additional space.

Table 12: College of Education and Human Services Department Summary

Division	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
CNS	3,746	4,694	-948	5,022	-1,276	5,563	-1,817	6,215	-2,469
CRJ	4,004	4,151	-147	4,448	-444	4,944	-940	5,537	-1,533
DEAN	3,414	2,289	1,125	2,289	1,125	2,565	849	2,565	849
EDU	3,613	4,855	-1,242	5,302	-1,689	5,712	-2,099	6,205	-2,592
ESC	3,866	4,266	-400	4,527	-661	4,961	-1,095	5,682	-1,816
MIL	2,743	3,577	-834	3,700	-957	3,906	-1,163	4,153	-1,410
SWK	4,294	3,788	506	4,045	249	4,482	-188	5,001	-707
TCH	11,074	12,595	-1,521	13,484	-2,410	14,966	-3,892	16,745	-5,671
Sub Total	36,754	40,216	-3,462	42,817	-6,063	47,100	-10,346	52,103	-15,349

School of Academic Programs and Services

The School of Academic Programs and Services is responsible for eight program areas at Shippensburg University. These include: the Office of Undeclared Students, The Office of Disability Services, the Learning Center, the Martin Luther King (MLK) Program, the Summer Bridge Program, Academic Success Program (Act101), Academic Support for Student Athletes, campus-wide Placement Testing, and advisor development. Currently the School has about 10,579 assignable square feet of space.

Chart 6: School of Academic Programs and Services by Space Type

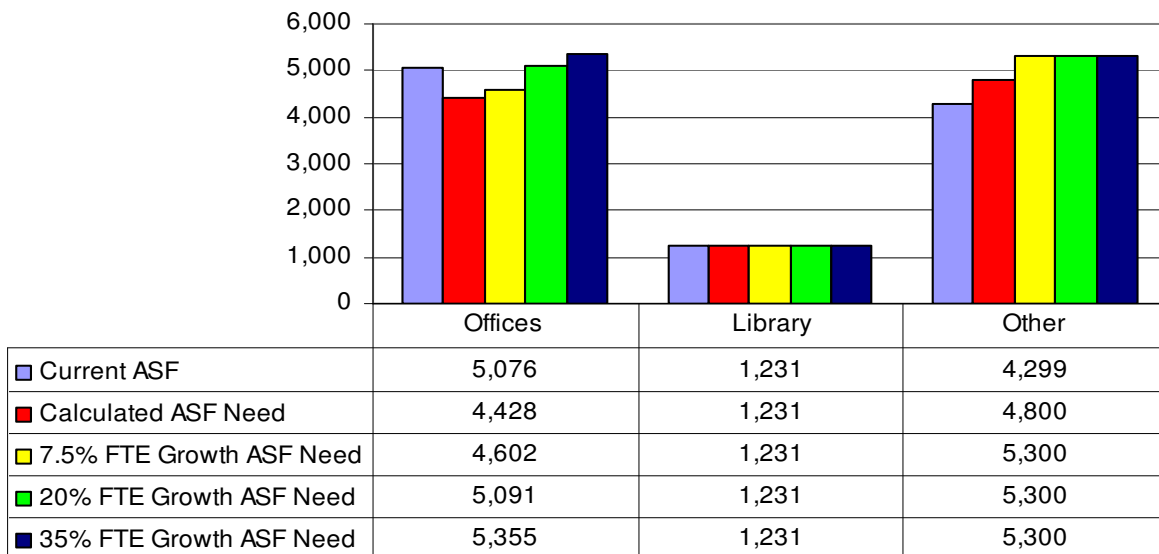


Table 13: School of Academic Programs and Services Department Summary

Division	Current ASF	Calculated ASF Need	Diff from Current ASF	7.5% FTE Growth ASF Need	Diff from Current ASF	20% FTE Growth ASF Need	Diff from Current ASF	35% FTE Growth ASF Need	Diff from Current ASF
SUC	2,135	1,260	875	1,325	810	1,433	702	1,564	571
DEAN	2,818	2,888	-70	2,930	-112	3,200	-382	3,200	-382
LC	5,626	6,311	-685	6,878	-1,252	6,989	-1,363	7,123	-1,497
Sub Total	10,579	10,459	120	11,133	-554	11,622	-1,043	11,886	-1,307

Classroom Analysis

The University's space inventory and schedule of classes (class file) databases were used to develop a current profile of the number of classrooms available (supply) and the instructional demand for classrooms as of the Fall 2007 semester. The utilization study is documented in a separate report titled: Shippensburg University Classroom Analysis. This data provides a baseline from which the future classroom needs are developed. The total number of available classrooms is 102, which includes 72 rooms with scheduled use during the Fall 2007 semester as well as rooms in Dauphin Humanities Center and Henderson Gymnasium that were under renovation at the time of this study but will be reactivated during 2008. The total assignable square feet is 84,970, which includes classroom service space. Two rooms used by Exercise Science in the Conference Center during the Fall 2007 are not included in the future classroom supply.

Summary

The University's current calculated ASF need is 388,267 ASF, with a net space deficiency of about 69% concentrated in three primary categories: library and labs. Among the academic units, the College of Arts and Sciences has the greatest space deficit, both currently and in each enrollment growth projection, followed by the College of Education and Human Services. The John L Grove College of Business and the School of Academic Programs and Services have modest space needs. As the projected enrollment growth scenarios are factored in there will be areas of significant need specifically in offices and labs. Future aggregate campus space needs based on the planned enrollment growth scenarios indicate total needs of approximately 412,300 ASF (7.5% growth); to 443,500 ASF (20% growth); to 480,500 ASF (35% growth).

With the planned enrollment growth, the future space needs for the Academic units could require 115,150 additional assignable square feet or about 31% additional space. Classroom space is adequate to address the current and up to the 20% enrollment growth scenario with improvements to existing scheduling and utilization practices.

Part of the scope of work for the space assessment portion of the campus master plan included a detailed evaluation of the condition of the classroom and class laboratory supply based on a set of criteria used to define a quality classroom facility. The assessment is documented in two separate reports, titled Shippensburg University Classroom Condition Evaluation and Shippensburg University Laboratory Condition Evaluation. Classroom and laboratory attributes not matching these criteria were scored as being deficient and are presented in a separate report. The classroom evaluation identified eighteen rooms that were considered to be poor quality instructional spaces and should be considered for removal from the classroom supply. These rooms could then be available for reuse to meet other campus needs. These 18 rooms are located in Horton Hall, Gilbert Hall, Stewart Hall, the Faculty Office Building and Wright Hall. Besides being determined as most deficient, reuse or removal of these rooms from the supply is suggested as the rooms in Horton and Gilbert are remote from the academic core, while the rooms in the Faculty Office Building and Wright are in facilities being considered for future demolition.