Make Space! Curbing Campus Growth and Using Space Wisely

Better Buildings Summit

May 10, 2016

11:15 AM-12:30 PM

Agenda

- Introductions
- Why Space Management? APPA
- Strategic & Planning Alignment, NACUBO
- Trends & Opportunities in Research Space, CU Boulder
- Q&A

Today's Presenters

- John Bernhards, APPA
- Sally Grans Korsh, NACUBO
- Kathy Ramirez-Aguilar, University of Colorado Boulder

Why Space Management?
John Bernhards

U.S. DEPARTMENT OF ENERGY

Make Space!

Curbing Campus Growth
And Using Space Wisely

Better Buildings Summit

U.S. Department of Energy

May 10, 2016

Presenter:
John F. Bernhards
Associate Vice President
APPA – Leadership in Educational Facilities

APPA Leadership in Educational Facilities

Why Space Management? Why Now?

Campus Space Is…

UNDERUTILIZED

POORLY MEASURED

EXPENSIVE

IN DEMAND

OFTEN TIMES, POORLY MANAGED

"FREE"

… AND CANNOT BE IGNORED!

Space is an **Institutional Asset**

It's now time to develop and promote a new space **management vision** and **enterprise-wide policies** about space within the institution.

Facilities are Assets and an INVESTMENT

We need to be as thoughtful about our space portfolio, as we are about our endowment investment portfolio.

A New Generation of Best Practices For Space Management and Utilization

- Establish metrics to better measure and allocate space.
- Develop effective policies, decision processes, and standards.
- Design spaces that are easy to manage.

- Create effective organizational governance structures.
- Implement incentives to encourage smart space management.

What are the Strategies?

- Align Space Management to the Institutional Mission.
- Treat buildings as the Assets they really are.
- Change the “culture” of space.
- Develop effective policies, processes and organizational structures to manage space.
- Implement a space inventory system to understand resources and identify needs.
- Address space utilization by assembling credible data and adopting best practices.

At APPA…

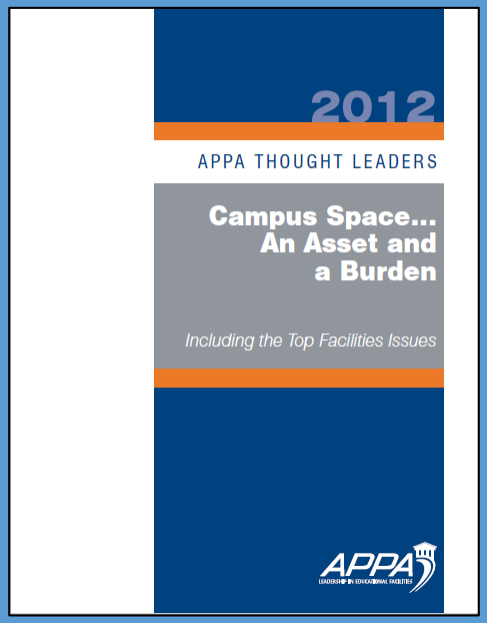
- **We are now developing the first ANSI Standard to address "Total Cost of Ownership" for Facilities Assets.**

ANSI/APPA 1000: *Total Cost of Ownership for Facilities Asset Management*

- **We are collecting critical data and research on facilities management and facilities assets.**

APPA Facilities Performance Indicators (FPI)

At APPA…



- **Thought Leaders Report 2012: *Campus Space… An Asset and a Burden***
- Available for **free download** on the APPA web site bookstore.
- Visit **www.appa.org/bookstore**

Thank you!

John F. Bernhards
Associate Vice President
APPA International
1643 Prince Street
Alexandria, Virginia 22314
Email: jbernhards@appa.org
www.appa.org

Strategic and Planning Alignment
Sally Grans Korsh

U.S. DEPARTMENT OF ENERGY

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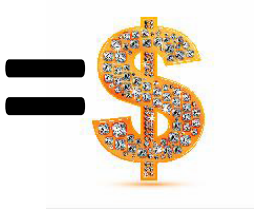
Curbing Campus Growth: Using Space Wisely

Strategic and Planning Alignment

Better Buildings Summit – U.S. Department of Energy - May 9, 2016

Sally Grans Korsh, NACUBO
Director, Facilities Management and Environmental Policy
sgranskorsh@nacubo.org 202-861-2571



Space = Cost

Cost to Build and Cost to Maintain
What, Why, Where, How, When

WHAT is the space?
Type: classroom, lab, office, support, fit for these issues

WHY does space exist?
Program – Mission of Institution – Attributes and Condition

WHERE
Location and Operations: energy use, utilities, operations, updates and environmental issues?

HOW is it used? Regular, sporadic , students, community?

WHEN is it used?
Time of day, semester, other?

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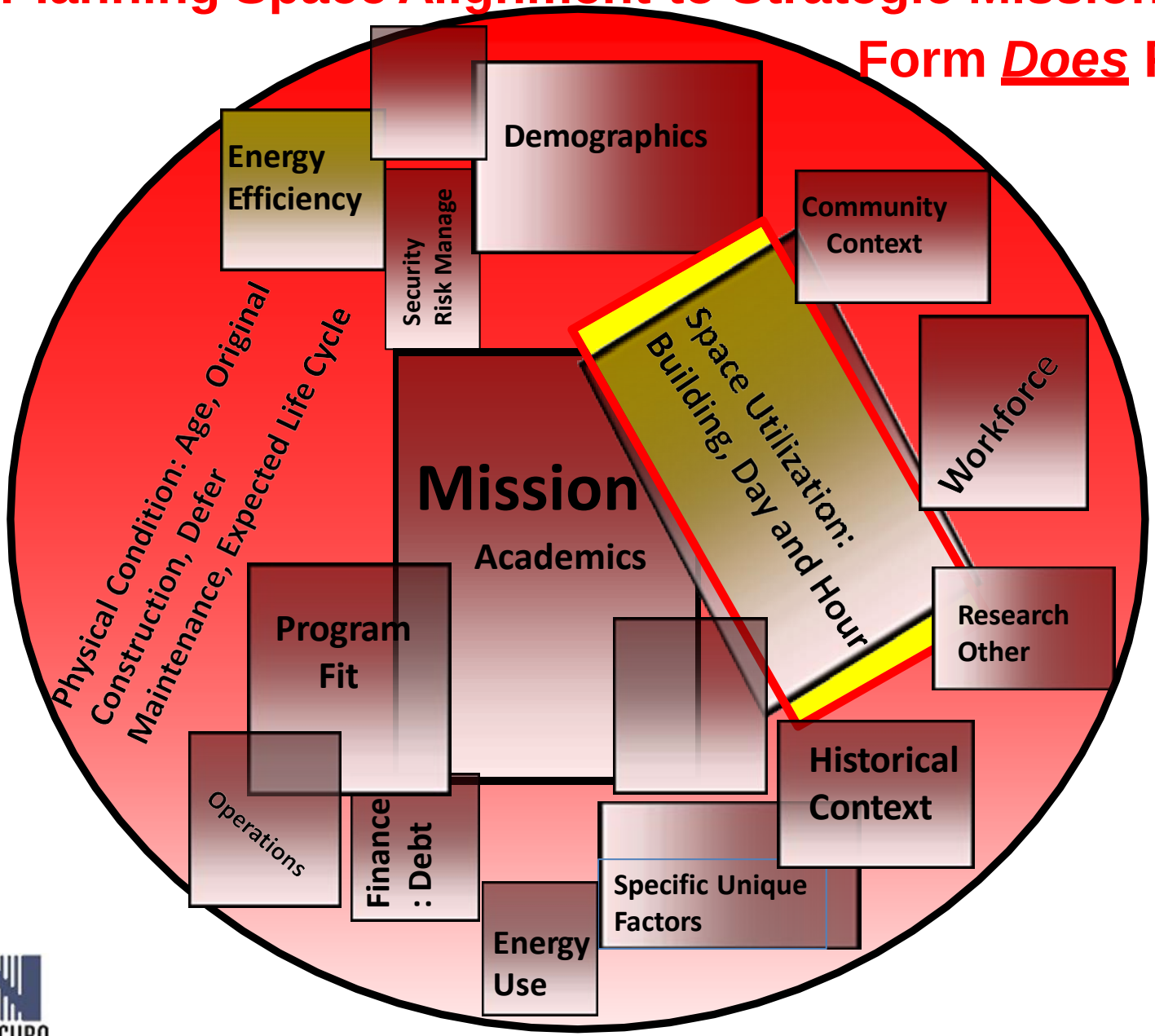
Why, What, Where, How

Planning Space Alignment to Strategic Mission -

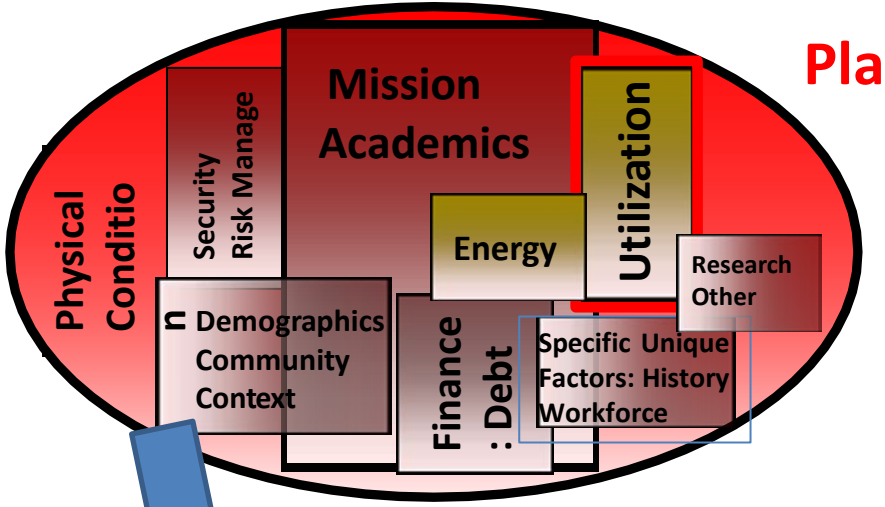
Form *Does* Follow Function



Planning Alignment to Strategic Mission

Space = Master Plan

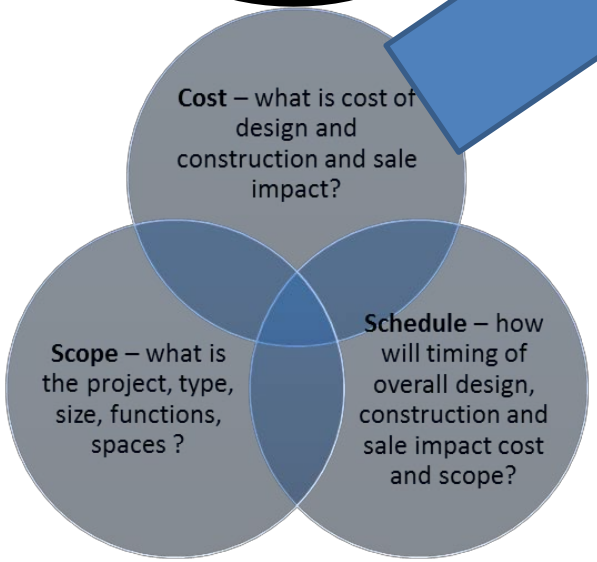
Incremental Plan – NOW up to Five Years to Long term – 25-50 Mission Vision Goals



Campus Individual Capital Plan: Incremental Near, Mid and Long Term

Predesign

- Other Funding- Donations, Grants Partnerships
- Operational Funds from Campuses – Repair and Replacement
- Revenue/Debt Bond Sale
- Legislative Appropriation: Fundraising/Donors



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Planning Utilization/Space and Energy Efficiency Alignment to Strategic Mission Incremental Plan – NOW – 5 Years

Space Utilization & Energy Use:
- classroom
- office

Campus Individual Capital Plan: ***Incremental*** **Near, Mid and Long Term**

Predesign

- Other Funding- Donations, Grants Partnerships
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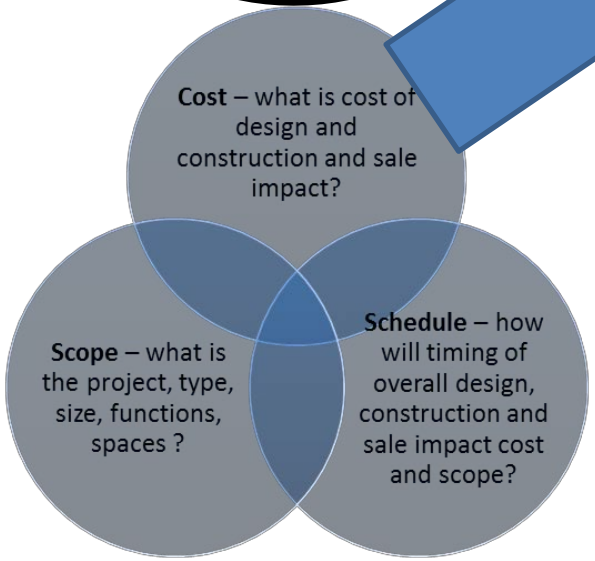

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What is Campus Space? Explaining the VALUE
Space as a driver of energy

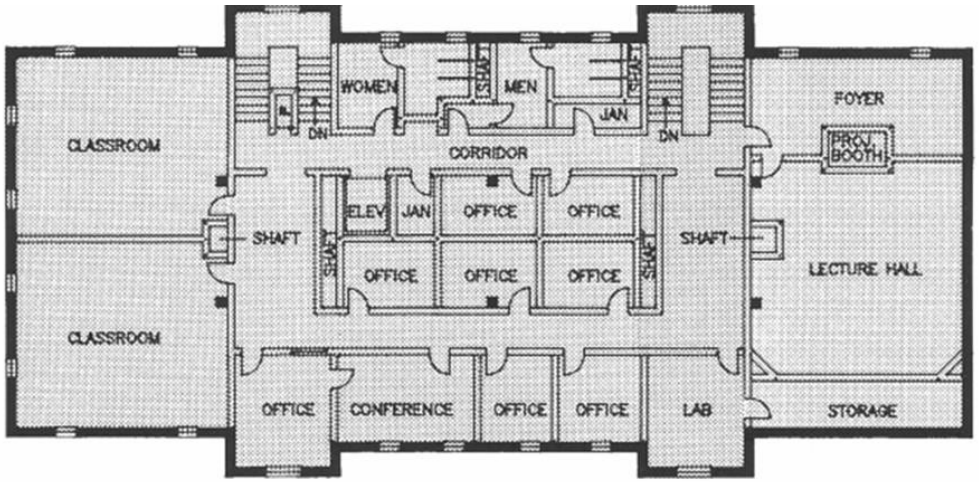
Various metrics can be used, i.e. Building Replacement Cost = What Value is it to each Student/Staff? Utilities/Operations = What Value to students?

Embodied Value as Campus Capital Asset – Example: Campus has 500,000 sq ft

Replacement average of $353/sq ft = $176.5 Million
Utilities/Operations @$5/sq ft = $2.5 M annually

2,000 students = $88,250/per student of physical assets
$1,250 per student of utilities/operations

5,000 students = $35,300/per student of physical assets
$500 per student of utilities/operations



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Intersection of Space and Key Facilities Metrics = VALUE

APPA LEADERSHIP IN EDUCATIONAL FACILITIES

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Key Facilities Metrics

...that every business officer should know

www.appa.org/research/nacubo.cfm

Simple metrics by GSF or by FTE:

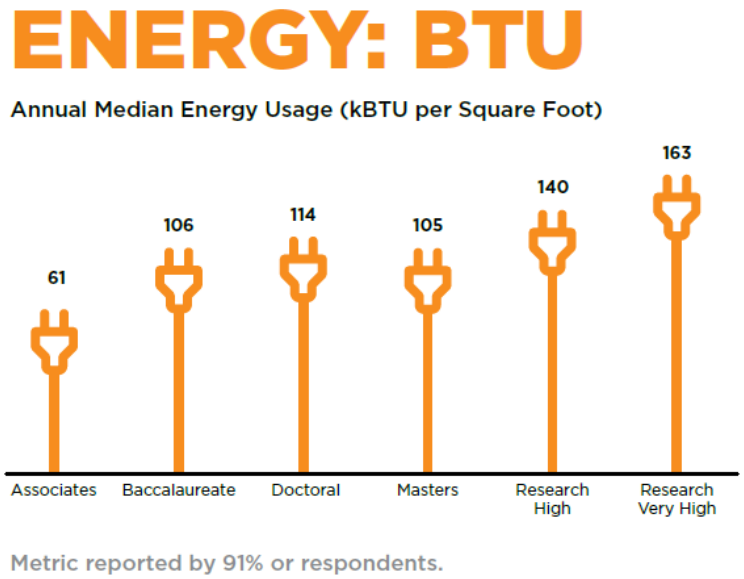
BTU

KW – electrical

Water

Waste: garbage and recycle

Carbon Footprint



Results
www.nacubo.org/Business_and_Policy_Areas/Sustainability/APPA/NACUBO_Key_Facilities_Metrics_Results.html

Or www.appa log in and under MyResearch APPA/NACUBO Key Facilities Metrics

Answer all five questions (*or* some of them) starting in Aug 2016 and closes early Dec, 2016.
www.appa.org/nacubosurvey16

What is Space Type?

Assignable Sq Ft	Actual Research Institution *2009 Scott Carlson April 17, 2009 "Campus Officials Seek Building Efficiency, One Square Foot at a Time," Chronicle of Higher Education	Univ of Illinois	Sample Community College
Classrooms	3%	5%	6%
Labs	5%	10%	3%
Special Use Labs	9%	2%	4%
Study/Library Space	7%	11%	22%
General Use – student union, auditorium	9%	5%	20%
Research	10%	23%	NA
Institutional support (Admin, IT, security, health care) other	13%	13%	13%
Office	23%	31%	32%
Total - verify if all office space	*36%*	*43%*	*45%*
Residential	22%	.5	NA

When Space is Used - Analysis of Student/ Class Enrollment

ALL HOURS

CORE HOURS

University of North Dakota

Student enrollment by building and room for fall 2012

Courses listed by BEGIN time

Sum of Enrollment	DayW								
BEGIN	1) Mon	2) Tue	3) Wed	4) Thu	5) Fri	6) Sat	Grand Total		
6:00:00 AM	41		41		41		123	443	0.37%
6:30:00 AM		8					8		
7:00:00 AM	55		55		55		165		
7:30:00 AM	11	57	11	57	11		147		
8:00:00 AM	1940	1978	1838	1891	1789	9	9445	109899	91.01%
8:30:00 AM	15	44	34	44			137		
9:00:00 AM	3798	1278	3753	1131	3443	70	13473		
9:30:00 AM	241	3514	241	3635			7631		
9:45:00 AM			19				19		
10:00:00 AM	4356	743	4195	754	3704		13752		
10:30:00 AM	11	15	11	15			52		
11:00:00 AM	4168	4464	4054	4493	3036		20215		
11:30:00 AM		100	36	124	36		296		
12:00:00 PM	1995	382	1868	498	1691		6434		
12:30:00 PM	252	3620	307	3578			7757		
1:00:00 PM	3891	836	3759	950	3042		12478		
1:30:00 PM	13	88		43			144		
2:00:00 PM	2642	3206	2690	3245	1485		13268		
2:15:00 PM		42		42			84		
2:30:00 PM	71		57				128		
3:00:00 PM	1435	417	1503	422	737		4514		
3:15:00 PM		36		36			72		
3:30:00 PM	49	1185	60	1086	14		2394		
4:00:00 PM	359	349	373	318	125		1524	8014	6.64%
4:10:00 PM	117		117		117		351		
4:15:00 PM			13				13		
4:30:00 PM	64	87	94	60			305		
5:00:00 PM	299	403	309	431	51		1493		
5:15:00 PM		93		93			186		
5:30:00 PM	147	248	44	58	39		536		
6:00:00 PM	221	569	361	376	23		1550		
6:15:00 PM	5	40	22				67		
6:30:00 PM	54	81	54	64			253		
7:00:00 PM	370	286	394	261	20		1331		
7:15:00 PM		11					11		
7:30:00 PM	24	36	24	36	14		134		
8:00:00 PM		35	35	38			108		
(blank)	1			7		144	152		
Grand Total	26645	24251	26372	23786	19473	223	120750		

Core Hours 8am-4pm	25236	22297	24798	22305	19102	79	113817
	20.90%	18.47%	20.54%	18.47%	15.82%	0.07%	94.26%

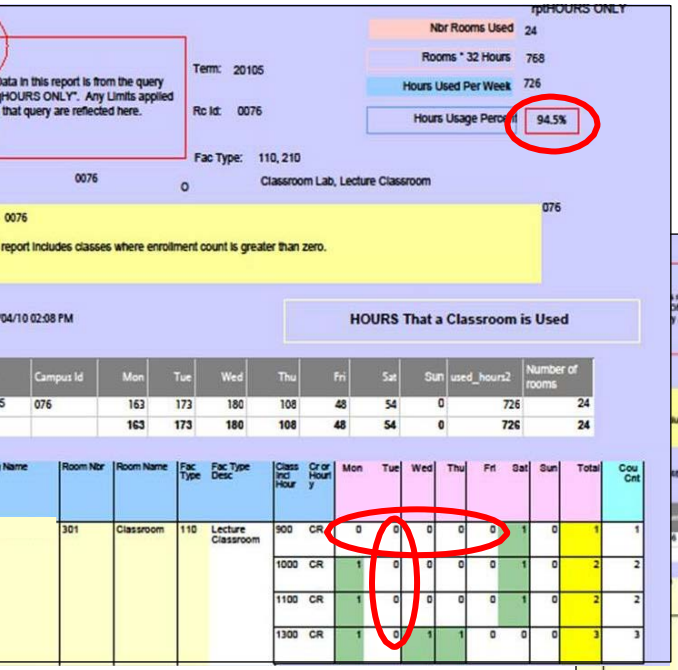
Other Hours (OS Core	1409	1954	1574	1481	371	144	6933
	1.17%	1.62%	1.30%	1.23%	0.31%	0.12%	5.74%

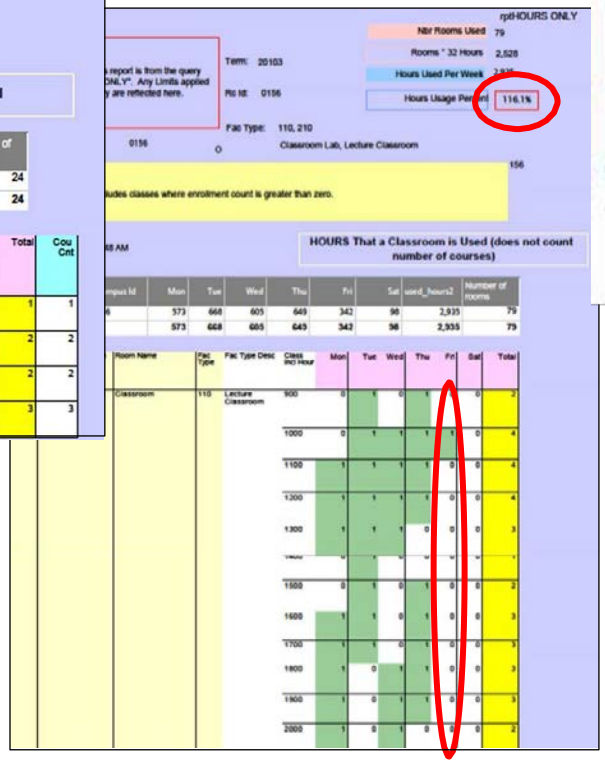
When Space is used - Space Utilization/Needs Assessment

Below Left: Strong overall room use at 30 hours a week - 94% utilization based on a 32 hour week at 100% – **but times are still available such as between 8-10 Mon-Fri and 10 -12 on Tues, Wed, Thurs, Fri**

Middle: Mainly full schedule (8am-6pm) classroom – 176% utilization based on a 32 hour week at 100% - **however, no classes on Fridays.**

Right: graphics clearly indicate utilization – makes it easier to identify classrooms attributes that allow campus to improve others (size, configuration, technology, acoustics, etc.)





USED 0 - 23 HOURS PER WEEK
USED 24 - 30 HOURS PER WEEK
USED 31 - 48 HOURS PER WEEK
USED MORE THAN 48 HOURS PER WEEK
STAFF/OFFICE SPACE
MECHANICAL/BUILDING SUPPORT

Policies Vary

1. Utilization measurement dashboards – share this info

2. Explicit standards for space allocation and exceptions management for your particular mission

3. Incentives for adhering to allocation targets

4. Central space banks

5. Flexible and collaborative space

Space Management Policies

- **Centralize scheduling** of general purpose classrooms and class-labs
- **Identify classrooms an**d labs for departmental use and scheduling
- **Establish space utilization standards**, guidelines and targets
- **Establish standardized invent**ory of room types, size and configuration
- **Centralize planning and establish standardized** inventory of room characteristics
- **Establish inventory** of collaboration and learner support spaces
- **Establish room use protocols**

Chancellor's Leadership Group:

University of North Carolina at Greensboro

- **Review Utilization of Academic and Instructional Space**
- **Concepts to consider – "My" Space attitude is not institutional space**
- **Concept of "Turf" ownership does not right size utilization**

- Explore the use of flexible hours
  - Expand classroom usage hours beyond traditional schedule to accommodate new generation of non-traditional learners

- Design adaptable spaces to create multipurpose classrooms
  - Flexible learning spaces that will allow for different type of classes to be taught in the same space – lecture, discussion, MOOC's, active learning
  - Moveable furniture, lockers, and portable partitions to provide flexibility within the space

- Develop guidelines for future classroom design
  - Understand technology needs for different pedagogies
  - Research new breed of classroom furniture
  - Identify best finishes for new classroom uses
  - Determine "right" sf per student for types of classes that will be taught in each space

Many Resources on Web for Space Utilization Policies

Utilization of Classrooms in U.S. Colleges and Universities

January 25, 2016

EFC
EDUCATION
FACILITIES
CLEARINGHOUSE

The Association for the Advancement of Sustainability in Higher Education. (N.D.). *Maximize Space Utilization to Minimize or Avoid New Construction. Retrieved January 19/ 2016 from http:/Jwww.aashe.org/wiki/coo/ campus-how-guide-co/lege-and-university-climate-action-planninq/55-maximize-space-utilizat*

The University System of Georgia. (2013, July). *The University System of Georgia Space Utilization Initiative*. Downloaded on January 21, 2016 from http://www.usg.edu/facilities/documents/USG_SpaceUtilizationInitiative_Julv2013.pdf

Sightlines. (2015, November 11). *Decline in Student Enroflment Creating Shortfafl of Students to Fill New Space on College Campuses, According to Sightlines Report*. Downloaded on January 21, 2016 from http://proxygw.wrlc.org/login?url=http://search.proguest.com.proxygw.wrlc.org/docview/1667754610?accountid=11243

Cheston, D. (2012, October 30). *Students in space: Universities Build a Lot of Classrooms, But Use Them Infrequently*. The John William Pope Center for Higher Education Policy. Downloaded on January 21, 2016 from http://www.popecenter.org/commentaries/article.html?id=2757

Education Advisory Board. (n.d.). *Maximizing Space Utilization: Measuring, Allocating, and Incentivizing Efficient Use of Facilities*. Downloaded on January 21, 2016 from https://www.eab.com/research-and insights/academic-affairs-forum/studies/2010/maximizing-space-utilization

Why Space is Used: Existing Classroom Conditions

classrooms, including;

Flat Floor Classrooms

Tiered Floor Classrooms

Sloped Floor Classrooms

Dakota, it is important to understand existing conditions on campus.

Currently, the physical and economical environment at UND includes:

- 548 acres; 229 buildings
- 6.1M gross square feet of facilities
- 37 academic buildings; 252 classrooms/lab spaces
- 15,250 students; 72% taught in traditional manner; 14% non-traditional; 14% both
- Average age of buildings is 41 Years
- Total building replacement value: $1.35B (estimate)
- Economic impact on state and region: $1B annually

As part of this study, we visited many of the academic facilities, class rooms, instructional laboratories and student success spaces. A brief summary of existing conditions follows.

Assessment of Existing Classrooms

There are many different sizes, types and styles of classrooms across UND campus, including:

- Flat floor classrooms
- Tiered floor classrooms
- Sloped floor classrooms
- Small seminar style classrooms
- Medium sized classrooms (30 – 60 students)
- Large classrooms (more than 60 students)
- Active learning environments

Nearly all of the existing classrooms have a defined "front" with mar chalk boards, an instructor station and technology equipment. Tech- nology packages vary by classroom and include manual and motorized projection screens, overhead projectors, televisions, flat screen LCD computers, digital controls, DVD's and VHS machines.

There is also a wide variety of classroom furniture in use at UND inclu ing: moveable tablet arm chairs; fixed tablet arm chairs; moveable tables with fixed chairs; moveable tables with moveable chairs; and m tiple sizes and shapes of tables. Architectural finishes within classroo are generally similar in nature and include painted walls, suspended c ings and carpeted floors. In many cases, rooms appear dated and da

Overall, most of the existing classrooms on the UND campus currentl support a 'direct' education environment where instructors lecture and students take notes. There are a few notable differences in acti learning environments where students are aligned in teams, and instr tors travel through classrooms and engage students in groups or one

Classroom Planning Principles

- **Flexibility**
  - Allow for multiple educational methods/pedagogies
  - Encourage hands-on, experiential learning
  - Emphasize transparency
  - Provide multiple, changeable configurations
  - Develop multiple sizes and locations
  - Provide easy access to power and technology
  - Support multiple disciplines, when possible
  - Right size facilities
- **Standardize where possible**
  - Technology systems
  - Controls
  - Furniture
- **Use appropriate planning metrics**
  - 25 square feet per student

Lab Planning Principles

- **Safety**
  - Circulation of people, materials, equipment
  - Appropriate containment devices
  - Storage systems for chemicals and materials
- **Infrastructure**
  - Right size equipment and systems
  - Plan for flexibility/plug and play
  - Provide adequate HVAC
  - Allow for access to electrical and technology systems
  - Embrace efficiency

Recommendations

- **Develop a strategy for classroom and class-lab planning, renewal or new classrooms, including:**
  - No net additional square footage strategies
  - Upgrade the best spaces and re-purpose or discard the others
  - Review other UND spaces, such as offices, for appropriate number and size
- **Develop 'swing' space locations which allow for renewal of classrooms and/or class-labs**
- **Develop a space management department and space management policies, to oversee**
  - Space inventory
  - Allocation of space
  - Assess utilization and reallocation of space in support of Academic and Strategic Plans

Why Space is Used - Advancing Learning Planning Principles

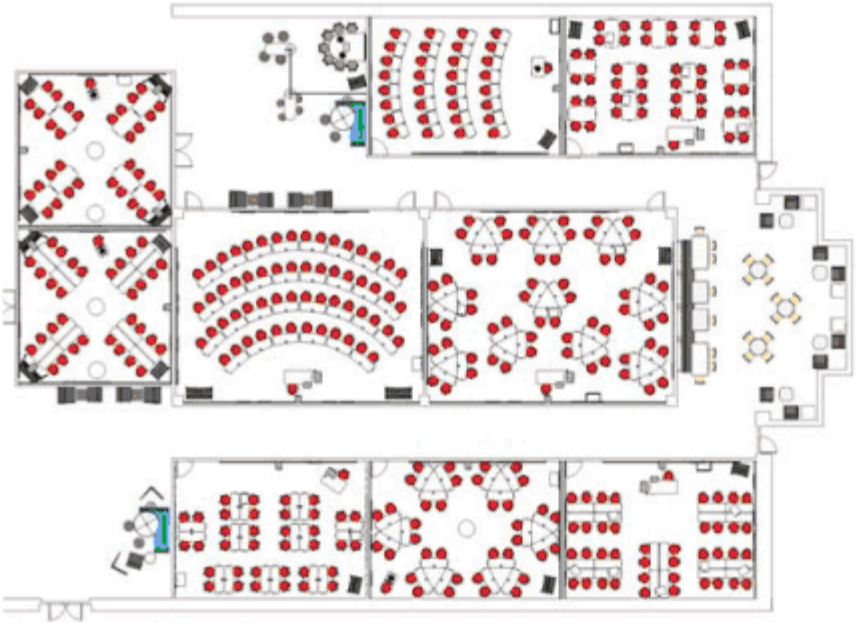
Traditional: 14-20 square feet

Rows with tables and chairs:
20-25 square feet per student

Active/flexible learning:
25-30 square feet per student

- *Positive interdependence.* Team members have to rely upon one another.
- *Individual accountability.* Each member is responsible for doing their own fair share of the work and for mastering all the material.
- *Face-to-face interaction.* Some or all of the group effort must be spent with members working together.
- *Appropriate use of interpersonal skills.* Members must receive instruction and then practice leadership, decision-making, communication, and conflict management.
- *Regular self-assessment of group functioning.* Groups need to evaluate how well their team is functioning, where they could improve, and what they should do differently in the future.

These environments come in many different shapes, sizes and configurations as indicated in the Steelcase illustration below, and in the photographs to the right:



University of Notre Dame

Hobart College

University of Minnesota

University of Notre Dame

- **Emphasize transparency.** Transparency lets people know what's going on within UND academic facilities. This transparency is a valuable tool in the recruitment and retention of students and faculty members; it showcases UND programs; and it builds excitement among faculty, staff and

University of British Columbia

University of Kansas

NACUBO

Standard Classroom Planning Principles

Capacity to accommodate 24 students.

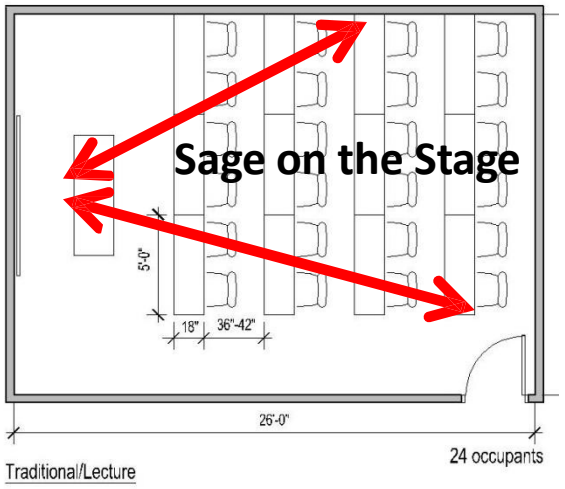
Approximately 500 SF.

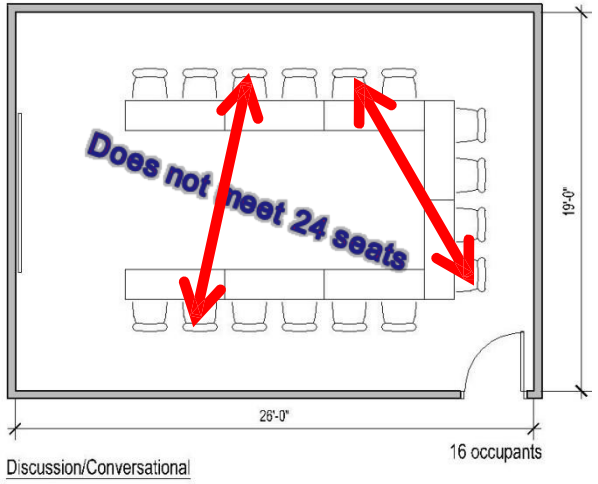
Small does not mean inflexible. Four furniture configurations in a small classroom each accommodate
16 – 24 students in varying configurations.

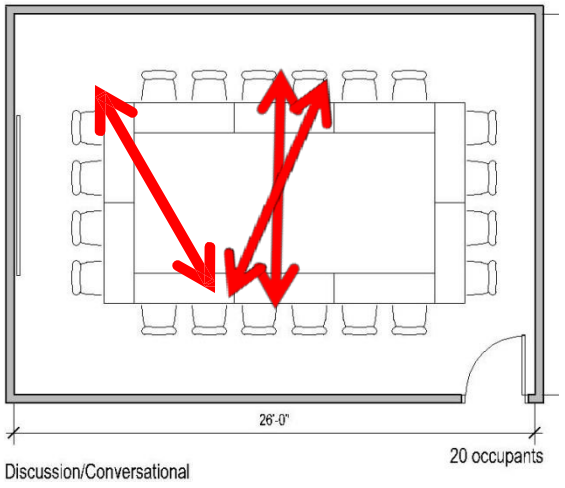
The more modular and flexible the furniture, the greater the opportunity for reconfiguration.

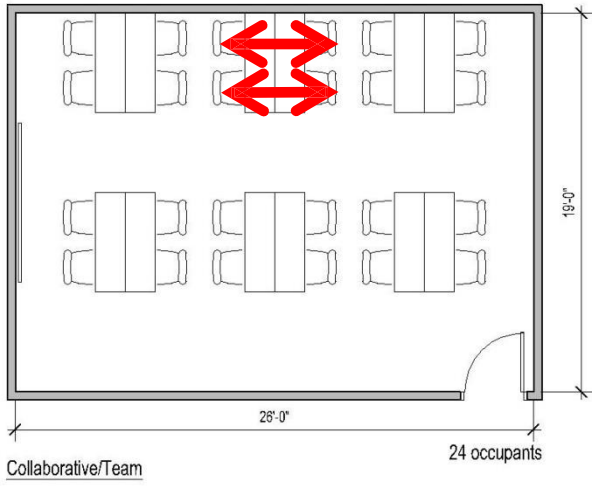
These classrooms are indicated with one door, but adding two doors may benefit overall program usability of the space and ease student circulation and congestion.

Add sidelight or window in door to allow for visual security.









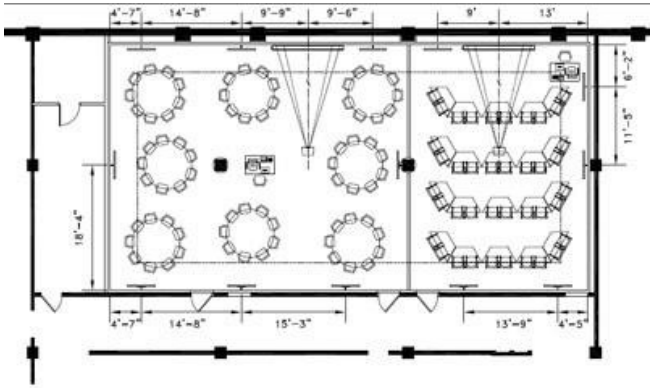
Active Learning Classrooms

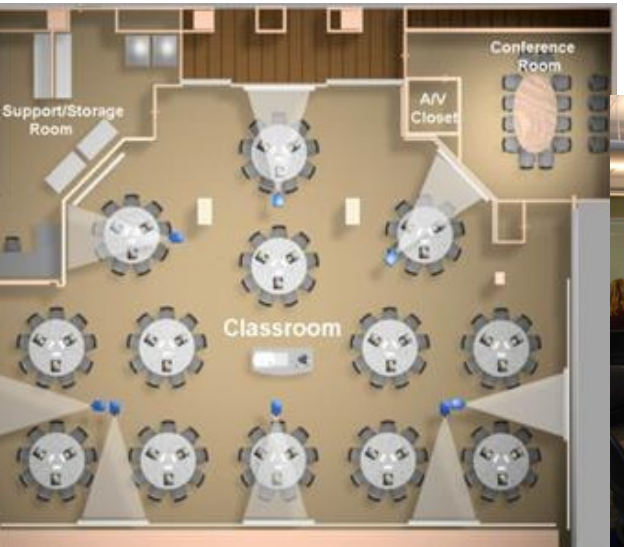
www.classroom.umn.edu

SCALE – UP

Student **C**entered **A**ctive **L**earning **E**nvironment with **U**pside-down **P**edagogies

www.scaleup.ncsu.edu

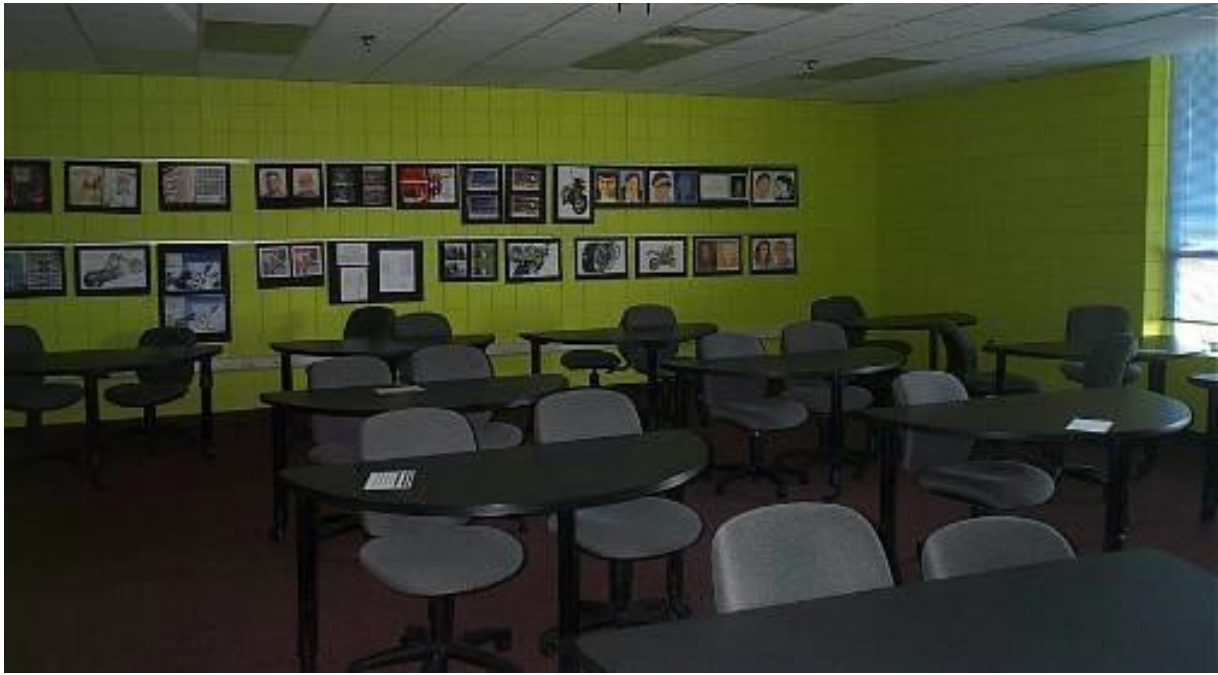




Incremental Changes - done incrementally over time create long term change

New carpet, paint and furniture transfigure a former tired classroom

Flexible tables can be set up ‘lecture’ style or brought together for circle conversation



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Learning Spaces in All Places

Cafeteria serves as extension of Learning Resource Space

“Mining” Space to Find Learning Spaces

Before - left

Thinking “Students/Learning First” this corridor at right becomes more than just a pass thru space; multiple ways to study and engage.

After - below

Learning Spaces = Transition Spaces

Reviewing interiors to reflect changing needs

Taking the corridor and making it an active learning/engaging area

Former corridor transformed-
Entry between student service office commons and main entry becomes “hang out – touch down” space

Taking space liabilities and creating assets

Before

NACUBO

“Mining” space involved analysis of existing cavernous space

Campus “found” space in a major, underused entry and carved new areas for new program functions for study, teaming, learning and gathering. Added stair that increased use of second floor.

Before

Elephant in the Room

Offices

18th Century

Today

Administrative Awesomeness or Abyss

- **Offices are 25-45% square footage** of all campus space: inventory, evaluate, analysis, policy development

- **Offices contain the human capital of the campus**: justifiable overhead

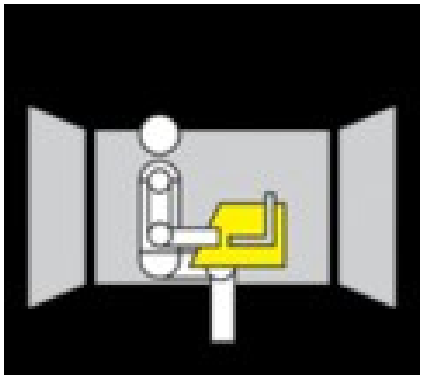
- **Office use transmits the campus mission perspective; values, prestige, purpose**

Administrative and Faculty Office Abyss

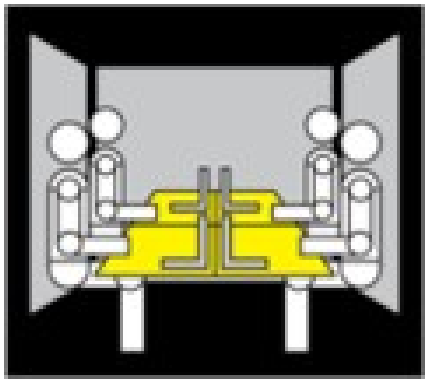
Policies/guidelines: formulate on type, privacy levels and access, utilization, clean-up, storage, equipment, etc.

Administrative Definitions: Spatial Options Exist

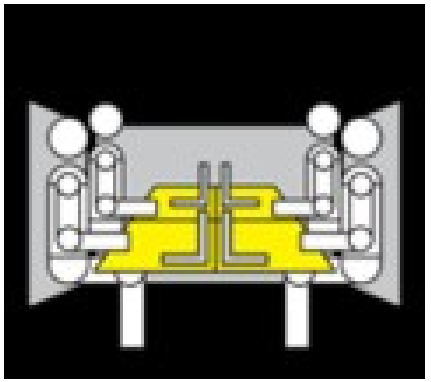
Private Office



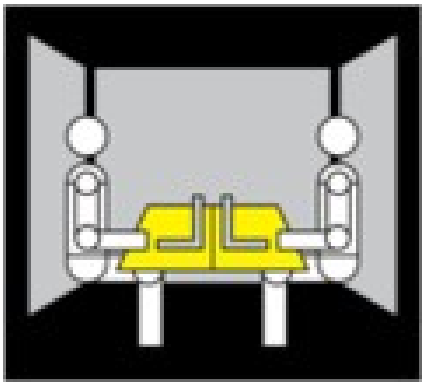
Cubicle



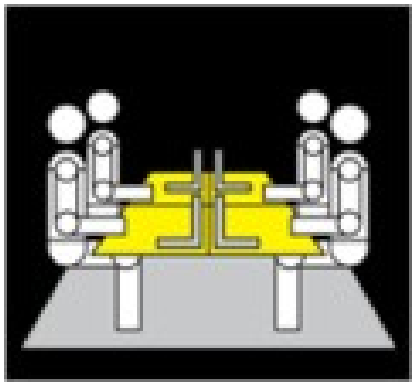
Team Room



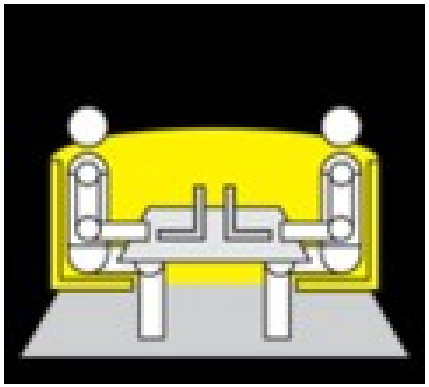
Team Space



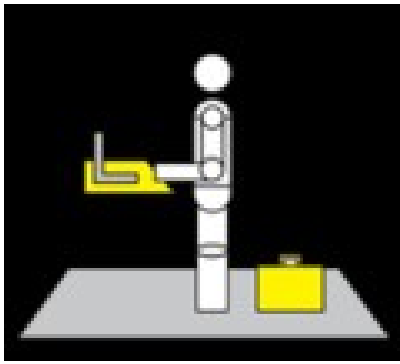
Shared Office



Open Office



Work Lounge



Touch Down

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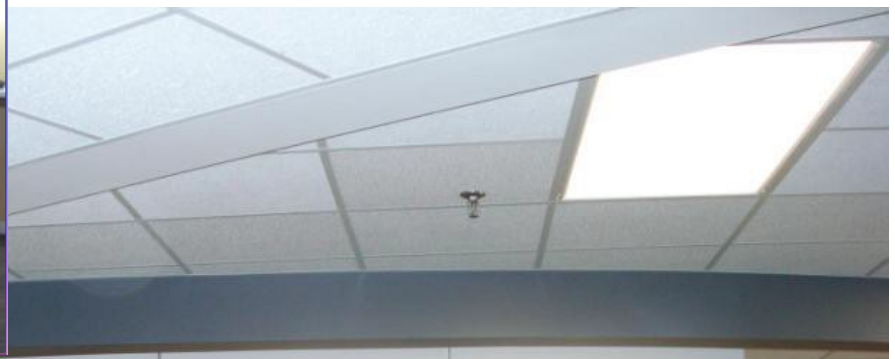
Student Services – One Stop Shopping success at space savings for square footage and for staffing operational efficiencies - staff cross training innovation



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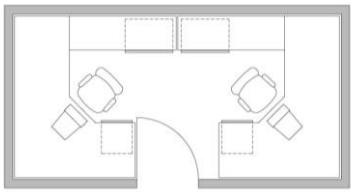
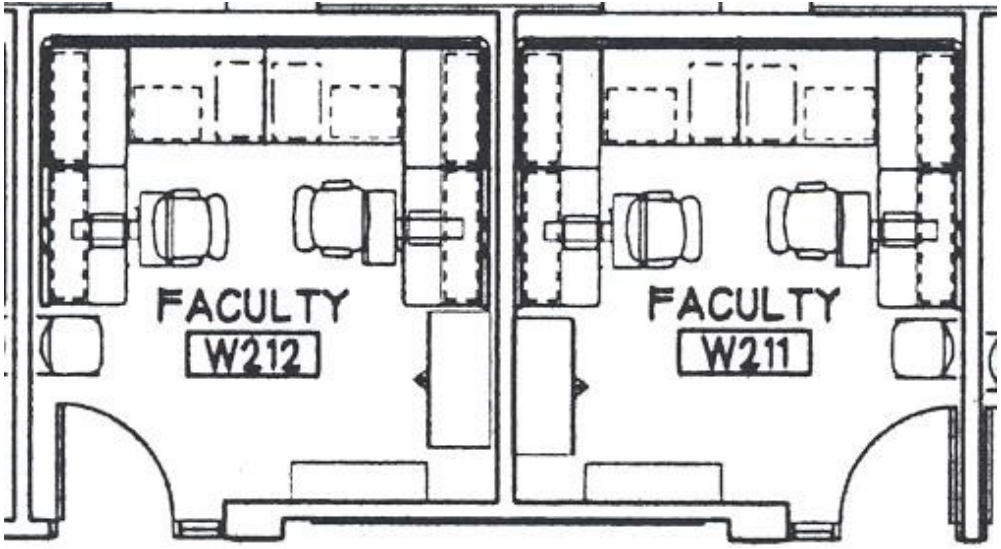
Administrative offices are often innovative……

Many business spaces are open offices with transparent and translucent partitions to assist in ease of communication, sharing info and having a small space feel much larger !

Teaming is an attribute

Shared Offices





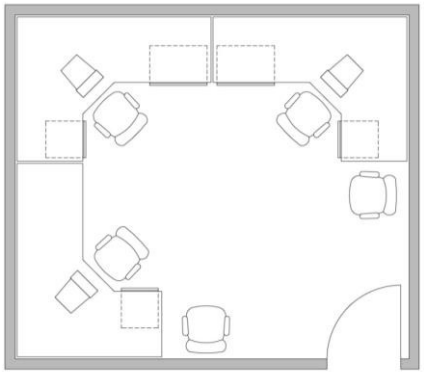
Reevaluate office space and the way work is conducted to systemically improve space use and space utilization.

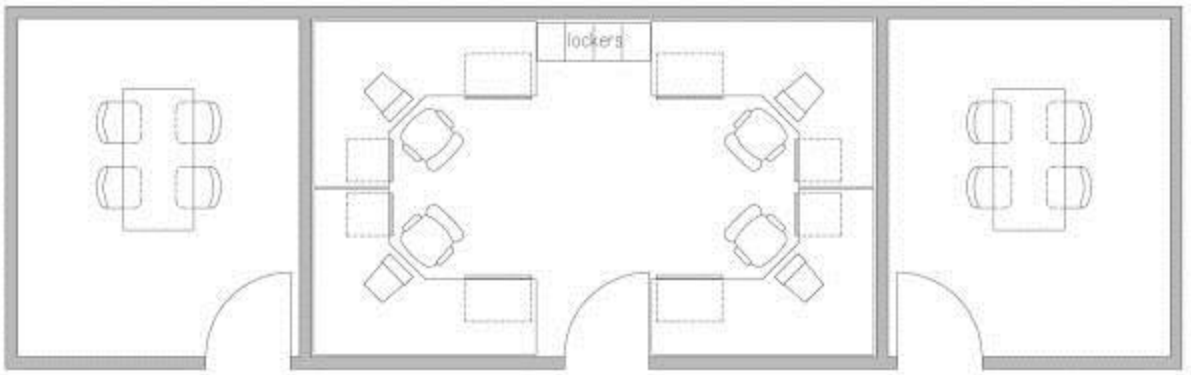
Working collaboratively can produce benefits.

Understand and communicate the concept an “office” is ***not*** a permanently owned space.

Many private corporations have long embraced the idea of open offices for the benefit of communication, collaboration and effectiveness.

Critical to allow areas for private conversations and meetings.





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Think Smaller Offices

- Proper equipment
- Proper storage
- **Access to other rooms for privacy, student conf, teaming -**
- Provides additional layer of security.

Anoka Ramsey Community College
Cambridge campus
Great offices at 81 sq ft

Think Smaller Offices

Reduction from 120 to 100 sq ft office

Every 10 offices built - - -

Yields a 200 sq ft conference room available to all students and staff for teaming…

Understand the Space problem is not always about “space”.

Design and organizational consultant – example from Univ of Mn and brightspot strategy

space utilization initiative

The Space Utilization Initiative is about developing a comprehensive institutional space management strategy:

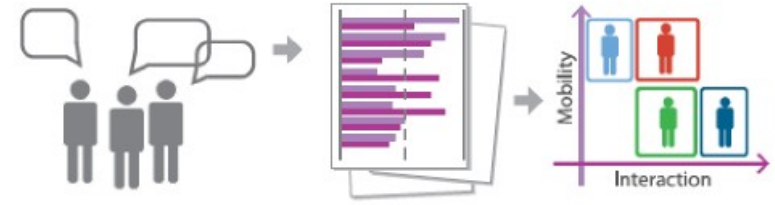
- Focus capital investment on renewal / replacement by emphasizing renewal, replacement, and space efficiency projects in capital plans
- Develop new space management tools through UM Analytics and the new Enterprise Asset Management (EAM) system.
- Implement Work+ to align space with how people work today and reduce the demand for net new space
- Continue efforts to decommission obsolete buildings and terminate leases

Understand the Space problem is not always about “space”.

Design and organizational consultant – example from Univ of Mn and brightspot strategy
Promoting alternative workspace strategies

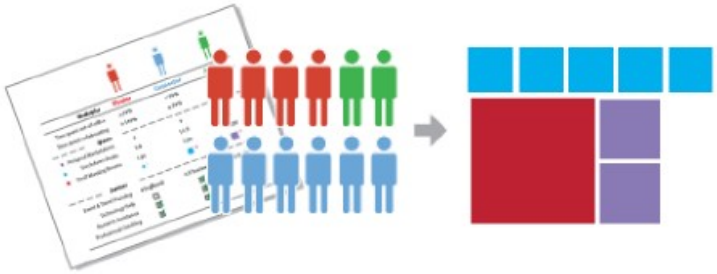
workstyles

Using work styles to understand needs and allocate space and technology



Staff take workplace survey

Translate survey responses to workstyle assignments



Create a space program from the kits-of-parts and workstyle assignments

Workstyle Programming Tool						
Space Program Calculator						
Workstyle Name	Campus Mobile Collaborative	Mobile Individual	Mobile Collaborative	Resident Individual - Focus	Resident Individual - Paper	Resident Confidential
% of Headcount by Workstyle	8%	3%	9%	67%	14%	0%
Headcount by Workstyle	5	2	6	44	9	0
Neighborhood Individual Space						
Unassigned Workstations (decimal)	1.67	1.33	4.00	0.00	0.00	0.00
Dedicated Workstation (Focus)	0.00	0.00	0.00	44.00	0.00	0.00
Dedicated Workstations (Paper-Heavy)	0.00	0.00	0.00	0.00	9.00	0.00
Offices	0.00	0.00	0.00	0.00	0.00	0.00
Touch down Workstations	0.25	0.10	0.30	2.20	0.45	0.00
Neighborhood Collaborative Space						
Phone Booths (1-2 ppl)	0.25	0.07	0.60	1.47	0.30	0.00
Huddle Rooms (1-4 ppl)	0.25	0.07	0.60	0.88	0.18	0.00
Small Meeting Room (5-8 ppl)	0.10	0.04	0.30	1.10	0.23	0.00
Medium Meeting Room (9-16 ppl)	0.10	0.02	0.20	0.44	0.09	0.00
Large Meeting Room (17-24 ppl)	0.05	0.02	0.06	0.44	0.09	0.00
Open Meeting Area (6 ppl)	0.25	0.07	0.60	0.88	0.18	0.00
Floor / Building Shared Amenity Space						
Working Lounge (24 ppl)	0.02	0.01	0.02	0.18	0.04	0.00
Library/Literature Room	0.02	0.01	0.02	0.18	0.04	0.00
Quiet Area / Room (8 ppl)	0.10	0.10	0.12	0.88	0.18	0.00
Storage Space						
Central Storage for Floor	0.05	0.02	0.06	0.44	0.09	0.00

work+ tools

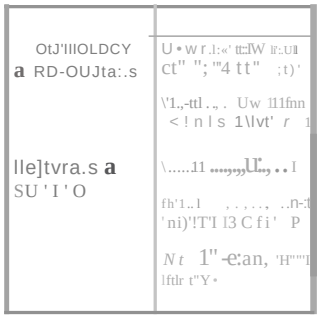
Interviews

Online Surveys

Workshops

Walkthroughs

Questionnaires



Workstyles

Space Programs

Category	Ratio / HC	Area/Space
Individual	1/1	120
Individual	1/1	45
	1/1	65
Individual	1/1	25
Collaborative	1/20	50
Collaborative	1/40	100
Collaborative	1/40	100
Collaborative	1/50	200

Adjacencies

Reviews

Post-Occupancy

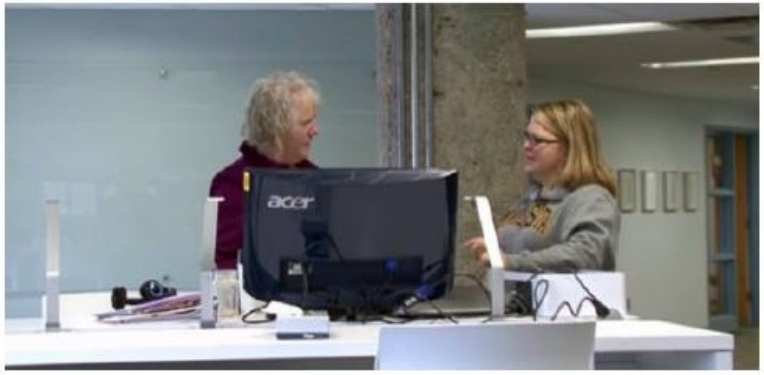
work+ training

Work+ doesn't just expect people to work differently, it gives them the tools and training to do so.

New Ways of Working	Workplace Storage	Managing Flexible Teams	Workplace Technology	Workplace Norms & Protocols
Understanding how to organize your day to work wherever you are most productive	Assessing current filing practices and options and then creating future filing	Learning how to set SMART goals to guide work and measure progress among a mobile workforce	Learning tools for vo1ce comms, data, and collaboration for activity-based working	Collectively establishing the norms and culture for a space in order to make the most of it

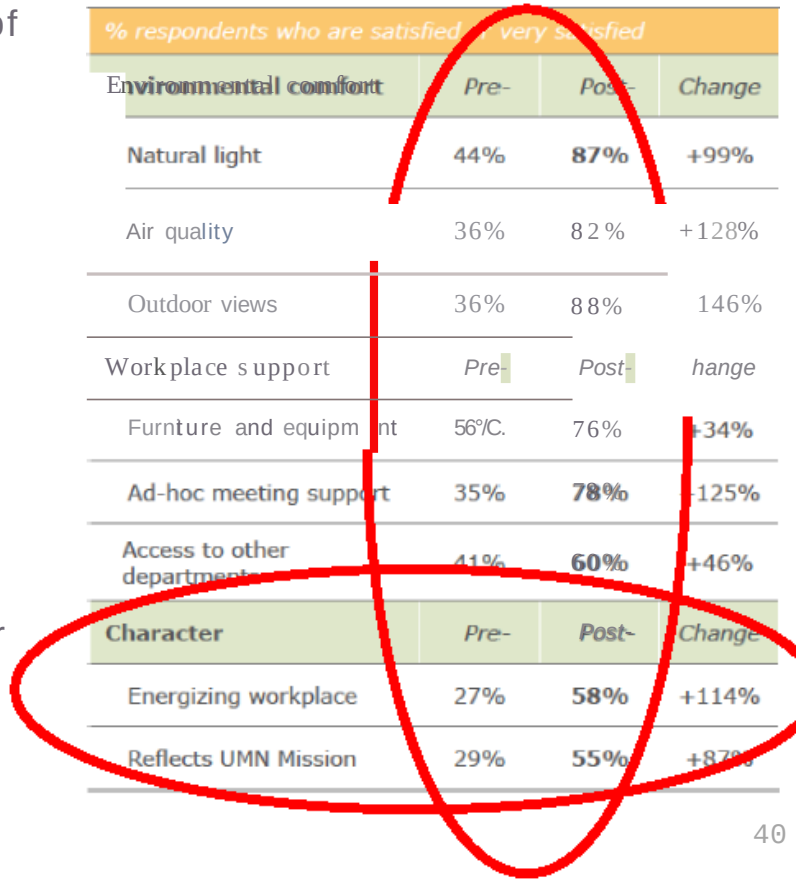
OHR Work+ finished space




OHR work+ post-occupancy evaluation

- More energizing workplace: satisfaction with the energy of the workplace went from 27% to 58% (but distractions also up slightly, by 17%)
- Sense of "One OHR" increased, with more inter department collaboration, coming somewhat at expense of intra-department cohesion
- Perceived importance of working with colleagues increased, from 25% ranking it first to 45% ranking in first
- Staff spend their time differently, for instance -33% less time at desk & -SO% more time collaborating informally
- Staff are saving time, including getting peer and manager feedback faster - down 69% from peers and 84% from managers



% respondents who are satisfied / very satisfied			
Environmental comfort	Pre-	Post-	Change
Natural light	44%	**87%**	+99%
Air quality	36%	82%	+128%
Outdoor views	36%	88%	146%
Workplace support	Pre-	Post-	hange
Furniture and equipment	56%	76%	+34%
Ad-hoc meeting support	35%	**78%**	+125%
Access to other departments	41%	**60%**	+46%
Character	Pre-	Post-	Change
Energizing workplace	27%	**58%**	+114%
Reflects UMN Mission	29%	**55%**	+87%

All Spaces have costs
All Spaces use energy and All Spaces = Learning Places

- **What? Analysis** of space is important – graphics help tell the story
- **When and Where?** Share information in multiple ways to convey critical information – trust the users - maps, charts, graphs
- **Why ? ALL spaces – ALL work is important** – no stone unturned!
- **Who?** Include diversity in team/multiple users to gather input
- **How? ALL spaces are potentials for improvement**
- **Process**; active, messy, complicated and needs champion or shepherd of importance to assist in finding the financial hook or implication

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Every space
can be a special learning space-

with ability to improve energy use, deferred conditions, learning outcomes, working efficiency, as well as enhanced space use!

Before - above
After – left

Exterior ‘class’ is actually scheduled!

Sally Grans Korsh
202-861-2571
sgranskorsh@nacubo.org

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Trends & Opportunities in Research Space
Kathy Ramirez Aguilar

U.S. DEPARTMENT OF ENERGY

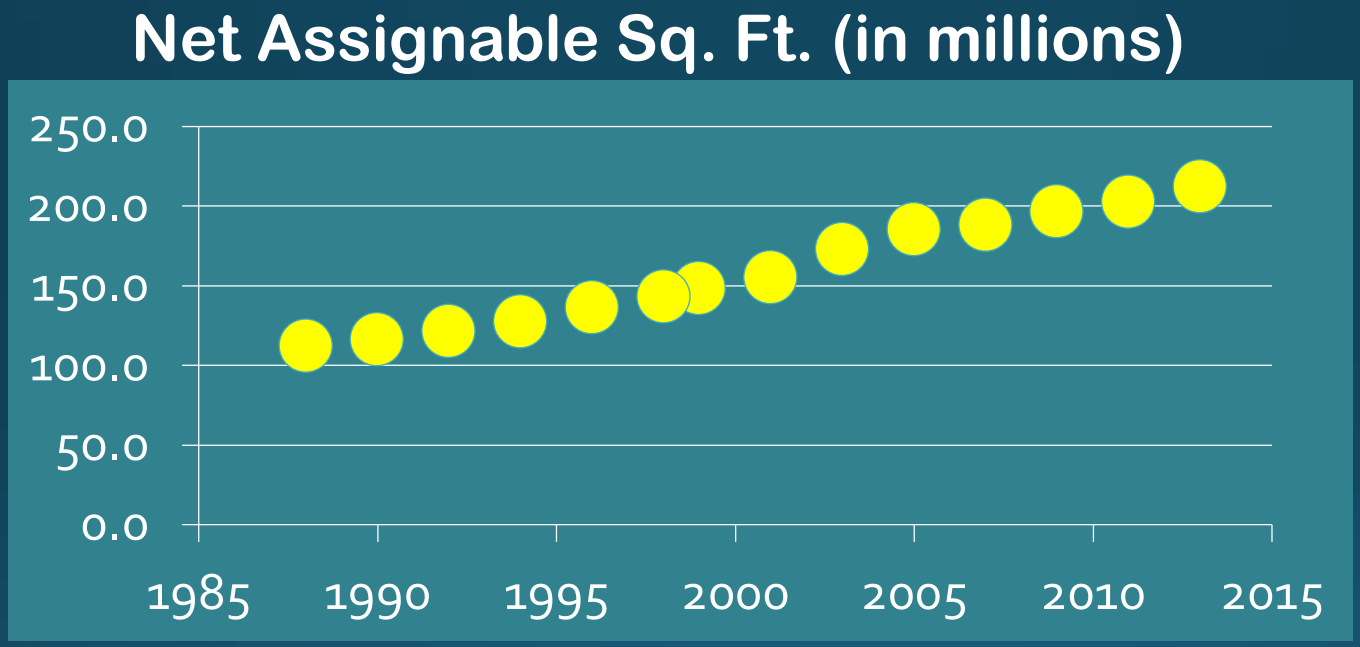
The consequences of growing US university research space

&

Benefits of using research space efficiently

Kathy Ramirez-Aguilar
University of Colorado Boulder
kramirez@colorado.edu

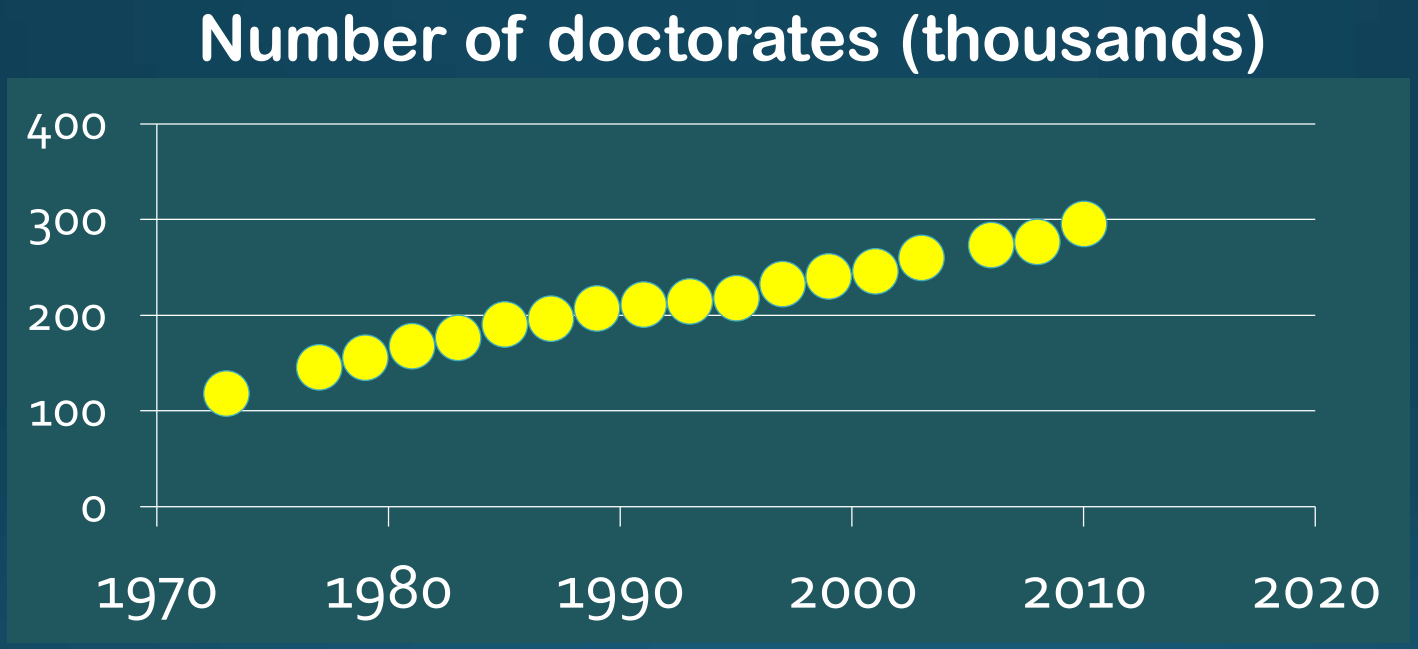
Increasing US university research sq.ft.



Source: http://www.nsf.gov/statistics/2015/nsf15316/

89% growth between 1988 & 2013

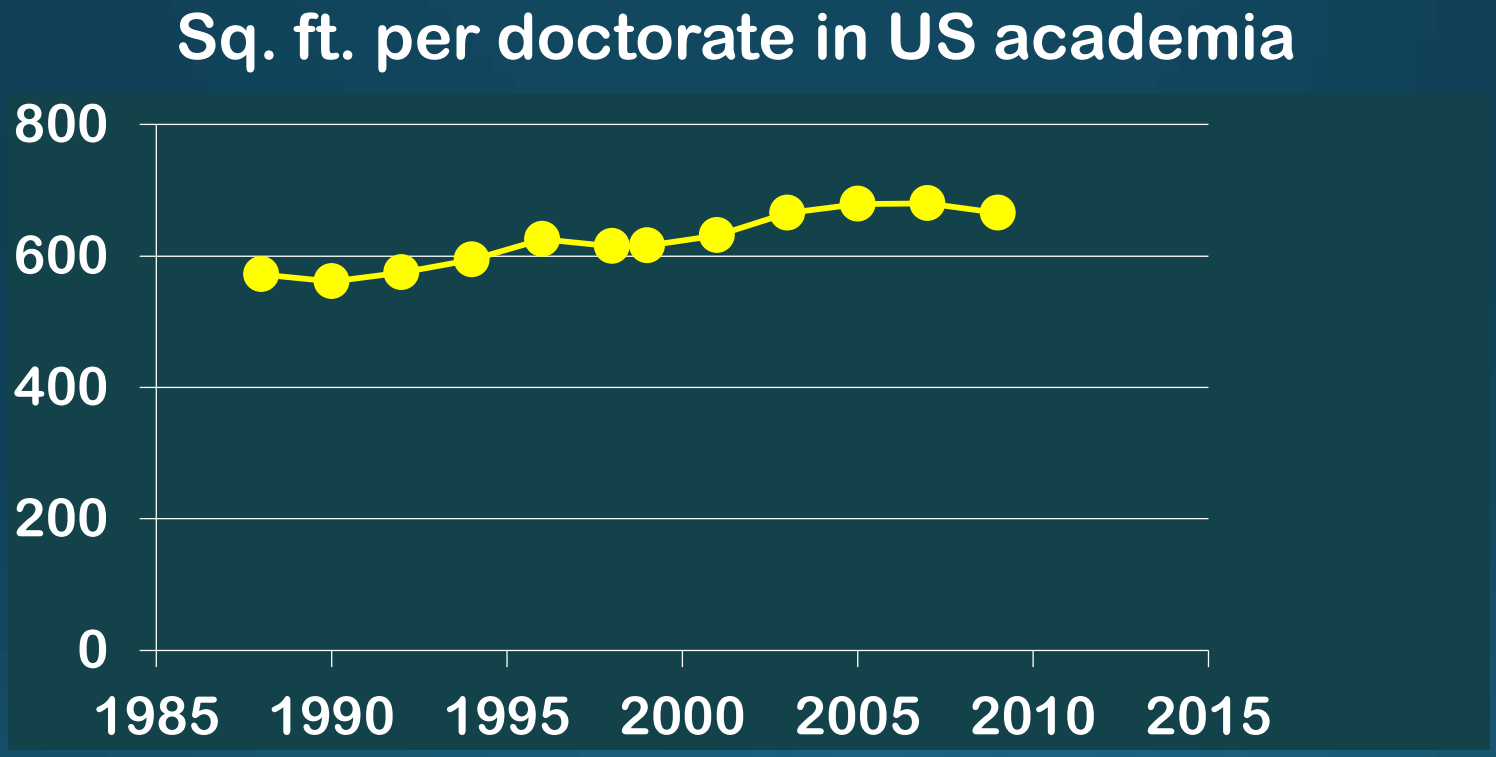
Growth of doctorates (science, engineering, health) employed in US academia



Source: http://www.nsf.gov/statistics/seind14/content/chapter-5/at05-15.pdf

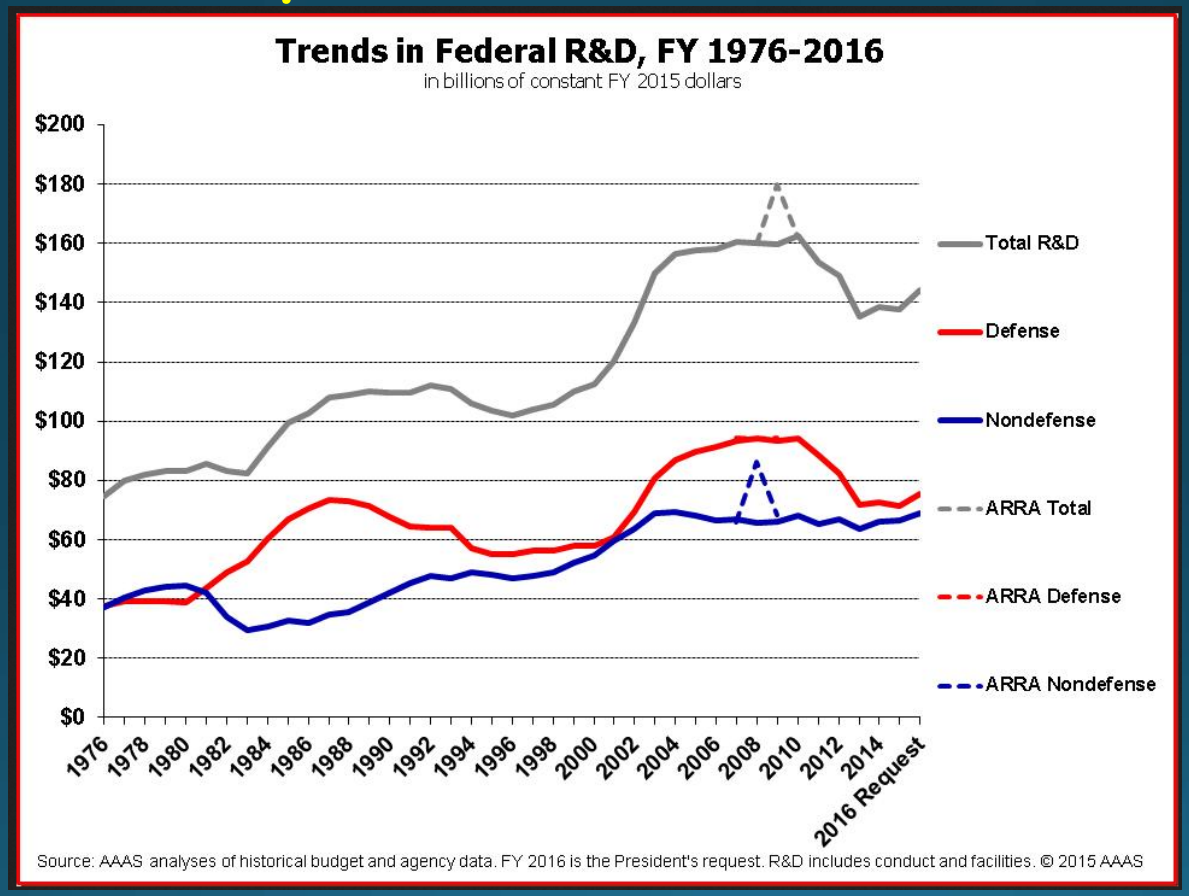
50% growth between 1987 & 2010

Space is growing faster than doctorates working in US academia

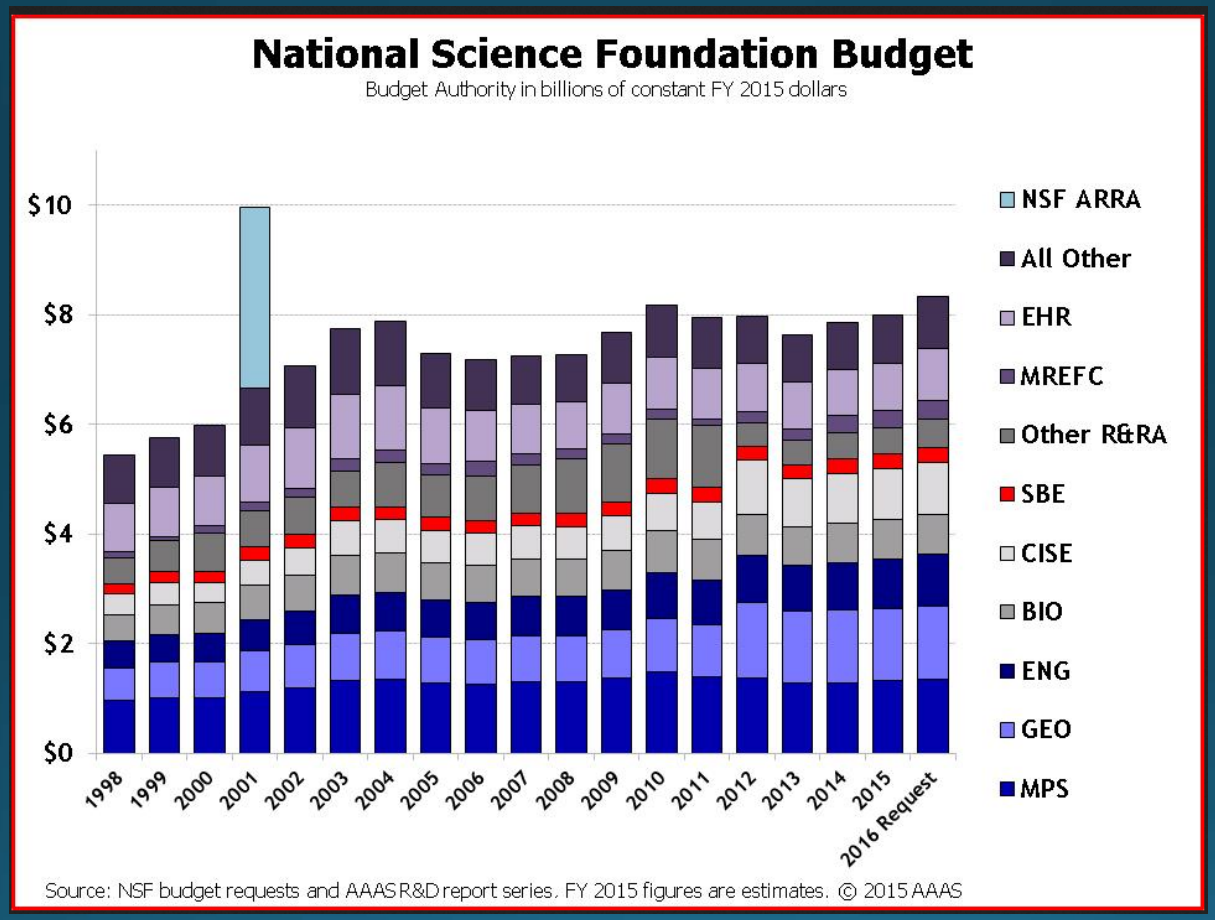


20% increase between 1990 & 2007

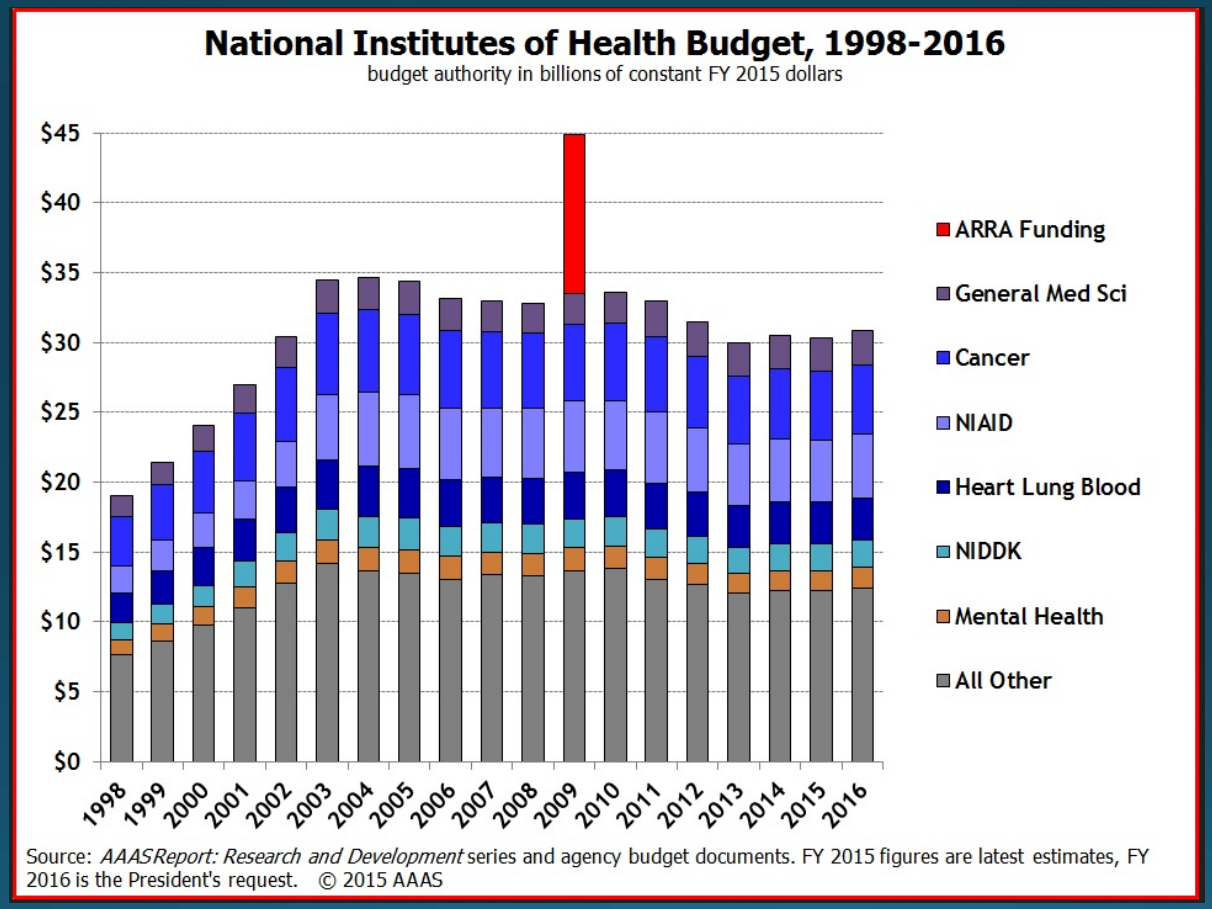
Non-defense US federal funding plateaued in 2003



NSF Funding 1998-2015



NIH funding 1998-2015

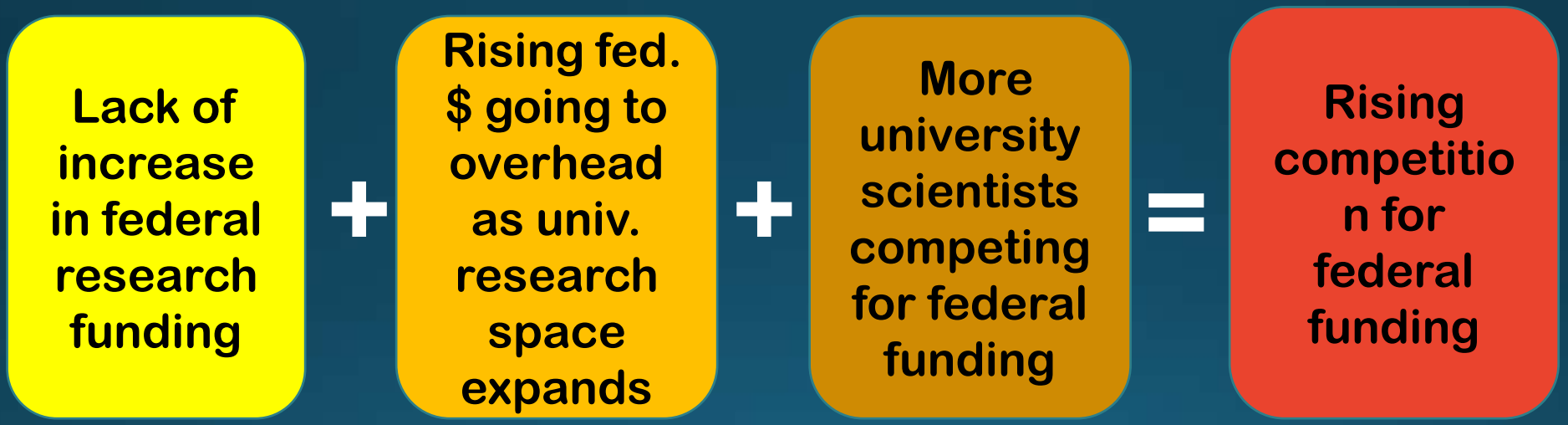


Majority of US University Research Is Funded by Federal Government

% research funding from federal govt.

CU–Boulder (FY14) = 80%
Univ. of Michigan (FY14) = 57%
Dartmouth (~FY14) = 86%
Stanford (~FY14) = 80%
Univ. of Florida (FY14) = 66%
Northwestern Univ. (FY14) = 73%
Univ. of Chicago (FY13) = 74%
Iowa State (FY15) = 53%
Penn State (FY14) = 62%
Rutgers Univ. (FY14) = 53%
UC-Davis (FY14) = 53%
UC-Irvine (FY15) = 66%
UC-Santa Barbara (FY15) = 78%
Univ. of Kansas (FY14) = 80%
Univ. of Minnesota (FY15) = 61%
Univ. of Oregon (FY15) = 90%
Univ. of Washington (FY15) = 80%
Princeton (FY14) = 72%
Univ. of Rochester (FY15) = 75%
Univ. of Wash.- St. Louis (FY15) = 75%

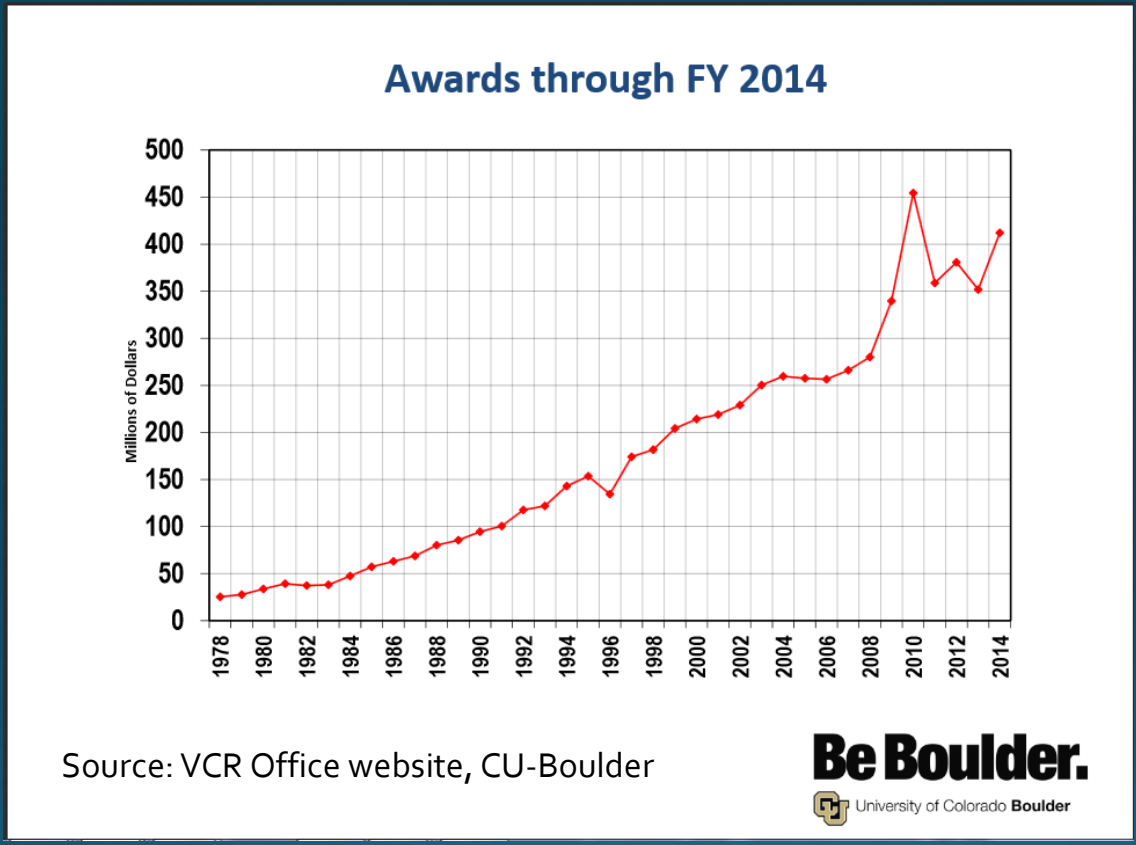
Why are scientists facing tough competition for federal funding?



As US universities think about continuing to expand research space…

- Federal research funding is not growing like it did prior to 2003, and is being stretched and stretched
- Federal F&A dollars will only come in if scientists are able to bring in federal grants

Likely the trend that large research universities are used to:



https://www.colorado.edu/vcr/sites/default/files/attached-files/ResBudgetDec.pdf

Uniform Guidance CFRs requiring equipment sharing & avoid duplication

Uniform Guidance CFR 200.313 c2

"must also make equipment available for use on other projects or programs currently or previously supported by the Federal Government, provided that such use will not interfere with the work on the projects or program for which it was originally acquired.": http://www.ecfr.gov/cgi-bin/text-idx?SID=597cf895a4e1859ccf447c54c795d4b3&node=se2.1.200_1313&rgn=div8

Uniform Guidance CFR 200.318 d

"must avoid acquisition of unnecessary or duplicative items" : http://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1.4.31&rgn=div7

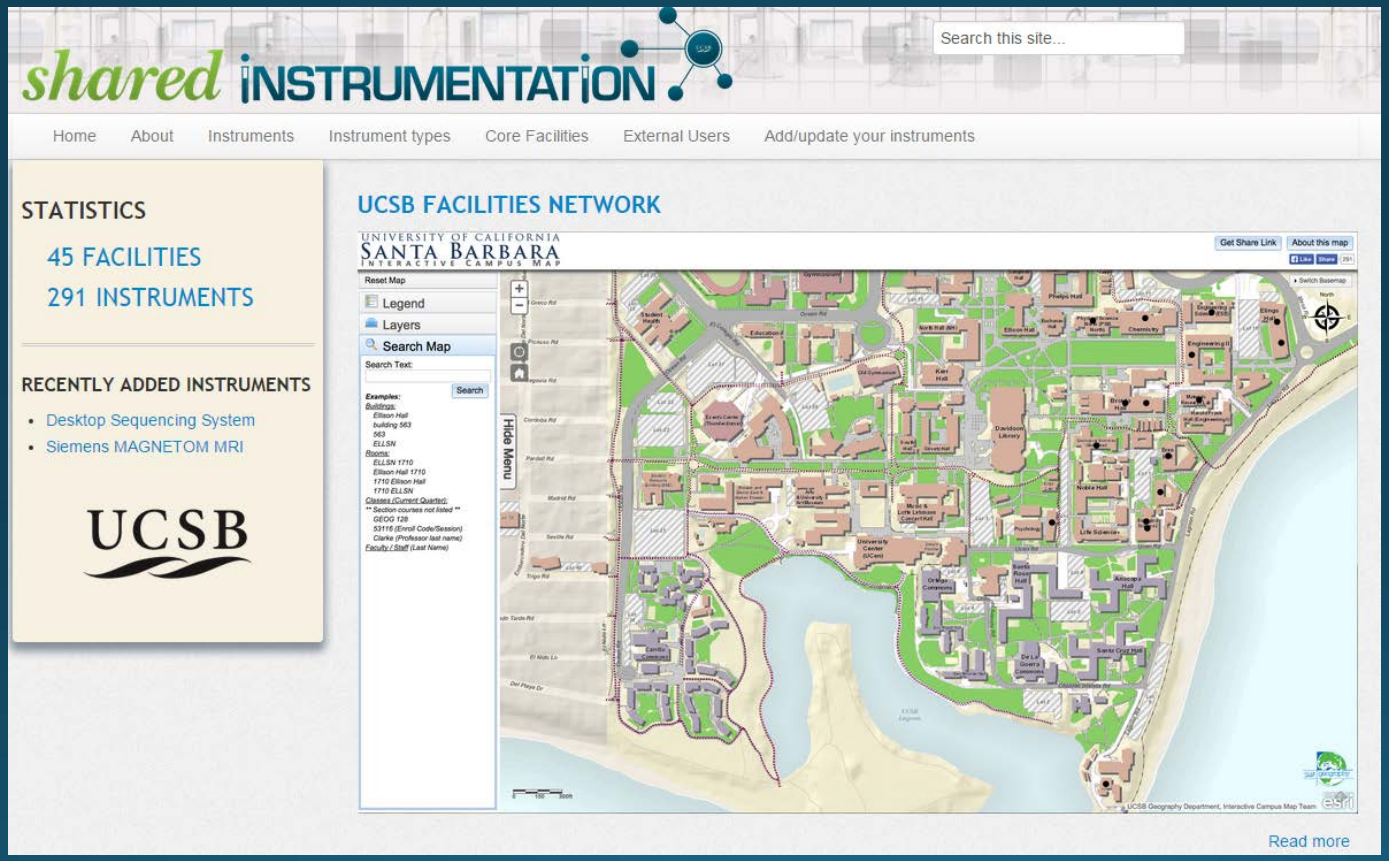
Benefits of shared equipment in shared spaces

- Saves funding
- Saves time
- Attracts talent & promotes collaboration
- Benefits space & equipment utilization
- Compliance with CFRs
- In line with campus sustainability goals

Great example of sharing equipment and space

- No names on doors policy
- Collaborative spaces with collaborative equipment
- Grant ends- institute responsibility for equip
- Small start-up packages saving $
- Offer letter explains equip. policy
- Collaborative atmosphere brings in $

UCSB Shared Instrumentation On-line Tool



www.sharedinstrumentation.ucsb.edu

Greening Grants Meeting TODAY 2PM-5:30PM

Join us!

Efficient use of resources

- Maximizing effective use of federal research funding
- Minimizing the environmental footprint of research

Discussion

U.S. DEPARTMENT OF ENERGY

Thank you!

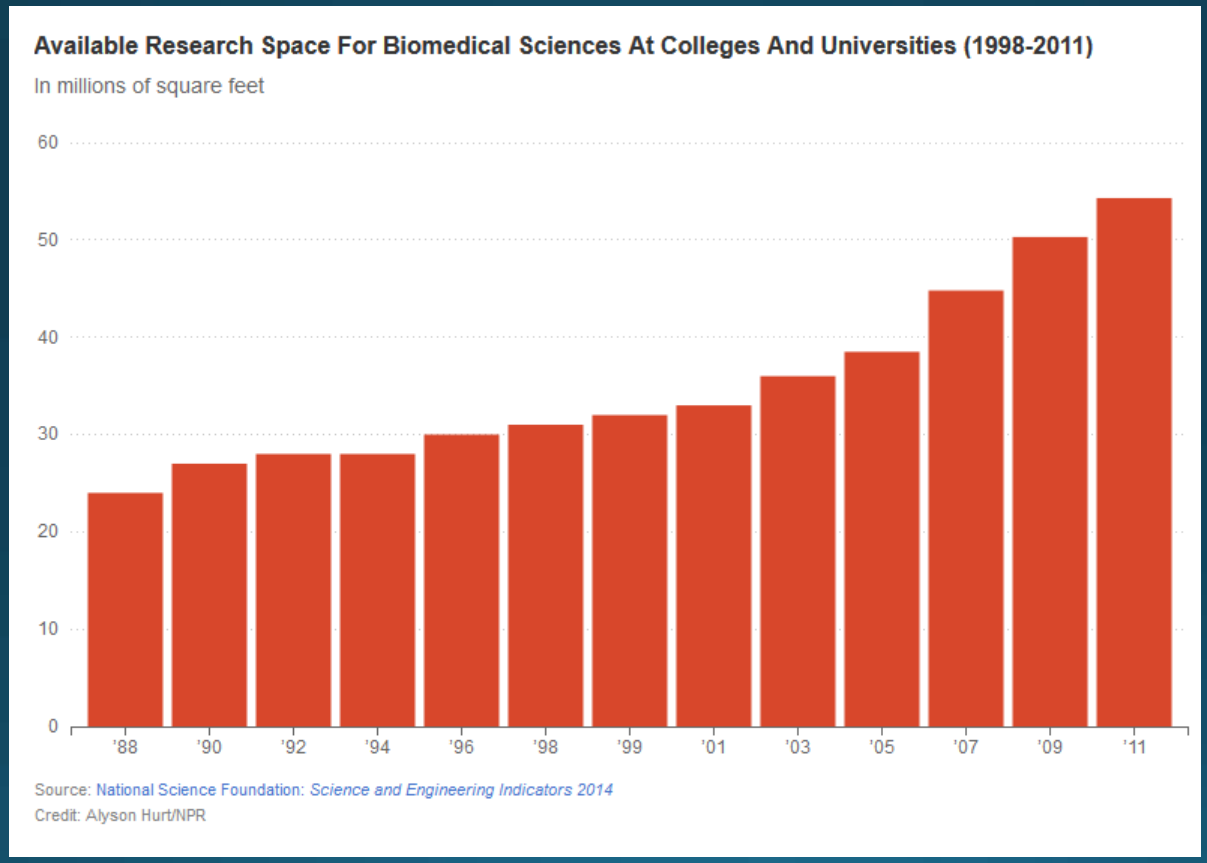
Sally Grans Korsh
NACUBO
(202) 861-2571
SGransKorsh@nacubo.org

John Bernhards
APPA: Leadership in Educational Facilities
(703) 542-3848
John@appa.org

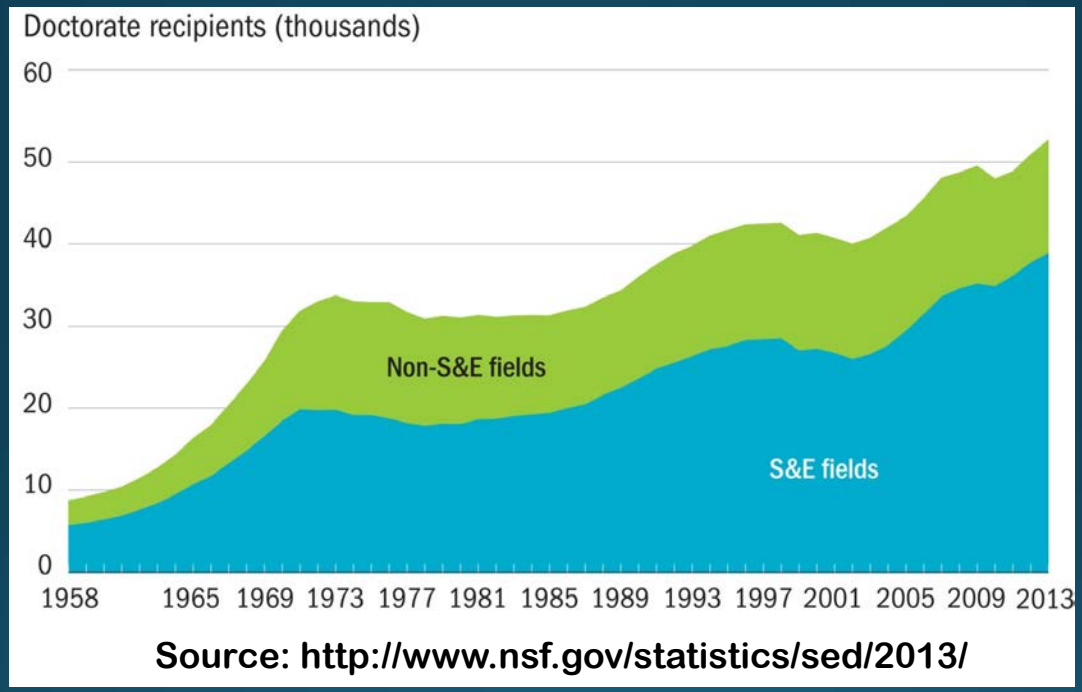
Kathy Ramirez-Aguilar
University of Colorado Boulder
(303) 859 2068
KRamirez@colorado.edu

Appendix

Increasing US Biomedical univ. sq.ft.



Increasing Doctorates Awarded in US 1958-2013



Source: http://www.nsf.gov/statistics/sed/2013/

- 30-40% of Science & Engineering (S&E) doctorates hold temporary visas (1993-2013)