

Designing, Building and Evaluating a Healthy Building

FR 515

Friday, June 22, 2018

10:30 am – 11:30 am

1.00 LU/HSW/GBCI/RIBA

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Speakers List

- **James Kolker, FAIA, LEED AP BD+C**
Associate Vice Chancellor and University Architect
Washington University in St. Louis
- **Neal Matsuno, AIA, LEED AP BD+C**
Principal, Moore Ruble Yudell Architects & Planners
- **Adam Padua, Assoc. AIA, LEED AP**
Senior Associate, Moore Ruble Yudell Architects & Planners

Course / Learning Objectives

Learning Objectives:

- Examine the importance of designing buildings that support health, wellness, and collaboration to improve occupant productivity and satisfaction.
- Discuss methods of planning for wellness, equity, and flexibility to build innovative and empowering learning environments.
- Review design features that improve faculty, staff, and student workplace satisfaction, building satisfaction, individual effectiveness, and social networking.
- Explore an effective toolkit for evaluating a building's health and wellness performance.

Building Health and Measuring Wellness: Designing, Building, and Evaluating a Healthy Building



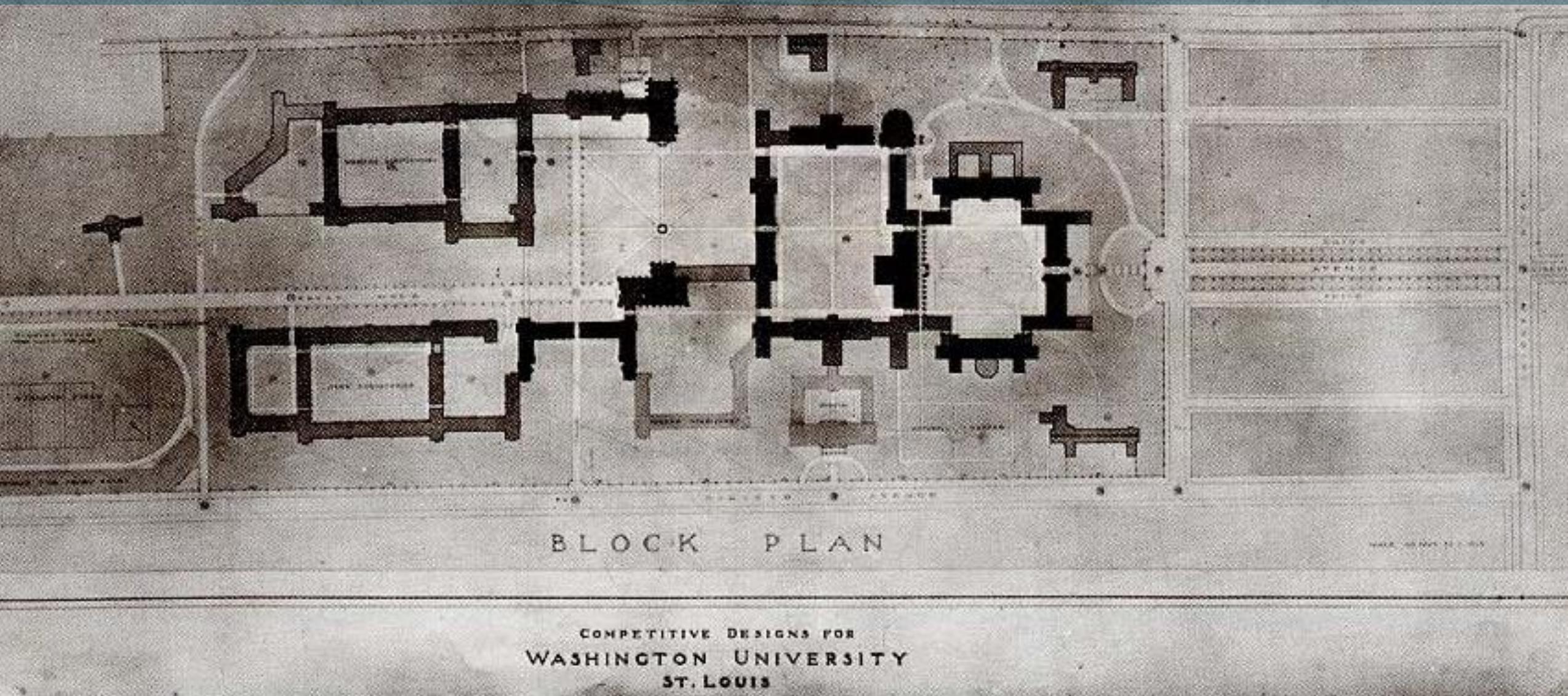
Washington University in St. Louis, Brown School of Social Work & Public Health

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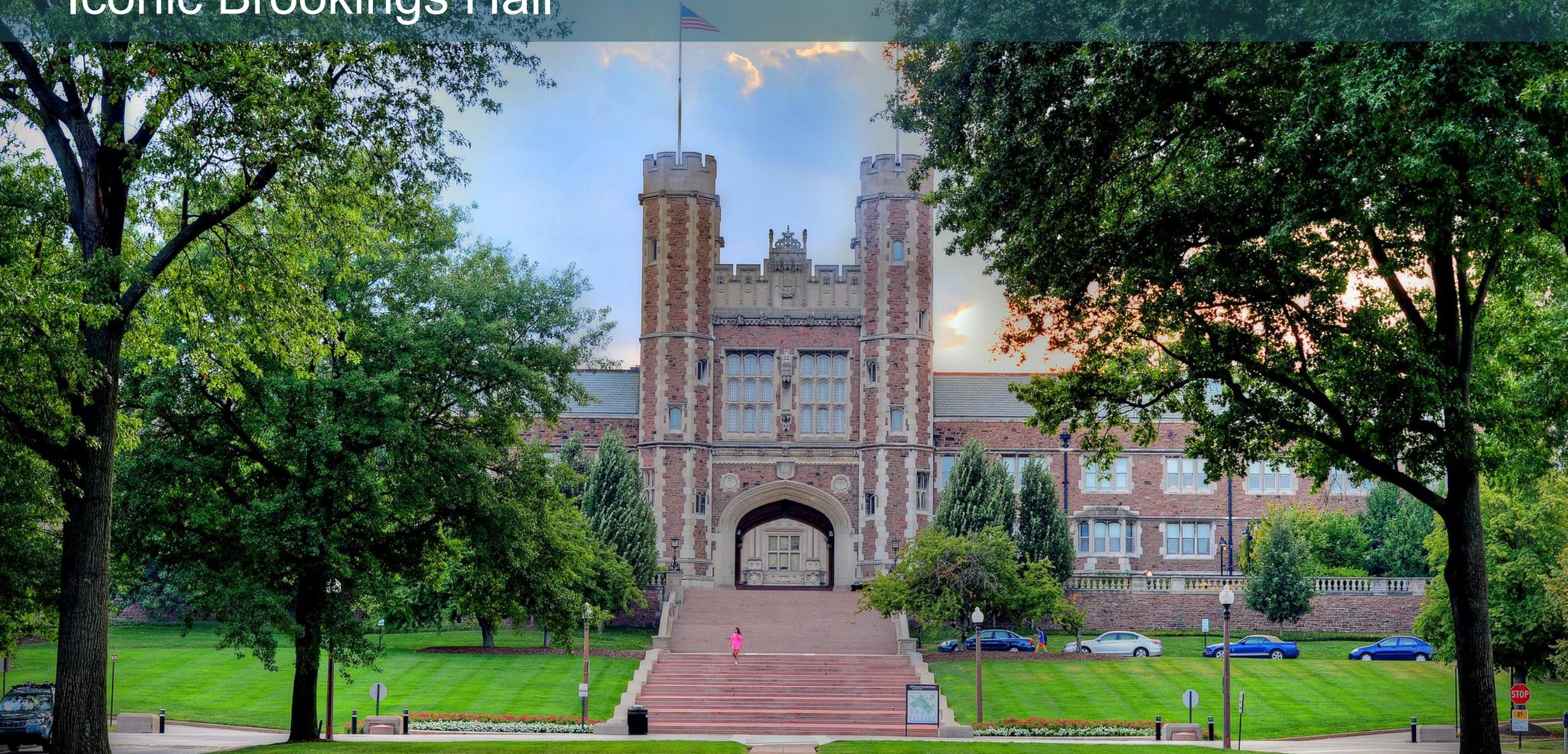
Designing, Building & Evaluating a Healthy Building

- Explore campus context and how study findings helped shape new East End
- Describe Brown School's Hillman Hall, a recently completed healthy building
- Present research tools & findings for measuring healthy outcomes
- Questions & Answers

Cope & Stewardson 1900 - Plan



Iconic Brookings Hall



Danforth Campus 2017



A Campus Transformation for Health & Wellness



Campus 2017

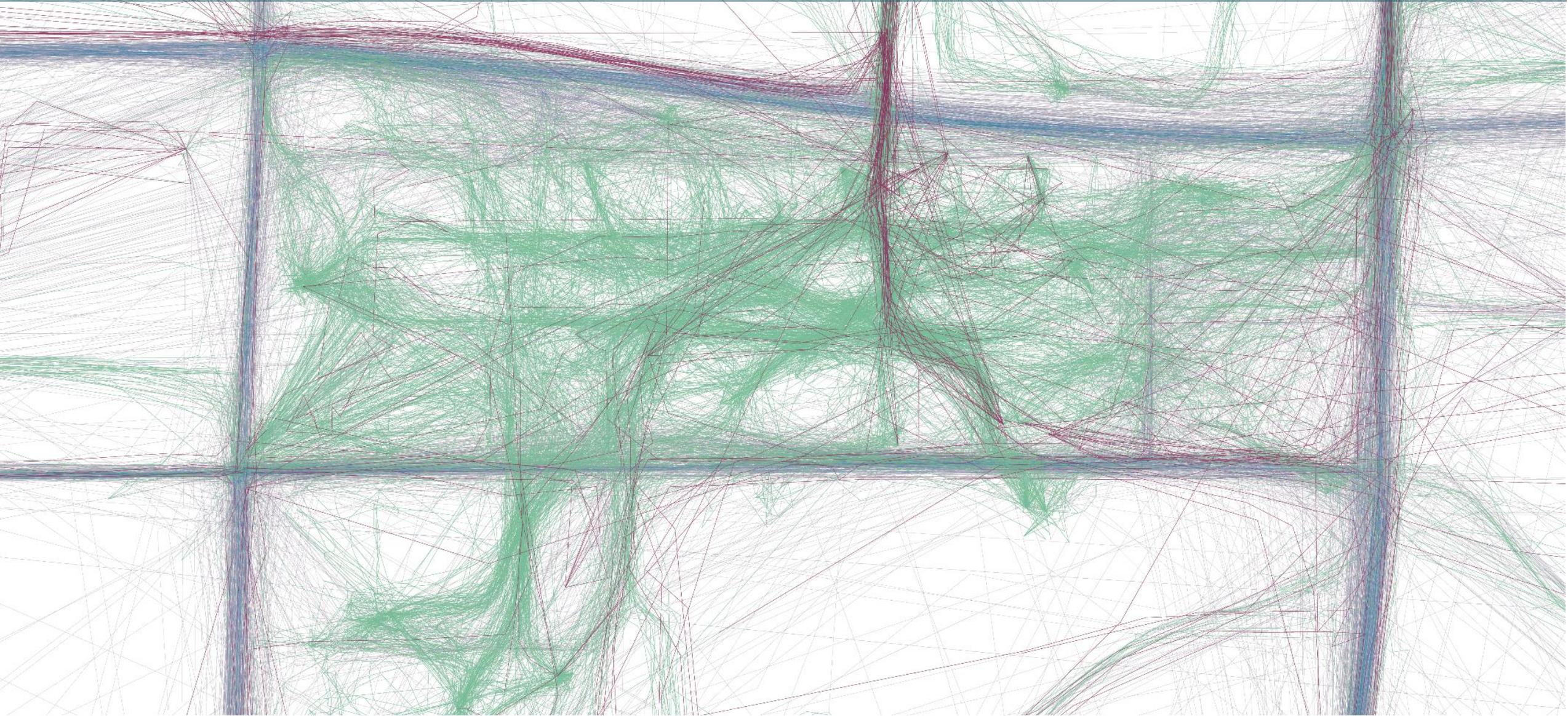


Hillman Hall

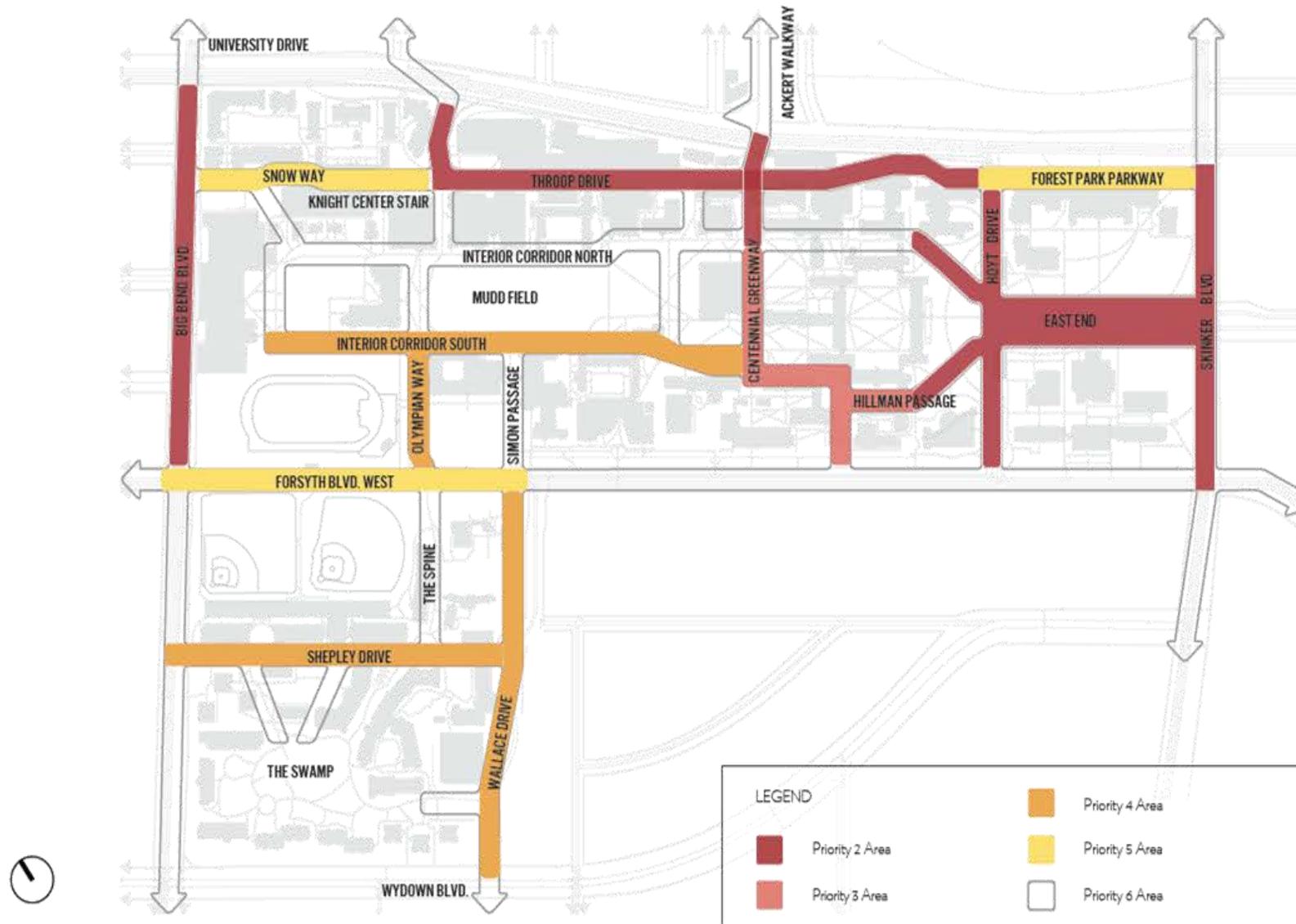
Campus 2020



Movement Tracking of Over 11,000 Trips



Prioritization & Implementation



Brown School of Social Work & Public Health

- First school of Social Work
Founded in 1913
- #1 Ranked School of Social Work
- School of Social Work and
Public Health
- Research Centers Include:
 - Diabetes Research
 - Mental Health Services
 - Obesity Prevention
 - Violence and Injury Prevention
 - American Indian Studies



“To Create Positive Social Change Through Research and Educational Excellence”



Inclusive Design Process

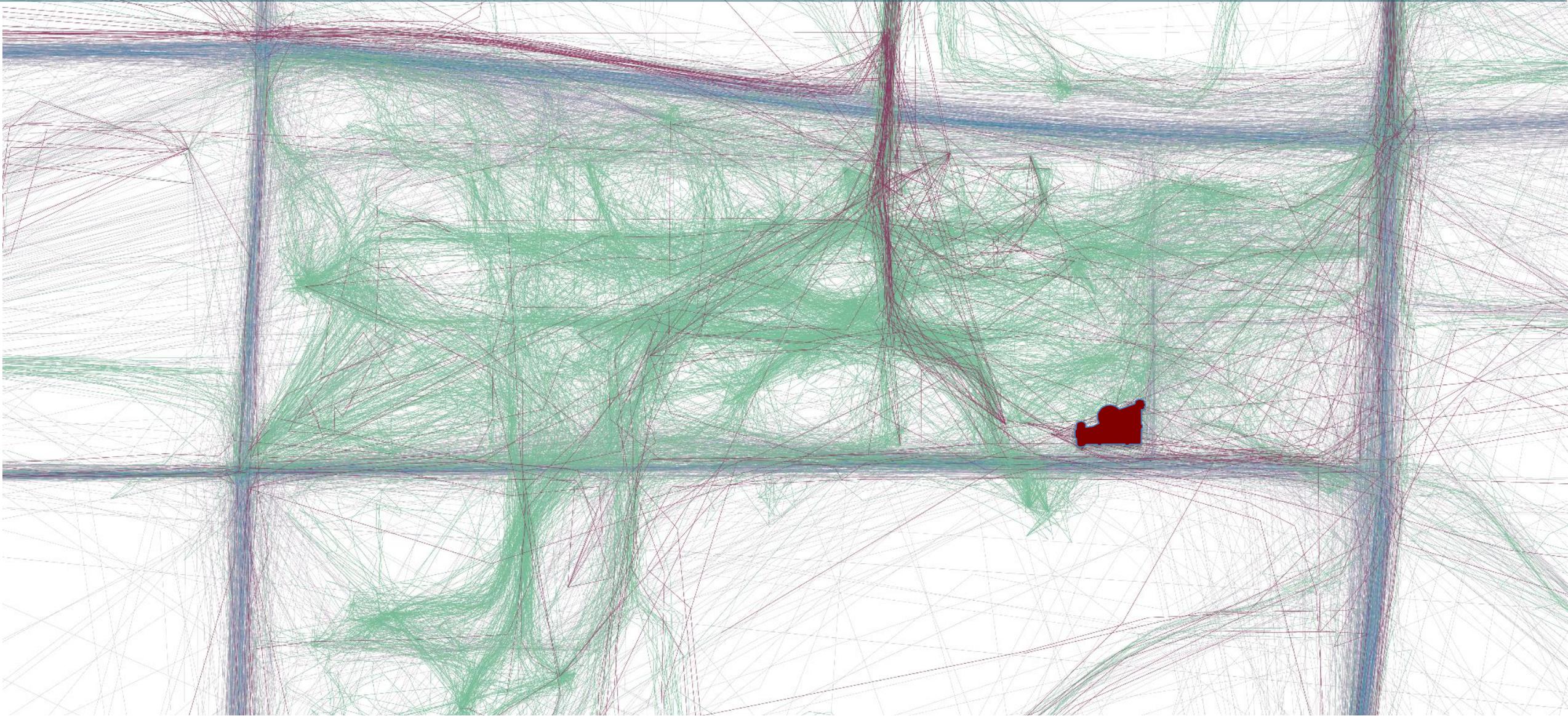


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Goals for Hillman Hall:

- Express core values of transparency, health, diversity, inclusiveness, inspiration and sustainability
- Encourage collaboration and communication
- Create strong indoor/outdoor connections
- Consider the physical, cognitive and sensory environment for occupants and visitors
- Test health and wellness outcomes to support healthy features in future buildings

Connecting Campus Paths



The Interior Street: Connecting Campus Paths



Hillman Hall in Context



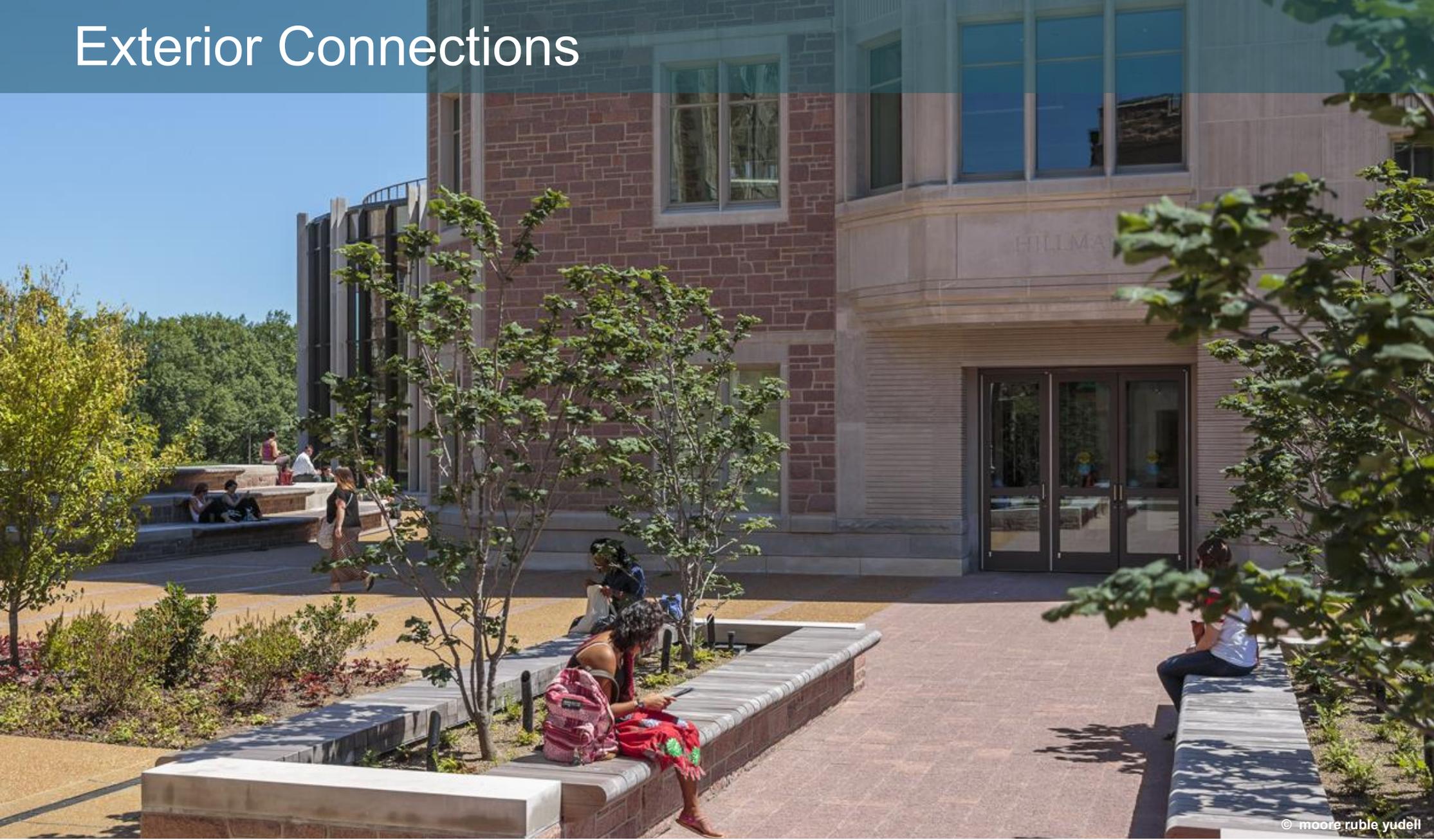
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Campus Gateway



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Exterior Connections



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Transparency & Welcome



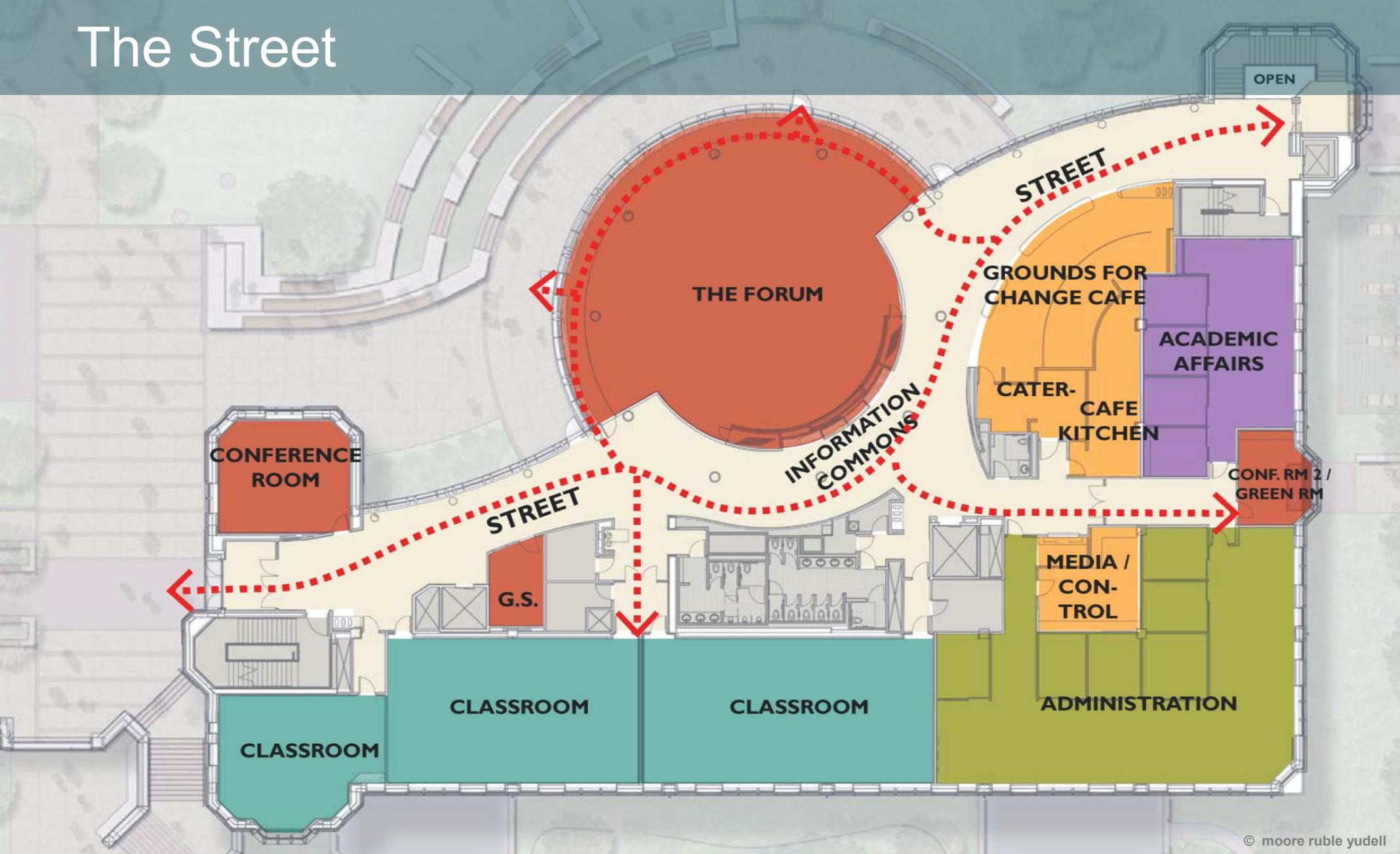
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Integrated Health and Wellness

- Core value to create a healthy workplace
- Planning to encourage physical activity
- Provide a mixed-use community of spaces
- Foster collaboration and interaction
- Connections to the outdoors
- Current and Future adaptability
- Increase workplace satisfaction

The Street



The Street



MAXINE CLARK
BOB FOX FORUM

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Forum - Heart of the School



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Healthy Menu Options



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Classrooms



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Social Stairs

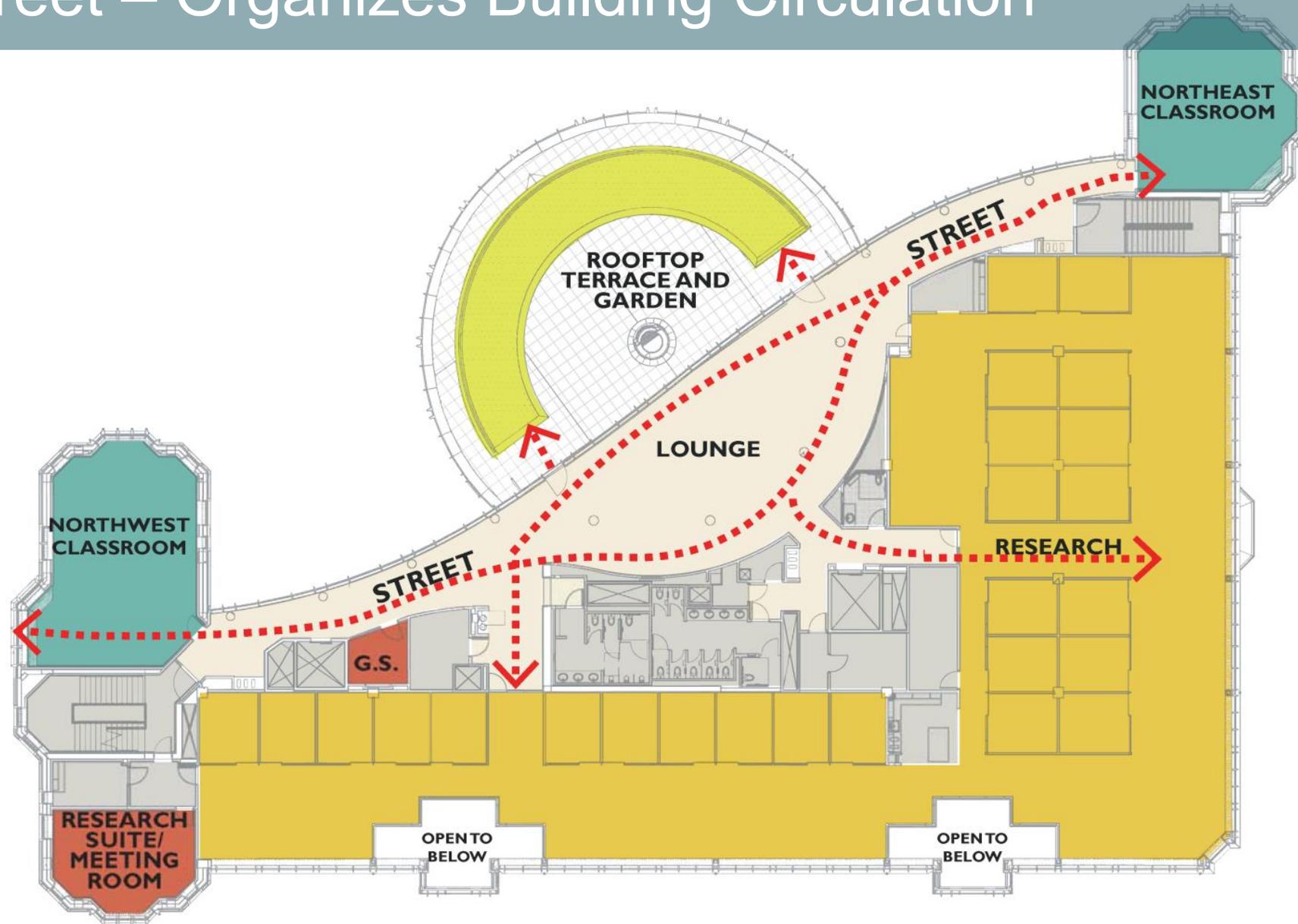


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The Street – Organizes Building Circulation

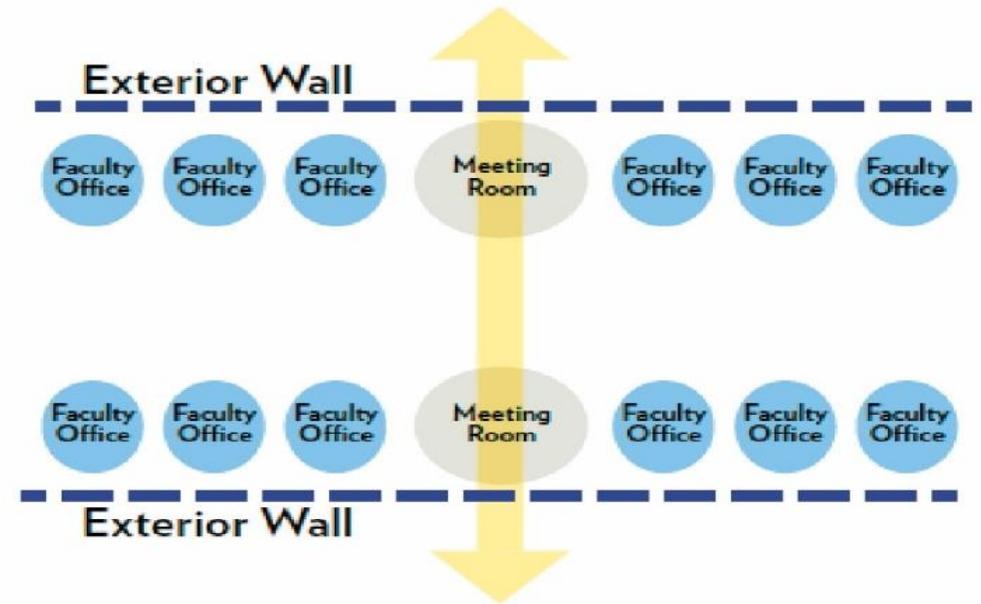


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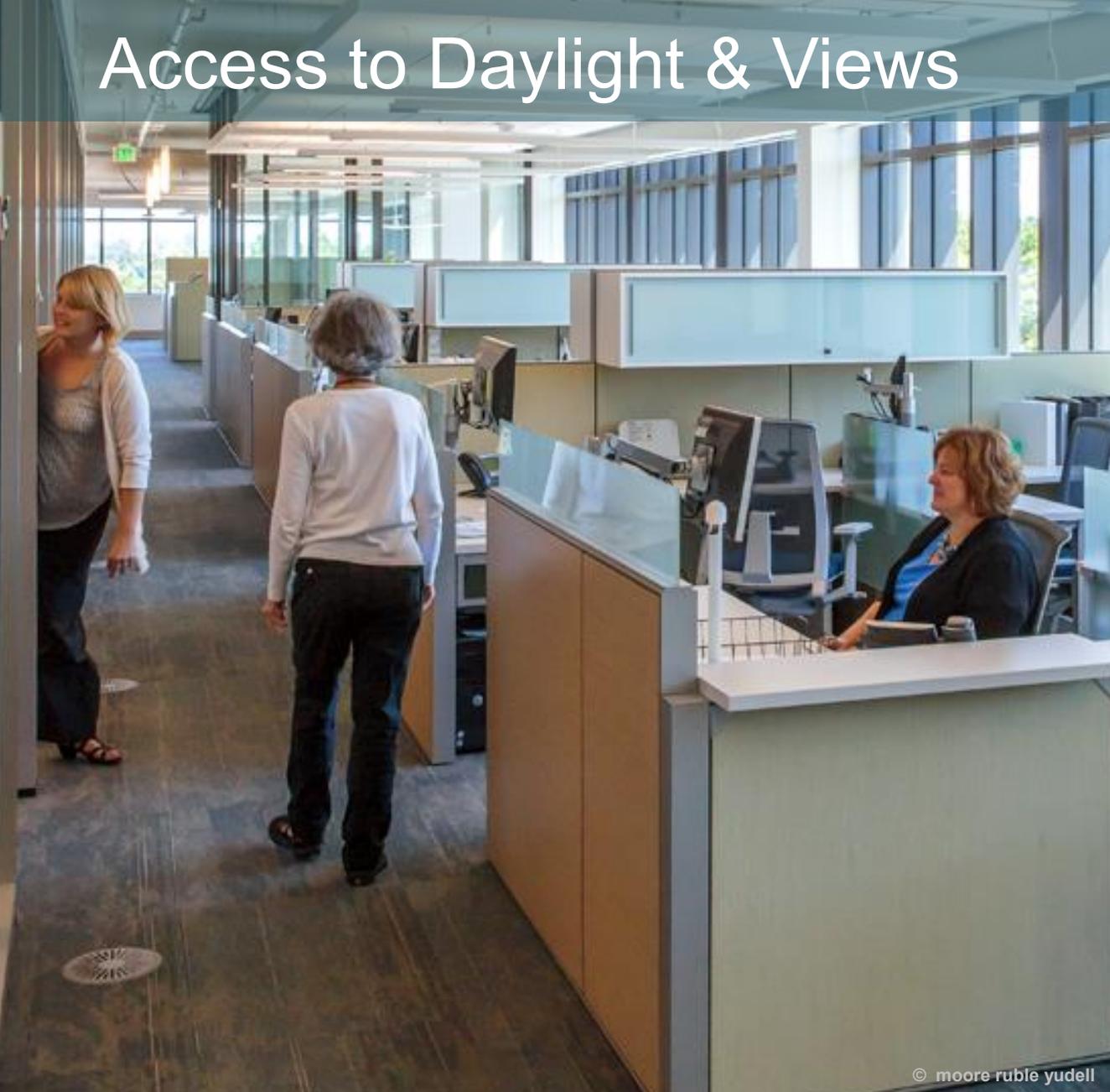
Goals for Faculty Offices

- Consolidate Faculty in one location
- Promote interaction and collaboration
- High workplace satisfaction
- Provide a rich mixed-use community
- Adapt to rapid changes in research projects
- Connection to the outdoors
- Democratic access to daylight and views

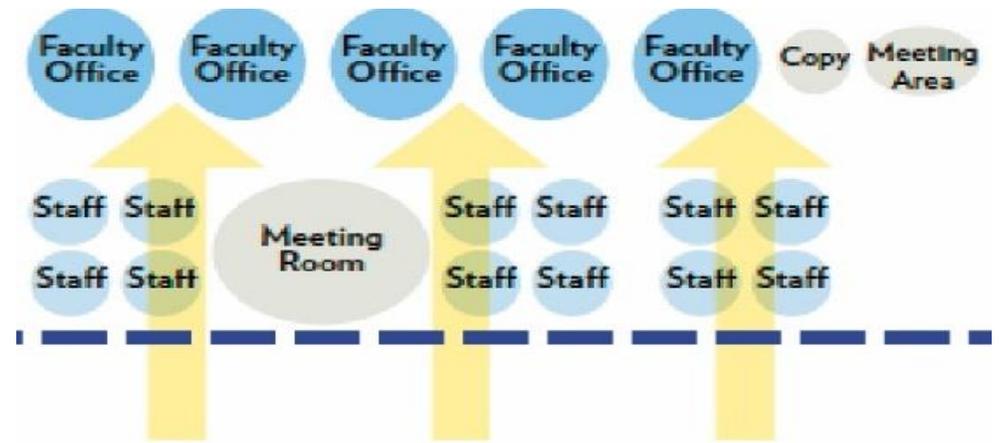
Existing Brown School Offices



Access to Daylight & Views



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Offices



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Ergonomics



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Gathering Spaces



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Interior Gardens



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Flexibility



A Diverse Community



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Outdoor Gathering Spaces



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Outdoor Classrooms



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Outdoor Spaces



Sustainable Performance

48%
Proposed
Energy Savings



48%
Reduction of
Potable Water Use



76%
FSC Certified
Wood



95%
Diverted
Construction Waste



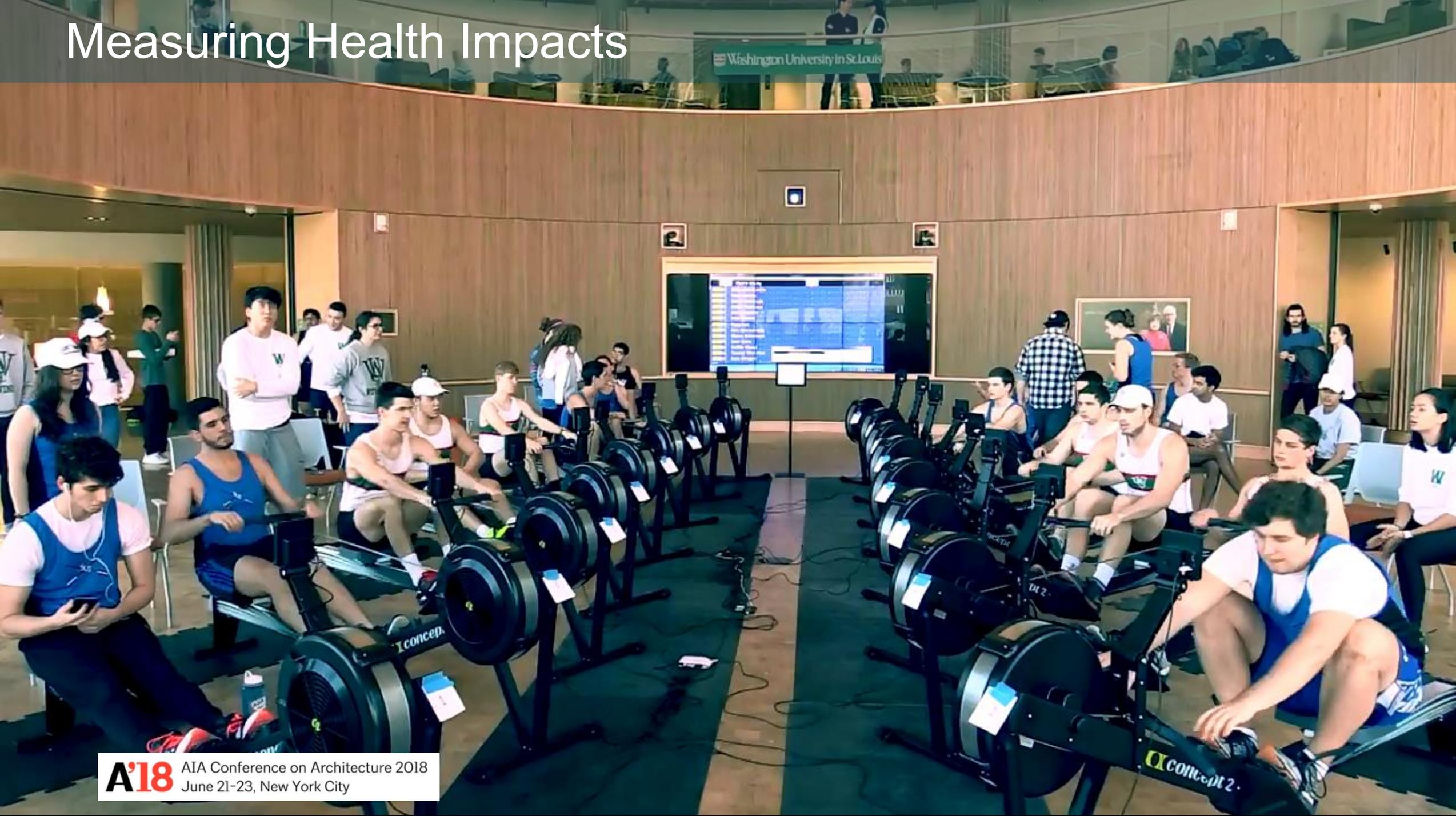
LEED Platinum: Greenest Building on Campus

2015-2020

Strategic Plan for SUSTAINABLE OPERATIONS



Measuring Health Impacts



Measuring Health Impacts

- Brown School BEEP Study
- Review a toolkit for evaluating a building's health and wellness performance
- Summarize findings of measuring health outcomes

Measuring Health Impacts

BEEP IS: **B**BROWN SCHOOL **E**XPANSION **E**EVALUATION **P**ROJECT

Design Workshop: June 2012

Researchers recognized the potential for a “natural experiment” to explore health and collaboration outcomes after moving to Hillman Hall

Amy Eyler, PhD

BEEP Co-Director
Brown School, Washington University in St. Louis

J. Aaron Hipp, PhD

BEEP Co-Director
North Carolina State University

Cheryl Valko, MPH, RD

BEEP Project Manager
Brown School, Washington University in St. Louis

Ramya Ramadas

BEEP Masters Research Fellow
Brown School, Washington University in St. Louis

BEEP Timeline



Start of Construction:
Baseline Data Collection:
Follow-up Data Collection:

July 2013
March – May 2015
March – May 2016

BEEP Timeline

2016

2017

2018

Dec.

Jan.

Jul.

Dec.

Jan.

Jul.

Dec.

PEER REVIEW

RESEARCH
PUBLISHED

DISTRIBUTION

Journal of
Physical Activity
and Health
April 2018

**Can Building Design Impact Physical Activity?
A Natural Experiment**
Authors: A. Eyler, J.A. Hipp, C. Valko, R. Ramades



Why study the connection between buildings &
health?

2,400 hours per year at work / 1,350 hours in school



“We are an evidence – based school. We are looking to contribute to the evidence on how all of these features influence the health of the occupants of Hillman Hall.”

Dr. Amy Eyler

Current Trends



Scientists Probe Indoor Work Spaces for Clues to Better Health

Office buildings are used as labs to determine optimum environmental conditions



Hillman Hall, at Washington University in St. Louis, was designed with easy access to stairways, lots of natural light and other health-minded features. A yearlong study begun this summer will test if the design features boost employees' physical activity and lead to greater collaboration. PHOTO: JAMES BYARD/WUSTL



Health.
It's a totally
different beast.™

Did you know?

Measuring Health Impacts



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Physical Activity

Movement
Sedentary Behavior
Standing Workstations
Garden Circuit

Team Science

Collaboration
Chance Interaction
Social Networks

BEEP: Tools & Methods

- Activity Monitors (ActivPAL Accelerometers)
- Ecological Momentary Assessments (EMA)
- Surveys
 - Physical Activity
 - Workplace Satisfaction
- Common Area Observations
- Focus Groups
- Stakeholder Interviews
- Social Network Analysis



Activity Monitors

- Real time sampling of current behavior – via text message
- 10 day period, Monday-Friday at 9 am, 12 pm and 3 pm)



Results Physical Activity: ActivPAL



24%

Increase in Physical Activity

*MET (Metabolic Equivalent of task energy expenditure during an activity independent of a person's weight)

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Results Physical Activity: ActivPAL



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23%

Increase in Hours Standing

Results Physical Activity: ActivPAL



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35%

**Increase in Steps
per Week**

Ecological Momentary Assessment (EMA)

- Real time sampling of current behavior – via App and text message
- 10 day period, Monday-Friday at 9 am, 12 pm and 3 pm)

Within the past 60 minutes, I have been primarily located at...

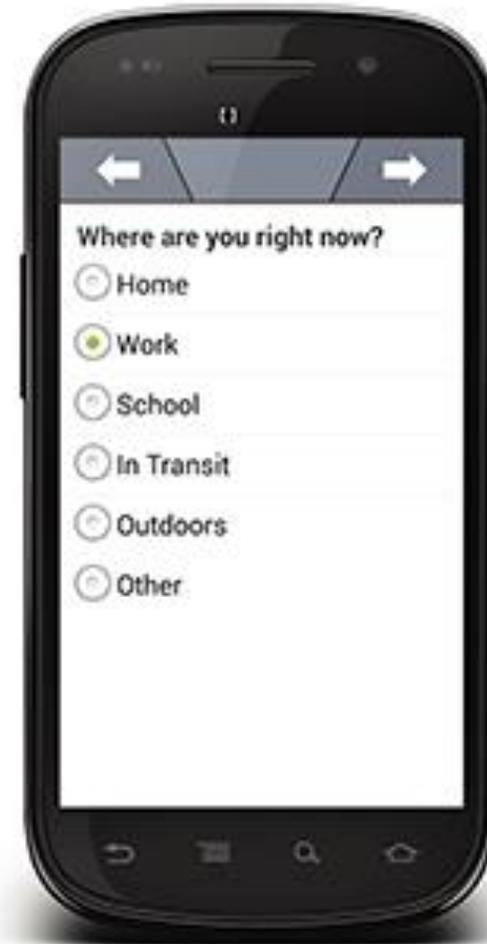
Make selections

In the past 60 minutes, which of the following have you used to print?

Make selections

In the past 60 minutes, have your office lights been on?

No



Ecological Momentary Assessment (EMA)

- Sustainability & Physical Activity Questions
- Collaboration & Workplace Quality Questions

Within the past 60 minutes, I have been primarily located at...

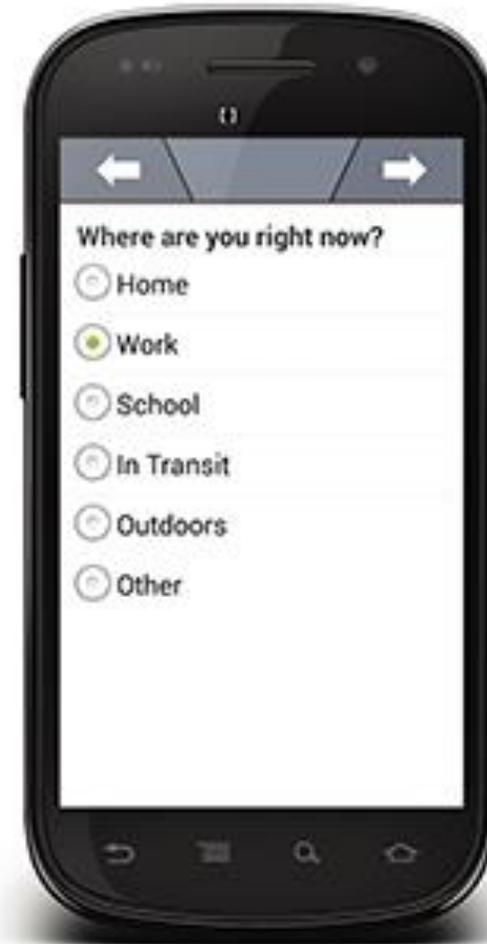
Make selections

In the past 60 minutes, which of the following have you used to print?

Make selections

In the past 60 minutes, have your office lights been on?

No



Survey: Physical Activity

D. Physical Activity

Table 11. Physical Activity Information (N=113)

Characteristic	n (%)	
	Faculty	Staff
Do you have a sit/stand option at your desk?		
Yes	10(22.7)	21(31.3)
No	34(77.3)	46(68.7)
Have you used a shower on campus (after exercise or commute)?		
Yes	0(0.0)	2(3.0)
No	42(100.0)	65(97.0)
Characteristic	Mean (SD)	
Faculty	Staff	
There are adequate places for me to change before or after exercise. ¹	3.00(2.03)	3.84(2.38)
I would feel supported if I chose to exercise during the workday. ¹	4.18(2.12)	4.39(2.10)
Total number of minutes in the past 5 workdays did moderate physical activity during the work day.	18.85(18.62)	23.68(15.94)

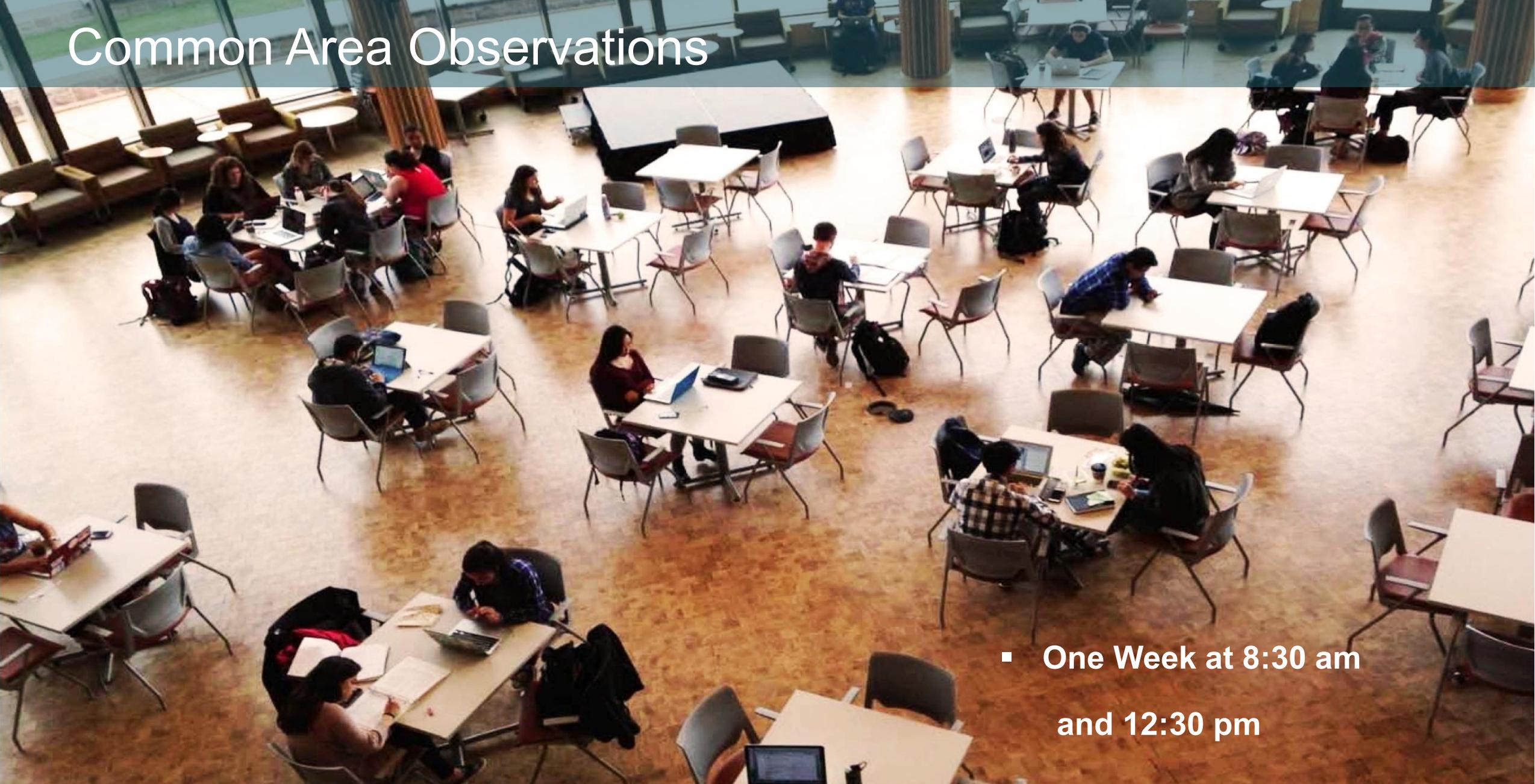
¹ Scores range from 1-7, where 1 represents strongly disagree and 7 represents strongly agree.

Survey: Workplace Experience

- 10 minute Survey Distributed at Faculty and Staff Meetings
- Distributed at Faculty and Staff Meetings – Over 170 participants

Please rate your level of agreement with the following:	Strongly agree			Strongly disagree				
I look forward to working in the building.	7	6	5	4	3	2	1	N/A
I am proud to show my building to visitors.	7	6	5	4	3	2	1	N/A
The overall appearance of the building is consistent with the mission of the Brown School.	7	6	5	4	3	2	1	N/A
There is a good sense of connection to the outdoors from inside the building.	7	6	5	4	3	2	1	N/A
There is a definite space that is the “heart” of the building.	7	6	5	4	3	2	1	N/A
I often stop and talk to others in corridors or break areas.	7	6	5	4	3	2	1	N/A
We have comfortable spaces to have lunch or take breaks inside the building.	7	6	5	4	3	2	1	N/A

Common Area Observations

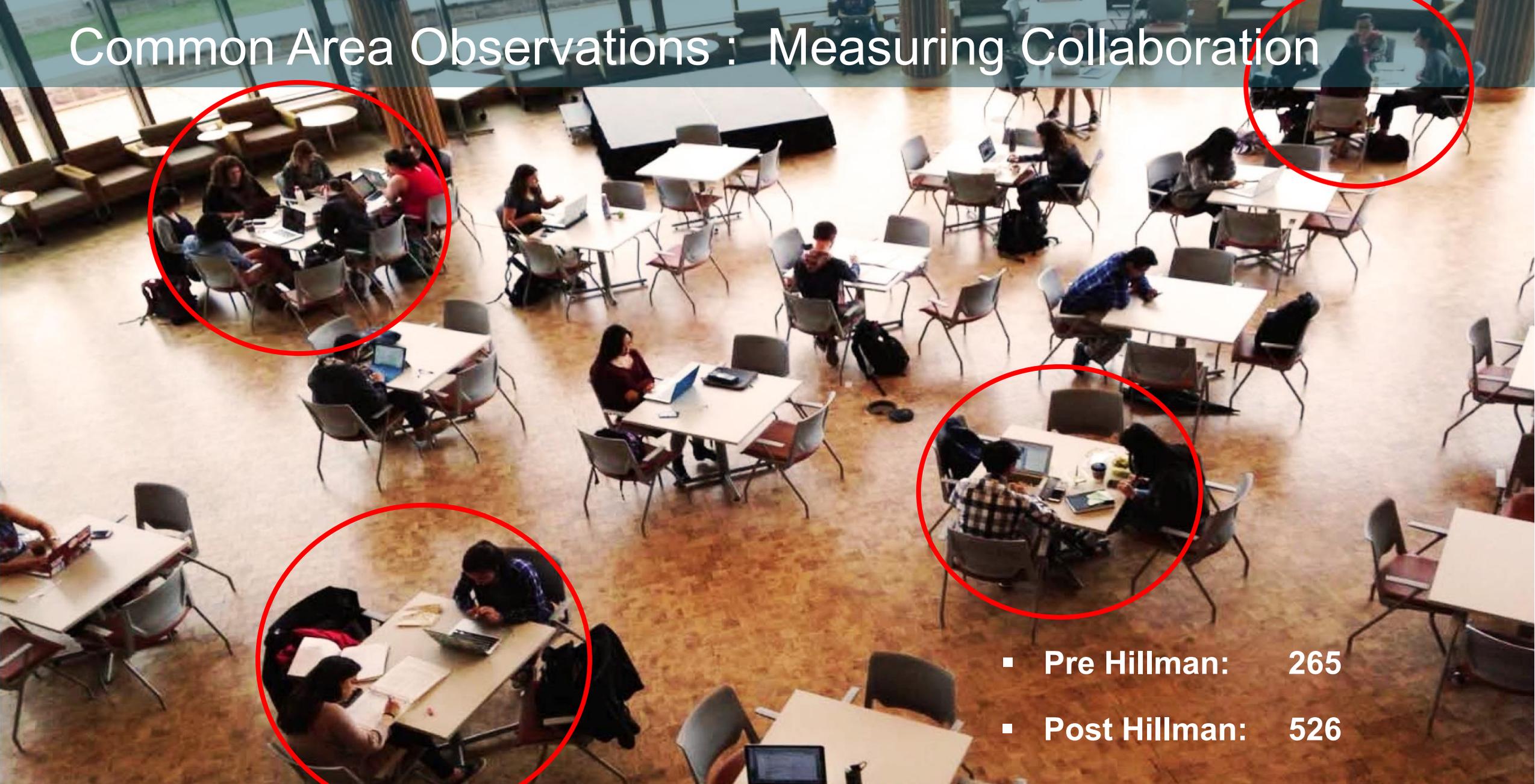


- One Week at 8:30 am
and 12:30 pm

Common Area Observations : Gathering



Common Area Observations : Measuring Collaboration



- Pre Hillman: 265
- Post Hillman: 526

Results Physical Activity: Survey and EMA



20%

Increase in Movement after Hillman Hall

“The showers have made a huge difference in allowing me to do non-incident physical activity . . . it feels empowering, especially if you want to commute by bike”

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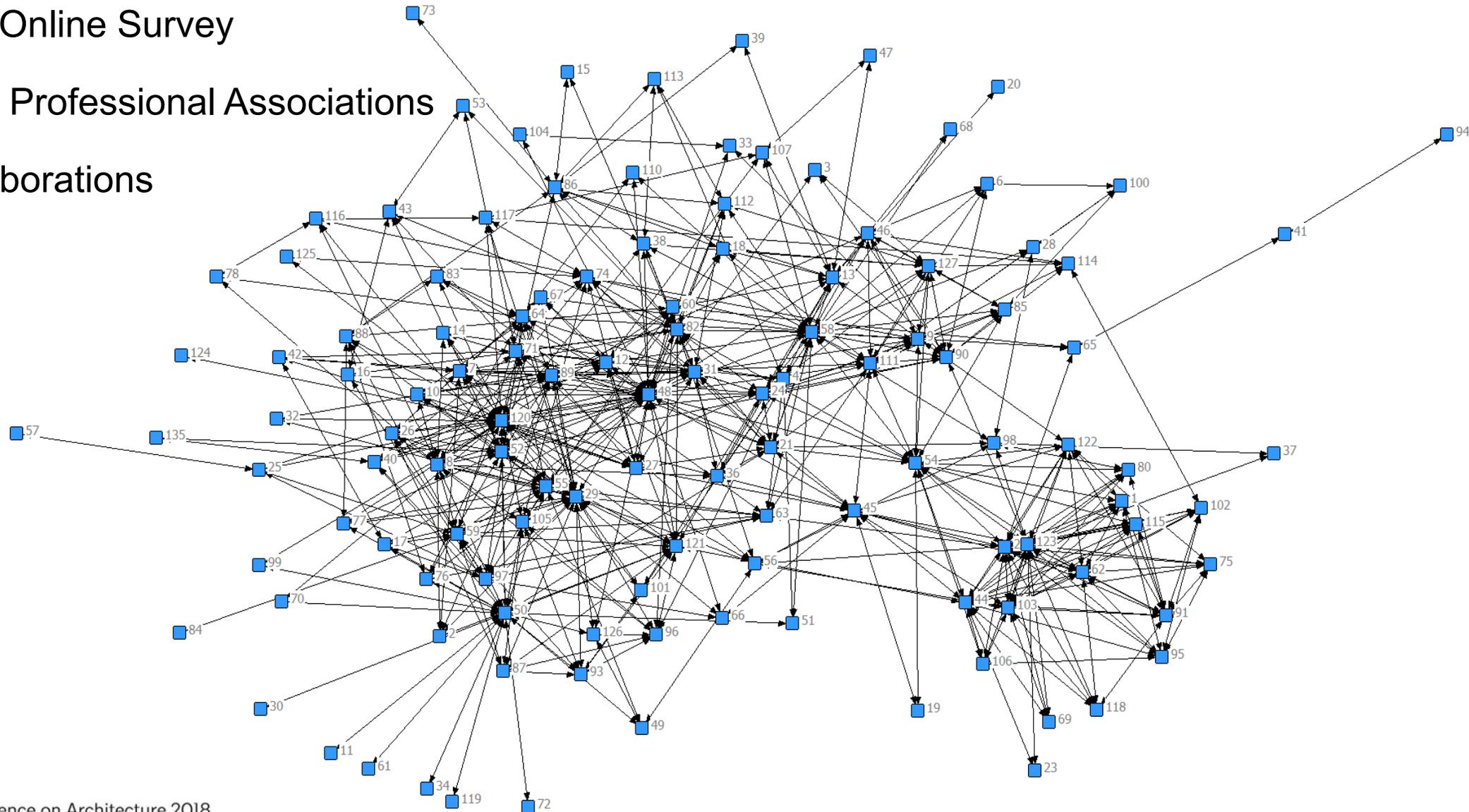
Team Science: Collaboration



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Social Network Density Analysis – Before Hillman Hall

- 15 minute Online Survey
- Social and Professional Associations and Collaborations

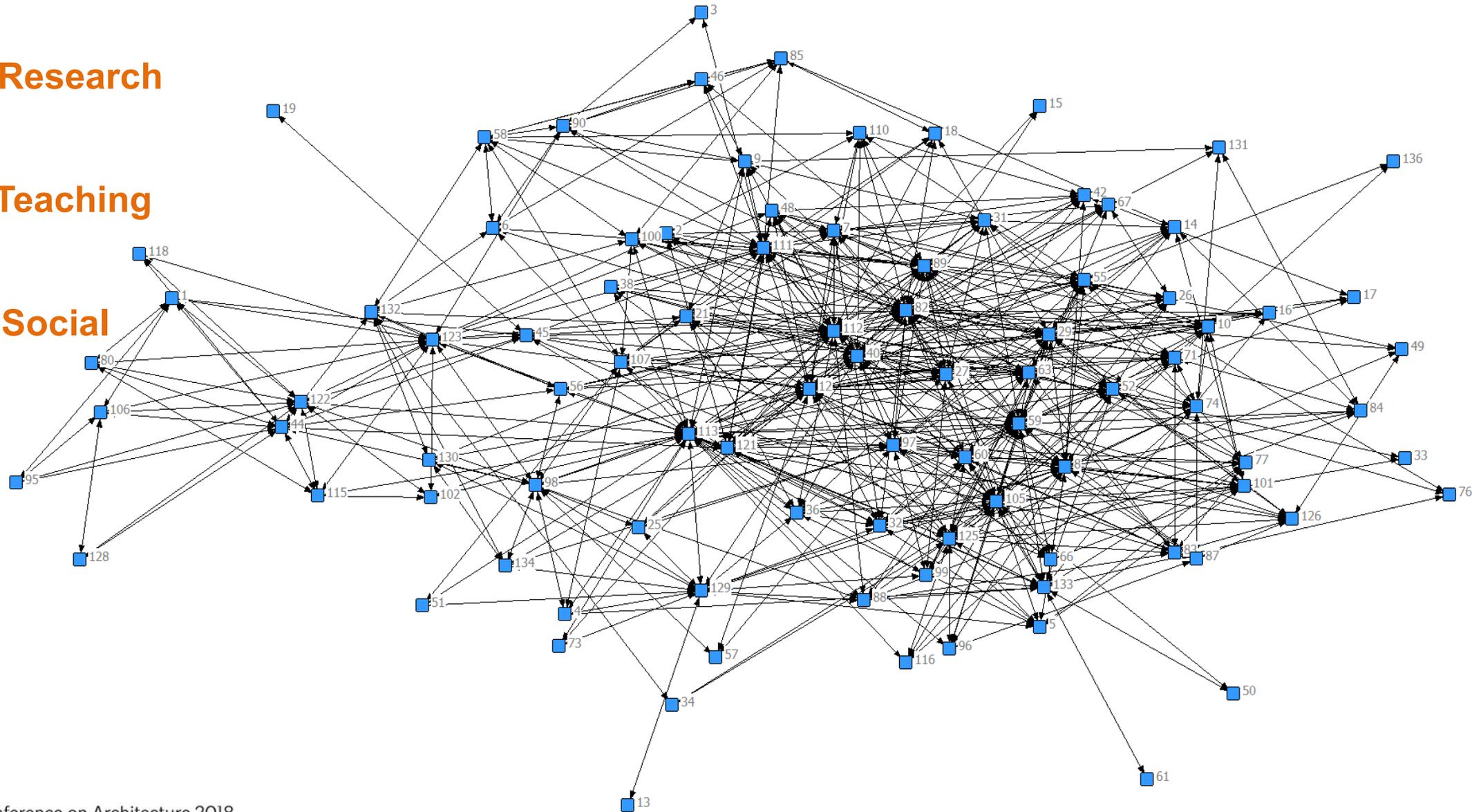


Social Network Density Increases – After Hillman Hall

25% Research

72% Teaching

113% Social



Team Science: Chance Interaction



18%

Increase
“Stop & Talk”

“We envisioned a ‘water cooler’ effect where people can have incidental interactions.”

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Team Science: Social Networks



19%

**Increase in
“Enhanced Work
With Others”**

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Team Science: Collaboration



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48%

Increase in Social Connections

“Happenstance meetings are easier.”

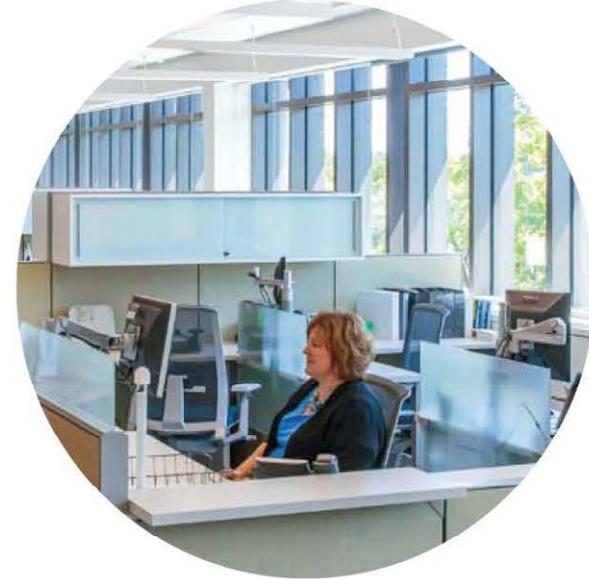
Overall Results – Increases



**Workplace
Satisfaction**



**Building
Satisfaction**



**Individual
Satisfaction**

*“There is the human factor that went into planning too.
Creating space that is healthy, beautiful, and productive for people who inhabit it.”*

Dr. Amy Eyler, Associate Professor and Assistant Dean for Public Health

'Building a Healthier Workplace A Toolkit for Architects, Planners, Researchers and Decision Makers'

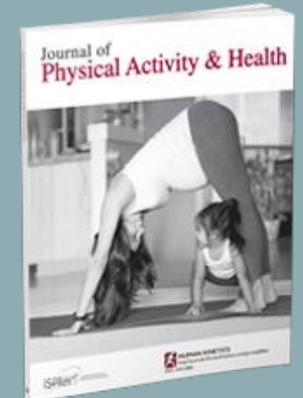
Prevention Research Center in St. Louis

www.prcstl.wustl.edu

Research And Findings: BEEP



'Can Building Design Impact Physical Activity? A Natural Experiment' Journal of Physical Activity and Health, April 2018



Acknowledgements/Credits

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architects & planners

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BROWN
SCHOOL
|| of Social Work ||

 Washington University in St. Louis

 MACKEY MITCHELL
ARCHITECTS

 ndropogon

 Alberici

BUROHAPPOLD
ENGINEERING

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kpff

QUESTIONS & ANSWERS



1. Which of these behaviors is deemed “the new smoking”?

- a. Working
- b. Sitting
- c. Driving
- d. Walking



1. Which of these behaviors is deemed “the new smoking”?

- a. Working
- b. Sitting**
- c. Driving
- d. Walking

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2. What is the average distance a person will choose to walk to a destination instead of drive?

- a. 0.25 mile
- b. 0.50 mile
- c. 0.75 mile
- d. 1 mile



2. What is the average distance a person will choose to walk to a destination instead of drive?

- a. 0.25 mile
- b. 0.50 mile**
- c. 0.75 mile
- d. 1 mile



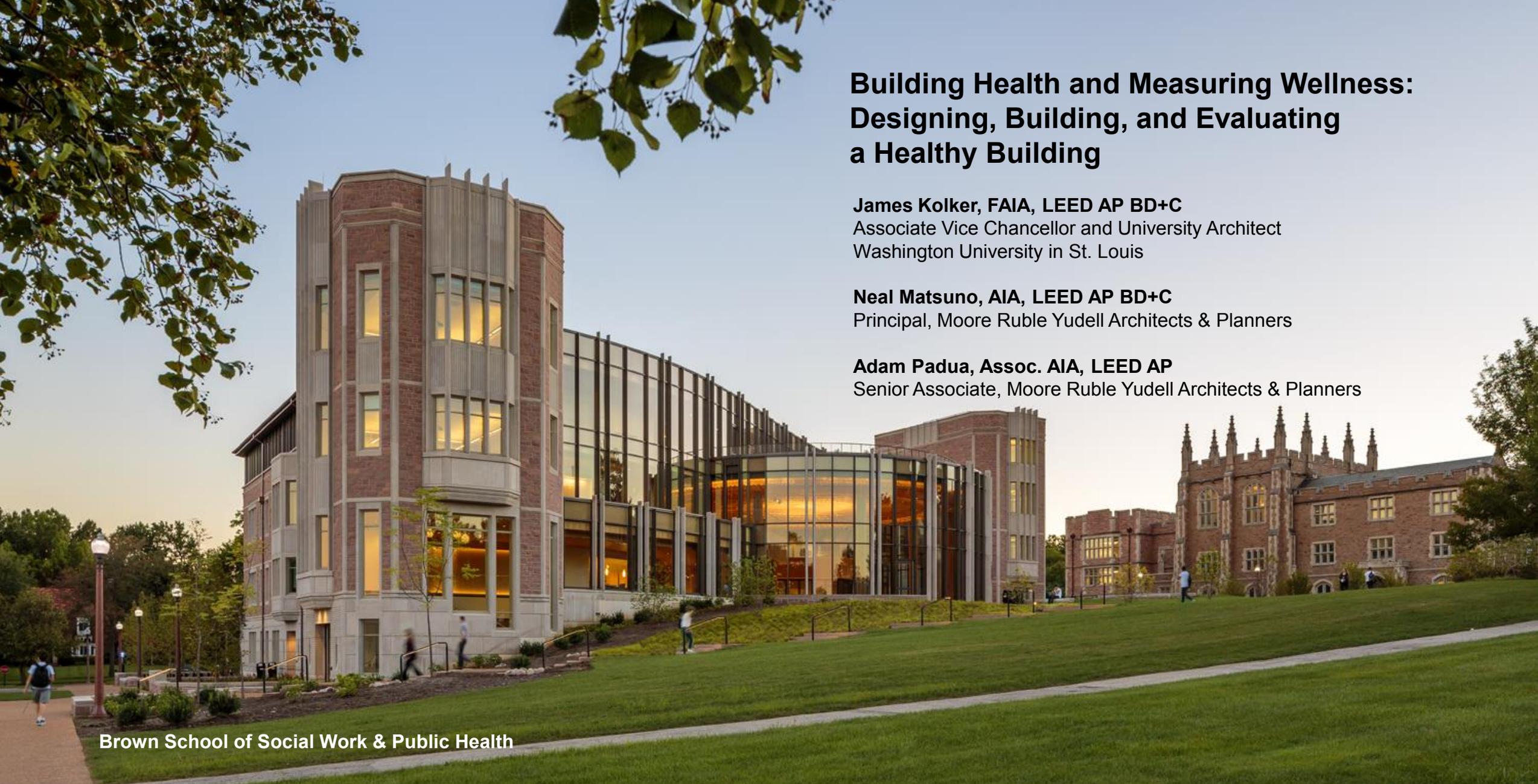
3. Of adults who own smartphones, what percentage report tracking a health behavior using mobile technology?

- a. 30%
- b. 50%
- c. 70%
- d. 90%



3. Of adults who own smartphones, what percentage report tracking a health behavior using mobile technology?

- a. 30%
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- c. 70%**
- d. 90%



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