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
Why Space Management?
Why Now?

UNDERUTILIZED
EXPENSIVE
IN DEMAND
"FREE"

Campus Space Is...

POORLY MEASURED
OFTEN TIMES, POORLY MANAGED

... AND CANNOT BE IGNORED!
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/APP A 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)
• 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](http://www.appa.org/bookstore)
Thank you!

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Strategic and Planning Alignment
Sally Grans Korsh
Curbing Campus Growth: Using Space Wisely

Strategic and Planning Alignment

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?

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

**HOW** is it used?
Regular, sporadic, students, community?
Why, What, Where, How
Planning Space Alignment to Strategic Mission -
Form *Does* Follow Function

- Mission
- Academics
- Demographics
- Community Context
- Workforce
- Research Other
- Space Utilization: Building, Day and Hour
- Specific Unique Factors
- Historical Context
- Energy Use
- Finance: Debt
- Program Fit
- Operations
- Physical Condition: Age, Original Maintenance, Expected Life Cycle
- Security Risk Manage
- Energy Efficiency
Planning Alignment to Strategic Mission
Space = Master Plan
Incremental Plan – NOW up to Five Years
to Long term – 25-50 Mission Vision Goals

Cost – what is cost of design and construction and sale impact?
Scope – what is the project, type, size, functions, spaces?
Schedule – how will timing of overall design, construction and sale impact cost and scope?

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

Specific Unique Factors: History, Workforce

Mission Academics
Energy
Utilization
Financial: Debt
Security Risk Manage
Demographics Community Context
Physical Condition

Research Other

Academics
Security
Risk Manage

Mission

Research

Demographics
Community Context

Energy

Operational Funds from Campuses – Repair and Replacement

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Research Other

Academics
Security
Risk Manage

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

Pre-design

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

Operational Funds from Campuses – Repair and Replacement

Legislative Appropriation: Fundraising/Donors

Revenue/Debt Bond Sale

Other Funding: Donations, Grants, Partnerships

Space Utilization & Energy Use:
- Classroom
- Office

Incremental Plan – NOW – 5 Years

Planning Utilization/Space:

- How will the project, type, size, function, and scope be aligned?

Cost – What is the cost of design and construction and sale impact?

Schedule – When is the overall design, construction, sale completion, and scope?
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
Intersection of Space and Key Facilities Metrics = VALUE

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?

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<th>Assignable Sq Ft</th>
<th>Actual Research Institution</th>
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*Total - verify if all office space*

| Residential      | 22%                           | .5               | NA                       |
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### Notes
- Core Hours: 8am-4pm
- Other Hours: 5pm-11pm

**University of North Dakota**

**June 2013**
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.)
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 and** labs for departmental use and scheduling
- **Establish space utilization standards**, guidelines and targets
- **Establish standardized inventory** 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


Why Space is Used: Existing Classroom Conditions

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, classrooms, 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 the 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 markers, chalk boards, an instructor station and technology equipment. Technology packages vary by classroom and include manual and motorized projection screens, overhead projectors, televisions, flat screen LCD’s, computers, digital controls, DVD’s and VHS machines.

There is also a wide variety of classroom furniture in use at UND including: moveable tablet arm chairs; fixed tablet arm chairs; moveable tables with fixed chairs; moveable tables with moveable chairs; and multiple sizes and shapes of tables. Architectural finishes within classrooms are generally similar in nature and include painted walls, suspended ceilings and carpeted floors. In many cases, rooms appear dated and dated.

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

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**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
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 Centered Active Learning Environment with Upside-down Pedagogies
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
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 common and main entry becomes “hang out – touch down” space
Taking space liabilities and creating assets

Before

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

![Diagram showing mobility and interaction]

Staff take workplace survey
Translate survey responses to workstyle assignments

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

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<tr>
<th>Workstyle Programming Tool</th>
<th>Campus Individual</th>
<th>Mobile Individual</th>
<th>Mobile Collaborative</th>
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<td>Phone Booths (1-2 ppl)</td>
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<td>Huddle Rooms (1-4 ppl)</td>
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<td>0.23</td>
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<td>Large Meeting Room (17-24 ppl)</td>
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<td>Floor / Building Shared Amenity Space</td>
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<td>Working Lounge (24 ppl)</td>
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<td>0.02</td>
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<td>Library/Literature Room</td>
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<td>0.01</td>
<td>0.02</td>
<td>0.05</td>
<td>0.04</td>
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<td>Cafeteria / Cafeteria Area</td>
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<td>0.02</td>
<td>0.00</td>
<td>0.44</td>
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</table>
work+ tools

Interviews

Online Surveys

Workshops

Walkthroughs

Questionnaires

Workstyles

Space Programs

Adjacencies

Reviews

Post-Occupancy

brightspot strategy I University of Minnesota 36
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
Understanding how to organize your day to work wherever you are most productive

Workplace Storage
Assessing current filing practices and options and then creating future filing

Managing Flexible Teams
Learning how to set SMART goals to guide work and measure progress among a mobile workforce

Workplace Technology
Learning tools for voice comms, data, and collaboration for activity-based working

Workplace Norms & Protocols
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 interdepartment 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 & -80% more time collaborating informally
- Staff are saving time, including getting peer and manager feedback faster - down 69% from peers and 84% from managers
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
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
Trends & Opportunities in Research Space
Kathy Ramirez Aguilar
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.

Net Assignable Sq. Ft. (in millions)

89% growth between 1988 & 2013

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

Number of doctorates (thousands)


50% growth between 1987 & 2010
Space is growing faster than doctorates working in US academia

Sq. ft. per doctorate in US academia

20% increase between 1990 & 2007
Non-defense US federal funding plateaued in 2003
NSF Funding 1998-2015

National Science Foundation Budget
Budget: Authority in billions of constant FY 2015 dollars

Source: NSF budget requests and AAAS R&D report series. FY 2015 figures are estimates. © 2015 AAAS
Majority of US University Research Is Funded by Federal Government

<table>
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<tr>
<th>University</th>
<th>FY</th>
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<tbody>
<tr>
<td>CU–Boulder</td>
<td>80%</td>
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<tr>
<td>Univ. of Michigan</td>
<td>57%</td>
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<tr>
<td>Dartmouth (~FY14)</td>
<td>86%</td>
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<tr>
<td>Stanford (~FY14)</td>
<td>80%</td>
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<tr>
<td>Univ. of Florida</td>
<td>66%</td>
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<tr>
<td>Northwestern Univ. (FY14)</td>
<td>73%</td>
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<td>Univ. of Chicago (FY13)</td>
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<tr>
<td>Iowa State (FY15)</td>
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<tr>
<td>Penn State (FY14)</td>
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<td>Rutgers Univ. (FY14)</td>
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<td>UC-Davis (FY14)</td>
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<td>UC-Irvine (FY15)</td>
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<td>UC-Santa Barbara (FY15)</td>
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<td>Univ. of Kansas (FY14)</td>
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<td>Princeton (FY14)</td>
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<td>Univ. of Rochester (FY15)</td>
<td>75%</td>
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<tr>
<td>Univ. of Wash.- St. Louis (FY15)</td>
<td>75%</td>
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Why are scientists facing tough competition for federal funding?

- Lack of increase in federal research funding
- Rising federal $ going to overhead as university research space expands
- More university scientists competing for federal funding

Rising competition for federal funding
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.

As US universities think about continuing to expand research space...
Likely the trend that large research universities are used to:

Source: VCR Office website, CU-Boulder

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=2:1.1.2.1.4.31&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
Thank you!

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Institution</th>
<th>Phone Number</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sally Grans Korsh</td>
<td>NACUBO</td>
<td>(202) 861-2571</td>
<td><a href="mailto:SGransKorsh@nacubo.org">SGransKorsh@nacubo.org</a></td>
</tr>
<tr>
<td>John Bernhards</td>
<td>APPA: Leadership in Educational Facilities</td>
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<td><a href="mailto:John@appa.org">John@appa.org</a></td>
</tr>
<tr>
<td>Kathy Ramirez-Aguilar</td>
<td>University of Colorado Boulder</td>
<td>(303) 859 2068</td>
<td><a href="mailto:KRamirez@colorado.edu">KRamirez@colorado.edu</a></td>
</tr>
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Appendix
Increasing US Biomedical univ. sq.ft.

Available Research Space For Biomedical Sciences At Colleges And Universities (1998-2011)

In millions of square feet

Source: National Science Foundation. Science and Engineering Indicators 2014
Credit: Alyson Hurt/NPR
Increasing Doctorates Awarded in US 1958-2013

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