STANFORD UNIVERSITY

INSTRUCTIONAL SPACE MASTER PLAN

BIDDISON HIER LTD.
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Table of Contents

Executive Summary

PLAN OVERVIEW

PURPOSE AND SCOPE OF THE MASTER PLAN

The purpose of the Instructional Space Master Plan is to provide vision to guide the creation, management and operation of 21st century classrooms that befit the caliber of Stanford and that provide inspiring and exciting environments for learning.

Although "instructional spaces" are broadly defined, the Master Plan focuses primarily on general use classrooms that are the purview of the Office of the Registrar. However, it also sets out parameters for the Registrar's involvement in instructional spaces that operate under shared responsibility with the Registrar's Office or are currently outside the purview of the Registrar's Office, to ensure that management and decision-making responsibilities for these spaces are clearly demarcated.

CONTEXT FOR THE PLAN

The Master Plan includes a summary of conditions that existed in the past few years (using analyses drawn from an instructional spaces assessment undertaken in 2006 and updated as appropriate), as well as issues in planning for the future.

The following are relevant considerations for future planning efforts.

- Current shortcomings
  - *Mismatch between supply and demand:* The overwhelming majority of Stanford's classes (86%) are small, with enrollments of 30 or fewer. By contrast, more than half of the inventory accommodates 30 or more students.
  - *Physical conditions:* Until recently, many of Stanford's rooms were "overfurnished" based on modern seating standards, although Stanford has begun to address this problem by reducing seating capacity in some rooms. Another significant problem is the poor physical condition of some of the classrooms and problems with certain room features (e.g., screens covering blackboards when in use, fixed seating that makes interactive teaching and learning difficult).
  - *Concentration of scheduling in "prime time":* Almost ¾ of daytime class meetings occur during "prime time" from 10am to 3pm. There are essentially no 8am classes and few 9am classes. If required, there are opportunities for increased scheduling in the morning hours.
  - *Schedule block:* Stanford's scheduling block is a series of overlapping class meeting periods designed to accommodate a wide range of pedagogical meeting requirements. The large number of overlapping periods creates a structural difficulty in being able to schedule efficiently.

- Recent Changes
  - *Classroom rightsizing:* Since 2006, the Registrar's Office has "rightsized" 34 rooms by adjusting the number of seats in the room to conform to modern square foot per seat allocations. In the process, the number of small rooms has increased, and the inventory is in better alignment with class sizes.
  - *Repurposing of Building 60:* To respond to the need for office and administrative space, and after modeling the impact of removing classrooms from the instructional space inventory, the Registrar's Office agreed to repurpose nine classrooms in Building 60 to administrative space.
- Proposed Projects: Stanford has a number of projects scheduled over the next 5+ years that will affect instructional spaces in some fashion.
  - *Science and Engineering Quad (SEQ) projects:*
    - … Energy and Environmental Building: will house one new classroom for general classroom use.
    - … Renovation of Building 524 and other changes on Panama Mall: The Terman building, which houses many Registrar classrooms, will be demolished as the School of Engineering Center is built. Replacements for these classrooms will be primarily in Building 524.
  - *Annenberg Auditorium:* The auditorium and related classrooms serving arts-related curricula will be removed from service around 2011 and replaced in a new building on the Arts Quad.
  - *Other Auditoria:* Kresge and Bishop Auditoria will be removed in the next few years. Current plan is to replace both with one auditorium in the new Graduate School of Business.
  - *Old Chem:* This building is likely to be repurposed as a science facility, but it is not clear at this time whether it will include classroom space.
  - *Professional School classroom spaces:* The Schools of Law, Business and Medicine are underway with new campus buildings which will include instructional spaces managed by the schools, although it is anticipated that as Stanford moves toward more interdisciplinary programs, more shared scheduling is likely to occur.

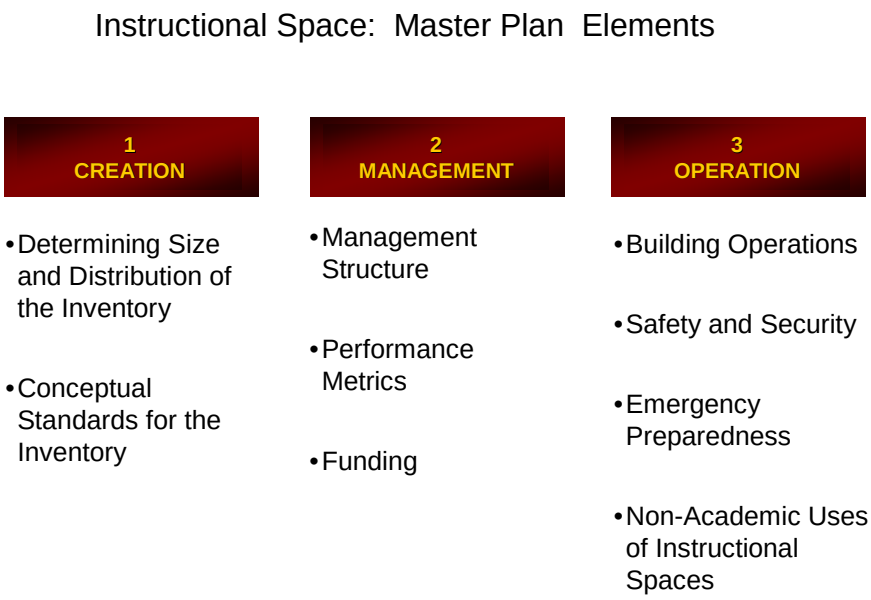
The Instructional Space Master Plan

Guiding principles and Elements of the Master Plan

Guiding principles are overarching tenets that derive from the philosophical underpinnings, goals and objectives for teaching and learning at Stanford, and are intended to provide guidance for planning, managing and allocating resources for instructional spaces.

There are three major *elements* of the Master Plan:

- ***Creating** instructional spaces:* the activities and guidelines necessary to size, produce and maintain an inventory of high quality instructional spaces
- ***Managing** instructional spaces:* strategic policies and longer-term planning considerations for instructional spaces
- ***Operating** instructional spaces:* the issues, activities and policies required for day-to-day use of instructional spaces.



Guiding principles and plan elements are summarized on the following pages.

12 Guiding Principles

1 *The pedagogical experience should be equalized among classrooms as much as possible in all aspects of classroom fit-out, quality and accessibility.*

2 *There should be an adequate inventory of classroom spaces in each of Stanford's five major Academic Quads – Main Quad, Social Sciences Quad, Arts Quad and SEQ1 and SEQ2 – so that a majority of instruction by academic disciplines residing in a Quad can be delivered within that Quad.*

As a corollary, to the extent possible, there should be careful balancing in locating classrooms within a quad. Generally, they should be concentrated to create critical masses within selected buildings in a Quad rather than dispersed in small numbers across several buildings, although it is also important to ensure that departmental offices and administrative spaces are not totally divorced from classrooms.

Finally, when possible, classrooms should be located on the periphery of buildings rather than deeply within to facilitate access and make it easier to manage security in buildings in which classrooms are located.

3 *Buildings on the Main Quad are an iconic and emblematic part of Stanford; as such, there should always be a substantial "instructional presence" on the Main Quad so that all students at Stanford have an opportunity to experience this part of campus.*

4 *All classrooms that are not intended for instructional uses should be deemed "University classrooms" and should be managed and controlled by the University rather than by individual departments.*

5 *Scheduling of all instructional spaces – whether University classrooms, specialized spaces or the limited number of departmental proprietary spaces – should be guided by the goal of achieving an efficient use of instructional space resources.*

6 *Acknowledging that learning occurs in many venues and in many forms at a university, general-use "University classrooms" should include a range of configurations to accommodate different pedagogical styles, and should be complemented by a range of other instructional spaces in each Quad.*

7 *The ever-changing nature of instructional technologies, combined with the existence of several organizations on-campus that have some involvement with them, requires both a clear understanding of each entity's role, as well as ongoing collaboration among them to address technologies in the classroom.*

8 *Information on instructional spaces should be centralized and shared.*

9 *The Registrar should be viewed as a resource for any planning issues and activities related to instructional spaces. This includes any classroom renovation or replacement being considered.*

10 *Priorities for University classrooms are, first, for academic instruction; second, for academic-related events (including Continuing Studies events); and finally, for non-academic events.*

11 *Priorities for using instructional space change during the summer to reflect different uses of this space outside of the academic year.*

12 *Wherever possible, the University should adopt environmentally sensitive and sustainable approaches in constructing, operating and fitting out its instructional spaces.*

Creating Instructional Spaces

Size and Distribution of the Inventory

The size and distribution of the space inventory required to support Stanford's instructional needs is directly affected by the nature of pedagogies offered; geographic concerns such as proximity of instructional spaces to departmental spaces; and scheduling considerations, including the length of the scheduling day and the degree to which classes can be scheduled throughout the day.

A significant interest for Stanford is to make each of the five major quads – Main Quad, Social Sciences Quad, Arts Quad, Science and Engineering Quad 1 (SEQ1), and Science and Engineering Quad 2 (SEQ2) – a vibrant hub of activity. The presence of instructional spaces – formal classrooms and other, informal learning spaces (e.g., group study rooms, work areas outside of classrooms) – is a significant contributor to this vitality. A goal of the Master Plan is to ensure an adequate distribution of instructional spaces in each quad.

Conceptual Standards for Instructional Space

The Master Plan provides standards at a conceptual level for the following classroom features:

- Room type and configuration, for all rooms (seminar rooms, general purpose classrooms, lecture halls, case study rooms, and auditoria)
- Square footage allocations
- Furnishings
- Finishes
- Writing and presentation surfaces
- Technology and audio-visual
- Lighting
- Accessibility

These standards are intended to provide a baseline level of quality that all instructional spaces should achieve, so that over time there is a consistent "Stanford classroom" in look and feel, one that befits the quality and reputation of the institution.

These standards should also be used to guide renovation and new construction activities and should be updated periodically to adapt to changing pedagogies, industry best practices and new developments in furnishings, finishes and particularly technology.

Managing Instructional Spaces

Organizational Issues

The Office of the Registrar manages day-to-day operations of instructional spaces (e.g., scheduling, coordination of maintenance). There is need, however, for a more strategic level of management that deals with all aspects of instructional spaces – pedagogy, physical conditions, scheduling, technology, funding, organization, etc. The Master Plan proposes the creation of an Instructional Space Committee that will have within its purview the ability to consider instructional spaces holistically. Initially it is proposed as an administrative committee, with the possibility of becoming a faculty-led committee if appropriate.

In addition to the Instructional Space Committee, two sub-committees are also proposed at this time, one to address technology planning and one focusing on management of classroom scheduling information. Each of these will include representation from the Registrar's office as well as appropriate stakeholder groups on campus who bring broader perspectives in each subject area. In the case of the Technology Planning Sub-Committee, for example, a focus will be to "look down the road" to emerging technologies and determine how they can eventually be folded into instructional spaces. For the Information Management Sub-Committee, the focus is on creation of policies to centralize scheduling information, and to develop practices and protocols that will encourage campus-wide participation in a centralized scheduling system.

Performance Metrics

Performance metrics provide an objective way to assess how instructional space resources are used. The Master Plan proposes a series of metrics that should be generated on a periodic basis – e.g., once a quarter or once per year – to provide quantitative data on instructional space usage, conformance to scheduling policies, accommodate of pedagogical needs, etc. The primary metrics identified in the Master Plan – along with examples of how to interpret them – are as follows:

- Room utilization
- Seat (station) utilization
- Net assignable square feet per seat
- Demand vs. supply
- Other measures (e.g., enrollment tracking, schedule block conformance)

Stanford has software reporting tools that may be used to generate these metrics easily, quickly and regularly.

Funding

The Master Plan inventories the different types of funds that have typically been available for instructional spaces on an annual basis – including operational, maintenance, technology and capital funds. It also presents future funding benchmarks that may be used to provide order-of-magnitude cost estimates for refurbishing existing spaces, renovating space, and adding instructional media.

Operating Instructional Spaces

By and large, the current system for managing day-to-day operations of instructional spaces works well. Rooms in each building are managed as part of overall building management and the Office of Facilities Operations oversees cleaning and maintenance on behalf of the Registrar. The Master Plan includes some suggestions for more active management of instructional spaces, as well as thoughts on safety and security (e.g., hours of operation, implications of mixing instructional spaces within other uses in a building), and emergency preparedness.

It also includes a section on the use of auditorium spaces for non-academic uses, and some of the operational issues that arise as a result (e.g., need for centralized management of these spaces, issues of cost recovery, need for non-instructional spaces that might serve as "community resources" in addition to and / or in place of instructional auditoria).

Summary of Master Plan Recommendations

Recommendations presented here are excerpted or summarized from the Master Plan.

Management / Organizational Issues

Recommendation 1: Strategic Management

Create an Instructional Space Committee to handle activities associated with general use instructional spaces that are long-term and strategic in nature. The Committee should have a holistic view of instructional spaces and their issues, and should be comprised of University stakeholders who represent the full spectrum of instructional space issues. The scope and range of functions of the committee would be determined by consensus of the participants. An initial list of functions for consideration is below.

- Evaluate the adequacy of instructional spaces (e.g., configuration, furnishings, technology, etc.) to support current and anticipated pedagogies at Stanford.
- Provide ongoing review of scheduling grids and protocols
- Communicate schedule planning requirements across the many entities involved in scheduling across campus (e.g., academic courses, finals, conferences and other summer activities) to ensure that planning happens as early as possible.
- Represent / advocate for an instructional space perspective in all Stanford planning initiatives involving renovation or new construction of instructional space (e.g., with the Office of Land and Buildings, individual Schools, capital planning meetings with deans).
- Periodically review performance metrics (see Section 2.2.2.B. “Performance Metrics” below)
- Review “best practices” nationally and from other institutions, as information is available
- Review instructional space needs that require capital funding; determine budget needs and resource allocation priorities for major capital expenditures related to instructional spaces
- Provide ongoing communication about instructional space issues to the campus at-large, particularly to faculty and other frequent users of instructional spaces
- Oversee the implementation of the Instructional Space Master Plan, ensure that changes to instructional spaces are in accordance with the Plan, and update the Plan as necessary.
- Formulate policies for and approve changes to instructional space use.
- Develop an “Annual State of Instructional Spaces” report to highlight progress that has been made during the year in upgrading instructional spaces, meeting performance metrics, etc.

Initially the committee would be administrative in nature. Ultimately the goal is to also have significant faculty involvement, and if appropriate, the focus of the committee structure could shift from administrative to faculty-led, with a home in the Faculty Senate. In such a circumstance, adjustments to the composition and structure of the committee would shift as necessary to conform to the policies, procedures and protocols of Faculty Senate committees.

Recommendation 2: Technology

Create a Technology Planning Sub-Committee as the vehicle by which the Registrar's Office and other campus entities involved in instructional technologies coordinate and collaborate to bring emerging technologies into the classroom. The sub-committee would provide the means for the following:

- Informing the Registrar's Office about emerging technologies and how they might be incorporated into the classroom, including technologies that are in the forefront, technologies that are five years down the line, etc. (This type of collaborative effort is already happening in other areas on campus.)
- Learning about and discussing best practices at other institutions to ensure that Stanford's instructional spaces continue to be competitive with peers.
- Identifying staffing and training implications of new technologies and strategies to provide these.
- Determining funding requirements and serving an advocacy role with senior administration in securing funding for the constant evolution of instructional space technology.

Recommendation 3a: Information Management

Centralize information on instructional spaces and develop systems for sharing this information among all constituencies using instructional spaces, using Resource25 as the central database.

Recommendation 3b: Information Management

Create an Information Management Sub-Committee to:

- Implement the move toward Resource25 as the single, unified system for scheduling information.
- Identify and recommend support systems that need to be developed to train personnel across campus to use Resource25 effectively, and to ensure the reliability of information entered into the Resource25 system.
- Meet with representatives across campus to understand issues and concerns with moving toward a central information system for storing scheduling data, and to communicate information about the potential benefits of centralized storage of scheduling data (e.g., better planning tools for determining class section needs, faculty and graduate student staffing needs, enrollment planning and estimating, etc.).
- Develop policies and procedures that respond to user concerns.
- Develop tools for planning and periodic reporting using Resource25 (and the reporting functions of its related software package, X25).[1]

[1] Examples of some of the reporting tools, in the form of "performance metrics," are presented in *"Section 2.2.2.B. Performance Metrics."*

Capital Planning and Funding

Recommendation 4: Short-Term Capital Planning

In the early planning phases for the projects coming in the next five-plus years (e.g., Building 524, Energy and Environmental Building), analyze classroom needs for these buildings in the context of overall need for instructional spaces in the targeted quad.

Recommendation 5: Long-Term Capital Planning

As new or replacement classroom space is deemed necessary, consider creation of dedicated classroom buildings in one or more of the five quads, to allow for efficient development and maintenance of instructional spaces.

Recommendation 6: Capital Funding Requirements

Develop a long-term projection of funding requirements based on expenditures required to achieve the primary goals of the Master Plan, including achieving a base level of quality and fit-out for all instructional spaces, meeting targets for providing and refreshing baseline technologies in instructional spaces as required, and constructing new instructional spaces.

Recommendation 7: Cost Recovery

Develop a university wide policy for cost recovery when instructional spaces are used for non-academic events, addressing charges for basic set-up and room usage, basic and specialized technologies, clean-up, etc.

Scheduling

Recommendation 8: Monitoring Prime Time Usage

Review scheduling patterns on a regular basis to measure room use during peak vs. off-peak periods, with a goal, over time, of promoting schedule shifting into off-peak hours wherever practical (e.g., discussion sections) and / or considering scheduling incentives to increase the attractiveness of selecting off-peak hours (e.g., better room locations, preferential treatment in selecting prime time spaces for those who teach in off-peak times as well).

Recommendation 9: Finals Scheduling

Explore approaches to finals scheduling that would rely on the honor system and eliminate alternative seating, to allow finals to be given in the rooms where a class is scheduled during the term. This would have a dramatic impact on the need for auditorium space during finals periods.

Recommendation 10: Transition Planning for General Use Classrooms

Conduct a review of instructional spaces that are now departmentally-controlled over the next one to two years to identify spaces that meet criteria for "general use classrooms" as outlined under *Guiding Principle 4* of the Master Plan. For spaces that meet the criteria, the department and the Registrar, on behalf of the University, should work out a plan to transition the space(s) to University management, after allowing for the following:

- Each department should have access to a space (or spaces, depending on the size of the department) that they can freely schedule for departmental meetings, conferences, and other activities, and an instructional space under review may be converted to such use.
- Such spaces must be fully supported, funded and managed by the department.

Recommendation 11: Instructional Support Spaces

The University should review needs for other spaces that support instructional and learning activities (e.g., group study spaces, computing facilities, informal student work areas, multi-purpose spaces) and develop long-term plans to address these space needs, particularly in quads where there currently is or is anticipated to be a high volume of student activity (e.g., Main Quad, SEQ areas).

Recommendation 12: ADA Requirements

Conduct a study of ADA requirements in instructional spaces within the next three years and incorporate results and recommendations into the Master Plan. Among the issues to be considered in the study are:

- Improving signage for ADA accessibility
- Guidelines for accessibility to tiered classrooms
- Adequate distribution of ADA accessible spaces among the major quadrants of campus
- Phasing and funding considerations and requirements for implementing changes to achieve ADA compliance.

Recommendation 13: Sustainability

Develop a set of goals and principles for adopting environmentally sustainable practices in instructional space and / or adopt existing University standards that may exist.

Recommendation 14: Emergency Preparedness

Create the necessary "infrastructure" to ensure that instructional spaces can be managed effectively in times of emergency. Specifically:

- All instructional spaces should be scheduled in Resource25 (R25) so that there is a complete database of information on the use and occupancy of these spaces. Spaces can be coded in R25 to distinguish special use from general use spaces. (See *Recommendation 3a* above.)
- The Instructional Space Committee should develop a common set of policies and procedures with regard to classroom security and emergency preparedness. These guidelines would then be distributed to the Registrar's Office (for University instructional spaces) and to each department (for special use instructional spaces) for implementation.
- Concurrent with distribution of these guidelines, the Instructional Space Committee should develop a protocol for communication between the Committee, the Registrar's Office and the individual departments so that information on important matters involving all instructional spaces can be disseminated easily and consistently – particularly in times of emergency.
- Review all physical standards to meet best practices for safety – e.g., fire safety, terror safety, earthquake safety, etc.

STANFORD UNIVERSITY

INSTRUCTIONAL SPACE MASTER PLAN

Introduction

Over the past decade, Stanford University has engaged in systematic analysis of its instructional spaces to gain a better understanding of the instructional environment which it offers.

Efforts have included the following:

- June 1998: "Main Campus Classroom Utilization Study" (and subsequent Main Quad analyses through 1999)
- June 2006: "Main Campus Instructional Space Assessment 2006"
- October 2006: "Auditoria Analysis Needs Assessment 2006"
- November 2006: "Elimination of Building 60 Second Floor Classrooms."

This master plan draws from these analyses and findings to lay out a plan for instructional spaces over the next 10 to 15 years.

PURPOSE OF THE INSTRUCTIONAL SPACE MASTER PLAN

At the broadest level, the purpose of the Instructional Space Master Plan is to provide vision to guide the creation, management and operation of 21st century classrooms that befit the caliber of Stanford and that provide inspiring and exciting environments for learning.

Classrooms are a somewhat "fluid" resource. Over time, a number of incremental changes happen to a room – e.g., changes in seat capacity, furnishings, technology fit-out, even repurposing for other uses. Consequently, a Master Plan that will endure for a 10 or 15 year period cannot be limited to recommendations for a specific set of spaces. Rather, it should also provide context, prescriptive guidelines and criteria for decision-making in all resource allocation matters related to instructional spaces – e.g., what renovations to undertake with respect to classrooms, how to evaluate proposals made by others on-campus that potentially affect classrooms, what new spaces should be built – as well as planning tools and agreed-upon practices for management and operations.

Scope of the Instructional Space Master Plan

In an academic setting, learning takes place in a variety of venues. Hence, "instructional spaces" can be broadly defined to include classrooms, teaching labs, group study rooms, even common spaces in residence halls. For purposes of this Master Plan, instructional spaces are primarily thought of as formal classroom and teaching lab spaces.

Among the many types of instructional space at Stanford, the Registrar, in partnership with the University, has primary management responsibility for one type of instructional space – general use classrooms. Other instructional spaces are the responsibility of departments or other administrative units at Stanford. Still others operate under various responsibility-sharing arrangements. The principles and guidelines in this Master Plan are intended to apply to all rooms that are the responsibility of the Registrar. The Master Plan also attempts to set out parameters for the Registrar's involvement in instructional spaces that operate under shared responsibility with the Registrar's Office or are currently outside the purview of the Registrar's Office, to ensure that management and decision-making responsibilities for these spaces are clearly demarcated.

Specifically *excluded* from the Master Plan are instructional spaces – largely specialized in nature – in the following areas:

- *Professional schools (Law, Business and Medicine):* For various reasons, including different scheduling requirements, instructional spaces in each of the professional schools are managed by the individual schools. There has historically been a cooperative relationship between these schools and the Registrar's Office, particularly with respect to their auditoria, which may be made available for wider University use after the needs of the individual school have been met.
- *Stanford Center for Innovations in Learning (SCIL):* SCIL has some of the most sophisticated instructional technology spaces on campus, as well as a dedicated staff managing these spaces.
- *Performing arts spaces:* These spaces accommodate many non-standard classroom uses, including rehearsals, venues for guest speakers, theatrical and musical performances, etc., with scheduling requirements that are of necessity very different than standard Registrar scheduling blocks. Because of the special nature of these spaces and their scheduling requirements, they are managed outside of the Registrar's Office.
- Computing labs: Laboratories, computing and science labs are managed by the Office of Academic Computing and individual schools.

Appendix A includes a list of Registrar instructional spaces in 2007 - 2008.

Responsibility for the Instructional Space Master Plan

Instructional spaces are a University-wide resource and many constituents have a vested interest in ensuring that an adequate supply of high quality spaces is available. Traditionally, the Registrar's Office on a university campus has had responsibility for at least scheduling and sometimes fit-out of rooms, but no one entity on a university campus usually has comprehensive responsibility for all the moving parts – e.g., technology, scheduling, physical fit-out, funding, renovation, etc.

One of the goals of this master plan is to be intentional about how all aspects of instructional spaces are managed. To that end, the Registrar's Office has joined in partnership with the Office of Capital Planning to initiate this Master Plan – with the idea that eventually other stakeholders in instructional spaces will join with them in providing input and refinements to the Master Plan.

Structure of the Instructional Space Master Plan

Following this introduction, the substantive sections of the Master Plan are presented in two parts, as described below.

Part 1: Context for the Instructional Space Master Plan

Part 1 sets the stage for the recommendations of the Instructional Space Master Plan by enumerating existing conditions and known plans for the future. Specific topics include:

- Summary of Existing Conditions (taken largely from the findings of the 2006 studies)
  - The campus
  - The inventory
  - Physical issues
  - Profile of instruction
  - Adequacy of the inventory – supply vs. demand
  - Performance metrics
  - Scheduling issues
- Planning for the Future
  - Summary of current shortcomings
  - Recent changes
  - Proposed projects

Part 2: The Instructional Space Master Plan

Part 2 is the Master Plan itself, and includes the following topics:

- Guiding principles (basic concepts that help guide strategic decision-making, that reflect philosophical issues about instructional spaces, etc.)
- Plan Elements
  - Introduction
  - Creating instructional spaces
    - … Size and distribution of the inventory
    - … Conceptual standards for the inventory
  - Managing instructional spaces
    - … Management structure
    - … Performance metrics
    - … Funding
  - Operating instructional spaces
    - … Building operations
    - … Emergency preparedness
    - … Non-academic uses of instructional space
- Recommendations

Part 1 Context for the Master Plan

Between new pedagogies and constantly evolving technology, planning for future instructional space needs is challenging and somewhat unpredictable. A starting point is understanding existing conditions, shortcomings, and proposed changes already in the pipeline.

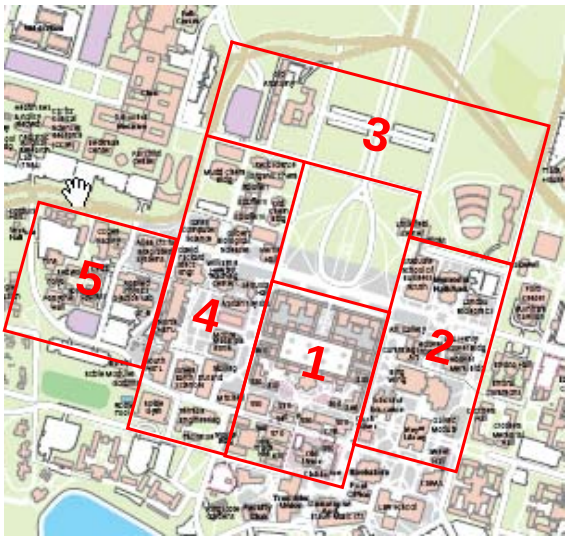
Section 1.1 – Summary of Existing Conditions

To provide a foundation for the Master Plan, an understanding of existing conditions in Stanford's instructional spaces as of a fixed point in time is necessary. What follows is a summary of conditions primarily drawn from Winter 2005 term data, the most recent academic year prior to the development of the Instructional Space Master Plan.[2]

The Campus

For purposes of the Master Plan, the main campus is divided into several quadrants, with the goal of having adequate classroom inventory in each area to accommodate the primary departments that are housed in that area. Law, Business and Medical quads will be adapted as the University's master plan evolves.

1. Main Quad
2. Social Sciences Quad
3. Arts Quad
4. Science and Engineering Quad 1 (SEQ1)
5. Science and Engineering Quad 2 (SEQ2)



[2] For a more detailed discussion of current conditions, refer to the Biddison Hier document "Stanford University Main Campus Instructional Space Assessment 2006 – Final Report" June 2006.

THE INVENTORY

As of Winter 2005, there were 183 rooms in the classroom inventory under the responsibility of the Registrar. The preponderance of these rooms (114 rooms) were on the Main Quad, with most (83 rooms) in 7 buildings on the Quad. Three buildings in the southeast area of the campus (the School of Education, Encina and Meyer Library) had 21 classrooms. All other buildings have 5 or fewer rooms, with many having only 1.

- Just over half of all rooms seat 30 or fewer students.
- Just under half are in 6 room sizes – 8, 15, 20, 25, 30 and 40 seats.
- Small rooms are concentrated on Main Quad. The 17 largest lecture halls and auditoria (capacity greater than 100 seats) are spread relatively evenly across campus.

	Inventory		
Room Size	Rooms		
	No.	*Pct.*	
Small Rooms			
001 to 10	9	*5%*	
011 to 20	35	*19%*	**56%**
021 to 30	59	*32%*	
Mid-Sized Rooms			
031 to 40	22	*12%*	**23%**
041 to 60	21	*11%*	
Large Rooms			
061 to 100	20	*11%*	**20%**
101 to 999	17	*9%*	
Total	**183**	*100%*	

The chart at right shows the distribution of classrooms by size (i.e., seat capacity).

PHYSICAL ISSUES

In focus groups conducted as part of a comprehensive review of instructional spaces, faculty expressed a wide range of concerns and perspectives about physical conditions in classrooms, from size and configuration of rooms (e.g., too tightly packed with furnishings, odd shapes that are sub-optimal for instruction) and furnishing requirements (strong interest in moveable tables and chairs), to writing surfaces (need lots of unobscured board space, moveable white boards) and lighting and ventilation considerations. Many comments focused on what made a classroom work well or poorly. Comments were particularly directed in the following areas:

- Seminar rooms – it is critical that all students have a seat at the table. Too many rooms rely on perimeter seating to accommodate the full class, with the result that some students are "second class citizens" during class time.
- Mid-size classrooms are not flexible enough; they would be more usable if fewer had fixed seating.
- Large lecture halls – are often too large for classes in them; they don't feel "intimate" and lack flexible furnishings.
- In a large number of rooms, the square footage allowance per seat is below or well-below modern standards – in about 75% of rooms seating 30 or fewer, and 9% of all other rooms.[3]
- Moveable furnishings are preferred, even "essential" according to faculty, and 70% of rooms have some type of moveable furniture. Moveable tables and chairs are generally preferred over tablet arm chairs, except for pedagogies where discussion circles are used (e.g., in language classes).
- With respect to technology, the best thing that Stanford has done is to add SmartPanels in classrooms. Expressed demand is high and at the time of the study, 59% of rooms were fitted out with these panels.
- Language departments were very fully represented in focus groups and highlighted several areas of need that are specific to their curriculum – e.g., for various types of technology, furnishing that accommodate group activity and a high degree of in-class interaction, soundproofing, etc.

[3] Modern square footage standards are presented in Section 2.2.1.B.

Profile of Instruction

The overwhelming majority of Stanford's classes are small – almost 1,400 of 1,600 (86%) have fewer than 30 students and 522 (32%) have fewer than 10 students.

- The greatest concentrations of enrollments are at 15, 20, 24, 25 and 30 students.
- Classes with enrollments above 40 do not appear to group naturally around any particular breakpoints.
- There are 10 classes with enrollments greater than 200, and the largest class enrolls 324.
- Humanities and Sciences is by far the largest school, with about 81% of all classes. Engineering is second with 14% and Education and Earth Sciences each have less than 5%.
- While the preponderance of classes is small, there are a large number of student contact hours across the board, suggesting that attention to instructional spaces at all sizes is important.

	By Meeting Type					
Enrollment	**Classes**		**Class Meetings**		**Class Meeting Hours**	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
Small						
0 to 10	522	32%	1,005	34%	1,339	37%
11 to 20	588	36%	1,065	36%	1,245	35%
21 to 30	275	17%	397	13%	419	12%
	1,385	86%	2,467	83%	3,003	84%
Mid-Size						
31 to 40	67	4%	132	4%	159	4%
41 to 60	59	4%	137	5%	157	4%
	126	8%	269	9%	316	9%
Large						
61 to 100	56	3%	124	4%	139	4%
101 to 999	44	3%	108	4%	115	3%
	100	6%	232	8%	253	7%
Total	**1,611**	**100%**	**2,968**	**100%**	**3,572**	**100%**

Adequacy of the Inventory – Supply vs. Demand

- Stanford's classroom capacity from 8am to 5pm is more than double the amount of demand for that capacity. However, there is a significant imbalance in the distribution of that capacity, with a substantial oversupply of large rooms and a shortage of small rooms (i.e., that accommodate enrollments up to 20).
- The shortage of small rooms is exacerbated by the fact that the highest interest in offering classes (i.e., the greatest demand) is between the hours of 10am and 3pm ("Prime Time").
- Demand patterns are slightly more regular on Monday, Wednesday and Friday than Tuesday and Thursday, although there is not a unified single pattern of start and stop times that all adhere to in selecting course times.
- Although the lunch hour is theoretically an unscheduled time, there is clear demand at that time – approximately 300 hours of courses are offered weekly through the lunch period. (Faculty note that they like to have the lunch hour open for language conversation groups, music performance ensembles and other activities.)
- Demand in Humanities and Sciences is primarily for small rooms; the majority of Engineering demand is also for small rooms, although it also has need for mid-size rooms and larger (up to 100). Demand for the largest rooms (100+) is minimal.
- Sixteen departments within H&S are the greatest generators of demand (approximately 65% of total H&S demand). Because they are large, their demand patterns have an impact on the overall need for classrooms.

Performance Metrics

- Overall room utilization is 43% (8am to 5pm); 54% in Prime Time, which means that no more than half of the inventory, on average, is used. At the peak periods of 11am, 1:15pm and 2:15pm, room usage approaches 80%.
- The room sizes with the highest average room utilization are 21 to 30 (47%) and 41 to 60 (46%); lowest utilization is in rooms with 10 or fewer seats (35%) or more than 100 seats (37%).
- Friday room usage is very low (25%).
- Room usage on the Main Quad and in the northeast area of campus is highest (47%); use of auditoria is lowest (8%).
- There is significant migration of small courses to larger rooms in part because of a relative imbalance between the supply and demand for small rooms and an oversupply of mid-sized and larger rooms. However, the degree of migration is substantial – some of the smallest courses are migrating to the very largest rooms – which cannot be attributable solely to supply and demand factors – suggesting that other factors (most likely physical condition, room fit-out and geographic) are at work.
  - Empirical evidence from requests made to the Registrar's Office suggests that significant migration is due to technology – i.e., faculty requesting to be in specific rooms to have access to SmartPanels and other technologies, regardless of the size of the room.
- Average seat utilization is 48%, somewhat higher in the smallest room sizes (50% to 60%) and lower in the larger room sizes (42% to 45%).
- It appears that with respect to geographic partitions and room features, there is a high degree of match, although it is unclear how extensively or accurately partition and feature requests are made using the scheduling software.

Scheduling Issues

- Stanford's "schedule block" of standardized class meeting patterns is complex and multi-dimensional, presumably to accommodate a wide variety of pedagogical preferences. While such a schedule sacrifices some efficiency in use of classrooms, it appears that there is a high degree of conformance to standard meeting times. (Fewer than 1% of class meeting hours are in non-standard patterns.)
- Faculty cited support for enforcement of standard blocks, while suggesting that there need to be incentives to teach more classes outside of "prime time."
- In general, faculty are interested in more and better data to support classroom planning, assignments, etc., including:
  - Enrollment forecasting systems (to reduce uncertainty in terms of room location, ultimate number in the class, and to better coordinate offerings with other classes that students will need to take)
  - On-line access for room identification and selection
- Combined with better data, faculty are also interested in better communications with the Registrar's office (e.g., communication of their needs to the Registrar, explanation of decisions made regarding requests, feedback on condition and fit-out of teaching space, etc.)

Section 1.2 – Planning for the Future

Planning for future instructional spaces at Stanford should address current shortcomings as well as take into account recent and anticipated changes. This section provides a brief overview of these.

Summary of Current Shortcomings

In theory, the Registrar has an adequate amount of classroom space relative to classes offered, but there are several factors that impede the ability to use the space effectively, as follows:

- A significant mismatch between existing supply and demand and, specifically, an insufficient number of good rooms to accommodate the high demand for seminar rooms and small class teaching environments.
- Physical conditions in some classrooms that make them less desirable than others, especially problems and inconsistencies in room fit-out and, in many cases, an "overfurnishing" of the room relative to available square feet and configuration.
- A concentration of scheduling in "prime time" (10am to 3pm) that puts addition pressures on the room inventory.
- To a lesser degree, Stanford's standard class meeting times, which although honored for the most part, result in less than optimal use of the room inventory because of the structural inefficiencies of a "multi-block" scheduling standard.
- A lack of appropriate technology in some of the instructional spaces.

1 Mismatch between Supply and Demand

- The overwhelming majority of Stanford's classes are small – 86% (about 1,400 out of 1,600) have fewer than 30 students and 32% (552) have 10 or fewer students. A high proportion of these are taught as seminars.
- On the other hand, almost half of Stanford's classrooms accommodate more than 30 students, and a significant number of rooms (20%) are very large (60 seats+) relative to the predominant class size.
- This mismatch is reflected in seat utilization rates, which are low. Average seat utilization across the entire inventory is 48%; in the largest classrooms, the average is as low as 42%; and 50% to 60% range in the smallest rooms. Because of the abundant supply of larger rooms relative to demand, a substantial number of small courses "migrate" to larger rooms.
  - Example: 35% of classes enrolling 10 or fewer students are scheduled in rooms with 21 to 30 seats and 26% are in rooms with 40 seats up to large lecture halls and auditoria (100+ seats).

2 Physical Conditions

- Physical conditions in some of the rooms exacerbate the problem.
- Perhaps the most significant problem is that in many cases, the number of seats in the room is excessive based on modern furnishing standards designed to accommodate moveable tables and chairs, an increased use of technology, better ADA accommodations, etc. In part, this is probably a result of Stanford's practice of including "perimeter seats" in many rooms – i.e., additional seating around the edge of the room. Particularly in rooms intended for seminar classes, faculty view this as problematic, as it is critical in a seminar setting for all students to be seated around the seminar table.
- Other problems are associated with overall poor condition of some rooms – "not befitting an institution like Stanford" – and problems with certain room features (lack of or poor placement of

SmartPanel, screens that cover blackboards when in use, fixed seating in mid-sized rooms that make it difficult for interactive teaching and learning).

- Rooms that lack technology have very limited usefulness given current and anticipated modes of instruction.

3 Concentration of Scheduling in "Prime Time"

- Average room utilization is 43% over the full day and 54% during Prime Time (10am to 3pm), when almost three-quarters of all daytime class meeting hours occur. Although it would appear that a 54% room utilization rate during Prime Time would suggest ample capacity to meet scheduling needs, the demand for small rooms (up to 10 seats) at this time outstrips supply by almost 4:1.
- There is an opportunity to make better use of capacity available outside of Prime Time. There are essentially no 8am classes and not many 9am classes. In the early morning hours – 8am to 10am – only 9% of all daytime class meeting hours occur (17% average room usage). In the late afternoon, between 3pm and 5pm, 22% of daytime hours are currently scheduled (43% average room usage). Contrast this against Prime Time when 70% of daytime class meeting hours are scheduled (54% average room usage).
- Humanities and Sciences is the largest school by far (with 81% of demand) and 16 of its 76 departments are responsible for 65% of H&S demand. Among these 16 are several departments whose scheduling is heavily geared toward Prime Time.

4 Schedule Block

- Stanford's scheduling block is "multi-dimensional" – that is, it publishes several sets of overlapping standard class meeting patterns designed to accommodate a range of pedagogical needs. There is wide conformance to scheduling within these patterns, but because there are so many combinations of scheduling options within a given time of day and day of week, there is a degree of structural inefficiency that is inherent with overlapping blocks.
- Given the size of the inventory relative to demand and the issues described above, which are arguably both more pressing and perhaps more easily addressed, the inefficiencies that may result from the current scheduling block are perhaps best viewed as a second tier issue at this time.

As a result of the 2006 study effort for instructional spaces, Stanford has made changes to address some of the shortcomings. Among the most significant are the following:

Classroom Rightsizing

"Rightsizing" is the process of adjusting room capacity to meet modern square footage allocations, ensuring that there is adequate space for all students in the room. Although rightsizing may involve renovation or reconfiguration, typically, the simplest approach to rightsizing is to alter the number and / or types of furnishings in the room to achieve a target square footage allocation per seat. For example, a 450 square foot room with 30 tablet arm chair seats has a current allocation of 15 sf per seat. A target standard based on modern furnishings (typically moveable tables and chairs) may be 20 sf or more per seat. Rightsizing the room to a 20 sf per seat target would involve refurnishing with tables and chairs and reducing the number of seats from 30 to 22.

Since 2006, the Registrar's Office has rightsized 34 rooms with the result that the distribution of rooms has skewed more heavily toward smaller seating capacities, where there is the greatest demand. A comparison of the room inventory distribution prior to and after rightsizing is shown in the chart below. (The chart also reflects the removal of certain rooms from the classroom inventory, as discussed in the "Repurposing of Building 60" section below.)

Room Size	Academic Year 2006			Post-Rightsizing			Change		
Seats	*No. of Rooms*	*Pct.*		*No. of Rooms*	*Pct.*		*No. of Rooms*	*Pct.*	
Small Rooms									
001 to 10	9	*5%*		7	*4%*		(2)	*-22%*	
011 to 20	35	*19%*	**56%**	48	*28%*	**64%**	13	*37%*	**6%**
021 to 30	59	*32%*		54	*32%*		(5)	*-8%*	
Mid-Sized Rooms									
031 to 40	22	*12%*	**23%**	12	*7%*	**17%**	(10)	*-45%*	**-33%**
041 to 60	21	*11%*		17	*10%*		(4)	*-19%*	
Large Rooms									
061 to 100	20	*11%*	**20%**	16	*9%*	**19%**	(4)	*-20%*	**-14%**
101 to 999	17	*9%*		16	*9%*		(1)	*-6%*	
Total	**183**	***100%***		**170**	***100%***		**(13)**	***-7%***	

Repurposing of Building 60

To respond to need for office and other administrative space, and in light of the 2006 study findings, the Registrar's Office agreed to repurpose classroom space in Building 60. Nine classrooms on the first floor were repurposed from instructional space to administrative space.

Also as part of this effort, two classrooms were rightsized and renamed (61H became Room 120, with 63 seats); and 61G became Rooms 122 and 123, respectively, each with 14 seats).

Projects currently in the planning stages which may have an impact on instructional spaces are described below. They are generally expected to come to fruition in the next five years.

SEQ Projects

Science and Engineering Quads (SEQ1 & 2) will result in a number of projects over the next 5+ years that include repurposing, swapping, eliminating and building new instructional spaces.

Energy and Environmental Building

The Energy and Environment building, the first building to open in the new Science and Engineering Quad, houses one new case style classroom. The building provides a case study-style classroom, which will be used for interdisciplinary instruction by a range of departments housed in the building. As other buildings are developed in the Quad, classroom needs will be assessed on a University-wide basis to ensure that teaching needs are met. The Nanotechnology building, for example, will house a replacement classroom for the one that is being demolished in Ginzton/Applied Physics.

Renovation of Building 524 and Rearrangements on Panama Mall

As the School of Engineering (SOE) develops the SOE Center, which will be located in the SEQ2, a number of classroom changes will be made. The Terman building, which houses many of the School's Registrar classrooms, will be demolished as the SOE Center is built. Classrooms will be replaced mostly in Building 524. The number and mix of these rooms will be planned from a University-wide perspective, to accommodate all of the needs in the region.

Annenberg Auditorium

Annenberg Auditorium, which currently serves as instructional space for arts-related curricula, and current Registrar classrooms in Annenberg are expected to be removed from service around 2011, and the focus of arts-related instructional spaces will shift north to the Arts Quad housed near the old Anatomy building. Replacements for Annenberg and the classrooms are currently envisioned in a new Art Building at the Anatomy site.

Other Auditoria

Kresge Auditorium will be removed from service sometime around 2010, and Bishop Auditorium in the existing Graduate School of Business will be lost when the South Building of the GSB closes. The current plan is to replace both auditorium spaces with one auditorium the size of Kresge in the new Graduate School of Business – sometime around 2010. (Bishop will not be closed until the new auditorium is on-line.)

Old Chem

Current planning is for the “Old Chem” building, located on the west side of the Oval , to be repurposed. It is unclear at this time whether the building could include classroom space.

Professional School Classroom Spaces

The Schools of Law, Business and Medicine are all underway with new campus buildings and plans that include instructional and classroom space. These spaces are managed by each of the schools for their particular uses; as Stanford moves toward more interdisciplinary and cross-school courses and programs, we anticipate that these rooms increasingly will see multiple uses and more shared scheduling.

Part 2 The Instructional Space Master Plan

Section 2.1 – Guiding Principles

Guiding principles are overarching tenets that derive from the philosophical underpinnings, goals and objectives for teaching and learning at Stanford, and are intended to provide guidance for planning, managing and allocating resources for instructional spaces. Guiding principles are advanced below.

Guiding Principle 1

The pedagogical experience at Stanford should be equalized among classrooms as much as possible in all aspects of classroom fit-out, quality and accessibility.

Depending on where a student's classes are concentrated, a student can experience very different types of classroom settings – ranging from modern, state-of-the-art facilities with high quality furnishings and good light, to others reflecting designs and configurations from one or more decades ago. Stanford is committed to equalizing basic conditions in classrooms so that all students can experience high quality learning environments.

Equally important is accessibility. Although it can be difficult to achieve in some buildings, Stanford is committed to making all instructional spaces accessible to all populations.

Guiding Principle 2

There should be an adequate inventory of classroom spaces in each of Stanford's five major Academic Quads – Main Quad, Social Sciences Quad, Arts Quad and SEQ1 and SEQ2 – so that a majority of instruction by academic disciplines residing in a Quad can be delivered within that Quad.

As a corollary, to the extent possible, there should be careful balancing in locating classrooms within a quad. Generally, classrooms should be concentrated to create critical masses within selected buildings in a Quad rather than dispersed in small numbers across several buildings, although it is also important to ensure that departmental offices and administrative spaces are not totally divorced from classrooms.

Finally, when possible, classrooms should be located on the periphery of buildings rather than deeply within them to facilitate access and make it easier to manage security in buildings in which classrooms are located.

Concentrating classrooms in a critical mass of buildings strategically dispersed in Quads across campus comports with Stanford's interest in creating academic communities within the larger Stanford community, promoting increased interactions between students and faculty, and creating environments that facilitate interdisciplinary learning and research activities.

Concentrating classrooms in targeted buildings in each Quad helps to ensure that classroom resources can be distributed in an equitable fashion across the departments in a Quad, and that such resources can be staffed and managed effectively.

Guiding Principle 3

Buildings on the Main Quad are an iconic and emblematic part of Stanford; as such, there should always be a substantial "instructional presence" on Main Quad so that all students at Stanford have an opportunity to experience this part of campus.

At present, about 60% of general purpose classrooms are located on the Main Quad. Ideally, this percentage should never fall below 50 % of instructional space. As is practical, Stanford is also committed to scheduling some large courses each term in Main Quad classrooms to maximize the potential for students to attend classes on the Main Quad.

Guiding Principle 4

All classrooms that are not intended for special instructional uses should be deemed "University classrooms" and should be managed and controlled by the University rather than by individual departments.

Instructional spaces intended for "special use" are distinguished by one or more of the following characteristics:

- Spaces that are designed for a specific or single use that would make it difficult for such rooms to be used for general instruction – e.g., music rehearsal room spaces, art studios, specially equipped dance spaces.
- Spaces fit out with specialized equipment that cannot be secured and protected easily without keeping the room itself under lock and key (e.g., certain types of teaching labs or distance learning facilities)
- A limited number of "proprietary spaces" – generally smaller seminar / conference-style rooms – within departments that provide some flexibility in scheduling departmental activities.

Such special use instructional spaces are the province of individual departments, research centers, etc. *All other instructional spaces* should be considered "University classrooms" managed and controlled by the University.

At present, the University, through the Office of the Registrar, manages an inventory of approximately 170 to 180 "general use" classrooms. To the extent that other classrooms that are "general-use" in nature (i.e., they have none of characteristics defined above that would qualify them as "special use" spaces) are managed or controlled by individual academic departments or offices, the goal is to make them part of the generally pool of University-controlled classrooms. Further, as a matter of policy, any new general-use classrooms that are created on-campus will become part of the University inventory.

"Unified" management of general-use classroom space by the University achieves the following objectives:

- Centrally managed classroom spaces will be equally or equitably accessible to all departments and disciplines.
- There are economies of scale in furnishing and fitting out classroom spaces.
- The physical appearance of these spaces benefits from a unified "Stanford look and feel" through the use of common design, technology and furnishing standards.

Guiding Principle 5

Scheduling of all instructional spaces – whether University classrooms, specialized spaces or the limited number of departmental proprietary spaces – should be guided by the goal of achieving an efficient use of instructional space resources.

Instructional spaces are costly to build, maintain and operate. To ensure that these spaces are used effectively, the following principles should be followed as closely as possible:

- Room assignments in University classrooms are on a "best fit" concept – i.e., although faculty and other preferences are taken into consideration as much as possible, whenever there is significant competition for instructional spaces (e.g., at peak times of day), the best use of the classroom is the primary consideration in scheduling.
- To support a system that allows for proprietary departmental spaces to exist, departments have to be good citizens in scheduling these spaces. When University classrooms are in short supply and a department has a proprietary space that could meet its needs, it will generally be expected to use that classroom so that other needs for general use spaces can be met.
- Efficient scheduling also extends to pedagogical considerations. In developing class schedules, there should be meaningful attempts to distribute courses throughout the day (especially sequences of required courses) to facilitate students' ability to meet their distribution requirements.

Guiding Principle 6

Acknowledging that learning occurs in many venues and in many forms at a university, general-use "University classrooms" should include a range of configurations to accommodate different pedagogical styles, and should be complemented by a range of other instructional spaces in each Quad.

Even within traditional classroom settings, new pedagogies and expanding use of technologies are changing the way instruction and learning occur, with increasing emphasis on smaller classes, flexibility to accommodate small group learning, etc. University classrooms need to be provided in sufficient variety and number to reflect these trends.

Because learning also takes place beyond the classroom, and to showcase the notion that education and learning are paramount activities within the University, classroom spaces should be augmented with a variety of formal and informing learning spaces. Examples to illustrate the range of needs:

- Spaces for congregating outside of classrooms, to make the connections between formal and informal learning more seamless, and to provide opportunities for different types of faculty / student interaction.
- Group study spaces, equipped with conference tables and basic technologies, to allow students to work in collaborative settings outside the classroom.
- Multi-purpose spaces that can be made available for student academic or co-curricular performances, organizational needs, etc., without having to tie up or compete for the limited formal auditoria and performance venues that exist on campus.
- Oral defense rooms and spaces for graduate workshops, which are a critical aspect of graduate learning.

Over time, the Instructional Space Master Plan should be coordinated with the University's housing master planning activities to ensure that plans for residential common spaces include learning-oriented environments as well.

Guiding Principle 7

The ever-changing nature of instructional technologies, combined with the existence of several organizations on-campus that have some involvement with them, requires both a clear understanding of each entity's role, as well as ongoing collaboration to address technologies in the classroom.

The Office of the Registrar provides "basic technology" for instructional spaces.[4] While the office is not staffed or resourced to take the lead on introducing emerging technologies (e.g., digitization of technology) into the classroom, it recognizes the need for effective partnerships and close collaboration with other campus technology groups to develop strategies for implementing emerging technologies, make the case within the University for funding such technologies, and ensure appropriate training and support accompanies introduction of these technologies.

Guiding Principle 8

Information on instructional spaces should be centralized and shared.

Regardless of who oversees or schedules an instructional space, it is in the interest of overall good use and management of instructional space to have a central repository of information on classrooms as well as policies and procedures for sharing this information.

Guiding Principle 9

The Registrar should be viewed as a resource for planning issues and activities related to instructional spaces.

Because of its heavy involvement in scheduling and managing instructional spaces on a day-to-day basis, the Office of the Registrar arguably has the most comprehensive view of classroom issues, needs and practices. The Registrar has responsibility for fitting out rooms, providing basic technology, overseeing routine maintenance and upgrades, accommodating pedagogical requirements, etc.

As such, the Office of the Registrar can provide valuable input into any planning process that involves the creation, renovation or management of instructional space, and should be consulted as early in the planning process as possible.

[4] See *"Technology and Audio-Visual – Baseline Technology"* under *Section 2.2.2.1.B* for detailed explanation of these technologies.

Guiding Principle 10

Priorities for University classrooms are, first, for academic instruction; second, for academic-related events (including Continuing Studies events); and finally, for non-academic events.

Because classroom spaces are often viewed as a "public good", generally available for the asking on campus, it is important to be clear as to what uses are appropriate for these spaces, and which activities have priority. University classrooms exist primarily as venues for academic instruction – i.e., university credit courses, discussion sections, etc. These activities always have first priority with respect to scheduling and use, and no user fees apply – i.e., costs are recovered through Registrar and other budgets allocated for instructional space.

Academic-related events, including Continuing Studies courses and student uses of instructional spaces for activities that support their progress toward a degree, can be scheduled in University classrooms after needs for academic instruction have been met. As with academic instruction activities, basic operating costs are recovered through Registrar and other budgets for instructional space. Extraordinary expenses – e.g., for special technologies – may be recovered through direct user fees.

As time and space remains after first and second priority uses are accommodated, University classrooms may be scheduled for certain non-academic events. Appropriate non-academic events are those that are sponsored by a university-related organization and are compatible with the room and the surrounding environment. As a general rule, this includes meetings, forums, discussions, lectures, etc. Events that are primarily social in nature and / or that potentially disturb other functions in an academic building (e.g., dances, musical parties, etc.) are generally not appropriate for University classrooms.

Guiding Principle 11

Priorities for using instructional space change during the summer to reflect different uses of this space outside of the academic year.

In summertime, the focus changes from academic classes as first priority to an equal emphasis on conference services, summer sessions, lectures, symposia and other summer activities. Basic operating costs for non-revenue generating activities are recovered through Registrar and other budgets for instructional space. For revenue-producing activities, fees for rental of instructional space may be appropriate depending on the nature of the event held, and are determined on a case-by-case basis. Extraordinary expenses – e.g., for special technologies – whether for revenue or non-revenue-generating activities, should be recovered through direct user fees.

Guiding Principle 12

Wherever possible, the University should adopt environmentally sensitive and sustainable approaches in constructing, operating and fitting out its instructional spaces.

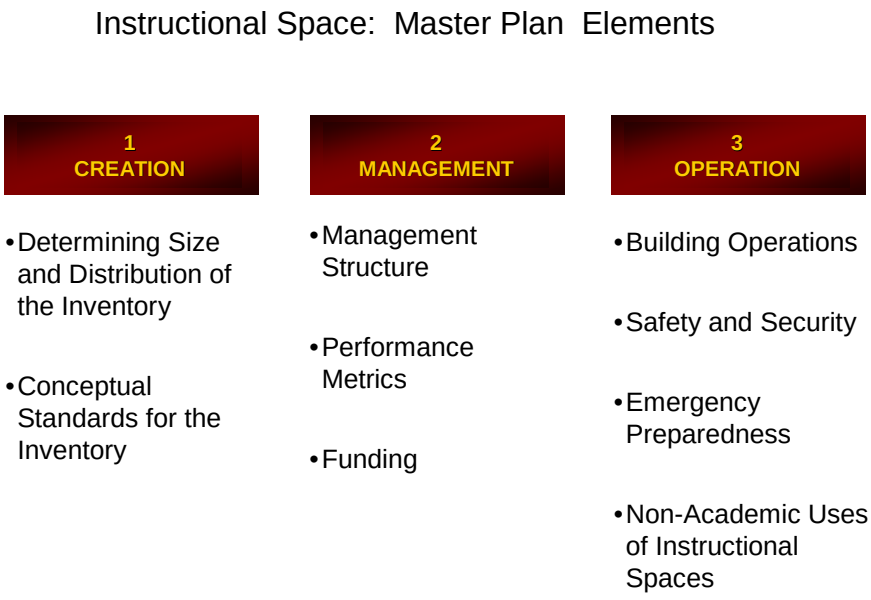
Increasingly, good stewardship of instructional spaces requires not only an effort to ensure their efficient use, but also an awareness of their impact on the environment. Classrooms are heavy users of electricity, technology equipment, supplies and cleaning materials. Planning for renovations and / or new construction should look to best practices in the field, and ongoing management of these spaces should be consistent with the University's overall goals and policies for sustainability.

SECTION 2.2 – PLAN ELEMENTS

INTRODUCTION

There are three major elements of the Master Plan:

- ***Creating** instructional spaces:* the activities and guidelines necessary to size, produce and maintain an inventory of high quality instructional spaces
- ***Managing** instructional spaces:* strategic policies and longer-term planning considerations for instructional spaces
- ***Operating** instructional spaces:* the issues, activities and policies required for day-to-day use of instructional spaces.



Each element is described in detail on the following pages.

Section 2.2.1 – Creating Instructional Spaces

This section addresses the size and distribution of the inventory as well as conceptual standards that govern the design and fit-out of instructional space.

Section 2.2.1.A. Determining Size and Distribution of the Inventory

The size and distribution of the inventory depends on a variety of factors:

- Pedagogical requirements – influence mix and composition of the inventory
- Geographic considerations – influence the number of rooms needed
- Scheduling considerations – influence the number of rooms needed.

Pedagogy

The term "pedagogy" generally refers to the strategies, techniques, approaches or styles of instruction employed by an instructor. The nature of the pedagogy dictates the type of teaching space needed to support it. *Guiding Principle 6* identifies a goal of accommodating the wide range of pedagogies that exist at Stanford. This section describes the pedagogies most prevalent at the time of the creation of the Master Plan.

Course Components

At Stanford, different pedagogies are generally described by "course components" that relate to the nature of the course. At this time, Stanford defines at least 20 different course components. For defining instructional space needs, the following are the most important components.[5]

- *Lecture:* A course of study where instruction occurs in a traditional classroom setting. Lectures almost always have larger class sizes than seminars (described below). Lecture courses may include a variety of pedagogies (discussion, class presentation) but are predominantly lecture-oriented.
- *Seminar:* A more interactive and typically smaller course than a lecture. Content may include student presentations and discussions based on literature, theory, problems or research. Enrollment is generally limited to allow for greater focus on students' critical reflection and exchange of ideas. Lecture is not the dominant pedagogical activity of the course.
- *Discussion:* A regularly scheduled course, or section of a larger course, designed solely for group discussion. Discussions are typically non-credit bearing, linked to a credit bearing course, and not stand-alone courses. Discussion sections generally contain fewer students than the course to which they are linked.
- *Colloquium:* A usually academic meeting at which specialists deliver addresses on a topic or on related topics and then answer questions related to them.
- *Laboratory:* Courses meet in a defined physical setting (i.e., a laboratory) for the purpose of the application of methods and principles of a discipline.

[5] A complete list of course components can be found on-line at http://registrar.stanford.edu/pdf/crse_components.pdf.

- *Workshop:* A usually brief intensive educational program for a relatively small group of people that focuses on techniques and skills in a particular field. This course of study provides a creative forum for a collaborative and interactive learning experience between faculty and all enrolled students.

Drawing from this list of pedagogies, instructional space must accommodate a variety of conditions – e.g., large lecture formats, small seminars, discussion groups, student presentations – with different implications for size, shape and fit-out of a room. Room types that support these different pedagogies are described in Section 2.2.1.B below.

Finals

In addition to course components described above, another significant pedagogical driver of instructional space needs is finals. At present, Stanford requires alternate seating for a final, which effectively doubles the size of each classroom needed during finals periods. With over 3,000 classes and ~300 exams, this can have a profound effect on the need for large spaces, particularly lecture halls and auditorium spaces, during a compressed and inflexible time period.

An alternative policy approach, which would rely fundamentally on the University's Honor Code, would eliminate alternative seating and allow finals to be given in the rooms where a class is scheduled during the term. This would have a dramatic impact on the need for auditorium space during finals periods. The University should explore this option.

Guiding Principle 2 states that there should be an adequate inventory of classrooms in each of Stanford's major quads, and to the extent possible that classrooms should be concentrated in critical masses within buildings rather than dispersed in small numbers among several buildings.

Ensuring Adequate Inventory in Each Quad

Providing classrooms in each Quad area is consistent with Stanford's goals for making each quad a vibrant hub of activities, interactions and cross-disciplinary connections. Classrooms ensure a regular student presence and create opportunities for natural interactions with faculty, both in and outside of the classroom.

The current distribution of classrooms by quad is as follows:

- 67%: Main Quad
- 18%: Social Sciences Quad
- 0%: Arts Quad (proposed)
- 14%: Science and Engineering Quad 1 (SEQ1)
- 2%: Science and Engineering Quad 2 (SEQ2)

It is not expected that all courses for every department in a quad will be taught in classrooms within that quad, as that would not be practical from a room scheduling or utilization standpoint. Larger classes, in particular, should make best use of campus-wide large lecture halls and auditoria. However, it is desirable to ensure that there is adequate classroom space in each quad so that a significant portion of departments' courses can be taught in their quad.

Determining the right number and distribution of classroom spaces within each quad is as much art as science, as there is no specific formula that provides the single, correct number and distribution. One reasonable proxy is to look at "supply vs. demand" as a starting point and then overlay qualitative considerations to arrive at a proposed inventory distribution for each quad.

The chart below shows, by quad, supply (the current number of classrooms in each quad, assuming that the 3 rooms in Cummings Art are replaced in a new building in the Arts Quad) versus three measures of demand, as follows:

- *Departmental courses:* the number of courses offered
- *Weekly meeting hours:* the total number of hours that courses meet in a week, an indicator of volume of activity within classrooms
- *Student contact hours:* the total number of weekly meeting hours times the number of students in a class – which can be thought of as a measure of "density of student activity" in an area.

In comparing supply vs. demand, weekly meeting hours are probably the best measure of demand because this tracks the volume of activity in any given quad. Using this measure, the chart below shows that there is a close match between supply and demand in the Main Quad, and slight imbalances in the Social Sciences Quad (somewhat more supply than demand) and in SEQ1 (somewhat less supply than demand). Proposed projects in the SEQ areas will provide opportunities to increase the classroom inventory in those quads and address some of the imbalance.

Quad	SUPPLY Classrooms		DEMAND Departmental Courses		Weekly Meeting Hours		Student Contact Hours	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
1 Main Quad	118	66%	984	61%	2,373	67%	40,873	49%
2 Social Sciences Quad	35	19%	226	14%	442	12%	14,101	17%
3 Arts Quad	3	2%	14	1%	37	1%	1,641	2%
4 SEQ1	21	12%	378	24%	715	20%	26,500	32%
5 SEQ2	3	2%		0%		0%		0%
Total	180	100%	1,602	100%	3,567	100%	83,115	100%

Student contact hours, although not as direct a measure of demand, are useful to keep in mind in light of Stanford's interests in ensuring that each area of campus has a certain vitality to it through the presence of faculty, staff and students. There is a different "density of student activity" than the weekly contact hours measure would suggest – i.e., many more students per class held in the SEQ area and fewer students per class on the Main Quad. The underlying explanation is that departments in the SEQ area tend to have, on balance, larger classes, hence the greater relative volume of student activity. From a planning standpoint, this means that both the Main Quad and the SEQ areas need to provide adequately not just for classrooms but other spaces that support instructional and learning activities (e.g., group study spaces, computing facilities, informal student work areas) for the high volume of students that frequent these quads.

Creating Critical Masses

Stanford has a large number of buildings that have very few classrooms. As the chart below shows, 20% of the classroom inventory is in buildings where there are two or fewer classrooms.

No of Classrooms in Building	No of Bldgs	Classrooms		
		Total No.	*Pct. Of Inventory*	
1	20	20	11%	20%
2	8	16	9%	
3	9	27	15%	
4	2	8	4%	
5	4	20	11%	
8	2	16	9%	
11	1	11	6%	
12	1	12	7%	
13	1	13	7%	
17	1	17	9%	
20	1	20	11%	
	50	**180**	**100%**	

Over the long-term, a goal is to minimize the number of buildings that hold only a few classrooms. Doing so is expected to yield several benefits:

- *Building security:* Buildings with classrooms have to remain unlocked and accessible in the evening, at a minimum to accommodate evening classes. The more buildings that remain open in the evening, the greater responsibility is placed on campus security forces to monitor buildings, secure them late in the evening, etc.
- *Classroom management efficiency:* Many of the activities that must be addressed in classrooms on a regular basis (e.g., cleaning, technology support and fit-out) can benefit from the "economies of scale" of having a critical mass of classrooms within a building. Conversely, it generally takes more staff when classrooms are spread out over buildings. Simply stated, it's more efficient to support technology, for example, in 9 rooms in one building than it is to support 1 room in each of 9 buildings.
- *Use compatibility:* Few classrooms in a building means that there is a high concentration of other functions (e.g., faculty offices, departmental administrative space); noise and traffic generated by students in normal comings and goings from classrooms can be disruptive to these other activities.

One caveat to the notion of reducing the number of buildings with only a few classrooms is that there is a benefit to having students coming in and out of all buildings. The presence of students serves as a reminder that teaching is one of the critical functions of the university. Thus, the best approach may to be strike a balance – with the preponderance of classrooms concentrated in key buildings in each quad, but where practical, given the benefits and concerns enumerated above, maintaining a limited classroom presence in other buildings within a quad.

Considerations for Achieving Critical Masses

In the short-term, buildings having two or fewer classrooms should be reviewed to evaluate the practicality of eliminating the classroom function. The chart below shows the name and seat capacity of each of the classrooms in buildings with two or fewer classrooms. Small classrooms (i.e., seating under 30), most of which are on the Main Quad, are highlighted.

Buildings with:

2 Classrooms

Building	*Seats*	*Room*
110	20	110-111A
	20	110-111P
300	100	300-300
	28	300-303
540	25	540-103
	49	540-108
MCCULLOUGH	40	McCullough 122
	30	McCullough 126
MITCH	20	Mitchell Earth Sciences 372
	72	Mitchell Earth Sciences B67
MUDD	112	Braun Lecture Hall (Mudd Chemistry)
ORG CHEM	24	Organic Chemistry 100
	24	Organic Chemistry 103

1 Classroom

Building	*Seats*	*Room*
40	18	40-42A
70	20	70-72A1
80	21	80-113
90	31	90-92Q
100	40	100-101K
360	20	360-361A
370	137	370-370
530	78	530-127
APPLIED PHYSICS	97	Applied Physics 200
CERAS	95	Ceras 300
GILBERT	20	Gilbert 117
REDWOOD	60	Redwood G19
SEQUOIA	45	Sequoia Hall 200
THORNTON	56	Thornton 110

Rooms with 30 or fewer seats

Factors to consider in this evaluation include:

- *Classroom sizes* – in general, the focus of consolidation should be on smaller general purpose classrooms (e.g., 30 seats and under), which are generally the most easily repurposed. (Larger lecture halls and auditoria, generally campus-wide resources, are usually more unforgiving in their configurations.)
- *Degree of utilization* – classrooms with low utilization rates can usually be removed from service without making scheduling appreciably more difficult.
- *Physical condition of classrooms* – money that might be considered for renovation of the lone worn classroom in a building can generally be better applied to a larger-scale renovation of a building with multiple classrooms.

Over the longer-term, as new or replacement classroom space is deemed necessary, the University should consider creation of dedicated classroom buildings in one or more of the five quads, for all of the reasons stated above. In particular, as space needs for Humanities and Sciences on the Main Quad become clearer, and for other faculties in other quads on campuses, it may serve many campus interests well for instructional spaces to be decanted from buildings which are primarily used for departmental office and administrative functions and centralized in one or more classroom buildings.

Scheduling Considerations

Two scheduling-related factors affect the need for classroom space:

- Length of scheduling day and degree of room use by time of day
- Complexity of the scheduling grid.

Length of the Scheduling Day and Degree of Room Use by Time of Day

Daytime scheduling at Stanford generally runs from 8:00am to 5:05pm, with some late afternoon classes also running as late as 7:05pm. The 2006 Study ("Main Campus Instructional Space Assessment") revealed that the bulk of daytime scheduling occurs during "prime time" from 10am to 3pm, where about 70% of course hours are scheduled.

Demand for "prime time" scheduling is strong and efforts to shift more scheduling into "off peak" times is admittedly difficult given the culture of the institution. With an overall daytime room utilization rate of 43% and a prime time utilization rate of 54%, it can be challenging to accommodate prime time demand, particularly in smaller rooms where demand well exceeds supply. For this reason, it is recommended that the nature of prime time scheduling be reviewed on a regular basis with a goal, over time, to promote schedule shifting into off-peak hours wherever practical (e.g., discussion sections) and / or consider scheduling "incentives" to increase the attractiveness of selecting off-peak hours (e.g., better room locations, preferential treatment in selecting prime time spaces for those who teach in off-peak times as well).

Complexity of the Scheduling Grid

The most straightforward schedule blocks include one set of discrete, non-overlapping times during a week. This minimizes class meeting conflicts and maximizes the ability to schedule classrooms efficiently. In practice, some schools with standard schedule blocks find it necessary to make exceptions to standard times to accommodate different pedagogies (e.g., classes that meet every day, a preference to meet on consecutive days, etc.) or for other reasons.

Stanford's "schedule block" appears to have been constructed with a high degree of accommodation to different meeting patterns. The grid of "standardized class meeting patterns" is complex and multi-dimensional, comprised of several block patterns, many that are overlapping. It results in a number of "standard" class lengths and day-of-week patterns in various combinations and permutations represented by A, B, C and D schedule blocks, e.g.:

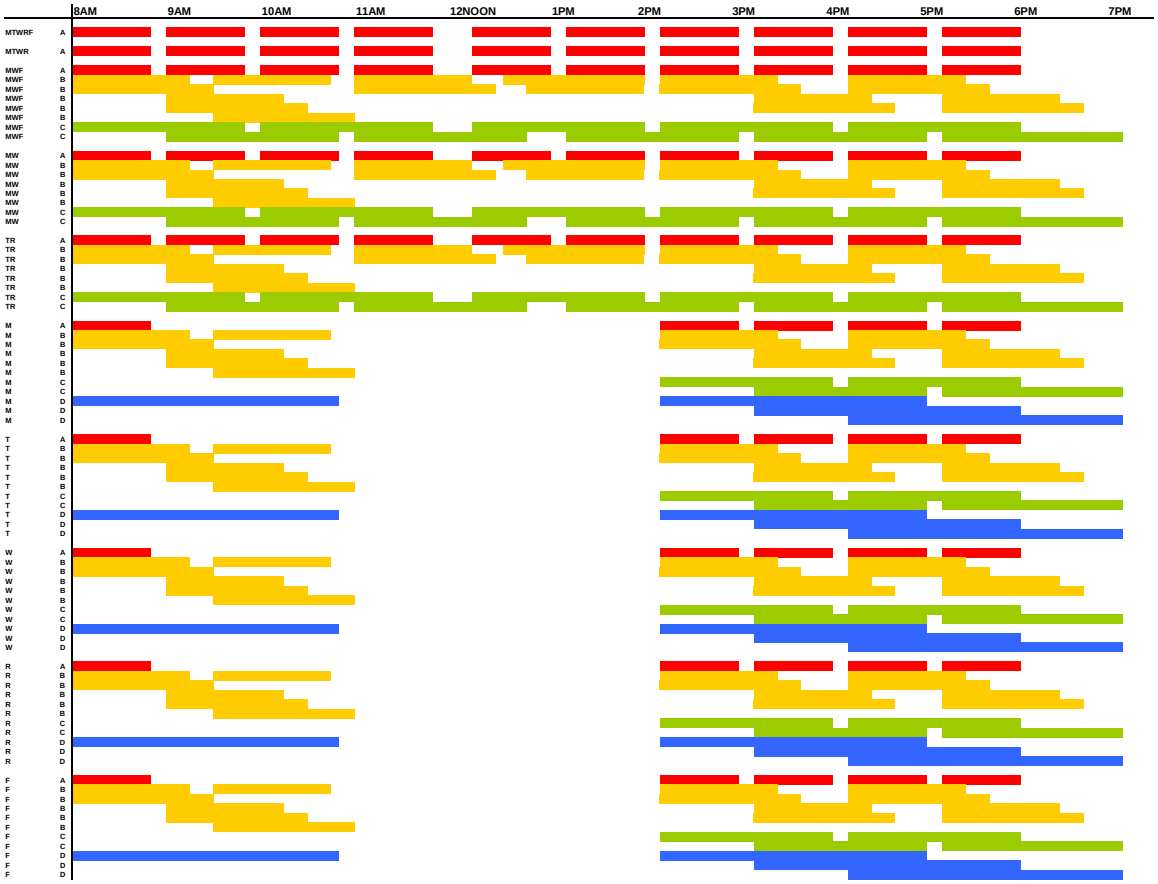
- Class lengths: 50, 75, 90, 110 and 170 minutes
- Day-of-week patterns: MTWRF, MTWR, MWF, MW, TR, single days.

The charts below illustrate Stanford's many scheduling permutations, in table format and graphically.

Stanford University Allowable Class Time and Day Patterns

Pattern		MTWRF	MTWR	MWF	MW	TR	M	T	W	R	F
A	8:00am to 8:50am	■	■	■	■	■	■	■	■	■	■
A	9:00am to 9:50am	■	■	■	■	■					
A	10:00am to 10:50am	■	■	■	■	■					
A	11:00am to 11:50am	■	■	■	■	■					
A	12:15pm to 1:05pm	■	■	■	■	■					
A	1:15pm to 2:05pm	■	■	■	■	■					
A	2:15pm to 3:05pm	■	■	■	■	■	■	■	■	■	■
A	3:15pm to 4:05pm	■	■	■	■	■	■	■	■	■	■
A	4:15pm to 5:05pm	■	■	■	■	■	■	■	■	■	■
A	5:15pm to 6:05pm	■	■	■	■	■	■	■	■	■	■
B	8:00am to 9:15am			■	■	■	■	■	■	■	■
B	8:00am to 9:30am			■	■	■	■	■	■	■	■
B	9:00am to 10:15am			■	■	■	■	■	■	■	■
B	9:00am to 10:30am			■	■	■	■	■	■	■	■
B	9:30am to 10:45am			■	■	■	■	■	■	■	■
B	9:30am to 11:00am			■	■	■	■	■	■	■	■
B	11:00am to 12:15pm			■	■	■					
B	11:00am to 12:30pm			■	■	■					
B	12:35pm to 2:05pm			■	■	■					
B	12:50pm to 2:05pm			■	■	■					
B	2:15pm to 3:30pm			■	■	■	■	■	■	■	■
B	2:15pm to 3:45pm			■	■	■	■	■	■	■	■
B	3:15pm to 4:30pm			■	■	■	■	■	■	■	■
B	3:15pm to 4:45pm			■	■	■	■	■	■	■	■
B	4:15pm to 5:30pm			■	■	■	■	■	■	■	■
B	4:15pm to 5:45pm			■	■	■	■	■	■	■	■
B	5:15pm to 6:30pm			■	■	■	■	■	■	■	■
B	5:15pm to 6:45pm			■	■	■	■	■	■	■	■
C	8:00am to 9:50am			■	■	■	■	■	■	■	■
C	9:00am to 10:50am			■	■	■					
C	10:00am to 11:50am			■	■	■					
C	11:00am to 12:50pm			■	■	■					
C	12:15pm to 2:05pm			■	■	■					
C	1:15pm to 3:05pm			■	■	■					
C	2:15pm to 4:05pm			■	■	■	■	■	■	■	■
C	3:15pm to 5:05pm			■	■	■	■	■	■	■	■
C	4:15pm to 6:05pm			■	■	■	■	■	■	■	■
C	5:15pm to 7:05pm			■	■	■	■	■	■	■	■
D	8:00am to 10:50am						■	■	■	■	■
D	2:15pm to 5:05pm						■	■	■	■	■
D	3:15pm to 6:05pm						■	■	■	■	■
D	4:15pm to 7:05pm						■	■	■	■	■

Graphic of Scheduling Grid by Meeting Pattern and Time of Day



The wide range of meeting patterns provides great flexibility for accommodating pedagogical needs and scheduling preferences. Although there is some loss of efficiency in scheduling the inventory because of the many overlapping patterns, there is at least a high degree of conformance to these "standard" meeting patterns – fewer than 1% of class meeting hours are in non-standard patterns. Should Stanford need to gain more efficiency in scheduling in the future, a review and simplification of its schedule blocks would most likely yield some efficiencies. For the time being, however, reformation of the scheduling block is not a priority in this Master Plan.

The quality and fit-out of an instructional space have a direct affect on the desirability and suitability of that space for teaching and learning. High quality spaces, particularly those that are well-equipped with technology, are sought after; spaces that have deferred maintenance, poor physical conditions, inadequate lighting, etc., often can sit empty, even when there is high demand for a space in a peak teaching period.

Guiding Principle 1 states that "the pedagogical experience should be equalized among classrooms as much as possible in all elements of classroom fit-out, quality and accessibility." The standards and guidelines in this section provide the road map for fulfilling this guiding principle.

Standards and guidelines for some of these elements are addressed at the room level (e.g., configuration of a particular room, square footage associated with a particular room type), while others are addressed at a building level (e.g., lighting standards should generally be the same across all instructional spaces within a building). The chart below illustrates these elements.

Elements that Affect Quality and Usability of Classrooms

	Building Level	Room Level
Room type and configuration		■
Square footage allocation		■
Type and quality of furnishings	■	■
Finishes	■	
Writing and presentation surfaces	■	
Technology & audio-visual		■
Lighting	■	
Accessibility	■	■

Room Type and Configuration

Stanford's instructional spaces that are suitable for "general use" are categorized into five major room types:

- Seminar rooms
- General purpose classrooms
- Lecture halls
- Case study rooms
- Auditoria

Basic characteristics and defining elements of each are below.

Seminar Room

The nature and configuration of the seminar room and furnishings are critical to the Socratic teaching that occurs in seminars, as they affect discussion and dialogue; the level of interaction and engagement among participants; comfort level and trust with others in the room; etc. Since student grades depend on participation, having seminar rooms that are appropriately configured is important.

It is also important to recognize that although the priority for seminar spaces – as is the case for all instructional spaces – is teaching first, seminar rooms are typically among the most flexible small spaces on campus and as such are sometimes used for other activities, such as outside speakers, graduate seminars and meetings of research groups, conference meetings, administrative meetings, etc.

Description: The primary purpose of seminar rooms is to promote discussions among a small group of people, usually not more than 20 to 25 individuals. These rooms can also be used for small section lectures and recitation sections.

Room Proportions, Configuration and Furnishings

- Square or rectangular (length / width ratio between 1:1 and 2:1)
- "A seat at the table" – a prime concern expressed in faculty focus groups. All students should be able to be seated at the table – i.e., no perimeter seating.
- Minimum height for the front of the room is 11 feet.
- Rooms need to be configured for the possibility of presentations, including the use of laptop projection.
- Furnishing: Two types of furnishings are appropriate for seminar rooms:
  - Moveable chairs around a conference table or a series of moveable tables that can be configured as a conference table. The latter permits tables and chairs to be rearranged for smaller working groups and discussions.
  - Tablet-arm chairs that can be arranged in a small circle, generally preferred for language instruction, where maximum flexibility in furnishing arrangement is desired..

General Purpose Classroom (up to ~100 seats)

Description: The general purpose classroom is the "workhorse" of the instructional space inventory. It is suitable for traditional lectures, A / V presentations and demonstrations. Ideally, it has a flat floor, although larger rooms may be tiered. These rooms generally accommodate between 25 and 100 students.

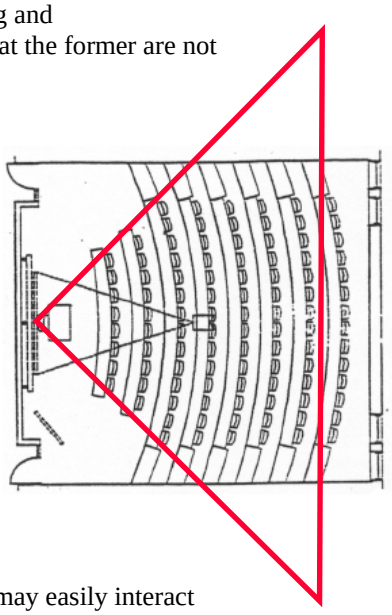
Room Proportions, Configuration and Furnishings

- Square proportions promote good sightlines and result in a reasonable distance from the instructor podium to the back row.
- For smaller rooms (e.g., under 50 to 60), a level floor with moveable tables is preferred.
- For larger rooms (greater than 60), a tiered floor with rows of fixed tables and moveable chairs provides the best sightlines to the instructor for the students, although a level floor with moveable tables provides more flexibility in layout at a slight compromise to sightlines.
- The minimum height for the front of this room is 12 feet. The height may need to be increased to 13 feet if a tiered floor is used.

- Furnishings:
  - Flat (level) floor: moveable tables with chairs.
  - Tiered room: fixed continuous tables and moveable chairs.

Lecture Halls (Large, 100+)

Description: A tiered teaching space with a capacity of 100 students to approximately 250 students that is most suitable for traditional lectures, multi-media presentations, basic distance learning and demonstrations. Lecture halls are distinguished from auditoria (described below) in that the former are not designed for or equipped to accommodate performances.



Room Proportions, Configuration and Furnishings

- Square proportions promote good sightlines and result in a reasonable distance from the instructor podium to the back row. Ideally, all seats should fall within a 90-degree cone of optimal vision. (The figure at right illustrates, in concept, such a lecture hall.)
- Typically, a sloped floor or tiered floor is required to achieve good sightlines for all seats. Slope should be designed to achieve optimal viewing angles to the board surface and screens.
- Minimum height for the front of this room is 16 to 18 feet. The height may need to be greater to accommodate for the steeper slope in the floor.
- Seating falls within 90-degree cone of optimal vision for best site lines.
- Furnishings
  - Fixed tables and moveable chairs for student seating.
  - If seating must be fixed, chairs should be designed to swivel so that students may easily interact with each other as well as with the instructor in the front of the room.

Case Study Room

Description: A tiered teaching space, usually accommodating between 40 and 80 students, that allows for a high level of interaction between instructors and students, and face-to-face, cross-room discussion among students. Although this configuration can be used for traditional lecture formats, and should be fully equipped with media, it is primarily designed for pedagogies that involve discussion among all parties – the instructor, students, guest lecturers, etc.

Room Proportions, Configuration and Furnishings

- Seating configuration determines the shape and size of the classroom. The basic configuration is a "U-shape" that results in a well in the middle of the room which permits the instructor to get closer to students. The precise configuration of the seating depends on the depth of the well (i.e., the depth of the "U"), and the angles and relative sizes of the "walls" of the U (i.e., left and right sides) vis-à-vis its base.
- Case study rooms have tiered floors, usually with no more than 3 to 4 tiers.
- Aisles are important both for ingress / egress, and to allow the instructor to move easily around the room. Predominant options are one aisle in the middle of the U or two aisles, one at each of the bottom corners of the U.
- Minimum height for the front of this room is 16 to 18 feet. The height may need to be greater to accommodate for the steeper slope in the floor.
- Seating falls within 90-degree cone of optimal vision for best site lines.
- Furnishings
  - Fixed tables and moveable chairs for student seating.
  - If seating must be fixed, chairs should be designed to swivel so that students may easily interact with each other as well as with the instructor in the front of the room.

Auditorium

Description: A tiered teaching space suitable for performances and speeches as well as traditional lectures, multi-media presentations, distance learning and demonstrations. Capacity typically exceeds 250 seats. A distinguishing feature from large lecture halls is that auditorium spaces have raised stages to accommodate performances. Depending on the primary intended uses, the auditorium may also have full or partial "back-of-the-house" space (e.g., wings and backstage areas) to accommodate sets, equipment, etc., and to provide access to and from the stage.

Room Proportions, Configuration and Furnishings

- Configuration of seating and stage areas are on a case-by-case basis, drawn from the programmatic needs associated with the intended use.
- Furnishings
  - Typically fixed theatre-style seating, with drop down tablets.

Square Footage Allocations

As planning parameters for renovations and new construction, the following minimum square footage allocations are recommended:

20 sf: Seminar rooms
20 sf: Mid-size general purpose classrooms up to 50 seats
18 sf: Mid-size general purpose classrooms, 51 to 100 seats
16 sf: Lecture halls, 100+ seats
16 sf: Auditoria
25 sf: Case study rooms

New Construction

In constructing new instructional spaces, these standards should be used as a starting point for planning, although specific building conditions may dictate a variance from these standards on a case-by-case basis. Generally, however, the above standards are intended as minimum requirements for most new classrooms.

Existing Spaces and "Rightsizing"

For existing instructional spaces, Stanford should from time to time compute the square footage allocation per seat. When there are significant variations from the standard, the University should evaluate whether a room should be "rightsized" by adjusting the number of seats in the room to bring it into closer compliance with the published standard.

Furnishings

As a general principle, flexible furnishings are preferred, even "essential", over fixed furnishings according to faculty in focus groups. Moveable tables and chairs are generally preferred, as they can be configured to accommodate any pedagogy. However, some faculty prefer tablet arm chairs so that they can easily be moved into a discussion circle (particularly in language departments). A categorization of furnishings based on a review of on-line photographs of each room as part of the Winter 2005 study suggests that about 70% of rooms have some type of moveable furniture.

Notwithstanding the preference for moveable furnishings, there are some instances in which fixed furnishings are also appropriate. The chart below lists the most usual pairings of seating and desk surfaces (moveable and fixed) that are appropriate for University general use classrooms.

Furnishing Matrix

	DESK SURFACES			
	Conference / Seminar Table	**Moveable Tables**	**Fixed Tables**	**Not Applicable**
SEATING				
Moveable Chairs	■	■	■	
Moveable Tablet Arm Chairs				■
Fixed Drop Arm Chairs				■
Fixed Chairs			■	

Important features and concepts for each type are described below. Specific furnishing standards, which may change from time to time, can be found on the Stanford website at http://www.xxxxxxxxxxxxx.

Desk Surfaces

Conference / Seminar Table

- Ideally, seminar rooms should be fit out with conference tables in an elliptical, oval or circular shape, so that all around the table can see each other easily.
- Where greater flexibility is desired, individual moveable tables (described below) can be grouped together in various "conference-style" configurations – e.g., open or closed squares, rectangles, etc. – although it should be noted that a square or rectangular shapes are less preferred than oval or circular shapes.
- Among seminar rooms, there should be a mix of conference tables sized to hold 15 or 25 students.

Moveable Tables

- Moveable student tables should provide a minimum width of 26 inches per student without interfering with table legs or supports, and a minimum depth of 20 inches.
- Each table should usually accommodate two or three people when used with seating on one side only.

Fixed Tables

- Linear continuous fixed student tables should have a minimum width of 26 inches per student without interfering with table legs or supports, and a minimum depth of 18 inches.
- Depending upon specific requirements, linear fixed continuous tables may have power capability specified at student stations.
- Attached or swivel-mount seating in conjunction with fixed tables is generally less preferred than moveable seating.

Combined Desk Surfaces and Seating

Moveable Tablet Arm Chairs

- Tablet-arm chair tablet arms ideally should have a minimum writing surface area of 144 square inches (e.g., 12 inches square, 11x14, 10x15, etc.)
- Ten percent of tablet-arm chairs in a classroom should be left-handed.

Fixed Drop Arm Chairs

- Fixed seating tablet arms ideally should have a minimum writing surface area of 130 square inches (e.g., 10x13).
- Ten percent of tablet arms should be configured left-handed. The arms should be arranged along the left side of the aisle as viewed from the presentation area.
- One percent or at least one of the aisle seating should be configured with a moveable armrest on the aisle side for accessibility.

Instructor Seating Area

- There should be a chair of appropriate height available at the teaching / control instructor station for the instructor.
- The instructor's seating should be coordinated with the other room furniture regarding finish detail.
- A table in the presentation area should be provided for the instructor. The table should be compatible with the finish of the student table / tablet arm writing surface in the classroom. The dimensions of the instructor's table should be proportional to the available space in the front of the room, but no smaller than 30 inches by 48 inches.

Finishes

Walls

- A chair rail should be installed on side and rear walls whenever moveable furniture may contact a wall surface.
- Wall surfaces should be washable.
- The lower wall surface should have extremely durable finishes (e.g., epoxy finish, abuse-resistant panels, etc.)
- Teaching wall material around boards should be non-reflective, durable, washable, and resistant to stains from dry erase marker residue.
- Internal classroom walls should run deck-to-deck to minimize sound transmissions between adjacent rooms.
- The front wall of the classroom ideally should have no protrusions into the room, so that presentation surfaces may span the entire wall.

Writing and Presentation Surfaces

Blackboards and White Boards

Blackboards and white boards are the primary "low-tech" writing surfaces in use today. While there is no single preference among Stanford faculty, the predominant preference appears to be for white boards. In rooms with technology, chalk dust can create problems, so these rooms are generally fitted with white boards. Exceptions to the white board preference are for disciplines which make heavy use of writing surfaces for complex proofs, analyses, etc. (e.g., Math, Engineering).

As a general rule, the more writing surfaces in a classroom, the better. In addition to boards at the front of the room, where space and budget permit, additional boards should be included on other walls in the classroom.

- Boards should be installed across as much of the front (instructor's) wall as possible.
- Additional boards may be required on secondary classroom surfaces.
- Boards should:
  - be mounted 36 inches above the finished floor.
  - be a minimum of 4 feet high.
  - have trays that run the full length of the boards.
- Board seams should be flush.
- There should be useable space on the board while the primary projection system is in use.
- Boards should be securely fastened / mounted on a wall (not freestanding).
- Large classrooms should be designed for multi-sectional (side-by-side) boards, with multiple horizontal or vertical panels in each section to provide more space for writing.
- Where possible, a tack strip should be placed above the board, running the full length of the board.
- For white boards, a cleaning supply dispenser system should be mounted near one end of each board.

Screens

- Screen sizes 10 feet and larger should be electrically operated.
- Screen controls should be located at switch height near the instructor podia and / or SmartPanels.
- Screens should be located so that there is a reasonable amount of writing surface still accessible when the screen is in use.
- For remodeling work, the finished ceiling height should be as high as possible to accommodate screen requirements.
- In classrooms with high ceilings, it may be possible to use the wall above the presentation writing surface for the screen surface, eliminating the necessity of raising and lowering the screen, a complex control system and the cost of an electric projection screen.
- As a general rule:
  - the distance from the screen to the first row should be no less than ½ the width of the screen. This guideline helps to avoid excessively high and uncomfortable viewing angles.
  - the maximum distance from the farthest screen edge to the most distant viewer should be no more than 8 times the height of the screen (6 times is preferred).
- Whenever possible, mechanical systems (ducts and piping) should be installed along sidewalls, so that the front central area of classrooms is clear for screen placements.

Technology and Audio-Visual

Baseline Technology

The basic technology for instructional spaces at Stanford is the SmartPanel, an all-in-one classroom unit or "docking station" that controls power, volume and media sources. SmartPanels are compact black rectangular wall panels typically installed next to the front blackboard, and have jacks compatible with Macintosh and PC computers, VCRs, laser disc players, audiocassette decks, microphones, Ethernet connectivity, and campus TV, all of which are controlled by illuminated buttons.

The 2007 generation of SmartPanels provide the following:

- Power: controls power for the SmartPanel itself, projector and sound system
- Volume: allows volume control from SmartPanel
- Ethernet (TSO): internet connectivity through and Ethernet cable (user supplied)
- Control of four types of media sources:
  - *External computer with VGA output:* allows projection of an image from a personal computer
  - *External computer with Macintosh video output:* allows projection of an image from a Macintosh computer
  - *Mounted VHS VCR:* allows projection of standard VHS VCR or S-VHS video cassette tapes
  - *Auxiliary video input:* accepts additional video and audio input.

Although not every room needs a SmartPanel, the Registrar's Office's goal is for 80% of rooms to be equipped with SmartPanels, distributed adequately across all of the Quads.

Enhanced Technologies

Technology-enhanced rooms are designed to facilitate multimedia presentations. In addition to SmartPanels, these rooms may also include one or more of the following: [6]

- Data/video projector (with resolution up to 1024 x 768)
- Enhanced lighting and window treatments
- Playback audio system
- Overhead projector
- Installed standard VCR or specialized VCR / DVD players
- Personal response systems

The Registrar's Office assumes responsibility for scheduling these rooms, but it is not staffed or funded to manage or maintain the enhanced technologies within the rooms. Responsibility for enhanced technologies falls to the Office of Classroom Technology Support.

A full discussion of the organizational infrastructure around technology support is in *Section 2.2.2.A "Management Structure for Instructional Spaces."*

Public Address Systems

For larger rooms (e.g., greater than 50 people), it may be necessary to install public address speakers. They should be placed so as to prevent audio feedback (either a low rumble or high end squeal). Acoustical treatments on the side and rear walls may be necessary to make the sound clean and audible to all students.

Lighting

Lighting Zones

- General use classrooms should have two lighting zones
  - Zone 1: The presentation (instructor's) area of the room.
  - Zone 2: The student area of the room. (There may be additional student area zones in large classrooms.)
- Auditorium / large classrooms should have four control lighting zones and variable illumination levels
  - Zone 1: The presentation (instructor's) area of the room.
  - Zone 2: The student area of the room. (A large room / auditorium may require multiple student area zones and may require different illumination levels.)

[6] A current list of rooms including their technology enhancements can be found on the web at http://registrar.stanford.edu/faculty/classrooms/enhanced_classrooms.htm?id=1.

- Zone 3: Instructor spotlights for seeing the instructor while showing slides.
- Zone 4: Signer illumination (sufficient lighting from presentation writing surface light for a sign language interpreter, from front lighting zone or from a separate spotlight).

Lighting for Presentation Writing Surface (Black / White Board)

- Lighting should be distributed uniformly across the entire writing surface.
- Installation and selection of board lighting should ensure that the lamps in the fixtures will not be directly visible from the student seating area. In addition, if the projection screen lowers below the presentation surface lighting fixtures, that section of the lighting system directly behind the projection screen(s) should be separately controlled.
- Presentation lighting fixtures should not directly be in contact with or interfere with the movement of the projection screen(s).

Lighting Control Locations

- Basic classroom lighting controls should be placed at all entrances in new construction.
- Emergency lighting must be provided as required by code.
- Controls for presentation writing surface lighting must be placed on both sides of the front wall.
- For new construction, lighting controls for the presentation writing surface should be configured to allow the projection screen and accessible writing surface to be used simultaneously. That is, the lights over the writing surface should be controlled in separate sections to provide illumination of a portion of the presentation writing surface while a projection screen is in use.

Accessibility

ADA Considerations

Stanford has thus far been able to accommodate ADA needs by moving courses to suitable classrooms. Consistent with *Guiding Principle 1*, however, which states that pedagogical experiences should be equalized among classrooms as much as possible in all aspects, including accessibility, the University needs an intentional plan for addressing ADA requirements.

The Master Plan recommends that such a study be conducted within the next three years, and that results and recommendations from the study be incorporated into the Master Plan. Among the issues to be considered in the study are:

- Improving signage for ADA accessibility
- Guidelines for accessibility to tiered classrooms
- Adequate distribution of ADA accessible spaces among the major quadrants of campus
- Phasing and funding considerations and requirements for implementing changes to achieve ADA compliance.

General Access Considerations

Where instructional spaces co-exist with other functions in a building, whenever possible there should be separate entrances / exits and access to these rooms and nearby restrooms so that they may be used after hours without disrupting or comprising security in other parts of the building.

Section 2.2.2 – Managing Instructional Spaces

This section addresses the strategic policies and longer-term planning considerations for instructional spaces.

Section 2.2.2.A: Management Structure for Instructional Spaces

Management of instructional spaces often creates a challenge on campus because there are many constituencies that "touch" classrooms, frequently without clear lines of authority or responsibility for managing these spaces. Among the different functions that come into play in instructional spaces are:

- Physical condition
- Pedagogical requirements
- Scheduling
- Technology specifications
- Planning

Some activities are operational in nature – i.e., the day-to-day activities required to keep instructional spaces functioning properly. Others are strategic in nature – i.e., assessing adequacy of the space, planning for the long-term, etc. The management structure below is proposed to address these various functions and activities.

Operations Management: The Office of the Registrar

Day-to-day activities associated with University (general use) instructional spaces are be managed by the Registrar's Office on behalf of the University. Such activities include:

- scheduling
- coordination of activities related to the physical condition of instructional spaces:
  - daily and ongoing maintenance
  - annual repair and replacement of furnishings, fixtures and equipment
- coordination of technology installed in classrooms.

The Office of the Registrar will directly or through close coordination with other Stanford offices (e.g., particularly Facilities Operations) ensure that instructional spaces are well-maintained and ready for use.

Strategic Management: The Instructional Space Committee

Functions of the Committee

We propose that Stanford convene an Instructional Space Committee to handle activities associated with University (general use) instructional spaces that are longer-term and more strategic in nature, e.g.:

- evaluate the adequacy of instructional spaces (e.g., configuration, furnishings, technology, etc.) to support current and anticipated pedagogies at Stanford.
- Provide ongoing review of scheduling grids and protocols
- communicate schedule planning requirements across the many entities involved in scheduling across campus (e.g., academic courses, finals, conferences and other summer activities) to ensure that planning happens as early as possible.
- represent / advocate for an instructional space perspective in all Stanford planning initiatives involving renovation or new construction of instructional space (e.g., with the Office of Land and Buildings, individual Schools, capital planning meetings with deans).
- Provide periodic review of performance metrics (see Section 2.2.2.B. "Performance Metrics" below)
- review of "best practices" nationally and from other institutions, as information is available
- review of instructional space needs that require capital funding; determination of budget needs and resource allocation priorities for major capital expenditures related to instructional spaces
- Facilitate ongoing communication about instructional space issues to the campus at-large, particularly to faculty and other frequent users of instructional spaces
- oversee the implementation of the Instructional Space Master Plan, ensure that changes to instructional spaces are in accordance with the Plan, and update the Plan as necessary.
- formulate policies for and approve changes to instructional space use.
- develop an "Annual State of Instructional Spaces" report to highlight progress that has been made during the year in upgrading instructional spaces, meeting performance metrics, etc.

The Committee should have a holistic view of instructional spaces and their issues, and to be effective, it ultimately must be vested with *both* responsibility and authority for these spaces.

Composition of the Committee

At present, efforts around planning, management and operation of classrooms have generally been led by the Office of the Registrar in conjunction with the Office of Capital Planning. During the Master Planning process, involvement was widened to include administrative representatives from all of the Schools, as well as other stakeholders with interests in classrooms (e.g., various campus technology organizations). A goal of this Master Plan is to formalize the lines of communication that have been developed during this planning effort into a committee, with representatives from all stakeholders who affect or are affected by instructional spaces. A preliminary list includes:

- Office of the Registrar
- Office of Facilities Operations
- Office of Land and Buildings and related departments (e.g., Capital Planning)
- Office of Classroom Technology Support
- Other stakeholders with a specific interest in classroom instruction (e.g., Center for Teaching and Learning, Academic Computing, etc.)
- Student representatives

Ultimately; the goal is to also have significant faculty involvement, and if appropriate, the focus of the committee structure could shift from administrative to faculty-led, with a home in the Faculty Senate. In such a circumstance, adjustments to the composition and structure of the committee would shift as necessary to conform to the policies, procedures and protocols of Faculty Senate committees.

Mechanics of the Committee

The full Committee should come together only a few times each year to address major policy and planning decisions. In the interim, subsets of the Committee would meet or coordinate, as necessary, to keep the work of the Committee moving forward and to prepare for full Committee meetings.

Strategic Management: Sub-Committees and *Ad Hoc* Task Forces

As needs arise, either temporarily or on an ongoing basis, sub-committees or *ad hoc* task forces should be formed to address these needs. As part of the implementation of this Master Plan, two sub-committees are recommended for immediate creation:

- Technology Planning Sub-Committee
- Information Management Sub-Committee

Technology Planning Sub-Committee

Rationale for the Sub-Committee

As has been noted earlier in this report, the Office of the Registrar provides for basic technologies in the classrooms. Although it is mindful of the constant advances in technology (e.g., the current move toward delivery of more content over the Internet rather than in VCR / DVD / other formats), this office is neither staffed nor funded to assume leadership in getting emerging technologies into classrooms.

Stanford, however, has many other organizations on campus that are exploring the frontiers of technology The Registrar's Office is interested in maintaining close lines of communication with these offices so that as technologies move from "early adoption" to "mainstream", the Registrar's Office can be involved in bringing these technologies into the classroom.

Functions of the Sub-Committee

A Technology Planning Sub-Committee is the recommended vehicle by which the Registrar's Office and other campus entities involved in instructional technologies can coordinate and collaborate to bring emerging technologies into the classroom. The sub-committee would provide the venue for the following:

- Informing the Registrar's Office about emerging technologies and how they might be incorporated into the classroom, including technologies that are in the forefront, technologies that are five years down the line, etc. (This type of collaborative effort is already happening in other areas on campus.)

- Learning about and discussing best practices at other institutions to ensure that Stanford's instructional spaces continue to be competitive with peers.
- Identifying staffing and training implications of new technologies and strategies to provide these.
- Determining funding requirements and serving an advocacy role with senior administration in securing funding for the constant evolution of instructional space technology.

Involvement of Other Technology-Related Groups

There are several campus organizations that should be involved in this sub-committee. A partial list of includes the following:

Academic Computing
Academic Computing, a division of the Stanford University Libraries and Academic Information Resources (SULAIR). provides technology, expertise and resources in support of the University's academic mission, both directly to students and faculty, including public computing (in the residences, Meyer and Tresidder computer clusters, and libraries), technology help for students via Residential Computing and the Meyer Library Tech Desk, technology help for faculty via the Academic Technology Specialists and the Academic Technology Lab, CourseWork (Stanford's course management system), assistive technology and support via the Assistive Learning Technology Center, and publications. (Web page: http://academiccomputing.stanford.edu/)

Stanford Center for Innovations in Learning (SCIL)
The Stanford Center for Innovations in Learning (SCIL) conducts scholarly research to advance the science, technology and practice of learning and teaching. The Center brings together teachers, scholars and students from around the world to study how to improve formal and informal learning across cultural boundaries. Located in Wallenberg Hall, SCIL is a state-of-the-art testing ground for technology applications in the classroom. (Web page: http://scil.stanford.edu/)

Center for Teaching and Learning (CTL)
CTL provides the Stanford community with services and resources on effective teaching. The organization identifies and involves successful teachers who are willing to share their talents with others; provides those who are seeking to improve their teaching with the means to do so; acquaints the Stanford community with important innovations and new technologies for teaching; prepares inexperienced teachers for their responsibilities; contributes to the professional development of teaching assistants; and expands awareness of the role of teaching at research universities. (Web page: http://ctl.stanford.edu)

Information Management Sub-Committee

Rationale for the Sub-Committee

At least two of the guiding principles provide rationales for the Information Management Subcommittee. *Guiding Principle 5* advocates for scheduling to achieve efficient use of all campus instructional spaces, and *Guiding Principle 8* states that "information on instructional spaces should be centralized and shared."

Achieving efficient use requires good and comprehensive information on scheduling. Currently, there are multiple sources of scheduling data depending on whether the instructional space is a general use classroom, an auditorium, an instructional space in a professional school or a proprietary department space, etc. Although much of the information is stored electronically in Resource 25, there are other electronic databases in use as well, and some data is recorded in hard copy only. Obtaining a comprehensive or coherent understanding of how instructional spaces are used across the campus, and where there may be opportunities for better stewardship of these resources, is extremely challenging with the current set of information systems.

Functions of the Sub-Committee

The Information Management Sub-Committee is proposed to undertake the following activities:

- Move the institution toward a single, unified system for recording scheduling data – using Resource25 as the standard.
- Identify and recommend support systems that need to be developed to train personnel across campus to use Resource25 effectively, and to ensure the reliability of information entered into the Resource25 system.
- Meet with representatives across campus to understand issues and concerns with moving toward a central information system for storing scheduling data, and to communicate information about the potential benefits of centralized storage of scheduling data (e.g., better planning tools for determining class section needs, faculty and graduate student staffing needs, enrollment planning and estimating, etc.).
- Develop policies and procedures that respond to user concerns.
- Develop tools for planning and periodic reporting using Resource25 (and the reporting functions of its related software package, X25). (Examples of some of the reporting tools, in the form of "performance metrics," are presented in *"Section 2.2.2.B. Performance Metrics"* below.)

Non-General Use Instructional Spaces: Management and Coordination Considerations

Guiding Principle 4 states that "all classrooms that are not intended for special instructional uses should be deemed 'University classrooms' and should be managed and controlled by the University rather than by individual departments." This approach ensures that general use instructional spaces can be scheduled and managed effectively, and also helps to equalize instructional space resources available to all departments, some of whom may have benefited or been disadvantaged in their access to teaching space as an artifact of viewing some spaces as "departmental classrooms."

Transitioning to Registrar Management

To begin the transition, a full review of instructional spaces that are now departmentally-controlled should occur over the next one to two years. Where spaces are identified that meet the criteria for "general use classrooms" outlined in *Guiding Principle 4*, the department and the Registrar, on behalf of the University, should work out a plan to transition the space(s) to University management. In this process, we acknowledge that each department should have access to a space (or spaces, depending on the size of the department) that they can freely schedule for departmental meetings, conferences, and other activities, and that an instructional space under review may be converted to such use. We also acknowledge that such spaces must be fully supported, funded and managed by the department.

Considerations for Classrooms Outside of the University (General Use) Inventory

There are some issues common to all instructional spaces regardless of whether they are "general use" managed by the University, or "special use" managed by a department. These issues relate primarily to security and emergency preparedness. For example, security considerations in buildings with instructional spaces are arguably no different based on who manages a room – they still must be patrolled, secured after hours, etc. More importantly, as earthquakes and other serious disasters have demonstrated, in times of emergency it is critical to know where classes are being held – no matter who schedules them – so that students can be located, emergency planning measures can be implemented, etc.

For these reasons, we make the following recommendations are made with regard to *all instructional spaces* – whether general or special use:

- All instructional spaces should be scheduled in Resource25 (R25) so that there is a complete database of information on the use and occupancy of these spaces. Spaces can be coded in R25 to distinguish special use from general use spaces. (See "Information Management Sub-Committee" above for a fuller discussion of this recommendation.)
- The Instructional Space Committee should develop a common set of policies and procedures with regard to classroom security and emergency preparedness. These guidelines would then be distributed to the Registrar's Office (for University instructional spaces) and to each department (for special use instructional spaces) for implementation.
- Concurrent with distribution of these guidelines, the Instructional Space Committee should develop a protocol for communication between the Committee, the Registrar's Office and the individual departments so that information on important matters involving all instructional spaces can be disseminated easily and consistently – particularly in times of emergency.

SECTION 2.2.2.B: PERFORMANCE METRICS

Performance metrics provide an objective way to assess how instructional space resources are used. Standard metrics typically are physical in nature – i.e., room and seat utilization, supply vs. demand, etc. Increasingly, more sophisticated measures are being developed that reveal more information about use of instructional spaces – e.g., measures such as distribution of class scheduling throughout the day, enrollment patterning, density mapping of courses by geographic location, etc.

As instructional spaces are resources that are costly to build and maintain, it is in Stanford's best interests to monitor the use of the spaces to ensure that they are used wisely. In some cases, it may even be possible through good management to increase the productivity of these spaces, which may result in some being turned back to the University for other uses.

This section of the Master Plan defines some of the most useful performance metrics, identifies how they may be used to monitor the productivity of Stanford's instructional spaces, what the current metric is at Stanford (if known) and, where appropriate, what standards or targets may be useful to consider for the future.

We should note that although some "standards" exist nationally as to what constitutes acceptable instructional space usage, they are typically promulgated by or for state institutions and thus are not directly relevant to the nature or culture of Stanford. To assess performance at Stanford, therefore, it is more appropriate to developed metrics that reflect the particular facts and circumstances of its curriculum, pedagogy, cultural expectations and resources.

The Metrics

Room Utilization

Definition

Room utilization refers to the percentage of time that a room is used over a given time period. It is a shorthand measure for illustrating how intensively the instructional space inventory is used. Room utilization can be measured over the entire inventory or for a given room or set of rooms. It can also be measured over the full scheduling period (e.g., 8am to 5pm Monday through Friday) or for one or more selected periods (e.g., peak vs. non-peak hours) for comparative purposes.

Example

In a standard 45 hour week (8am to 5pm, Mon – Fri), a room scheduled for 30 hours has a utilization rate of 66%.

The Current Environment at Stanford (from the 2006 Study)

- Overall room utilization is 43% (8am to 5pm); 54% in Prime Time, which means that no more than half of the inventory, on average, is used. However, at the peak periods of 11am, 1:15pm and 2:15pm, room usage approaches 80%.
- The room sizes with the highest average room utilization are 21 to 30 seats (47%) and 41 to 60 (46%); lowest utilization is in rooms with 10 or fewer seats (35%) or more than 100 seats (37%).
- Friday room usage is very low (25%).
- Room usage on the Main Quad and in the northeast area of campus is highest (47%); use of auditoria is lowest (8%).

Targets

The room utilization rate measured across the entire inventory changes only if the supply (number of rooms) or demand (number of classes offered) changes. Thus, we suggest that the initial focus in evaluating room utilization should be on comparative rather than absolute measures of utilization. A few examples of comparative analyses are below:

- *Peak ("Prime Time") vs. non-peak utilization:* Because the use of instructional spaces in peak times is substantially higher than in non-peak times, Stanford's inventory must include many more classrooms to accommodate peak demand than if scheduling were spread more evenly across the inventory. Monitoring the difference in peak vs. non-peak utilization, and understanding what factors drive peak utilization, will allow the University to determine whether there are opportunities to shift some classes to non-peak hours.
- *Utilization by time of day and day of week:* It is almost axiomatic in higher education – at least among private institutions – that few classes are held at 8am and on Fridays. While it may be "swimming upstream" to pursue greater scheduling in these time periods, monitoring room utilization by time of day and day of week, especially if done by department, may reveal opportunities to schedule more intensively in underutilized time periods.
- *Utilization after changes in room conditions:* Anecdotally, it seems that rooms that are in poor physical condition or that lack certain types of technology are less frequently used than rooms that are in better condition or better-equipped. Looking at comparative room utilization data "before and after" a significant change in the room can provide hard, quantitative information on whether the change made a difference. Over the long-term, such information can be useful in making resource allocation decisions during repair and replacement and capital investment planning discussions.
- *Registrar vs. non-Registrar rooms:* Utilization rates should be measured periodically to determine whether there are significant differences in use of these two types of rooms and to understand the reasons for such differences.

Seat (Station) Utilization, Seat Migration and Square Footage Allocations

Definitions

Seat utilization measures the percentage of seats used whenever a room is scheduled. This is a shorthand measure for illustrating the "fit" between room size and classes placed in the room. It shows the average usage, although it does not address the concept of variation around the average.

Example

In 2 different 30 seat rooms, Room 1 has two classes with 5 and 25 students enrolled, respectively; Room 2 has two classes of 15 students. Both have average seat utilization of 50%, but actual seat utilization in each class is quite different between the two rooms.

Seat migration is the degree to which classes are scheduled in rooms substantially larger than needed – e.g., a class enrolling 10 students scheduled in a room with 50 seats would be viewed as having migrated "considerably" from an ideal size, which might be no more than 20 seats.

Example

The chart below depicts Stanford's seat migration in Winter 2006 by showing the number of classes at each enrollment breakpoint and how they are scheduled across the inventory by room capacity breakpoint.

SEAT MIGRATION -- ALL COURSES, 8AM TO 5PM (Number of class meeting hours in each room size)

For courses with enrollments in the range of:	No of Class Mtg Hrs	They are scheduled into rooms as follows: 0 to 10	11 to 20	21 to 30	31 to 40	41 to 60	61 to 100	101 to 999	Total
0 to 10	**1,366**	133	399	479	164	127	48	17	**1,366**
11 to 20	**1,256**	9	268	634	148	127	50	20	**1,256**
21 to 30	**421**		14	131	89	94	75	17	**421**
31 to 40	**159**			8	23	46	60	22	**159**
41 to 60	**157**			4	5	32	83	34	**157**
61 to 100	**139**			2		7	62	68	**139**
101 to 999	**115**		1				6	108	**115**
Total	**3,612**	**142**	**681**	**1,257**	**429**	**433**	**384**	**285**	**3,612**

SEAT MIGRATION -- ALL COURSES, 8AM TO 5PM (Percentage of courses in each room size)

For courses with enrollments in the range of:	No of Class Mtg Hrs	They are scheduled into rooms as follows: 0 to 10	11 to 20	21 to 30	31 to 40	41 to 60	61 to 100	101 to 999	Total
0 to 10	**1,366**	10%	29%	35%	12%	9%	4%	1%	**100%**
11 to 20	**1,256**	1%	21%	50%	12%	10%	4%	2%	**100%**
21 to 30	**421**		3%	31%	21%	22%	18%	4%	**100%**
31 to 40	**159**			5%	14%	29%	38%	14%	**100%**
41 to 60	**157**			2%	3%	20%	53%	21%	**100%**
61 to 100	**139**			1%		5%	44%	49%	**100%**
101 to 999	**115**		1%				5%	94%	**100%**
Total	**3,612**	**4%**	**19%**	**35%**	**12%**	**12%**	**11%**	**8%**	**100%**

Net Assignable Square Feet (NASF) Per Seat (Station) measures the amount of physical space allotted per seat (or, more practically, student) in each room. Computing NASF per seat gives an idea of whether a room is adequately sized for the number of seats included. To be most meaningful, the interpreter should have an understanding of context – i.e., room configuration, furnishings, and teaching formats that will occur in the room.

Example

Before technology or modern pedagogies, NASF was often 15 sf per seat. More recently, norms are closer to 20 or more sf per seat.

The Current Environment at Stanford (from the 2006 Study)

- Average seat utilization is 48%, somewhat higher in the smallest room sizes (50% to 60%) and lower in the larger room sizes (42% to 45%).
- There is significant migration of small courses to larger rooms in part because of a relative imbalance between the supply and demand for small rooms and an oversupply of mid-sized and larger rooms. For example, of all the classes with enrollments of 10 or fewer, only 10% are scheduled in rooms with up to 10 seats. A significant percentage of these classes – 35% – are scheduled in rooms with 21 to 30

seats. Because the degree of migration is substantial – with some of the smallest courses migrating to the very largest rooms – this suggests that migration is not attributable solely to supply and demand factors and that other factors (most likely physical condition, room fit-out and geographic) are at work.

– Empirical evidence from requests made to the Registrar's Office suggests that significant migration is due to technology – i.e., faculty requesting to be in specific rooms to have access to SmartPanels and other technologies, regardless of the size of the room.

Targets

Because seat utilization is a physical measure, there are standards that can be applied regardless of the nature of the institution. Generally, a seat utilization rate in the range of 60% to 75% is a reasonable target, with the mitigating factor of square footage allocation per seat – the lower the square footage allocation per seat, the more cramped a room feels when full, so a seat utilization rate at the lower end of the range may be more acceptable than at the higher end.

Analyses of seat utilization, seat migration and square footage per seat allocation measures should be undertaken and reviewed in tandem. A seat migration chart will give an overall picture of the "appropriateness of fit" of the inventory to the distribution of classes. Seat utilization measures by room will identify rooms that fall within and outside the acceptable target range, and square footage per seat allocation measures will identify rooms that may be over- or under-furnished relative to the space available in the room.

Demand vs. Supply

Definition

Demand is the number of class meeting hours needing to be placed in classrooms. *Supply* is the number of classroom hours available for scheduling these class meetings. Combining the two gives a clear picture of how the inventory measures up to the classes that need scheduling by illustrating gaps in supply, and helps to identify what additional classroom spaces might be needed. Demand vs. supply can be measured in the aggregate, or disaggregated in a number of ways – e.g., by time of day, day of week, school or department, etc. One caveat in using this measure is that it takes into account quantity of space without regard to space quality, fit-out, location, or other factors that affect the ability or desire to use a space. In this sense, this measure can sometimes lead to an overstatement of *realistic* supply.

Example

An inventory with 100 rooms and a 45 hour week has a supply of 4500 class meeting hours. If total demand is 2000 meeting hours, the demand vs. supply ratio is .44 – i.e., all classes can be scheduled in 44% of the inventory. If some of these rooms are rarely or never scheduled because of poor physical condition or lack of appropriate technology, then the supply is overstated. In such case, a second demand vs. supply ratio might be calculated without these rooms to give a truer picture.

The Current Environment at Stanford (from the 2006 Study)

By enrollment and room size

- Overall, there is more than double the supply to meet the demand for classroom space (8,235 room hours vs. 3,572 class meeting hours). However, there is a significant imbalance in the smallest sizes. The demand for rooms to seat 10 or fewer students is more than three times the supply, and the demand for rooms in the 11 to 20 range is also high (79% of available supply).
- Even though there are far fewer mid-size and large rooms, the need for these is relatively low vis-à-vis the number of classes offered with those enrollments.

By time of day and day of week

- Time of day
  - Peak demand times are at 10am, 11am, 1:15pm and 2:15pm. 69% of courses are scheduled in Prime Time, which is 55% (5/9) of the day (including lunch time).
  - Demand patterns are more regular on MWF, less so on TR, and there is better conformance in the morning than the afternoon.
- Day of week
  - Demand from 12:15pm to 1:15pm, which is generally a lunch period, is approximately 300 hours.

By school

- Humanities and Sciences, the largest school (2,892 weekly meeting hours, or 81% of all daytime courses), offers predominantly small courses and its primary needs are for small classrooms.
- Engineering, the second largest school (511weekly meeting hours, or 14% of all daytime courses), offers courses at a range of sizes. It has the greatest need for small rooms, but it also needs mid-size rooms and rooms to accommodate between 61 and 100 students.
- There is minimal demand for the very largest rooms, i.e., those accommodating more than 100 students.

Targets

The overarching goal is to align demand and supply more closely. In the absence of adding rooms, the focus has to be on managing demand, and the most effective way to do this given the current environment at Stanford would appear to be an evaluation of demand patterns by department, particularly the largest departments (e.g., IHUM, Econ, Math, English, History), where changes in demand patterns can have the greatest impact. The objective is to determine whether there are opportunities to shift some of the heavy "prime time" scheduling in one or more of these departments to off-peak periods.

In this sense, there is no "fixed target" per se. Rather, using quantitative scheduling data that comes from the University's databases, the Registrar's Office should meet with various departments to understand the rationale behind current scheduling patterns and to discuss whether there are viable options for great off-peak scheduling.

Other Measures

Once performance for the measures above is monitored and evaluated on a regular cycle, the University may wish to expand its performance tracking to other aspects of instructional space use. Numerous possibilities exist; a few that might be most helpful are outlined below.

Enrollment Tracking

Since Stanford does not have pre-registration, it is difficult to schedule instructional spaces in the absence of hard enrollment data. Currently, Stanford relies on departmental estimates of enrollment to make an

initial assignment of rooms. During the first few weeks of classes in a new term, as enrollments change, there is much shifting of classrooms. Final enrollments are not known until after the 3rd week of classes.

Regular tracking of enrollment data across terms can potentially yield better predictive information with which to make initial room scheduling decisions. Each term, the University should record enrollment "snapshots" prior to the beginning of a term, as well as after enrollments are finalized in the 3rd week of the term. Then, by comparing pre-term and final enrollment data across terms – looking for variations and similarities across terms – more reliable enrollment estimates can be developed over time.

Schedule Block Conformance

As was noted in Section 2.2.1.A. "Scheduling Considerations", Stanford's scheduling grid is complex and multi-layered. Most courses appear to conform reasonably well to the scheduling grid, but there are so many combinations and permutations that conformance at this time is not that meaningful. If Stanford determines to simplify the scheduling grid in the future, then it should analyze scheduling grid conformance on a regular basis to be sure that the hard work of converting to a simpler, less flexible grid is not negated by individual courses straying from the grid.

Reporting / Assessment / Action

In addition to Resource 25, Stanford University also has licensed X25, the complementary analytical tool for reporting on instructional space use. X25 provides a robust complement of metrics in three major areas:

- Inventory fitness
- Scheduling effectiveness
- Utilization

The University, under the auspices of the Office of the Registrar, should make use of X25 reporting tools on a regular basis, at least once per term, to review the metrics outline above. Periodic reviews will show where targets are being met, and where there are opportunities for improvement. These tools will also help to monitor adherence to scheduling standards. The Office of the Registrar should share this information with the Instructional Space Committee, which will be charged with determining what courses of action should be taken with respect to meeting performance targets.

Current Funding

Stanford currently has several different funding sources related to instructional spaces, as follows:[7]

- Operational funds
  - *Custodial budget:* approximately $150,000 per year, to fund basic custodial activities and needs, e.g., supplies (chalk and erasers), cleaning, locking and unlocking classrooms.
- Maintenance funds (Furnishings and Technology)
  - Approximately $550,000 per year in recent years
- Capital funds
  - *Facilities Reserve Fund:* up to $150,000 per year, to be used on capital projects – construction, major renovation projects (e.g., room conversions or reconfigurations), technology or other classroom improvements.

Leaving aside operational funds (i.e., the custodial budget), total funding available for annual maintenance, renewal and technology is approximately $550,000. If the Facilities Reserve Fund is included, the total is $700,000 per year. This equates, on a "per unit" basis, as follows:

- Per room (170 rooms): $4,100
- Per gross square foot (111,689 gsf): $6.30

Viewed in a life cycle approach, with a general classroom refurbishment cycle of 10 years, funding availability on a per room basis is as follows:

- 170 rooms over 10 years equals 17 rooms per year
- Maintenance and capital funds per year: $700,000
- Funding per room per year (17 rooms per year): $41,200

Average funding available based on other replacement cycles (7 to 12 years) is shown in the chart below.

Refurbishment Funding for University Instructional Spaces		**170 Rooms**
Refurbishment Cycle	**No. of Rooms Refurbished Per Yr**	**Funding Available Per Room Per Year**
GENERAL CLASSROOM REFURBISHMENT		**$ 700,000 total**
7 years	**24**	**$ 29,200 per room**
8	**21**	**$ 33,300**
9	**19**	**$ 36,800**
10	**17**	**$ 41,200**
11	**15**	**$ 46,700**
12	**14**	**$ 50,000**

[7] All figures in this section are expressed in 2007 dollars.

Future Funding Benchmarks / Requirements

Specific estimates of reinvestment costs to renovate and modernize Stanford's instructional spaces and upgrade its furnishings and audio / visual equipment are dependent upon existing conditions in each classroom, which can vary widely across the inventory. However, the following may be used as benchmarks for "order-of-magnitude" budget planning purposes, with the caveat that precise estimates should be derived based on a specific program of changes and a detailed review and audit of existing conditions in any classroom that is a target for reinvestment.

- *Refurbishing existing spaces:* $275 to 300 per square foot[8]
  - Changes are primarily for "cosmetics" such as new furnishings, fixtures and finishes (painting, etc.) and upgraded lighting. Refurbishing does not address structural changes or major systems / infrastructure needs (e.g., heating, ventilation, air conditioning).
- *Substantial renovation:* $330 construction costs / $470 project costs per square foot
  - Changes include all those under "Refurbishing existing spaces" above, plus…significant changes in room configuration (e.g., resizing and reconfiguring fixed seating) and heavy infrastructure / systems work (e.g., modernization or replacement of HVAC systems, electrical service, etc.)
- *Instructional media:* Costs of upgrading and modernizing instructional media are in addition to either of the above approaches to reinvestment, and are currently estimated in the range of $60,000 to $120,000 per room depending on the level of technology fit-out.

[8] Per square foot cost estimates were provided by the Stanford University Office of Capital Planning.

Section 2.2.3 – Operations

Building Operations

At this time, there is a "grassroots approach" to managing day-to-day operations of instructional spaces, with rooms in each building managed as part of overall building management, usually overseen by a departmental manager, a building manager, or some designate. In some cases, particularly some of the larger spaces (e.g., Kresge Auditorium), there may not be one person with primary management responsibility for the space. The Office of Facilities Operations supervises cleaning and maintenance on behalf of the Office of the Registrar.

Although the current system is not necessarily easily describable, the view is that by and large, it works adequately.

Safety and Security

Hours of Operation

Beyond the normal scheduling day, instructional spaces should be available for use during a reasonable period of time in the evening. As of 2008, normal operating hours for most instructional spaces are from 7am to 9pm, with variations depending on other security requirements of buildings where classrooms are located.

Although students are typically interested in 24 / 7 access to study spaces, including classrooms, other than during finals periods it is not practical to keep instructional spaces available at all times. During the normal academic year, late night study venues for students will be outside of instructional space (e.g., in the Old Union and residential areas).

Mixing Instructional and Other Space Types

There is value in having research, administration and instructional space co-located within a building. For practical reasons, however, in considering location and design of classroom spaces in mixed-use buildings, it is important to ensure that the functional requirements of each type of space use are taken into account – e.g., requirements for quiet and some level of privacy for faculty offices, easy public accessibility to main administrative areas, access to instructional spaces after hours when faculty and administrative offices and closed and locked.

Emergency Preparedness

Planning adequately in advance will permit Stanford to respond effectively when emergencies arise. From the perspective of instructional spaces, two critical factors in emergency preparedness are (1) having quick access to reliable information to be able to contact campus constituents quickly; and (2) policies and procedures that will enable the University to resume operations as quickly as possible.

Access to Reliable Information

As the situation at Virginia Tech in 2007 revealed, the inability to locate and communicate with campus constituents in an emergency can have grave consequences. During the course of a day, one way of being able to locate faculty and students is to know what classes they are in. This necessitates having as complete and accurate a record of classrooms scheduled and students enrolled in each class. Action items:

- Use the Resource 25 as the campus-wide classroom and event scheduling database.
- Require that all classes be recorded in R25 regardless of who schedules the classes and what rooms are used – University (general use) classrooms or departmental (special use) classrooms.
- Once enrollments are finalized for a term, update student enrollment information in PeopleSoft and upload new information into R25 as required so that R25 information is current as well.
- Spot check data periodically to confirm that all spaces – general and special use – are being included in R25.
- Develop a protocol for being able to extract data for all spaces in use on campus at a given time (whether Registrar or proprietary spaces).

Policies and Procedures for Operations Recovery

With respect to instructional spaces, policies and procedures that will facilitate operations recovery are as follows:

- The Provost should confirm that in the event of a major disaster, conference rooms and other suitable spaces would be given over to house classes on a temporary basis.
- The Registrar can use Schedule 25 (S25), the scheduling counterpart to R25, and X25 to assess the impact on classes of any building closures. Once the extent of building closures is known, the Registrar's Office can develop new emergency campus partitions that omit the rooms out of service, add in conference and other rooms given over to instruction during the emergency, and reschedule classes. This process should be able to be accomplished within a matter of a few days.

Non-Academic Use of Classrooms / Auditoria and Community Spaces

Guiding Principle 10 clearly states the priorities for using instructional space – which are first, for academic instruction, then for academic-related events, and finally for non-academic events. *Guiding Principle 6* highlights the notion that learning takes place beyond formal classrooms and suggests the need for informal learning spaces as well. Both of these principles point to a gray area in instructional space management – i.e., the need for a set of spaces to support both informal learning activities as well as spaces that can serve as broader "community resources."

It is not specifically part of the scope of this Master Plan to address the need for community space resources. However, because the auditoria included among instructional spaces are frequently used as community resources (in some cases more frequently for that purpose than for instructional activities), the Master Plan offers the following initial recommendations for managing these spaces to begin a dialogue on campus

- Because of the size and special nature of auditorium spaces, ideally they should be centrally managed and controlled. At present, some are controlled by individual schools, and technology may be managed by other entities on campus. Diffused operation of these spaces makes it difficult to maintain, schedule and plan for their use. If central management is not possible, then there should at least be use agreements between the controller of each auditorium space and the Registrar's Office so that policies on use and access are clear.
- Cost recovery
  - When auditoria are used for academic or academic-related events, normal usage costs are recovered through the Office of the Registrar and other budgets for instructional space. Extraordinary expenses incurred – e.g., for special technology – should be charged and recovered directly from users.
  - For events that are "community-wide" and not necessarily related to an academic use, the University needs to develop clear policies on use and cost recovery for auditorium spaces. Depending on the nature of the function, the University may wish to provide space sometimes on a *pro bono* basis, on the theory that part of the mission of the institution is to provide venues for the exchange of ideas (e.g., outside speakers invited to campus but not tied to a specific academic purpose), and sometimes on a fee basis (e.g., where activities are revenue-generating).
- Because some of the auditoria included among instructional spaces are highly specialized in fit-out and / or equipment, it may also be useful for the University to consider creating some "lower-tech" large meeting spaces that can be managed with lower operating costs and staffing requirements.

Appendix A
Registrar Instructional Spaces

The following are instructional spaces managed by the Registrar in 2007 - 2008.

Main Quad			Social Sciences Quad	Science & Engineering Quad 1	Science & Engineering Quad 2
100-101K	200-217	380-381T	ANNAUD	BRAUNAUD	APPHY200
110-111A	200-219	380-381U	ART2	BRAUNLEC	REDWDG19
110-111P	200-230	40-42A	ART4	GATES100	SEQUOIA200
120-314	200-303	420-040	BISHOPAUD	GATESB12	
120-414	200-305	420-041	CERAS300	GILBERT117	
120-59	20-21B	420-048	CUBAUD	HERRINT175	
160-314	20-21G	420-050	ECON106	HERRINT185	
160-315	20-22K	420-147	ECON139	HERRINT195	
160-317	240-101	420-245	ECON140	HEWLETT101	
160-318	240-108	420-286	ECON206	HEWLETT102	
160-319	240-202	420-371	ECON218	HEWLETT103	
160-321	250-251B	460-301	EDUC128	HEWLETT200	
160-322	250-251K	460-334	EDUC130	HEWLETT201	
160-323	250-252A	50-51B	EDUC206	MCCULL122	
160-325	260-001	50-51P	EDUC207	MCCULL126	
160-326	260-002	50-52E	EDUC208	ORGCHEM103	
160-328	260-003	50-52H	EDUC210	ORGCHEM110	
160-329	260-004	530-127	EDUC229	TERMAN152	
160-330	260-007	540-103	EDUC230	TERMAN332	
160-331	260-008	540-108	EDUC313	TERMAN399	
160-332	260-011	550-550A	EDUC334	THORNT110	
160-B35	260-012	550-550D	EDUC36		
160-B36	260-113	550-553R	EDUC41		
160-B37	260-244	60-61A	ENCINAC464		
160-B38	260-301	60-61F	ENCINAW101		
160-B39	260-311A	60-61G	ENCINAW106		
160-B40	300-300	60-61H	ENCINAW108		
200-002	300-303	60-62A	ENCINAW202		
200-013	320-105	60-62C	GESB124		
200-015	320-109	60-62J	GESB131		
200-030	320-220	60-62L	GESB134		
200-032	320-221	60-62M	KRESGEAUD		
200-034	360-361A	60-62N	MEYER142		
200-105	370-370	60-62P	MEYER143		
200-107	380-380C	70-72A1	MEYER146		
200-124	380-380D	80-113	MEYER147		
200-201	380-380F	90-92Q	MEYERFORUM		
200-202	380-380W	DINKAUD	MITCHB67		
200-203	380-380X				
200-205	380-380Y				

Appendix B
Participants in the Instructional Space Master Planning Process

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