

T e c h n i c a l M e m o r a n d u m

Date October 2008

Project Tennessee State University Campus Master Plan

Subject 4. Future Campus Requirements
 4.2 Space Needs Analysis to Target Year
 4.2.3 Academic Space Requirements by Academic Division

From Paulien & Associates, Inc

To Tennessee State University

1. CLASSROOM ANALYSIS

Classrooms are defined as any room generally used for scheduled instruction requiring no special equipment and referred to as a "general purpose" classroom, seminar room, or lecture hall. Classroom service space directly supports one or more classrooms as an extension of the classroom activities by providing media space, preparation areas, or storage. The classroom station size includes the classroom service area space; however, additional service space can be justified on a program or classroom basis.

2. CLASSROOM UTILIZATION

Process

Utilization of classrooms was reviewed using Fall 2006 course and facility data. Understanding how classrooms are scheduled and utilized provides the foundation for and assists in the formulation of the classroom guideline application.

The utilization analysis includes scheduled classroom use by day and time of day, as well as classroom utilization analyzing weekly room hours of use and student station occupancy percentage. The information is used to guide the space needs analysis component in the overall master planning process.

Utilization for a room is determined by calculating the average enrollment of the courses taught in the room along with the total weekly student contact hours, weekly room hours, and its student station occupancy percentage. Weekly student contact hours are calculated by multiplying the enrollment of a course by the weekly contact or room hours that the course is held. Weekly room/contact hours are determined by calculating the number of hours a course meets (start and end times) and multiplying the result by the number of days the course meets each week. Both of these factors are totaled on a room-by-room basis. If a course does not meet for a full term, the number of hours is prorated by the number of weeks in a semester. The student station occupancy for a room is determined by dividing the room's weekly student contact hours by the room's weekly student contact hour capacity (a course's weekly contact hours times the room's number of student stations). This study did not include analysis of quality of space, sight lines, acoustics, or equipment in rooms.

WEEKLY ROOM/CONTACT HOURS (WRH OR WCH) = No. of Days X ((End Time - Start Time)/60)

WEEKLY STUDENT CONTACT HOURS (WSCH) = Students X Weekly Room/Contact Hours

WEEKLY STUDENT CONTACT HOUR CAPACITY = Student Stations X Weekly Room/Contact Hours

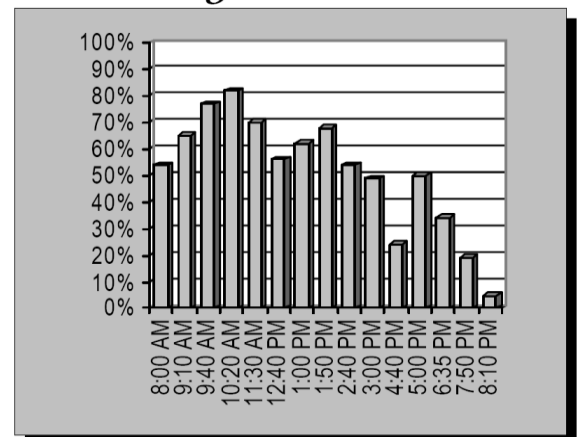
STUDENT STATION OCCUPANCY % = WSCH / WSCH Capacity

Scheduled Classroom Use by Day and Hour – Main Campus

For purposes of this analysis, the Tennessee State University Main Campus has a total of 119 classrooms. The number of classrooms in use from Monday through Friday by hour shows that peak start times are from 9:10 AM to 2:40 PM. During this timeframe, at most 88% of the classrooms are scheduled. Many campuses show lower use of classrooms on Friday afternoons. TSU's Main Campus maintains a consistent level of classroom use Monday through Thursday. On Fridays, classroom usages dips at 3:00 PM. There is very little scheduled activity on Saturday and none on Sunday.

AVERAGE PERCENT OF CLASSROOMS IN USE MAIN CAMPUS

Average (Mon-Thurs)



The following table and graphs illustrate the classroom use by hour for each day of the week. The average percent of classrooms in use is based on Monday through Thursday and excludes Friday. Including Friday in the average distorts how well the rooms are scheduled Monday through Thursday and does not reflect scheduling trends.

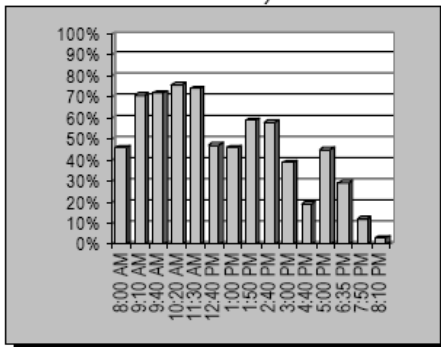
Table 1a: Main Campus Scheduled Classroom Use by Day and Hour

Time of Day	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Average*	
	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use
8:00 AM	55	46%	72	61%	55	46%	75	63%	56	47%	8	7%	0	0%	64	54%
9:10 AM	85	71%	67	56%	86	72%	70	59%	88	74%	8	7%	0	0%	77	65%
9:40 AM	86	72%	97	82%	86	72%	97	82%	89	75%	8	7%	0	0%	92	77%
10:20 AM	91	76%	104	87%	91	76%	105	88%	87	73%	7	6%	0	0%	98	82%
11:30 AM	88	74%	82	69%	86	72%	78	66%	81	68%	6	5%	0	0%	84	70%
12:40 PM	56	47%	78	66%	56	47%	76	64%	47	39%	2	2%	0	0%	67	56%
1:00 PM	55	46%	93	78%	55	46%	92	77%	47	39%	4	3%	0	0%	74	62%
1:50 PM	70	59%	94	79%	68	57%	92	77%	51	43%	4	3%	0	0%	81	68%
2:40 PM	69	58%	63	53%	66	55%	60	50%	51	43%	2	2%	0	0%	65	54%
3:00 PM	46	39%	70	59%	49	41%	66	55%	24	20%	2	2%	0	0%	58	49%
4:40 PM	23	19%	38	32%	22	18%	29	24%	5	4%	1	1%	0	0%	28	24%
5:00 PM	54	45%	66	55%	56	47%	64	54%	8	7%	0	0%	0	0%	60	50%
6:35 PM	34	29%	47	39%	35	29%	45	38%	8	7%	0	0%	0	0%	40	34%
7:50 PM	14	12%	26	22%	19	16%	31	26%	4	3%	1	1%	0	0%	23	19%
8:10 PM	4	3%	8	7%	7	6%	6	5%	1	1%	1	1%	0	0%	6	5%

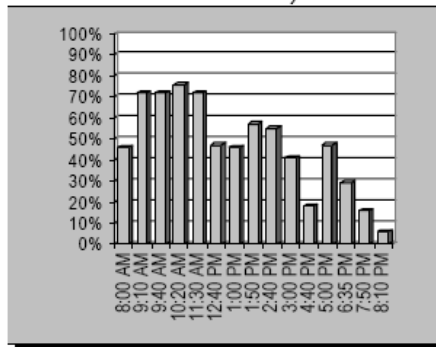
Note: Based on total classrooms of 119

*Based upon the consultant's experience, Friday is typically underutilized, therefore the average is calculated on Monday thru Thursday use.

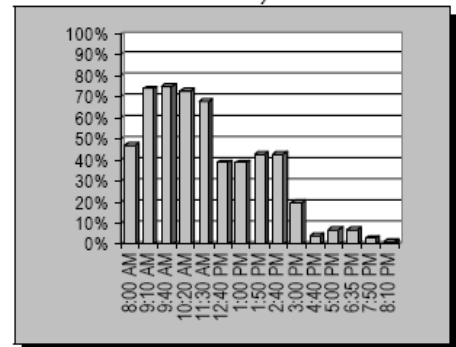
Monday



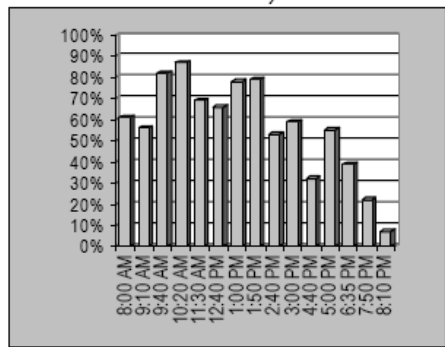
Wednesday



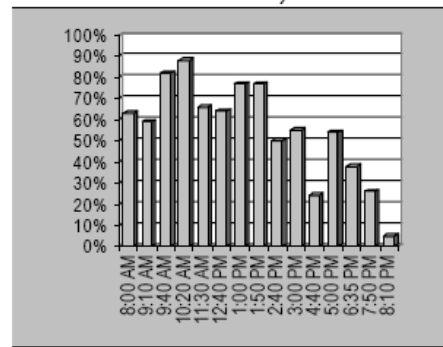
Friday



Tuesday



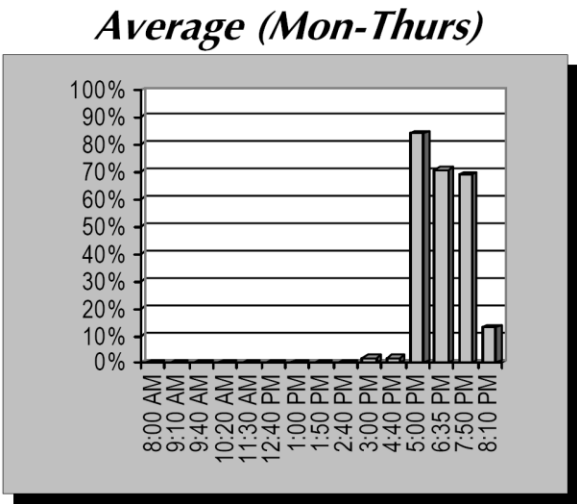
Thursday



Scheduled Classroom Use by Day and Hour – Avon Williams Campus

For purposes of this analysis, the Tennessee State University Avon Williams Campus has a total of 26 classrooms. The number of classrooms in use from Monday through Friday by hour shows that peak start times are from 5:00 PM to 7:50 PM. During this timeframe, at most 92% of the classrooms are scheduled. The Avon Williams Campus supports primarily continuing education and evening programs which explains its low classroom use from Monday through Friday before 5:00 PM. Saturday classroom usage does not exceed 62% and Sunday usage does not rise above 4%. TSU’s Avon Williams Campus maintains a consistent level of classroom use Monday through Thursday evenings with a slight dip in classroom usage on Friday evenings.

**AVERAGE PERCENT OF
CLASSROOMS IN USE
AVON WILLIAMS
CAMPUS**



The following table and graphs illustrate the classroom use by hour for each day of the week. The average percent of classrooms in use is based on Monday through Thursday and excludes Friday. Including Friday in the average distorts how well the rooms are scheduled Monday through Thursday and does not reflect scheduling trends.

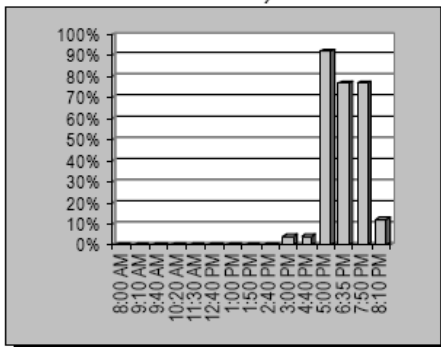
Table 1b: Avon Williams Campus Scheduled Classroom Use by Day and Hour

Time of Day	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Average*	
	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use	Rooms in Use	% In Use
8:00 AM	0	0%	0	0%	0	0%	0	0%	0	0%	16	62%	1	4%	0	0%
9:10 AM	0	0%	0	0%	0	0%	0	0%	0	0%	16	62%	1	4%	0	0%
9:40 AM	0	0%	0	0%	0	0%	0	0%	0	0%	16	62%	1	4%	0	0%
10:20 AM	0	0%	0	0%	0	0%	0	0%	0	0%	16	62%	1	4%	0	0%
11:30 AM	0	0%	0	0%	0	0%	0	0%	0	0%	13	50%	1	4%	0	0%
12:40 PM	0	0%	0	0%	0	0%	0	0%	0	0%	13	50%	1	4%	0	0%
1:00 PM	0	0%	0	0%	0	0%	0	0%	0	0%	13	50%	1	4%	0	0%
1:50 PM	0	0%	0	0%	0	0%	0	0%	0	0%	13	50%	1	4%	0	0%
2:40 PM	0	0%	0	0%	0	0%	0	0%	0	0%	12	46%	1	4%	0	0%
3:00 PM	1	4%	0	0%	1	4%	0	0%	1	4%	12	46%	1	4%	1	2%
4:40 PM	1	4%	0	0%	1	4%	0	0%	1	4%	11	42%	0	0%	1	2%
5:00 PM	24	92%	21	81%	21	81%	21	81%	12	46%	11	42%	0	0%	22	84%
6:35 PM	20	77%	19	73%	17	65%	18	69%	12	46%	0	0%	0	0%	19	71%
7:50 PM	20	77%	19	73%	16	62%	17	65%	11	42%	0	0%	0	0%	18	69%
8:10 PM	3	12%	2	8%	5	19%	4	15%	11	42%	0	0%	0	0%	4	13%

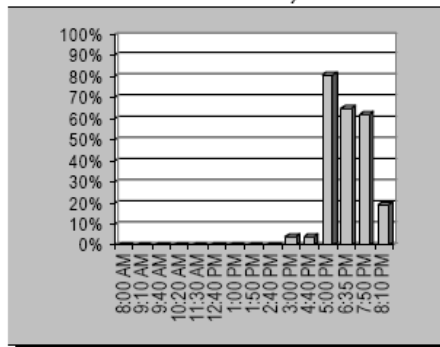
Note: Based on total classrooms of 26

*Based upon the consultant's experience, Friday is typically underutilized, therefore the average is calculated on Monday thru Thursday use.

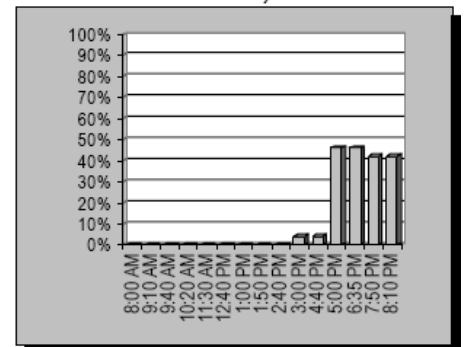
Monday



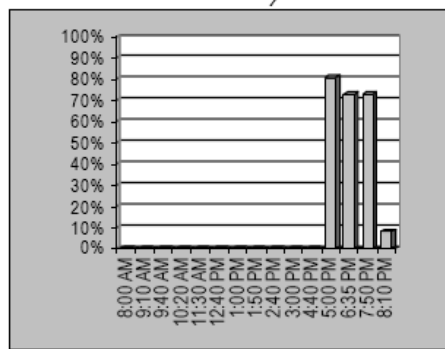
Wednesday



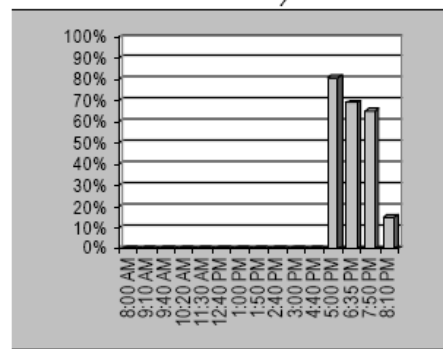
Friday

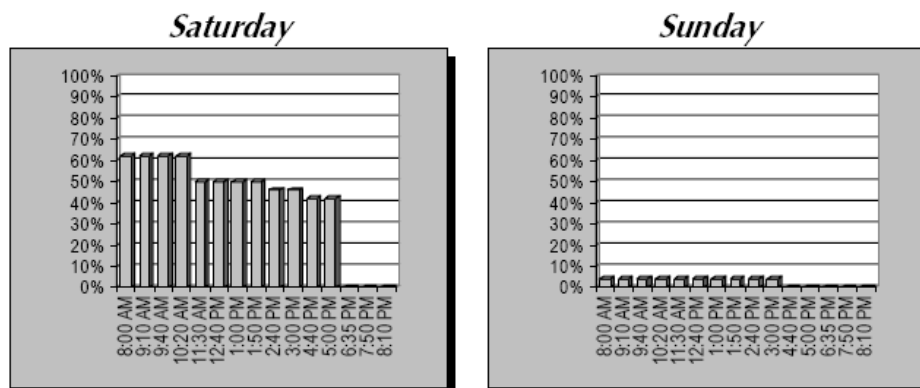


Tuesday



Thursday





When reviewing the use of classrooms on the Main Campus and the Avon Williams Campus, there is very little time overlap. In other words the predominant use of the Main Campus' classrooms is during the day whereas the primary use of the Avon Williams Campus classrooms is in the evenings and on the weekends. The one time where there is a good deal of overlap is the 5:00 PM timeslot, where between 45 and 55% of all classrooms are scheduled on the Main Campus (Monday through Thursday) and 81% and 92% of all classrooms are scheduled on the Avon Williams Campus (Monday through Thursday). On Friday's, the Avon Williams Campus uses 46% of all their classrooms at 5:00 PM.

Classroom Utilization Analysis by Room Capacity

The consultants maintain a database of the different utilization expectations various states and systems use. The planning standards used in this study are comparable to these utilization expectations. TSU's Main Campus uses its 119 classrooms slightly less than the weekly room hour expectation of 32 hours per week. When the classrooms are in use, the student station occupancy is 64% which is slightly less than the expectation of 67%.

National Classroom Guideline

	Weekly Room Hours	Student Station Occupancy Percentage
Average of Guidelines	35	64%
Median	32	65%
Most Used Guideline	30	60%
Planning Standards used in Analysis	32	67%
TSU Main	28	64%
TSU Avon Williams	17	57%

TSU's Avon Williams Campus uses its 26 classrooms at a much lower rate than the weekly room hour expectation of 32 hours per week, at an average of only 17 weekly room hours per week. Given the fact that the Avon Williams Campus is primarily evening use, 17 hours of scheduled use is relatively high compared to the maximum number of hours that can be scheduled in the evening. When the classrooms are in use, the student station occupancy of 57% is lower than the planning standard expectation of 67%.

When reviewing the classroom utilization by room capacity, the classrooms with the greatest utilization at the Main Campus are in the 151-200, 41-45 and 46-50 capacity groups. At the Avon Williams Campus, classrooms with the greatest utilization are in the 26-30 capacity.

While the overall average at the Main Campus is 28 hours per week, 43% of the rooms have over 32 hours of scheduled use ranging from 33-57 hours of scheduled use. The capacity grouping with the lowest utilization is the one classroom in the 101 -150 group.

At the Avon Williams Campus the overall average is 17 hours per week and no room capacity groups have over 23 hours of scheduled use. The capacity grouping with the lowest utilization is the one classroom in the 101-150 grouping at an average six hours per week.

The graphs on the following page illustrate a common trend. Smaller classrooms typically are not scheduled as much as the larger classrooms, so as the capacity of the classrooms increase so do the weekly room hours. Conversely, smaller classrooms tend to have a greater student station occupancy ratio while the larger rooms have a lower student station occupancy ratio.

Table 2a: Classroom Utilization by Room Capacity - Main

Room Capacity	No. of Rooms	Average Room Size	Average ASF per Station	Average Section Size	Average Weekly Room Hours	Hours in Use Student Station Occupancy %
20 and Under	7	512	32	11	13	85%
21 - 25	20	521	22	16	22	69%
26 - 30	15	532	18	19	26	68%
31 - 35	23	541	16	23	29	68%
36 - 40	30	633	16	25	33	64%
41 - 45	6	704	16	30	36	68%
46 - 50	3	963	20	24	35	50%
51 - 60	3	804	14	30	28	48%
61 - 75	6	1,227	17	31	34	49%
76 - 100	3	1,504	16	34	18	39%
101 - 150	1	2,196	22	37	9	36%
151 - 250	2	1,816	11	45	37	28%
AVERAGE TOTAL	119	678	18	23	28	64%

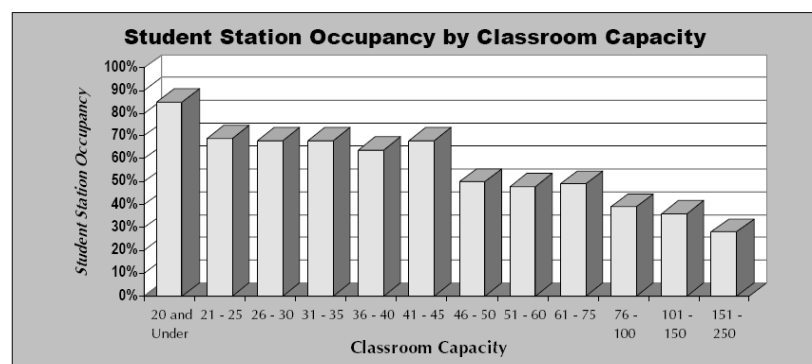
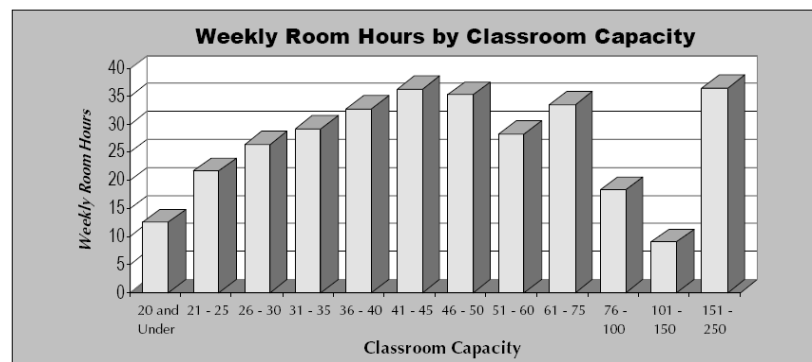
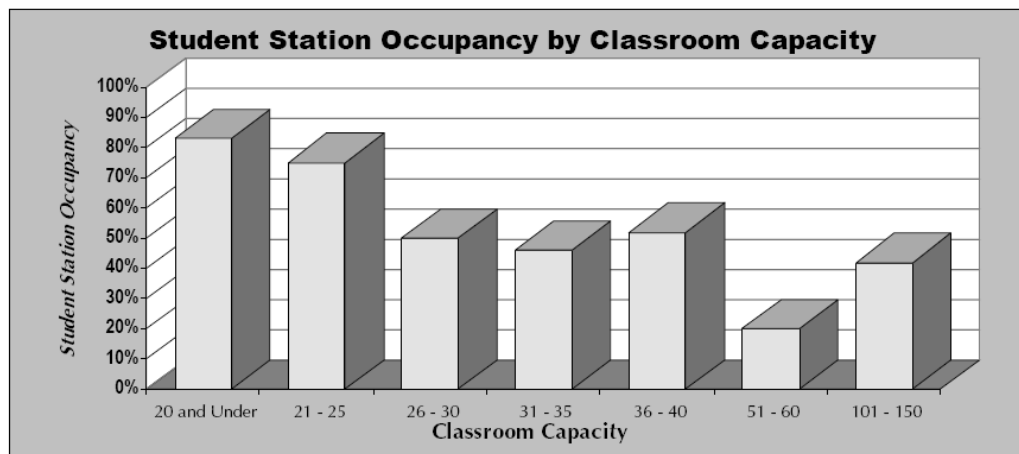
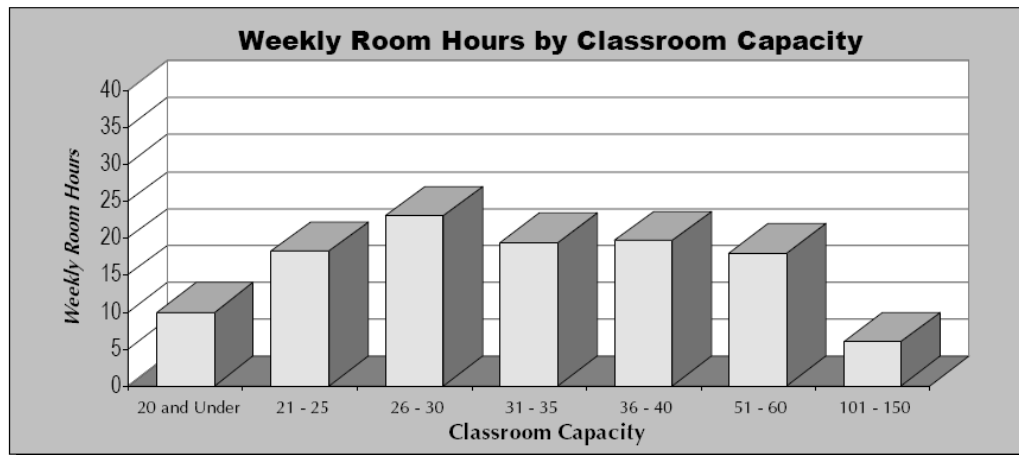


Table 2b: Classroom Utilization by Room Capacity – Avon Williams

Room Capacity	No. of Rooms	Average Room Size	Average ASF per Station	Average Section Size	Average Weekly Room Hours	Hours in Use Student Station Occupancy %
20 and Under	4	471	33	14	10	83%
21 - 25	5	581	27	19	18	75%
26 - 30	1	720	28	15	23	50%
31 - 35	5	737	23	16	19	46%
36 - 40	9	791	21	21	20	52%
51 - 60	1	1,118	19	17	18	20%
101 - 150	1	1,744	16	47	6	42%
AVERAGE TOTAL	26	737	24	19	17	57%

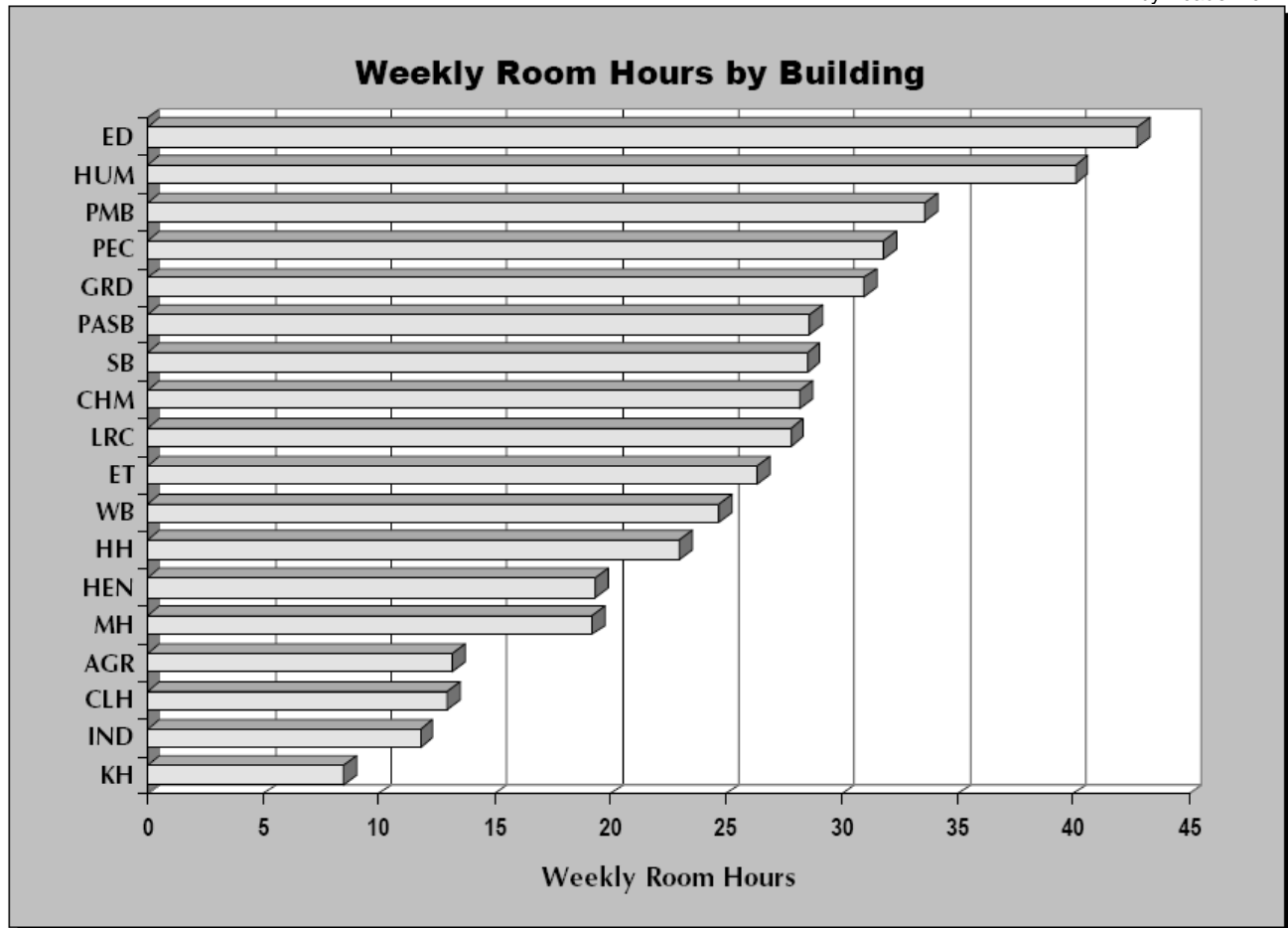


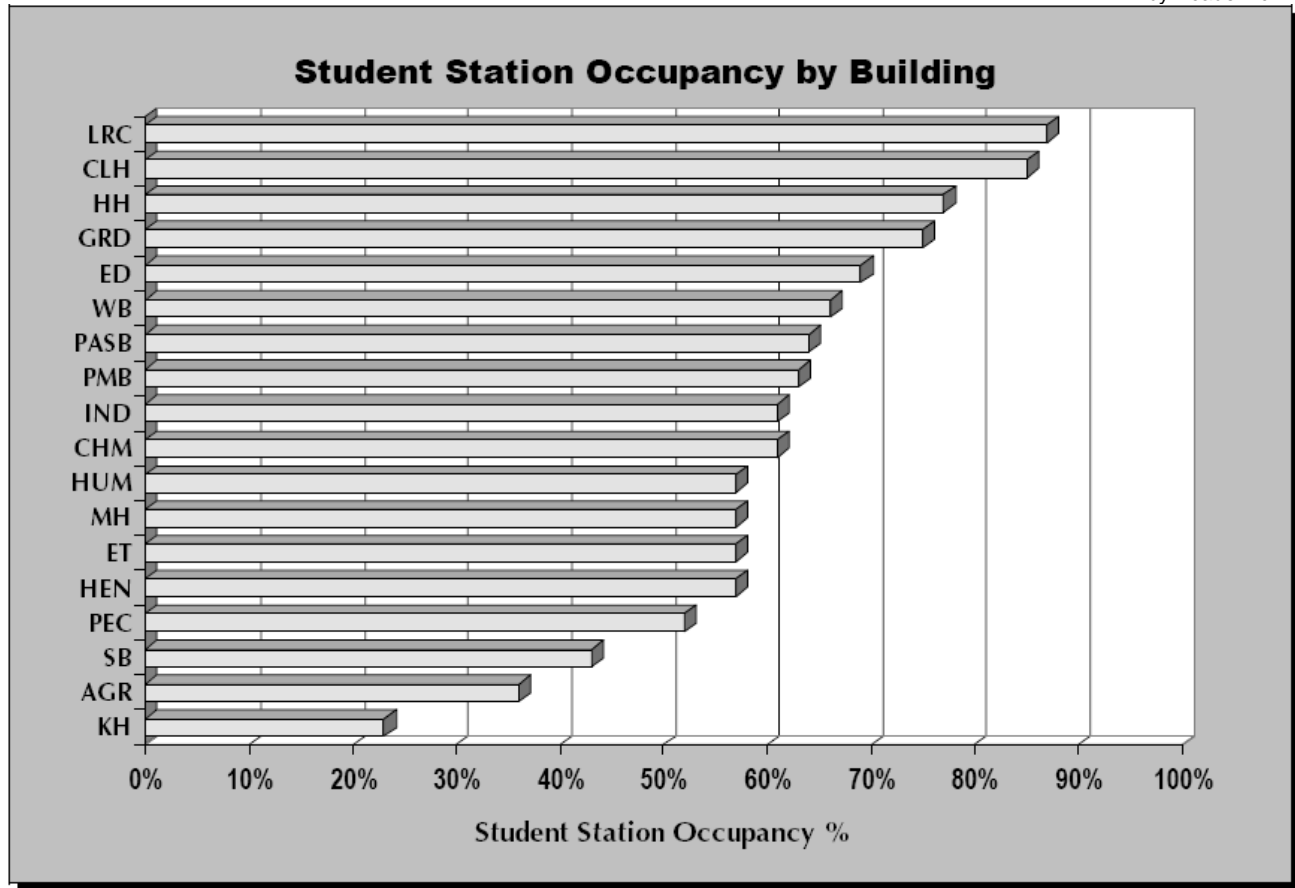
Classroom Utilization Analysis by Building Summary

The eight classrooms in Clay Education Building are utilized an average of 43 hours per week at a student station occupancy of 69%. The 11 classrooms in the Davis Humanities Building are also scheduled very well, averaging 40 hours per week. The two classrooms at Kean Hall have the lowest average weekly room hour usage at nine and an equally low student station occupancy of 23%. Classrooms in the Jackson Industrial Arts Building and Lawson Agricultural Building are also scheduled poorly, averaging 12 and 13 hours per week respectively. While the one classroom in Clement Hall is also used an average of 13 hours per week, the student station occupancy of 85% is high. The tables and charts on the following page show the utilization for all buildings on the Main Campus.

Table 3a: Classroom Utilization by Building - Main

Building Name and Id		No. of Rooms	Average Room Size	Average ASF per Station	Average Section Size	Average Weekly Room Hours	Hours in Use Student Station Occupancy %
Boswell Physics/Math Building	<i>PMB</i>	10	628	17	20	34	63%
Chemistry Building	<i>CHM</i>	5	847	17	31	28	61%
Clay Education Building	<i>ED</i>	8	693	18	26	43	69%
Clement Hall	<i>CLH</i>	1	505	21	18	13	85%
Crouch Grad Building	<i>GRD</i>	19	555	16	26	31	75%
Davis Humanities Building	<i>HUM</i>	11	602	15	23	40	57%
Elliott Hall	<i>WB</i>	10	631	18	25	25	66%
Gentry Athletic Complex	<i>PEC</i>	5	698	19	19	32	52%
Harned Hall	<i>HH</i>	1	451	15	23	23	77%
HML Learning Resource Center	<i>LRC</i>	5	657	24	24	28	87%
Holland Business Building	<i>SB</i>	4	1,571	21	31	29	43%
Humphries Hall	<i>HEN</i>	8	939	17	31	19	57%
Jackson Industrial Arts Building	<i>IND</i>	5	525	21	15	12	61%
Kean Hall	<i>KH</i>	2	1,241	15	17	9	23%
Lawson Agricultural Building	<i>AGR</i>	5	501	24	6	13	36%
McCord Engineering Building	<i>MH</i>	9	561	15	21	19	57%
Performing Arts Center	<i>PASB</i>	8	651	26	18	29	64%
Torrence Engineering Building	<i>ET</i>	3	574	18	18	26	57%
AVERAGE TOTAL		119	678	18	23	28	64%





3. CLASSROOM SPACE NEEDS ANALYSIS

The planning standards used for this study specifies a classroom utilization goal of 32 hours of use per week at 67% student station occupancy. Older guidelines call for 15 ASF as the average classroom station size. This guideline was developed in 1985 when tablet armchair classrooms predominated and it is significantly lower than what many of today's active classrooms require. Classrooms that have good sight lines which are required by technology and flexible seating arrangements usually average between 20 and 25 ASF per student station. For this analysis, the consultants used 25 ASF per student station for classrooms.

Classroom space requirements were determined by a formula that takes the target utilization of hours per week, multiplies it by the average student occupancy target, and divides the result into the specified ASF per student station. This calculation produces a guideline of 1.17 ASF per weekly student contact hour for classrooms. Assignable square feet per weekly student contact hour (ASF/WSCH) is calculated as follows:

Lecture Guideline per Weekly Student Contact Hour (WSCH):

$$\frac{25 \text{ ASF/STATION}}{32 \text{ WEEKLY ROOM HOURS} \times 67\% \text{ STUDENT STATION OCCUPANCY}} = 1.17 \text{ ASF/WSCH}$$

As further explanation, the total number of weekly student contact hours for a lecture course section is obtained by multiplying the enrollment of the course section by the number of meeting hours in one week. For example: a history course with 37 students enrolled which meets three (3) times a week for one hour produces 111 weekly student contact hours (WSCH). Multiplying the 111 weekly student contact hours by the classroom guideline of 1.17 ASF per WSCH generates 130 ASF of classroom space.

EXAMPLE OF CLASSROOM GUIDELINE APPLICATION:

Step 1 • Calculate Weekly Student Contact Hours for Lecture Section

Enrollment (37) X Weekly Room Hours (3) = Weekly Student Contact Hours (111)

Step 2 • Calculate Classroom Guideline

$$\frac{25 \text{ ASF/Station}}{32 \text{ Weekly Room Hours X } 67\% \text{ Student Station Occupancy}} = 1.17 \text{ ASF/WSCH}$$

Step 3 • Calculate Guideline Square Footage

Weekly Student Contact Hours (111) X ASF/WSCH (1.17) = Guideline Square Footage (130)

The classroom guideline application for the University showed a deficit at the Main Campus of 16%, approximately 13,100 ASF. At the moderate growth target, the deficit increases to 31% (25,700 ASF), while at the aggressive growth target, the deficit increases to 51% (42,800 ASF).

The need for classroom space on the Main Campus is more an indication of size of existing classrooms rather than a need for more classrooms. The average space per student station is 18 ASF, which is 28% less than the 25 ASF per student station used as the planning factor. Many of TSU's classrooms are outfitted with tablet armchairs rather than tables and chairs. Should TSU decide to create more classrooms to support collaborative learning environments with multi media, many of the existing rooms would lose up to 25% of their existing student station capacities.

When applying the guideline to classrooms at the Avon Williams Campus the University realizes a surplus of 61%, approximately 13,300 ASF. The surplus decreases to 57% at the moderate growth target (or 12,200 ASF) and decreases again to 50% at the aggressive growth target (or 10,800 ASF).

This surplus is an indication that there is very little day use. For the evening program to expand more classroom space is needed. This expansion could possibly happen on the Main Campus as there are classrooms available in the evening.

4. TEACHING LABORATORY ANALYSIS

Teaching Laboratories, are defined as rooms used primarily by regularly scheduled classes that require special purpose equipment to serve the needs of particular disciplines for group instruction, participation, observation, experimentation, or practice. Station sizes in teaching laboratories vary by discipline. Space requirements are calculated with a formula which is similar to that used to determine classroom space requirements, except that the ASF per student station varies by discipline.

The CEFPI space per student station guideline has approximately 50 different subject areas for which it provides teaching laboratory modules. The guideline space per station in each discipline includes service space for laboratories and takes into account the need for enough space for new paradigms in teaching methodology requiring collaborative learning environments such as mediated laboratories. CEFPI Guidelines indicate a standard of 80% student station occupancy. The weekly room hour standard varies by discipline.

The consultants reduced the weekly room hour expectations in certain disciplines based upon the program's ability to attain the utilization expectations. Program size and existing laboratory usage were also reviewed in making this decision. This review was conducted so that the teaching laboratory space needs would not be understated.

Table 5: Teaching Laboratory Guidelines

Lab Guidelines	ASF/ Station	Student Station Occupancy	Weekly Room Hours	ASF/WSCH
<i>College of Arts & Sciences</i>				
Art	80	80%	12.00	8.33
Biological Sciences	65	80%	20.00	4.06
Chemistry	75	80%	20.00	4.69
Communications	50	80%	20.00	3.13
Music	60	80%	20.00	3.75
Physics	75	80%	20.00	4.69
Computer based Labs	40	80%	20.00	2.50
<i>College of Business</i>	40	80%	20.00	2.50
<i>College of Education</i>				
Education	40	80%	20.00	2.50
Human Performance & Sports Science	50	80%	20.00	3.13
Psychology	50	80%	20.00	3.13
<i>College of Engineering & Technology</i>				
All Engineering Disciplines	120	80%	20.00	7.50
Computer Science	60	80%	20.00	3.75
<i>College of Health Sciences</i>				
Dental Hygiene	70	80%	20.00	4.38
All other Health Sciences	80	80%	20.00	5.00
Computer based Labs	40	80%	20.00	2.50
<i>School of Agriculture & Consumer Science</i>				
Agriculture	80	80%	11.25	8.89
Family & Consumer Science	60	80%	20.00	3.75
<i>School of Nursing</i>	80	80%	20.00	5.00

At the base year, there is a 14% surplus of space on the Main Campus – approximately 10,800 ASF. At the moderate growth target, the surplus decreases to 1,500 ASF and at the aggressive growth target the University shows a deficit of 11,800 ASF or 12%.

Table 6: Teaching Laboratory Analysis

COLLEGE/UNIT	Existing ASF	Fall 2006 <i>Student FTE = 7,464</i>		Moderate Growth <i>Student FTE = 8,671</i>		Aggressive Growth <i>Student FTE = 9,910</i>	
		Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)
Avon Williams - Department Not Assigned	1,911	0	1,911	0	1,911	0	1,911
College of Arts & Sciences	46,128	40,295	5,833	45,372	756	52,225	(6,097)
College of Business	1,072	2,957	(1,885)	3,301	(2,229)	3,811	(2,739)
College of Education	3,412	5,984	(2,572)	6,532	(3,120)	7,250	(3,838)
College of Engineering & Technology	12,385	7,292	5,093	8,068	4,317	9,304	3,081
College of Health Sciences	8,569	14,807	(6,238)	16,561	(7,992)	19,189	(10,620)
Division of Academic Affairs	1,975	2,145	(170)	2,413	(438)	2,785	(810)
School of Agriculture & Consumer Science	11,768	2,867	8,901	3,168	8,600	3,642	8,126
School of Nursing	2,510	2,580	(70)	2,870	(360)	3,320	(810)
TOTAL	89,730	78,927	10,803	88,285	1,445	101,526	(11,796)

5. OPEN LABORATORY ANALYSIS

The category of open laboratory space (220's) consists of rooms that are open for student use and are not used on a regularly scheduled basis. These rooms provide equipment to serve the needs of particular disciplines for group instruction in informally or irregularly scheduled classes. Alternatively, these rooms are used for individual student experimentation, observation, or practice in a particular field of study. The size of these laboratories is based on equipment size and/or on the station size and student count desired and should be determined on an individual basis. Types of rooms included in this category are computer laboratories, language laboratories, music practice rooms, and tutoring and testing facilities.

Open laboratories are not specifically addressed by the CEFPI guidelines. In recent benchmarking and consulting work with several statewide systems, the consultants found between five (5) and ten (10) ASF per student FTE allocated for space in this category. The consultants note that the amount of space TSU has classified in this category is approximately eight (8) ASF per student FTE. For this analysis nine (9) ASF per student FTE was used as the space standard.

For Fall 2006, the analysis shows a deficit of 9,800 ASF, at the moderate growth target this deficit increases to 20,700 ASF, and at the aggressive growth target the deficit grows to 32,500 ASF.

The guideline is distributed proportionately among the units that already have or need this type of space. Some of the spaces not readily present on campus include collaborative learning areas. These spaces are becoming increasingly important to institutions. Also, there does not appear to be adequate art studios and senior capstone spaces across campus.

6. RESEARCH LABORATORY ANALYSIS

Research laboratories (250's) are rooms used for unscheduled laboratory experimentation or training in research methods and observation. The research may be conducted by either faculty or students for both funded and non-funded research. This room type does not have utilization expectations.

TSU has 32,800 ASF in research space split among Biological Sciences, Chemistry, Physics, Engineering, Health Sciences and Agriculture.

Determining research space needs is a complex issue which requires an examination of many different factors including, but not limited to, research expenditures, number of faculty conducting research, research space per expenditure dollar, space per faculty, etc. For this analysis, the consultants decided to apply research guidelines to programs that currently have research space (listed earlier).

The methodology used to determine research space needs was developed by the consultants based on space per faculty. The consultants have tested this model at many different universities with a great deal of confidence. The guidelines vary depending on the existing level of research and type of research lab space required by particular disciplines. The guidelines used and the results are as follows:

Table 7: Research Guideline Application

	ASF/ Faculty	Fall 2006		Moderate Growth		Aggressive Growth	
		No. of Faculty	Guideline ASF	Projected No. of Faculty	Guideline ASF	No. of Faculty	Guideline ASF
College of Arts & Sciences							
<i>Biological Sciences</i>	300	19	5,700	22	6,600	25	7,500
<i>Chemistry</i>	300	12	3,600	14	4,200	16	4,800
<i>Physics</i>	300	24	7,200	28	8,400	32	9,600
<i>Subtotal</i>		55	16,500	64	19,200	73	21,900
College of Business							
<i>Business</i>	80	13	1,040	15	1,200	17	1,360
College of Engineering & Technology							
<i>Aeronautical & Industrial Technology</i>	375	2	750	2	750	3	1,125
<i>Architectural & Facilities Engineering</i>	375	3	1,125	3	1,125	4	1,500
<i>Civil & Environmental Engineering</i>	375	4	1,500	5	1,875	5	1,875
<i>Computer Science</i>	375	7	2,625	8	3,000	9	3,375
<i>Electrical & Computer Engineering</i>	375	5	1,875	6	2,250	7	2,625
<i>Mechanical & Manufacturing Engineering</i>	375	4	1,500	5	1,875	5	1,875
<i>Subtotal</i>		25	9,375	29	10,875	33	12,375
College of Health Sciences							
<i>Physical Therapy</i>	150	7	1,050	8	1,200	9	1,350
School of Agriculture & Consumer Science							
<i>Agriculture Sciences</i>	300	6	1,800	7	2,100	8	2,400
Division of Academic Affairs							
<i>Coop Agricultural Research</i>	300	16	4,800	18	5,400	21	6,300
<i>Extension Services</i>	300	14	4,200	16	4,800	19	5,700
<i>Subtotal</i>		30	9,000	34	10,200	40	12,000
Division of Research & Sponsored Programs							
<i>ISEM Center of Excellence</i>	150	4	600	5	750	5	750
TOTAL		140	39,365	162	45,525	185	52,135

ASF = Assignable Square Feet

The consultant's method based on square footage per faculty generated approximately 6,500 ASF more than the amount of space currently identified as research space. The moderate growth target analysis shows a deficit of approximately 12,700 ASF and the aggressive growth target shows a deficit of 19,300 ASF.

Table 8: Research Analysis

COLLEGE/UNIT	Existing ASF	Fall 2006		Moderate Growth		Aggressive Growth	
		<i>Student FTE = 7,464</i>		<i>Student FTE = 8,671</i>		<i>Student FTE = 9,910</i>	
		Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)
College of Arts & Sciences	12,471	16,500	(4,029)	19,200	(6,729)	21,900	(9,429)
College of Business	1,166	1,040	126	1,200	(34)	1,360	(194)
College of Engineering & Technology	2,092	9,375	(7,283)	10,875	(8,783)	12,375	(10,283)
College of Health Sciences	722	1,050	(328)	1,200	(478)	1,350	(628)
Division of Academic Affairs	8,143	9,000	(857)	10,200	(2,057)	12,000	(3,857)
Division of Research & Sponsored Programs	4,265	600	3,665	750	3,515	750	3,515
School of Agriculture & Consumer Science	3,957	1,800	2,157	2,100	1,857	2,400	1,557
TOTAL	32,816	39,365	(6,549)	45,525	(12,709)	52,135	(19,319)

ASF = Assignable Square Feet

The Colleges of Arts & Sciences and Engineering & Technology have the greatest need for research space. The “surplus” of space under the Division of Research & Sponsored Programs reflects the fact that the faculty for the Center for Systems Science Research and the ISEM Center of Excellence are generating space under their home departments. Therefore, the surplus of space is being offset by the deficit of space in the Colleges.

The space requirements shown above are approximate. As research activity increases, research space needs should be re-examined based on the types of research programs. The objective of the research analysis is to point to the magnitude of need and bring to light the deficit in this space category.

7. OFFICE SPACE ANALYSIS (ACADEMIC AND ADMINISTRATIVE)

Process

The CEFPI guideline determines office space needs based on major categories of staff and application of space amounts for office service and conference space needs. The consultants then applied the CEFPI guidelines to each major category. The amount of office space allotted to each position is specified based on the status and duties of the employee.

Table 9: Office Guidelines

Employee Type: <i>Applied per Headcount</i>	Office ASF	Conference ASF	Service ASF
Executive / Administrator	160-450	50	30
Faculty (T/TT)	140	20	30
Instructor	120	0	0
Professional / Supervisors	140	20	30
Technical / Paraprofessional	120	0	15
Secretarial / Clerical	120	20	30
Graduate Assistant	35	0	0
Student Workers	25	0	0
Crafts & Trades	0	0	0
Service Maintenance	0	0	0
Library Personnel (Office Space in library Gldns)	0	0	0

CEFPI identifies certain units to receive an additional amount (80 ASF) of office space per headcount for extra office space or studio space. These units are Art and Music.

When viewing the guidelines for office space, it is important to note that many older buildings on campus have offices that are larger than the size specified by the CEFPI guidelines. Campuswide, the average office size is 139 ASF just inside the guideline of 140 ASF. When using the 140 ASF per office to calculate space needs, the analysis under-represents the amount of space needed for offices and indicates a surplus of office space. The Holland Business Building has nine offices with an average size of 209 ASF while the Chemistry Building houses 17 offices with an average size of only 95 ASF and the McCord Engineering Building has 32 offices with an average size of 105 ASF. It is necessary to balance the guidelines against the reality of the average size of existing offices when interpreting the results of this analysis for use in detailed program planning in new construction or renovation.

Below is the office guideline application used for Tennessee State University.

Table 10A: Office Guideline Application

Staffing Type	Office Guideline ASF per Headcount	Fall 2006			Moderate Growth		Aggressive Growth	
		Head- count	Total Guideline ASF	Existing ASF	Head- count	Total Guideline ASF	Head- count	Total Guideline ASF
President	450	1	450		1	450	1	450
Vice President	250	5	1,250		5	1,250	5	1,250
Provost	250	1	250		1	250	1	250
Associate Vice President	200	10	2,000		10	2,000	10	2,000
Assistant Vice President	160	2	320		2	320	2	320
Dean	200	11	2,200		11	2,200	11	2,200
Associate Dean	160	8	1,280		8	1,280	9	1,440
Assistant Dean	140	4	560		4	560	5	700
Executive/Administative	160	8	1,280		8	1,280	11	1,760
Director	160	71	11,360		71	11,360	71	11,360
Chair	160	23	3,680		23	3,680	23	3,680
Chair (Music)	240	1	240		1	240	1	240
Assoc Director	160	14	2,240		14	2,240	16	2,560
Asst Director	160	31	4,960		32	5,120	37	5,920
Faculty	140	401	56,140		461	64,540	532	74,480
Faculty (Music)	220	11	2,420		13	2,860	15	3,300
Instructor	120	38	4,560		42	5,040	48	5,760
Professional	140	266	37,240		279	39,060	301	42,140
Supervisor	140	31	4,340		32	4,480	34	4,760
Research Professional	140	32	4,480		33	4,620	37	5,180
Technical / Paraprofessional	120	35	4,200		36	4,320	38	4,560
Secretarial & Clerical	120	181	21,720		187	22,440	196	23,520
Graduate Assistant	55	23	1,265		25	1,375	29	1,595
Student Worker	25	1	25		1	25	1	25
Police Officer	30	28	840		30	900	32	960
Library Personnel (Office Space in Library G	0	38	0		44	0	51	0
Crafts & Trades	0	43	0		46	0	49	0
Service & Maintenance (no office required)	0	71	0		76	0	81	0
Total Office Space			169,300	187,006		181,890		200,410
Total Service Space			33,885	33,491		36,420		40,110
Total Conference Room Space			26,170	23,235		27,850		30,380
TOTAL		1,389	229,355	243,732	1,496	246,160	1,647	270,900
Surplus/(Deficit)			14,377			(2,428)		(27,168)

Academic Office Analysis

The units included in the Academic Office Analysis are the nine Schools and Colleges and all programs under each, plus the Division of Academic Affairs, Division of Research & Sponsored Programs, along with Avon Williams Campus offices without departmental assignments. The average office size is 139 ASF which is equal to the most used office guideline of 140 ASF.

The base year guideline analysis shows a surplus of 12,116 ASF which changes to a deficit of 2,274 ASF at the moderate growth target, and increases again at the aggressive growth target to a 21,719 ASF deficit. The Total Office Guideline column in Table 9a represents the total of all three guidelines, office, service, and conference room space.

Table 10B: Academic Office Analysis

COLLEGE/UNIT	Existing ASF	Fall 2006 <i>Student FTE = 7,464</i>		Moderate Growth <i>Student FTE = 8,671</i>		Aggressive Growth <i>Student FTE = 9,910</i>	
		Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)
Avon Williams - Department Not Assigned	6,736	0	6,736	0	6,736	0	6,736
College of Arts & Sciences	42,182	40,445	1,737	45,325	(3,143)	51,155	(8,973)
College of Business	11,437	11,535	(98)	12,295	(858)	13,660	(2,223)
College of Education	14,465	17,955	(3,490)	19,855	(5,390)	22,635	(8,170)
College of Engineering & Technology	11,639	8,790	2,849	9,550	2,089	10,430	1,209
College of Health Sciences	17,947	13,775	4,172	15,105	2,842	16,870	1,077
College of Public Service and Urban Affairs	6,496	1,930	4,566	2,120	4,376	2,310	4,186
Division of Academic Affairs	35,357	40,800	(5,443)	43,350	(7,993)	47,415	(12,058)
Division of Research & Sponsored Programs	15,257	12,210	3,047	12,780	2,477	13,540	1,717
School of Agriculture & Consumer Science	6,365	4,085	2,280	4,465	1,900	4,845	1,520
School of Graduate Studies	1,154	1,600	(446)	1,600	(446)	1,770	(616)
School of Nursing	5,156	8,950	(3,794)	10,020	(4,864)	11,280	(6,124)
TOTAL	174,191	162,075	12,116	176,465	(2,274)	195,910	(21,719)

ASF = Assignable Square Feet

Administrative Office Analysis

The units included in the Administrative Office Analysis show a small surplus in the base year of 2,261 ASF. This surplus becomes a small deficit at the moderate growth target of 154 ASF and increases to a deficit of 5,449 ASF at the aggressive growth target.

The Total Office Guideline column in Table 9b represents the total of all three guidelines, office, service, and conference room space.

Table 10C: Administrative Office Analysis

COLLEGE/UNIT	Existing ASF	Fall 2006 <i>Student FTE = 7,464</i>		Moderate Growth <i>Student FTE = 8,671</i>		Aggressive Growth <i>Student FTE = 9,910</i>	
		Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)
Main Campus - Department Not Assigned	4,667	0	4,667	0	4,667	0	4,667
Athletics	0	8,575	(8,575)	8,955	(8,955)	9,905	(9,905)
Division of Business & Finance	21,416	22,370	(954)	23,810	(2,394)	25,160	(3,744)
Division of Student Affairs	28,402	19,670	8,732	19,940	8,462	21,180	7,222
Division of Technology	7,581	6,810	771	7,135	446	7,820	(239)
Division of University Relations & Development	3,700	6,765	(3,065)	6,765	(3,065)	7,355	(3,655)
Office of the President	3,775	3,090	685	3,090	685	3,570	205
TOTAL	69,541	67,280	2,261	69,695	(154)	74,990	(5,449)

ASF = Assignable Square Feet

8. LIBRARY ANALYSIS

Most of the guideline systems for library space utilize one set of factors for collections, another for readers, and a third for service space. This approach is used by the CEFPI guidelines. The library analysis is based on collections data reported to the consultants. Growth is assumed at approximately 1-2% per year depending on the time frame that the student growth is achieved. The analysis includes all space assigned to and used by the library (room use codes 300's, 400's, 600's, and 700's).

The CEFPI Guidelines for library collections assumes a sliding scale starting with .10 ASF per volume to .07 ASF per volume for collection space. Refer to the table below. Reader space calculations are based on a percentage of total population as follows: 15% factor for undergraduate students FTE, 20% factor for graduate students FTE, and 10% to the total full-time equivalent faculty. In determining the guidelines for reader station sizes, the consultants believe the 25 square feet per reader station recommended by CEFPI is not adequate because of the increased use of electronic study stations. The consultants applied 30 ASF per reader station for all reader stations knowing that some will require less and others will require more.

CEFPI suggests 25% of the total collection and reader station space for service and staff space. ACRL, in their most recent guidelines, changed this category to 12.5%. The consultants used the 12.5% figure because the 25% factor appears to over generate service space needs. The service space calculation is intended to include office space for the library staff. Lounge space is calculated using the CEFPI recommendation of three (3) ASF per reader station.

Campuswide, the library shows a deficit of space at the base year of approximately 31,000 ASF, a 28% deficit. This deficit increases significantly at the moderate growth target to

45,700 ASF – a 36% deficit and at the aggressive growth target that deficit grows to 55,700 ASF or 40%.

Separately, the library at the TSU Main Campus shows a deficit of 38% or 25,200 ASF at the base year, which grows significantly to 56% or 37,100 ASF at the moderate growth target and then to 68% at the aggressive growth target or 45,700 ASF.

Table 11a: Library Guideline Application - Main Campus

								Fall 2006 Guideline ASF	Moderate Growth Target	Aggressive Growth Target
VOLUME GENERATION	Current Items	Conversion Factor	Fall 2006 Volumes	Volume Growth	Moderate Growth	Volume Growth	Aggressive Growth			
Books/Serials (Volumes)	375,000	1.00	375,000	10.00%	412,500	10.00%	412,500			
Microforms	889,000	80.00	11,113	10.00%	12,224	10.00%	12,224			
Audio/Visual Materials	10,000	5.00	2,000	10.00%	2,200	10.00%	2,200			
TOTAL VOLUME EQUIVALENTS								388,113	426,924	426,924
No. of Volumes										
Collection Space	0 - 150,000	150,001 - 300,000	300,001 - 600,000	600,001 - 2,000,000	2,000,001 and above					
ASF per Volume	0.100	0.090	0.080	0.070	0.030					
Fall 2006 Collection Space	15,000	13,500	7,049	0	0					
Moderate Growth Collection	15,000	13,500	10,154	0	0					
Aggressive Growth Collection	15,000	13,500	10,154	0	0					
Total Collection Space								35,549	38,654	38,654
Study Space	Percent of FTE	Fall 2006 FTE	Fall 2006 Stations	Moderate Growth FTE	Moderate Growth Stations	Aggressive Growth FTE	Aggressive Growth Stations			
Undergraduate Students	20%	6,378	1,276	7,409	1,482	8,468	1,694			
Graduate Students	10%	1,086	109	1,262	126	1,442	144			
Faculty (FTE)	5%	601	30	697	35	800	40			
Total Study Stations			1,414		1,643		1,878			
Study Stations 100% @ 30 ASF/Station			42,420		49,290		56,340			
Total Study Space								42,420	49,290	56,340
TOTAL COLLECTION & STUDY SPACE								77,969	87,944	94,994
Service Space (12.5% of Total Collection and Study Space)								9,746	10,993	11,874
Lounge Space (3 ASF per Study Station)								4,242	4,929	5,634
TOTAL LIBRARY GUIDELINE SPACE								91,957	103,866	112,502

Table 11b: Library Guideline Application - Avon Williams

								Fall 2006 Guideline ASF	Moderate Growth Target	Aggressive Growth Target
VOLUME GENERATION	Current Items	Conversion Factor	Fall 2006 Volumes	Volume Growth	Moderate Growth	Volume Growth	Aggressive Growth			
Books/Serials (Volumes)	130,000	1.00	130,000	10.00%	143,000	10.00%	143,000			
TOTAL VOLUME EQUIVALENTS								130,000	143,000	143,000
No. of Volumes										
Collection Space	0 - 150,000	150,001 - 300,000	300,001 - 600,000	600,001 - 2,000,000	2,000,001 and above					
<i>ASF per Volume</i>	<i>0.100</i>	<i>0.090</i>	<i>0.080</i>	<i>0.070</i>	<i>0.030</i>					
Fall 2006 Collection Space	13,000	0	0	0	0					
Moderate Growth Collection	14,300	0	0	0	0					
Aggressive Growth Collection	14,300	0	0	0	0					
Total Collection Space								13,000	14,300	14,300
Study Space	Percent of FTE	Fall 2006 FTE	Fall 2006 Stations	Moderate Growth FTE	Moderate Growth Stations	Aggressive Growth FTE	Aggressive Growth Stations			
Undergraduate Students	10%	2,000	200	2,320	232	2,660	266			
Graduate Students	5%	500	25	580	29	665	33			
Faculty (FTE)	0%	0	0	0	0	0	0			
Total Study Stations			224		261		299			
<i>Study Stations 100% @ 30 ASF/Station</i>			6,720		7,830		8,970			
Total Study Space								6,720	7,830	8,970
TOTAL COLLECTION & STUDY SPACE								19,720	22,130	23,270
Service Space										
<i>(12.5% of Total Collection and Study Space)</i>								2,465	2,766	2,909
Lounge Space										
<i>(ASF per Study Station)</i>								0	0	0
TOTAL LIBRARY GUIDELINE SPACE								22,185	24,896	26,179

Table 11c: Library Guideline Analysis - Campuswide

	Existing ASF	Fall 2006		Moderate Growth		Aggressive Growth	
		Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)
Library							
Library - Main Campus	66,768	91,958	(25,190)	103,865	(37,097)	112,502	(45,734)
Library - Avon Williams Campus	16,253	22,219	(5,966)	24,896	(8,643)	26,179	(9,926)
Institution Total	83,021	114,177	(31,156)	128,761	(45,740)	138,681	(55,660)

ASF = Assignable Square Feet

9. PHYSICAL EDUCATION AND RECREATION SPACE ANALYSIS

This category includes spaces that are coded in the 520's used by the general student population for recreation and health and physical education programs that are not dedicated to intercollegiate athletic programs. The space represented should reflect indoor spaces only. The consultants used the CEFPI guidelines to generate physical education and recreation space.

The CEFPI formula for physical education and recreation space uses a core of 20,000 ASF for the first 1,000 headcount students. An additional five (5) ASF per headcount is added to the base of 20,000 ASF for the students over the first 1,000. If the headcount enrollment is over 2,000 then the Student FTE is substituted for the student headcount. Student FTE was used for this analysis. An additional 9,500 ASF is added for a swimming pool. Facilities included are spaces in: Practice/Event Building; Wellness Center; OD Basketball Center; Tennis Fieldhouse; Kean Hall/Gymnasium; and Gentry Athletic Complex.

The analysis of the base year shows a surplus of 14,400 ASF. The surplus decreases to 8,300 ASF at the moderate growth target and again at the aggressive growth target to 2,100 ASF. The surplus reflects the fact that some of this space is also used for athletics and the possibility that some of the space may be outdoor facilities.

10. OTHER ACADEMIC DEPARTMENT SPACE ANALYSIS

Other department space consists of a variety of space types. Again, no guideline has been developed by CEFPI to deal with such a diverse set of space types. In recent benchmarking studies, the consultants found other department space to have a wide range of space from as little as one (1) ASF per Student FTE to as much as 46 ASF per Student FTE. The types of space included in this space category at TSU include:

- departmental study/reading/resource rooms (400's) like spaces assigned to Africana Studies, Chemistry, Education, Music, and Nursing
- media production space (530's) like spaces assigned to Communication and Extended and Distance Education
- clinic space (540's) like spaces assigned to Speech Pathology
- demonstration rooms (550's)

- animal quarters (570's)
- greenhouses (580's)
- lounges (650's) for faculty and staff and select student groups
- meeting rooms (680's) like those at the Avon Williams Campus used for non-credit instruction like Extended & Continuing Education
- computer rooms (710's)
- shops (720's) like spaces assigned to Agriculture Sciences
- storage (730's) like spaces assigned to various departments that are non centralized storage areas

Other academic departmental space averages about 13 ASF per Student FTE at the University. The guideline applied for this space category is reduced at the various enrollment levels assuming that certain economies of scale are reached. The guideline starts at 14 ASF per student FTE which is then reduced to 13 ASF per student FTE at the moderate growth rate and then 12 ASF per student FTE at the aggressive growth rate.

The consultant's assessment of the different spaces within this category at the University points to the need for additional spaces that would fall into this category. For example, as TSU increases its on-line curriculum there will be a greater need for studio, editing, and training spaces for curriculum development. The Sciences and Engineering also have need for additional spaces such as greenhouses, an enhanced vivarium, and shop space. The Graduate School has need of adequate lounge and support spaces for the students it serves. The existing office suite is inadequate and does not provide the right types of spaces found in today's Graduate Schools.

For this space category the analysis at the base year showed a deficit of 8,100 ASF. At the moderate growth target the deficit increases to 16,300 ASF and at the aggressive growth target in increases to 22,500 ASF.

11. ASSEMBLY & EXHIBIT SPACE ANALYSIS

Assembly and exhibit space is defined as any room designed and equipped for the assembly of large numbers of people (610's). This includes theaters, auditoriums, concert halls, arenas, and chapels. Exhibit spaces (620's) are used for exhibition of materials, works of art, or artifacts and specimens intended for use by students and the campus community. One of the key qualifications for this space category is that the space should be in direct support of academic programs.

The CEFPI guideline has a core allowance of 22,450 ASF for institutions with enrollments of over 5,000 student FTE and an active Fine Arts program plus an additional six (6) ASF per student FTE over the 5,000 minimum. An additional 5,000 ASF is provided for institutions with active music programs. For Tennessee State University, all three additions were calculated and added to the 22,450 ASF core. Application of the CEFPI guidelines shows a current surplus of approximately 2,900 ASF and projects a deficit of 4,300 ASF at the moderate growth target and increases to a deficit of 24,200 ASF at the aggressive growth target.

The space in this category includes facilities at Elliott Hall, Floyd-Payne Campus Center, the Davis Humanities Building, the Performing Arts Center, as well as the Avon Williams Campus.

12. PHYSICAL PLANT ANALYSIS

Physical plant space includes room use codes 720 through 765 but excludes parking decks. If central storage space (730's) is not space assigned to and controlled by physical plant operations, it is counted in other space categories such as other department space, library, or athletics.

Most guidelines suggest a percentage of seven (7) to eight percent (8%) of all square footage on campus, minus existing physical plant, residence life and farm space, be used to determine space needs in this category. CEFPI recommends eight percent (8%). In most cases, these percentages generate a space need that is greater than the amount of physical plant space typically found at an institution. From previous studies, the consultants have found that the average percentage used to calculate physical plant space needs is approximately four (4) to seven percent (7%).

For this analysis, the consultants used six percent (6%) as the guideline for the main campus. The base year guideline analysis shows a deficit of 8,600 ASF, a shortage of 17%. For the moderate growth target the guideline is based on the projected need in all the other space categories, including day care, inactive/conversion space, the farm at McMinnville Buildings. For the Avon Williams campus, the guideline used was four percent (4%) of all existing space. Because the facilities in this location are not expected to increase during this planning cycle, the consultant used four percent (4%) of all existing space for not only the base year but both planning scenarios.

13. OTHER ADMINISTRATIVE DEPARTMENT SPACE ANALYSIS

Like other academic department space, other administrative department space deals with the same variety of space types. Again, no guideline has been developed by CEFPI to deal with such a diverse set of space types. Examples of the types of spaces included in this category are:

- Staff and faculty lounge areas;
- Information technology server rooms and institution wide computer rooms and support spaces
- Non-student / executive dining areas such as what is in the Floyd Payne Campus Center and at the Avon Williams Campus
- The President's residence

Other administrative departmental space averages just over two (2) ASF per student FTE at the University. The consultants believe that a reasonable guideline for this space category is three (3) ASF per student FTE. This guideline produces a deficit of at the base year which increases at both the moderate and aggressive growth scenarios.

14. ATHLETIC SPACE NEEDS

Due to the varied space requirements of indoor athletics program space, there is not one guideline that addresses this space category. Athletic space needs are usually based on the number and competitive level of the intercollegiate athletic activities. Tennessee State University competes as an NCAA Division I institution.

In order to quantify an appropriate amount of indoor space for athletics, the consultants already possessed some comparative data. The consultants reviewed athletic facilities data contained in their data warehouse of institutions of the same student body size and institutions competing in Division I. The average amount of square footage for athletic space was 139,000 ASF, ranging from a low of 66,000 ASF to a high of 190,000 ASF.

Because TSU desires to build a new football stadium some preliminary visioning has been done. Between the comparative analysis, the stated goals for new football facilities, and the need for an indoor practice facility, 200,000 ASF was applied as a benchmark guideline for this master planning exercise.

The existing space includes space in the Hale Stadium and the Gentry Center. The comparative guideline suggests that there is an approximate deficit of 83,800 ASF of athletic space. Design is currently underway for an indoor practice facility at 50,750 GSF, 22% of that space will house administrative offices and meeting rooms.

The amount of space generated for this space type does not include offices for the staff. It includes only the 520 range of room use codes plus space for concessions, training facilities, locker/shower rooms, and meeting/viewing/conference facilities required to support intercollegiate athletics. Space needs calculated in this report are for indoor space only and do not include the needs for outdoor athletic fields.

15. STUDENT CENTER SPACE

The older CEFPI recommends a formula of nine (9) ASF per student for generating student union space. These guidelines for space application provide space for the various functions and the room use code designations that are typically found in a comprehensive student union including: food service (630's), bookstore (660's), lounge (650's), recreation space (670's), meeting space (680's), student government/club space (300's and 680's), and other student service type space categories.

At the base year, the application of space guideline shows TSU with a space shortage of approximately 8,000 ASF (14%). At the moderate growth target the deficit increases to 23,800 ASF and at the aggressive growth target that deficit increases to 48,800 ASF. TSU would prefer to have a separate building for student services functions as the current facility also houses administrative functions and Athletics. Student activity space lacks adequate meeting and organizations work spaces.

16. STUDENT HEALTH CARE FACILITIES

These facilities are usually coded in the 800's and are defined as clinics established for the use of students. Health care facilities are not specifically addressed by the CEFPI guidelines. In recent benchmarking and consulting work with several statewide systems, the consultants found amounts of space in this category ranging from 0.3 ASF per Student FTE to four (4) ASF per Student FTE. The average space per Student FTE for this category at the University was approximately 0.19 ASF per Student FTE. The consultants believe that a reasonable guideline for the University is 0.50 ASF per Student FTE.

The guideline application shows a deficit of about 1,100 ASF or a 31% deficit at the base year. This deficit increases to approximately 1,800 ASF for the moderate growth target and again to 2,400 ASF at the aggressive growth target.

17. FARM SPACE

Tennessee State University utilizes farmland and greenhouses for its extensive agriculture and consumer research programs. The buildings with space included in this category include: River Road Farm house, barn and pavilion; Greenhouses 501, 502, 803 and 804; Poultry Operation; Farm Lab Facility; as well as several storage sheds for equipment, pesticides, and hay. A 17,000 square foot addition for animal facilities should be completed over the next five years. There are not any specific master planning guidelines for this space type and are therefore excluded from the analysis.

18. INACTIVE / CONVERSION SPACE

Spaces in the facilities inventory database coded as inactive / conversion space include approximately 21% of the space in the Research/Sponsored Programs Building, 20% of the space in the Holland Business Building, and less than 1% of the space in Humphries Hall.